Hahn-Meitner-Institut Berlin

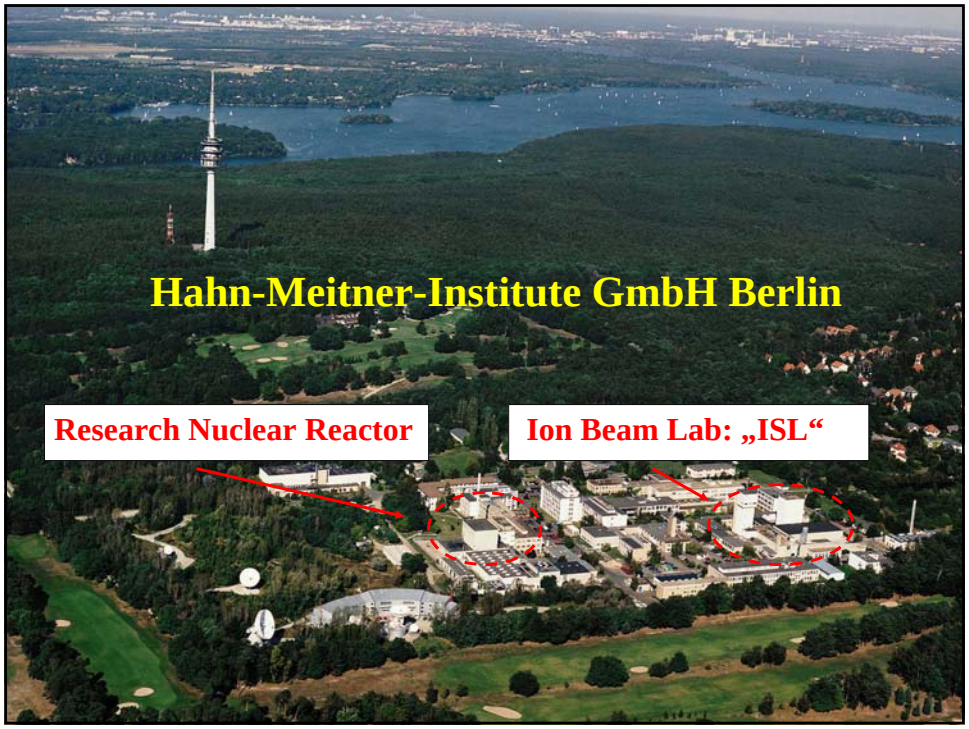
# ‘*VICKSI* ’ - Control System Upgrade

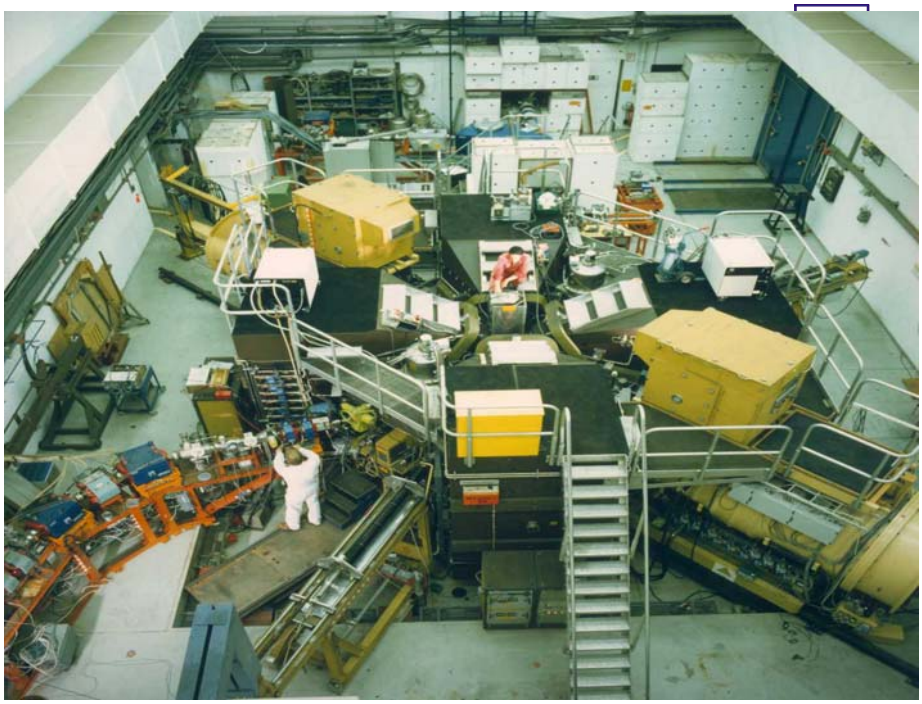
## at the Ion Beam Laboratory ‘ ISL ’

