

Introduction

In most instances semiconductor Fabs have no (or limited) control of their medium consumption. Chemicals, which are in use, are very expensive in both the acquisition and disposal. With LeviFlow™ from Levitronix®, semiconductor Fabs are able to monitor/control their facility consumption in an easy and precise manner and can react in the event of an unusual and/or unexpected high consumption of medium. LeviFlow is an ultrasonic flowsensor based on transit time measurement.

A "Volume Counter" function that is a feature of LeviFlow enables monitoring of the overall weekly, monthly and annual consumption of each chemistry.

Main background for this application is to waste NO medium in an uncontrolled way.

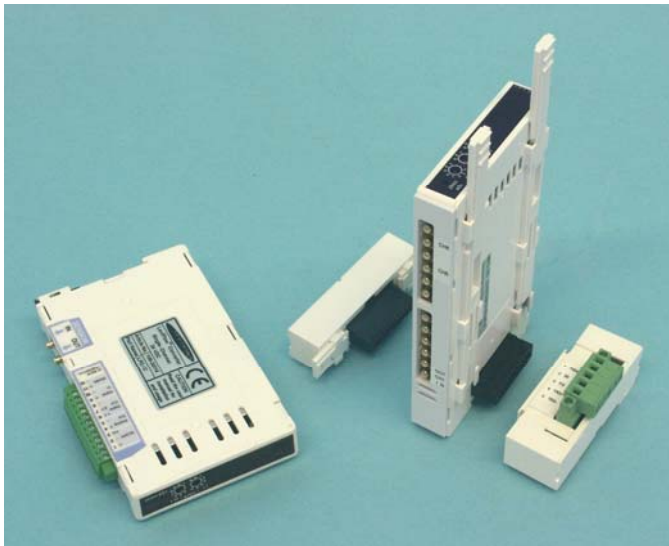
This application note provides a technical overview in order to monitor the consumption flow:

LeviFlow™

LeviFlow™ Sensor (available in U- and Z-shape):



LeviFlow™ Converter:

