



Doug Voda and Vincenzo Balzano, September 24-26, 2014 – Dalmine, Italy

ABB OEM Days 2014

From components to smart solutions

Technical session

From components to smart solutions

- Speaker name
- Speaker title
- Company Name
- Location

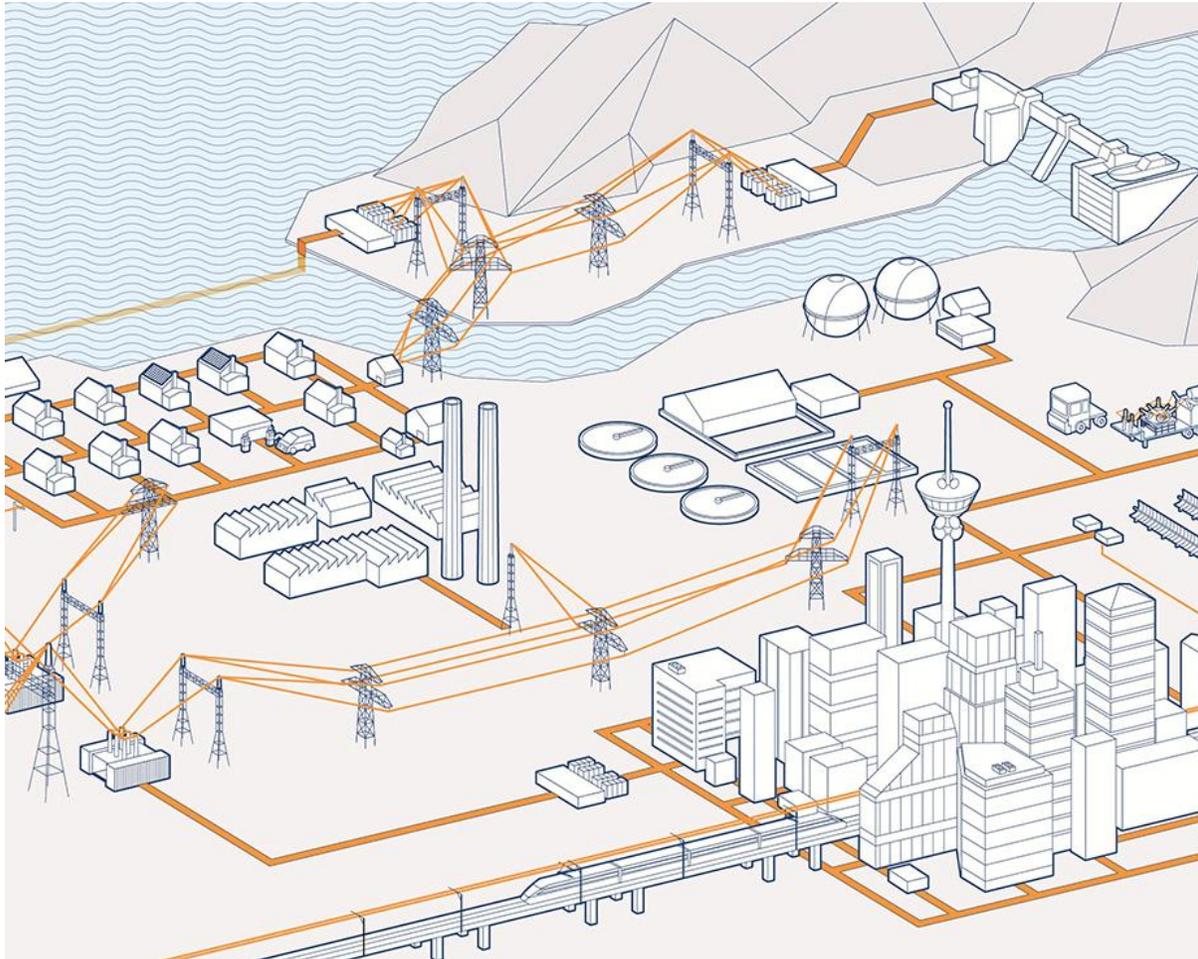
Doug Voda
PPMV Smart Grid Leader
ABB
Lake Mary, USA

- Co-presenter name
- Title
- Company Name
- Location

Vincenzo Balzano
Smart Grid Program Manager
ABB
Dalmine, Italy

Smart grids for distribution networks

Focus is on distribution grid automation



Traditional automation areas

- Distribution control centers
 - Network management SCADA/DMS
 - Outage management
 - Workforce management
- Substation automation – HV/MV
 - Integrated protection, control and monitoring

Recent Technology and Market Changes

- Communication technology
- Distributed generation
- Government regulations
- Efficiency and performance benefits (voltage regulation)
- Secondary distribution – fault passage indication, voltage regulation
- Asset management

Smart grids for distribution networks

Customer requirements for Smart Grid

Capacity	Upgrade/install capacity economically Provide additional infrastructure (PHEVs, Renewables)
Reliability	Stabilize the system and avoid outages Provide high quality power all the time
Efficiency	Improve efficiency of power generation Reduce losses in transport and consumption
Sustainability	Connect renewable energy to the grid Useful life of products as technology changes
Safety	Eliminate or reduce risk of harm or injury