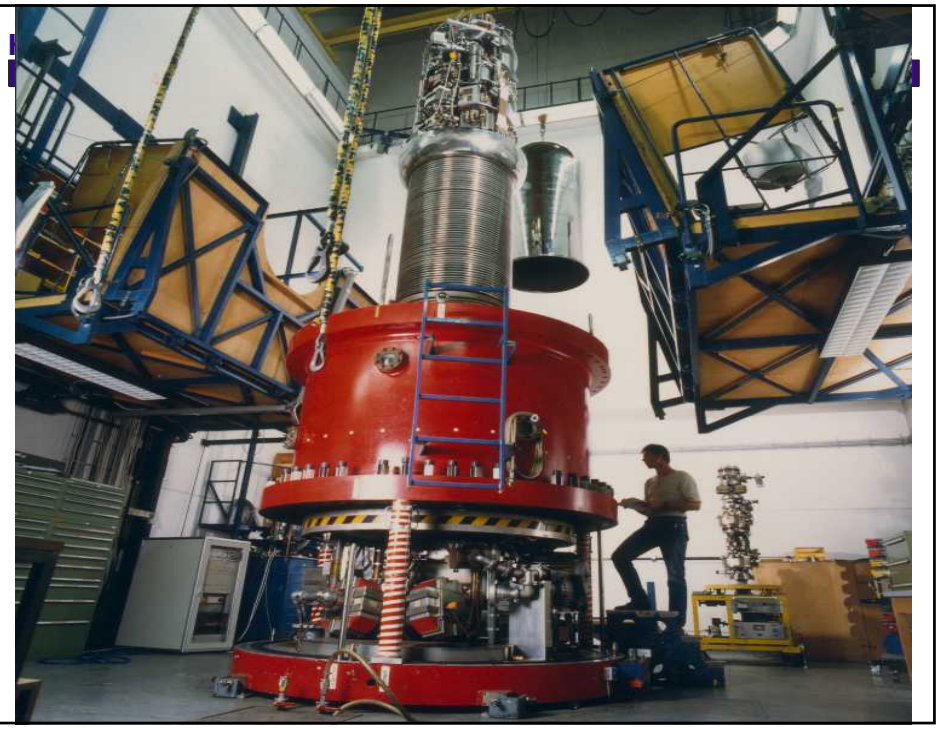
## of Hahn-Meitner-Institute Berlin

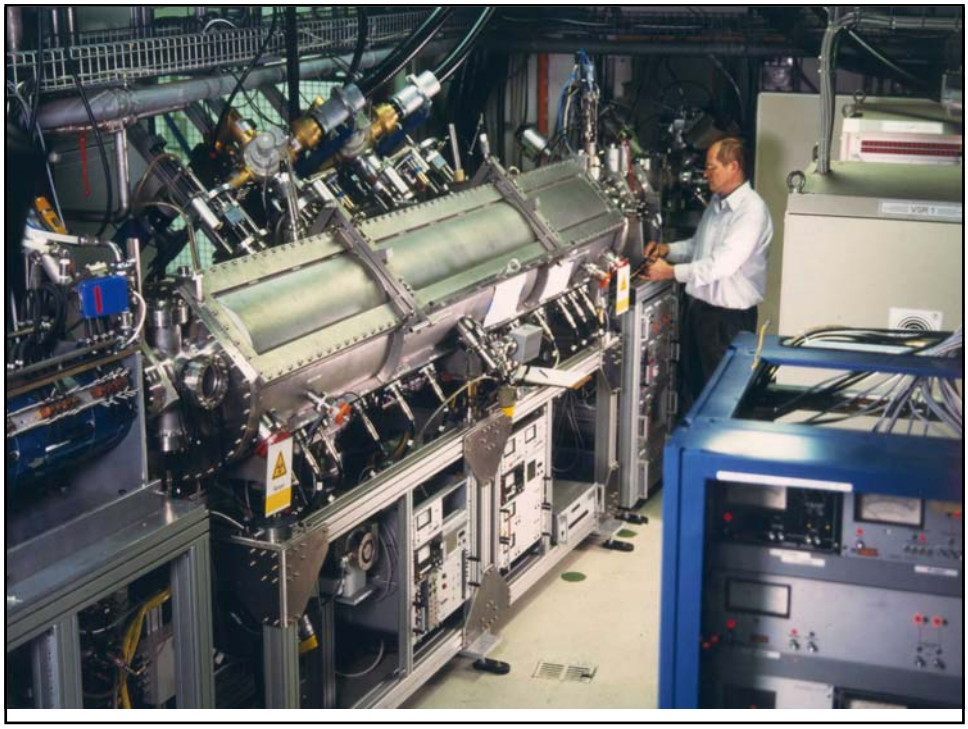
W. Busse, C. Rethfeldt

1. **Ion Beam Lab / Science & Applications**
2. **VICKSI - ISL 1975 - 2002 / VICKSI Control System (VCS)**
3. **ISL 2002 / Strategies to Exchange Components**
4. **Take over useful VCS-Features to the VISTA-Environment**
5. **Summary**