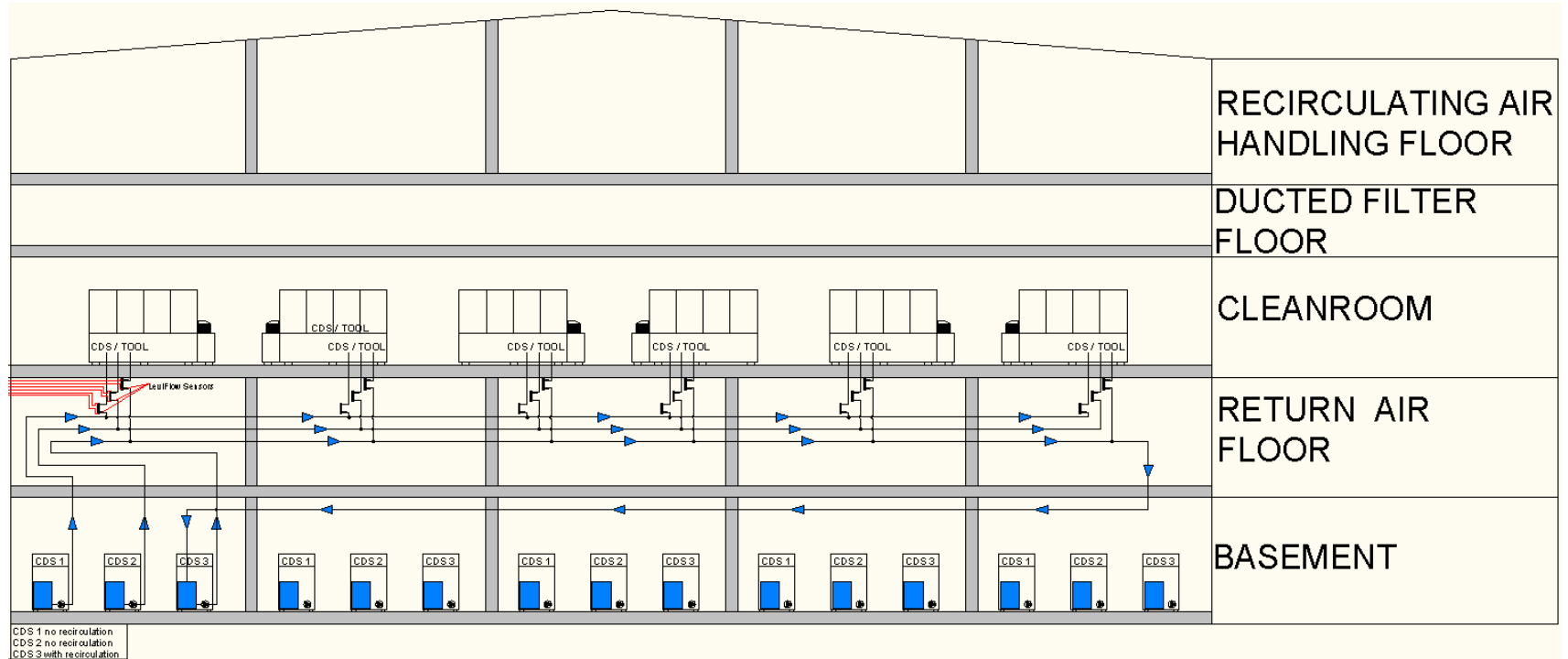


There are two types of converter available:

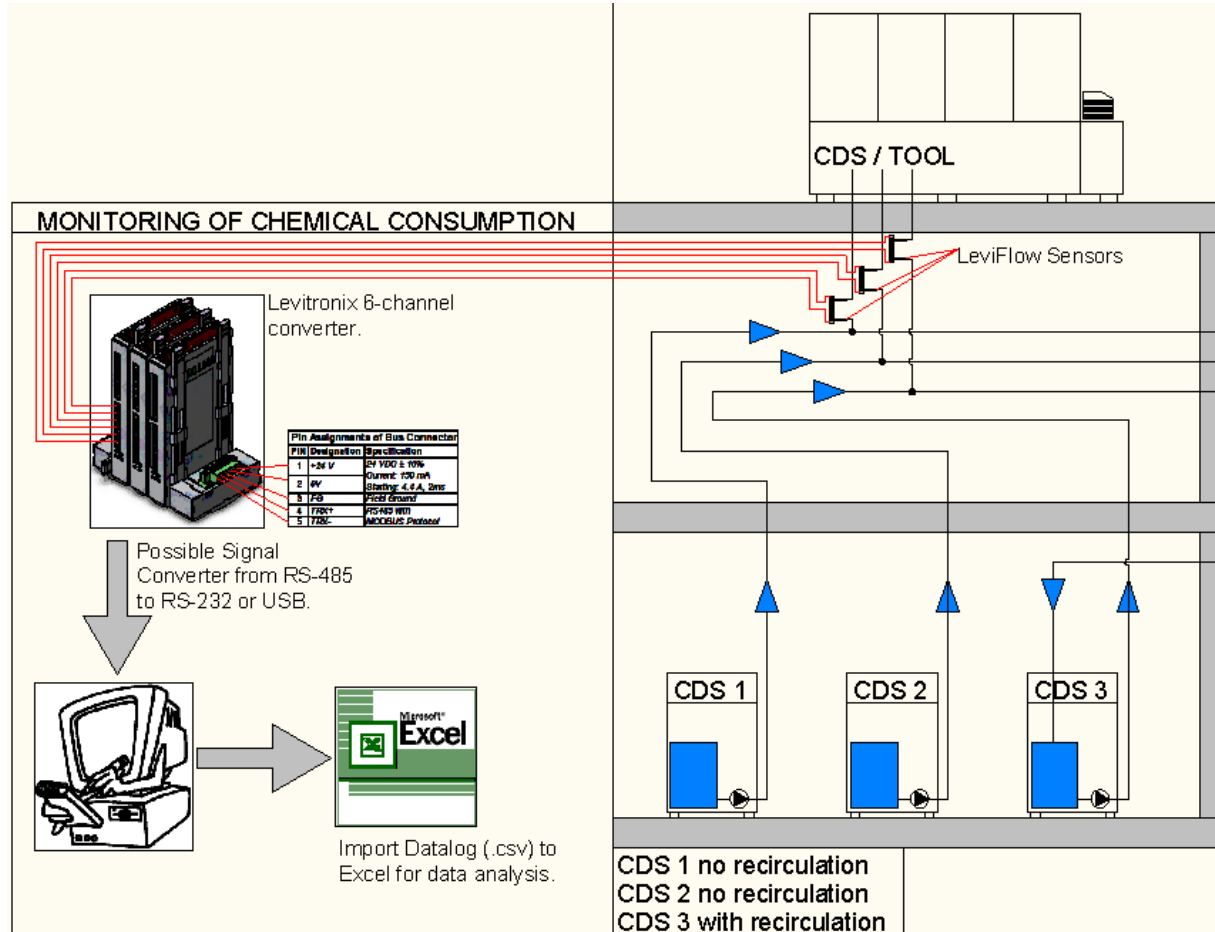
- 1) Single channel converter (left side, connects to an individual flowsensor)
- 2) Multi channel converter (right side, connects up to 6 flowsensors)

