

Trends in Substation Automation





P. V. Sivaram
Managing Director
B&R Industrial Automation Pvt Ltd
Pune



About B&R



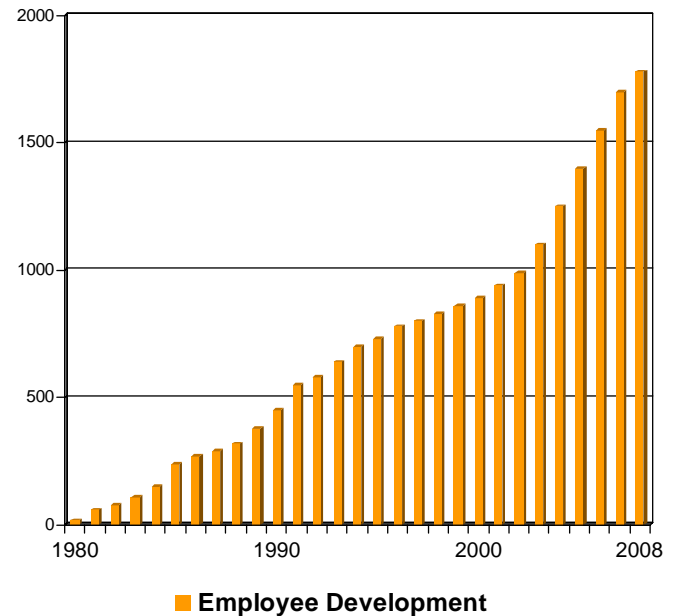
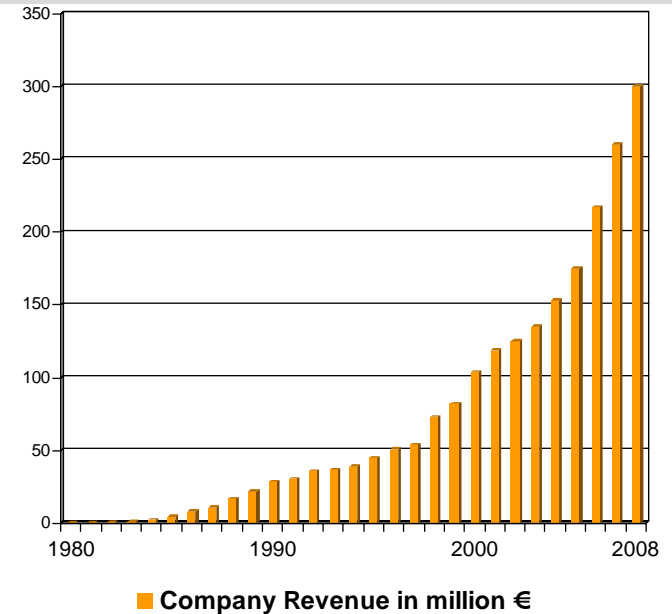
Company Headquarters and Factory at Eggelsberg, Austria



Revenue / Employees



- Privately owned company
- Established in 1979
- 300 million Euro revenue
- 1,780 employees
- 700 B&R experts at partner companies



Global Presence



155 offices in 60 countries worldwide

with sales, marketing, application, training, support and service



- ARGENTINA
- AUSTRALIA
- AUSTRIA
- BELARUS
- BELGIUM
- BOTSWANA
- BRAZIL
- BULGARIA
- CANADA
- CHILE
- CHINA
- COLOMBIA
- CROATIA
- CYPRUS
- CZECH REPUBLIC
- DENMARK
- EGYPT
- FINLAND
- FRANCE
- GERMANY
- GREECE
- HUNGARY
- INDIA
- INDONESIA
- IRELAND
- ISRAEL
- ITALY
- JAPAN
- KOREA
- KYRGYZSTAN

- LUXEMBURG
- MALAYSIA
- MEXICO
- MOSAMBIQUE
- NAMIBIA
- THE NETHERLANDS
- NEW ZEALAND
- NORWAY
- PAKISTAN
- POLAND
- PORTUGAL
- ROMANIA
- RUSSIA
- SERBIA
- SIMBABWE
- SINGAPORE
- SLOVAKIA
- SLOVENIA
- SOUTH AFRICA
- SPAIN
- SWEDEN
- SWITZERLAND
- TAIWAN
- THAILAND
- TURKEY
- UKRAINE
- UNITED ARAB EMIRATES
- UNITED KINGDOM
- UNITED STATES
- VENEZUELA
- VIETNAM

B&R India - Offices



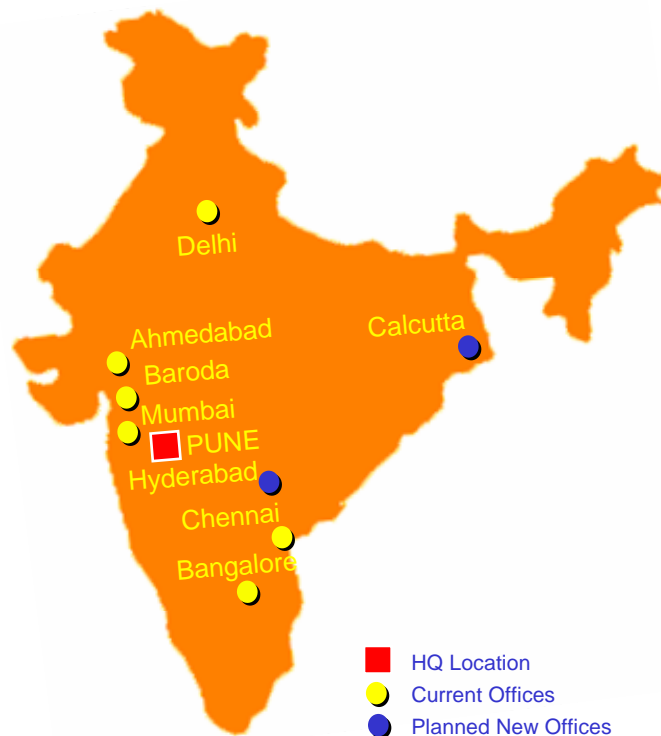
■ B&R Headquarters: Pune

B&R Industrial Automation Pvt Ltd
8, Tara Heights
Mumbai Pune Road
Wakdevadi
Pune 411003

Phone : +91 (0)20/66011522

Fax : +91 (0)20/66011520

Email office.in@br-automation.com



■ B&R Ahmedabad

B&R Industrial Automation Pvt. Ltd.

■ B&R Bangalore

B&R Industrial Automation Pvt. Ltd.

■ B&R Delhi

Caterpillar Electric Pvt. Ltd.

■ B&R Baroda

B&R Industrial Automation Pvt. Ltd.

■ B&R Mumbai

B&R Industrial Automation Pvt. Ltd.

■ B&R Chennai

B&R Industrial Automation Pvt. Ltd.