A smarter grid

OEM equipment for industrial and utility customers



Reclosers, switches & disconnectors



Transformers



Energy storage systems



Switchgear

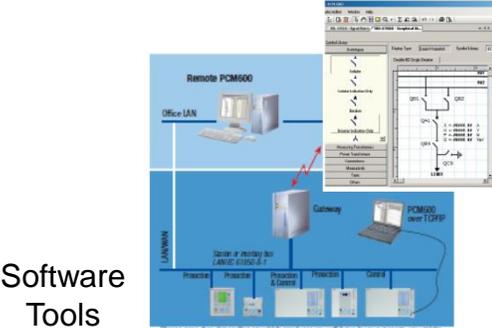


Circuit breakers

Grid automation equipment



Protection relays & substation controllers



Software Tools



Utility communication



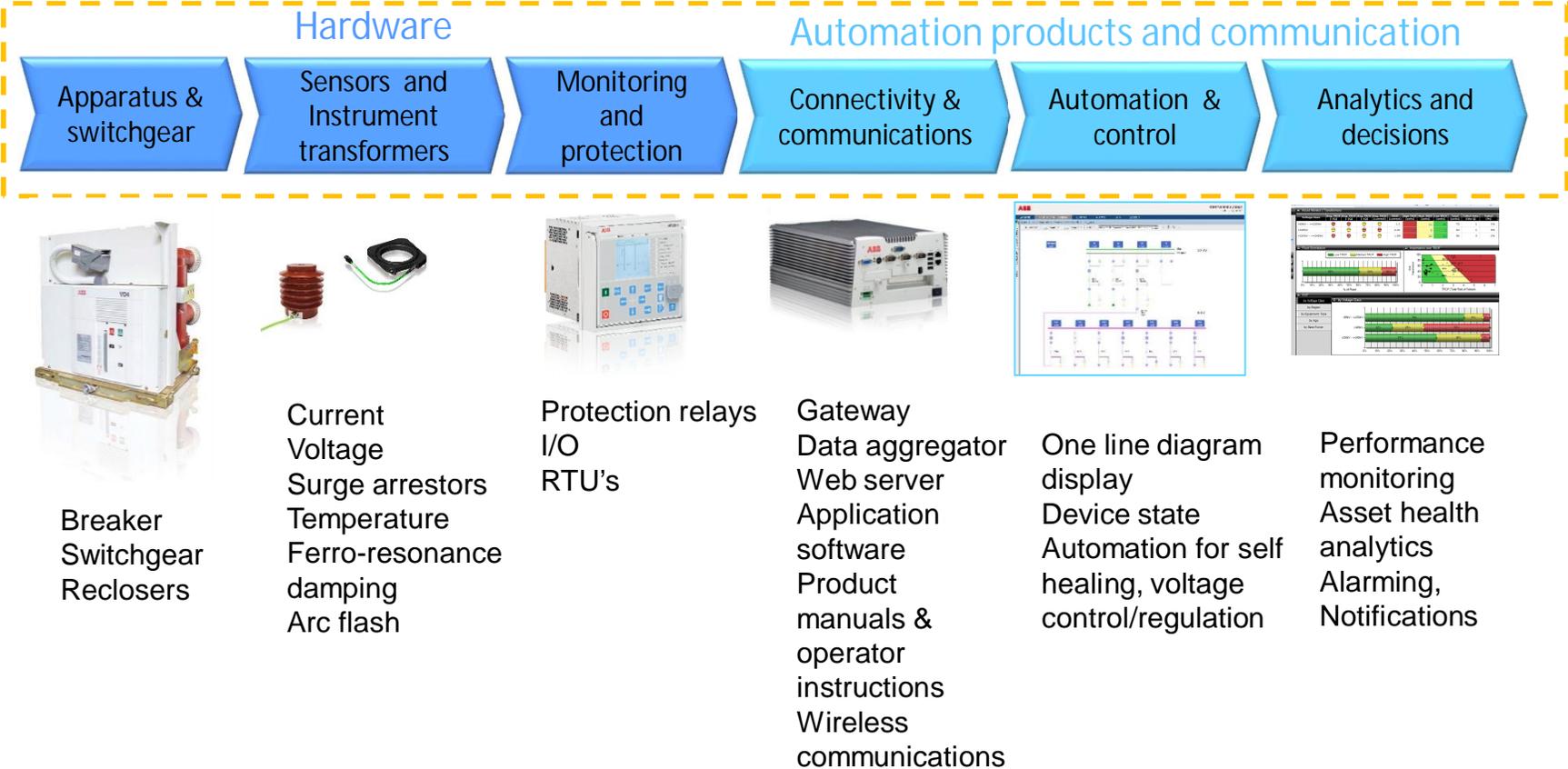
Capacitor banks



Instrument transformers, sensors, arresters

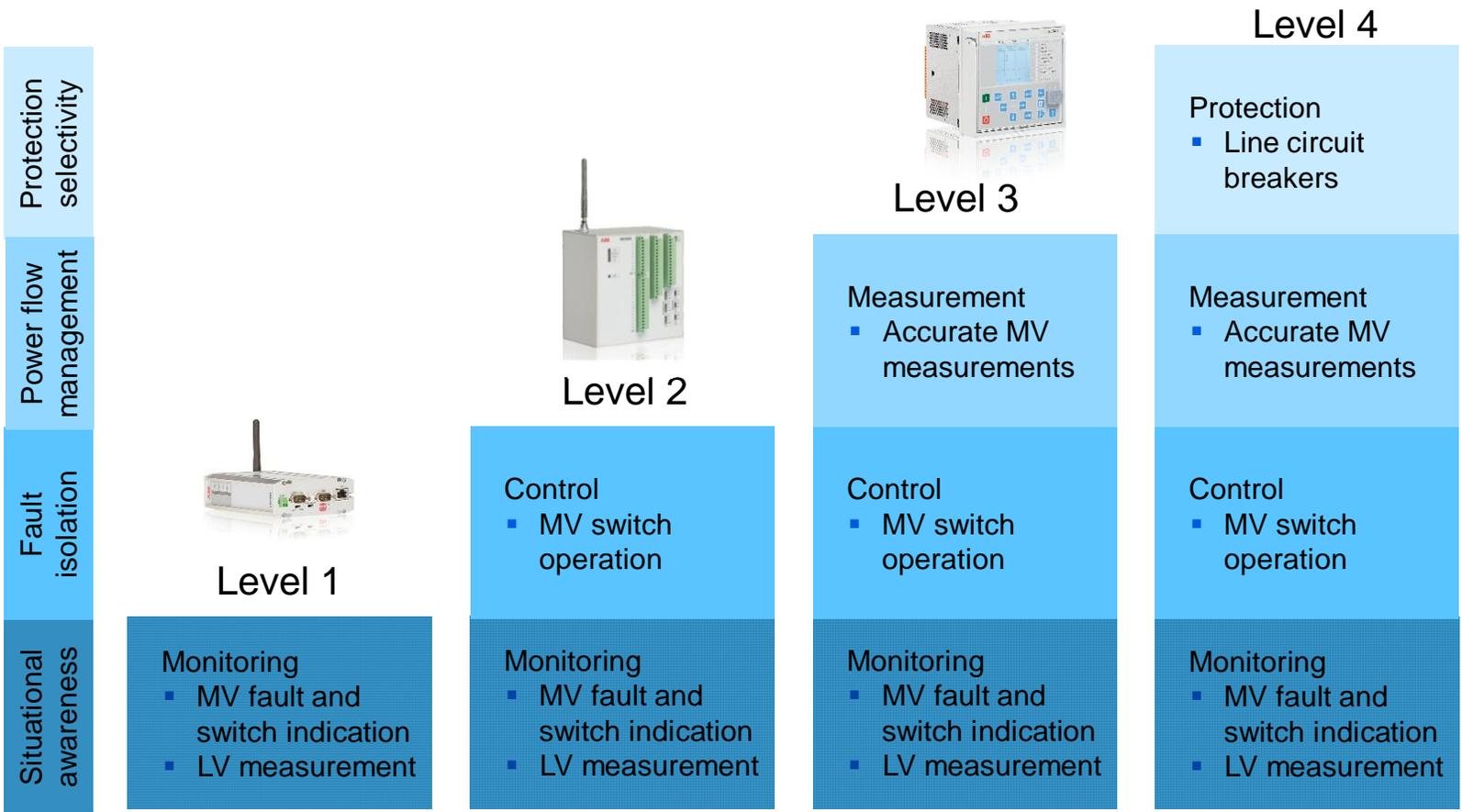
A smarter grid

Medium voltage packages for industrial and utility applications



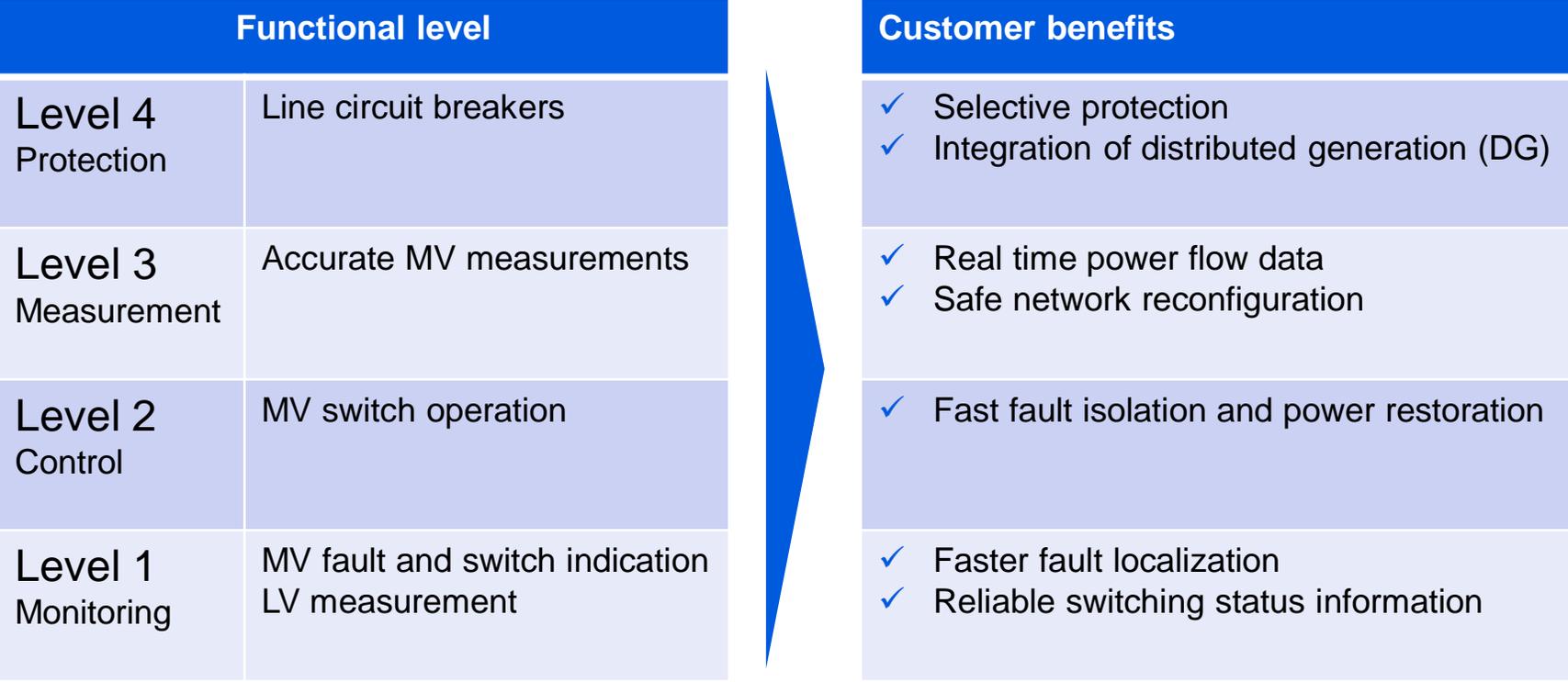
Building solutions for industrial & utility customers

