



ABB MOTION SERVICES

ABB ABILITY™ DIGITAL POWERTRAIN

Enabling Hardware Brochure

**ENGINEERED
TO OUTRUN**

If the powertrain stops, operation stops

Reactive maintenance costs downtime



A single failure can stop entire production lines



Aging assets and limited manpower increase risk



Unplanned downtime costs on average **\$170,000 per hour***



Most maintenance is still reactive

**ABB Modernization for Resilience whitepaper, 2025*



Prevent downtime. Move to predictive maintenance

Reactive maintenance is no longer enough

How ABB enables predictive maintenance:

1

DETECT



Securely collect and analyze condition data — capturing early deviations.

2

PREDICT



Apply advanced analytics and human expertise to identify failure risks.

3

RECOMMEND



Provide clear guidance on what to fix and when so reliability teams can ACT before downtime occurs

Enabling action before downtime occurs

ABB Ability™ Digital Powertrain portfolio

Two digital service models for predictive maintenance



ABB Ability™ Predictive Intelligence for powertrains

Expert-led predictive intelligence

- **ABB expert + advanced analytics** detect, predict, prioritize risks, and recommend actions
- Continuous monitoring with “**what to fix and when**” guidance
- Outcomes: **Maximum reliability and peace of mind**



ABB Ability™ Digital Powertrain Insights

Self-service asset intelligence

- **Digital platform** delivering real-time asset health insights
- Advanced **analytics-powered alerts and insights** for in-house teams
- Outcomes: **Full visibility and control**

ABB Ability™ Predictive Intelligence for powertrains

Expert-led predictive maintenance.

We monitor, analyze, and guide action to prevent downtime.

What ABB delivers:

- Continuous remote monitoring of motors, drives & driven equipment
- Advanced analytics combined with ABB domain expertise
- Structured performance and condition reports
- Clear “what to fix and when” recommendations
- Scalable from single sites to global fleets

Benefits:

- **Higher uptime** through earlier intervention
- **Lower maintenance costs** and better resource allocation
- **Reduced operational risk**
- **Extended asset life** & improved energy use

[Learn more](#)



ABB Ability™ Digital Powertrain Insights

A **self-service digital platform** providing real-time, actionable asset intelligence.

