



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



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## **Why ZX Digital?**

Digital GIS definition  
& value add

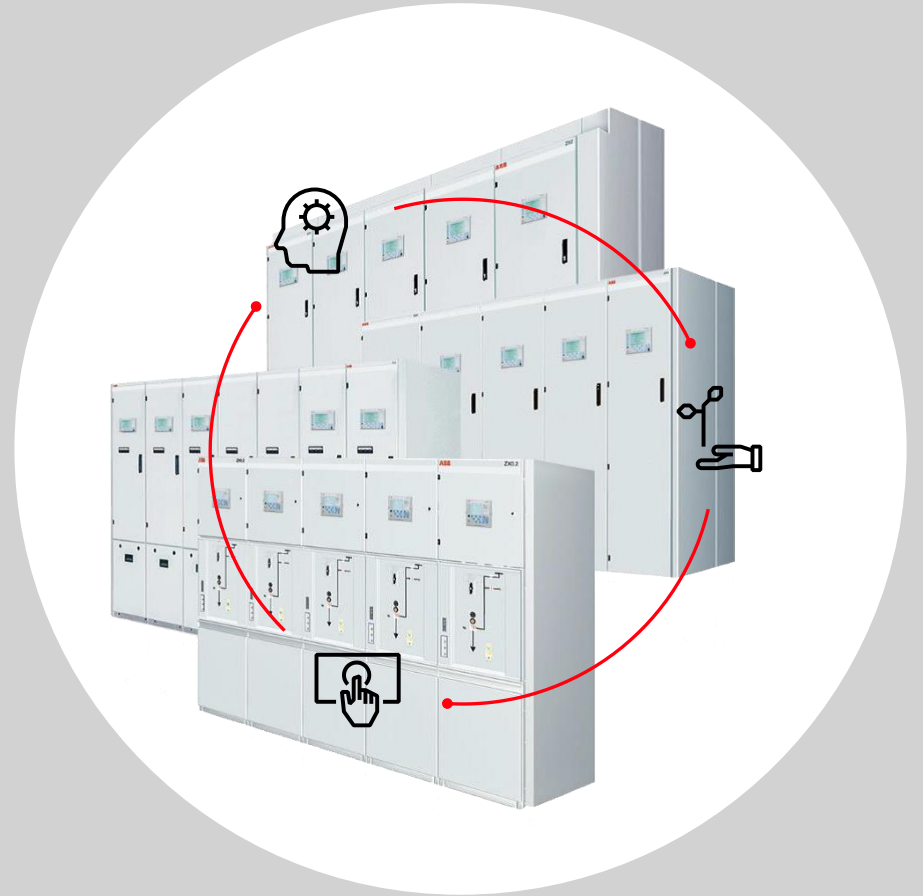
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# ZX Digital – The smarter GIS from ABB

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)

