OVAL INSTRUCTIONS

Ins. No. E-022-5-E

SMART COMMUNICATION UNIT
MODEL EL 2310-05E □□□

Applicable flowmeter: OVAL Coriolis Flowmeters

ULTRA*mass MKⅡ*, Mass Flex, ST*mass MKⅡ*, VR*mass*

Transmitters: CT9401, ST9801, EV9201
MT9411, MT9603, MT9431

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

CONTENTS

CONVENTIONS

Shown in this manual are the signal words NOTE, CAUTION and WARNING, as described in the examples below:

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

⚠ CAUTION: Caution statements signal the user about hazards or unsafe practices which could result in minor personal injury or product or property damage.

⚠ WARNING: Warning statements signal the user about hazards or unsafe practices which could result in severe 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.

※1. The EL2310 operates on the application software "LinkTop" furnished.
※2. This instruction manual applies to the transmitter ST9801 (MT9603) for the STmass MKⅡ, transmitter CT9401 (MT9411) for the ULTRAmas MKⅡ(including the Mass Flex), transmitter EV9201 for the VRmass,"D" sensor and extra-high pressure service transmitter MT9431
The application software automatically distinguishes between the transmitter connected and changes the window accordingly from the STmass MKⅡ to the VRmass, and vice versa.
Since they basically have windows in common, the windows covered in this manual are of the ULTRAmass MKⅡ.

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

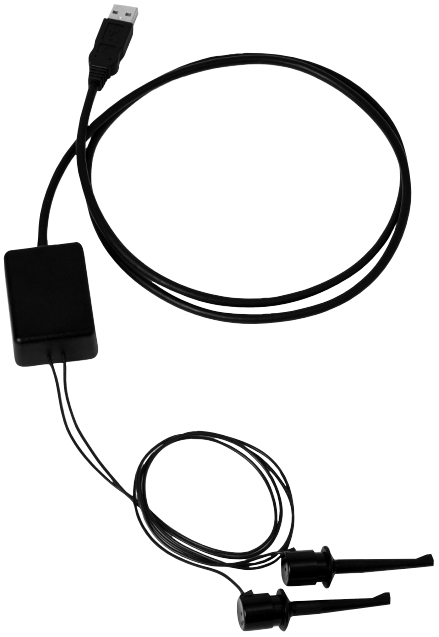


Fig.1

➡ 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.

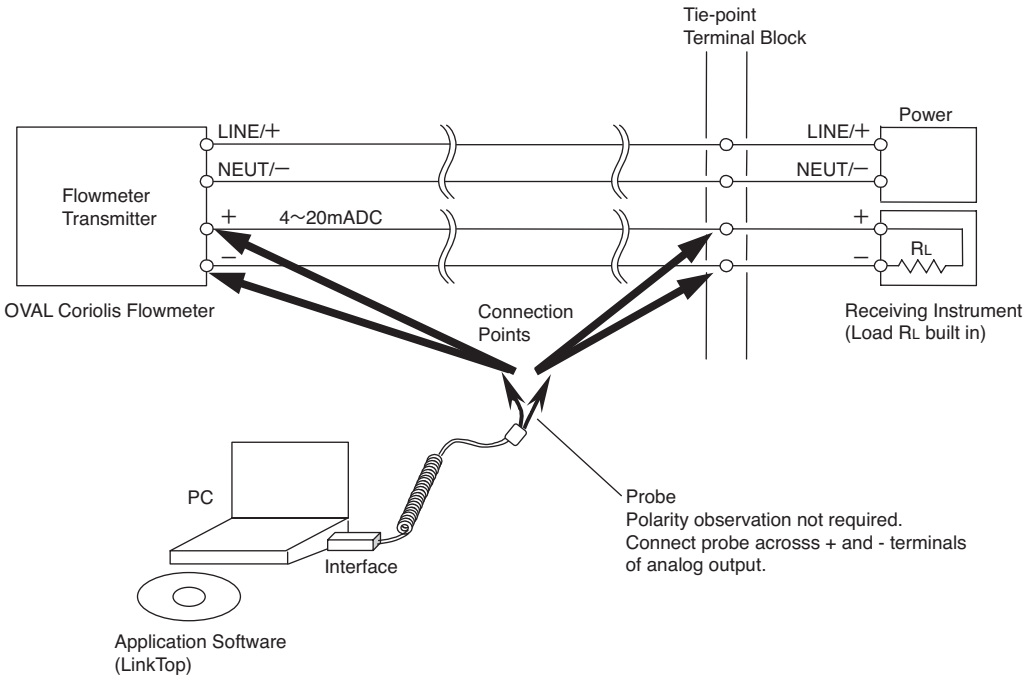


Fig.2

➡ 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, Windows Vista, Windows 7 to 11.
◇RAM: 8MB 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.

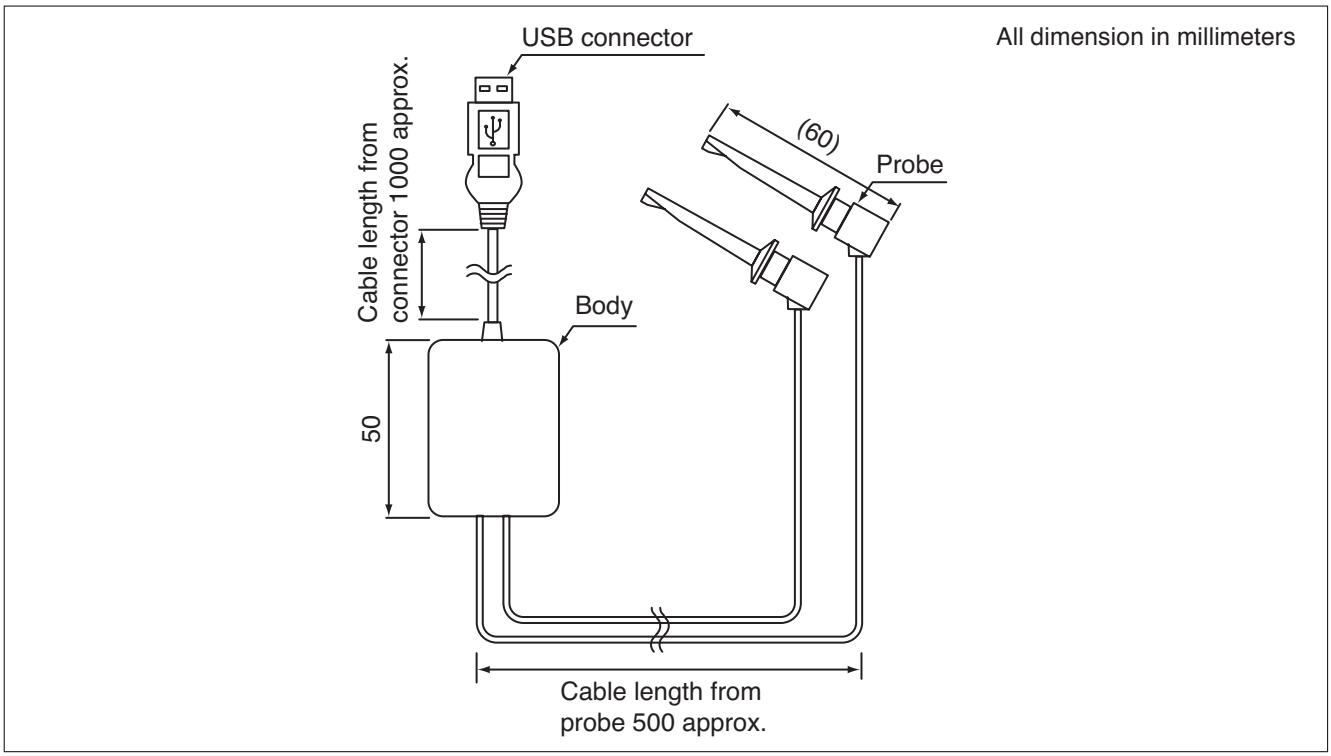


Fig.3

3.EL2310 OPERATION

3.1 About LinkTop Screen

Fig. 4 shows how the LinkTop window looks like.

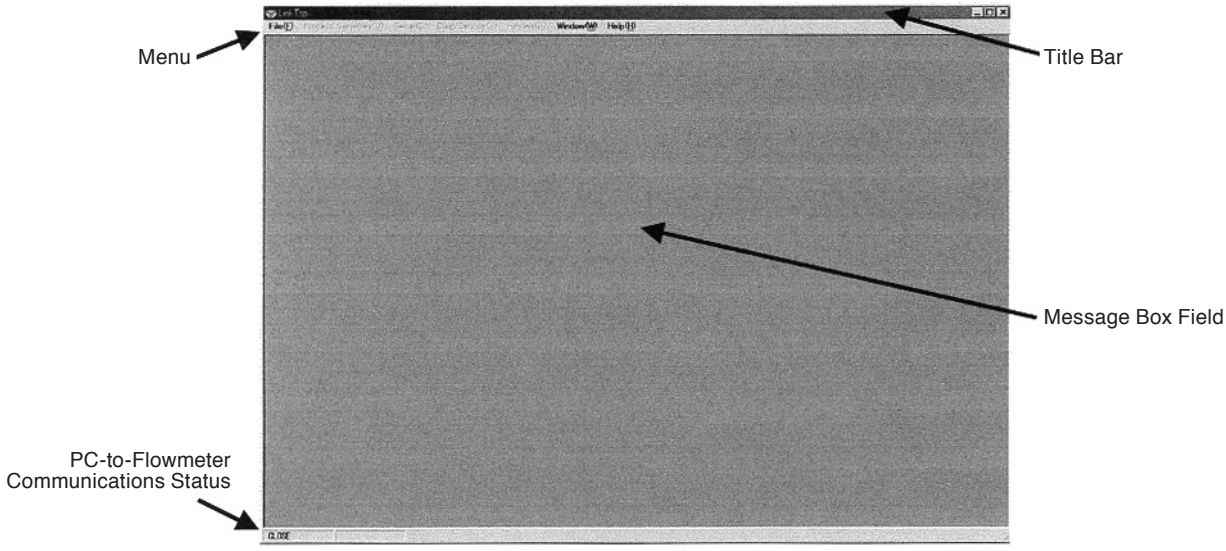


Fig.4

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.

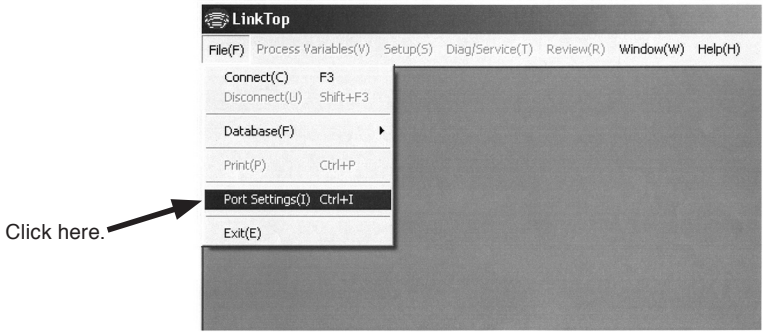


Fig.5

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

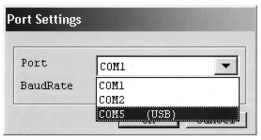


Fig.6

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.

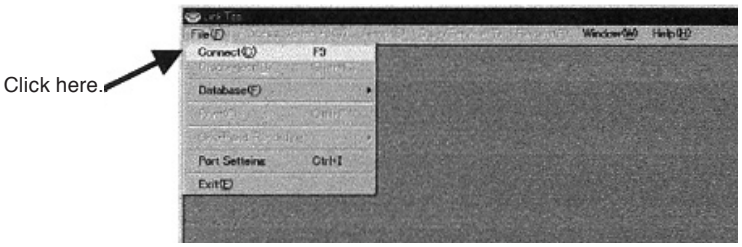


Fig.7

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

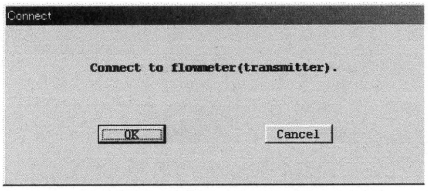


Fig.8

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.

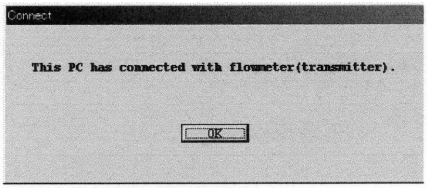


Fig.10

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).

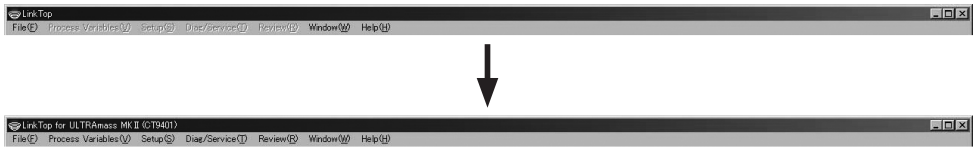


Fig.11

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.

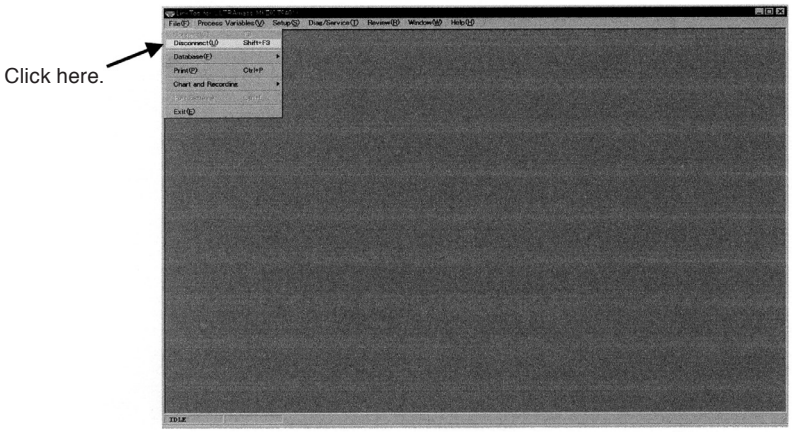


Fig.12

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.

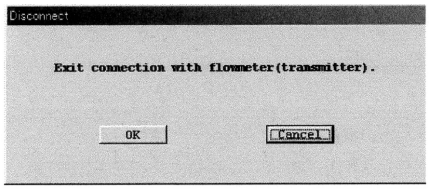


Fig.13

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

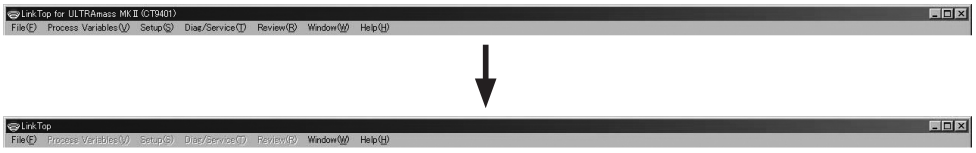


Fig.14

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."

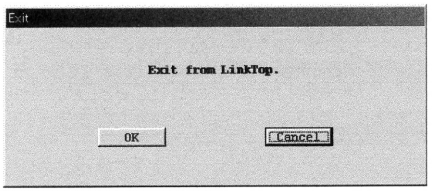


Fig.15

3.5 Menu : Process Variables

At "Process Variables," the process variables of the flowmeter (instantaneous flowrate, fluid density, fluid temperature, total flow, analog output), and H/L alarm can be reviewed. You can also reset the total counter.

3.5.1 Measure Process Variables (View Fld Dev Vars)

① Click on "Process Variable (V)" at the top-level menu of the screen and click on "View fl dev avers" again.

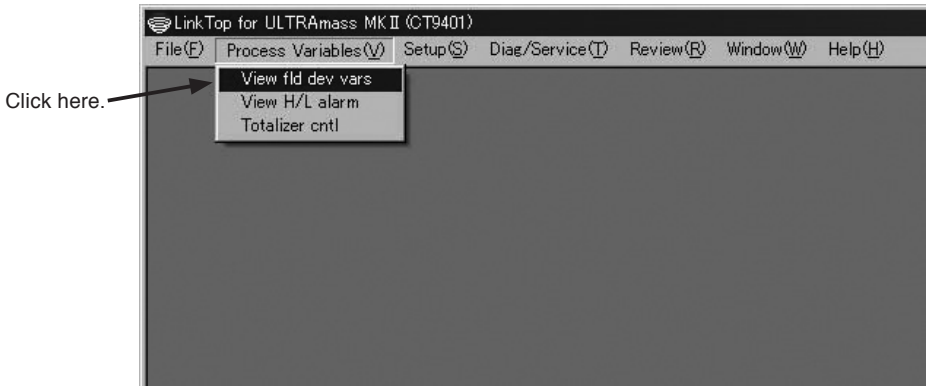


Fig.16

② A message box for measuring process variables appears as shown in Fig. 17.

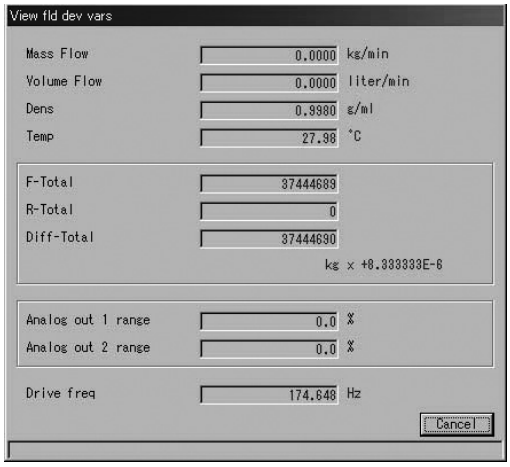


Fig.17

In ST9801, there is no "Volume Flow" menu.
In EV9201, neither "Volume Flow" nor "Dens" menu is shown.

