



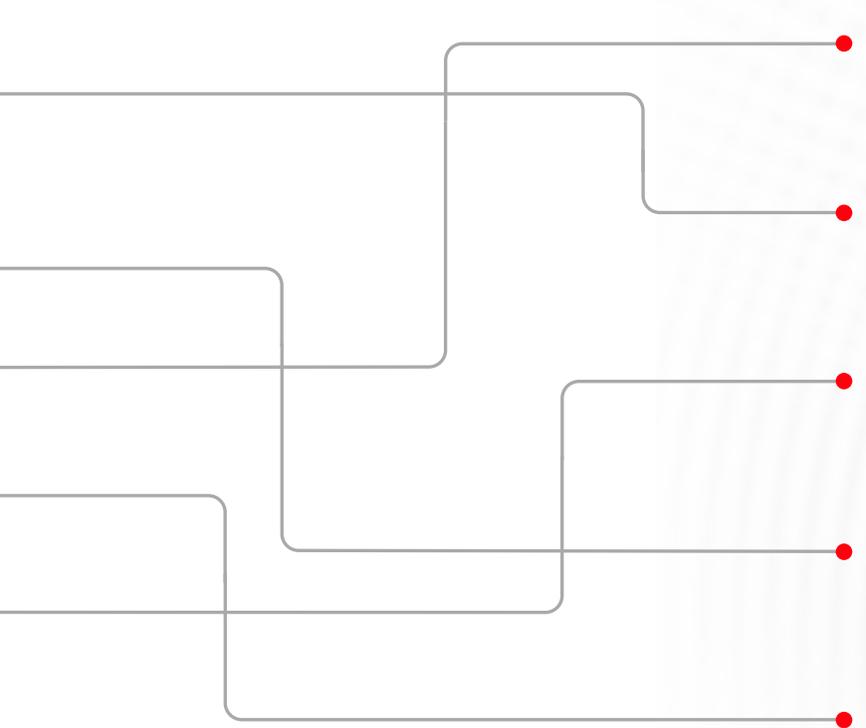
DISTRIBUTION SOLUTIONS | MEDIUM-VOLTAGE PRIMARY GAS-INSULATED SWITCHGEAR (GIS)

Digital, smart, sustainable.

The next chapter of GIS

ZX Digital – The smarter GIS solution





Why ZX Digital?



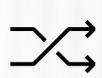
Smart Automation & Control



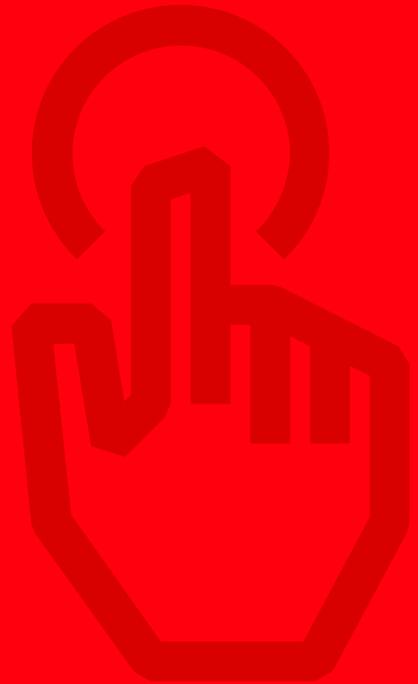
Monitoring & Diagnostic Solution (M&D)



Digital benefits summary



Let's transform your GIS



Why ZX Digital?

