Rev.2.2

USF Terminal Setup Instruction

USF TERM

For

Ultrasonic Flowmeter

typed

USF200S/USF300C

⚠ Warning	Please read this manual carefully and understand the contents for your safety.

⚠ Warning	Store this manual in a area of workplace and be sure that it is accusable when needed

TOFLO CORPORATION

109-R05

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Thank you for purchasing USF TERM. Prior to the operation please read this manual carefully.

1. Overview

Ultrasonic flowmeter typed USF200S/USF300C (hereinafter referred to the USF) utilizes RS-485 communication for parameter setup. This manual describes on how to setup parameters for the USF.200S/USF300C.

2. Installation

In order to enable a remote control system you need to install a USF TERM Software to host PC. Installation instructions are as follows.

1. Insert the USF TERM CD into CD Drive.
2. Shut down all active applications.
3. Double click the SETUP.EXE under the current directly.
4. Follow the installation instructions.
5. Reboot the PC.

3. RS-485 Converter

USF TERM requires RS-485 converter and communication cable to set the parameters from PC. Performance has been confirmed with following products:

Manufacture: System Sacom
Product Type:KS-485

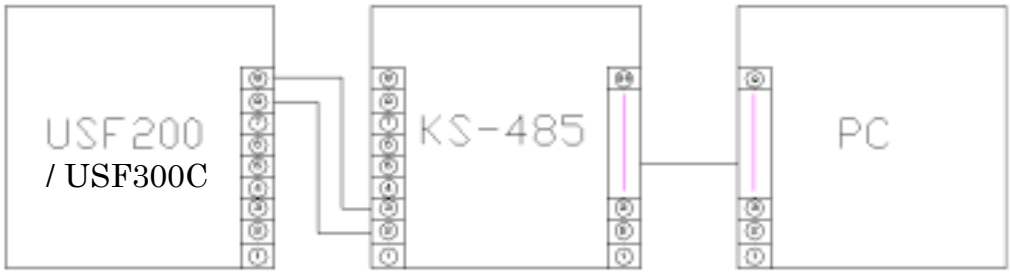
KS-485 is recommended and can be supply by us as option; however, we shall not check an individual performance prior to the shipment.

Communication cable is also available as option. Connector specifications are as follows;

USF200S/USF300C -Dsub9 pin Female
PC -Dsub25 pin Female

4. Connections

Make sure there is no power is applied to USF200S/USF300C, KS-485 and PC before connecting cables as shown below.



RS-232C cable for DOS/V9 pins
Dsub25pin male – Dsub9pin female

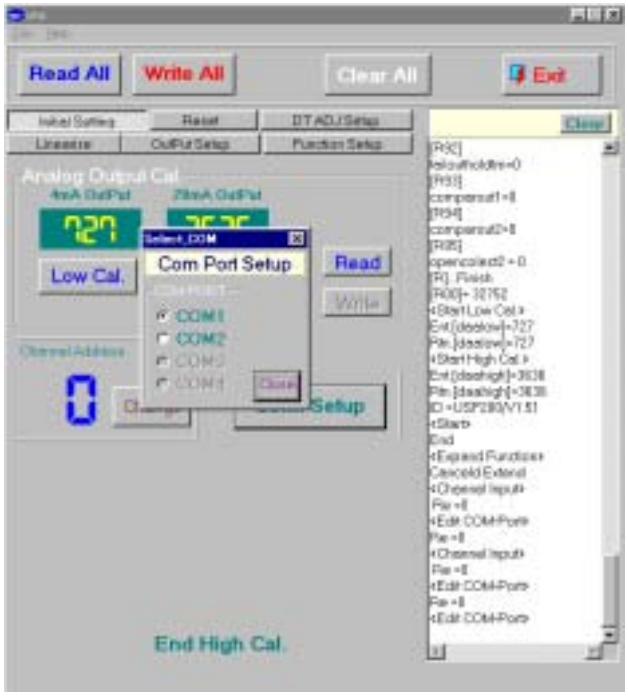
(Fig. 1)

5. Parameter Setup

(1) Preparation.

