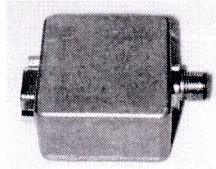
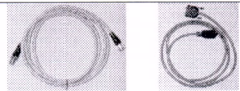


Flow Monitoring System

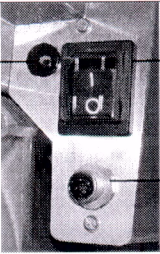
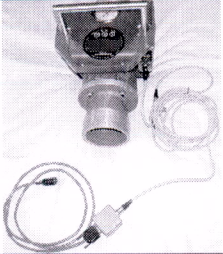
The flow monitoring system provides a data logging function on a PC or laptop of the flow rates measured by the Flowmaster. The flow monitoring system consists of an RS485 to RS232 converter that interfaces the flow meter to the PC or laptop, cables and software to capture and display flow data.

Specifications:

Converter:		
Function:	Converts RS485 output data to RS232 format.	
Format:	Half-duplex at 9,600 baud.	
Dimensions:	60 x 40 x 25 mm	
Weight:	100 grams	
Protection:	IP54 (dust-proof)	
Power:	Supplied from Flowmaster battery	
Input:	4-pin IP65 connector.	
Output:	9-pin RS232 connector.	

Cables:		
Input Cable:	2.0 m long IP65 (drip-proof) cable linking flow meter and converter.	
Output Cable:	1.5 m long IP54 (dust-proof) cable linking converter to laptop.	

Software:	
Functions:	<ul style="list-style-type: none"> - Interpret data stream from Flowmaster and extract flow data - Readout of current flow rate. - Readout of cumulative volume flowed. - Log of flow readings generated - File save of flow data logged in MS Excel format. - Date and time displayed on screen.
Utilities:	<ul style="list-style-type: none"> - Choice of sampling rates: 30 msec, 0.2 sec, 1 sec, 5 sec. - Choice of readout units: litres per minute, litres per second. - Set readout LSB to zero to facilitate viewing. - Select between integration of flow readings between samples (default) or instantaneous flow value. - Record data for fixed time frame or according to start/stop buttons.

 <div style="position: absolute; left: 165px; top: 748px;">Battery charger input</div> <div style="position: absolute; left: 385px; top: 758px;">Power switch</div> <div style="position: absolute; left: 385px; top: 810px;">Serial data output</div>	
Connector panel with digital output	Flowmaster with converter attached.

Flow Monitoring System

Operating Procedure:

1. Connect signal cable between Flowmaster and convertor and RS-232 serial cable between convertor and laptop or PC.
2. Power on laptop and Flowmaster.
3. Select and start the program "TSI Flow Monitor" from program list.
4. Click on SAVE button and type in a log file name. Use BROWSE option to select a directory in which to save the log file. Note that this step is not necessary if you do not wish to save a log file.
5. Click on SAMPLING button if you wish to change the default sampling rate and filter selection.
6. Click on START to begin monitoring flow rate. The flow rate in litres per minute and the cumulative flow in litres will be displayed dynamically. The sample number and log time are also displayed.
7. Click on STOP to end the flow rate monitoring. Flow data is written to file.
8. Repeat steps three through to seven as often as desired.
9. Click on CANCEL to exit the program.

Analysis:

The flow data is logged in tab-delimited Microsoft Excel format and can be analysed using the Excel program. A graph of flow rate versus time or automatic extraction of features from log file generate useful information.

Notes:

1. Sampling Rate is defined in seconds and default is 0.1 sec which equates to ten samples per second. Minimum sampling rate is 0.03 sec.
2. Mean filtering is applied to sampled data using a default of ten flow samples. The user can select to have no filtering or to change the number of samples used in generation of mean value.
3. User can select which PC COM port to use. Older PC's have two serial ports defined as COM1 and COM 2.