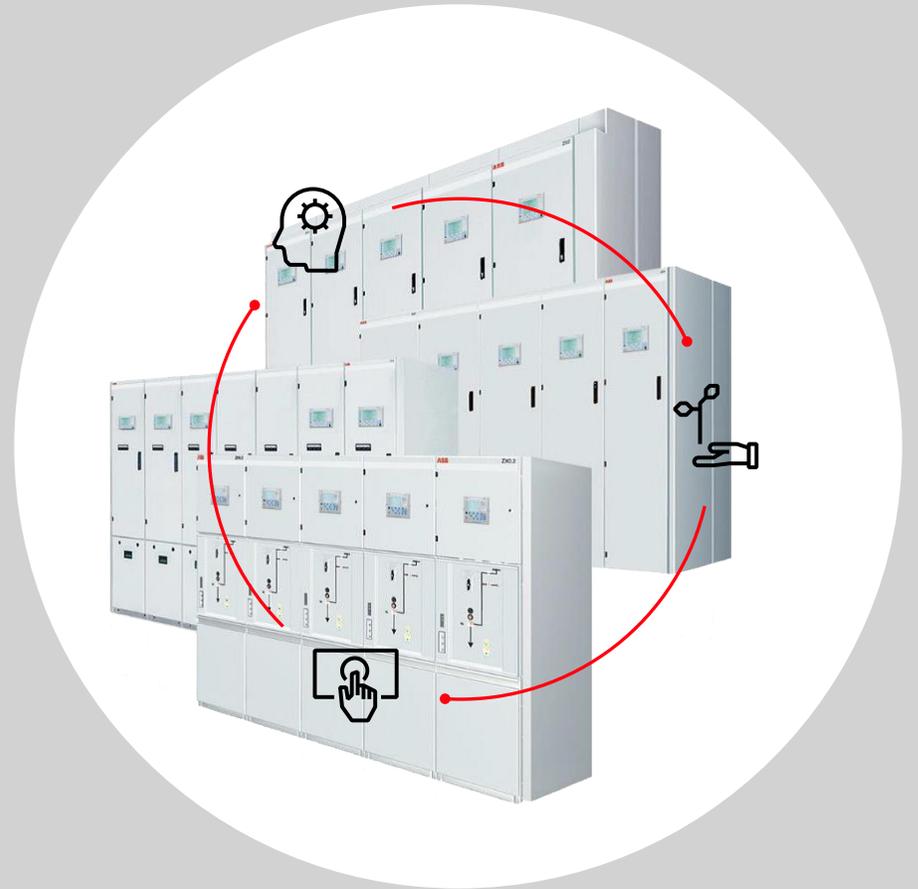
Digital GIS definition
& value add

ZX Digital – The smarter GIS from ABB

At ABB, we believe in a world in which nature and technology go hand in hand. A world in which powering your operations also means powering positive change – for your business and our planet. We strive to create products and solutions that make a difference.

Be digital, smart and sustainable.

That's the thinking behind our philosophy for medium-voltage, Primary Gas Insulated-Switchgear (GIS): **ZX Digital**.



Digital definition Of ABB MV Digital GIS

Two pillars to make a GIS digital

ABB's Digital solutions make our proven GIS smarter, safer and more efficient



Smart Automation & Control

Enabling you to efficiently act and quickly react. Use automated solutions and latest technologies for safe and efficient operation & increased availability of power supply.



Monitoring & Diagnostics (M&D)

For peace-of-mind of GIS users: Be sure that switchgear is in good condition for highest reliability. For a lower total cost of ownership: Do maintenance when really needed.

ABB ABILITY™



Energy & Asset Manager



DIGITAL GIS

With ABB Digital Solutions for MV GIS for increased efficiency over the switchgear lifetime



Smart Automation & Control

- IEC 61850 bus communication
- Current & Voltage Sensors
- Grid Automation solutions



Monitoring & Diagnostics

- Asset Health Monitoring
- Condition monitoring
- Local & Remote solution



BASE GIS

ABB GIS Switchgear with renowned reliability



Primary GIS

- ZX series
- PrimeGear ZX series



Secondary GIS

- SafeRing
- SafePlus
- SafeLink

Make your GIS smarter

M&D Features

Pillar 1: Smart Automation & Control

- 1 IEC 61850 Bus communication
- 2 Current Sensors
- 3 Voltage Sensors (in socket) or Voltage Sensors (on cable plug)

Pillar 2: Monitoring & Diagnostics

Currently available:

- 1 Remote gas density monitoring
- 2 Cable connection Temperature
- 3 VI Electrical Life estimation
- 4 CB mechanism (Basic: Hall sensors)
- 5 Env. Temp & Humidity (LVC)

Coming soon

- 5 Environment (switchgear building)
- 6 CB mechanism (Adv.: Angle sensors)
- 7 3PS Monitoring (Electrical)