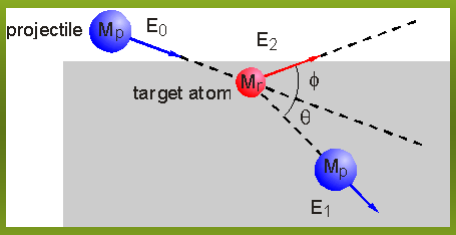


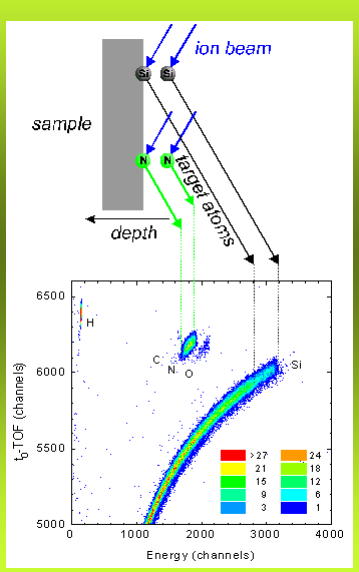






## ERDA-measuring principle

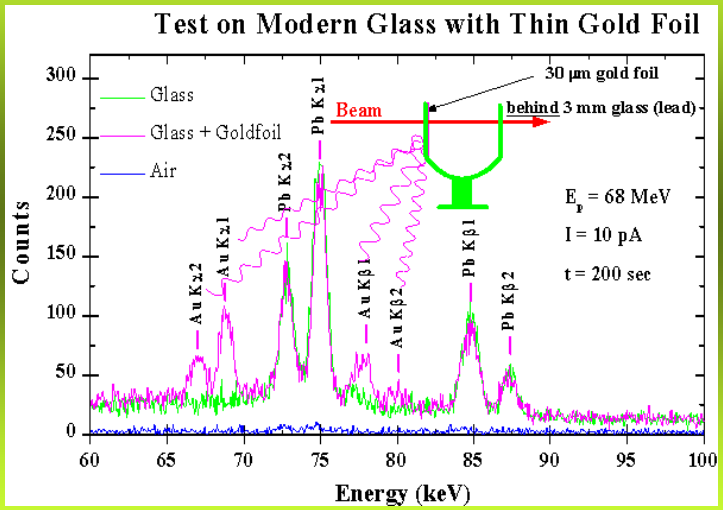



**Example: $SiN_xH$ layer on Si**

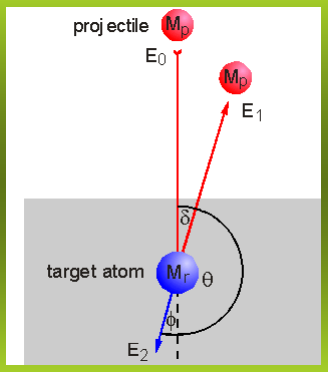
**scattered to 230 MeV $^{129}$Xe-ions**

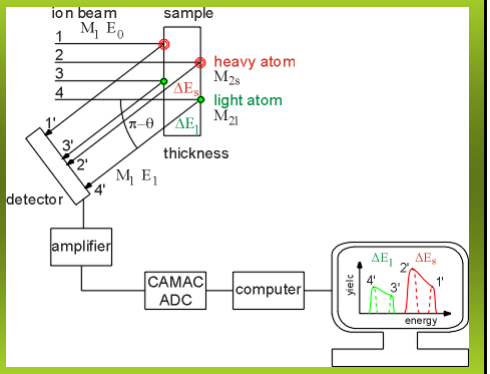
## PIXE-measuring principle




## PIXE-measuring principle

# RBS-measuring principle

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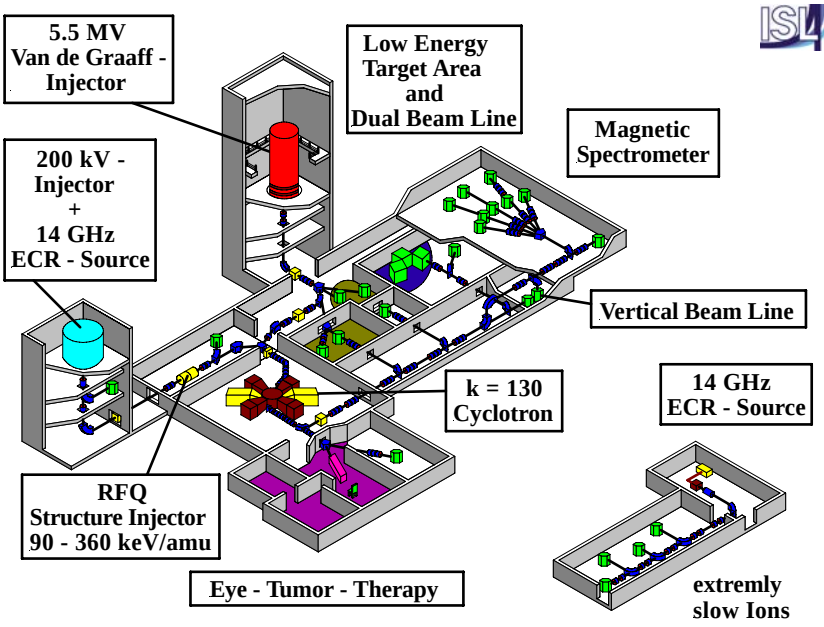
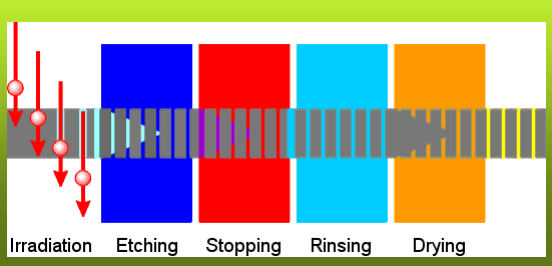
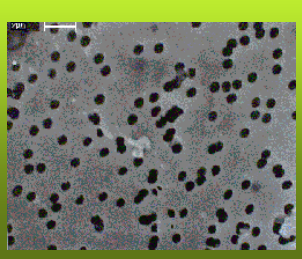
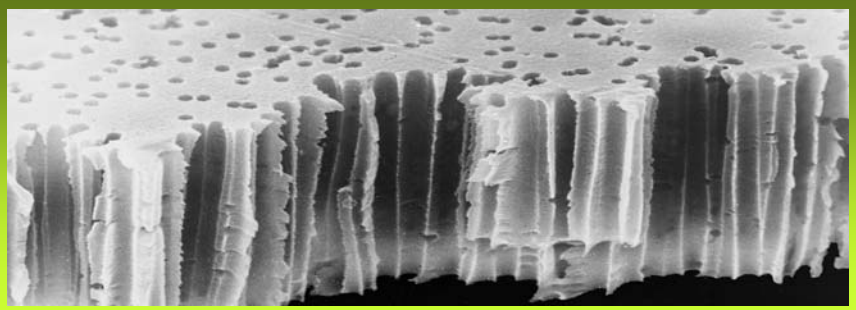