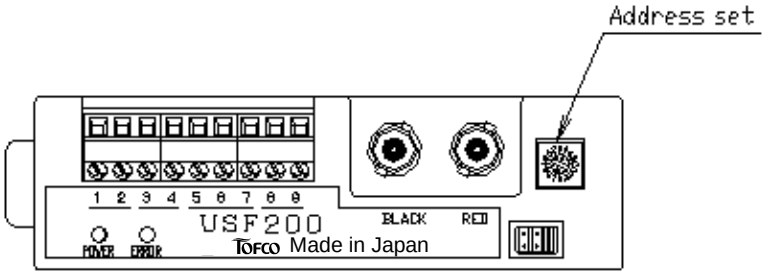
1. Connect cables as above.
2. Turn on a PC.
3. Turn on a USF200S/USF300C and KS-485.
4. Startup the USF TERM.
5. Click the "Initial Setting" tab.
6. Click "Com. Port" icon and specifies the communication port in accordance with your CP.

E.G:



(Fig. 2)

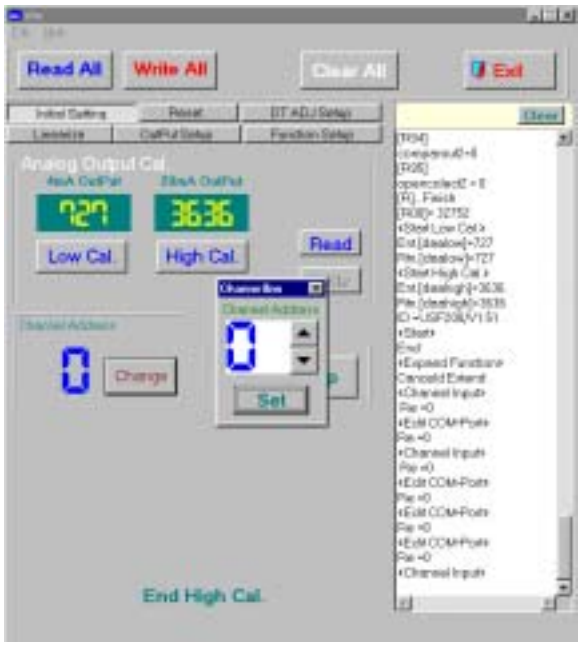
7. Setting an address for USF electronic element.



(Fig. 3)

8. Click "Change" icon and specifies the channel address in accordance with USF channel setting by ▲ ▼ key.

E.G:



(Fig. 4 Channel Address Setting)

- Following is a channel addresses correspondence tables.

USF electronics part address	USF TERM Channel address	USF electronics part address	USF TERM Channel address	USF electronics part address	USF TERM Channel address
0	0	6	6	C	12
1	1	7	7	D	13
2	2	8	8	E	14
3	3	9	9	F	15
4	4	A	10		
5	5	B	11		

(Fig. 5 Hexadecimal address table)

9. If an address is correctly set, you can download a data which is stored in the electronic element by clicking “Read All Data” icon.

*Changing channel address also downloads the data from the USF200S/USF300C electronics.

- When an error occurs, please followings;
  (1) Check data cable connection
  (2) Check whether channel and address are matched
  (3) Check whether other application is running in RS485(avoid data crush)
  (4) Comport error (check the device manager on host PC)

- Make sure that 1to 9 procedures has taken place correctly.
- Do not change any channel addresses while the USF electronic is powered on. –In case you need to change the address, first, power off the electronic element, change the address and then power on the electronic element.

(2) Parameter Settings.

Followings are the parameters you can set with USF TERM.

Parameter Setup Table.

a) Initial Setting.

1. 4-20mA analogue output calibration.
2. Channel Address setup.
3. Communication port select.

b) Function Setup.

1. Moving Average.
2. Sampling Time.
3. Low Cut.
4. Quick Response Active.
5. Open Collector Output

c) Reset.

1. Zero Point Reset.
2. Integrated Flow Volume Reset.

d) DT ADG Setup.

e) Linearize Setup.

f) Outpute Setup.