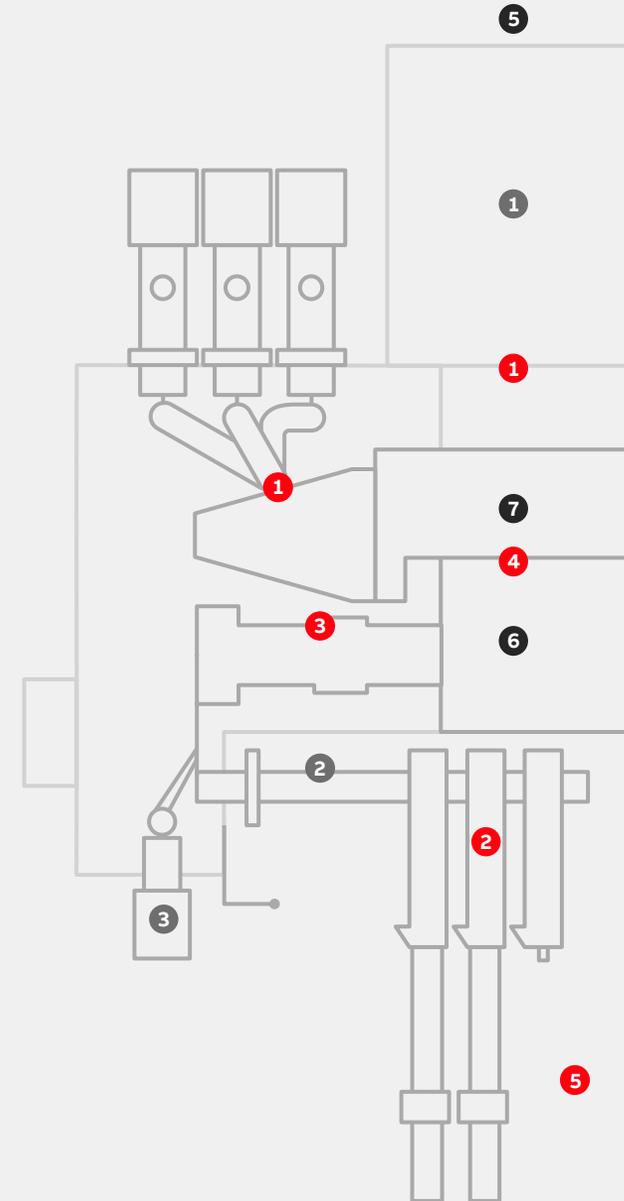


ABB offering for digital medium-voltage switchgear GIS for primary power distribution

1. ZX0.2

- Up to 36kV, 2500A, 31.5kA
- With solid insulated busbar
- Front access enables space saving wall-mounted installation

2. PrimeGear ZX0

- Up to 24kV, 1250A, 25kA
- With solid-insulated busbar
- SF6-free version available

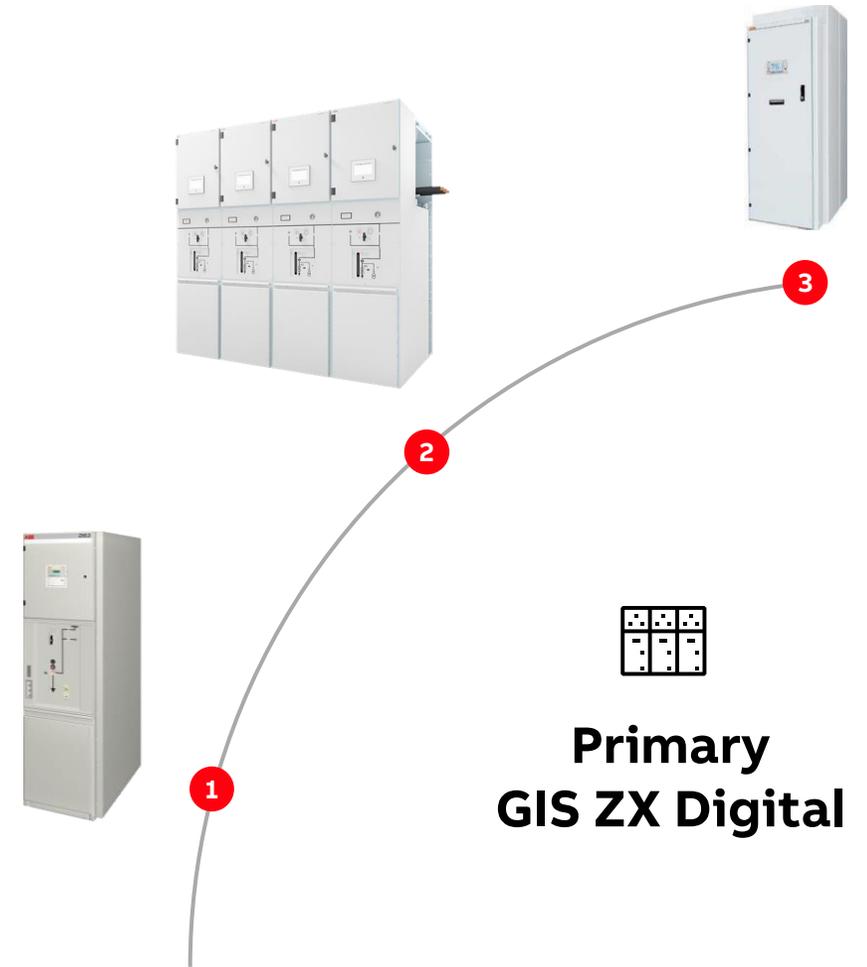
3.1 ZX2

- Up to 36kV, 2500A, 40 kA¹
- With gas-insulated busbar
- Single & double busbar with same space-saving footprint
- SF6-free version available for selected ratings

3.2 ZX1.2

- Up to 36kV, 2500A, 31.5 kA
- With gas-insulated busbar
- Single & double busbar with same space-saving footprint

1. Higher ratings available upon request



Digital GIS

For more value along
the switchgear lifecycle



Planning & Purchase

-  Early clarification of CTs & VTs not a problem anymore
-  Less impact of requirement changes and documentation rework

