

Supervision of the gas distribution in a semiconductors plant in Dresden



The SCADA system FabView™ (from Air Liquide) and ALERT supervise the gas distribution in the plant of a semiconductor manufacturer in Dresden (Germany)

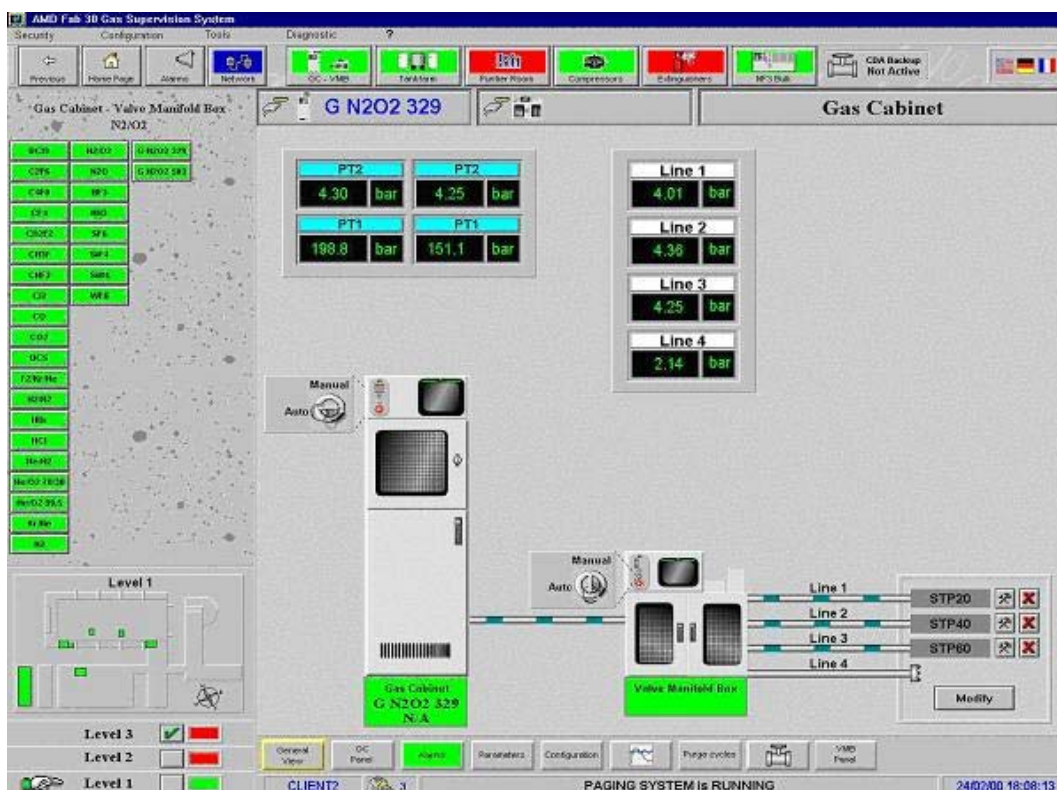
AIR LIQUIDE Electronics' mission, through continuous technological leadership in gases, equipment and services, is to create value worldwide for the Customers in the electronics industry by delivering innovative global multi-fluid solutions that are friendly to the environment.

Semiconductor manufacturing in particular requires the very best quality of materials used like gases and wet chemicals 100% of the time, so uptime is key in fluid distribution systems.

AIR LIQUIDE Electronics in Germany won a couple of years ago, the complete distribution package (equipment, piping and hook-up) of Electronics Speciality Gases (ESG) for a new semiconductor manufacturing plant, in Dresden.

AIR LIQUIDE is also providing Total Gas Management Services (TGM) to operate the installed gas systems. In order to supervise continuously the gas systems the TGM team benefits from Air Liquide's Supervisory Control And Data Acquisition (SCADA) system called FabView™. FabView™ is an application used for visualization and alarm information. It was developed and installed by AIR LIQUIDE ELECTRONICS SYSTEMS (ALES) in Grenoble, France.

FabView™, Screen shot (here gas cabinet)



FabView™ is a Wonderware INTouch based system running under Microsoft WinNT or Win 2000. Management of the huge amount of data coming onto FabView™ is performed by a Microsoft Industrial SQL Server. Thanks to ALERT, messages and alarms are vocally synthesized and phone calls are automatically generated to the on call service. Hereafter you will find an overview of the monitored systems as well as of the SCADA system.