Crossview
through
wafer Fab /
Proposal

This schematic gives an rough overview of the chemical distribution system of a wafer fab:



Our Proposal for implementing such a monitoring/control function is to use our datalog software (LeviFlow Config Software) and collect all data in a central HDD storage (PC/Laptop), other data logging systems can be used as well. For detail please see schematic below:

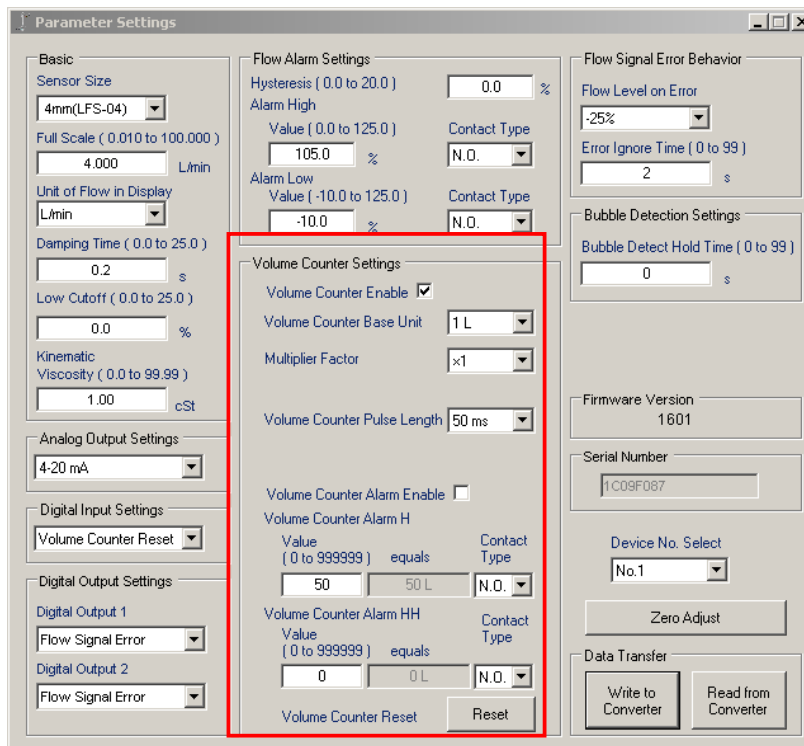


The way how this feature works:

We are using our LeviFlow™ software feature “volume counter”.