Installation & Commissioning

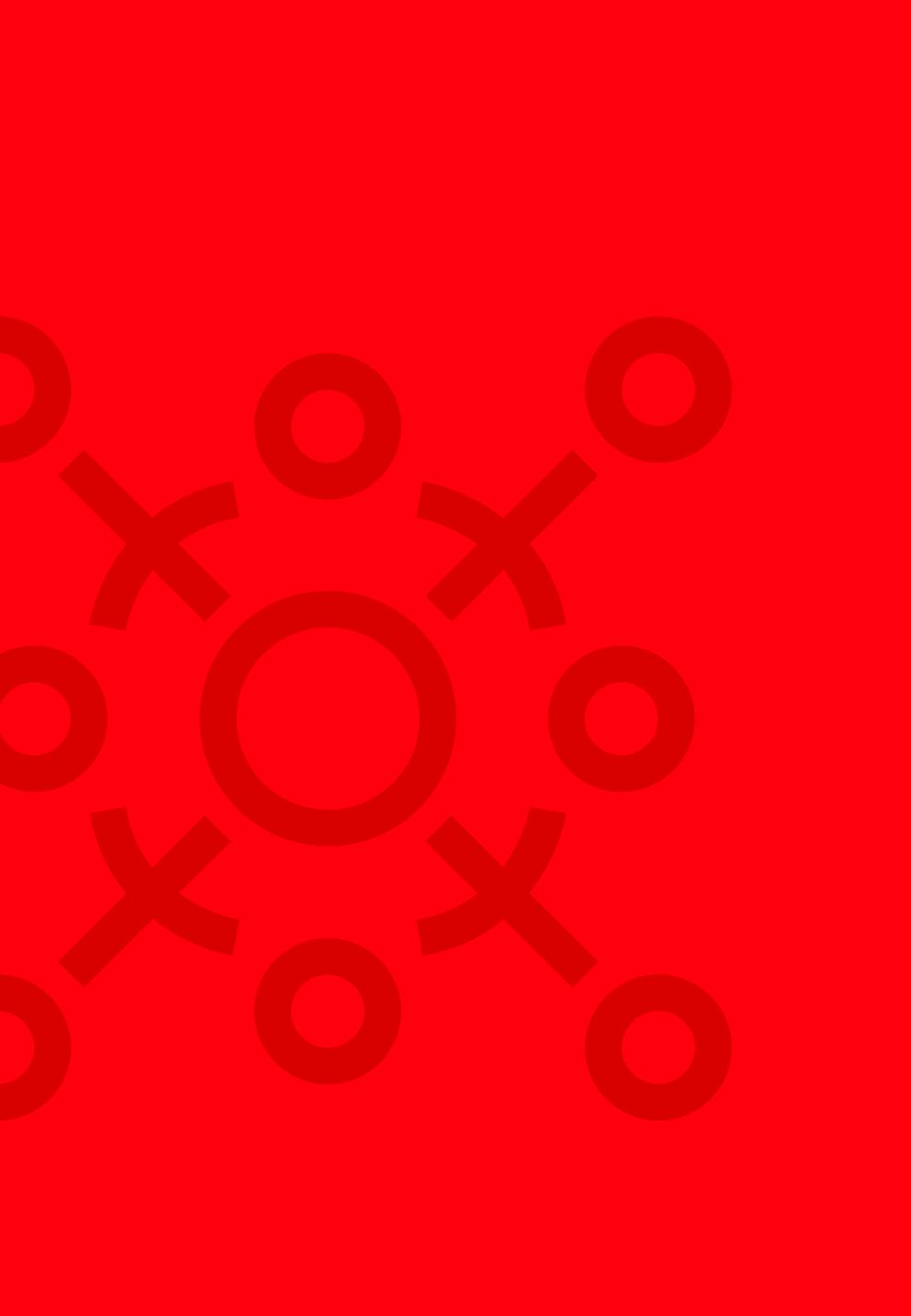
-  Less on-site wiring, testing & changes in documentation
-  Less damages during panel or cable installation

Operation & Maintenance

-  Changing feeder loads do not require CT replacement anymore
-  Less potential failures due to undetected pre-damages
-  Less local site visit needed to know GIS condition

 Smart Automation & Control

 Monitoring & Diagnostics



Smart Automation & Control



Our intelligent digital solutions will make your business smarter

01. Smart Automation & Control

Latest technologies for safe and efficient operation and simple processes:

- IEC 61850 bus communication
- Current and voltage sensors
- Grid automation solutions
- Local solutions or convenient access from remote locations

Make your GIS smarter

ZX – Digital and Smart Features and Benefits



Digital and Smart Options

- One multi-purpose bus for all signals (IEC 61850)
- Current and voltage sensors instead of conventional
- Multiple options for M&D



More Safety

Low energy signals and self supervision on IEC 61850 bus reduce probability of failures and allow an early failure detection



More Efficiency, More Sustainability

- Lower electrical losses with sensor technology
- Easy data access, local or remote



Reduced Planning Effort

Easier planning and change handling, reduced outage times / costs



Lower operational cost

No early clarification of CT/VT values, less limitation in I/Os

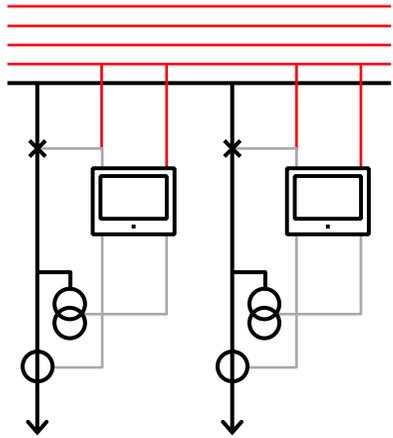


More Flexibility

- No exchange of instrument transformers needed – sensors can just be reconfigured
- Modifications can often be implemented without change of LVC wiring

How is GIS changing to make your switchgear smarter?