Four functional classes for indoor and outdoor solutions



Building solutions for industrial & utility customers

Benefits through levels of solution offering

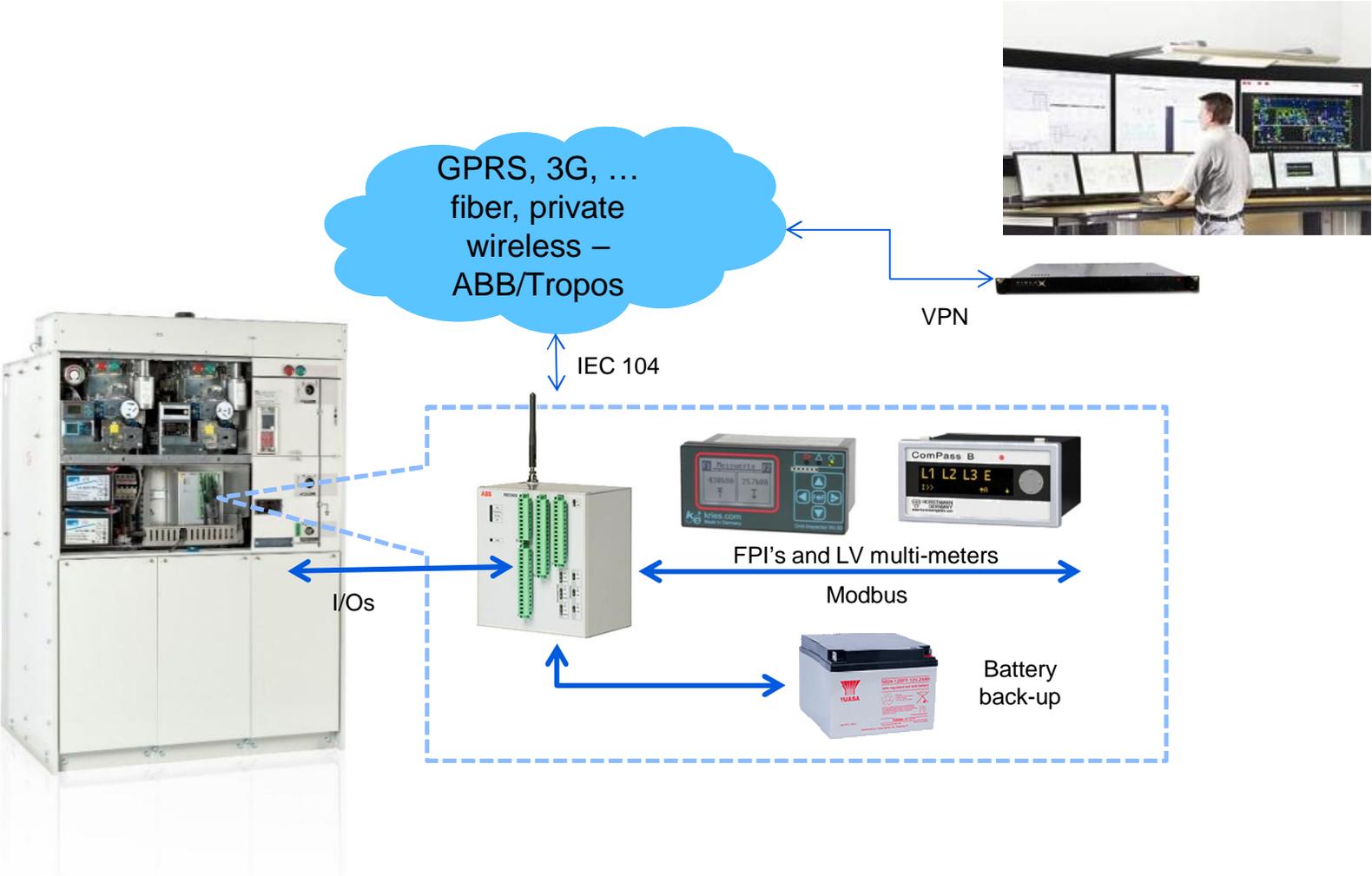


Level 2 solution example

SafeRing with integrated intelligence

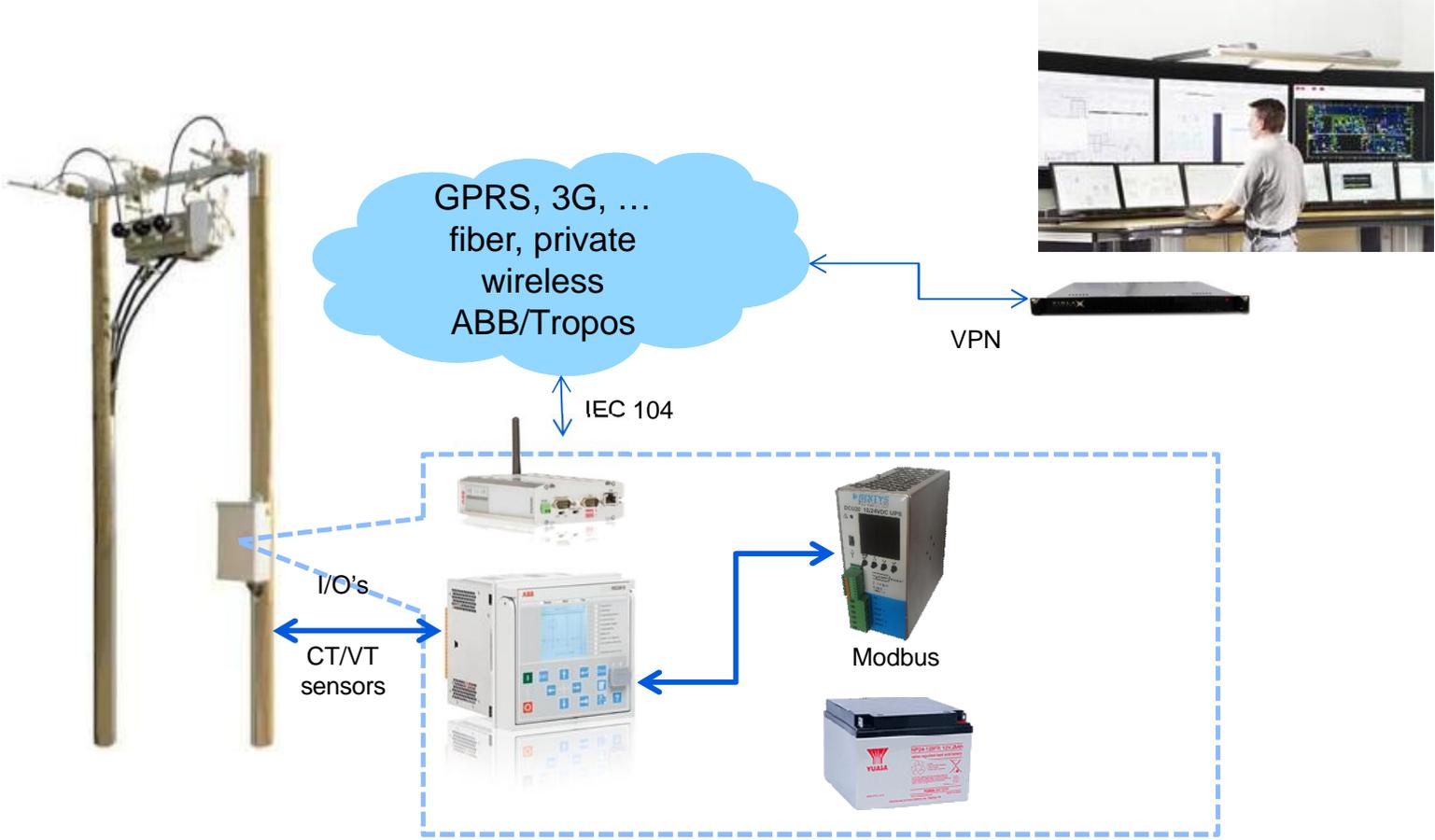
Level 2

- Control
 - MV switch operation
- Monitoring
 - MV fault and switch indication
 - LV measurement



Level 3 solution example