1. Analog Output.
2. Pulse Output.
3. Fail Output.

- To check or change setup data, please refer this manual. Before you make any changes, please note the all default values as your backup reference.
- Any changes which applies to the correction, it may cause some error on flow accuracy. If any nonconformity which is caused by changing preset values by the end user, it shall be unwarranted.
- Changing any values of DT ADJ and Linearization data it would be subject to customers responsibility.
- Any damage or problem caused by installing this software shall not be covered by warranty.

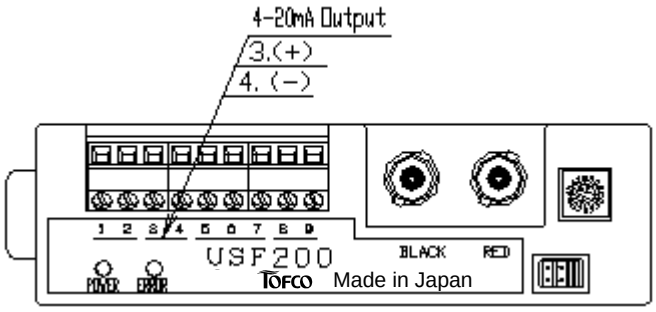
a) Initial Settings

a-1) 4-20mA output calibration.

This calibrates 4mA and 20mA output values.

- This calibration has been done by factory prior to a shipment. Due to this, please do not execute the calibration unless defect has occurred.

1. Connect multimeter to 3rd and 4th terminal.



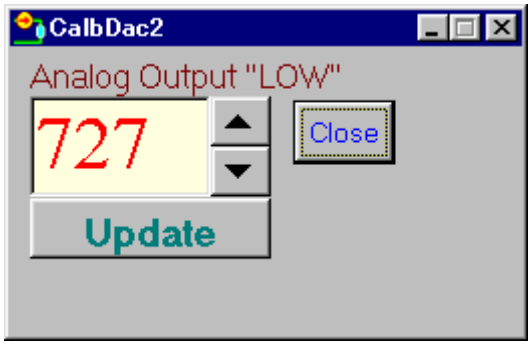
(Fig. 6)

2. Press “Low Calibration” icon in Initial Setting Menu for 4mA setting.

(Fig. 7)

3. To calibrate 4mA by change values with ▲ ▼ key and press “Update” icon to renew the value in Calb Dac2 window

   * changing value by arrow key only does not save the values.



(Fig. 8)

4. Adjust 4mA on multimeter.
5. Save the new set value by pressing “close” icon to go back to initial setting menu.
6. Repeat above procedure for high calibration (20mA) also.
7. Check value of 4mA once again to make sure that tune is stable.

a-2) Channel Address Setup.

One electronic element has 16 address set point for RS-485 parallel connection. Each flowmeter shall have an individual channel address so please make sure the flowmeter and electronic element should match.

Please refer the Fig. 5, “address table for channel address setting.

1. Check channel address on USF electronics.
2. Click on icon for “changing address” in the “initial setting menu.
3. Changing value with ▲ ▼ key and press OK to confirm.
4. Pressing OK downloads all set parameters. If you download all data correctly, the communication is established.

a-3) Communication Port Setup.

To set parameters, it requires RS485 communication via external PC to setup data. Please refer the communication port setting in Parameter Setup menu.

1. Select address channel on the USF.
2. Click “Com. Setup” icon in the initial setting menu to select communication port.
3. Make sure that host PC communicates with USF200S/USF300C.

b) Function Setup

Setup guide for below functions.

(Fig. 9)

b.-1) Moving Average.

This function is to even off flow fluctuation. If a sampling time (shown in b-2) is lager, the fluctuation will become smaller, however the response time will become slower as compromise. Setup range shall be 1~100. Use ▲ ▼ key to change the parameter then press write icon to save the changes.

b-2) Sampling Time.

This is to set a sequence of sampling time.

Range is 0.1~ 3Sec.(a figure is 0.1sec)

Use ▲ ▼ key to change the parameter then press write icon to save the changes.

b-3) Low Cut

It cuts flow rate which can be ignored. If the flow rate becomes lower than set point, the flow rate is read as zero. Setup range shall be from 1 and up (Refer section d DT ADJ)

Use ▲ ▼ key to change the parameter then press write icon to save the changes.

b-4) High Response Enable

When flow rate changes, but it prefers not to be averaged, enable this function and specify the threshold value in order to output the instant flow rate at the time the sensor read. The threshold value must be smaller than flow rate change otherwise an averaged flow rate will be output.