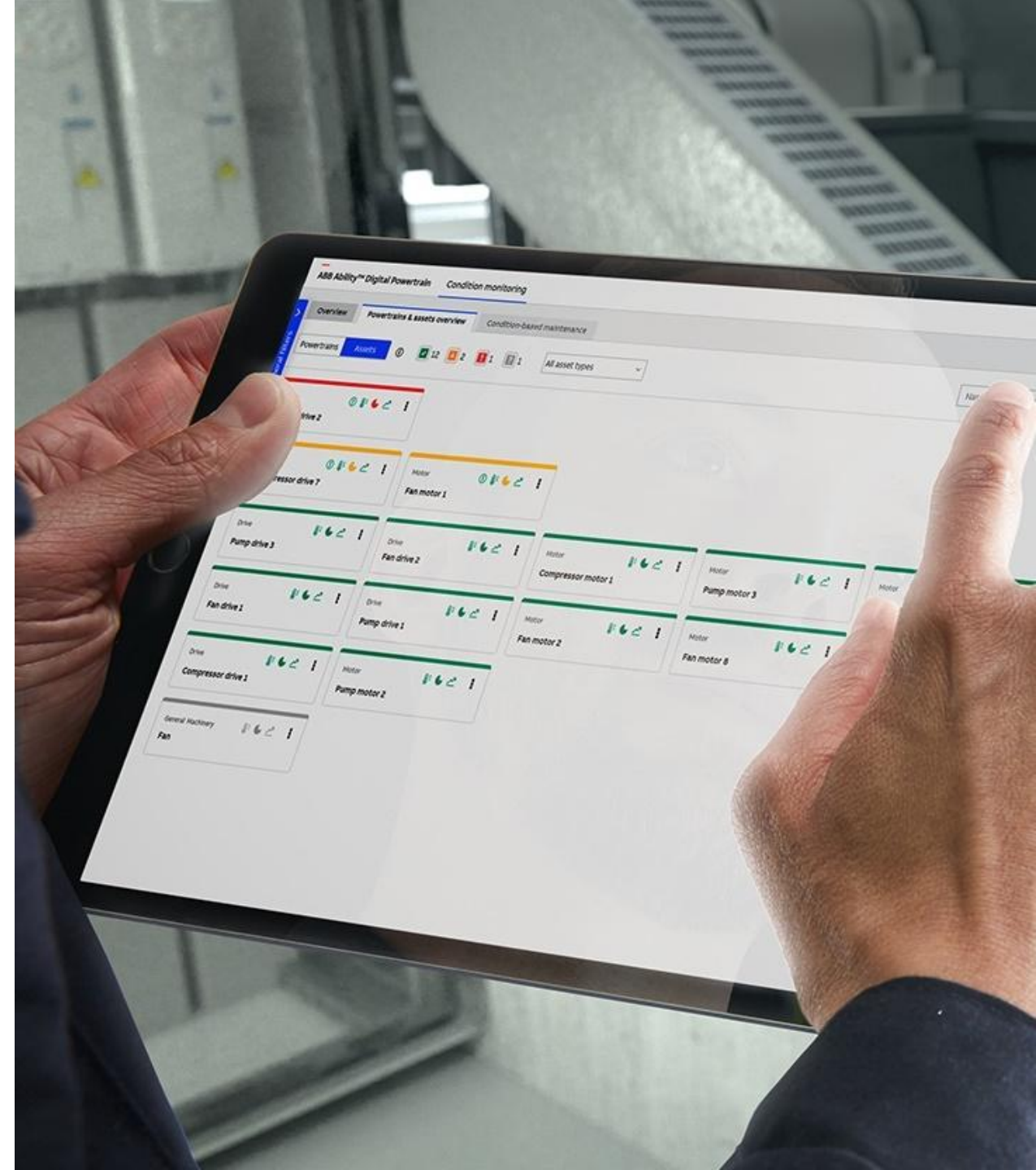
What your team can do:

- Access real-time dashboards for motors, drives & rotating equipment
- Receive analytics-powered alerts on emerging risks
- Analyze trends to support proactive maintenance planning
- Securely access data via ABB's digital portal
- Opt for optional expert reports for deeper analysis

Benefits:

- **Earlier risk visibility** to reduce downtime
- **Data-driven maintenance** planning and resource optimization
- **Centralized asset visibility** across sites and fleets
- **Empowered in-house teams**

[Learn more](#)