Outdoor apparatus with cabinet



Level 3

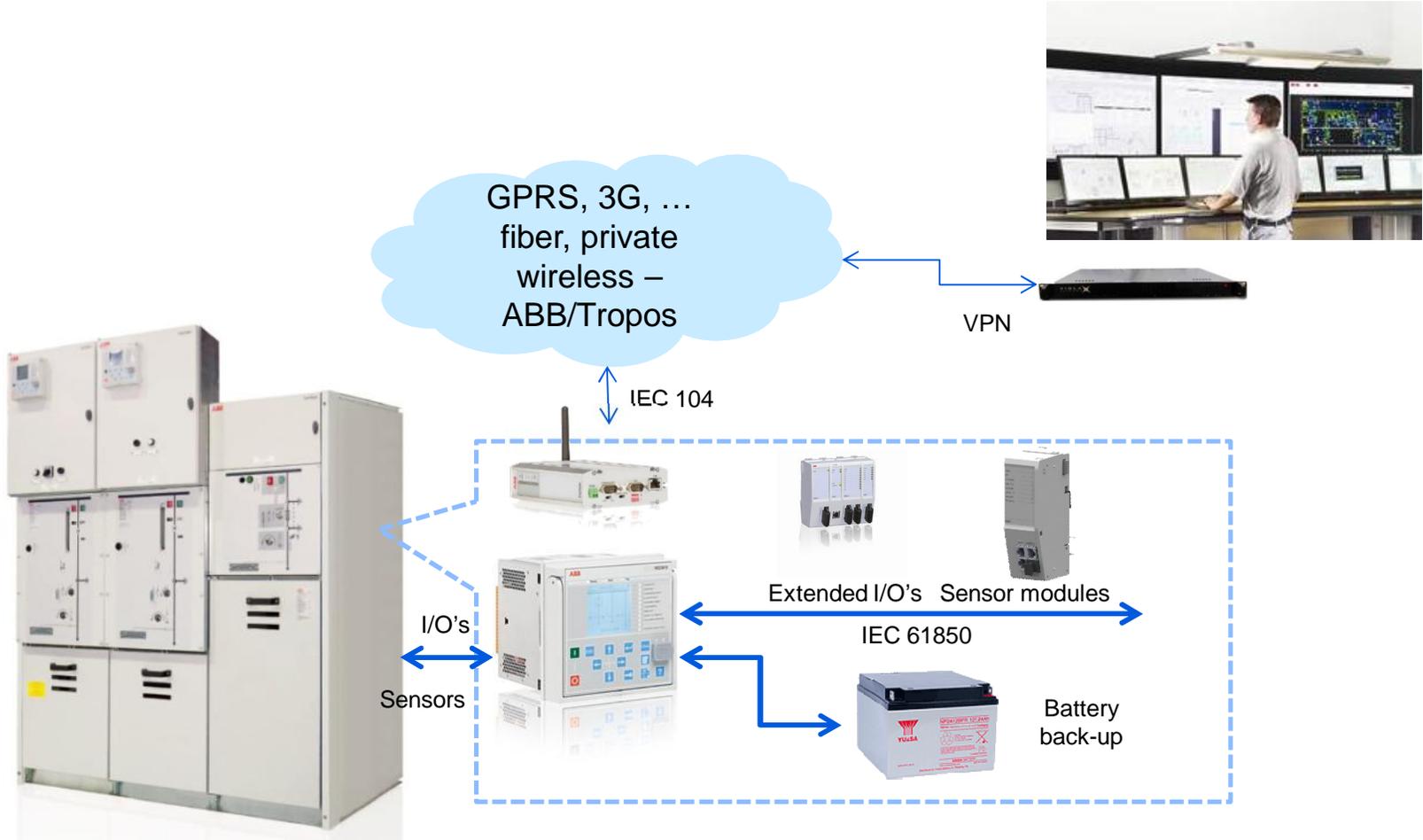
- Measurement
 - Accurate MV measurements
- Control
 - MV switch operation
- Monitoring
 - MV fault and switch indication
 - LV measurement

Level 4 solution example

UniSec with integrated intelligence

Level 4

- Protection
 - Line circuit breakers
- Measurement
 - Accurate MV measurements
- Control
 - MV switch operation
- Monitoring
 - MV fault and switch indication
 - LV measurement