- High Response

  Check the box to enable High Response mode.

- Threshold value for High Response.

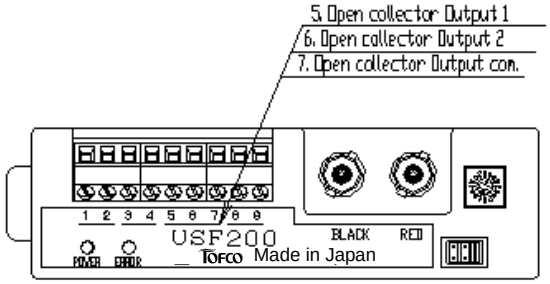
  To set threshold value, specify the difference in flow rate.

  - E.g. From 0ml/min to 250ml/min the difference is 250, in this case try the threshold from 150 ~200 ml/min 60% an up
  - Over and down shoot should be considered when determining the threshold value.

  Setup range shall be from 1 and up (Refer the section d, DT ADJ)

  Use ▲ ▼ key to change the parameter then press write icon to save the changes.

b-5) Open collector output setting.



(Figure 10)

Set output signal for the USF.

Select the type of output and click “write” icon to save.

○ Open collector output 1 (pin 5 and 7 for COM) has the following 6 parameters can be set

● Instant frequency output:

Instant flow rate shall be generated in frequency. The flow rate shall be in proportion full scale frequency. (Refer f-2)

● Integrated pulse output:

Integrated flow value shall be generated in pulse. The pulse will be generated each time when integration flow value reach to the set point. (Refer f-2)

● Comparative output (low limit at instant flow).

Enter the value and press “write” icon. (0~32000ml)

● Comparative output (low limit at integrated flow).

Enter the value and press “write” icon. (0~32000ml)

● Comparative output (upper limit at instant flow).

Enter the value and press “write” icon. (0~32000ml)

● Comparative output (upper limit at integrated flow).

Enter the value and press “write” icon. (0~32000ml)

○ Open collector output 2 (pin 6 and 7 for COM) has the following 5 parameters can be set

● Fail output

Fail output is selected in the situation where ultrasonic waves are fully interrupted by air bubbles, etc. in the measuring section. In this case it will output when the fail situation has been maintained more than the predetermined delay time in the “f-3. Fail output delay function in the Fail item”.

● Comparative output (Low limit at instant flow)

● Comparative output (Low limit at integrated flow)

● Comparative output(Upper limit at instant flow)

● Comparative output (Upper limit at integrated flow)

Relating to the comparative outputs they are the same contents as the open collector output 1 as shown above.

c) Reset

c.-1) Zero Point Reset.

To initialize zero point when no fluid is moving.

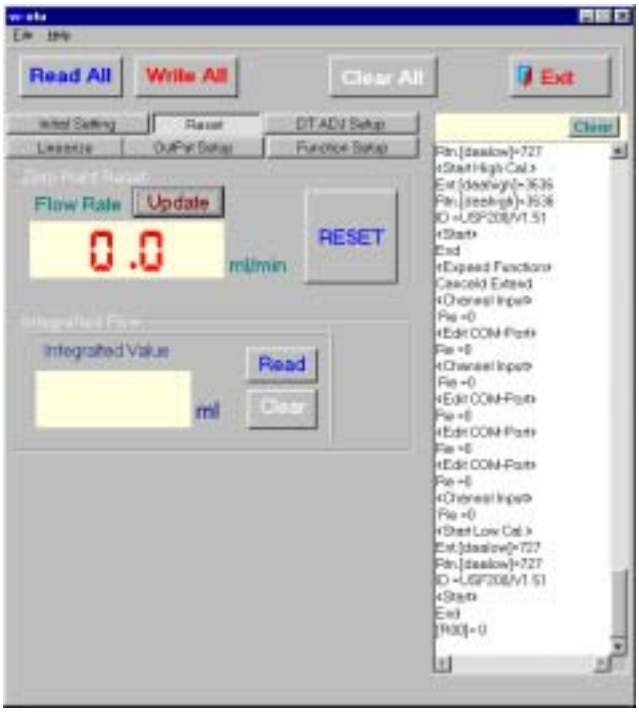
*Make sure there is no fluid moving, otherwise 0 point may not be accurate and it may effects accuracy in measurement

*Low Cut setting must be set as zero prior to activate this command (Function Setup - Low Cut).