Conventional solution

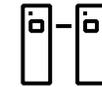
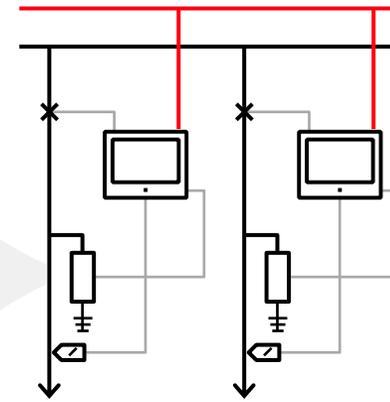


Many hard-wired loops for inter-panel signals



Inductive current and voltage transformers

Digital solution



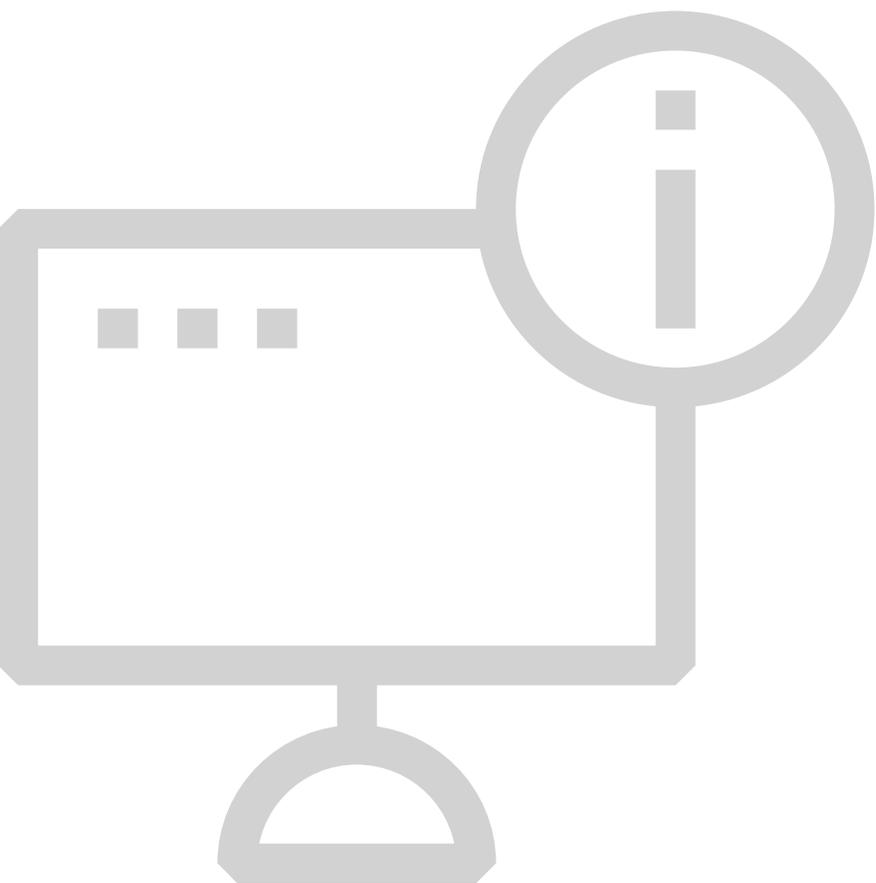
One multi-purpose bus for all signals, IEC 61850



Current and voltage sensor



M&D Solution Features & Architecture



Our intelligent digital solutions will make your business smarter

02. Monitoring and diagnostics

Asset health monitoring for peace of mind and lower operational cost:

- Valuable insights on the switchgear condition
- Early detection of potential failures
- Local solutions or convenient access from remote locations