## Irradiation of Foils





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## ISL-Applications

Irradiation of Foils

Irradiation Study of Semiconductor Elements

Proton Therapy of Eye Tumors

## Irradiation Study of Semiconductors

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## ISL-Applications

Irradiation of Foils

Irradiation Study of Semiconductor Elements

Proton Therapy of Eye Tumors

## Eye Tumor Therapy with 68 MeV Protons

## at Hahn-Meitner-Institute-Berlin

**1998 First patient treated**

**2000 167 patients**

**2002 ~270 patients**

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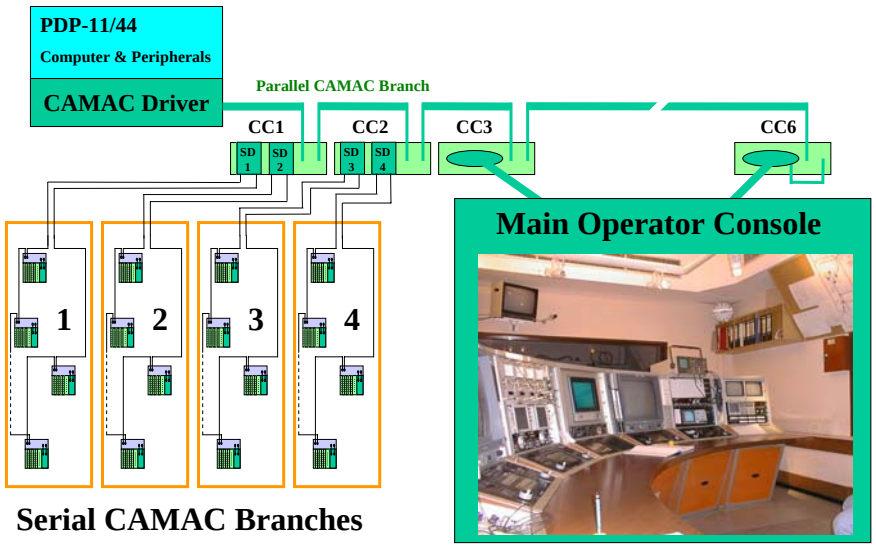
## Topology of the VICKSI Control System




**Serial CAMAC Branches**

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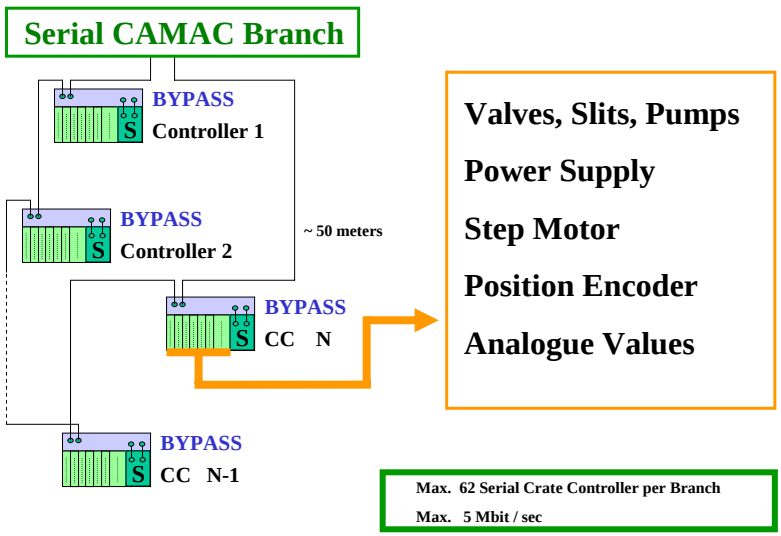


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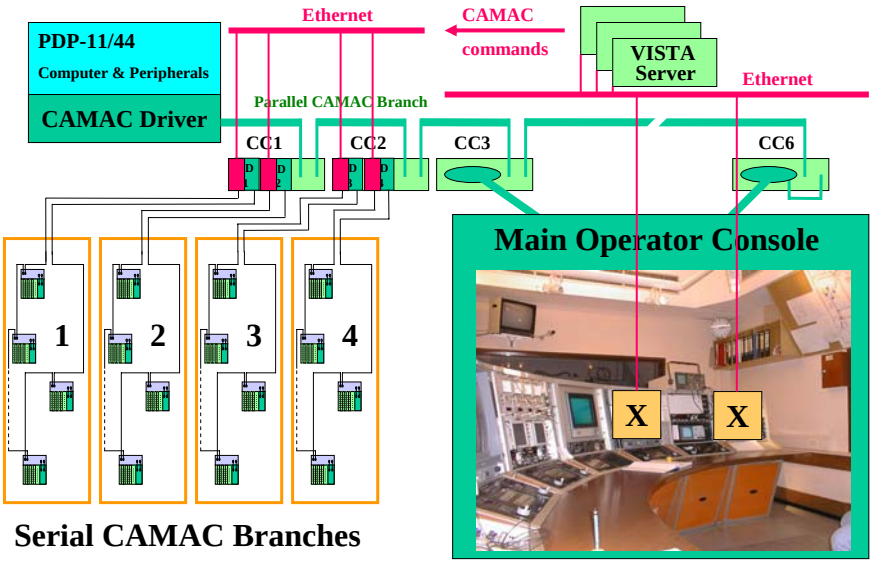
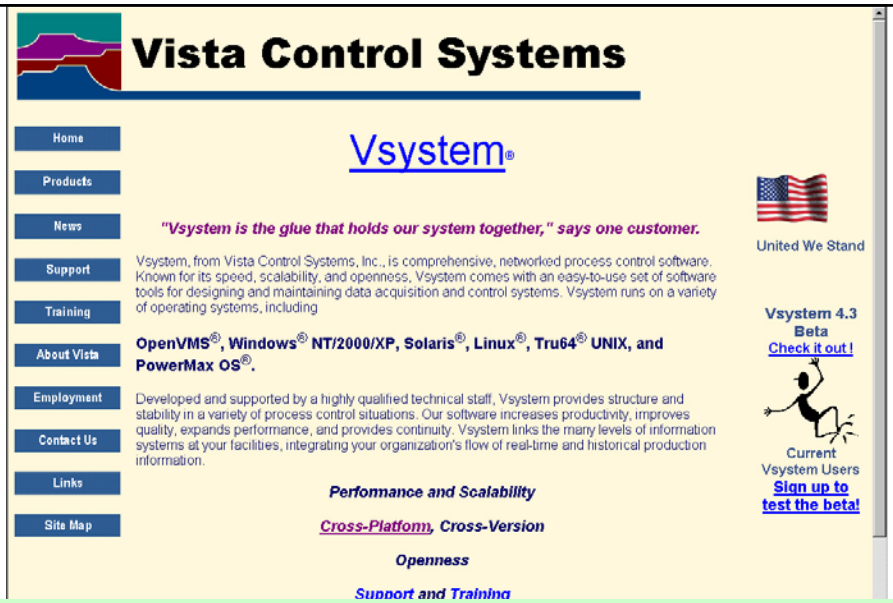
## VICKSI Control System Upgrade Phase 1






