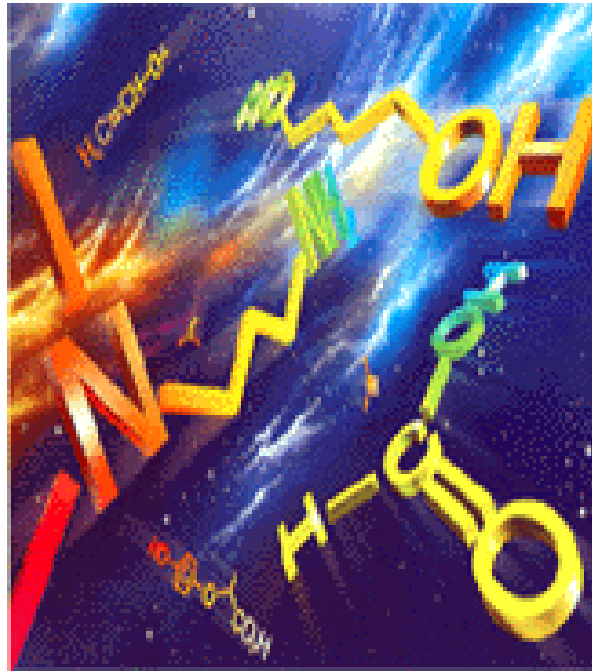


## Chemical Development Research



*Computer control of pilot chemical reactors yields increased safety and better research data for BASF*

BASF says "We don't make a lot of the products you buy. We make a lot of the products you buy better."

The US based BASF corporation is a division of the parent company BASF AG headquartered in Germany and located worldwide. Products include chemicals, plastics, nylon fibers, automotive and industrial coatings, dispersions, dyestuffs and pigments, agricultural products, pharmaceuticals, vitamins, and magnetic media.

At one of BASF's US research facilities, the formulas and processes used in chemical production are developed in multiple "pilot-scale" reactors that are used to simulate "production scale" reactors in plants. Data from this research facility is used to enhance the operation of the plant reactors and to develop new products.

Prior to installing the Opto 22 reactor automation and data acquisition system, all pilot reactor processes were controlled manually.



### Easy And Quick

#### *Tight Integration Is The Key*

The flow chart programming language allowed the research engineers to focus on the process instead of the syntax of developing PC code. It allowed for complex strategies to be developed using a high level language and was easy and quick to learn.

The tight integration of the MMI with the flow chart strategies made it easy to accomplish their objectives in a timely fashion.



### Reasons for automating the process included the following:

- Improve the quality of the products produced
- Improve the safety of the processes
- Make better utilization of research personnel
- Add controllable flexibility to the processes
- Automate data acquisition
- More accurately simulate the production plant processes
- Shorten the research cycle

### Opto 22 Solution Description

The Opto 22 system installed at this facility consists of two G4LC32SX controllers with G4 analog and digital Multifunction Bricks controlling multiple "pilot scale" reactors. The typical reactor requires approximately 30 analog and digital points. Multiple PCs are networked on the system, all running Opto 22's MMI software. All control and alarming is handled by Cyrano flow chart programs running in the G4LC32SX controllers and mission-critical PID loops are run at the analog I/O.

The MMIs are used to give the operators a graphical view of the process, download recipe changes to tune the processes, and accomplish data acquisition.

### Off-The-Shelf Quality

BASF was pleasantly surprised to find an off-the-shelf system that could meet the control and data acquisition requirements.

The Opto system has been bullet proof. We have had absolutely zero product failures.

### Benefits and Quotes from the Project Manager

Safety in the research lab was greatly improved using the Opto 22 system

The flow chart programming language allowed the research engineers to focus on the process instead of the syntax of developing PC code. It allowed for complex strategies to be developed using a high level language and was easy and quick to learn.

The long tag names greatly enhanced the documentation of the system.

Graphical characteristics of MMI helped research personnel to picture the reactor systems and get a better understanding of the process, allowing them to make more educated adjustments to the process.

The IEEE floating point math capabilities of the controllers, configurable in the flow charts, are a great help in research calculations.

Flow Chart language allows for in-house programming  
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Sample OptoDisplay Screen