ENABLING HARDWARE

ABB Ability™ Digital Powertrain

Condition monitoring for powertrains

What is monitored

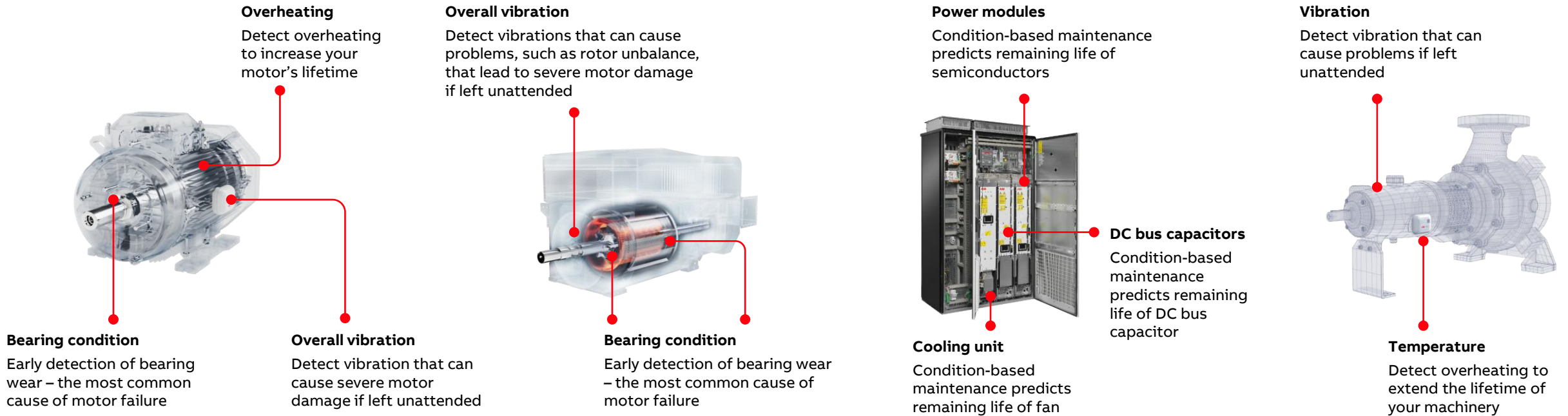


ABB Ability™ Digital Powertrain monitoring devices

Overview

ABB Ability™ Smart Sensor for rotating equipment



Specification & features

- Industrial AC motors
- Machinery (e.g. pumps, fans)

Motor frame sizes:

- IEC: 56 – 500
- NEMA: 42 – NEMA449
- above : 5000 – 6800

RED, FCC, IC, ATEX, IECEX, NEC
500 certified

SEE MORE SLIDES

ABB Ability™ Machine Guardian for high power motors and generators and driven equipment



Specification & features

- 3-phase AC induction motors and synchronous motors and generators
- Machinery (e.g. pumps, fans)

Shaft heights:

- 560 mm and higher

RED, FCC, IC certified

SEE MORE SLIDES

Connectivity Panel for drives



Specification & features

- Low voltage single drives
- Plug & play cellular cloud connectivity
- For remote locations and sites without internet connection
- Check market availability

SEE MORE SLIDES

EGW-02 for drives



Specification & features

- Medium and low voltage system drives and single drives
- Up to 10 drive control units can be connected to one EGW-02
- In-built LTE modem
- State-of-the-art cyber security

SEE MORE SLIDES

NETA-21 for drives



Specification & features

- Medium and low voltage system drives and single drives
- Up to 9 drives can be connected to one NETA-21

SEE MORE SLIDES

ABB Ability™ Smart Sensor

ABB Ability™ Smart Sensor

MOTORS

- Industrial AC motors, induction or synchronous
- Continuous or intermittent duty with duty cycle durations of more than 20 minutes
- Frame sizes:
 - IEC: 56 - 500
 - NEMA: 42 - 449, above NEMA: 5000 - 6800
- Fixed speed or variable speed
- Certified for use in explosive atmospheres
- New or existing motors from ABB or other manufacturers

DRIVEN EQUIPMENT

- Assets, such as pumps and fans, in which only temperature and vibration need to be measured and monitored

ABB Ability™ Smart Sensor for rotating equipment

Monitored parameters for motors and driven equipment

MOTORS

Health parameters

- Overall condition
- Overall vibration
- Bearing condition
- Skin temperature

Operating parameters

- Vibration in 3 axis
 - velocity RMS
 - acceleration RMS and peak to peak
- Speed
- Total running time
- Total number of starts
- Supply frequency
- Output power
- Regreasing count-down

DRIVEN EQUIPMENT

Health parameters

- Overall vibration
- Overall acceleration
- Skin temperature

Operating parameters

- Vibration in 3 axis
 - velocity RMS
 - acceleration RMS peak to peak



ABB Ability™ Smart Sensor for rotating equipment

Easy to use

INSTALLATION AND ACTIVATION

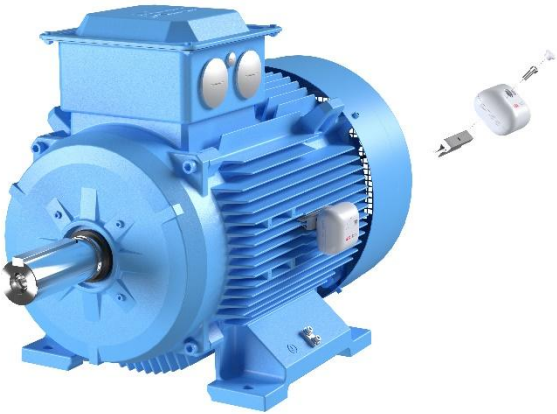
- Sensor is simply attached to the equipment's frame with a clamping bracket and a screw or with adhesive putty
- No machining or wiring required
- Easy activation by NFC