www.vista-control.com

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**Benefits of this unique architecture:**

- Speed, manageability, security, and scalability
- High performance and memory resident
- Channel types: binary, integer (8-, 16-, and 32-bit; signed/unsigned), single-precision floating-point, double-precision floating-point, string ($2^{32}$ characters), and time (resolution 1ns)
- Numeric channels can be arrays up to $2^{32}$ elements
- Array channels can be circular buffers; each value can optionally be time stamped
- Each database can have up to 64,000 channels
- Up to 64,000 databases in a system, with any number on each computer
- Alarming with delayed alarms and reference alarms
- Full API
- Event-driven change notification on all fields
- Dynamic memory management
- All channels can be time stamped
- User-written conversion routines with parameters
- User-written I/O routines
- Most fields are dynamically changeable
- Channels can be added dynamically to a running system
- All releases intercommunicate since V2.6--no need to upgrade old system when a new system is added
- $2^{32}$ alarm priorities
- Database, channel, and field security

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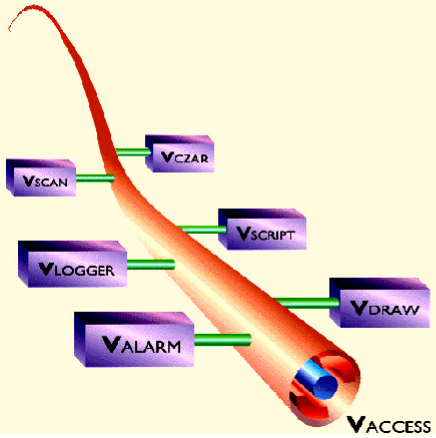
### Some of the many components of Vsystem are:




**Vaccess** Our networked, real-time database...

**Vdraw** Our MMI (man-machine interface) package, with built-in tools that provide automatic connection to database channels...

**Vlogger** Our high-performance data archiving and retrieval package...

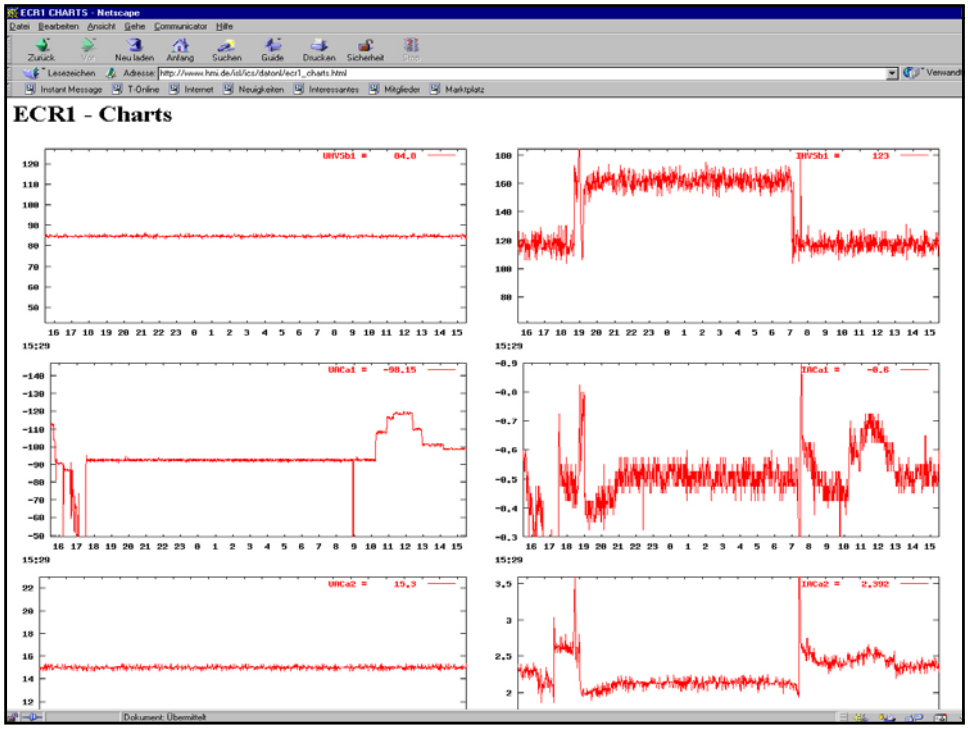
**Vtrend** Our history and trending tool for viewing logged data...