- no. 1 supplier for Indian machine industry
- major supplier to process industry with partners (Power Distribution, Water treatment, Waste water, Cement, ...)
- Distributor sales to end customers

Customer Structure



■ Sales distribution

- 70% Europe
- 15% America
- 15% Asia

■ Customers

- More than 2,000 OEM machine manufacturers
- Installation at more than 60,000 end user sites
- More than 2,400 customers use B&R plant automation



Optimal solutions for every Industry



- Standard products independent of any one industry
- Innovation potential for all branches of industry
- Integrated automation
 - Fast processing times
 - Shortest reaction times
 - Open fieldbus technology
 - Flexible I/O handling
 - Scalable, high potential visualizations
 - Dynamic positioning
 - All functions integrated in a project using a single tool



Our Customers are our best reference



SIG Corpoplast



Extrusion is more



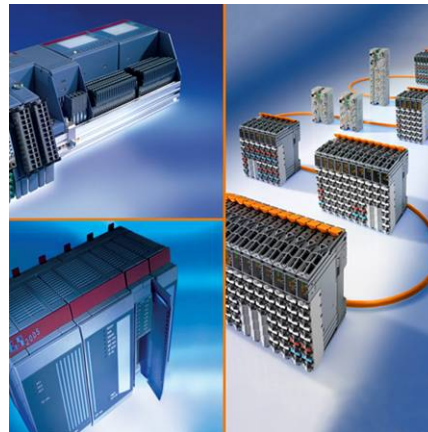
Portfolio - Industrial Automation



Complete product portfolio for industrial automation



Industrial PCs
Microsoft Windows
Operator panels
Mobile panels

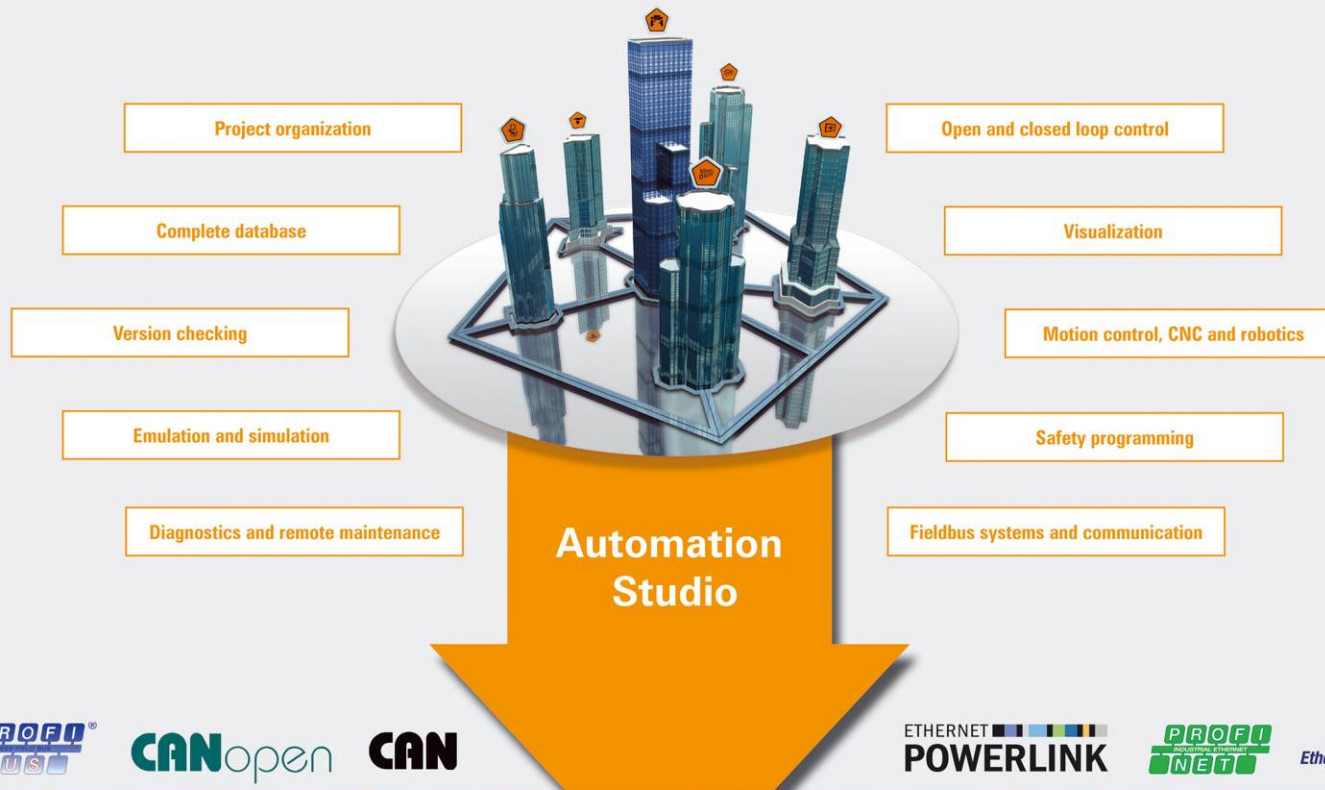


PLC / Soft PLCs
I/O systems / safety
Fieldbuses
Power supplies



Servo drives / safety
Linear motors
Servo motors
Direct drives
CNC / robotics

The Integrated, Scalable Solution



DeviceNet

PROFIBUS

CANopen

CAN

ETHERNET
POWERLINK

PROFINET

EtherNet/IP

Modbus-IDA
the architecture for distributed automation



Motors



ACOPOSmulti



ACOPOS



X67



X20 CPU



X20



SafeLOGIC



ACOPOSmicro



Automation PC



Power Panel



Mobile Panel



Automation Panel 800

International Standards



■ Certifications

- ISO 9001 certification since 1992
- UL and c-UL listing since 1991
- GOST-R certification since 2000

■ Standards

- EN 61000-6 (emissions + immunity)
- IEC 61131 (PLC and IPC)
- IEC 61800 (drives)
- UL 508 (industrial control equipment)
- UL 508c (power conversion equipment)

CERTIFICATE



Management system as per
EN ISO 9001:2000

In accordance with TÜV CERT procedures, it is hereby certified that



BERNECKER + RAINER
Industrie-Elektronik Ges.m.b.H.
A-5142 Eggelsberg, B&R Strasse 1

applies a management system in line with the above standard for the following scope

design, manufacture and sales of systems and components for the automation of machines and plants with a product range including controllers (PLCs, I/Os), industrial computers, visualization devices (HMIs), servo drives and motors, CNC, robotics, process control systems and software

Certificate Registration No. 20 100 42000589

Valid until 2010-06-17
Initial certification 2004-06-18

R. Fritsch

TÜV CERT Certification Body
at TÜV AUSTRIA CERT GMBH

Vienna, 2007-07-23

This certification was conducted in accordance with TÜV CERT auditing and certification procedures and is subject to regular surveillance audits.
TÜV AUSTRIA CERT GMBH Krugerstraße 16 A-1015 Wien www.tuv.at

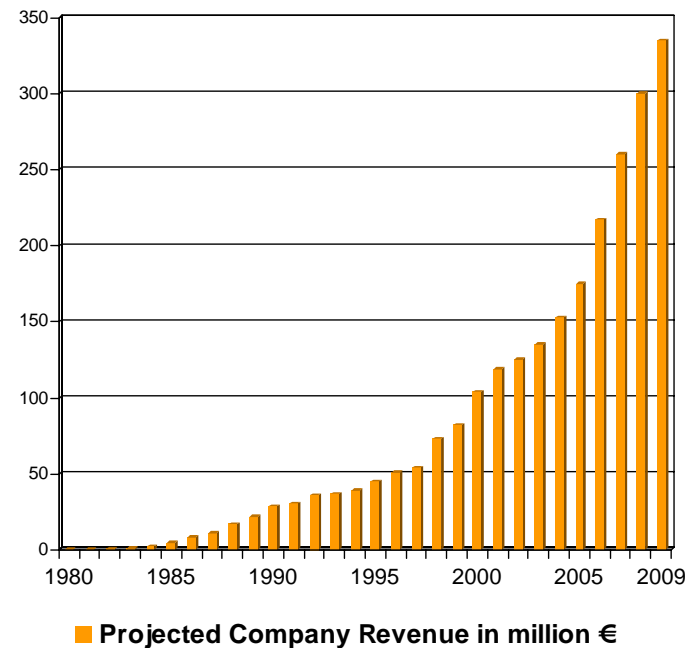


CH01

Expansion Goals



- Product innovations for OEM automation applications
- Solutions for process control applications
- Further internationalization
- Company growth of at least 15% per anno