COMMISSIONING

- Commissioning and registration of the sensor/asset via the mobile app takes only a couple of minutes¹
- User registration and group management can be done by authorized users via the web portal

MONITORING

- Users can check the status of their equipment at any time via the mobile app and web portal
- The app includes a 'traffic light' display for a quick overview of all the equipment that is being monitored



1. For bigger installations a PC tool is available

ABB Ability™ Smart Sensor for rotating equipment

Hardware

Designed for hazardous areas

ATEX, IECEx and NEC 500 certified – compliant with strictest requirements for equipment operating in explosive atmospheres

Long battery life

The high-performance sensor has a lifetime of up to 15 years under standard operating conditions; for the standard performance sensor it is up to 5 years¹



Pinpoint detection accuracy

Superior sensors enable detection of even slight anomalies in the equipment's condition at a very early stage

Ease of use

- Quick installation and activation for instant monitoring
- Same hardware can be used for different assets, saving time and reducing stock
- For ABB and third-party equipment

1. ABB indicates a maximum sensor lifetime which varies between sensor types and is based upon standard usage conditions. Standard conditions of operations are as follows: sensor measurement interval of 1 hour; raw data collection once per day; non-condensing environment; measured asset skin temperature: +15 °C to +50 °C

ABB Ability™ Smart Sensor, generation 2

Available variants

	High performance sensor	Standard performance sensor
Key parameters		
Lifetime under standard conditions ¹	Up to 15 years ¹	Up to 5 years ¹
Battery type (not replaceable)	C-type	AA-type
Dangerous goods group	UN3091, Lithium Metal Batteries / Cells –PI970 Section I	UN3091, Lithium Metal Batteries / Cells –PI970 Section II
Low frequency acceleration measurement (x, y, z direction)	0.4 Hz – 3.3 kHz	0.4 Hz – 3.3 kHz
High frequency acceleration measurement (z direction)	2.4 Hz - 10 kHz	N/A
Magnetic field measurement (x, y, z direction)	0.1 – 280 Hz, 1 – 1600 µT	0.1 – 280 Hz, 1 – 1600 µT
Ultrasonic sound measurement	100 Hz – 80 kHz, 0.6 mN/m ² – 20 N/m ²	100 Hz – 80 kHz, 0.6 mN/m ² – 20 N/m ²
Communication	Bluetooth® 5.0, Bluetooth® Low Energy or WirelessHART	Bluetooth® 5.0, Bluetooth® Low Energy
Dimensions (WxDxH) and weight	82 mm x 69 mm x 45 mm, 185 g	75 mm x 58 mm x 33 mm, 130 g

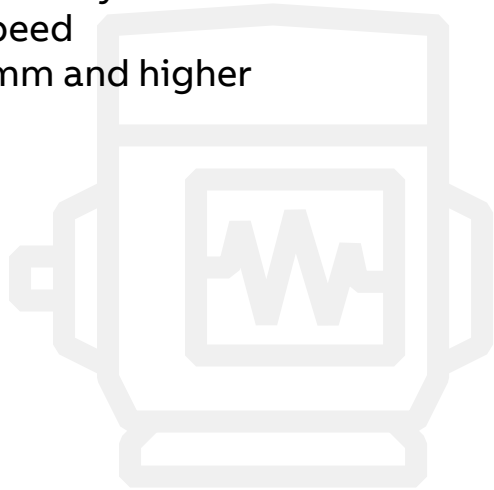
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ABB Ability™ Machine Guardian

ABB Ability™ Machine Guardian

MOTORS AND GENERATORS

- 3-phase AC induction motors
- 3-phase synchronous motors and generators
- Continuous or intermittent duty
- Fixed speed or variable speed
- For shaft heights of 560 mm and higher



DRIVEN EQUIPMENT

- Assets, such as pumps and fans, in which only temperature and vibration need to be measured and monitored



ABB Ability™ Machine Guardian

Features

- 1 Temperature sensors**
Factory fitted at bearing, stator and inside machine
- 2 Vibration sensors**
Mounted at each bearing. For complete analysis, 3 sensors are recommended on each bearing. Each measuring horizontal, vertical and axial direction
- 3 Data acquisition unit (DAU)**
- 4 Magnetic flux sensors**
Mounted on stator body



The picture shows the basic configuration; additional sensors for current, voltage, oil and partial discharge are available

ABB Ability™ Machine Guardian sensors

What they do



Vibration

Identifies imbalances, misalignments, bearing wear, and structural defects. Analyzing vibration patterns can diagnose specific mechanical issues.