Monitored Systems

- * Approximately 400 fully automated ESG distribution systems. The ESG are supplied from pressurized cylinders through gas cabinets and Valve Manifold Boxes (VMBs). All these systems are equipped with their own PLC (Siemens SIMATIC S5 95 or S7 300) which communicate with the SCADA system.
- * One bulk nitrogen trifluoride (NF3) distribution system.
- * One air separation unit which generates ultra pure nitrogen and ultra pure oxygen by distillation of liquefied cryogenic air.
- * Nine bulk gas tanks used for storing and supplying ultra pure liquefied gases like nitrogen, oxygen, argon, helium and hydrogen.
- * Eight thermo and one cryogenic gas purifiers.
- * Twelve gas analytical systems.
- * Two gas mixers for the production of forming gas (composed of nitrogen and hydrogen).
- * Ten automated filtration stations.
- * One plant generating compressed dry air (CDA). This plant consists of five compressors, ten filtration skids, two distribution manifolds, and one emergency back-up system.

SCADA System FabView™

Hardware:

- *2 S5 -155u, so called data concentrators receiving all information coming from the field
- *200 remote I/Os (ET 200)
- *1 Data and acquisition server
- *1 Alarm server including vocal modems
- *10 View nodes (clients)
- *25 Networks in the field area
- *Ethernet-Network in the communication area

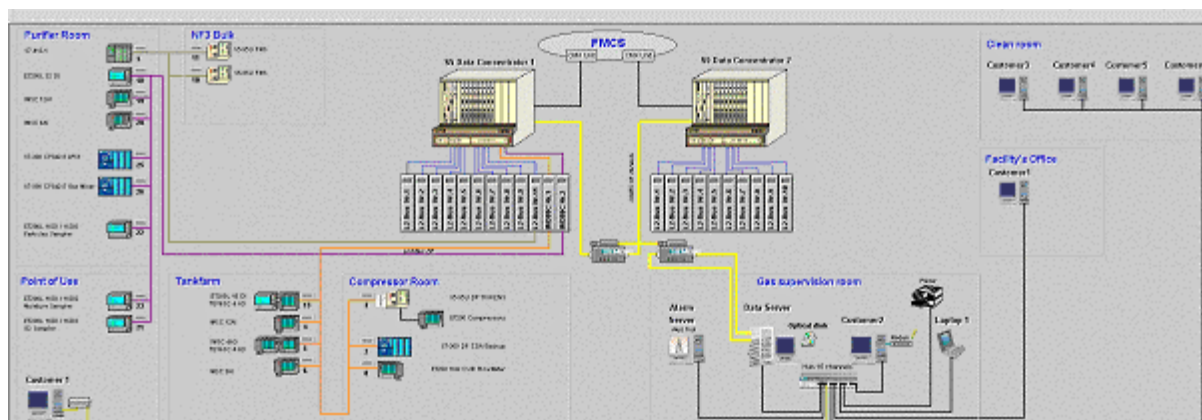
Software:

- *Microsoft Win NT 4.0 incl. Microsoft Office
- *Wonderware InTouch version 7.1
- *Microsoft INSQL
- *Appicom Server 3
- *Micromedia ALERT

Architecture,

IT

network



Alarm data base and automated phone calls performed by ALERT

One of the TGCM team duties on-site is call service. Two team members are always equipped with mobile phones (on call mobile and back up mobile) on which major alarms are transferred as synthesized voice messages by ALERT. These emergency calls happen to appear in a serial not in a parallel way, meaning only if the first cellular is out of response the back up mobile is going to be called. In case that even the second mobile does not answer, two other emergency numbers (home numbers) are successively dialed. If still nobody answers, the call chain starts again until somebody acknowledges this call by entering his personal identification code.

All potential alarms and messages amount to 30 000. ALERT makes a selection of those alarms which really require an immediate intervention by the service team. Nevertheless, even by filtering more than 6000 alarms remain in ALERT's database.

Since during the dayshift, most of AIR LIQUIDE members are on site emergency calls are automatically transferred to the site office. The team's on call duty schedule is entered into ALERT several months in advance; that is why during daily business almost no configuration of the ALERT software has to be done.

Once a week, a preventive check of the system takes place. Eventual recent changes of shift or phone numbers can be corrected. To ensure the proper function of ALERT, a sample call is generated (ALERT integrated feature) in order to track the phone call chain. If for any reason, the system and the call fail, a redundant function of ALERT comes up. This kind of "watchdog" is situated on another server to check permanently the availability of ALERT and a proper call out connection. If a problem occurs, another phone call is generated via a second modem explaining that emergency calls are no longer available and the concerned service technician can immediately focus on the problem.