③ If any problem is found in the flowmeter transmitter, an error message appears in a window below the message box for process variables. For detailed information, see"3.15 Error Messages".
For the total counter display, see "3. Measure Total Flow (Totalizer cntl)".

④ To hide the message box for process variables, click on "Cancel".

3.5.2 H/L Alarm (View H/L alarm)

① Click on "Process Variables (V)" at top-level menu, select "View H/L alarm", and click on again. A message box for H/L alarm then appears as shown in Fig. 18.

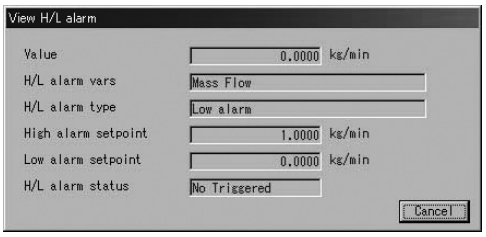


Fig.18

② At View H/L alarm, the "H/L alarm status" changes from "No Triggered" to "Triggered" when the selected item at "H/L alarm vars" of "Status output" reaches "High alarm point" or "Low alarm point," and the Status output changes from "ON" to "OFF."
In this connection, "H/L alarm status" is valid only when "H/L Alarm" is selected at "Status output func". As long as your option is other than "H/L Alarm," the "H/L alarm status" does not change to "Triggered" whether or not the setpoint is exceeded, and the status output also remains unchanged at "ON."

③ To hide the H/L alarm message box, click on "Cancel."

3.5.3 Measure Total Flow (Totalizer cntl)

① Click on "Process Variable (V)" at top-level menu on the screen, select "Totalizer cntl", and click on again. A message box for measuring the total flow appears as shown in Fig. 19.

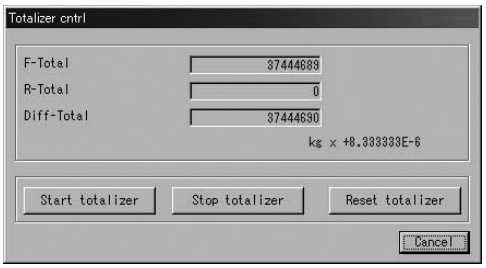


Fig.19

② Total flow comes in "F-Total", "R-Total" and "Diff-Total".

・"F-Total": Counts up while the fluid flows in the direction (forward) set at "Flow direction."

・"R-Total": Counts up while the fluid flows in the reverse direction with "Bi Direction" selected at "Status output func".

・Diff-Total": Means a relationship "Diff-Total = F-Total−R-Total" and is equal to "F-Total" except "Bi direction" is selected.
Here, the flow direction indicated on the flowmeter is regarded as "forward direction" when "Flow direction" is "Forward". The flow direction opposite to the arrow direction indicated on the flowmeter is regarded as "forward direction" when it is "Reverse".

③ At this message box, you can "Start", "Stop" or "Reset" the total counter. Remember that "Start", "Stop" and "Reset" are valid for the total counter reading, and by no means affect the pulse output.

④ To hide the message box for total flow measurement, click on "Cancel."

3.6 Menu : Setup

At "Setup", you can set up flowmeter parameters, transmitter information, etc.

> ⚠ **CAUTION**
>
> **To prevent erratic operation attributable to improper, conflicting parameter settings, make sure, following changes in parameters, that the changes in settings have correctly been made by comparing against "Menu : Review (a list of setup parameters)".**

If "Dia/Service (T)" message box is shown on the screen, you cannot set up parameters, transmitter information, etc. Close that message box (Epsom) before you begin.

3.6.1 Assign

① Click on "Setup (S)" at top-level menu of the screen, select "Assign", and click on again.

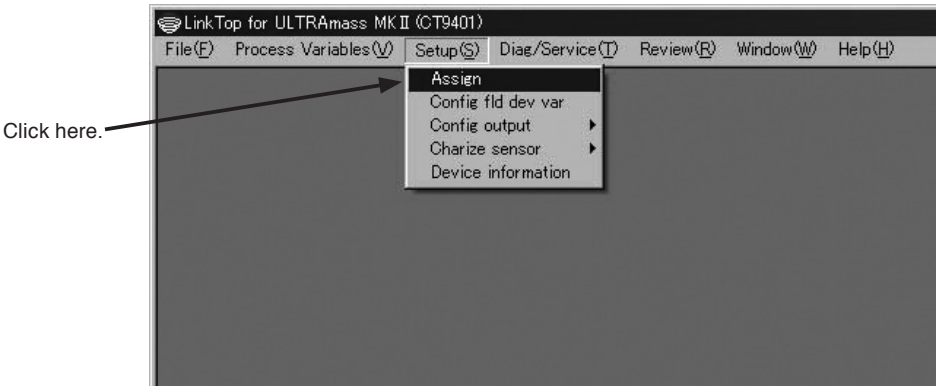


Fig.20

② A message box as shown in Fig. 21 appears. At this window, Analog outputs 1 and 2, and Pulse output are assigned.

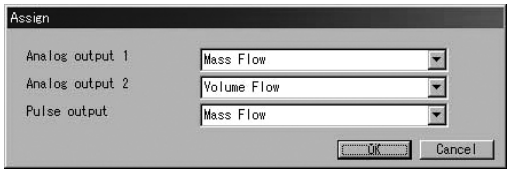


Fig.21

Since the pulse output of ST9801 and EV9201 is fixed to "Mass Flow", item "Pulse output" is not available.

③ Assign individual items : click on the arrow mart at right of the field and select your option from the drop-down list as shown in Fig. 22.

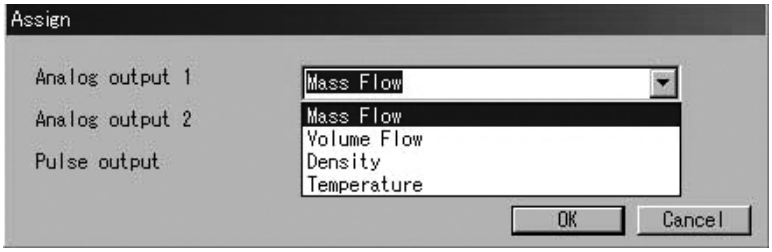


Fig.22

At "Analog output 1" and "Analog output 2", an item "Volume Flow" is not available.
In "Analog output 1" and "Analog output 2", neither "Volume Flow" nor "Density" menu item is shown.

④ After filling in all the fields required, click on "OK" button. A message box as shown in Fig. 23 then appears.
Clicking on "OK" at this point changes the previous settings to the new settings just entered. However, the flowmeter output also changes with the changes in settings made. For safety's sake, therefore, in applications where the flowmeter output controls a valve (s) or other devices, it is necessary that the control loop be switched to manual control to ensure that the control loop is unaffected by the flowmeter output.

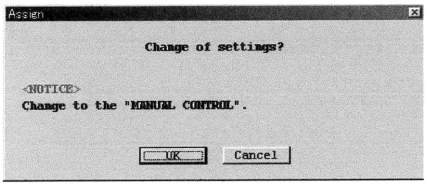


Fig.23

⑤ When the previous settings are replaced with the new settings just entered in response to clicking on "OK", a massage box as shown in Fig. 24 appears. Clicking on "OK" button at this point completes the setup.

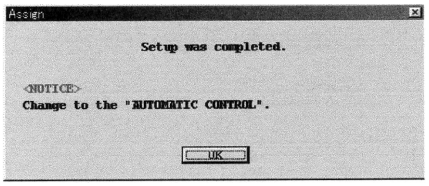


Fig.24

⑥ After clicking on "OK" button, the message box for filling in fields of menu items appears again.
Click on "Cancel" button to hide the setup message box.
To abort the setup process, click on "Cancel" button in the course of steps ② through ④ .

3.6.2 Transmitter Parameters (Config fld dev var)

① Click on "Setup (S)" at the top-level menu of the screen, select "Config fld dev var" drop-down menu, and click again.

② A message box like the one shown in Fig. 25 appears. Transmitter parameters (flowrate, density, and temperature related parameters) are set up at this window.

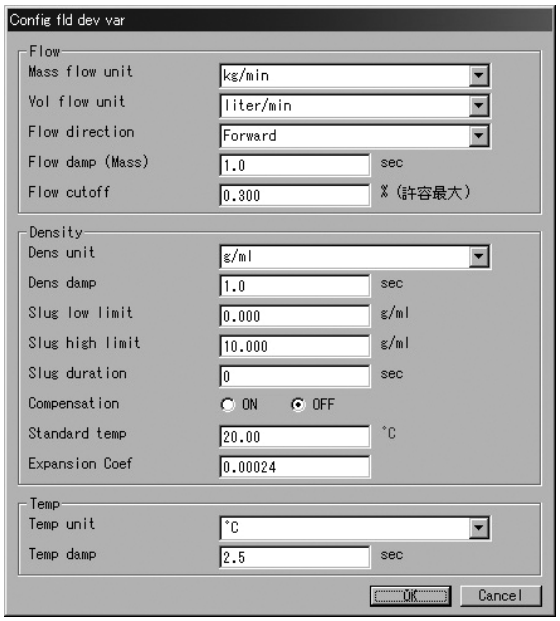


Fig.25

③ At the Flow menu, you can set up mass flowrate unit, volume flowrate unit, flow direction, flow damping, and flow cutoff.

In the ST9801 and EV9201, there is no "Volume flow unit" menu item.

Flow direction is either "Forward" of "Reverse." In the "Forward", the flow direction indicated by the arrow on the flowmeter body is taken as "Forward", whereas in the "Reverse", the flow direction opposite to the arrow is taken as "Forward".

"Flow cutoff" reads in percent with respect to the max. permissible flowrate and functions both in forward and reverse flow. Default setting is "0.3%".

④ At the Density menu, you can set up density unit, density damping, slug flow identification, and density correction.

In slug flow identification, any flow in which the obtained density measurement exceeds preselected "Slug low limit" or "Slug high limit" is interpreted as a gas-mixed flow or slug flow, and the obtained flowmeter results and their outputs are forcibly reduced to "0." When settings are such that "Slug low limit"=0 and "Slug high limit"=10, the slug flow identifying function is inactivated. However, within the period preset at "Slug duration", the transmitter ignores the status of a slug flow and continues usual measurement.

In density correction, density and volume flow readings are reduced to the values corrected at the reference temperature if "Compensation" is "ON" (conversion calculated on the basis of "Standard temp" and "Expansion Coef").

In the EV9201, there is no "Density" menu item.

⑤ At "Temp", you can set up temperature units and temperature damping.

⑥ You are to set up individual items : for items with an arrow mark at right, click on the arrow mark at right, select the item from the drop-down list ; for other items, Key in appropriate values directly.

⑦ After filling in all the fields required, click on "OK" button. A message box as shown in Fig. 26 then appears.
Clicking on "OK" at this window changes the previous settings to the new settings just entered.
However, the flowmeter output also changes with the changes in settings made. For safety's sake, therefore, in applications where the flowmeter output controls a valve or other devices, it is necessary that the control loop be switched to manual control to ensure that the control loop is unaffected by the flowmeter output.

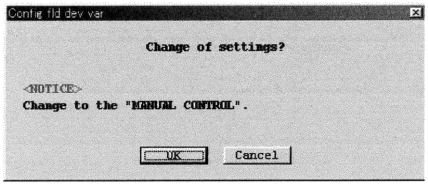


Fig.26

⑧ When the previous settings are replaced with the new settings just entered in response to clicking on "OK", a message box as shown in Fig. 27 appears. Clicking on "OK" button at this point completes the setup.

Fig.27

⑨ After clicking on "OK" button, the message box for filling in fields of menu items appears again.
Click on "Cancel" button to hide the message box for filling in fields of setup items.
To abort the setup process, click on "Cancel" button in the course of steps ② through ⑦ .

⚠ CAUTION

When the units of measurement are changed, it is necessary to change the units of measurement included in other message boxes. When Some message box is open with units of measurement included, close that message box once and then open it again before renewing the units.

3.6.3 Analog output 1

① Click on "Setup (S)" at the top-level menu of the screen, select "Analog Output 1" from " Config output" drop-down menu, and click on again.

② A message box like the one shown in Fig. 28 appears. Analog output 1 is set up at this window.

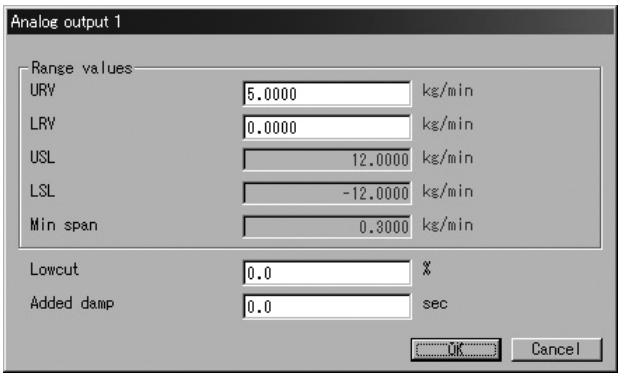


Fig.28

③ You are to set up individual items. Acceptable ranges of USL (sensor's upper limit), LSL (sensor's lower limit), Min. Span are shown at URV (setting at 20mA) and LRV (setting at 4mA) as a guide to your entering setpoints.

The low cutoff function is "OFF" when your "Lowcut" option is "0.0%". Default is "0.0%". When items other than flowrate (mass and volume) are assigned, do not fail to set to "0.0%". If "Bi direction" is chosen, the low cutoff functions both in the forward and reverse directions.

④ After filling in all the fields required, click on "OK" button. A message box as shown in Fig. 29 then appears.

Clicking on "OK" at this window changes the previous settings to the new settings just entered.

However, the flowmeter output also changes with the changes in settings made. For safety's sake, therefore, in applications where the flowmeter output controls a valve (s) or other devices, it is necessary that the control loop be switched to manual control to ensure that the control loop is unaffected by the flowmeter output.

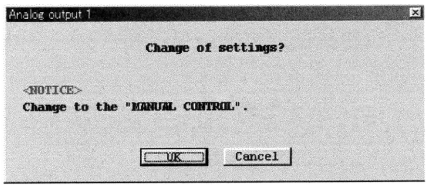


Fig.29

⑤ When the previous settings are replaced with the new settings just entered in response to clicking on "OK", a message box as shown in Fig. 30 appears. Clicking on "OK" button at this point completes the setup.

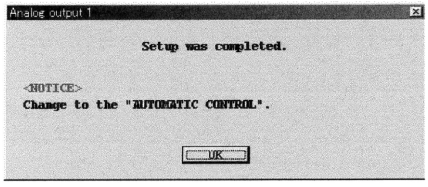


Fig.30

⑥ Clicking on "OK" brings the screen to return to the message box for filling in fields of items.

Click on "Cancel" button to hide the message box for filling in fields of items.

To abort the setup process, click on "Cancel" button in the course of steps ② through ④ .

3.6.4 Analog Output 2

① Click on "Setup (S)" at the top-level menu of the screen, select "Analog Output 2" from "Config output" drop-down menu, and click on again.

② Similar to the procedure outlined in Steps ② through ⑤ in "3. Analog Output 1", Analog output 2 is set up here.

3.6.5 Pulse Output

① Click on "Setup (S)" at the top-level menu of the screen, select "Pulse output" from "Config output" drop-down menu, and click on again.

② A message box like the one shown in Fig. 31 appears. Pulse output 2 is set up at this window.

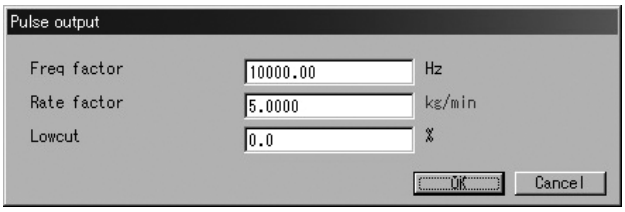


Fig.31

③ You are to set up individual items.
The low cutoff is "OFF" when your "Lowcut" option is "0.0%". Default setting is "0.0%".
If "Bi direction" is chosen, the cutoff functions both in the forward and reverse direction.

④ After filling in all the fields required, click on "OK" button. A message box as shown in Fig. 32 then appears.
Clicking on "OK" at this window changes the previous settings to the new settings just entered. However, the flowmeter output also changes with the changes in settings made. For safety's sake, therefore, in applications where the flowmeter output controls a valve or other devices, it is necessary that the control loop be switched to manual control to ensure that the control loop is unaffected by the flowmeter output.

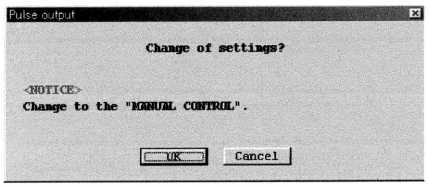


Fig.32

⑤ When the previous settings are replaced with the new settings just entered in response to clicking on "OK", a message box as shown in Fig. 33 appears. Clicking on "OK" button at this point completes the setup.

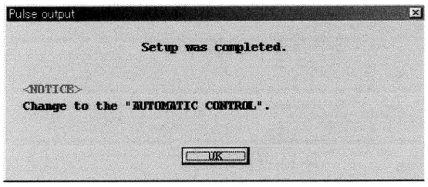


Fig.33

⑥ After clicking on "OK" button, the message box for filling in fields of items appears again. Click on "Cancel" button to hide the message box for filling in fields of items. To abort the setup process, click on "Cancel" button in the course of steps ② through ④ .