Monitoring & Diagnostics outlook

Maintenance Concept

Without M&D

1. Corrective maintenance

Run to failure

With M&D

2. Time- / Usage-based maintenance

Every 2 years / 5.000 operations

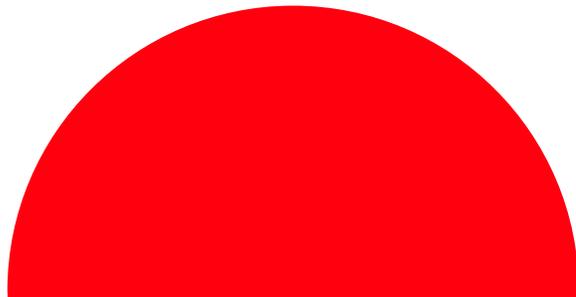
3. Condition-based maintenance

Upon health status warning

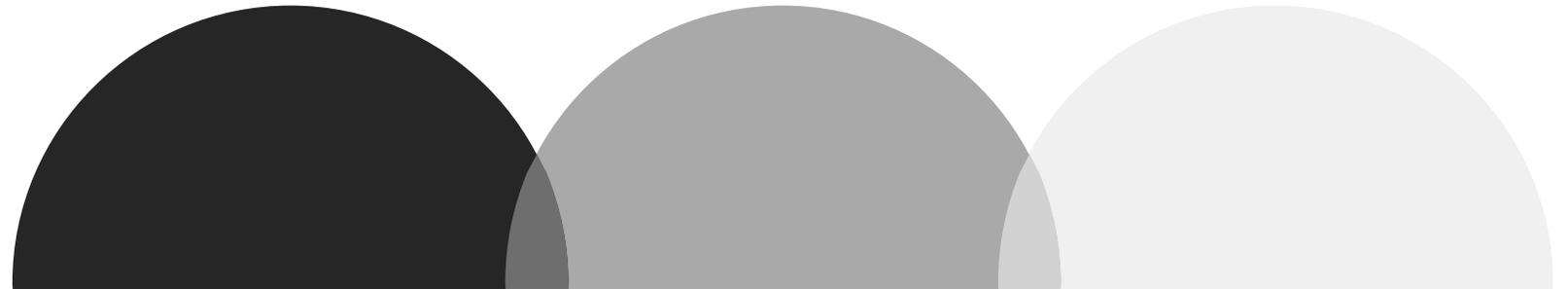
4. Predictive maintenance

When in the future?