Flow Monitoring System

Flow Rate (lpm)

0

Cumulative Flow (l)

Save Options

Speicheroptionen

File Name

Dateiname

Browse

Speichern unter

Data Log Options

Optionen

☒ Time

Zeit

☐ Cumulative Flow

Gesamtdurchflussmenge

OK

Cancel

Abbrechen

No Log File Specified

Settings

COM

Sampling

Cancel

tsi

0000



Flow Monitoring System



Flow Rate (lpm)

0

Sampling and Filter controls



Messintervall- und Filtersteuerung

Sample every
Messung alle

0.1

Seconds
Sekunden

Filter

☐ No Filtering
Kein Filter

☒ Mean Filtering using
Mittelwertbildung über

10

points
Punkte

OK

Cancel

tsi



Flow Monitoring System



Flow Rate (lpm)

Durchflussmenge (Liter pro Minute)

0

Cumulative Flow (l)

Gesamtdurchflussmenge (l)

0.0

Sample Number: Nr. der Messung 0

Log Time: Messzeitpunkt 0:00

Start

Stop

Save
Speichern

No Log File Specified Dateiname nicht definiert

Settings

Einstellungen

COM
Schnittstelle

Sampling
Messintervall / Filter

Cancel

Abbrechen

tsi::



Flow Monitoring System



Flow Rate (lpm)

0

Cumulative Flow (l)

0.0

Serial COM



Serielle Schnittstelle

Serial Address

COM1

Schnittstellenadresse

OK

No Log File Specified

Settings

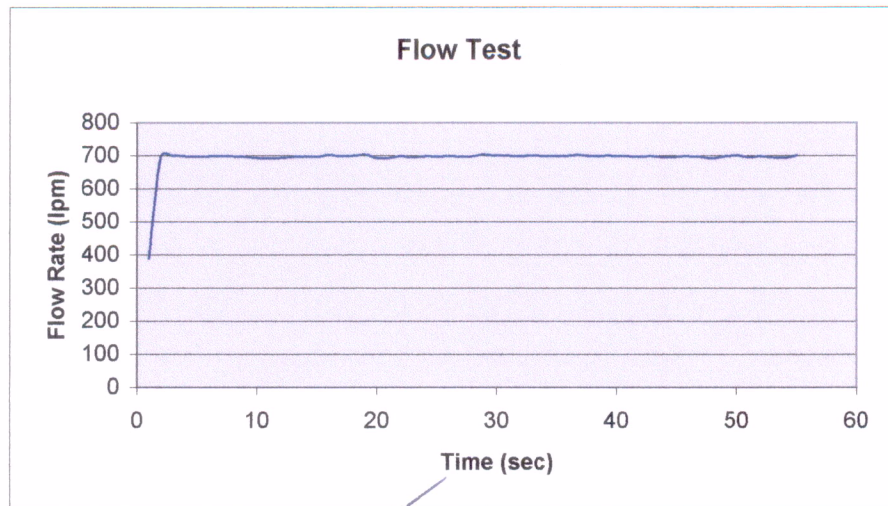
COM

Sampling

Cancel

tsi

Time (secc	Flow
1.001.000	388
2.003.000	698
3.004.000	700
4.006.000	698
5.007.000	697
6.009.000	699
7.010.000	699
8.011.000	698
9.013.000	697
10.014.000	694
11.016.000	692
12.017.000	694
13.019.000	697
14.020.000	699
15.021.000	696
16.023.000	701
17.024.000	698
18.026.000	700
19.027.000	703
20.029.000	694
21.030.000	694
22.032.000	699
23.033.000	695
24.034.000	698
25.036.000	696
26.037.000	698
27.039.000	697
28.040.000	699
29.042.000	703
30.043.000	700
31.045.000	700
32.046.000	698
33.047.000	700
34.049.000	699
35.050.000	698
36.052.000	700
37.053.000	702
38.055.000	699
39.056.000	700
40.057.000	698
41.059.000	698
42.060.000	697
43.062.000	699
44.063.000	695
45.065.000	696
46.066.000	699
47.068.000	696
48.069.000	692
49.070.000	699
50.072.000	701
51.073.000	695
52.075.000	698
53.076.000	695
54.078.000	693
55.079.000	701



Nicht Zeit in sec, sondern Anzahl Zyklen