B&R as a Partner



- Total solutions from one source
- One tool for all products
- Scalable, compatible products
- Constant product innovations
- Continuity and investment security
- Flexibility in support
- Expertise at hand





- most innovative products
- full application support
- training on site
 - standard or customer specific training,
 - in all our B&R offices or at customers site
- large stock maintained at Pune
 - lead time for spare part delivery < 48h (within India)

B&R India – Training facilities



- Best technology is the key to get the best people
- Offering the best education in the industry
- Result orientated payment
- Team spirit

B&R India – In all Industries



- Paper and Printing



- Metal and Mining

- Food and Beverage



- Textile

- Packaging



- Plastics

- Handling and Robotics



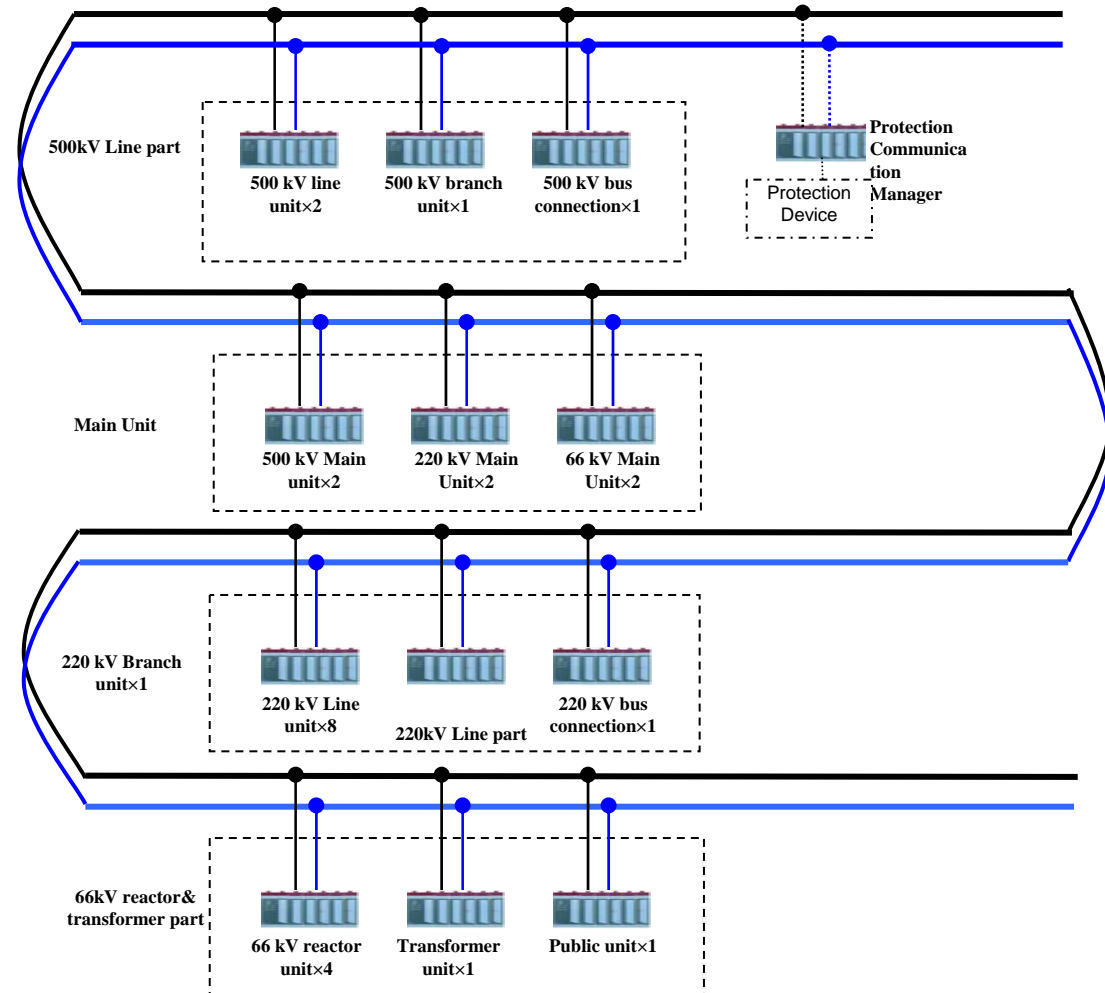
- Special Machinery

- Energy



- Automotive

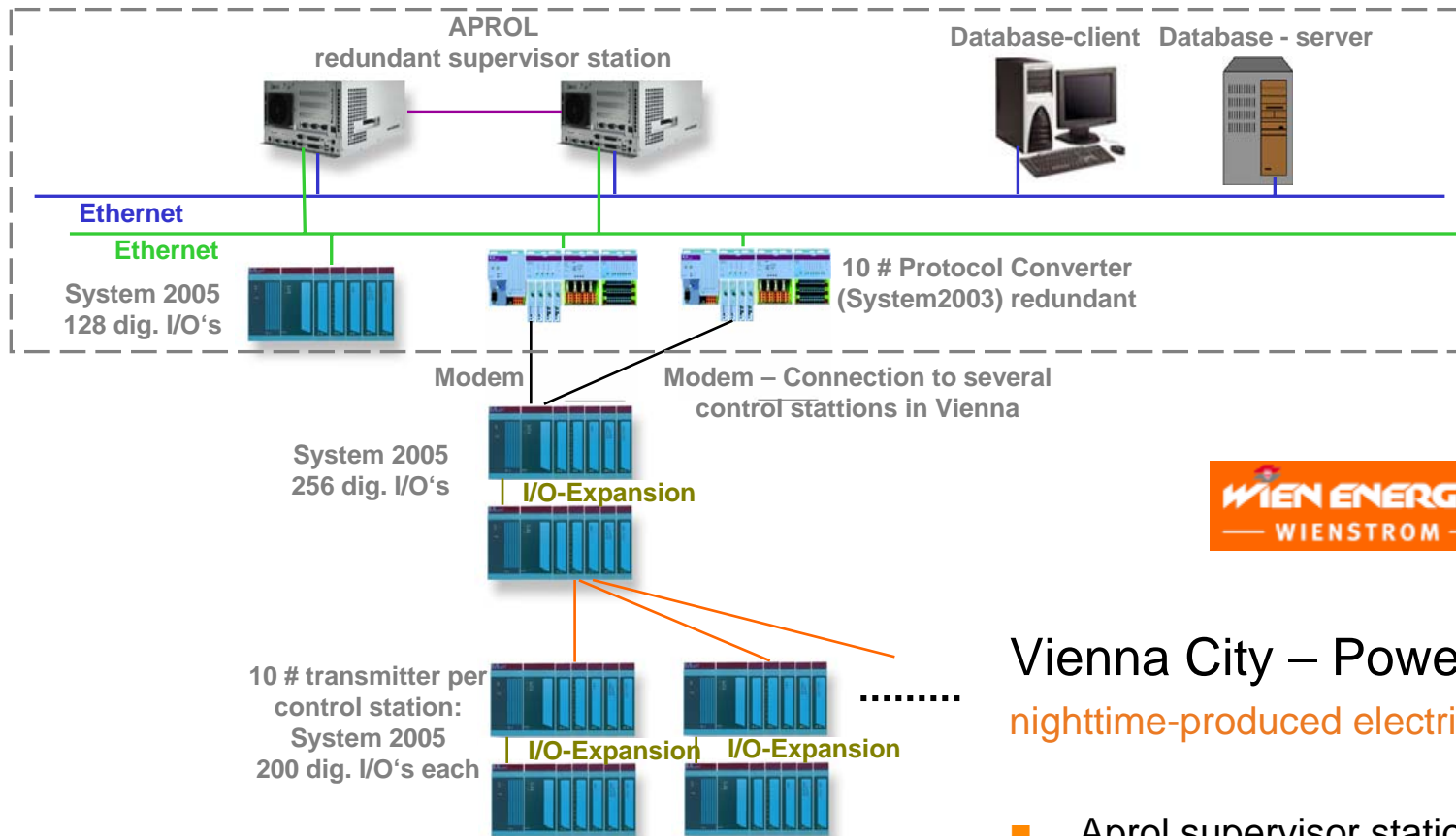
B&R Electricity Generation and Distribution