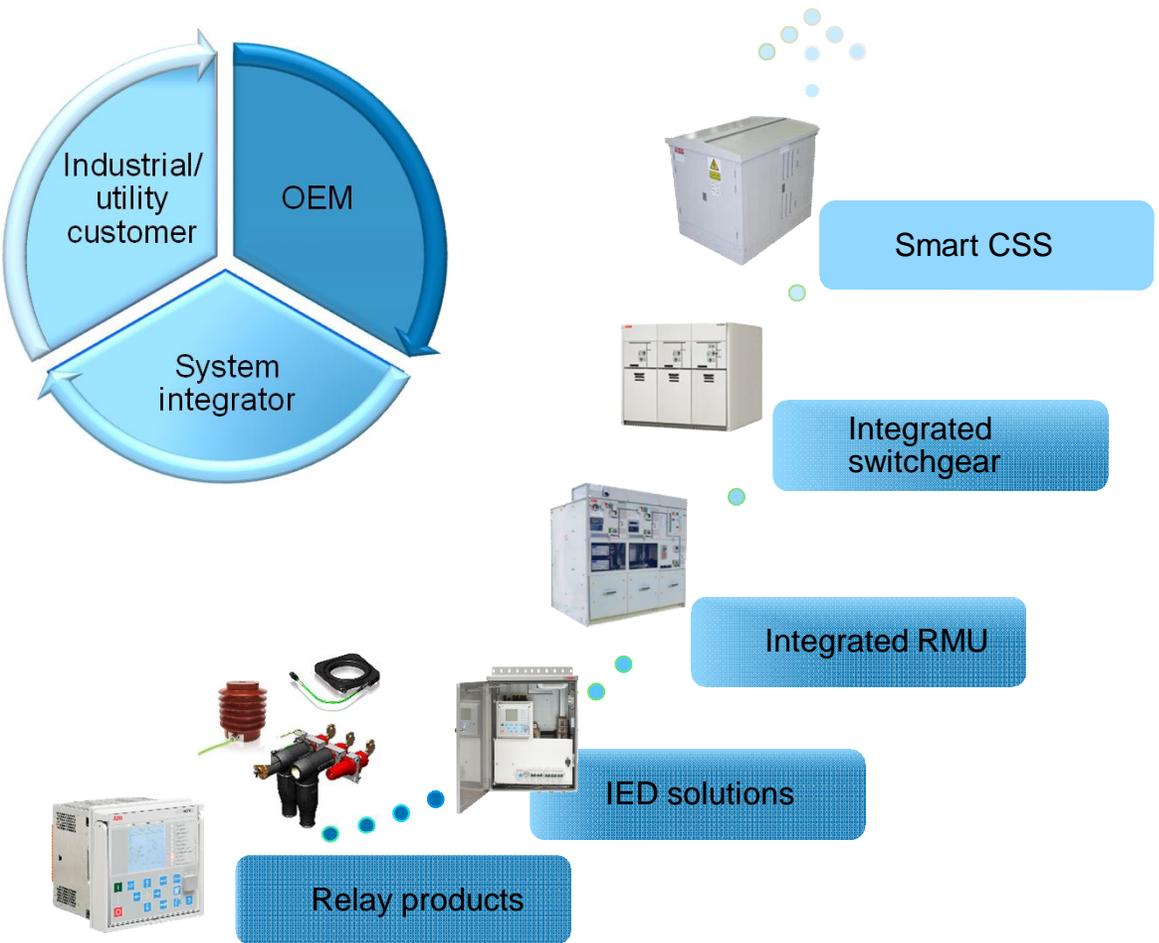
Smart Lab Configuration



- Equipped with all the basic equipment found in distribution networks:
 - wireless network communication, SCADA, MV transformer with tap changer, inverter, solar panels and LV circuit breaker with IEC 61850 communication
- The simulation model enables multiple scenarios and observes the behavior of protection and automation equipment when faults occur in different sections of the network

ABB's grid automation products and solutions

Optimal solution for entire value chain



Using the Center of Excellence and Smart Grid Lab

New market positioning

Reliability		Distributed generation		Better customer service	
					
OEM needs		ABB solutions			
Multiple protocols and migration to a single communication standard (IEC 61850)		System with multiple protocols converted to IEC 61850 platform			
Support OEM manufacturers growth		Integration lab connects different components and validates operation as one platform			
Lack of automation expertise		Expertise in distribution automation available			
Resource constraints		Expertise in distribution automation available Engineering support for configuration Support to develop standard solutions			
Selling bundled solutions		Sales training and marketing collateral available as well as support when using ABB components			

Relion® product family

Best fit for every need

	Series	Highlights
	670/650	Flexibility, performance and ease of use from ready-to-use solutions for generation, transmission and sub-transmission applications
	630	Flexibility and performance for demanding applications
	620	Expandability and performance
	615	Compact with powerful standard configurations
	611	Preconfigured solutions and Web HMI
	610	Protection for dedicated applications
	605	Simplicity for protection

Grid automation

RER601/603 - overview



- For collection of monitoring information from secondary substation, both from hardwired (RER603) or serial communication (RER601/603)
- Offers a seamless upgrade
- Able to communicate with control center using wireless public network GPRS
- RER 603 one switching device to control open and close

Grid automation

REC601/603 - overview



- For monitoring and control switching in secondary substation, both from hardwired and serial communication
- Able to communicate with control center using wireless public network GPRS
- It can control from 1 (REC601) up to 3 (REC603) bays of secondary switchgear with switch disconnecter
- Advanced battery charger always included

Grid automation

RER615/REC615 - overview



- Able to control one CB bay and up to 3 switch disconnector bays (only with REC 615)
- Advanced smart grids functionalities like load shedding and power quality
- Supports IEC 61850, IEC 60870-5-101, IEC 60870-5-104
- Available for connection with traditional CTs, VTs and innovative combined current and voltage sensors