*After powered on, leave for one hour for aging in order to achieve appropriate environment for the rest. Make sure there is no air bubble, the temperature of the ambient and the fluid is appropriate.

*Zero Point Reset can also be done by manually by using jumper pin.

1. Fulfillment of above requirements, click "Update" icon in the Reset Setup menu to achieve current flow rate.



(Fig. 11)

2. If the value is too far from zero, click "RESET" icon.
3. Click "OK" icon to enter 0 value.

(Fig. 12)

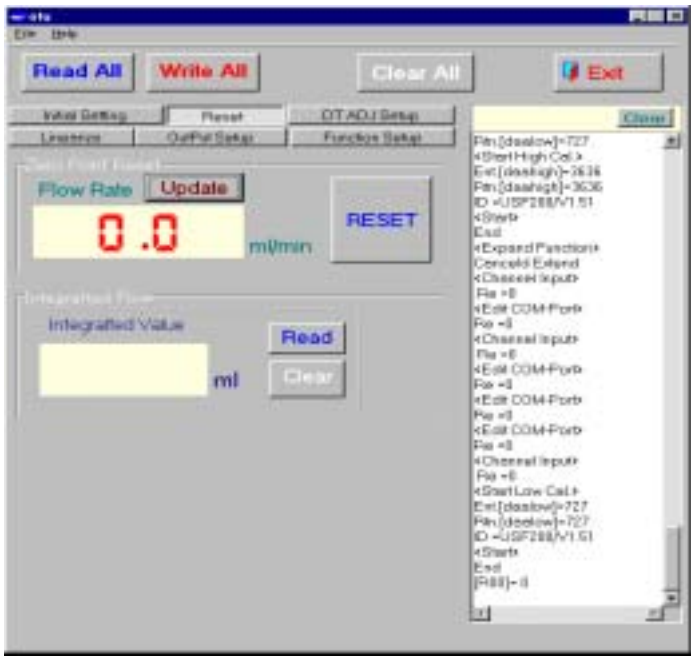
4. Make sure it shows zero on display and click “Close” icon.

c-2) Integrated Reset

This function is to reset integrated flow volume as zero.

- The integrated flow zero reset also can be done by the jumper pin.

1. Click “Read” icon to achieve integrated flow rate in the Reset menu.
2. Click “Clear” icon to reset.
3. Click “Read” again to make sure the “integrated value” is zero on the display.



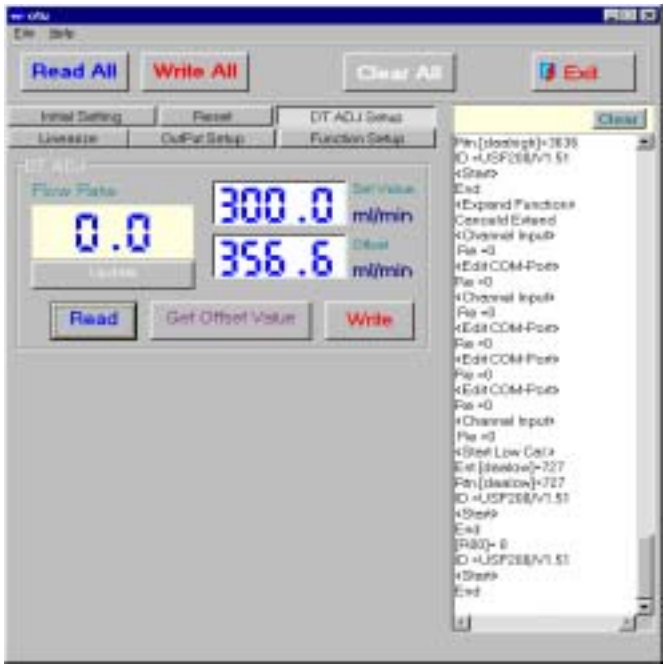
(Fig. 13)

d) DT ADJ Setup

This function is to offset the deference between actual flow and read instant flow at full scale.