Power monitoring

- > 480 substations
- B&R system 2005
- in future with Aprol

B&R Electricity Generation and Distribution



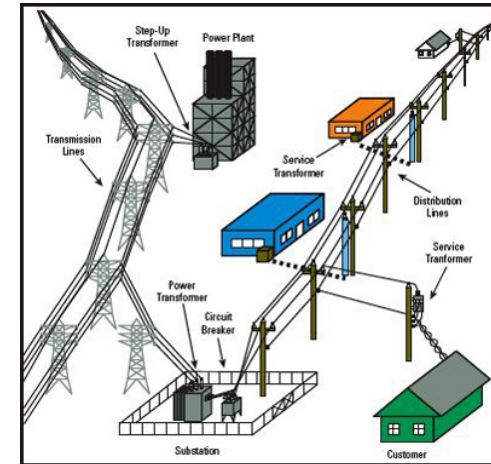
Vienna City – Power Management nighttime-produced electricity, street light,...

- Apröl supervisor station
- 50 control stations B&R system 2005
- 10.000 dig. I/Os

Substation Automation



- B&R has a wide variety of solutions for Substation Automation.
- Here we share a few solutions as implemented in China
- In China, the implementation is done by the partner CEPRI { China Electric Power Research Institute }.
- B&R Supplies the hardware, and provides training to engineers of CEPRI as well as the utility.



Facts and Figures



- Till date there are nearly 500 substations implemented by CEPRI using B&R solution
- The Category – 35kV, 110 kV, 220 kV and 500 kV
- Functions implemented : remote measurement, regulation and control with SCADA



What is appropriate ?



- The choice of Automation is dictated by the criticality of the application.
- The choice of Automation is dictated by future growth expectation
- It should not be necessary that we buy equipment suitable for five years hence, already today
- The choice should have a protection against obsolescence.
- Modularity so that expansion is easily possible for future data requirement.
- Software platform should be such that application and engineering effort is portable.

Business Model



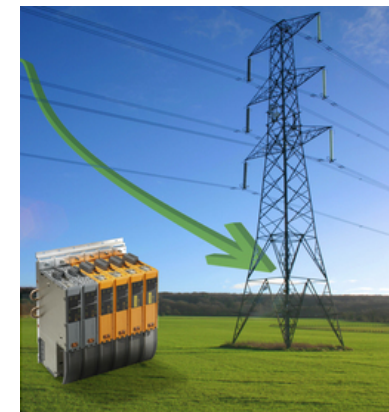
- The business model is also to be chosen carefully.
- By this it is meant that the hardware should be sourced from the best manufacturer.
- The implementation should involve local knowledge and presence.
- With this means, one can get the best of both worlds.
- For the model to succeed, the SW platform has to be flexible enough.



Flexibility in data to be collected and transmitted



- The type of data to be collected and transmitted is quite variable, depending on the focus of the utility at the given point of time
- A complete flexibility in data point choice is needed.
- So we must look for centralised configuration and download possibilities
- In Transmission, as well as in the local area, the choice of protocol makes a big difference in the life-cycle cost of the system.



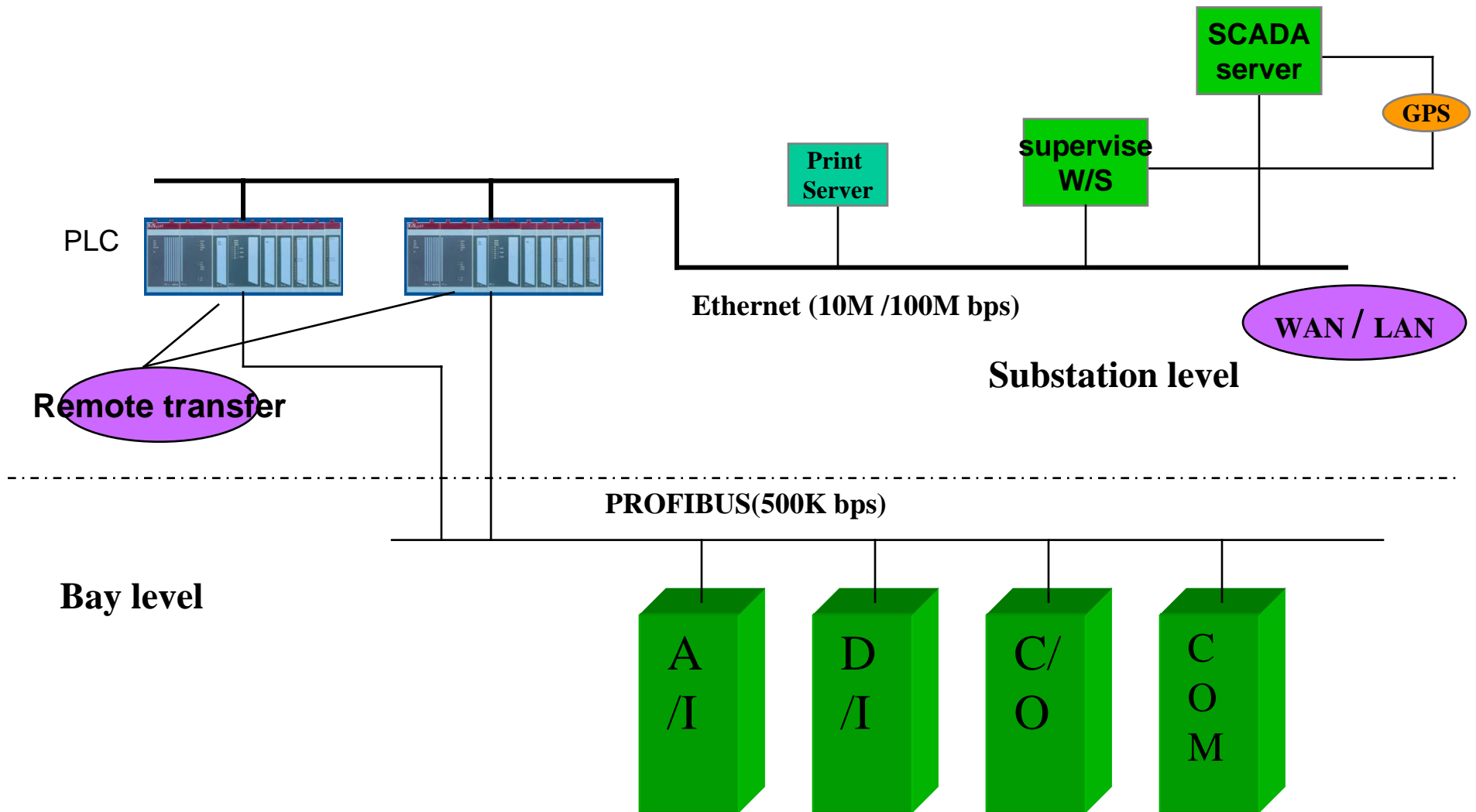
Typical Solutions for Substation Automation