3.6.6 Status Input

① Click on "Setup (S)" at top-level menu of the screen, select "Status input" from "Config output" drop-down list, and click on again.

② A message box as shown in Fig. 34 appears. Status input function is set up at this window.

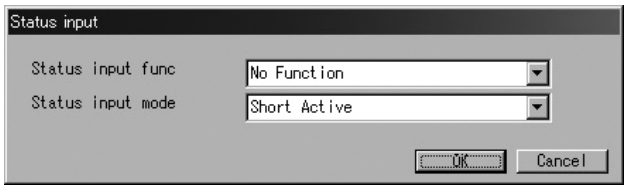


Fig.34

③ By clicking on the arrow mark at right, select the function to be set up from the drop-down list as shown in Fig. 35.

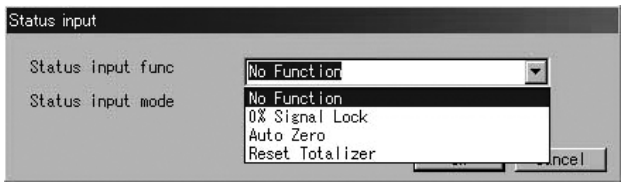


Fig.35

④ You can select the status input from three functions-"0% Signal Lock", "Auto Zero" and "Reset Totalizer".

・"0% Signal Lock" : Forcibly locks individual outputs at 0%.

・"Auto Zero" : Zeroes from a terminal in a remote location (remote zero).

・"Reset Totalizer" : Reset the totalizer from a terminal in a remote location.

Default setting is "No Function". To disable the status input function, select "No Function".

⑤ You can select the status input from two types of input- "a" form contact input or "b" form contact input.

・"Short Active" : "a" form contact input

・"Open Active" : "b" form contact input

Default setting is "Short Active".

After filling in all the fields required, click on "OK" button. A message box as shown in Fig. 36 then appears. Clicking on "OK" at this window changes the previous settings to the new settings just entered. However, the flowmeter output also changes with the changes in settings made. For safety's sake, therefore, in applications where the flowmeter output controls a valve (s) or other devices, it is necessary that the control loop be switched to manual control to ensure that the control loop is unaffected by the flowmeter output.

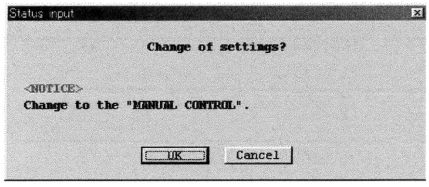


Fig.36

⑥ When the previous settings are replaced with the new settings just entered in response to clicking on "OK", a massage box as shown in Fig. 37 appears. Clicking on "OK" button at this point completes the setup.

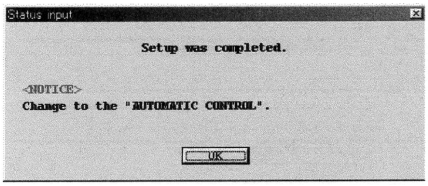


Fig.37

⑦ After clicking on "OK" button, the message box for filling in fields of items appears again. Click on "Cancel" button to hide the setup message box.
To abort the setup process, click on "Cancel" button in the course of steps ② through ④ .

3.6.7 Status Output

① Click on "Setup (S)" at top-level menu of the screen, select "Status output" from "Config output" drop-down list, and click on again.
② A message box as shown in Fig. 38 appears. Status output function is set up at this window.

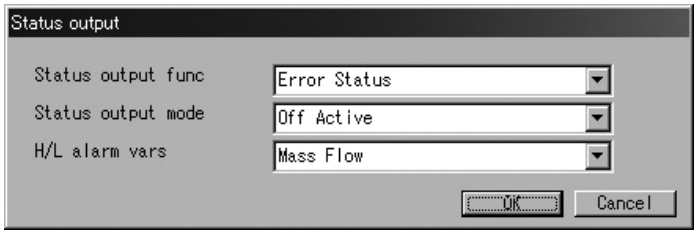


Fig.38

③ As shown in Fig. 39, select from the drop-down list the function to be set up for the status output by clicking on the arrow mark at right of "Status output func".

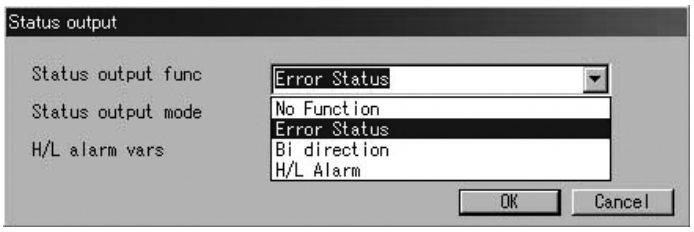


Fig.39

④ Status output is an open collector output available from three functions- "Error Status", "Bi direction" and "H/L Alarm".

・"Error Status" : Turns the status output "OFF" when the item selected at "Error select" is in error.

・"Bi direction" : Accepts the flow (mass and volume) in the bidirectional mode (output increases with increased flowrate, regardless of the flow direction) and turns the status output "OFF" on reverse flows. Incidentally, the flow direction arrow indicated on the flowmeter is taken as "Forward" direction when the "Flow direction" is "Forward", whereas the flow direction opposite to the arrow indicated on the flowmeter is taken as "Forward" when it is "Reverse".

・"H/L Alarm" : Turns the status output "OFF" when the menu item set up at "H/L alarm vars" reaches the point preset at "High alarm point" or "Low alarm point".

Default setting is "Error status."

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

If "No Function" is your option, the status output remains "OFF".

By the way, status output logic is selectable in "Status output mode".

Default is "OFF", that is to say "OFF active" is selected.

⑤ If you want to use the status output for "H/L Alarm", click on the arrow mark at right of "H/L alarm vars" and select from the drawdown list the item for setting the H/L alarm as shown in Fig. 40.

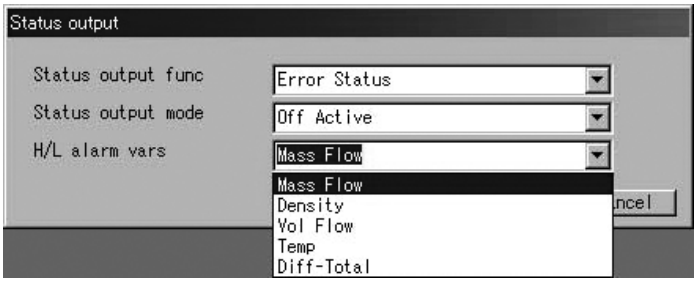


Fig.40

You can choose from five "H/L alarm vars" items- "Mass Flow", "Density", "Vol Flow", "Temp" and "Diff-Total".

The ST9801 is not provided with menu item "Vol Flow" for selection.

The EV9201 has neither "Vol Flow" nor "Density" menu item.

⑥ After filling in all the fields required, click in "OK" button. A message box as shown in Fig. 41 then appears.

Clicking on "OK" at this window changes the previous settings to the new settings just entered. However, the flowmeter output also changes with the changes in settings made. For safety's sake, therefore, in applications where the flowmeter output controls a valve or other devices, it is necessary that the control loop be switched to manual control to ensure that the control loop is unaffected by the flowmeter output.

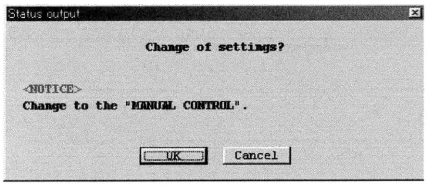


Fig.41

⑦ When the previous settings are replaced with the new settings just entered in response to clicking on "OK", a message box as shown in Fig. 42 appears. Clicking on "OK" button at this point completes the setup.

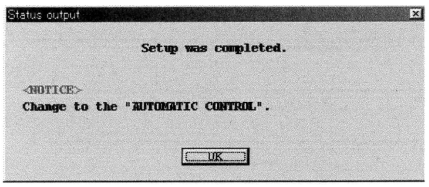


Fig.42

⑧ After clicking on "OK" button, the message box for filling in fields of items appears again. Click on "Cancel" button to hide the message box for filling in fields of items.
To abort the setup process, click on "Cancel" button in the course of steps ② through ⑥ .

3.6.8 H/L Alarm

① Click on "Setup (S)" at top-level menu of the screen, select "H/L alarm" from "Conf. output" drop-down list, and click on again.
② A message box as shown in Fig. 43 appears. H/L alarm related items are set up here.

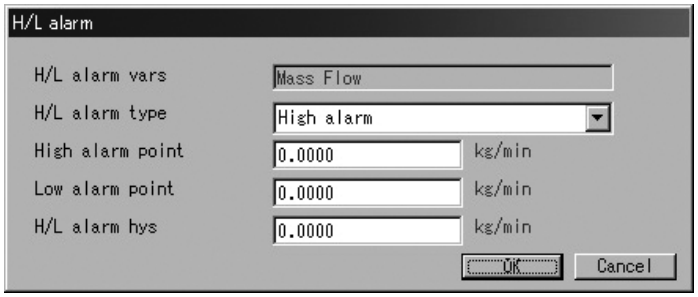


Fig.43

③ H/L alarm is a function to turn the status output "OFF" when the item set at "H/L alarm vars" reaches "High alarm point" or "Low alarm point" (where "Status output func" is set to "H/L Alarm").
Select one type to suit your particular application from three available alarms- "High alarm", "Low alarm" and "H/L alarm".
・"High alarm" : turns the status output "OFF" when "High alarm point" is reached.
・"Low alarm" : Turns the status output "OFF" when "Low alarm point" is reached.
・"H/L alarm" : Turns the status output "OFF" when "High alarm point" or "Low alarm point" is reached.
H/L alarm status can be reviewed at "View H/L alarm" and "Process Variables (V)".
④ Set up individual items. For items with an arrow mark at right, click on the arrow mark at right, select from the drop-down list ; for other items, key in appropriate Estonians directly.

⑤ After filling in all the fields required, click on "OK" button. A message box as shown in Fig. 44 then appears.
Clicking on "OK" at this window changes the previous settings to the new settings just entered. However, the flowmeter output also changes with the changes in settings made. For safety's sake, therefore, in applications where the flowmeter output controls a valve or other devices, it is necessary that the control loop be switched to manual control to ensure that the control loop is unaffected by the flowmeter output.

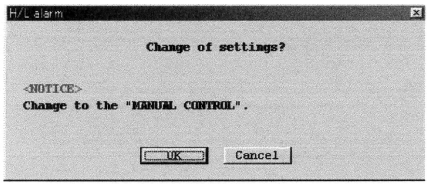


Fig.44

⑥ When the previous settings are replaced with the new settings just entered in response to clicking on "OK", a message box as shown in Fig. 45 appears. Clicking on "OK" button at this point completes the setup.

Fig.45

⑦ After clicking on "OK" button, the message box for filling in fields of items appears again. Click on "Cancel" button to hide the message box for filling in items.
To abort the setup process, click on "Cancel" button in the course of steps ② through ⑤ .

3.6.9 Error Output Select (Error select)

① Click on "Setup (S)" at top-level menu of the screen, select "Error select" from "Conf. output" drop-down list, and click on again.

② A message box as shown in Fig. 46 appears. Items to be assigned to the status output are set up here.

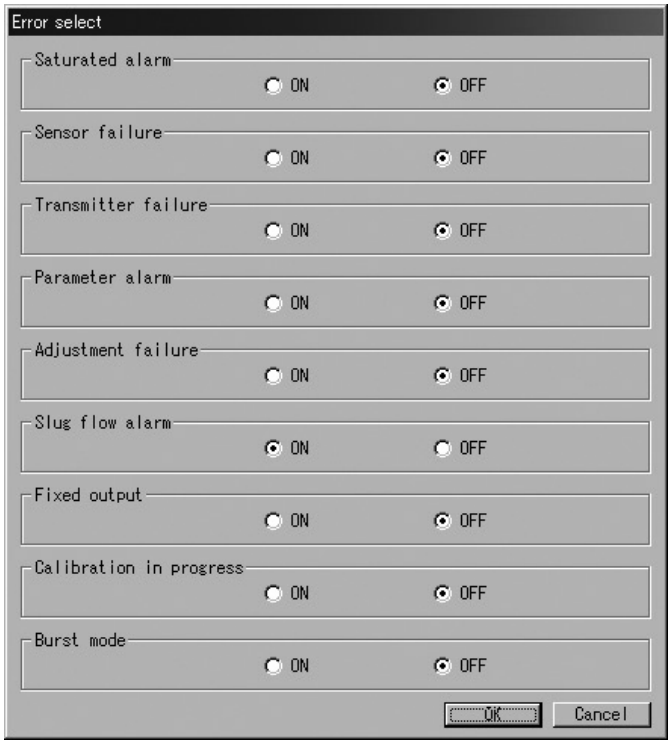


Fig.46

In the EV9201, menu item "Slug flow alarm" is not included.

③ Tabulated below are the selectable items and their descriptions.

Item	Error Name	Description
Saturated alarm	Saturated output alarm	Analog output out of 2.4mA or 21.6mA range, or pulse output above 11kHz
Sensor failure	Sensor alarm	Input from sensor out of range (drive and temp.), or obtained readings (flowrate and density) out of tolerance
Transmitter failure	Transmitter alarm	An error in data processing within the transmitter
Parameter alarm	Parameter alarm	Parameter (s) out of acceptable range
Adjustment failure	Zeroing error	An error in zeroing (exceeding the max. allowable range ±1.5%)
Slug flow alarm	Gas-mixed flow alarm	Density out of preselected range due to bubble entrapment, etc. (Ct. 0.3 to 2g/MBA)
Fixed output	Fixed output	Analog output, pulse output, status output levels, etc. are fixed.
Calibration in progress	Calibration in progress	Calibration is in progress (zeroing incl.).
Burst mode	Burst mode active	Burst mode is active.

➡ NOTES : 1. Click "ON" the items you want to set for an error output.
2. Error output is valid only when "Status output func" is set to "Error Status".
3. If one or more items are in error, the status output is made to be "OFF".
4. For details of the nature of errors, refer to "3.15 Error Messages".

④ After filling in all the fields required, click on "OK" button. A message box as shown in Fig. 47 then appears.
Clicking on "OK" at this window changes the previous settings to the new settings just entered. However, the flowmeter output also changes with the changes in settings made. For safety's sake, therefore, in applications where the flowmeter output controls a valve (s) or other devices, it is necessary that the control loop be switched to manual control to ensure that the control loop is unaffected by the flowmeter output.

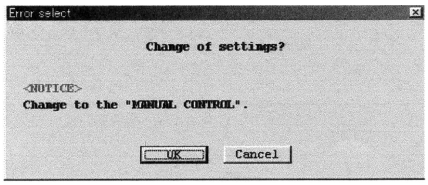


Fig.47

⑤ When the previous settings are replaced with the new settings just entered in response to clicking on "OK", a message box as shown in Fig. 48 appears. Clicking on "OK" button at this point completes the setup.

Fig.48

⑥ After clicking on "OK" button, the message box for filling in fields of items appears again. Click on "Cancel" button to hide the message box for filling in fields of items.
To abort the setup process, click on "Cancel" button in the course of steps ② through ④.

3.6.10 Output Level in an Error (Error indicator)

① Click on "Setup (S)" at top-level menu of the screen, select "Error output" from "Conf. output" drop-down list, and click on again.
② A message box as shown in Fig. 49 appears. Output levels in an error are set up at this window.

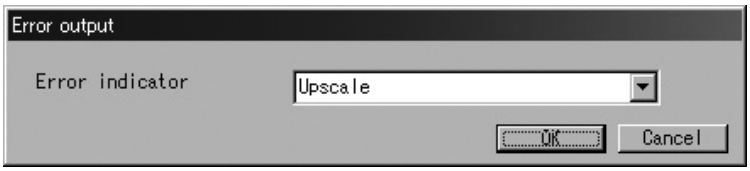


Fig.49

③ As shown in Fig. 50, select the output level from the drop-down list by clicking on the arrow mark at right.

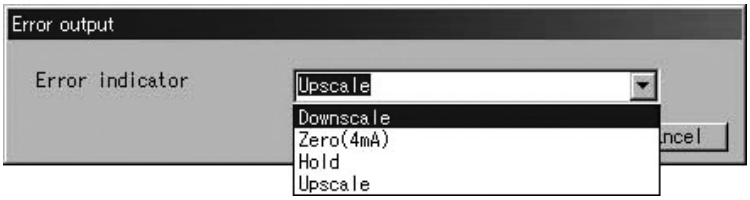


Fig.50

④ Given in the table below are output levels.

Output Level	Analog Output	Pulse Output
Downscale	2.4mA	0Hz
Zero (4mA)	4mA	0Hz
Hold	Holds the last measured reading.	Holds the last measured reading.
Upscale	21.6mA	11kHz

➡ NOTES : "Error indicator" does not function in all the errors. For applicable error items, refer to "3.15 Error Messages".

⑤ After filling in all the fields required, click on "OK" button. A message box as shown in Fig. 51 then appears.
Clicking on "OK" at this window changes the previous settings to the new settings just entered. However, the flowmeter output also changes with the changes in settings made. For safety's sake, therefore, in applications where the flowmeter output controls a valve or other devices, it is necessary that the control loop be switched to manual control to ensure that the control loop is unaffected by the flowmeter output.

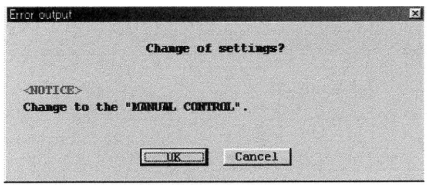


Fig.51

⑥ When the previous settings are replaced with the new settings just entered in response to clicking on "OK", a message box as shown in Fig. 52 appears. Clicking on "OK" button at this point completes the setup.