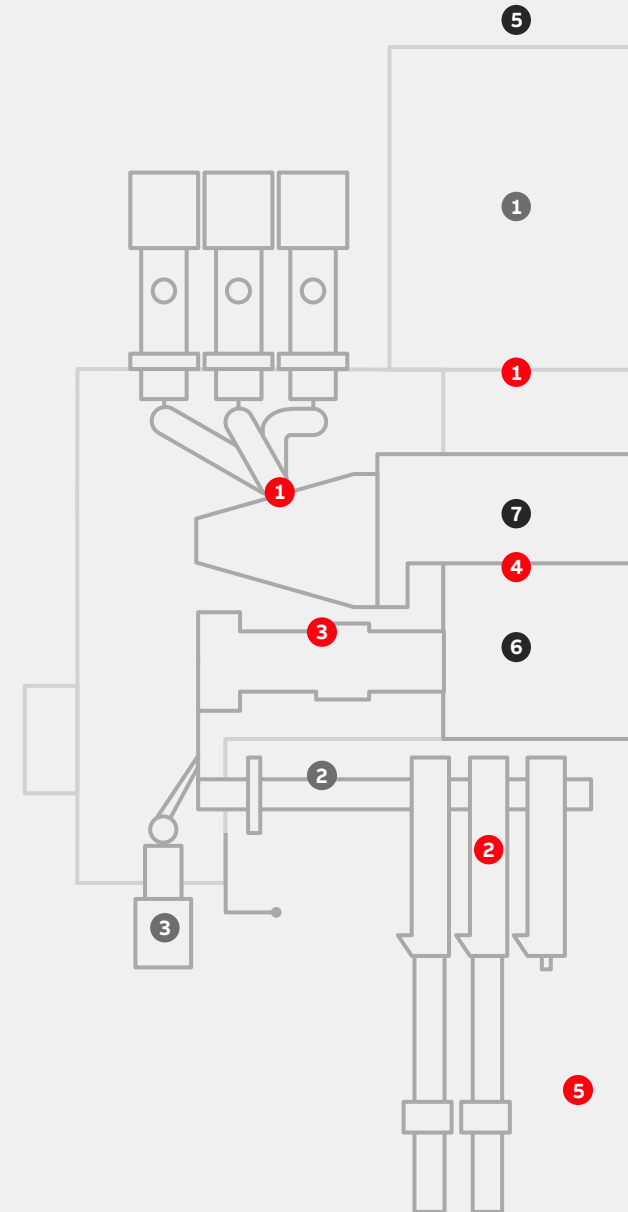
### Pillar 2: Monitoring & Diagnostics

#### 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

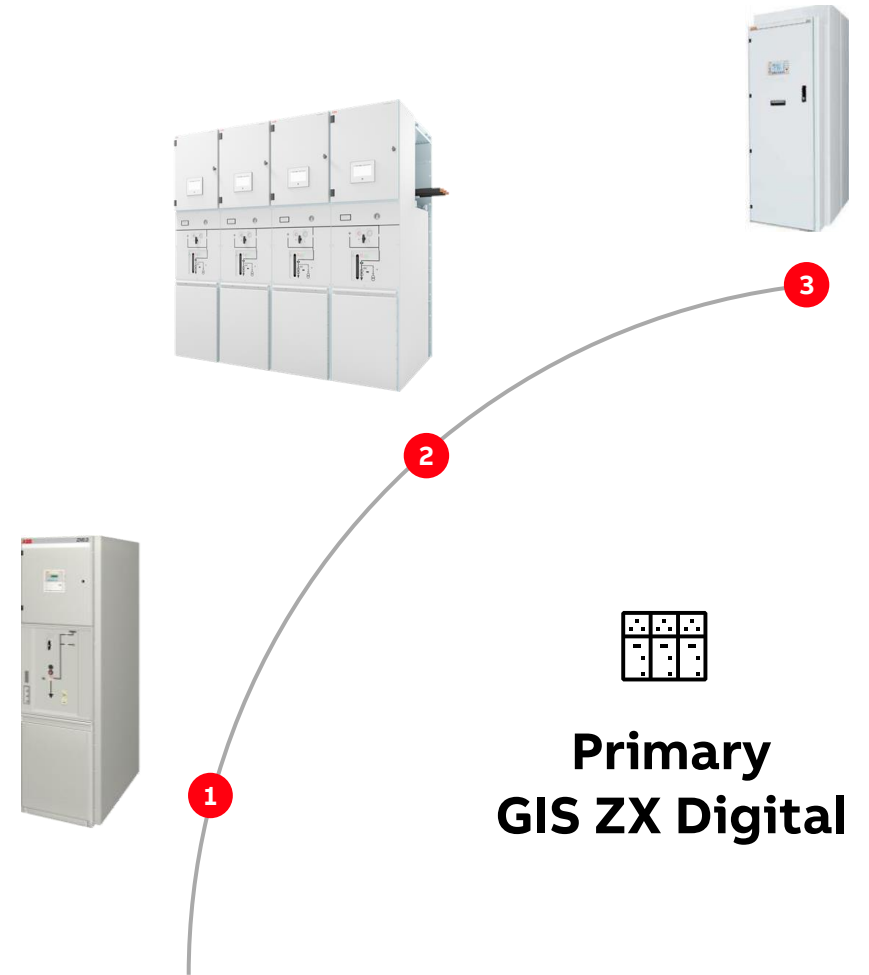
### 3.1 ZX2

- Up to 36kV, 2500A, 40 kA<sup>1</sup>
- 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