- Concept 1 field bus PROFIBUS
- Concept 2 field bus CAN BUS
- Concept 3 field bus CAN BUS
- Concept 4 dual field bus CAN BUS +dual industry Ethernet
- Concept 5 dual industry Ethernet

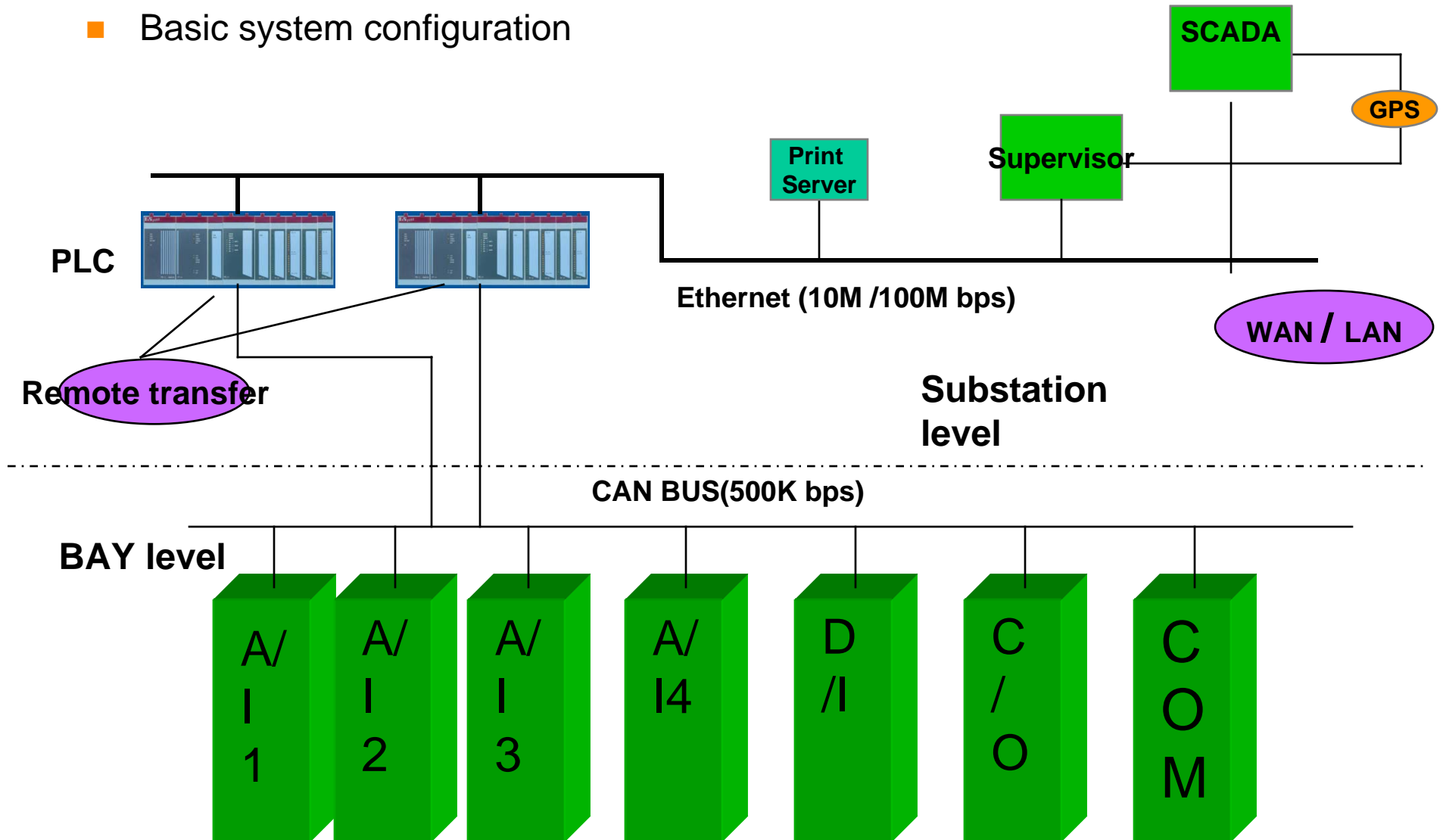


- Layout of substation automation system





Basic system configuration