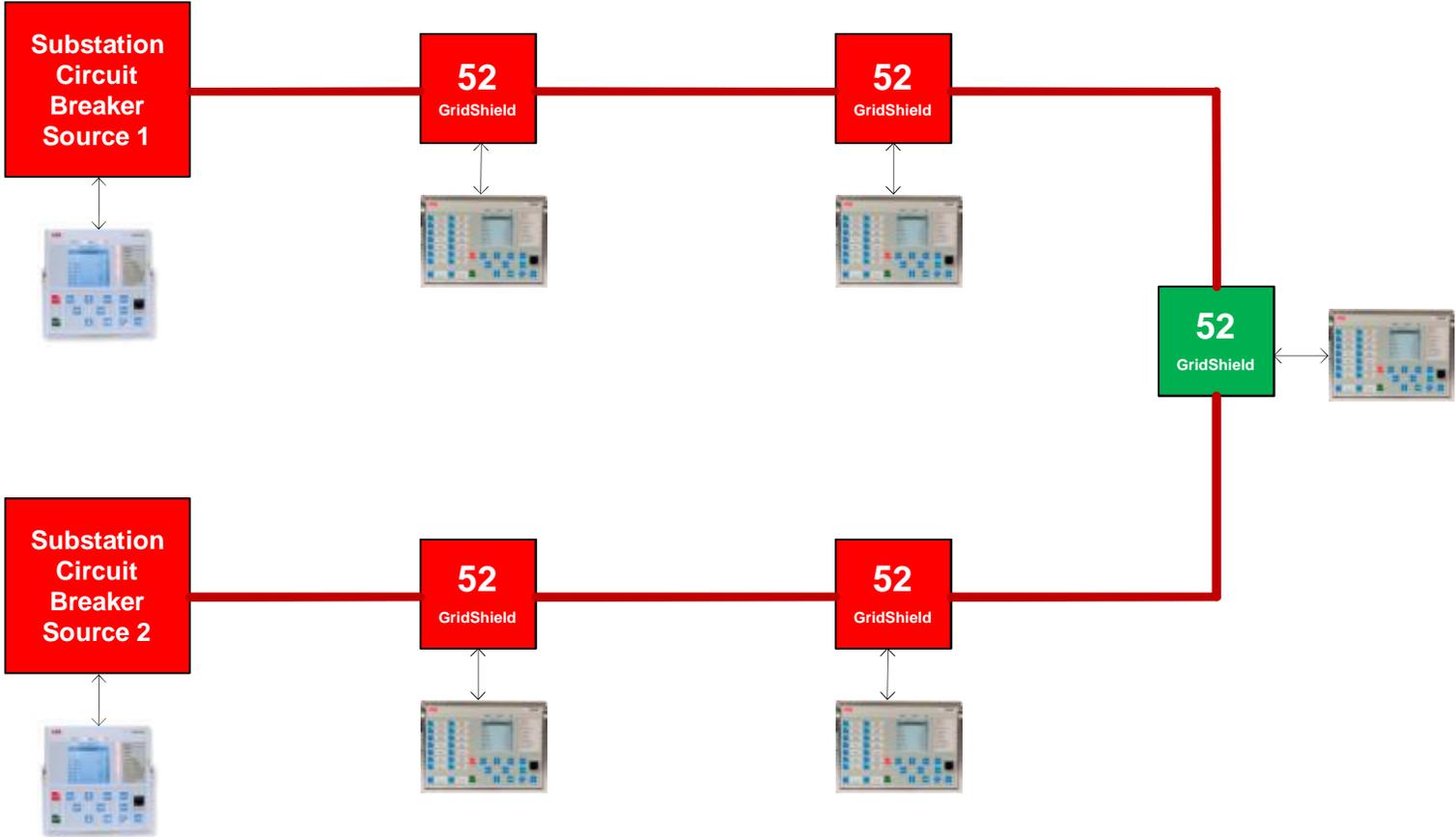
Remote I/O unit RIO600

Overview of features



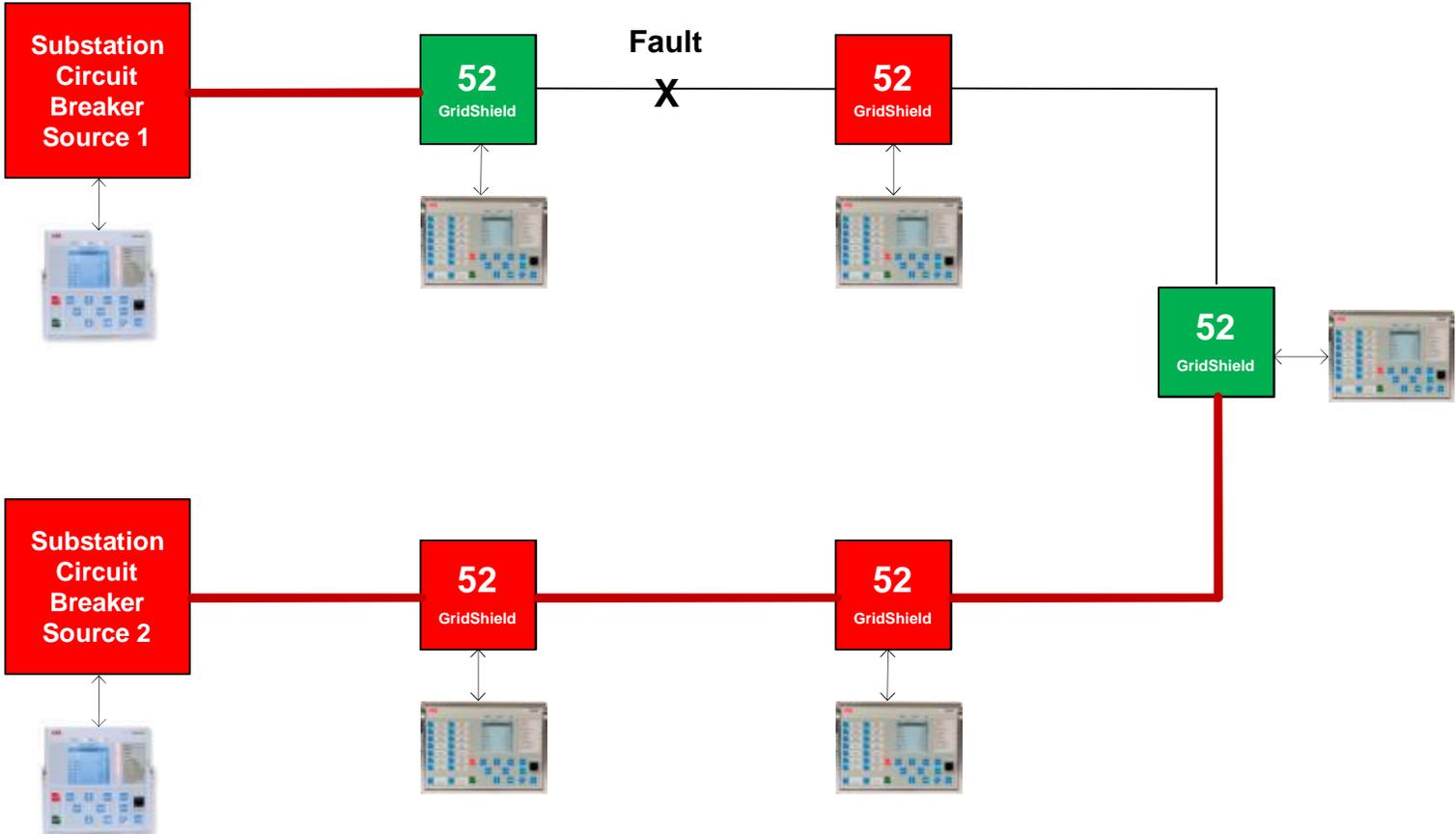
- IEC 61850 G.O.O.S.E. remote I/O, digital and analog signals
- Provides I/O extension flexibility to Relion[®] protection relays ensuring improved functionality and performance
- A modular design

Device level Loop automation (Loop Control - no communications)

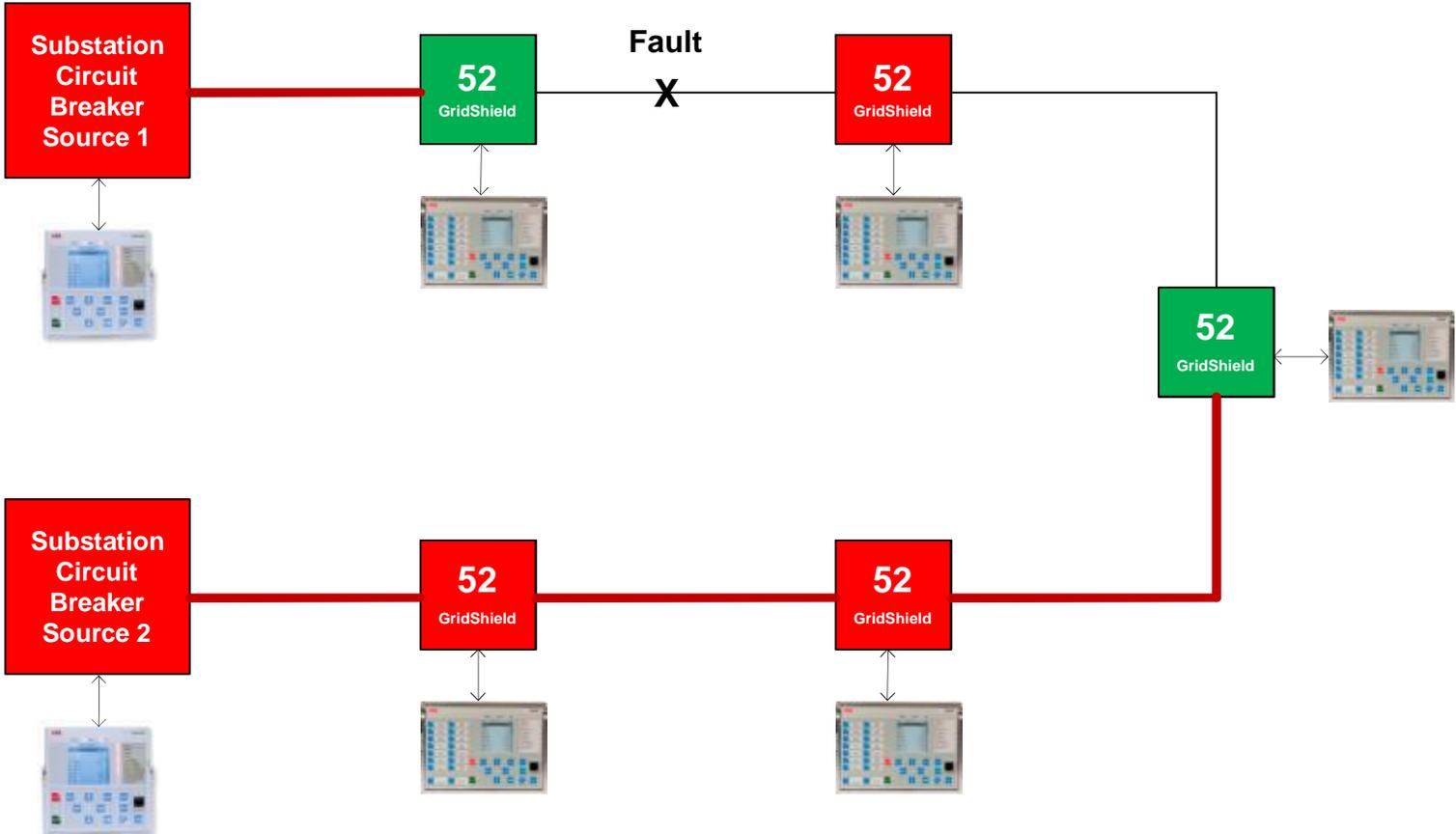


Device level

Loop automation (Loop Control - no communications)