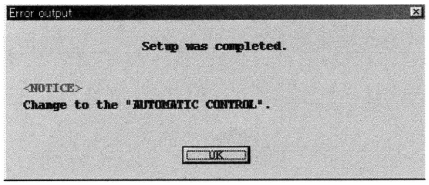


Fig.52

⑦ After clicking on "OK" button, the message box for filling in fields of items appears again. Click on "Cancel" button to hide the message box for filling in fields of items.
To abort setup process, click on "Cancel" button in the course of steps ② through ④.

3.6.11 Burst Mode Setup (HART output)

① Click on "Setup (S)" at top-level menu of the screen, select "HART output" from "Conf. output" drop-down list, and click on again.
② A message box as shown in Fig. 53 appears. Burst mode is set up at this window.

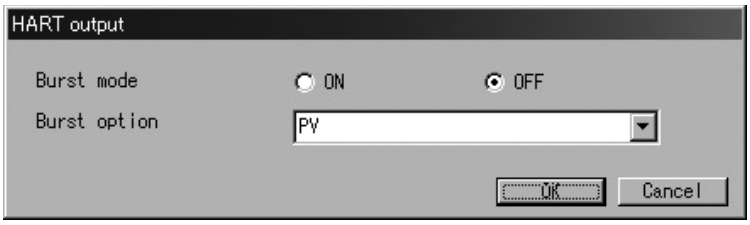


Fig.53

③ The burst mode is a function in which the process data are continuously transferred from the flowmeter transmitter.
To use the burst mode, click on "ON" at the burst mode window, click on the arrow at right of "Burst option" as shown in Fig. 54, and select from the drop-down list the type of data to be transferred.

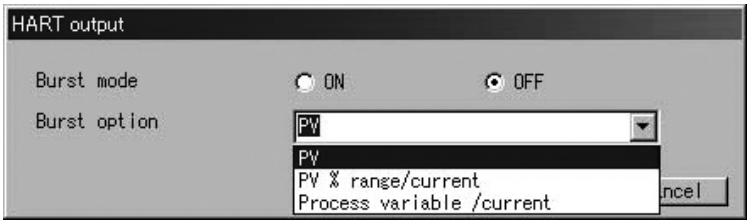


Fig.54

The process data acceptable for transferring continuously in the burst mode are "PF.", "PF.% range/current", and "Process variable/current".

・"PF." : Instantaneous value of the item set at Analog output 1
・"PF. % range/current" : Current magnitude (mA) of Analog output 1, % range
・"Process variable/current" : Current magnitude (mA) of Analog output 1, instantaneous value of the item set at Analog outputs 1 and 2, Total flow (Diff. Total) of the item set at Pulse output

④ After filling in all the fields required, click on "OK" button. A message box as shown in Fig. 55 then appears.
Clicking on "OK" at this window changes the previous settings to the new settings just entered. However, the flowmeter output also changes with the changes in settings made. For safety's sake, therefore, in applications where the flowmeter output controls a valve or other devices, it is necessary that control loop be switched to manual control to ensure that the control loop is unaffected by the flowmeter output.

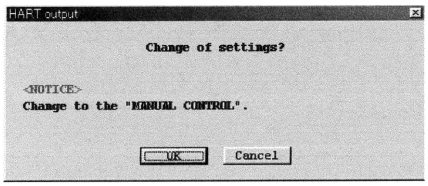


Fig.55

⑤ When the previous settings are replaced with the new settings just entered in response to clicking on "OK," a message box as shown in Fig. 56 appears. Clicking on "OK" button at this point completes the setup.

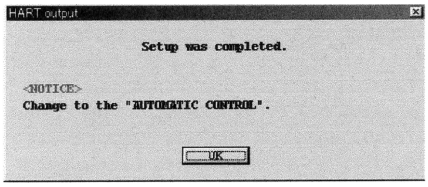


Fig.56

⑥ After clicking on "OK" button, the message box for filling in fields of items appears again. Click on "Cancel" button to hide the message box for filling in fields of items.
To abort the setup process, click on "Cancel" button in the course of steps ② through ④.

3.6.12 Bore Size

① Click on "Setup (S)" at top-level menu, select "Bore Size" from "Caries sensor" drop-down list, and click on again.
② A message box as shown in Fig. 57 appears. Bore size is set up at this window.

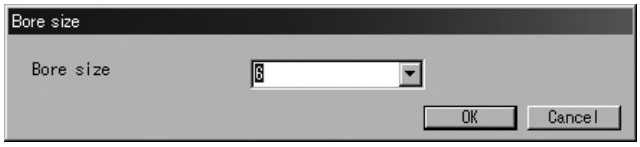


Fig.57

③ Click on the arrow mark at right and select from the drop-down list the bore size to be set as shown in Fig. 58.

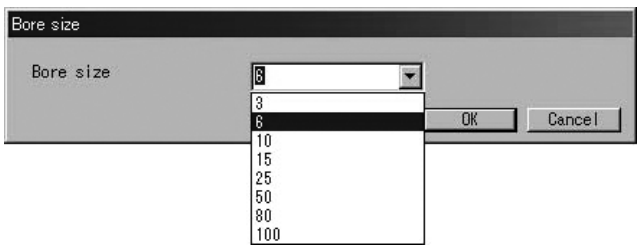


Fig.58

④ After filling in all the fields required, click on "OK" button. A message box as shown in Fig. 59 then appears. Clicking on "OK" at this point changes the previous settings to the new settings just entered. However, the flowmeter output also changes with the changes in settings made. For safety's sake, therefore, in applications where the flowmeter output controls a valve or other devices, it is necessary that the control loop be switched to manual control to ensure that the control loop is unaffected from the flowmeter output.

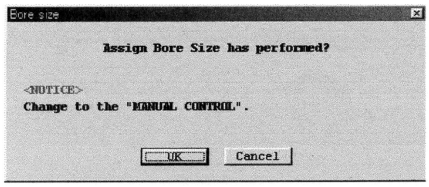


Fig.59

⑤ When the previous settings are replaced with the new settings just entered in response to clicking on "OK", a message box as shown in Fig.60 appears. Clicking on "OK" button at this point completes the setup.60

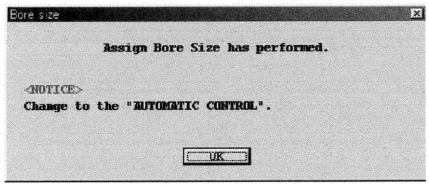


Fig.60

⑥ Following clicking on "OK" button, a message box for entering cert. items appears again. Click on "Cancel" button to hide the message box for entering setup items.
To abort the setup, click on "Cancel" button in the course of steps ② through ④.

⚠CAUTION:

Bore size has been set up according to the sensor used and no further change in bore size is required.

3.6.13 Flow Calibration Factor (Flow Cal)

① Click on "Setup (S)" at top-level menu of the screen, select "Flow Cal" from "Charize sensor" drop-down list, and click on again.
② A message box as shown in Fig. 61 appears. At this window, the flow calibration factor is set up.

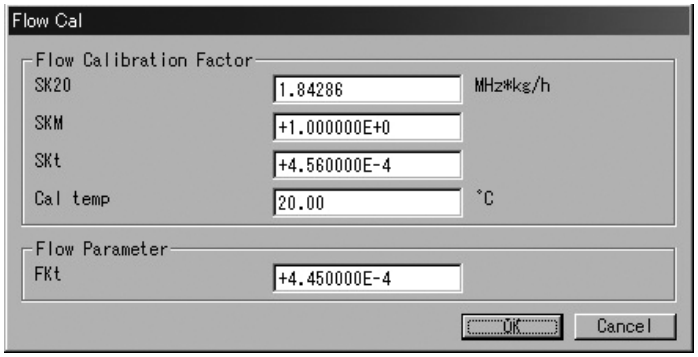


Fig.61

③ After filling in all the fields required, click on "OK" button. A message box as shown in Fig. 62 then appears.
Clicking on "OK" at this window changes the previous settings to the new settings just entered. However, the flowmeter output also changes with the changes in settings made. For safety's sake, therefore, in applications where the flowmeter output controls a valve or other devices, it is necessary that the control loop be switched to manual control to ensure that the control loop is unaffected by the flowmeter output.

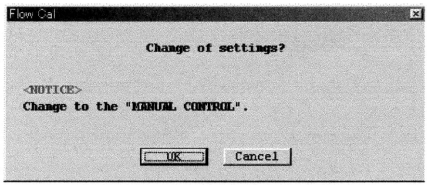


Fig.62

④ When the previous settings are replaced with the new settings just entered in response to clicking on "OK", a message box as shown in Fig. 63 appears. Clicking on "OK" button at this point completes the setup.

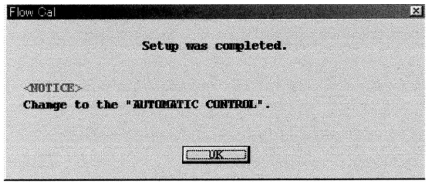


Fig.63

⑤ After clicking on "OK" button, the message box for filling in fields of individual items appears again. Click on "Cancel" button to hide the message box for filling in fields of items.
To abort the setup process, click on "Cancel" button in the course of steps ② through ③.

⚠ CAUTION:

Flowmeter calibration factor has already been set up before shipment from the factory and no further adjustment is required. Do not attempt to change the setting unless recalculating is absolutely necessary.

3.6.14 Density Factor (Density Cal)

① Click on "Setup (S)" at top-level menu of the screen, select "Density Cal" from "Charize sensor" drop-down list, and click on again.
② A message box as shown in Fig. 64 appears. At this window, density factors are set up.

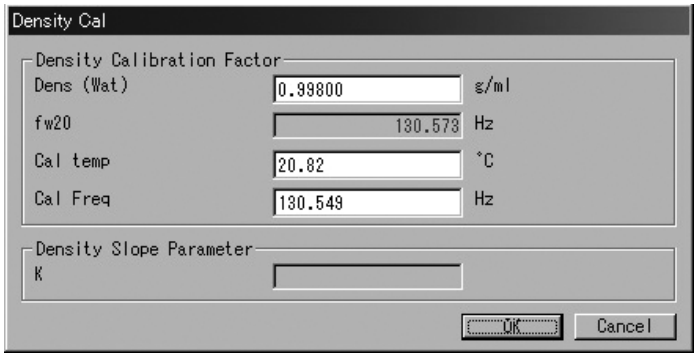


Fig.64

③ After filling in all the fields required, click on "OK" button. A message box as shown in Fig. 65 then appears.
Clicking on "OK" at this window changes the previous settings to the new settings just entered. However, the flowmeter output also changes with the changes in settings made. For safety's sake, therefore, in applications where the flowmeter output controls a valve or other devices, it is necessary that the control loop be switched to manual control to ensure that the control loop is unaffected by the flowmeter output.

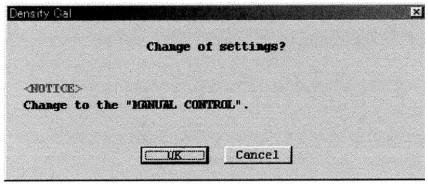


Fig.65

④ When the previous settings are replaced with the new settings just entered in response to clicking on "OK", a message box as shown in Fig. 66 appears. Clicking on "OK" button at this point completes the setup.

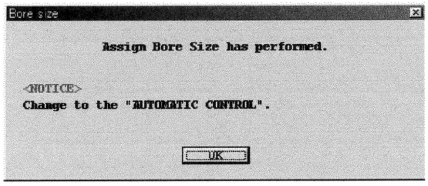


Fig.66

⑤ After clicking on "OK" button, the message box for filling in fields of individual items appears again. Click on "Cancel" button to hide the message box for filling in fields of items.
To abort the setup process, click on "Cancel" button in the course of steps ② through ③.

⚠ CAUTION:

Density factors have already been set up before shipment from the factory and no further adjustment is required. Do not attempt to change the settings unless recalculating is absolutely necessary.

In the EV9201, menu item "Density Cal" is not included.

3.6.15 Zero Factor

Zero factor is a value which is written down during the zeroing; no further adjustment is required in normal use. Only in the event sensor diameter is changed, it is required to set the value to 0 and perform the zeroing. Item "Xmtr auto zero" is always set in the "OFF".

⚠ CAUTION:

A zero factor modified to an improper value will result in inaccurate flow measurement. Do not attempt to change the setting except when sensor size is changed.

3.6.16 Transmitter Information (Device Information)

① Click on "Setup (S)" at top-level menu of the screen, select "Device information", and click on again.
② A massage box like the one shown in Fig. 67 appears. Transmitter information are set up at this window.

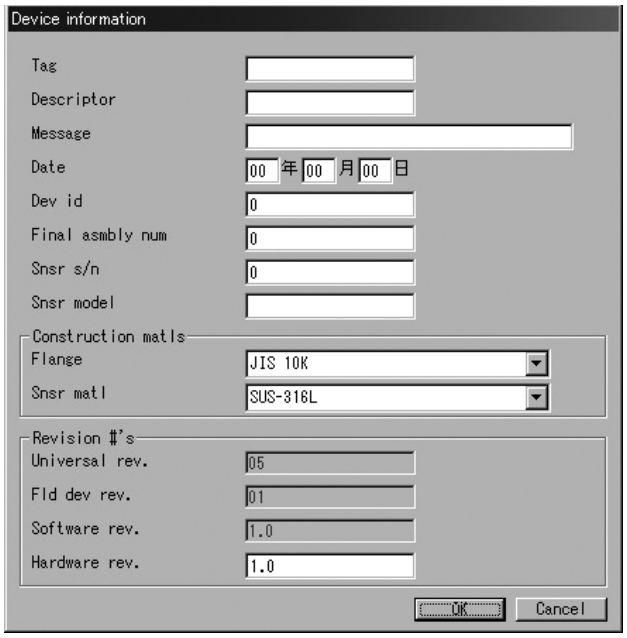


Fig.67

③ You are to set up individual items. For items with an arrow mark at right, click on the arrow mark at right and select one desired from the drop-down list; for other items, key in appropriate alphanumeric values directly.
④ For items to be directly entered, move the cursor to the field desired and a guide for keying in appropriate settings will appear as shown in Fig. 68.

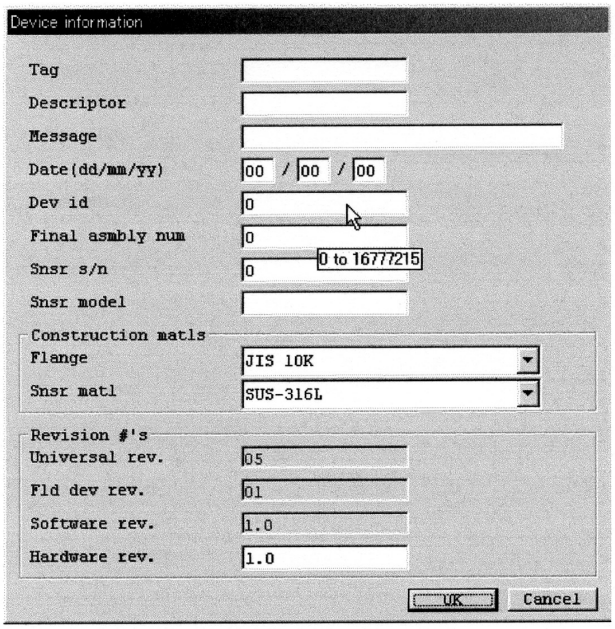


Fig.68

⑤ After filling in all the fields required, click on "OK" button. And a message box as shown in Fig. 69 appears.
Clicking on "OK" at this point changes the previous settings to the new settings just entered. However, the flowmeter output also changes with the changes in settings made. For safety's sake, therefore, in applications where the flowmeter output controls a valve or other devices, it is necessary that the control loop be switched to manual control to ensure that the control loop is unaffected by the flowmeter output.

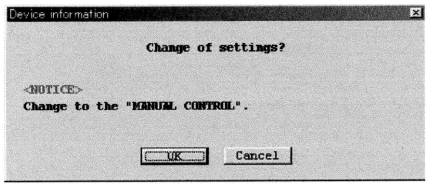


Fig.69

⑥ When the previous settings are replaced with the new settings just entered in response to clicking on "OK", a message box as shown in Fig. 70 appears. Clicking on "OK" button at this point completes the setup.

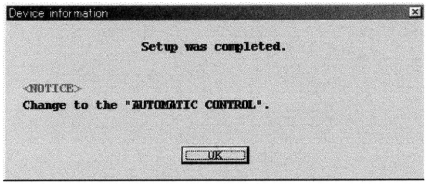


Fig.70

⑦ After clicking on "OK" button, the message box for filling in fields of individual items appears again. Click on "Cancel" button to hide the message box for filling in fields of items.
To abort the setup process, click on "Cancel" button in the course of steps ② through ⑤.

3.7 Menu : Diag/Service

"Diag/Service" includes flowmeter transmitter diagnostics, loop test of individual outputs, output adjustments, and calibration of sensor input. As long as "Setup (S)" message box stays on, Diag/Service remains disabled. Close the message box (Epsom) before you work. Also, at "Diag/Service (T)" message box, multiple message boxes cannot be shown simultaneously except for "Loop test".

3.7.1 Transmitter Diagnostics (Self test)

Self test of the flowmeter transmitter is performed at this menu.

① Click on "Diag/Service (T)", select "Test/Status" and click on again.