**Valarm** Our networked, real-time alarm management interface...

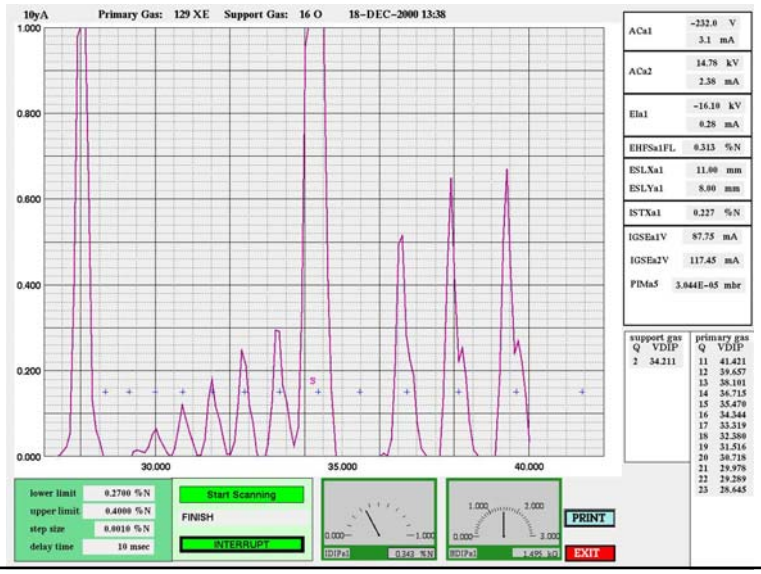
**Vscript** Our networked, easy-to-use database scripting interface...

**Vscan** Our tool that allows you to connect your databases to real-time hardware...

**Vczar** Our networked, real-time database management software package...



## VICKSI Control System Upgrade Phase 1

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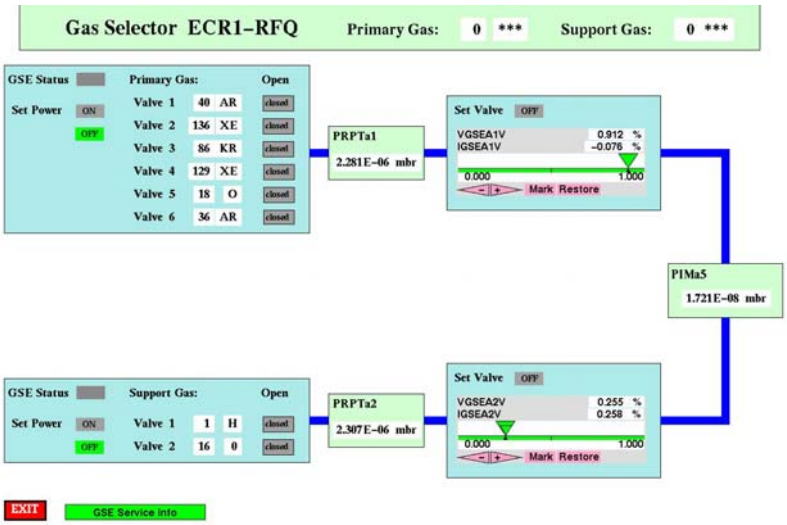
VICKSI Control System Upgrade Phase 1



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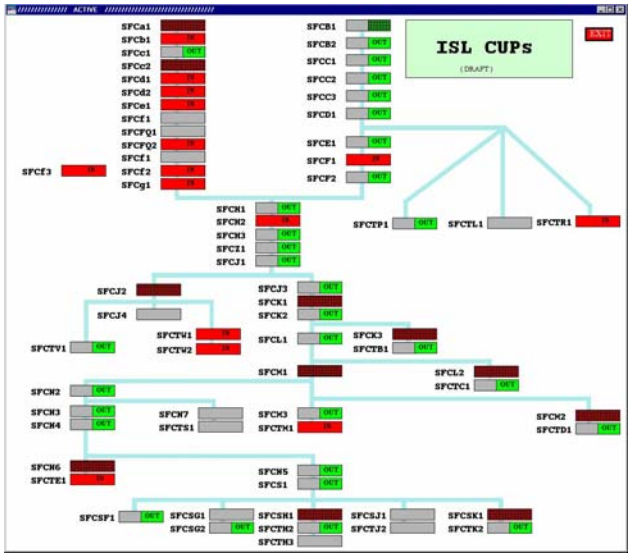


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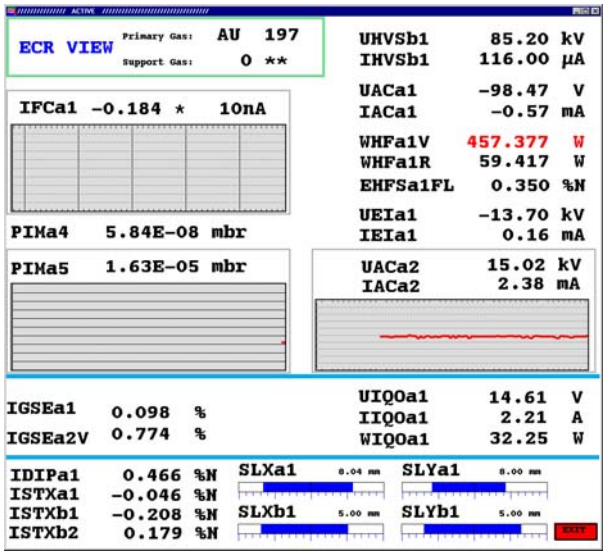