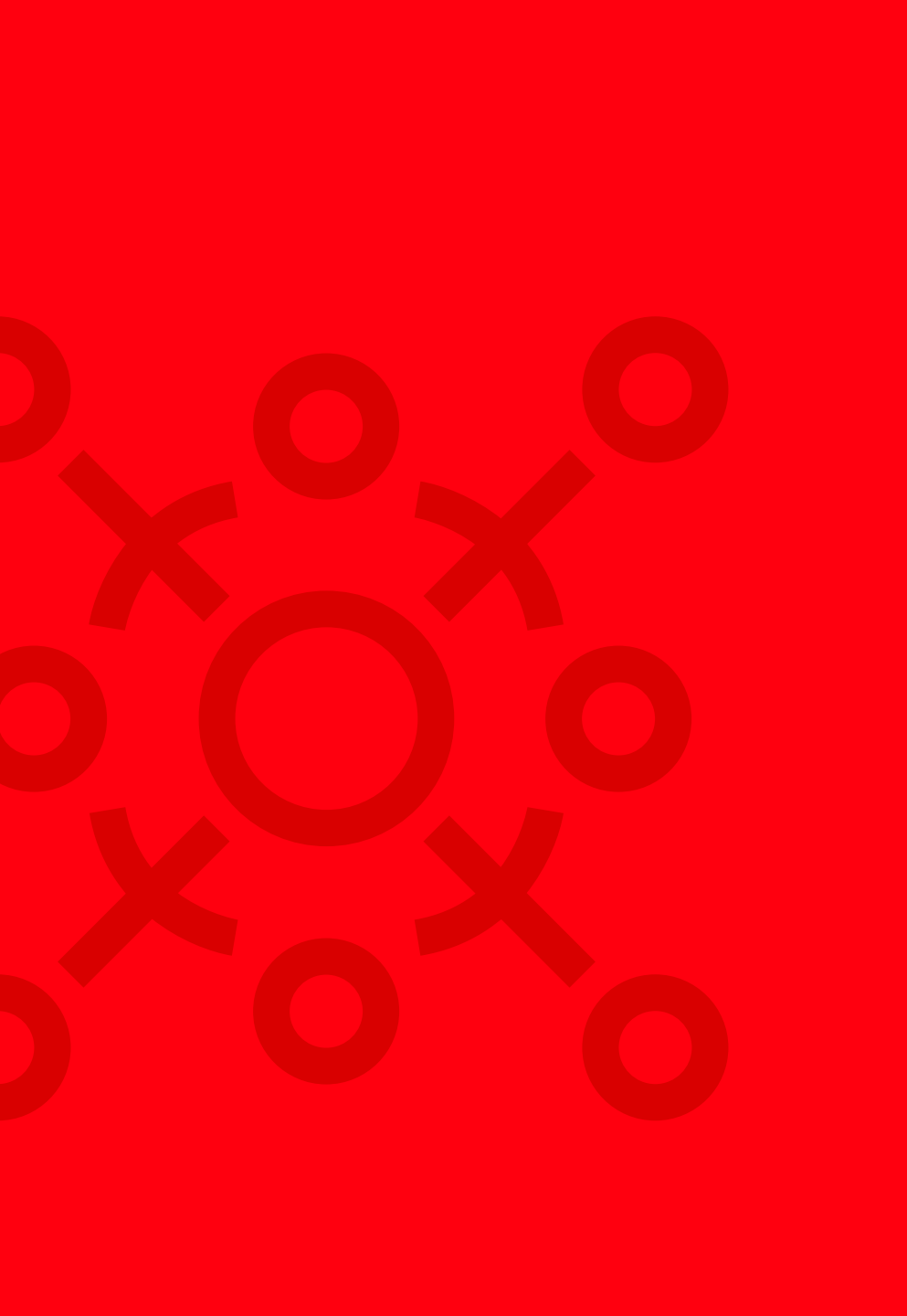
## Operation & Maintenance

- 🔗 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**



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# **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