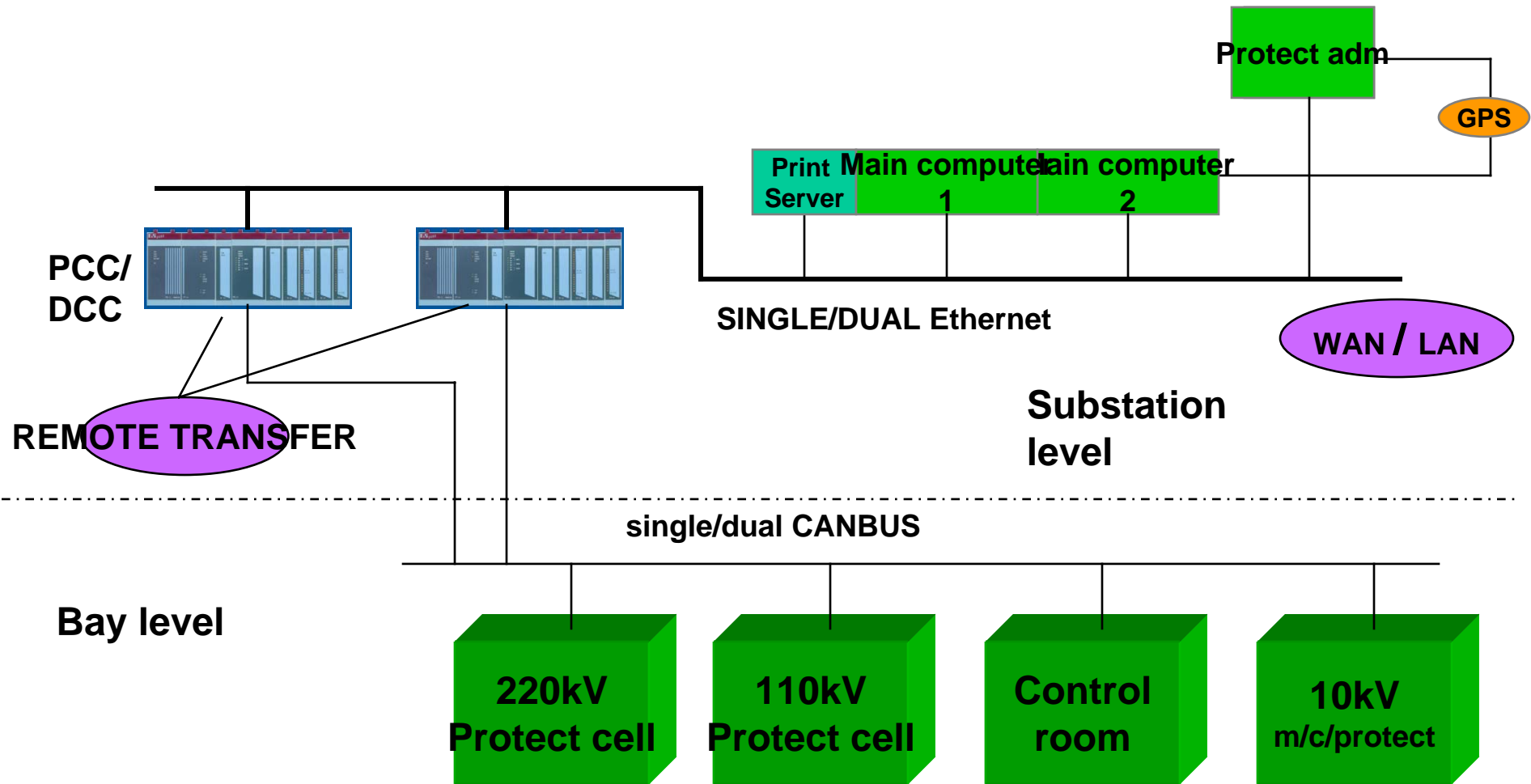
Concept 3 field bus-CAN BUS



Technical feature

- distributed lower cost
- CAN BUS-suitable for small amount of data, multiple nodes, 500KBps rated.

Basic configuration



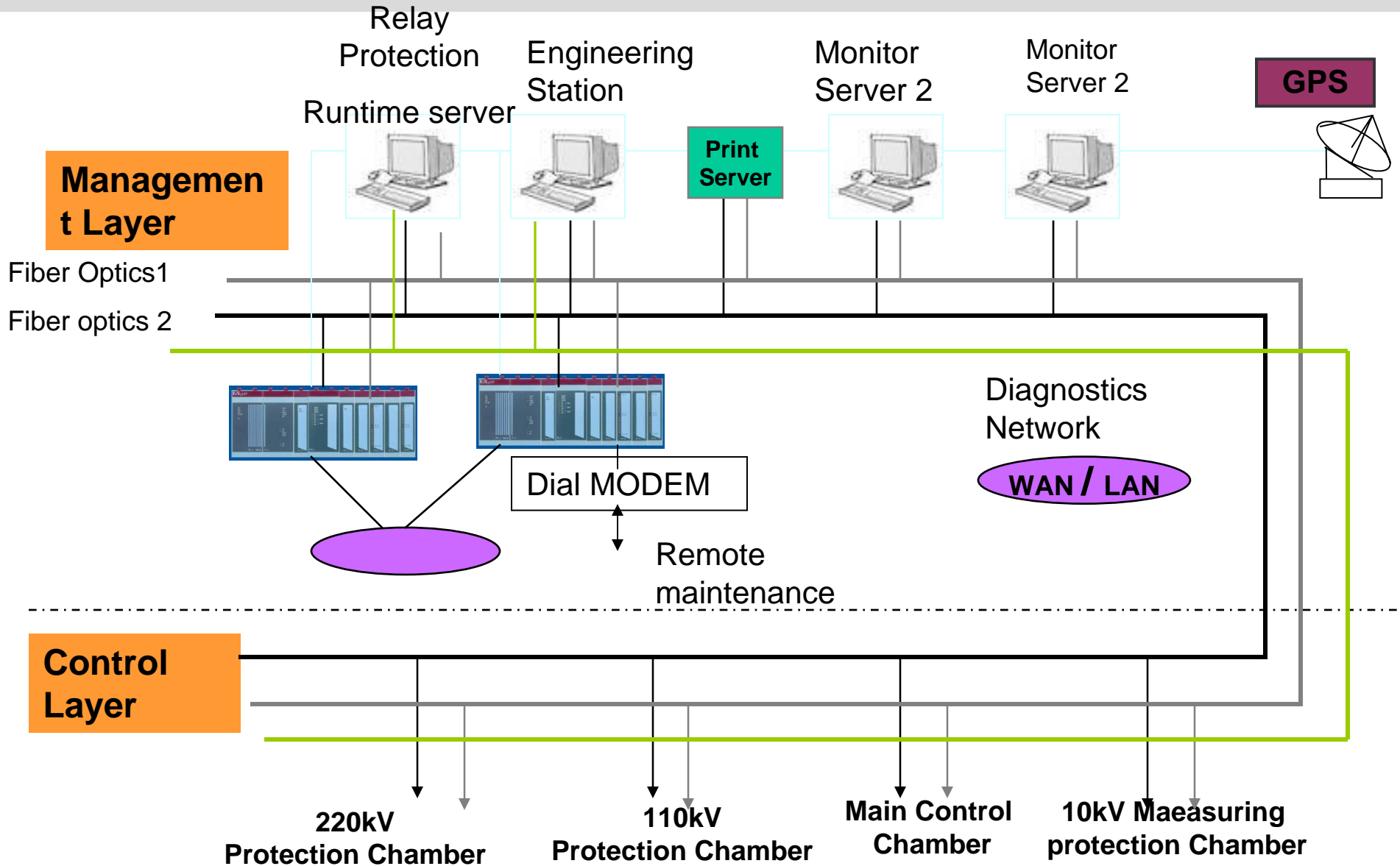
Concept 4 dual field bus-CAN BUS + dual industry Ethernet



