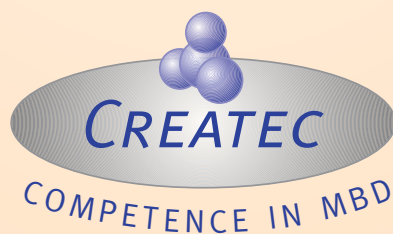


# EMERALD

## *Real Time MBD Process Control*

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# EMERALT

## Real Time MBD Process Control

EMERALT is a powerful computer based real-time process control system for research and industry. In collaboration with the Fraunhofer Society in Germany, EMERALT has been mainly developed as a versatile software tool for MBD applications scaling from basic control tasks to automation of complex environments. EMERALT runs on standard PC hardware and is freely user-configurable. Its clear, intuitive design makes it easy to use. At the same time, it is extremely versatile.

### Features

EMERALT is independent on the operating system. It runs on both MS Windows and UNIX operating systems respectively.

EMERALT has different user and operating levels. Its architecture is based on a dedicated kernel which controls the connected hardware and exchanges user data via the well known CORBA protocol. This concept makes EMERALT extremely robust and allows true real time processing. Moreover, the system can be controlled from different user accounts on different computers using protected network connections.

EMERALT's modular software design allows easy extension or reconfiguration by the user at any time. This is very useful to retrofit existing MBD systems.

EMERALT is fully scalable and it is able to grow with the requirement of the customer.

EMERALT features a powerful control language based on ANSI C which is used for the implementation of own processes. It allows the user to write very efficient and accurately timed recipes. For example, the control sequence for a superlattice structure may look as simple as this:

```
rep (20){  
  [10s] open (Ga);  
  [2s] shut (Ga);  
  [20s] open (Al);  
  [2s] shut (Al);  
}
```

The control language has a clear syntax and is easy to learn and use. If necessary, nested and mixed parallel, sequential and loop commands are possible.

Together with a complete mathematical library, complex tasks can be programmed and realised.

Moreover, event-driven programs can be created e.g. to wait until a certain pressure is reached before valves are opened. A high degree of automation allows an efficient usage of EMERALT.

All data and user interactions are logged (in ASCII format) on a continuous basis, 24 hours a day.

Data logging can be configured separately for each attached device.

### Supported Devices

- Eurotherm PID controllers: 800, 900, 905D, 2404, 2604, "3xxx" series
- MKS PR4000 Pressure Controller (MKS Instruments)
- DSP 9001 Controller
- IMS Stepper Motor Controller (Faberinc)
- Granville-Phillips Vacuum Process Controller 350, 307, 303
- Ion Pump Controller Digital MPC
- Any shutters, valves and other dual state equipment with TTL interface including endpoint detection
- New devices are continuously added, please inquire for the latest additions.

### **NEW!** Additional TCP/IP communication.

EMERALT can control each individual connected device via TCP/IP. Simple connection of all periphery via a standard network switch to the control computer is possible.

This makes EMERALT practically independent on control computer hardware. An upgrade or replacement of the PC is straightforward as well as retrofitting of RS232-based MBE systems to TCP/IP by using non-proprietary serial-to-ethernet converters.

If necessary EMERALT can be easily adapted to virtually any laboratory equipment by our experts. Please ask for further information.

### Technical Data

| Ports                       | Minimum number | Maximum number |
|-----------------------------|----------------|----------------|
| Digital I/O (TTL)           | 96 (0)         | 384            |
| RS-232C full duplex         | 8 (0)          | 128            |
| Analog voltage out (16 bit) | 2 (0)          | 8              |
| Analog voltage in (16 bit)  | 16 (0)         | 64             |



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