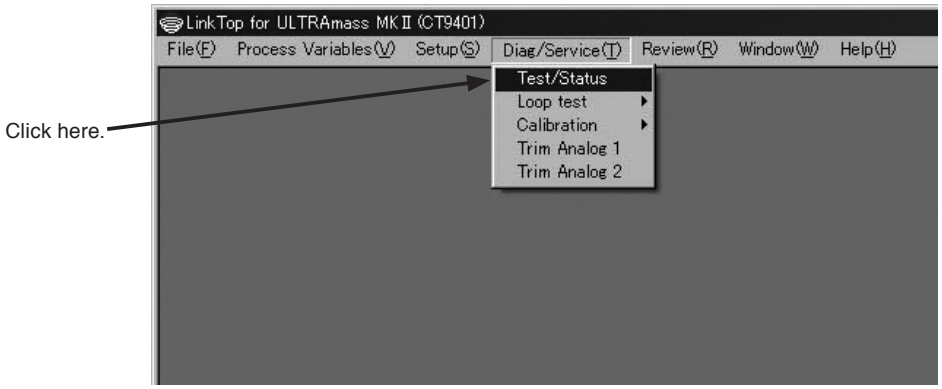


Fig.71

② A message box as shown in Fig. 72 appears. Click on "Self test" button.

Fig.72

③ To run a self test, click on "OK" button. A message box like the one shown in Fig. 73 then appears.

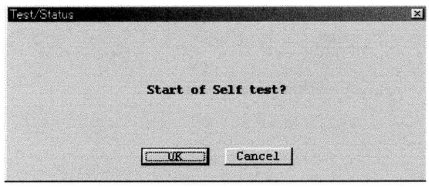


Fig.73

④ When the process of self test takes place, a message box as shown in Fig. 74 appears. Clicking on "OK" button ends the process of self test.

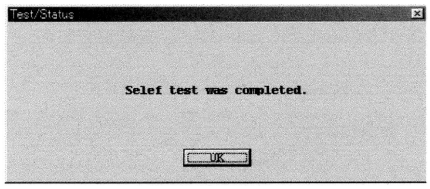


Fig.74

⑤ Clicking on "OK" button returns the screen to the Test/Status message box.
Results of self test appear in the window below the Test/Status message box as shown in Fig. 75.

- No problems in particular : A message "Good" appears.
- Some problem in flowmeter transmitter : An error message listed in the column "LinkTop" of "3.15 Error Messages appears".

Click on "Cancel" to hide the Test/Status message box.
To abort the process of self test, click on "Cancel" button sin the course of steps ② and ③.

Fig.75

3.7.2 Diagnostics of Transmitter LCD Display (LCD)

At this menu, you can diagnose the transmitter LCD display.

① Click on "Diag/Service (T)" at top-level menu of the screen, select "Test/Status", and click on again.

② A message box like the one shown in Fig. 76 appears. Click on "LCD test" button.

Fig.76

③ To diagnose the LCD display, click on "OK" button. A message box like the one shown in Fig. 77 then appears.

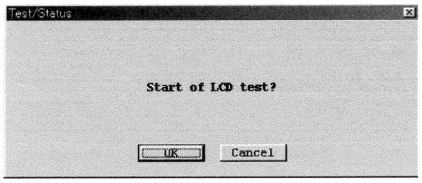


Fig.77

④ As the process of LCD display diagnostics begins, the transmitter LCD display shows a repeated performance of all elements lighting up and going off for five times. You can inspect the LCD for any sign of damage by this test.

When the LCD display diagnostics takes place in response to clicking on "OK", a message box as shown in Fig. 78 appears. Clicking on "OK" button ends the LCD display diagnostics.

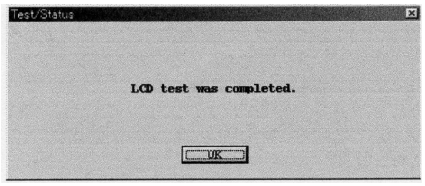


Fig.78

⑤ Clicking on "OK" button returns the screen to the Test/Status message box. Click on "Cancel" button to hide the Test/Status message box.

To abandon diagnostics of the LCD display, click on "Cancel" in the course of steps ② and ③.

The MT9411 is not provided with an LCD display; diagnostics are eliminated.

3.7.3 Loop Test of Analog Output 1 (Fix Analog 1)

At this menu, a loop test of the output line is conducted with the analog output 1 in the state of a simulated output. Since a simulated output is used here irrespective of the status of the process, in applications where the flowmeter output controls valves or other devices, it is necessary for the sake of safety that the control loop be changed to manual control.

① Click on "Diag/Service (T)" at top-level menu of the screen, select "Fix Analog 1" from the "Loop test" drop-down list, and click on again.

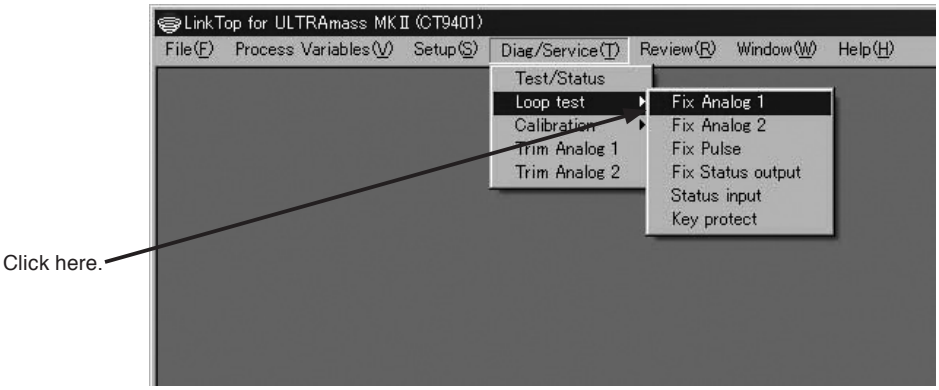


Fig.79

② A message box like the one shown in Fig. 80 appears. Select the simulated output level and click on "Start" button. If you want to obtain any current output in analog value (4 to 20mA) other than "4mA" and "20mA", select "Other" key in the analog value for the output desired, and click on "Start".

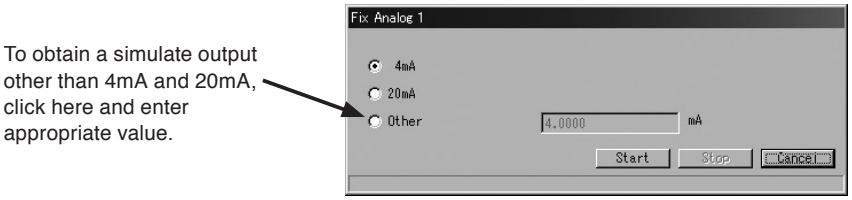


Fig.80

③ A message box as shown in Fig. 81 appears. If you want to use Analog Output 1 for the simulated output, click on "OK".
To abort the process, click on "Cancel".

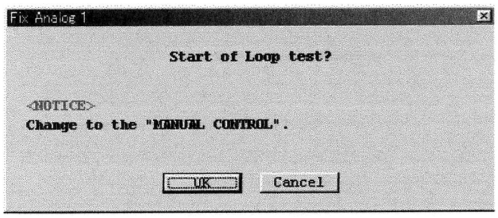


Fig.81

④ In response to clicking on "OK" button, a preselected analog output appears. While this output stays on, a message "Simulated output is provided now..." appears as shown in Fig. 82.
To stop the simulated output, click on "Stop" button.

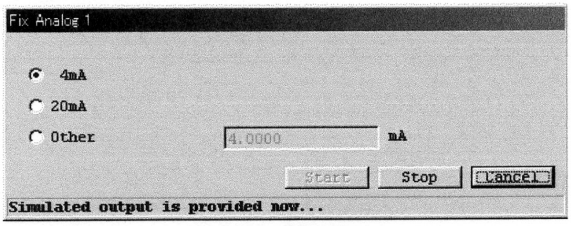


Fig.82

⑤ In response to clicking on "Stop" button, a message box like the one shown in Fig. 83 appears.
Click on "OK" button.

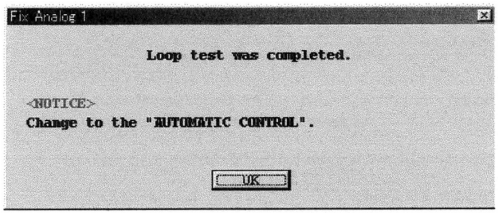


Fig.83

⑥ Clicking on "OK" button returns the screen to the Fix Analog 1 message box. Click on "Cancel" button to hide the Fix Analog 1 message box.

3.7.4 Loop Test of Analog Output 2 (Fix Analog 2)

A loop test for Analog Output 2 can be conducted by the procedure similar to steps ① through ⑥ in the loop test of "3. Loop Test of Analog Output 1".

3.7.5 Loop Test of Pulse Output (Fix Pulse)

At this menu, a loop test of the output line is conducted with the pulse output in the state of a simulated output. Since a simulated output is used here irrespective of the status of the process, in applications where the flowmeter output controls valves or other devices, it is necessary for the sake of safety that the control loop be changed to manual control.

① Click on "Diag/Service (T)" at top-level menu of the screen, select "Fix Pulse" from the "Loop test" drop-down list, and click on again.

② A message box like the one shown in Fig. 84 appears. Select the simulated output and click on "Start" button. To provide an output other than "10kHz", select "Other" key in the pulse frequency you want for the output, and then click on "Start". Acceptable pulse frequency ranges from 0.01 to 10000Hz.

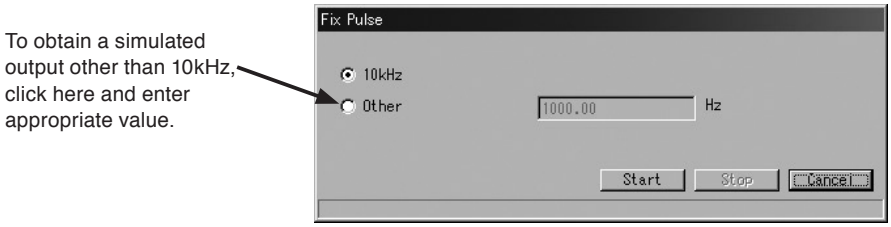


Fig.84

③ A message box as shown in Fig. 85 appears. If you want to use a pulse output for the simulated output, click on "OK".
To abort the process, click on "Cancel".

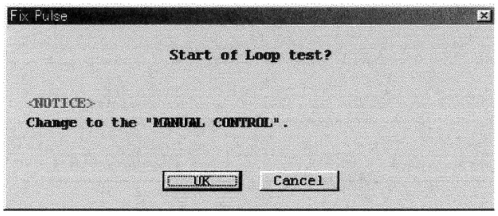


Fig.85

④ In response to clicking on "OK" button, a preselected pulse output appears. While this pulse output stays on, a message "Simulated output is provided now..." appears as shown in Fig. 86.
To stop the simulated output, click on "Stop" button.

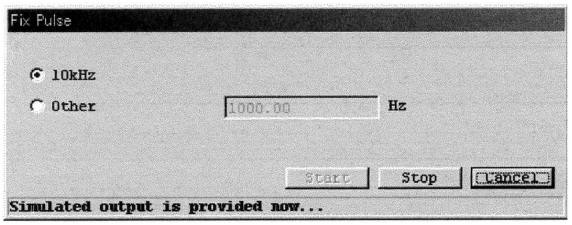


Fig.86

⑤ In response to clicking on "Stop" button, a message box like the one shown in Fig. 87 appears. Click on "OK" button.

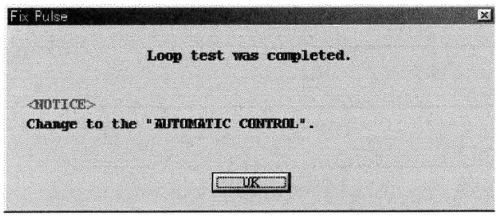


Fig.87

⑥ Clicking on "OK" button returns the screen to the Fix Pulse message box. Click on "Cancel" button to hide the Fix Pulse message box.

3.7.6 Loop Test of Status Output (Fix Status output)

At this menu, a loop test of the output line is conducted with the status output in the state of a simulated output. Since a simulated output is used here, irrespective of the status of the process, in applications where the flowmeter output controls valves or other devices, it is necessary for the sake of safety that the control loop be changed to manual control.

① Click on "Diag/Service (T)" at top-level menu of the screen, select "Fix Status output" from the "Loop test" drop-down list, and click on again.

② A message box like the one shown in Fig. 88 appears. Select either simulated output status "ON" or "OFF", and click on "Start" button.

Fig.88

③ A message box as shown in Fig. 89 appears. If you want to use a simulated output for the status output, click on "OK."
To abort the process, click on "Cancel".

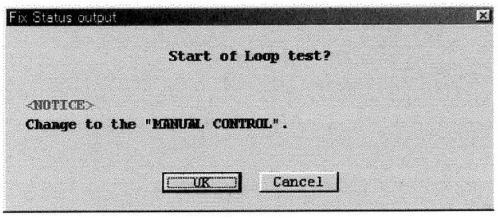


Fig.89

④In response to clicking on "OK" button, a preselected simulated output appears. While this simulated output stays on, a message "Simulated output is provided now..." appears as shown in Fig. 90.
To stop the simulated output, click on "Stop" button.

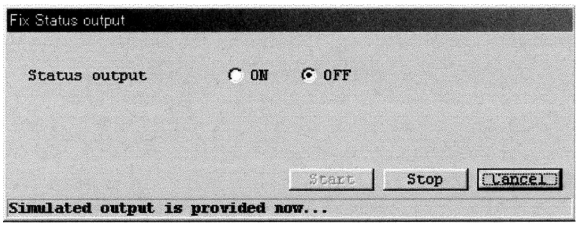


Fig.90

⑤ In response to clicking on "Stop" button, a message box like the one shown in Fig. 91 appears.
Click on "OK" button.

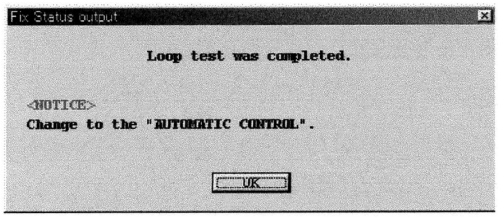


Fig.91

⑥ Clicking on "OK" button returns the screen to the Fix Status output message box. Click on "Cancel" button to hide the Fix Status output message box.

3.7.7 Loop Test of Status Input (Status input)

The status of status input is shown here.

① Click on "Diag/Service (T)" at top-level menu of the screen, select "Status input" from the "Loop test" drop-down list, and click on again.

② A message box like the one shown in Fig. 92 appears, indicating the current status of status input either "Short" or "Open". On acknowledging the status, click on "Cancel" button to hide the Status input message box.

Fig.92

3.7.8 Key Protect

This validates or invalidate the key operation (zeroing or total flow reset) from the LCD. With this feature "ON", key operation for zeroing and total flow reset remains disabled.

① Click on "Diag/Service (T)" at the top-level menu of the screen, select "Key protect" from the "Loop test" drop-down list and click on again.

② A message box like the one in Fig. 93 Appears. Select key operation "ON" or "OFF" and click on "OK" button.

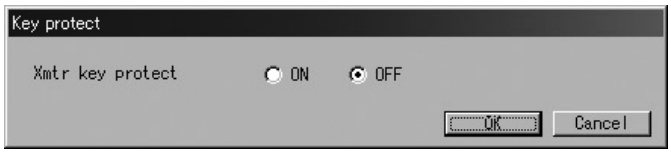


Fig.93

③ A message box like the one in Fig. 94 appears. If it is desired to change key operation status, click on "OK".
To cancel, click on "Cancel".

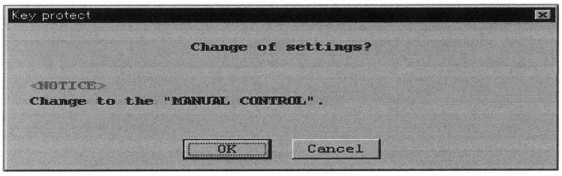


Fig.94

④ Click on "OK". A change in the setting now causes a message box as shown in Fig. 95 to appear. Click on "OK" button to complete the setup process.

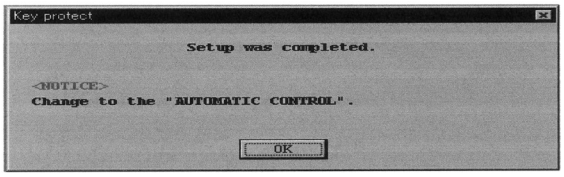


Fig.95

⑤ Following the "OK" button click, the screen returns to a message box for entering menu items.
Click on "Cancel" button to close the message box for entering menu items.
To abort the setup process, click on "Cancel" button between steps ② and ③.

3.7.9 Zero Point Adjustment (Auto Zero)

Flowmeter transmitter can be zeroed for flow measurement at this menu.

① Click on "Diag/Service (T)" at top-level menu of the screen, select "Auto Zero" from the Calibration" drop-down list, and click on again.

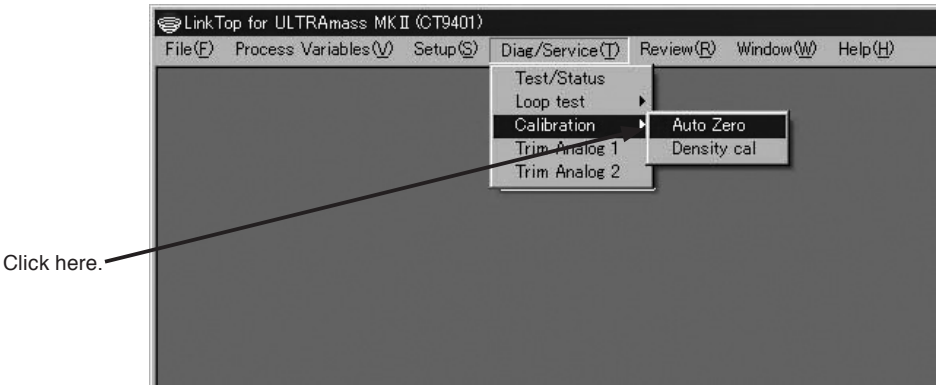


Fig.96

② A message box as shown in Fig. 97 appears. Stop the flow completely first and then click on "OK".