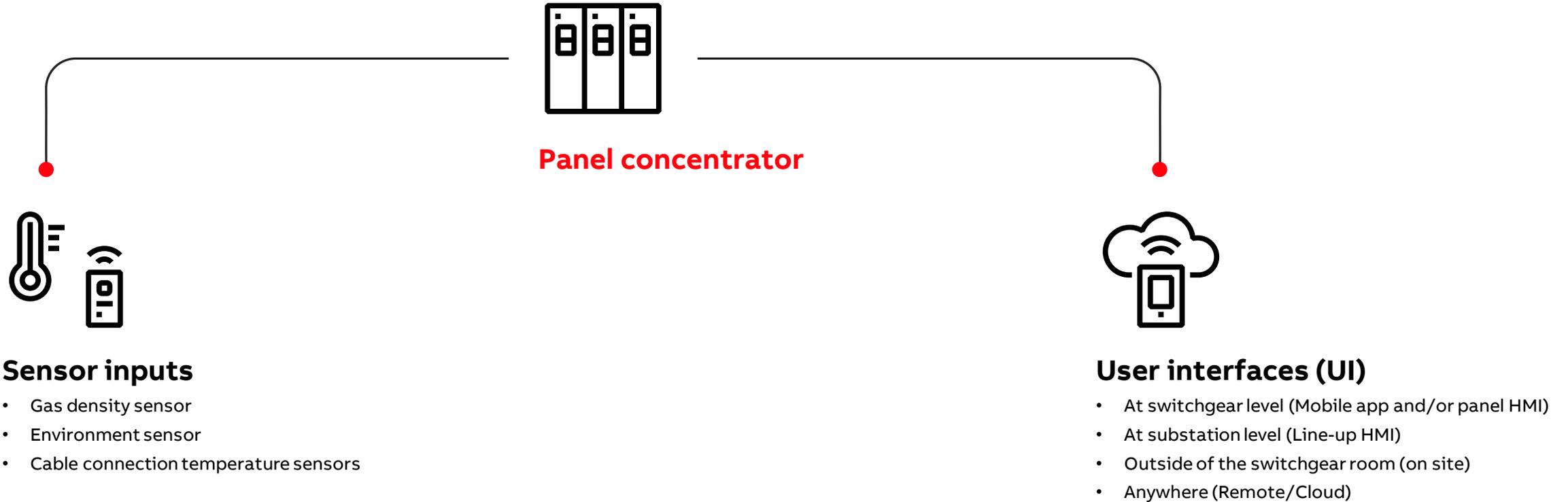
Corrective Maintenance



Reliability centered maintenance

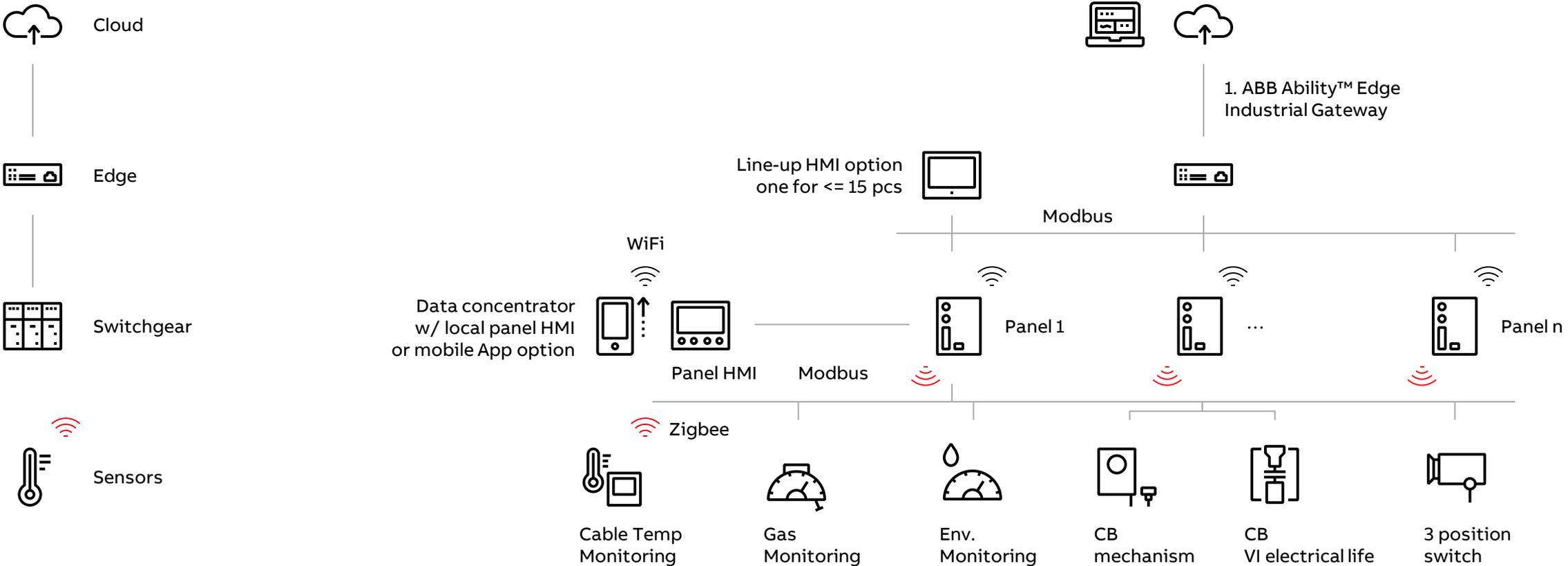


Our monitoring and diagnostics solution architecture



Monitoring & Diagnostics

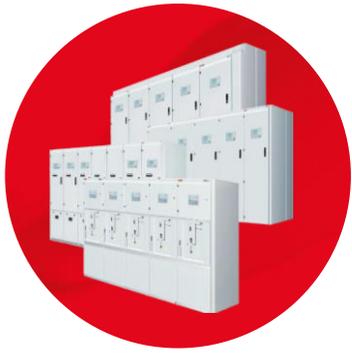
Communication architecture



1. The cloud connectivity is optional



Digital benefits summary



ZX Digital

The smarter medium-voltage GIS solution



Smart Automation & Control



More Safety

- Low-energy signals on bus/sensor
- Lower probability of failures



Less planning efforts, 10% faster installation, 20% faster execution time

- No early CT clarification
- Less limitations on I/Os



More Efficiency, Sustainability

- Lower electrical losses
- Easy data access, local or remote



Monitoring & Diagnostics



More Safety

- Low-energy signals on bus/sensor
- Lower probability of failures



Less failures and outages

- Supervised communication
- **Early detection** of failures through predictive maintenance