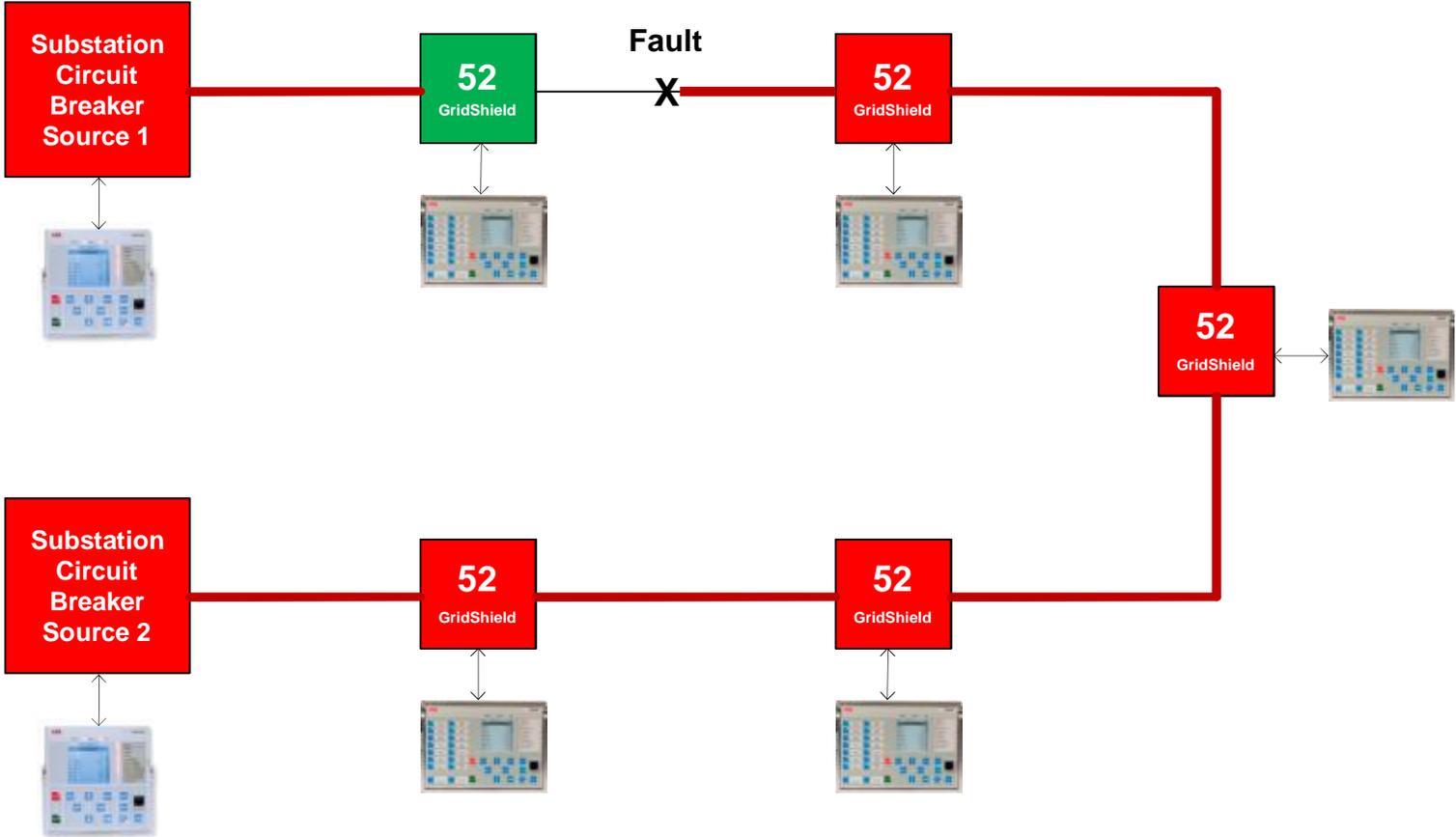


Device level Loop automation (Loop Control - no communications)