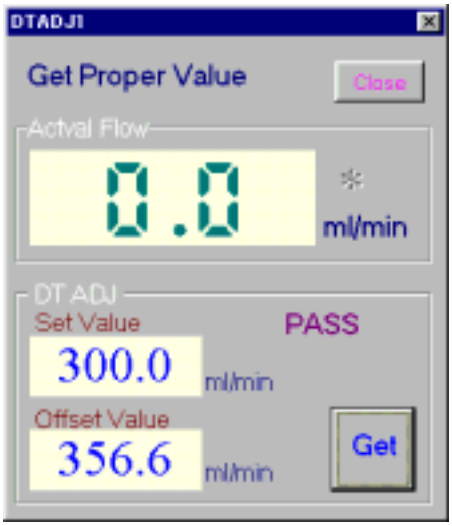
- This shall be done by manufacture prior to the shipment; however, due to changing the fluid type it may require DT ADJ adjustment.
- In case you need to do this, make sure that keep instant flow rate is steady and accurate.
- Make sure zero point value is correct prior to activate.
- Changing DT DAJ value will effect entire linearization data. Therefore re-calibration to linear point in might be required.

1. Open DT ADJ Setup Menu.



(Fig. 14)

2. Supply full scale of the instant flow rate for the USF200S/USF300C.
3. Press “Update” icon to achieve current flow volume on the USF.
4. Make correction if actual flow is different from the USF.
5. Click “Get Offset Value” icon to enter “Get Proper Value” window

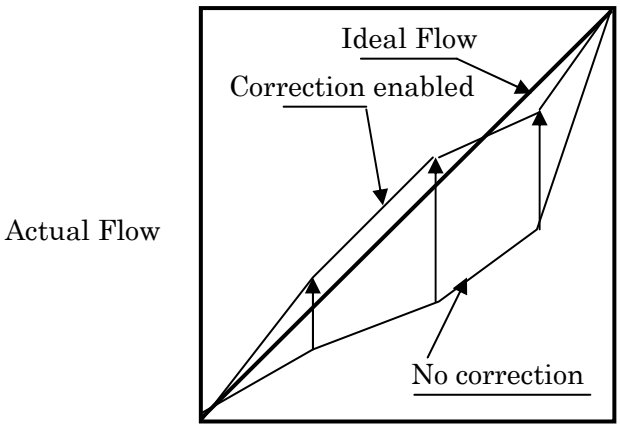


(Fig. 15)

6. Click "GET" icon to confirm the Offset Value.
7. Repeat above procedure in case of failure.

e) Linearization Setup

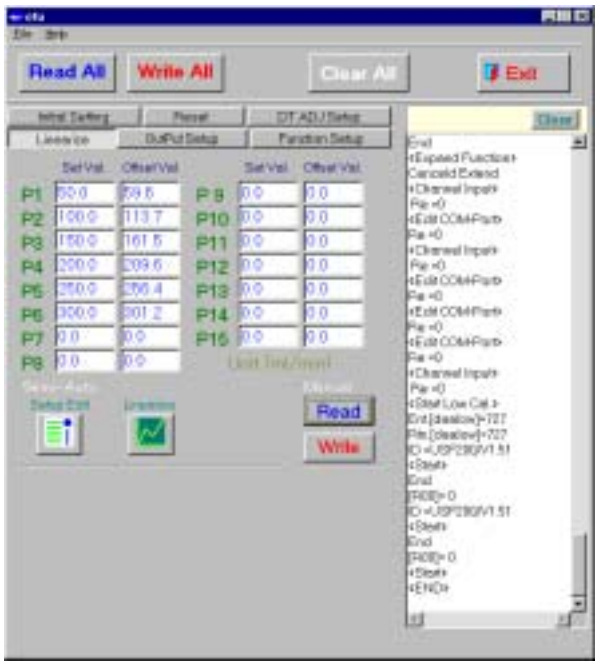
This function is to adjust the difference between actual instant flow and read instant flow rate to each linear point. Maximum set points are 15.