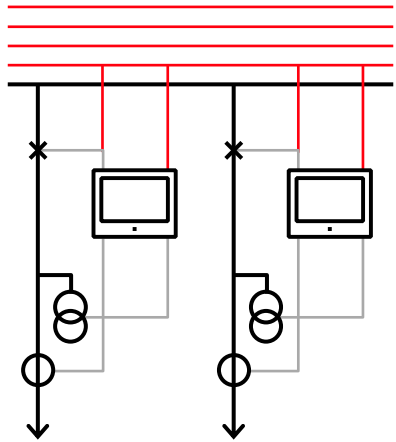
### More Flexibility

- 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

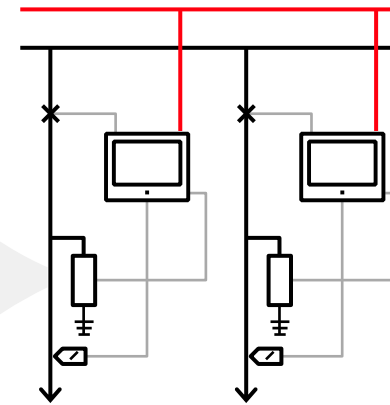


Many hard-wired loops  
for inter-panel signals



Inductive current and  
voltage transformers

## Digital solution



One multi-purpose bus  
for all signals, IEC 61850



Current  
and voltage sensor



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# **M&D Solution Features & Architecture**



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# **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

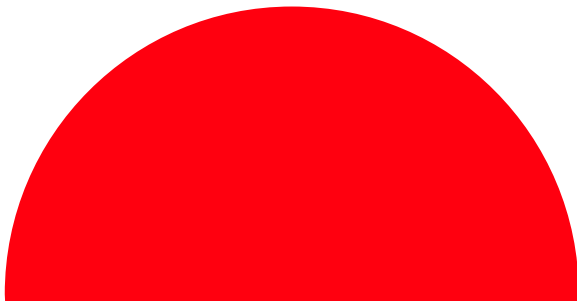
#### 3. Condition-based maintenance

Upon health status warning

#### 4. Predictive maintenance

When in the future?