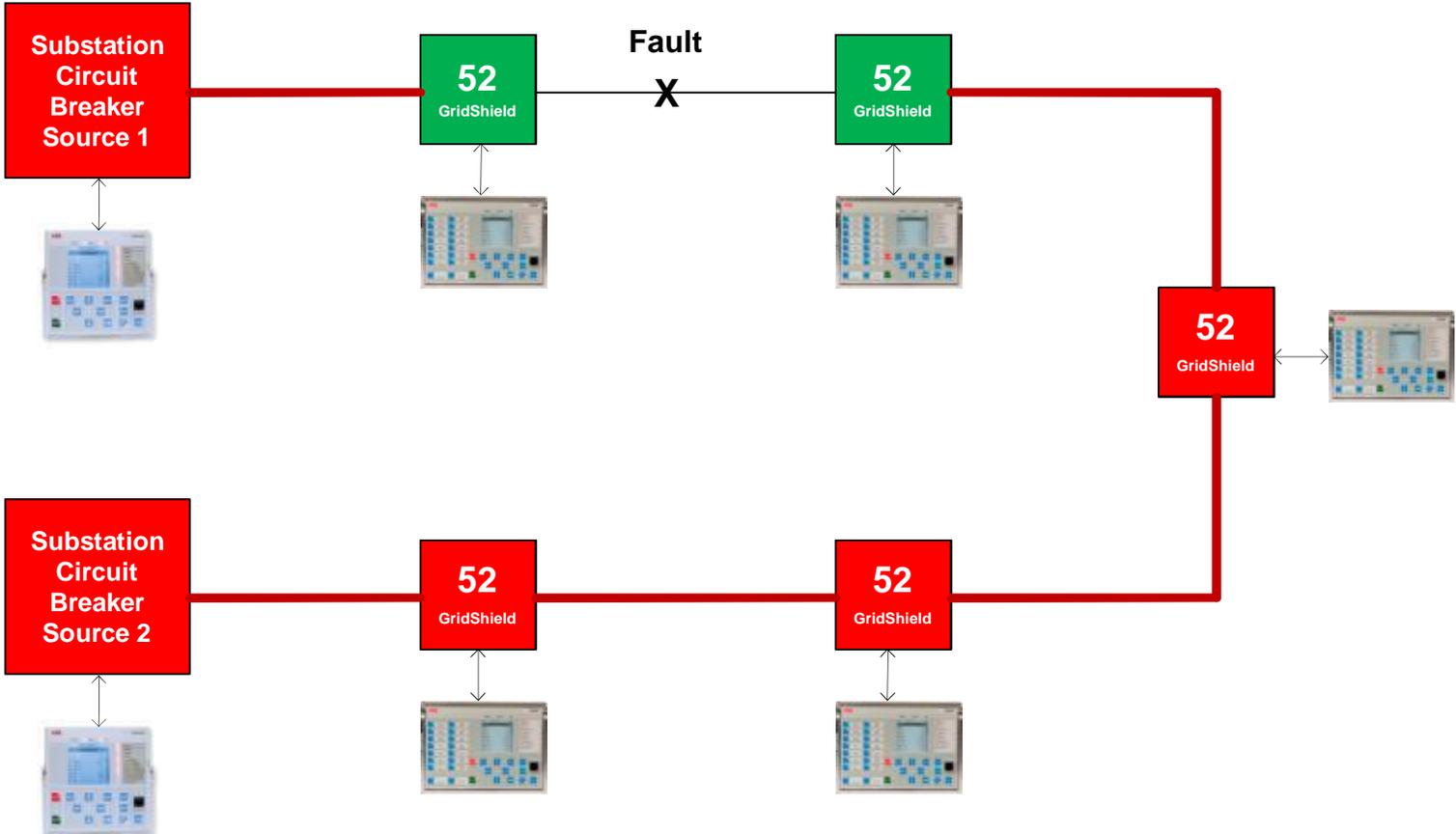


Device level

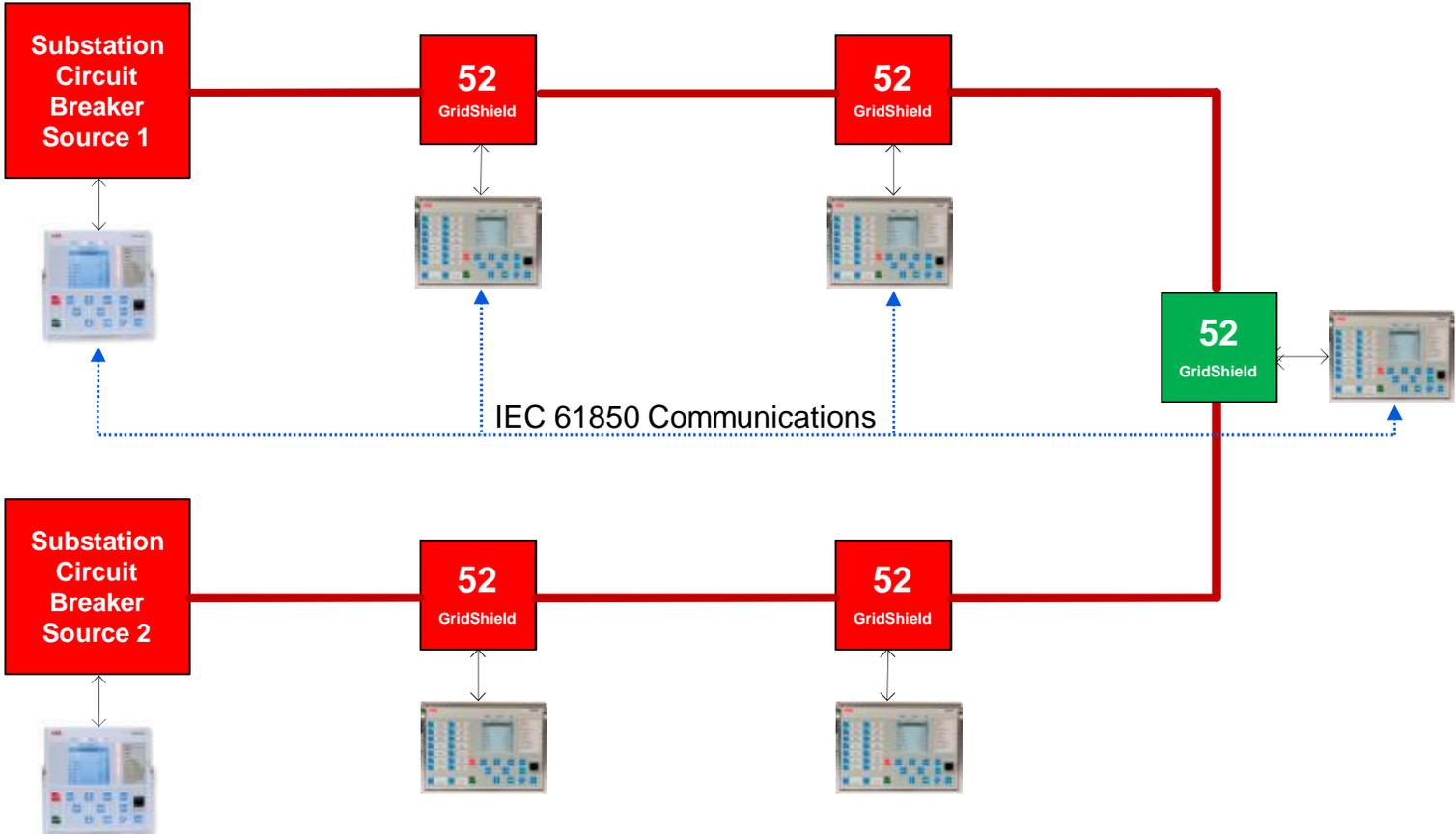
Loop automation (Loop Control - no communications)



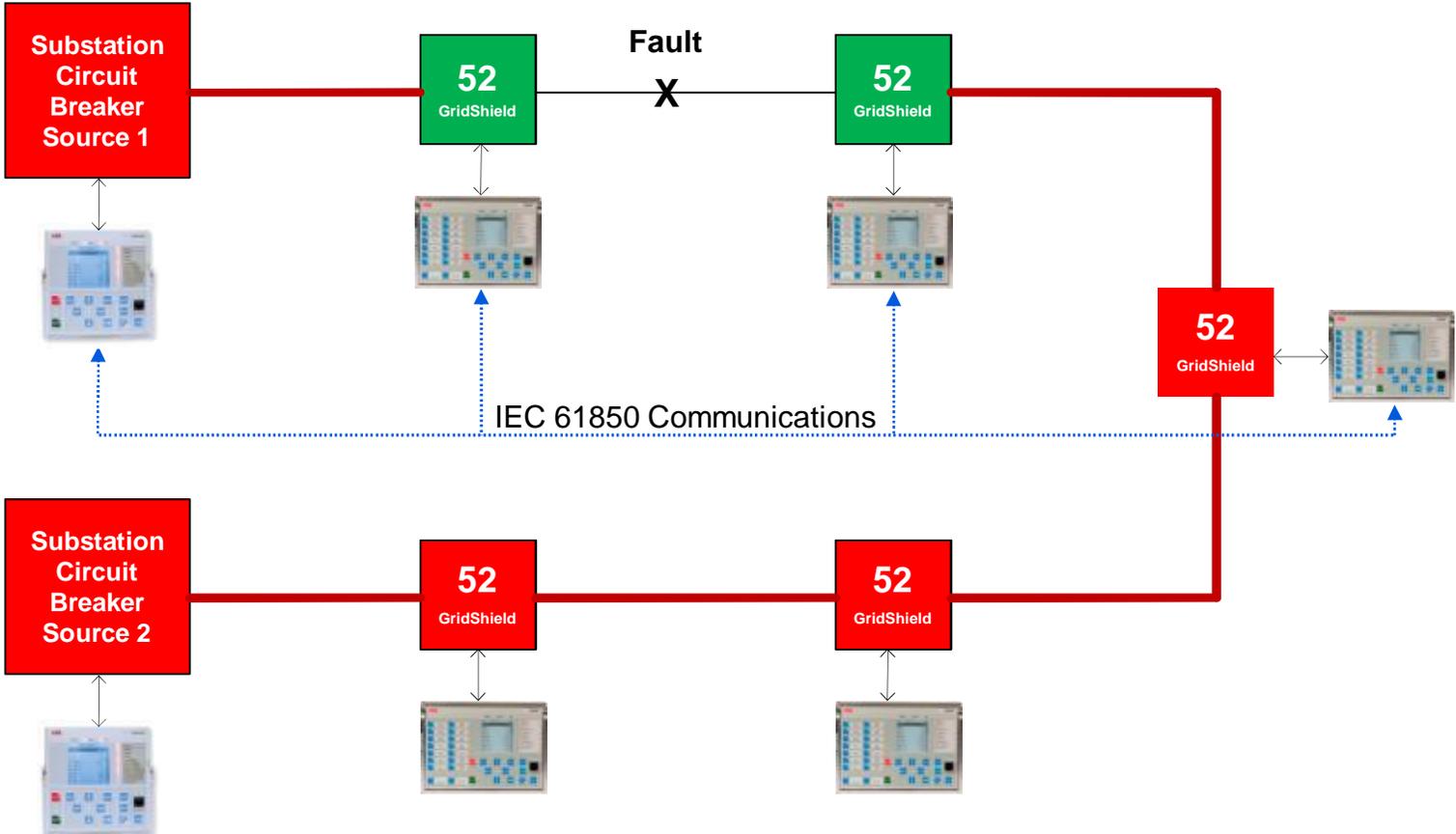
Device level Loop automation (Loop Control - no communications)



Device level Peer-to-Peer (61850 GOOSE, Communication)



Device level Peer-to-Peer (61850 GOOSE, Communication)



Take away from this session

Products and resources to support OEM manufacturers



- OEM's and system integrators can select ABB products and assemble elements into a “smart” solution.
- Resources available to support application design, component selection, assembly considerations
- Software tools and documentation available
- Smart Lab available to support your needs

Power and productivity
for a better world™