Technical feature

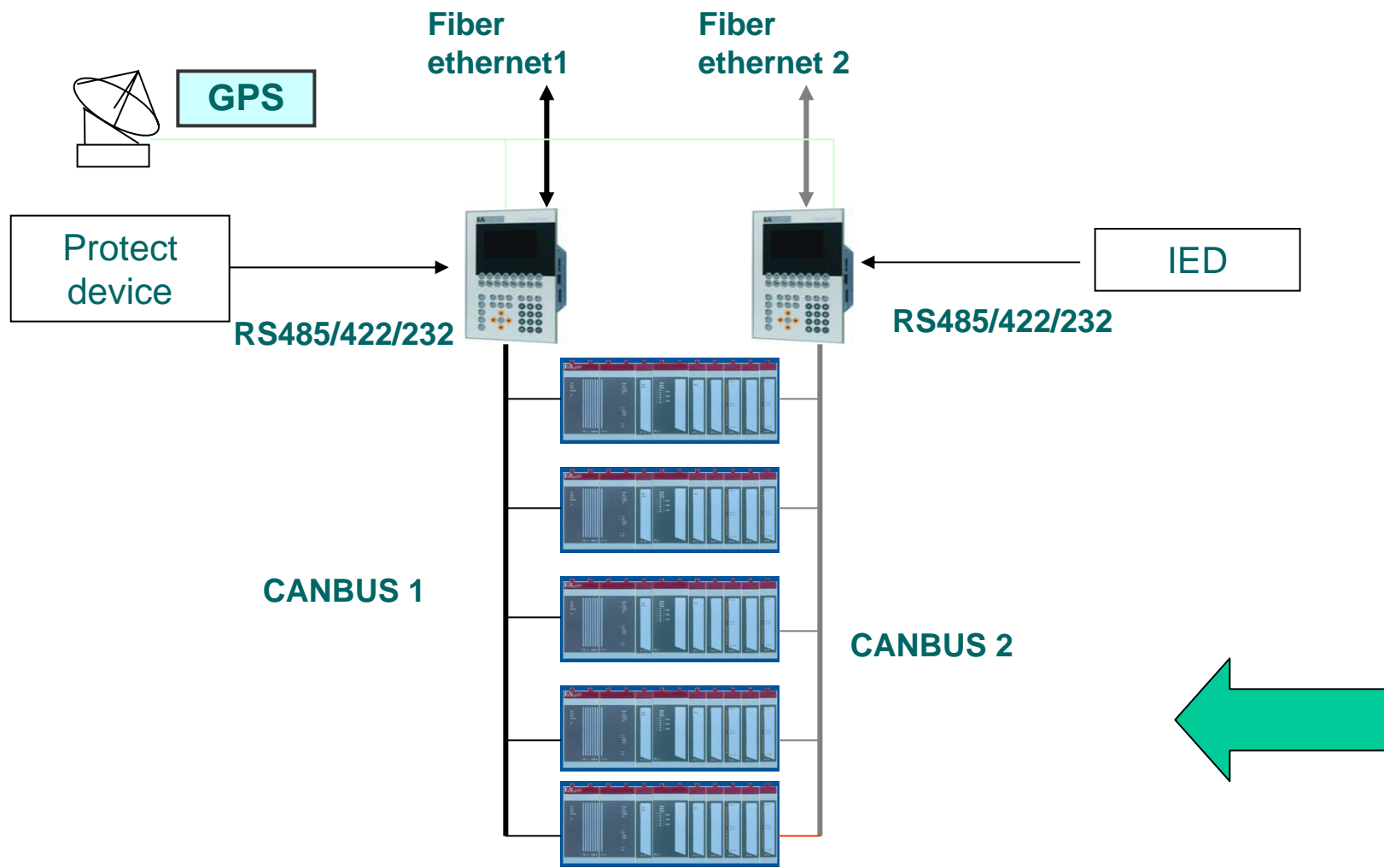
- The data of bay units gathered to concentrator unit
- With high speed Ethernet to realize data exchange among bay's concentrator units and substation computer
- Dual network to ensure the data transfer reliability