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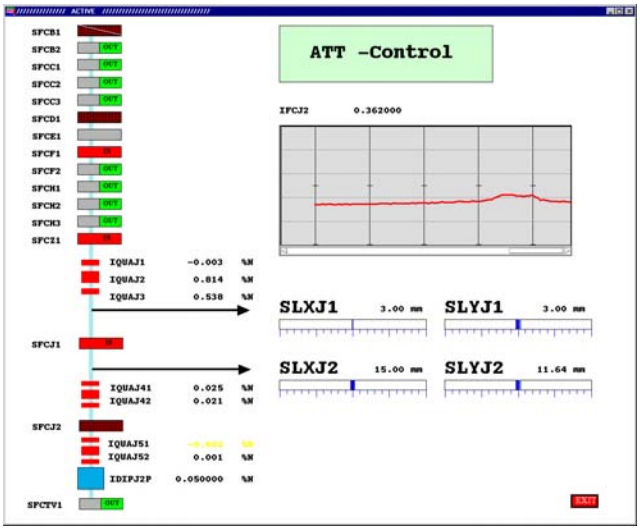


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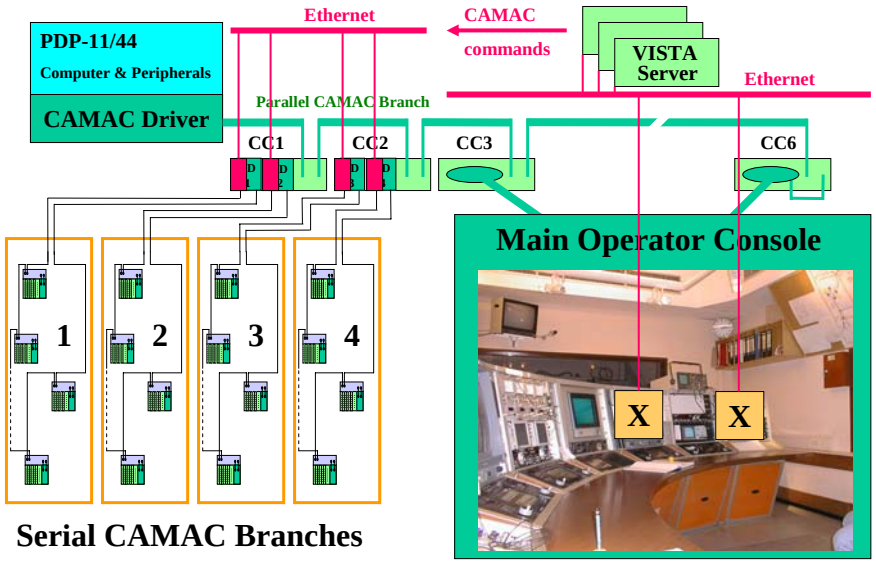
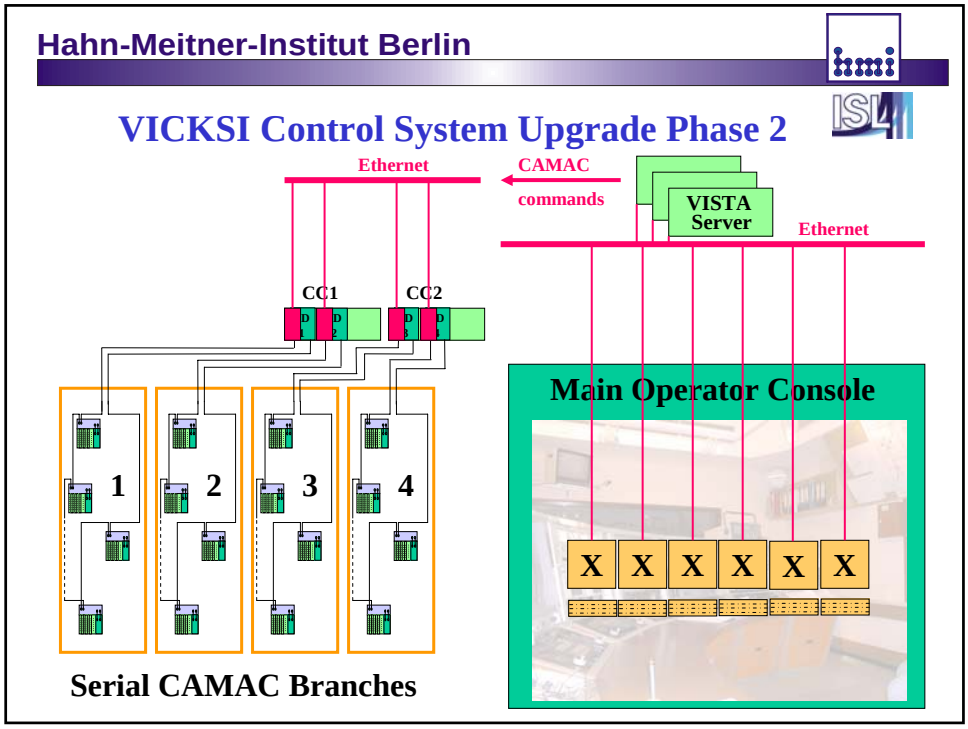
## VICKSI Control System Upgrade Phase 1