Flow Rate (Fig. 16)

- Once new offset value is entered, previous data will be over written. Therefore it is recommended to write the original offset value down before you make any changes.
- Make sure that Zero point and DT ADJ offset has took place prior to Linearization. (not the other way around)

1. Click “Linearize” tab.



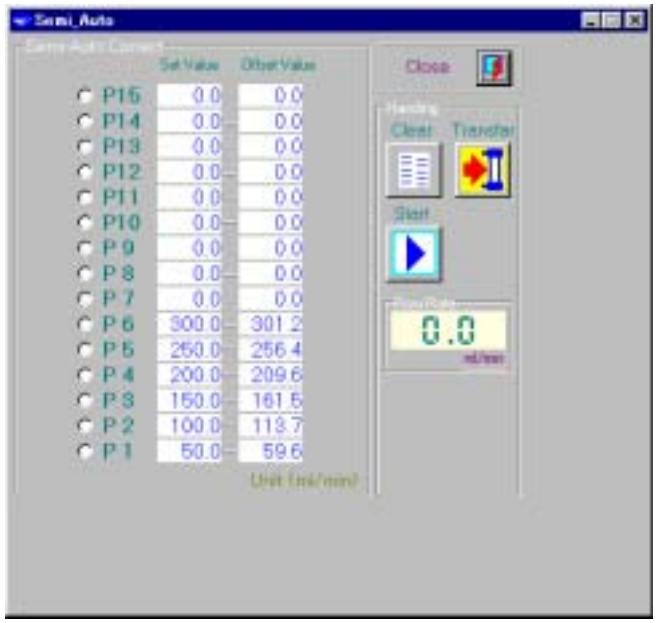
(Fig. 17)

2. Click the “Setup Edit” icon.

(Fig. 18)

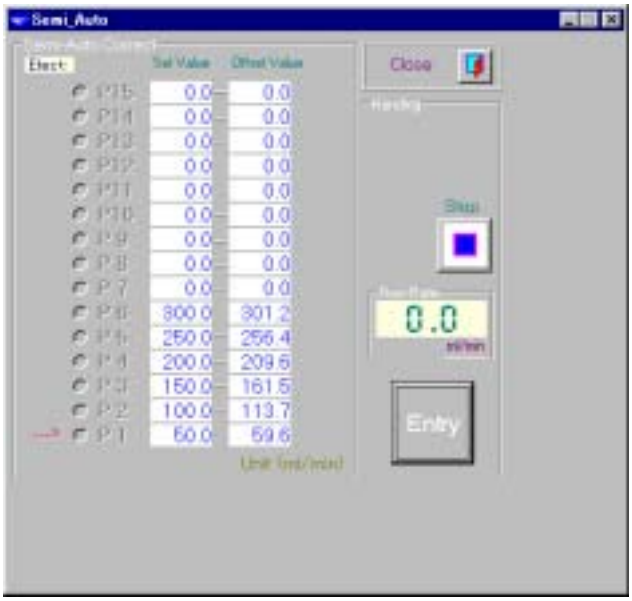
3. This table is to create linear point you would like to have. Enter the value you would like to Linearize.

4. Click “Close” icon then go back to Linearize Setup menu.
5. Click “Linearize” icon.
6. Choose a point you want to make offset.



(Fig. 9)

7. Apply steady and accurate instant flow to the point you would like to linearize.
8. Flow the setting flowrate at the corrected point into the USF200S/USF300C.