Basic Configuration



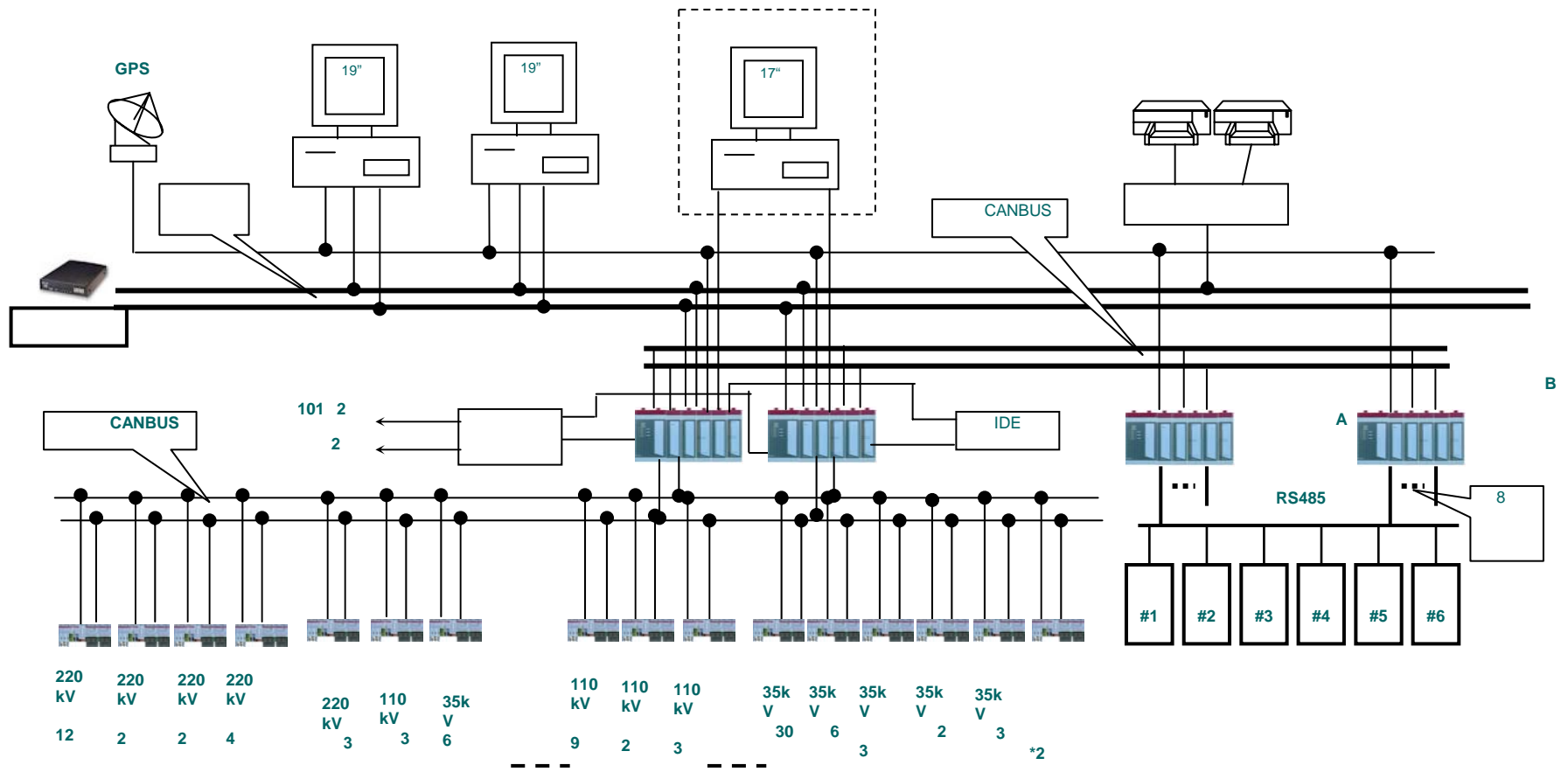


Communication links in the Protection Chamber





The Configuration for 220kV Substation –Slave station



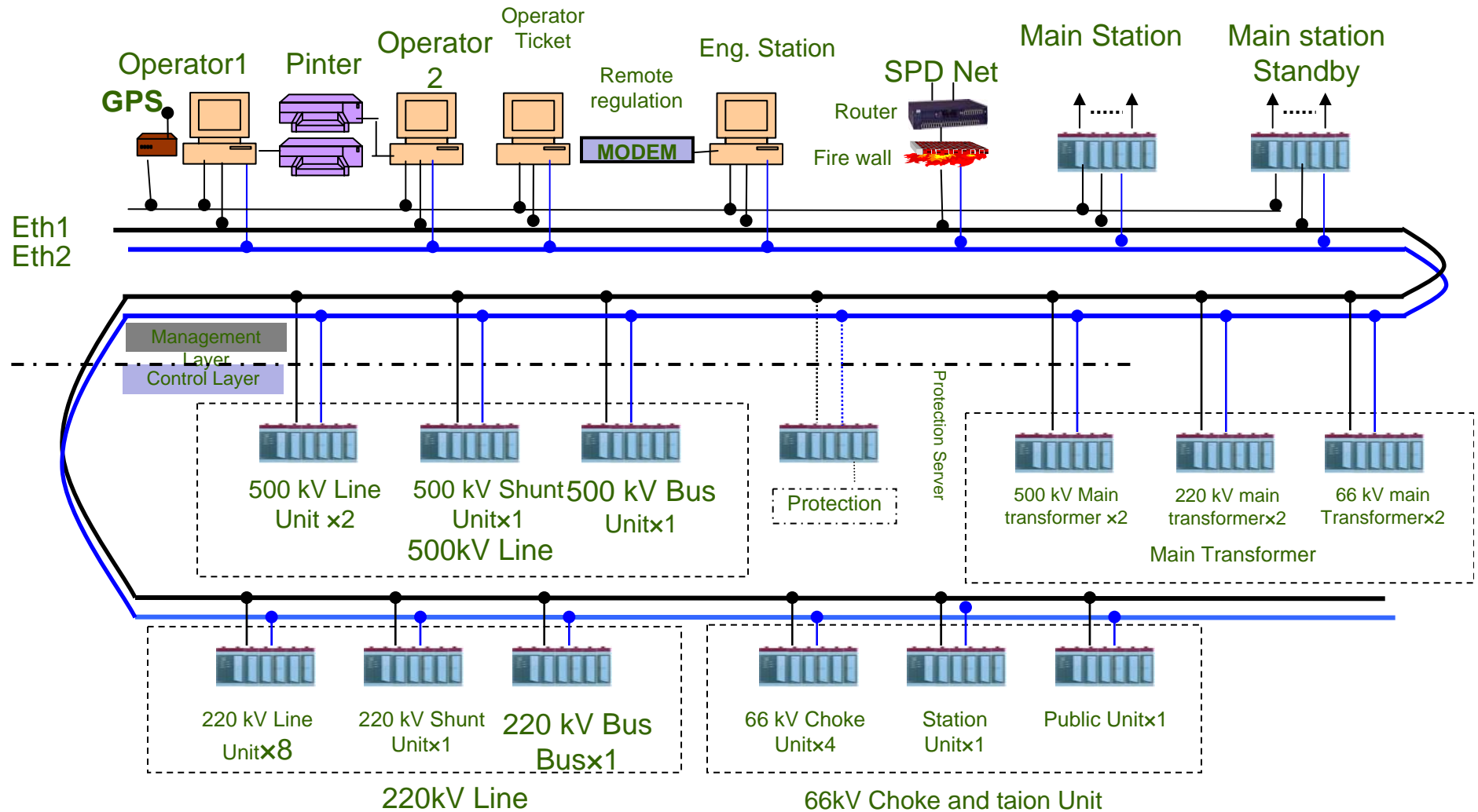
Concept 5 dual industry Ethernet



Technical feature

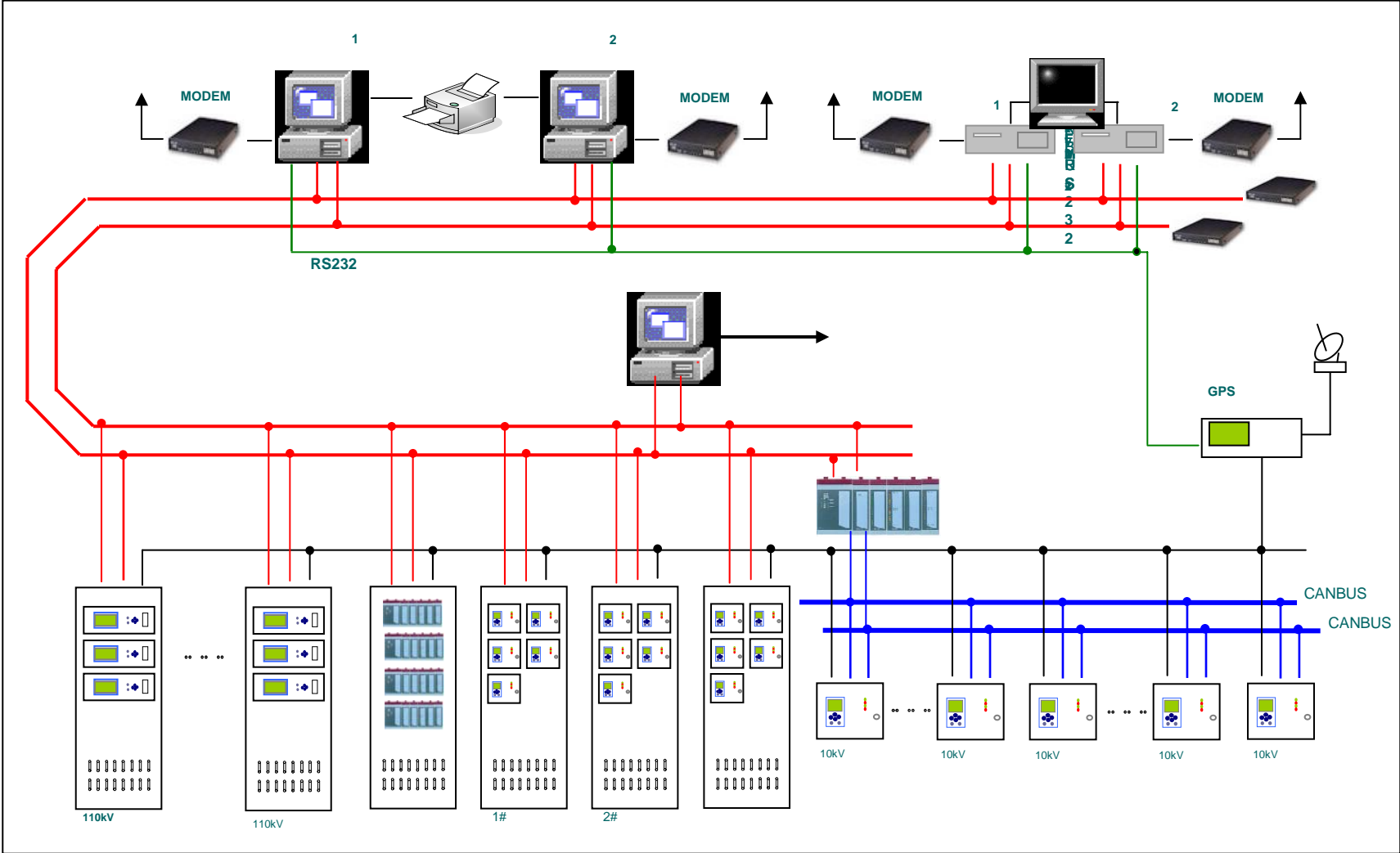
- With full distributed system used for big substation automation
- With High speed Ethernet to penetrate into bay units to realize data exchange among substation and bay units
- Reduce intermediate medium to enhance communication efficiency
- reliability of communication with Dual network system is ensured

Layout of system configuration





Configuration for 110kV Substation



Your worldwide automation partner