Lower operational cost

- Easy planning & change handling
- Less outage cost



More Flexibility

- No exchange of CTs/VTs
- Less secondary wiring changes



10% – 20% reduced footprint

- Enabled through current and voltage sensors



Optimized weight

- Up to 15% weight reduction

Reduced total cost of ownership (TOC) by 30%



FLEXIBLE



SMART



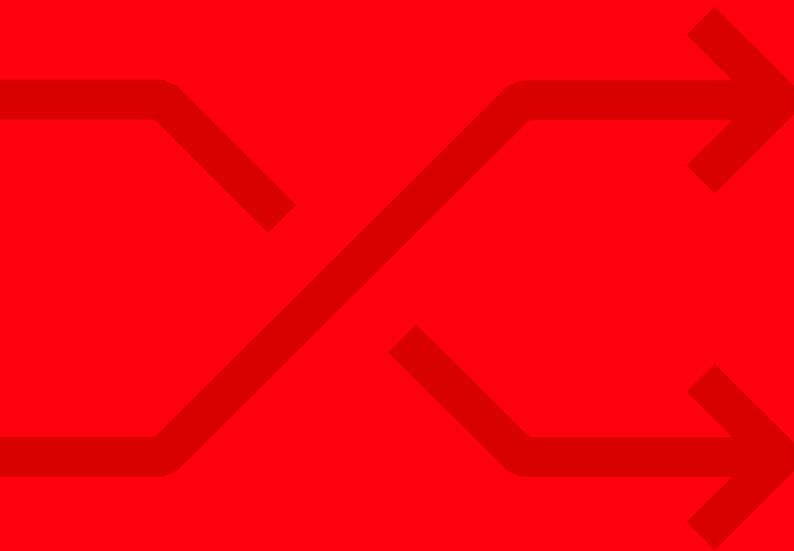
SAFE



SUSTAINABLE



ZX Digital for peace of mind



—
**Let's transform
your GIS**

Any questions? Feel free to ask

Digital switchgear from ABB

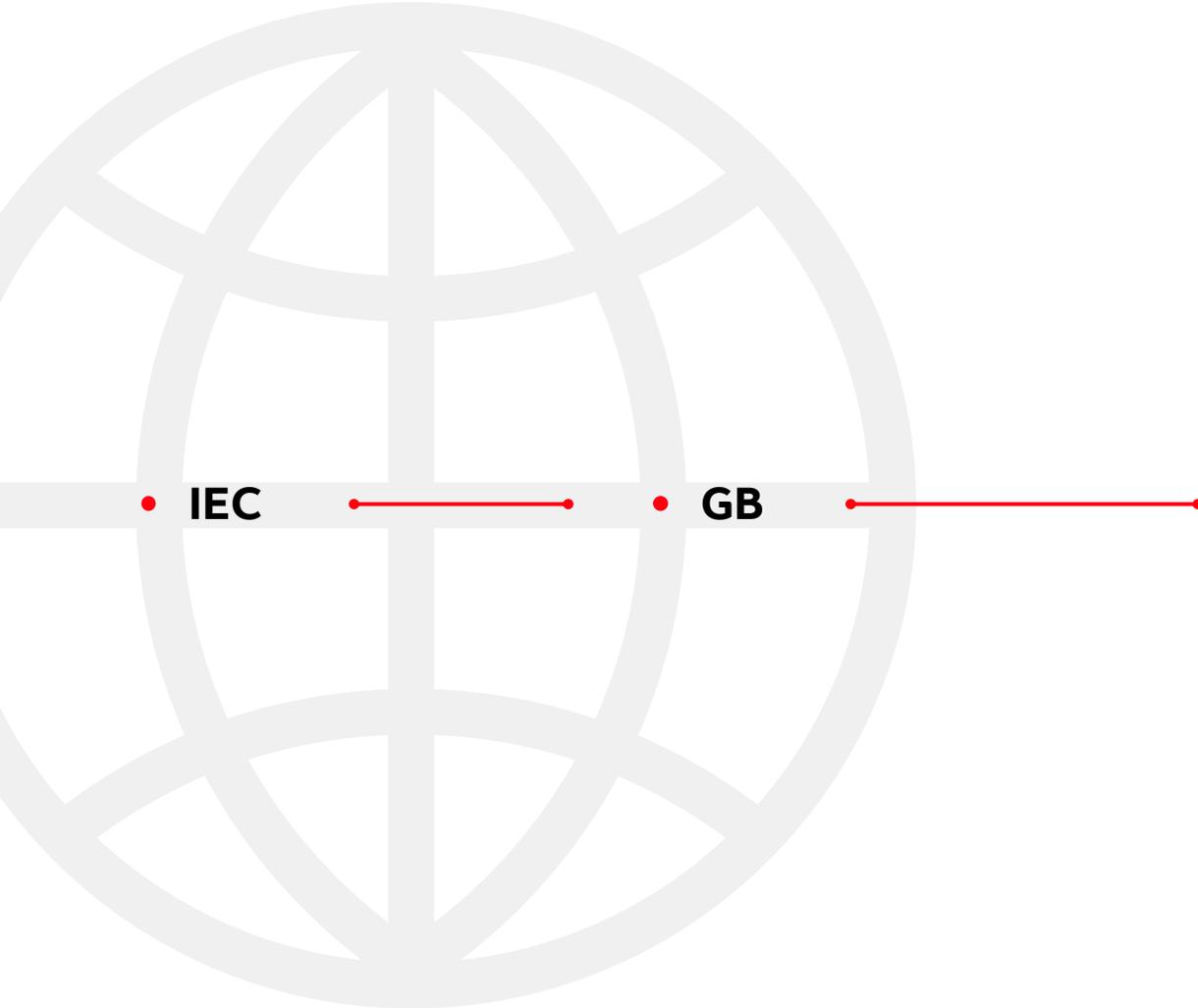
More

Sustainability Safety Efficiency Flexibility

Less

Planning efforts Failures Outages Operational cost

Our enhanced, next-generation switchgear



ZX Digital

Global launch:

- Launch in China GB market: 2020
- Launch in all IEC markets: 2021

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Find out more, visit:

ZX-DIGITAL



ABB