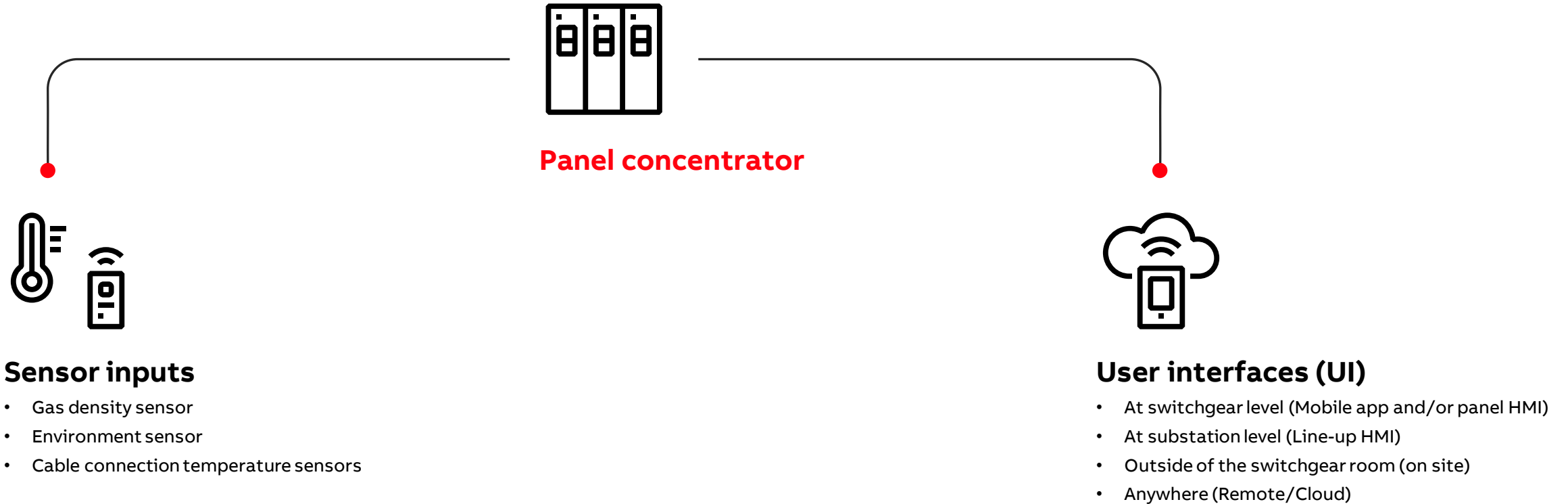
### Corrective Maintenance



### Reliability centered maintenance

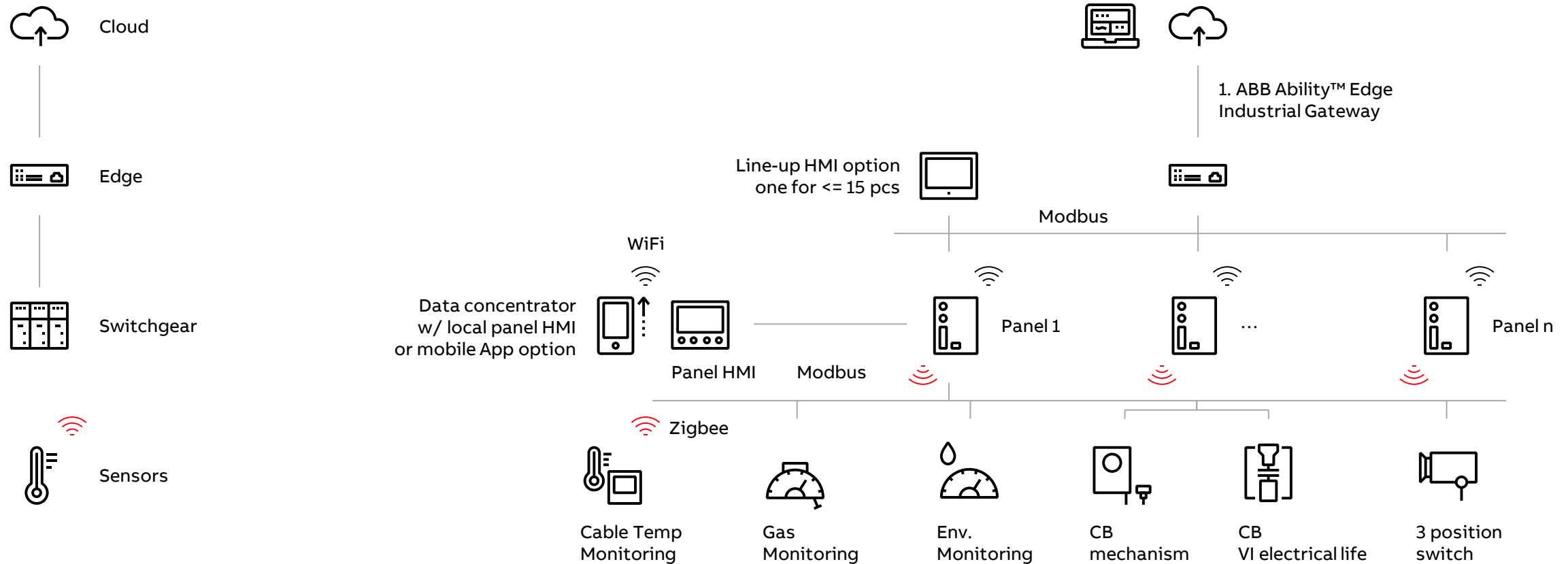


# Our monitoring and diagnostics solution architecture



# Monitoring & Diagnostics

## Communication architecture



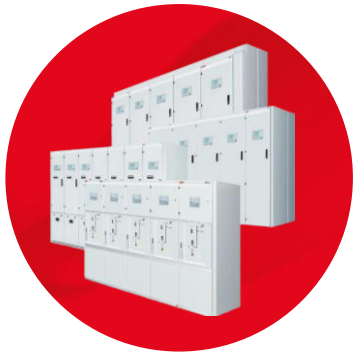
1. The cloud connectivity is optional





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# 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