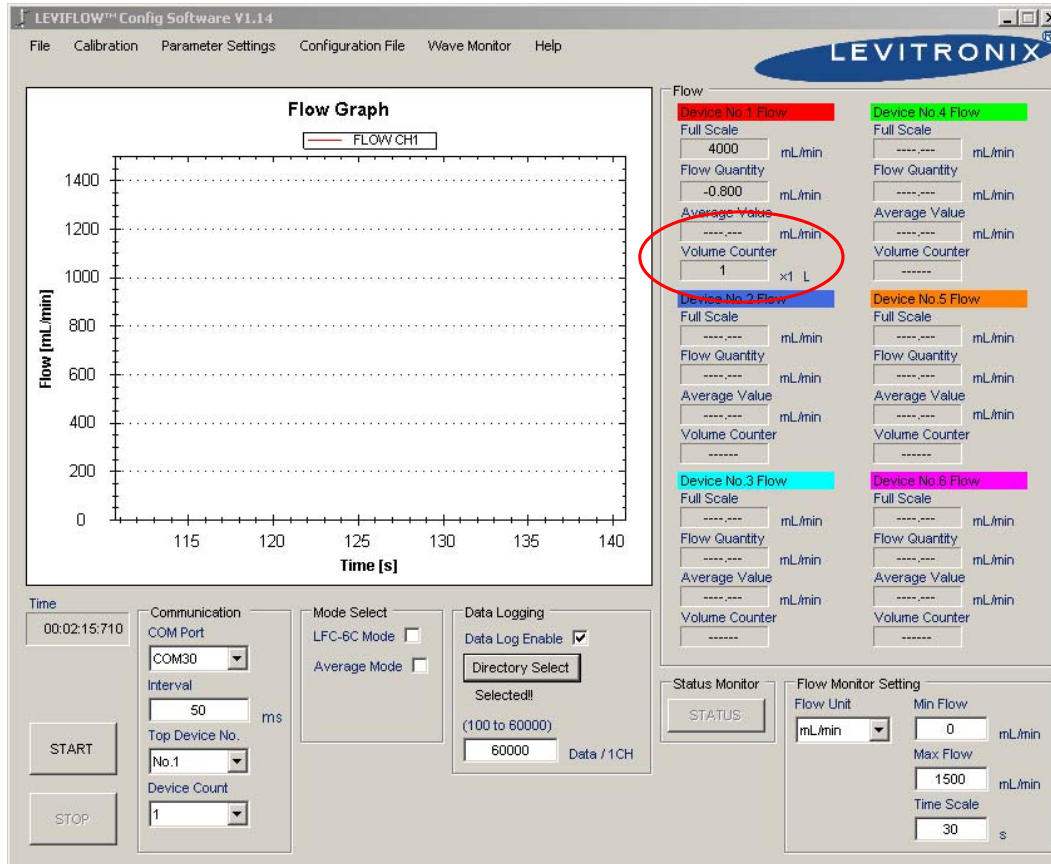
Volume Counter Setup (Totalizer):

- Counter per volume (.1ml, 1ml, 10ml, etc) and Pulse Length per count
- Volume settings per Output Signal activation
- N.O. or N.C. Contact Operation for Digital Outputs



The settings above mean that when 1 liter (volume) has passed through the sensor, a puls signal is created that can be additionally logged via our datalogging software. To summarize, this feature provide the chemical consumption data on a daily, weekly, monthly or yearly basis, along with flow rate (Max, Min and average).

The “volume counter” has an additional function over a digital input where it is possible to reset the counter back to zero.



Benefits

- Precise flow measurement with High Purity ultrasonic flowsensor
- Secure monitoring of medium consumption per tool
- Configurable measurement options for volume - ml, ltr or m³
- Simple flowsensor installation
- Chemically inert flow path - PFA wetted components, high chemical compatibility to highly aggressive chemicals (including HF) up to 100°C (higher temperatures on request)
- No moving parts - No particle generation in flowsensor or maintenance
- Very competitive pricing at high performance
- Correction factor for fluids with higher viscosity
- 6-channel converter available for highly cost effective solutions
- Bubble tolerant - for use with gaseous liquids

**Media waste
– cause and
effect**

- Needle valve adjustment for flow is not a calibrated method → actual flows can be higher from process specified or requested.
- Defective pneumatic valves, valve closes not correctly or is damaged , jammed poppet in the valve body → low flow or total loss of flow that can lead to process drift or loss of yield when no feedback signal is available.
- Process to drain applications → facility shut of valves are damaged or defect.
- 2 or 3-way valves in recirculation line → switching between CDS reclaim and drain line is not correct that can result in chemical loss.
- Tank maximum fill sensor is not responding → facility shut off valve get no signal from fill sensor → overflow into the chemical drain
- Leak Sensor in chemical cabinet is defect → fluids can't be detected

**Technical
Support**

For troubleshooting, support and detailed technical information contact *Levitronix®* Technical Service Department.

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