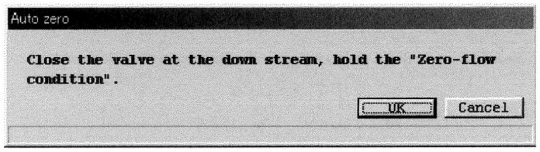


Fig.97

③ A message box like the one in Fig. 98 appears. If you want to run a zeroing, click on "OK".
To abort it, click on "cancel".

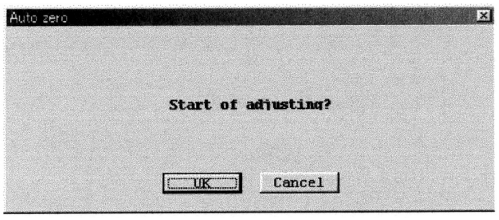


Fig.98

④ It takes about 30 seconds to complete the process of zeroing. While zeroing is in progress, a message box as shown in Fig. 99 appears.

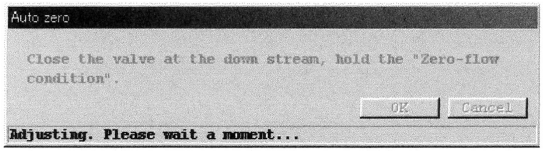


Fig.99

⑤ When zeroing has come to an end, a message box like the one shown in Fig. 100 appears.
Click on "OK" button.

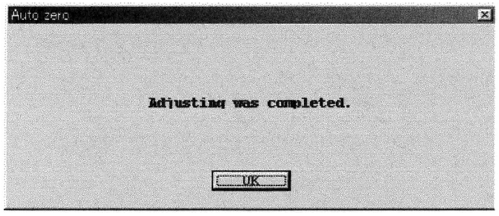


Fig.100

⑥ In response to clicking on "OK" button, the screen returns to the Auto Zero message box.
Click on "Cancel" button to hide the Auto Zero message box.

⚠ CAUTION:

It is necessary that the zero point adjustment be conducted while the process fluid is stable and at the operating temperature. The process fluid inside the sensor unit must be completely at zero flow. Otherwise, precise zeroing cannot be achieved.
For further details, refer to the information under the topic "Zero Point Adjustment" in the high-accuracy OVAL Coriolis flowmeter instruction manual.

3.7.10 Density Calibration (Density cal)

Described in this section is the procedure to calibrate the density of the flowmeter transmitter.

① Click on "Diag/Service (T)" at top-level menu of the screen, select "Density cal" at "Calibration" drop-down list, and click on again.

② A message box like the one shown in Fig. 101 appears. To start the density calibration, fill the sensor flow tube with density calibration fluid, key in the density value of calibration fluid, and click on "OK" button.

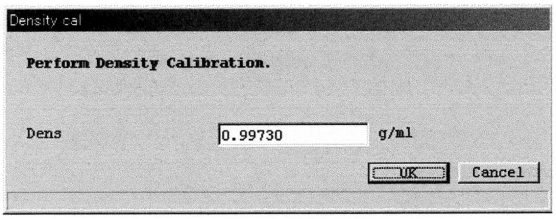


Fig.101

③ A message box as shown in Fig. 102 appears. If you want to make a density calibration, click on "OK". To abort it, click on "cancel".

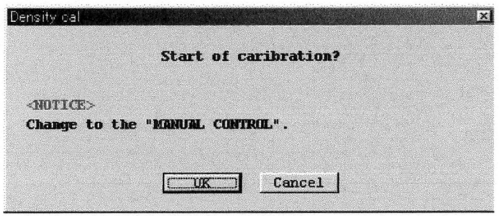


Fig.102

④ It takes about 30 seconds to complete the process of density calibration. While the density calibration is in progress, a message like the one shown in Fig. 103 stays on.

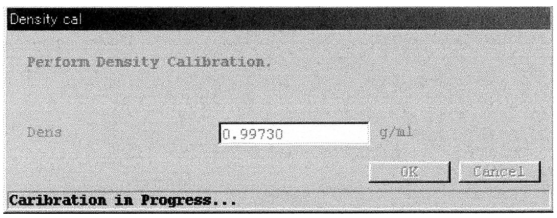


Fig.103

⑤ When the process of calibration has come to an end, a message like the one shown in Fig. 104 appears. Click on "OK" button.

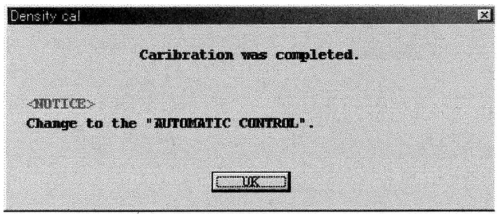


Fig.104

⑥ In response to clicking on "OK" button, the screen returns to "Density cal" message box.
Click on "Cancel" button to hide the Density cal message box.

⚠ CAUTION:

Density calibration has already been made in the factory before shipment and no further calibration is required. Do not attempt to recalculate unless it is absolutely necessary.

In the EV9201, "Density cal" menu item is not included.

3.7.11 Trim Analog Output 1 (Trim Analog 1)

Analog output 1 of the flowmeter transmitter is trimmed at this menu. In the "Trim Analog Output 1", adjustment is made by allowing outputs in analog values corresponding to the 4mA and 20mA, regardless of the conditions of the process. For safety's sake, in applications where the flowmeter output controls a valve (s) or other devices, it is necessary that the control loop be switched to manual control to ensure that the control loop is unaffected by the flowmeter output.

① Click on "Diag/Service (T)" at top-level menu of the screen, select "Trim Analog 1", and click on again.

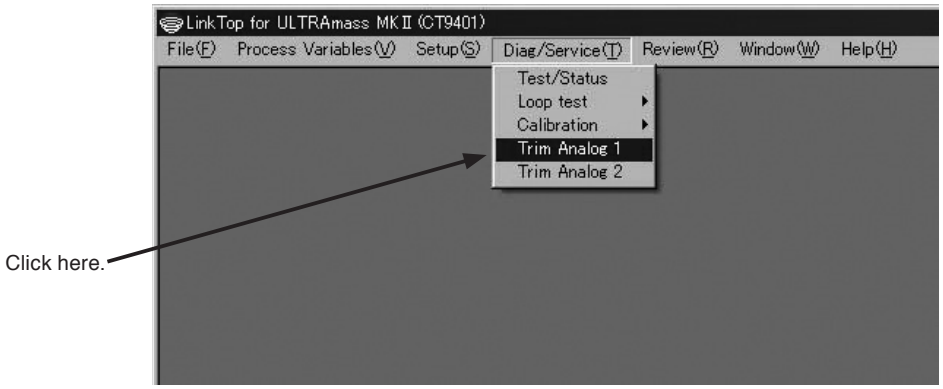


Fig.105

② A message box as shown in Fig. 106 appears. If you want to trim Analog Output 1, click on "OK" button.

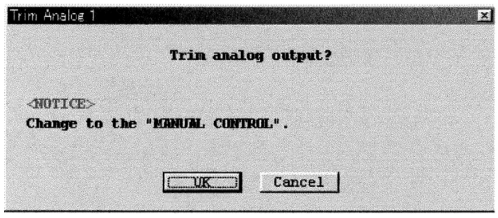


Fig.106

⚠ CAUTION:

Following this adjustment, the analog output from the transmitter is provided on the basis of the reading of the test instrument (ammeter or voltmeter) connected. For this reason, the test instrument to be coupled must be one that has been calibrated and is accurate enough. The analog output is accurately adjusted in the factory before shipment and requires no further adjustment.

③ A window like the one shown in Fig. 107 appears. Select either "4-20mA" scale or "Other scale" for Analog 1 trim, and click on "OK".

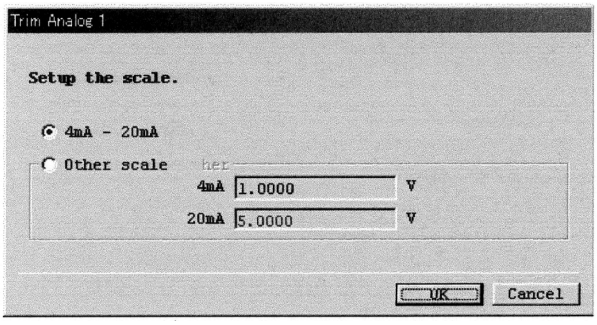


Fig.107

If you want to work with the 4-20mA scale, trimming is made by steps ④ through ⑦ by inserting a reference ammeter in series with the output loop of Analog Output 1.
On other scale, insert a load resistor (R_L=250Ω is inserted and the 1-5V scale across this resistor is used for adjustment) and trimming is made according to steps ⑧ through ⑫ .

④ At the window in Fig. 107, select "4mA-20mA" and click on "OK". A window as shown in Fig. 108 then appears, readying for selecting the 4mA or 20mA trim. Make the 4mA trim here, followed by the 20mA trim. Enter the ammeter reading of the current output and click on "OK" button.

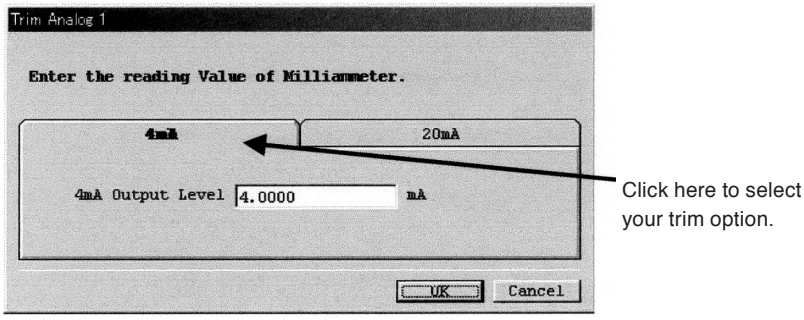


Fig.108

As the reading is transferred, the transmitter automatically adjusts the output to 4mA. Verify that the reading of the ammeter connected registers 4mA.
If it proves that readjustment is required, enter the ammeter reading again at this message box and click on "OK".

⑤ To trim the 20mA, click on the 20mA at the message box shown in Fig. 108. Similar to the 4mA trim, make an adjustment until the ammeter connected reads 20mA.
⑥ Clicking on "Cancel" button brings an end to analog output trim. A message box "Trimming is completed" as shown in Fig. 109 appears. Click on "OK" button.

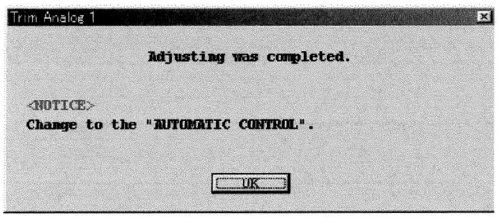


Fig.109

⑦ To abort the trim process, click on "Cancel" button and follow the instructions at the prompt on the screen.

⑧ If you selected "Other scale" at the message box as shown in Fig. 110, you can enter other scale as shown in Fig. 110. Keying in an analog value corresponding to the 4mA output (1V in this case) in the upper field (4mA setting) results in entering a corresponding value in the lower field (20mA setting) automatically.

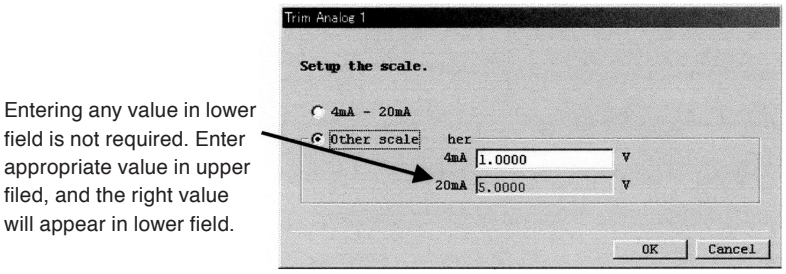


Fig.110

At this point, you can trim the analog output on the 1-5V scale.
Click on "OK" to begin the trim process. Couple the test instrument (reference voltmeter) across load resistor RL.

⑨ A message box like the one shown in Fig. 111 appears. Select either the 4mA trim or the 20mA trim. Firstly the 20mA trim is described here, followed by the 20mA trim.
Key in the reading of the test instrument and click on "OK" button.

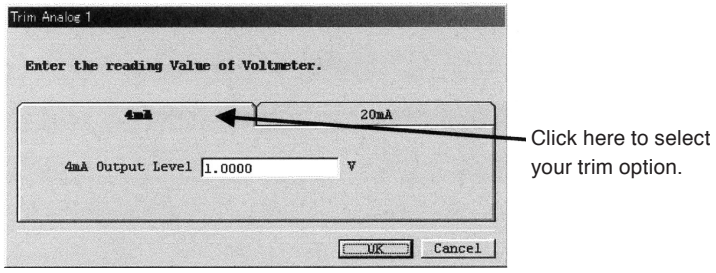


Fig.111

As the reading is transferred, the transmitter automatically adjusts the output to 4mA. Verify that the reading of the measuring instrument connected registers 1V.
If it proves that readjustment is required, enter the ammeter reading at this message box and click on "OK".

⑩ To proceed to the 20mA trim, click on the 20mA at the message box like the one shown in. Fig. 111 and, similar to the 4mA trim procedure, trim the reading until the test instrument connected registers 5V.

⑪ Clicking on "Cancel" button completes the analog output trim. A message box like the one shown in Fig. 112 appear. Click on "OK" button.

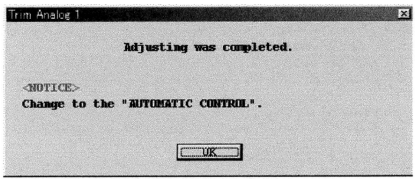


Fig.112

⑫ To abort the trim, click on "Cancel" button and follow the instructions at the prompt on the screen.

3.7.12 Trim Analog Output 2 (Trim Analog 2)

Analog output 2 of the flowmeter transmitter is trimmed here. Trimming the analog output 2 can be made in the procedure similar to steps ① through ⑫ in Section "3.7.11 Trim Analog Output 1".

3.8 Menu : Review (a list of setup parameters)

At Review, you can review a list of parameters set up in "3.6 Setup". "Review" is dedicated for reviewing available information. You cannot change parameters at the Review window.

3.8.1 Transmitter Status (Xmtr status)

Transmitter status is indicated at this window.

① Click on "Review (R)" at the top-level menu of the screen, select "Xmtr status" and click on again.

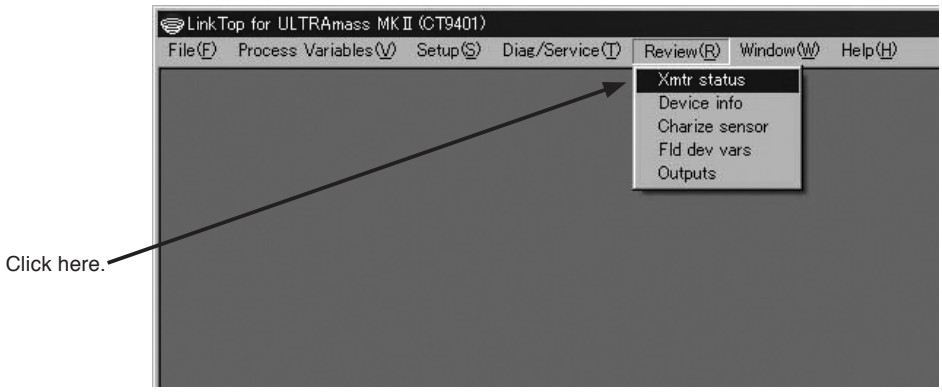


Fig.113

② A message box like the one shown in Fig. 114 appears. You can grasp the status of the transmitter.

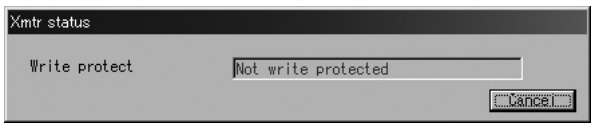


Fig.114

"Write protect" shows whether the transmitter is retractable.

・"Not write protected" : Parameters are alterable. Adjustments are acceptable.

・"Write protected" : Parameters are not alterable. Adjustments are not acceptable.

③ To hide the message box for acknowledging the status of the transmitter, click on "Cancel".

3.8.2 Transmitter Information (Device info)

Transmitter information is shown at this window.

① Click on "Review (R)" at the top-level menu of the screen, select "Device info" and click on again.

② A message box like the one shown in Fig. 115 appears. You can review the transmitter information.

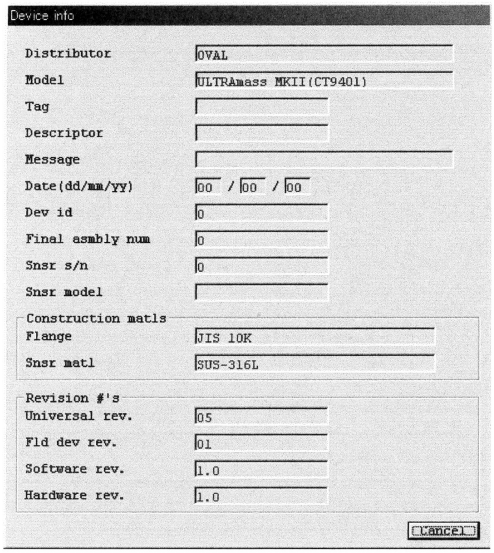


Fig.115

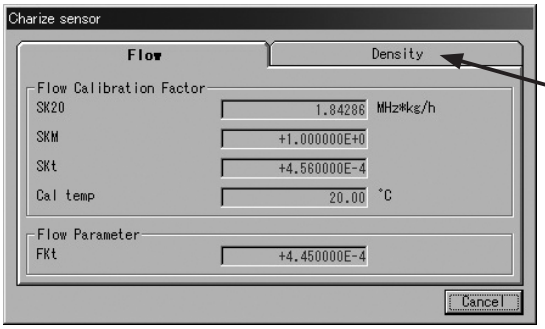
③ To hide the transmitter information message box, click on "Cancel".