#### 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



### 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

Reduced total cost of ownership (TOC) by 30%



FLEXIBLE



SMART



SAFE



SUSTAINABLE





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**ZX Digital for peace of mind**



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**Let's transform  
your GIS**

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**Any questions? Feel free to ask**

Digital switchgear from ABB

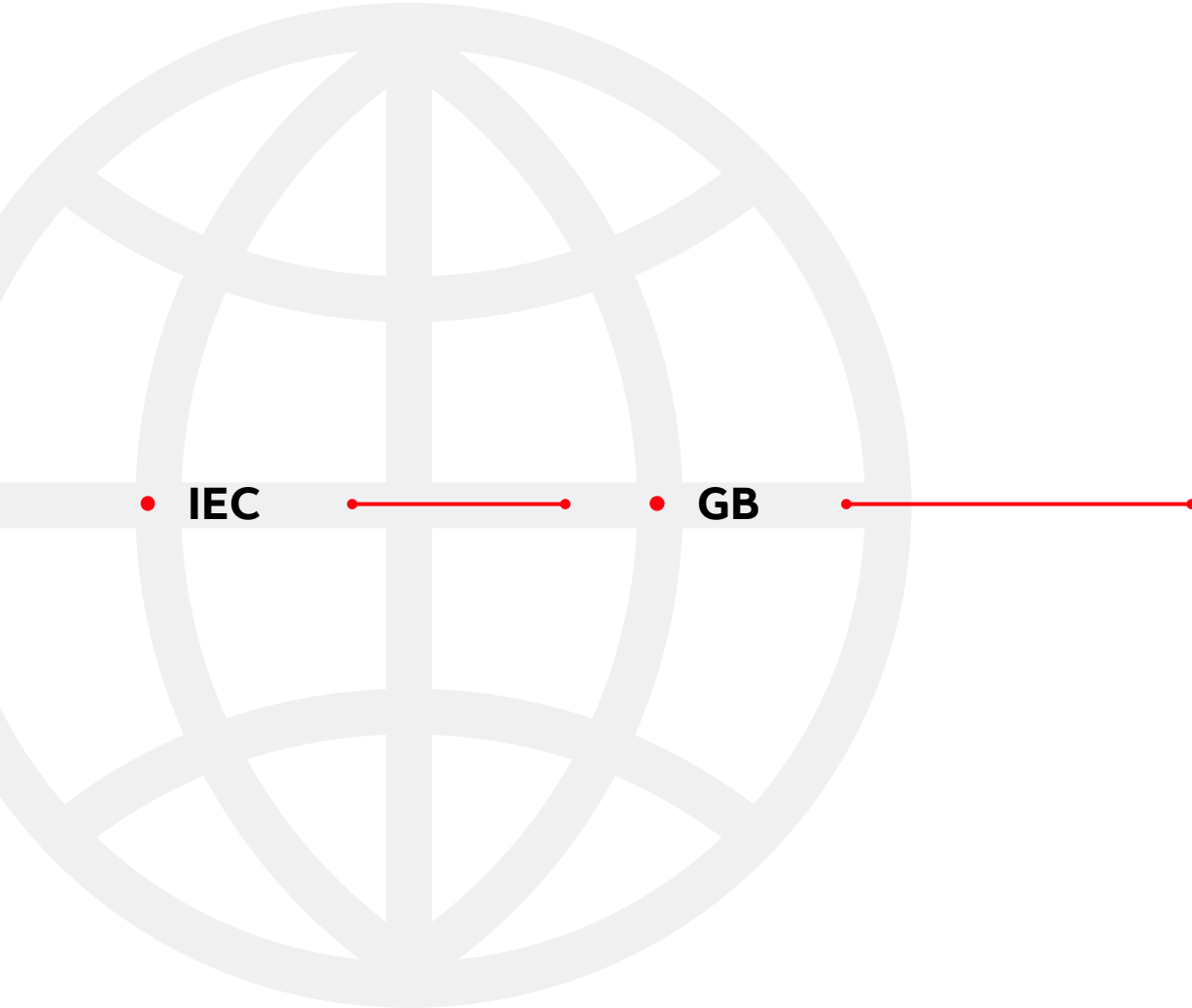
**More**

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**