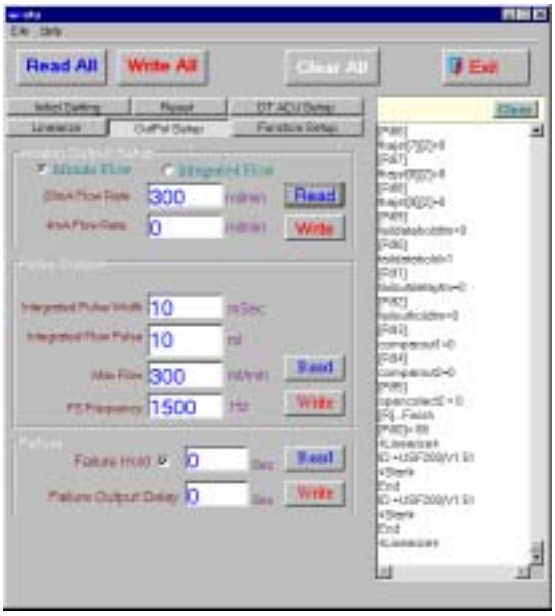
(Fig. 20)

9. When achieving correct flow then click “Entry” icon to achieve offset value.

10. Click “Transfer” icon to input correction value.
11. Click “Close” icon to go back to linearization setup menu.

f) Output Setup

Both settings of analog and pulse outputs are to be set.



(Fig. 21)

f.-1) Analog Output for 4-20mA

- This window is to specify the analogue output configuration

-After input of the new value click “write” icon to save the changes.

◯Instant flow / Integrated flow

There are two types of 4-20mA output. One is instant flow rate and the other one is integrated flow volume.

◯4mA flow rate.

Setup for instant flow rate and integrated flow are different.

Instant flow：

Setup flow rate for 4mA output.

Set value can be zero or up.

Integrated flow:

Set the value zero only.

◯20mA flow rate.

Instant flow rate and integrated flow volume are also different.

Instant flow：

Set within full scale of instant flow rate for 20mA output.

Setup value can be from 0 to 9999.

Integrated flow:

Enter maximum integrated flow value.

Setup value shall be within 0 to 9999.

f-2) Pulse Output

This window is to specify the pulse output configuration.

-After entering the value click “write” icon to save the changes.

◯Setup for frequency output / integrated pulse output.

In order to use this function, instant / integrated frequency output must be selected at open collector output (Refer b-5)

Frequency output.

Outputs instant flow rate by pulse. Input frequency value as of the full scale.

Integrated Pulse Output.

Outputs a pulse in accordance with integrated flow volume which can be specified. Output pulse width can be adjusted.

*When you are using integrated pulse mode, make sure the relation between integrated pulse width and integrated pulse output setting is proper, in radical case, the pulse may continually be generated.

◯Integrated pulse width.

Sets the length of output pulse between 1~800msec.

◯Integrated Pulse count.

Sets output pulse for integrated flow volume between 1~200ml.

◯Maximum flow rate in frequency.

Sets max flow rate for frequency output between 1~32000ml/min.

◯Full Scale Frequency.

Sets maximum outputs frequency between 100~3000Hz.

Note :Below 10Hz can not be output.

f-3)Fail

This function is to control reading failure caused by bubble entry for instance. After entering the value then click “write” icon to save the changes.

○Fail data holding function

In case of reading failure, the USF outputs an error signal; however at same time the system output previously read flow data in order to keep constant flow output (4-20mA or pulse output).

There are three parameters for this function.

1, Keeps previously read flow data until the flow rate recover itself.

2, Keeps previously read flow data within the specified the time (max 1800 sec) and when it has reached the time it outputs 0ml/min.

3, In case of reading failure occurs, it outputs true flow data.

With selection of function enables constant flow rate output incase of air bubble entering the USF. Setting ranges are 0 to 1800 sec.

- Fail output delay function:

  If the USF fails to read flow rate due to air bubble entry for instance, it outputs an error and read LED shall be turned on. However, instead of outputting an error straightway it can delay the timing for error to be generated in case of reading failure solved naturally with in the set time.

1. Sets delay time to generate an error. It can be set from 0 to maximum1800 sec.
2. It generates an error straightway when reading failure has occurred
   This function is independent from **FAIL DATA HOLDING TIME**.
   E.g.:
   - Fail output delay time set as 10 seconds,
   - Fail Data Holding time set as zero.

   In this case, it does not generate error, however; after the 10 sec. 0ml/min generate if the air still causing reading failure.

6. Where to contact

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