3.8.3 Flow Calibration Factor (Charize sensor)

Flowrate and density factors of the flowmeter transmitter are indicated at this window.

① Click on "Review (R)" at the top-level menu of the screen, select "Charize sensor" and click on again.

② A message box like the one shown in Fig. 116 appears. You can review calibration factors (flowrate and density factors).



To show density factor, click around here.
In the EV9201, Density factor menu item is not included.

Fig.116

③ To hide the message box for reviewing calibration factors, click on "Cancel".

3.8.4 View Transmitter Variables (Fld dev vars)

Transmitter variables (flowrate, density, and temperature related variables) are indicated.

① Click on "Review (R)" at the top-level menu of the screen, and click on "Fld dev vars" again.
② A message box as shown in Fig. 117 appears. You can review transmitter variables (flowrate, density, and temperature related variables).

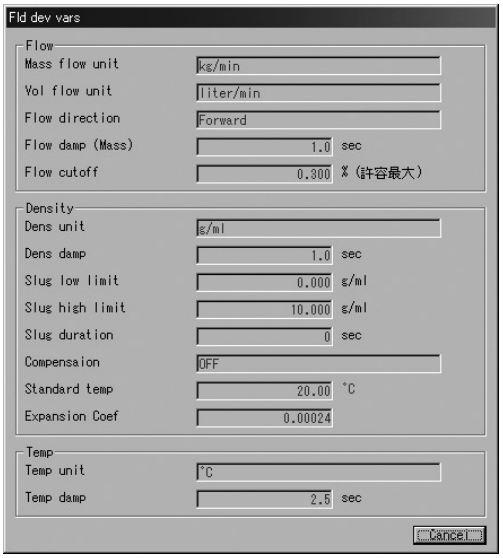


Fig.117

③ To hide the message box for reviewing transmitter variables, click on "Cancel".
In the EV9201, "Density" menu item is not included".

3.8.5 View Outputs

Individual outputs of the transmitter are indicated at this window.

① Click on "Review (R)" at the top-level menu of the screen, select "Outputs" and click on again.
② A message box as shown in Fig. 118 appears. You can review individual outputs (analog outputs 1 and 2, pulse output, and status output).

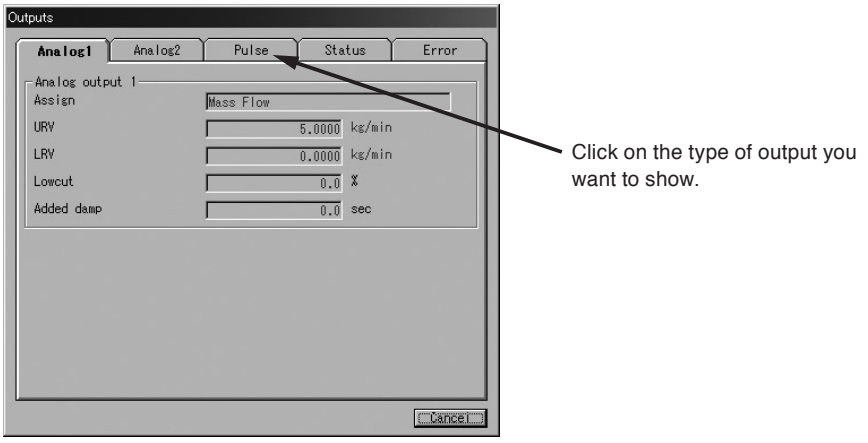


Fig.118

③ To hide the message box for reviewing individual outputs, click on "Cancel".

3.9 Menu : Window

When there are multiple message boxes on the screen, you can activate or deactivate any of them.

① If three message boxes are present on the screen as shown in Fig. 119, for example, clicking on "Window (W)" at the menu brings the names of these message boxes to appear in the window with a check mark before the active one.
(On the screen shown below, "3.8.2 Transmitter Info" is indicated as active.)

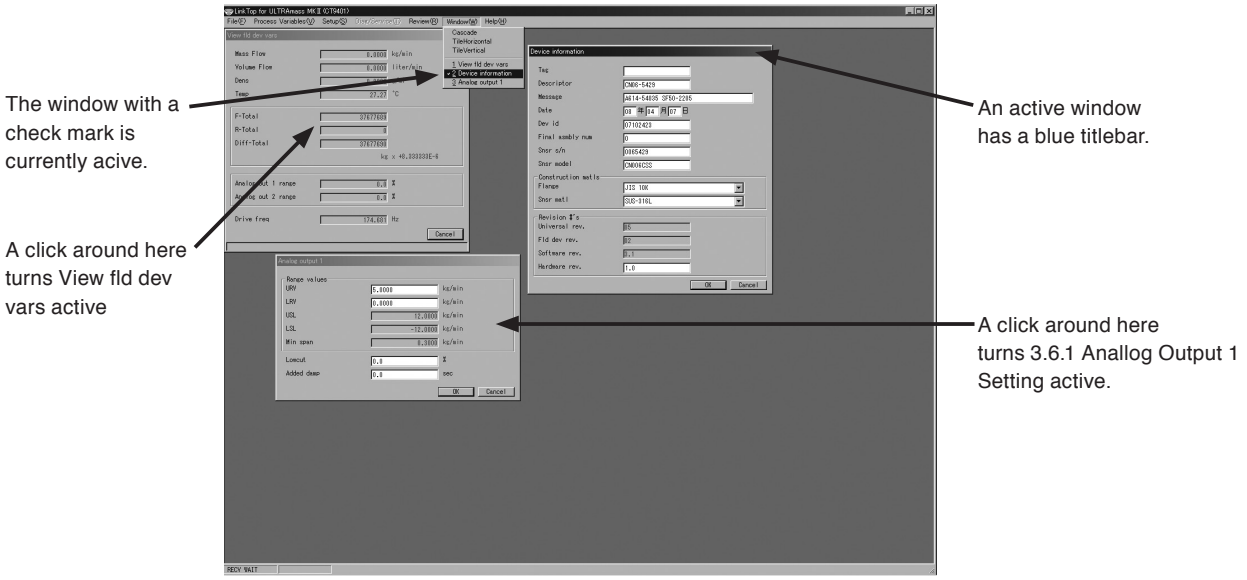


Fig.119

② Clicking on the name of the window you want to activate turns that window active.
③ Active and inactive can be selected by another approach : clicking on any part of the message box you want to make active on the screen turns that window active. See Fig. 119.

3.10 About the Database

The data (parameters, transmitter information, etc.) entered at "Menu : Setup" are stored in the form of a database which can be transferred to other storages, such as hard disks or floppy disks.
You can also download these data into the flowmeter transmitter.

＊ Download :
One complete file data is transferred to the flowmeter transmitter. This permits the setup data of one flowmeter to be transferred to another to duplicate the setup information of the former.

3.10.1 Open File

You can read the data saved in a file by the procedure below.

① Click on "File (F)" at the top-level menu of the screen, select "Database (F)", select "Open File (O) Ctrl+0" and click on again.

Fig.120

② Select the disk and folder that contains the file you want to open from the drop-down list.
③ Of the files shown, select the one you want to open. Acknowledge "File name" and click on "Open" button.

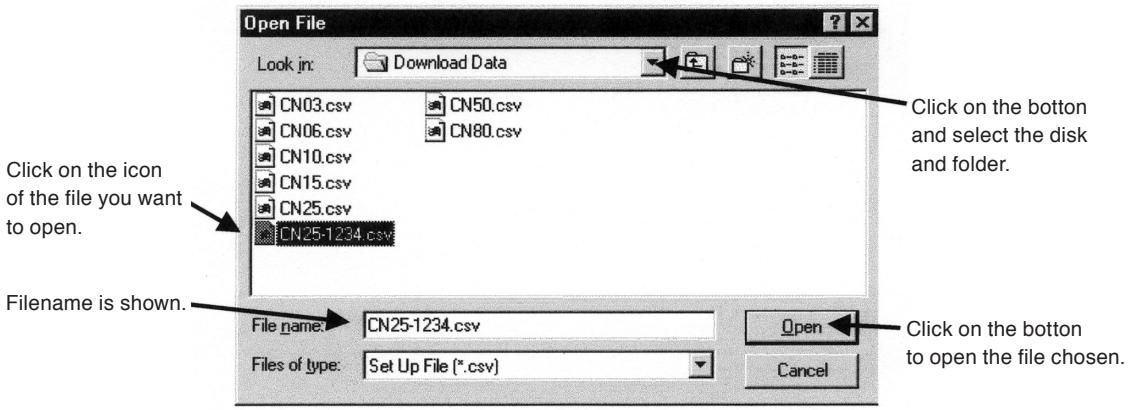


Fig.121

④ You can print the data of a file selected into a hard copy. For information about printing, see "3.11 Printing".

3.10.2 Save File

You can save into a file the setup data in the flowmeter transmitter. Take the steps given below.

① Click on "File (F)" at the top-level menu of the screen, select "Database (F)", select "Save File (S) Ctrl+S" and click on again.
② Select from the drop-down list the disk and folder into which you want to save the data.
③ Type in the filename of the file you want to save and click on "Save" button.

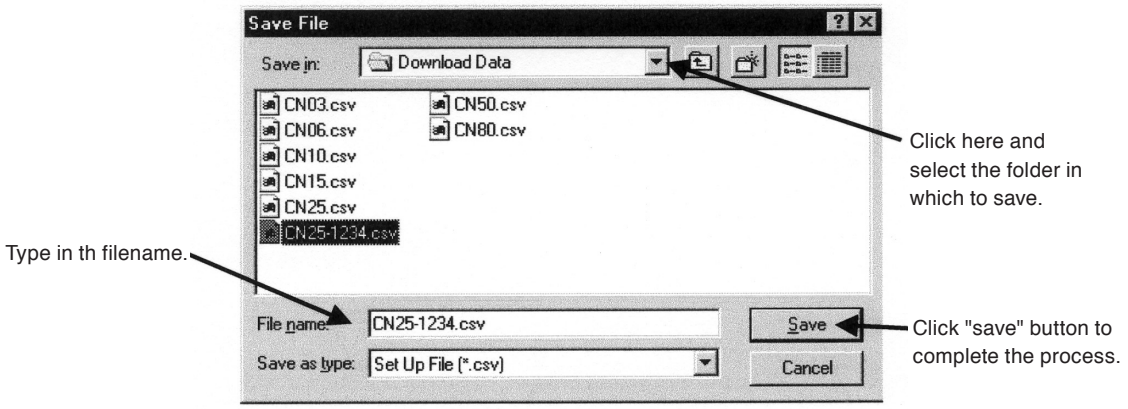


Fig.122

④ Saving a file is now complete.
⑤ If you have failed to select the right location of saving a file, click on "Cancel" button and try again.

3.10.3 Delete File

You can delete any file that is no longer needed.

① Click on "File (F)" at the top-level menu of the screen, select "Database (F)", select "Delete File (X) Ctrl+X," and click on agin.
② Select the disk and folder that contains the file you want to remove from the drop-down list.
③ Select the file you want to remove by clicking. Acknowledge "File name" and click on "Open" button.
④ In response to the clicking, the file you selected opens and a message box as shown in Fig. 124 appears. Click on "Yes" button if you want to delete, or "No" if you do not want. Clicking on "Yes" deletes that file.

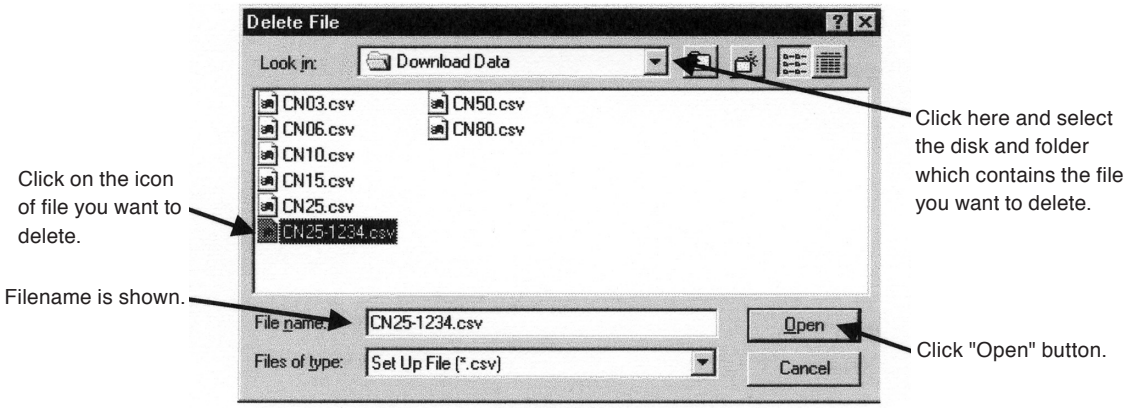


Fig.123

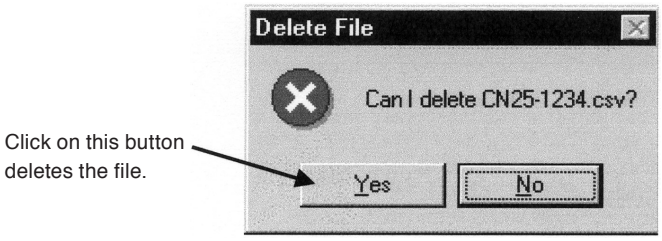


Fig.124

3.10.4 Download

＊ Download :

One complete file data is transferred to the flowmeter transmitter. This permits the setup data of one flowmeter to be transferred to another to duplicate the setup information of the former.

① By confirming the parameters currently present in the flowmeter, make sure that the flowmeter is the one subject to downloading before you start downloading.
If you want to save the parameters, follow the instructions outlined in "3.10.2 Save File."

② Select from the drop-down list the disk and folder which has the file subject to downloading.

③ Click on the file you want to download. Make sure of "Folder name (N)" and click on "Open (D) button.

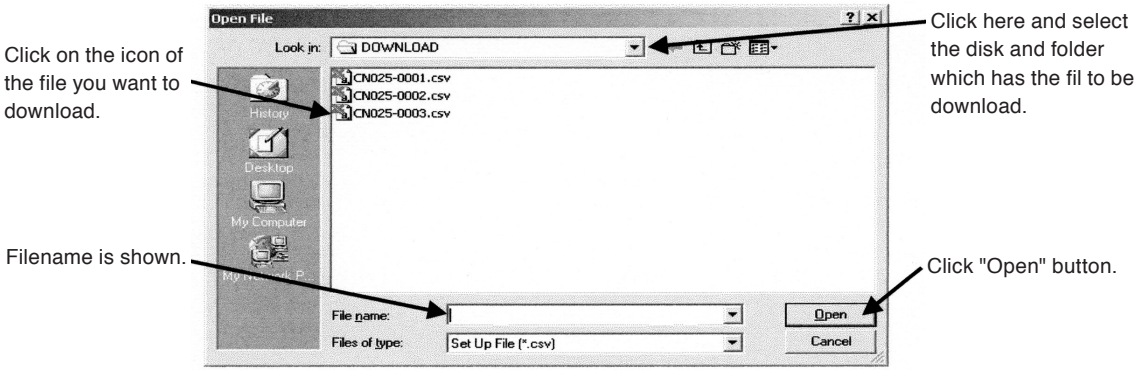


Fig.125

④ On seeing a message box like the one shown in Fig. 126, click on "OK" button if you want to download the data into the transmitter.
If you do not want to download, click on "Cancel" button.

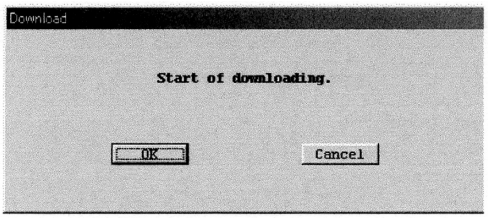


Fig.126

⑤ Downloading the data will result in changes in parameter settings. The output levels from the flowmeter will also change accordingly. For safety's sake, therefore, it is suggested that the control loop be switched to manual to avoid possible influence of output variation.

⑥ Starting the downloading by clicking on "OK" button brings out a message box as shown in Fig. 127. The bar graph at the center of message box tells you the progress of downloading.

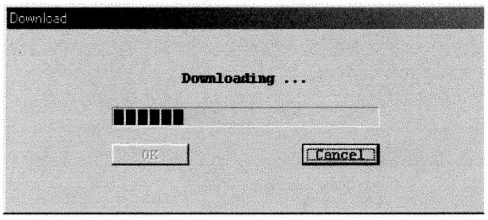


Fig.127

⑦ When downloading is completed, a message box like the one shown in Fig. 128 appears. Click on "OK".

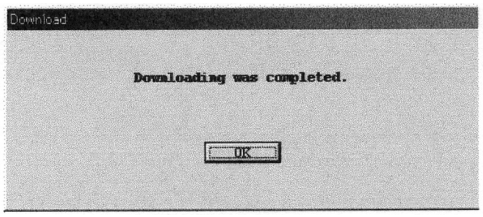


Fig.128

3.11 Printing

You can print a list of transmitter setup parameters.