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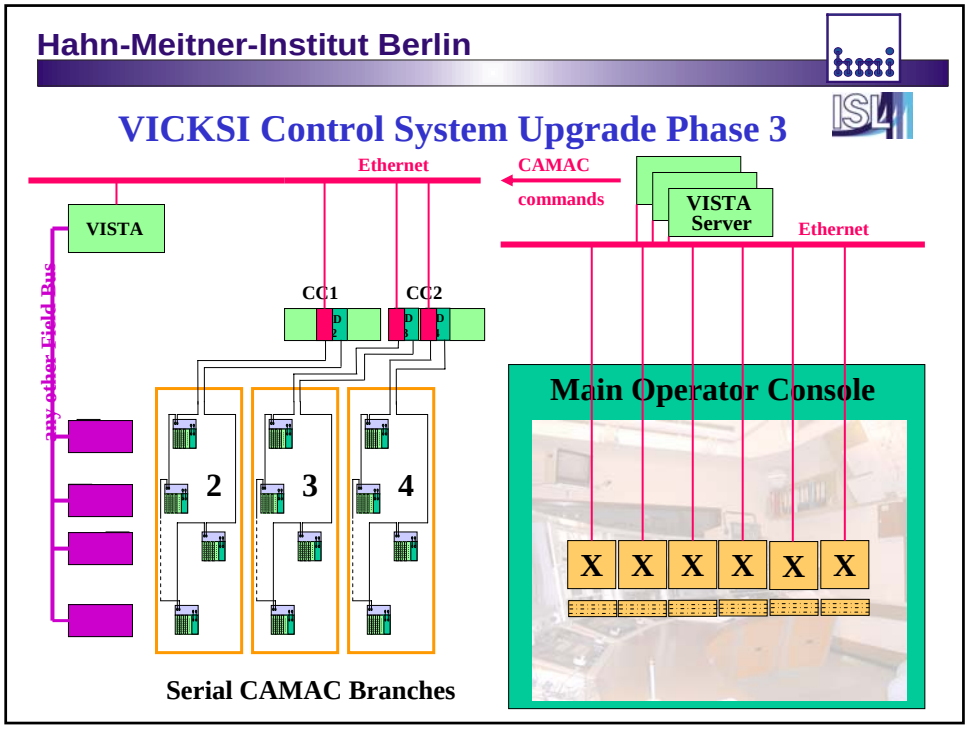
VICKSI Control System Upgrade Phase 2
Ethernet
CAMAC
commands
VISTA
Server
Ethernet
CC1
CC2
1
2
3
4
Main Operator Console
X
X
X
X
X
X
Serial CAMAC Branches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VICKSI Control System Upgrade Phase 3
Ethernet
CAMAC
commands
VISTA
Server
Ethernet
VISTA
any other Field Bus
CC1
CC2
2
3
4
Main Operator Console
X
X
X
X
X
X
Serial CAMAC Branches

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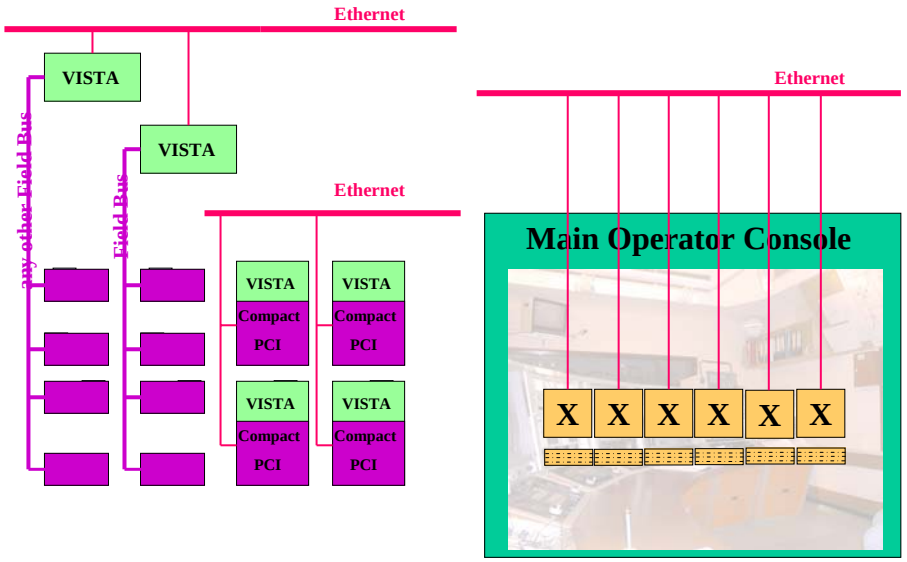
## VICKSI Control System Upgrade Phase 3

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## Take over useful VICKSI features

### Access “Coupled VDB-Channel”

**Special Handler Routine**

| | |
|---|---|
| hparam1 | Centre of Slit Opening |
| hparam2 | Right Position=F(drive1) |
| hparam3 | Left Position =F(drive2) |
| *** | |
| hparamN | |

**Special Convert Routine**

| | |
|---|---|
| cparam1 | conv1 = Position(drive1) |
| cparam2 | conv2 = Position(drive2) |
| cparam3 | conv3 = F (device X) |
| *** | |
| cparamN | convN |

**CAMAC Handler**

VDB Drive 1

hparam1 C1
hparam2 N1
hparam3 A1
hparam4 F1

cparam1 CO1
cparam2 CO2
cparam3 CO3
cparam4 CO4

VDB Drive 2

hparam1 C1
hparam2 N1
hparam3 A1
hparam4 F1

cparam1 CO1
cparam2 CO2
cparam3 CO3
cparam4 CO4

## Summary

Present status: Upgrade 1 Phase / Find individual solutions

Next steps: complete control by VISTA / till end 2003

Our experience:

Main question:

| Own solution | versus | Commercial solution |
|---|---|---|
| Need manpower<br>Spend time<br>...need more $ ? | | Need money<br>Could save time<br>... save more $ ? |

We use VISTA because: No manpower, Not so much time, Want a 'State of the Art' solution, Long time support of OS