① Click on "File (F)" at the top-level menu of the screen, select "Print (P) Cntl+P" and click on again.
② On seeing a window like the one shown in Fig. 129, click on "OK" button.
Through a series of these steps of operation, you can obtain a hard copy of the list of setup parameters.

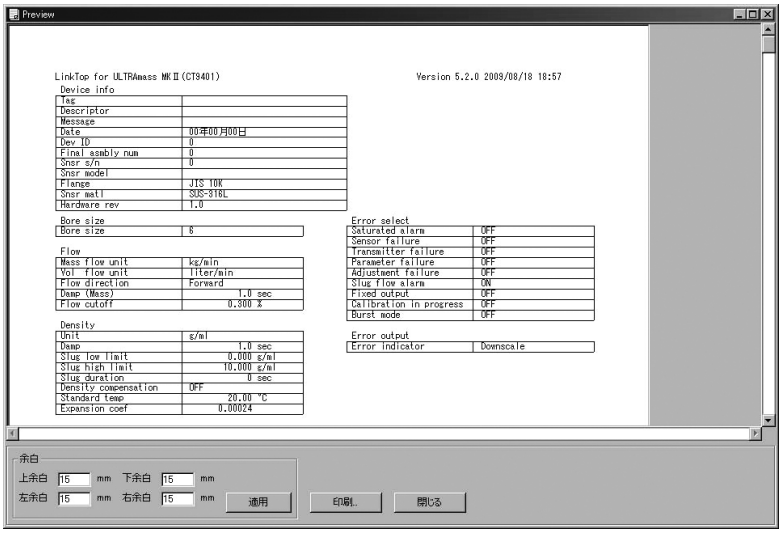


Fig.129

③ The printing format is shown on the next page.

LinkTop for ULTRAmass MKⅡ(CT9401)(excluding the Mass Flex)

Device info

Tag	
Descriptor	
Message	
Date	00-00-00 in year-month-day format
Dev ID	00000000
Final asmbly num	0
Snsr s/h	0000000
Snsr model	0
Flange	JIS 10K
Snsr matl	SUS-316L
Hardware rev	1.0

Bore size

Bore size	25

Flow

Mass flow unit	kg/min
Vol flow unit	CuMtr/min
Flow direction	Forward
Damp (Mass)	1.0 sec
Flow cutoff	0.000 %

Density

Unit	g/ml
Damp	4.0 sec
Slug low limit	0.000 g/ml
Slug high limit	10.000 g/ml
Slug duration	0 sec
Density compensation	OFF
Standard temp	20.00 °C
Expansion coef	0.00024

Temperature

Unit	°C
Damp	2.5 sec

Analog output 1

Assign	Mass Flow
URV	180.000 kg/min
LRV	0.000 kg/min
Lowcut	0.0 %
Added damp	0.0 sec

Analog output 2

Assign	Temperature
URV	100.000 °C
LRV	0.000 °C
Lowcut	0.0 %
Added damp	0.0 sec

Pulse output

Assign	Mass Flow
Freq factor	1000.00 Hz
Rate factor	180.0000 kg/min
Lowcut	0.6 %

Status input/output

Input function	Auto Zero
Input mode	Short Active
Output function	Error Status
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

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

Error output

Error indicator	Downscale

Flow Cal

SK20	56.05967 MHz*kg/h
SKM	1.00000
SKt	+4.440000E-4
Cal temp	20.00 °C
FKt	+4.220000E-4

Density Cal

Dens (Water)	0.99730 g/ml
Cal temp	20.00 °C
Cal Freq	148.000 Hz

3.12 If There is No Response

If communication fails for some reason between the PC and the flowmeter connected according to the procedure outlined in "3.2 Starting the LinkTop and Connection" or while running on this application software, you will see a window like the one shown in Fig. 130. If such an event happens, click on "OK" button and run the following checks :

◇ Is the probe and/or connections of Smart Communication Unit properly in position?
◇ Is power supplied to the flowmeter transmitter?
If trouble persists following the above checks, make connections all over again according to the procedure outlined in "3.2 Starting the LinkTop and Connection".

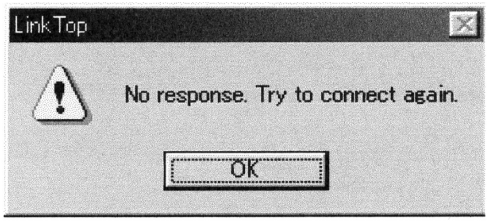


Fig.130

3.13 If Connecting the Flowmeter Fails

When the flowmeter is connected according to the procedure outlined in "3.2 Starting the LinkTop and Connection", you will see a message box like the one shown in Fig. 131 if a transmitter not compatible with this application software is connected. In a case like this, click on "OK" button and run the following check :

◇ Is the type of transmitter connected compatible with the application software now running?
If trouble persists following the above check, make connections all over agin according to the procedure outlined in "3.2 Starting the LinkTop and Connection".

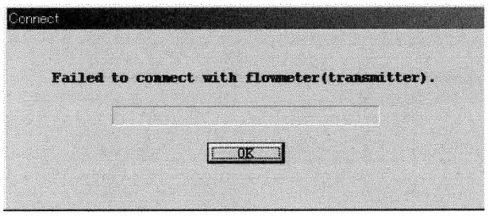


Fig.131

3.14 Input Error

In case some unacceptable data have inadvertently been entered at "Menu : Setup" or "Menu : Diag/ Service", an attempt to communicate with the flowmeter at any time will brings up an error box to appear on the desktop with a message "Input error".
Input error comes in two types: one interpreted as an error in setup on the LinkTop and the other found to be an error in setup on the part of the transmitter as data is sent to the flowmeter transmitter.

① With all menu items selected and "OK" button clicked, when an error is found in any of these settings, a warning error box appears as shown in Fig. 132. Click on "OK" and correct the wrong entry.

Fig.132

② With all setup items entered and "OK" button clicked, when an error is found in these settings on the part of the transmitter, a warning error box like the one shown in Fig. 133 appears.
Click on "OK" and correct the wrong entry.
An error found on the part of the transmitter, a message indicating the nature of that error appears. Use it as a guide to correcting the wrong entry.

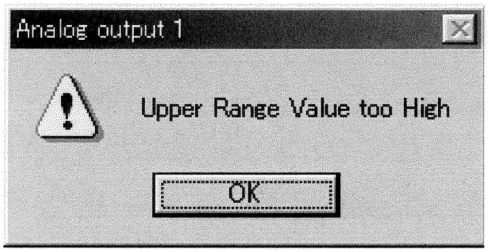


Fig.133

Error Type	Error Display		Description	Resolutive Conditions	Output Processing		
	On LCD	On Link Top			Analog output	Pulse out.	Status out.
Saturated Alarm	Err-11	Analog Output 1 Saturated	Analog output 1 out of 2.4-21.6mA range	Comes under the range.	Analog output 1 only saturated	Continued	OFF
	Err-12	Analog Output 2 Saturated	Analog output 2 out of 2.4-21.6mA range	"	Analog output 2 only saturated	"	
	Err-13	Pulse Output Saturated	Pulse output above 11kHz	"	Continued	Saturated	
Sensor Failure	Err-21	Drive Input Out of Range	Tube freq, out of range 50-200Hz (CT9401, MT9411) 350-750Hz (ST9801) 250-650Hz (Ev9201)	"	Select at Error Indicator	Same as left	"
	Err-22	Scale Over	Above 110% of max. allowable flowrate	"			
	Err-23	Temperature Out of Range	Temperature out of -220-220 °C range	"			
	Err-24	Density Outside Limits	Density out of 0-5g/mL range	"			
	Err-25	P.O Sig Alarm	AD input out of 10-95% range	"			
Transmitter Failure	Err-31	EEPROM Error	EEPROM checksum error	Seek our service.	"	Stopped	"
	Err-32	Date Update Error	Internal data not updated				
Parameter Alarm	Err-41	Ana 1 Span Set Error	Ana 1 setting out of range	Comes under the range.	"	"	"
	Err-42	Ana 2 Span Set Error	Ana 2 setting out of range	"			
	Err-43	TV Rate Factr Set Error	TV Rate Factr setting out of range	"			
	Err-44	SK20 Set Error	SK20 setting out of range	"			
	Err-45	H/L Alarm Point Set Error	H/L Alarm Point setting out of range	"			
Adj Failure	Err-51	Auto Zero Failed	Zeroing error (max. allowable range ±1.5%)	Readjust or power cycling	Continued	Continued	"
Slug Alarm	Err-61	Slug Flow	Out of range "Dens. Low Limit-Dens. High Limit"	Comes under the range.	Flow output only stopped	Stopped	"
Fixed Output	------	Analog Output 1 Fixed	Analog output 1 fixed	When unfixed	Analog output 1 only fixed	Continued	"
	------	Analog Output 2 Fixed	Analog output 2 fixed	"	Analog output 2 only fixed	"	"
	------	Pulse Output Fixed	Pulse output fixed	"	Continued	Fixed	"
	------	Status Output Fixed	Contact-closure output fixed	"	"	Continued	Fixed
	------	0% Sig Lock	All outputs fixed to 0	"	0% (4mA) fixed	0Hz fixed	OFF
In Progress	------	Calibration in Progress	Calibration in progress (zeroing inclusive)	At end of calibration	Continued	Continued	"
Burst Mode	------	Burst Mode Enabled	Burst mode enabled	When burst mode disabled	"	"	"
H/L Alarm	------	H/L Alarm Triggered	Out of Low Alarm Point-High Alarm Point range (selected at H/L Alarm Type)	Comes under the range.	"	"	" (Note 4)

➡ NOTES : 1. Priorities in output processing when multiple errors exist are Continued ＜ Saturated ＜ Processing selected at Error Indicator ＜ Stopped ＜ Fixed.

2. When output is saturated, the analog output is fixed at 2.4mA or 21.4mA ; the pulse output at 11kHz.

3. Contact-closure output is "OFF" only when "Error Status" is selected at Status Output menu and "ON" is selected Error Select menu (normally "ON").

4. Valid only when "H/L Alarm" is selected at Status Output menu. (Unlike Error Status, Error Select has no menu items.)

5. When Transmitter Failure (Err-31 or Err-32) appears, seek our technical assistance.

3.16 Parameters

No.	Item	Description	Type of Setup	Factory Setting	Setting Value
Assign					
1	Analog output 1	Analog output 1 select	Specs. set		
2	Analog output 2	Analog output 2 select	Specs. set		
3	Pulse output	Pulse output select	Specs. set		
Config fld dev vars					
4	Mass flow unit	Mass flow unit select	Specs. set		
5	Vol flow unit	Volume flow unit select	Specs. set		
6	Flow direction	Flow direction select	Specs. set		
7	Flow damp (Mass)	Flow (mass) damping	Specs. set		
8	Flow cutoff	Flow (mass) cutoff	Specs. set		
9	Dens unit	Density unit select	Specs. set		
10	Dens damp	Density damping	Specs. set		
11	Slug low limit	Lower limit density of slug flow	Specs. set		
12	Slug high limit	Upper limit density of slug flow	Specs. set		
13	Slug duration	Duration to identify slug flow	Specs. set		
14	Compensation	Density compensation	Specs. set		
15	Standard temp	Reference temp.	Specs. set		
16	Expansion coef	Expansion coefficient	Specs. set		
17	Temp unit	Temp. unit select	Specs. set		
18	Temp damp	Temp. damping	Specs. set		
Analog output 1					
19	URV	20mA flowrate of Analog out 1	Specs. set		
20	LRV	4mA flowrate of Analog out 1	Specs. set		
21	Lowcut	Low cutoff of Analog out 1	Specs. set		
22	Added damp	Added damp of Analog out 1	Specs. set		
Analog output 2					
23	URV	20mA flowrate, Analog out 2	Specs. set		
24	LRV	4mA flowrate, Analog out 2	Specs. set		
25	Lowcut	Low cutoff, Analog output 2	Specs. set		
26	Added damp	Added damping, Analog out 2	Specs. set		

➡ NOTES : No. 3 and 5 are items available for CT9401 (MT9411) and MT9431 only.
No. 9 through 16 are not included in the EV9201.

About Settings

Factory set : Parameters are set up before the product is shipped from the factory. Do not attempt to alter settings in the field.

Specs. set : Specifications are factory set according to the customer specifications. If later changes are desired, new settings must meet the operating environment.

Factory setting : Note here the parameter at the time of shipment from the factory.

Update setting : Note here the parameter following later changes made.

Cont.

No.	Item	Description	Type of Setup	Factory Setting	Setting Value
Pulse Output					
27	Freq factor	Pulse output full scale freq. setup	Specs. set		
28	Rate factor	Pulse output full scale flowrate setup	Specs. set		
29	Lowcut	Pulse output low cutoff setup	Specs. set		
Status Input					
30	Status input func	H/L alarm item select	Specs. set		
Status Output					
31	Status output	Status output function select	Specs. set		
32	H/L alarm vars	H/L alarm item select	Specs. set		
H/L Alarm					
33	H/L alarm type	H/L alarm type select	Specs. set		
34	High alarm point	High alarm setpoint	Specs. set		
35	Low alarm point	Low alarm setpoint	Specs. set		
Error Select					
36	Saturated alarm	Error output ON/OFF select	Specs. set		
37	Sensor failure				
38	Transmitter failure				
39	Parameter alarm				
40	Adjustment failure				
41	Slug flow alarm				
42	Fixed output				
43	Calibration in progress				
44	Burst mode				
Error Output					
45	Error indicator	Output level select in an error			
Burst Mode (HART output)					
46	Burst mode	Burst mode ON/OFF select	Specs. set		
47	Burst option	Burst data select	Specs. set		
Bore Size					
48	Bore size	Bore size select	Factory set		
Flow Calibration Factor					
49	SK20	Meter factor	Factory set		
50	SKM	Meter error correction factor	Factory set		
51	SKt	Flow correction factor (SKt)	Factory set		
52	Cal temp	Temp. at flow calibration	Factory set		
53	Cal temp (Outer)	Temp. at flow calibration(outside)	Factory set		
54	Cal freq	Freq. at flow calibration	Factory set		

➡ NOTES : No.53 is an item available only in the ST9801 and EV9201.
No.54 is an item available only in the ST9801, EV9201, and CT9401 dedicated to the Mass Flex.
No.41 is not included in the EV9201.

Cont'd.

No.	Item	Description	Type of Setup	Factory Setting	Setting Value
55	SKdf	Flowrate corr. coeff. (SKdt)	Factory set		
56	SKfa	Flowrate corr. coeff. (SKfa)	Factory set		
57	SKfb	Flowrate corr. coeff. (SKfb)	Factory set		
58	FKt	Flowrate corr. coeff. (FKt)	Factory set		
59	FKdt	Flowrate corr. coeff. (FKdt)	Factory set		
Density Factor (Density Cal)					
60	Dens (Water)	Density at density calibration	Factory set		
61	Cal temp	Temp. at density calibration	Factory set		
62	Cal temp (Outer)	Temp. at density calibration (outside)	Factory set		
63	Cal freq	Freq. at density calibration	Factory set		
64	Freq coeff β	Density calibration coeff.β	Factory set		
65	Zero factor	Zero factor	Specs. set		
Transmitter Information					
66	Tag	Tag No.	Specs. set		
67	Descriptor	Descriptor	Specs. set		
68	Message	Message	Specs. set		
69	Date	Date of manufacture	Factory set		
70	Device id	Device ID	Factory set		
71	Final asmbly num	Serial No.	Factory set		
72	Snsr s/n	Sensor serial No.	Factory set		
73	Snsr model	Sensor model	Factory set		
74	Flange	Flange rating	Factory set		
75	Snsr matl	Sensor material	Factory set		
76	Hardware rev.	Hardware revision	Factory set		

➡ NOTES : No. 62 is an item available only in the ST9801.
No. 55 and 59 are items only in the ST9801 and EV9201.
No. 64 is an item available only in the ST9801 and CT9401 dedicated to the Mass Flex.
No. 56 and 57 are items available only in the ST9801, EV9201, and CT9401 dedicated to the Mass Flex.
No. 60 through 64 are not included in the EV9201.

4. PRODUCT CODE EXPLANATION

Item	Product Code												Description
	①	②	③	④	⑤	⑥	—	⑦	⑧	⑨	⑩	⑪	⑫	
Model	E	L	2	3	1	0	—							Smart Communication Unit
Power								0						Always “0”
Applicable flowmeter (application software) (※1)									5					OVAL Coriolis flowmeters (CT9401, ST9801, EV9201), (MT9411, MT9431, MT9603) (※2)
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)												1		CD-ROM
												9		Other than above
Reserved code													0	Always “0”

NOTES : ※1 Application software (LinkTop) for EL2300 with RS-232C connection specification is not usable.
※2 You need different software for transmitters depending on their production periods.
Please check the product code of the transmitter to choose the corresponding EL2310 in the table below.

	Product code	Corresponding EL2310
MT9603	MT9603-□□□□□□A	EL2310-05□□□□
	MT9603-□□□□□□B	EL2310-08□□□□
MT9411 MT9431	MT9411-□□□□□□ MT9431-□□□□□□	EL2310-05□□□□
	MT9411-□□□□□□B MT9431-□□□□□□B	EL2310-08□□□□

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		HARTTM 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, Windows Vista, Windows 7 to 11 (compatible with Japanese or English version)
Application software (LinkTop) is available in Japanese OS or English OS version.
・RAM: 8MB or larger.
・Hard disk: 10MB or larger
・Provision of USB port

All specifications are subject to change for improvement.

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