Magnetic flux

Enable speed measurement. Detects issues like rotor bar defects, air-gap eccentricities. Consistent flux anomalies indicate potential failures.



Temperature

Detect overheating, indicating potential issues like bearing failure, insulation degradation, or load imbalances.



Humidity

This sensor monitors the moisture levels inside the machine. This enables a better understanding about the water coolers health and other humidity related faults.



Current & voltage

This sensor measures electrical parameters in both the stator and excitation, providing electrical signature analysis to be able to detect electrical related faults. Those can be turn to turn fault or supply unbalance.



Oil particle wear

Real-time sensor for detecting metallic particles in fluids like oil. Categorizes and sizes the metals, giving you early warnings for possible component faults.



Partial discharge

This sensor detects partial discharge events in electrical insulation, which can lead to insulation failure and downtime. Early detection of partial discharges helps in preventing equipment failure and extends the life of electrical components.



Sleeve bearing sensor

This sensor measures mechanical forces applied to sleeve bearings. Useful to find rubbing and sleeve bearing anomalies.

ABB Ability™ Machine Guardian

Monitored parameters for motors, generators & driven equipment

MOTORS/GENERATORS

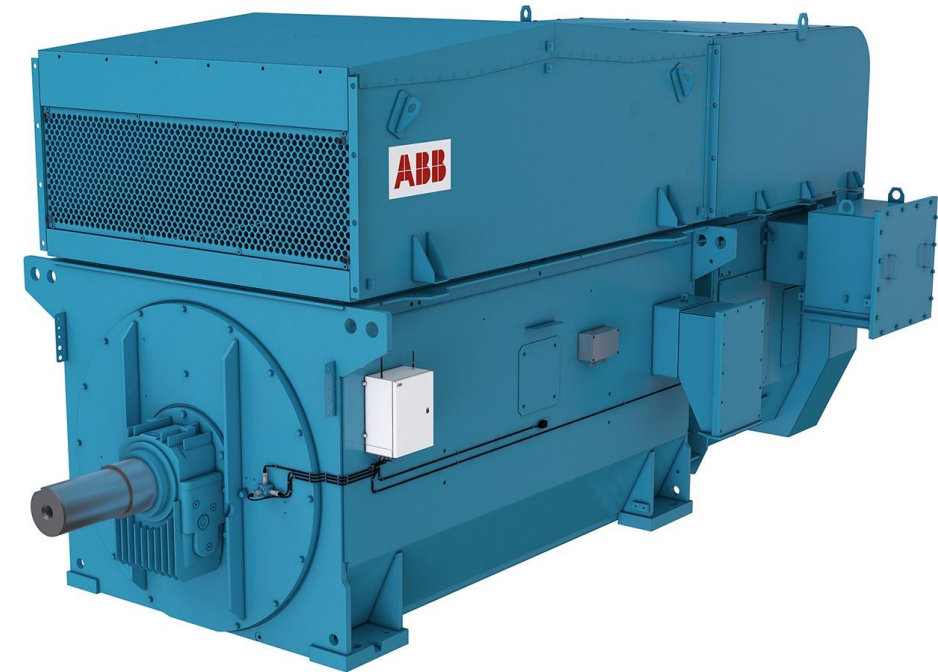
Examples of operating parameters

- Thermal
 - Temperature on stator, bearing & oil
- Electric
 - Partial discharge
 - Power quality
 - Winding health
- Ambient
 - Humidity
- Mechanical
 - Vibration on bearings and stator
 - Oil contamination and wear

DRIVEN EQUIPMENT

Operating parameters

- Vibration
 - Acceleration RMS
 - Velocity RMS
 - Displacement RMS
 - Acceleration peak to peak
 - Acceleration kurtosis
- Temperature



* only available for motors

ABB Ability™ Machine Guardian specifications

Specifications	
Vibration measurements	Frequency range: 1 Hz to 40 kHz (configurable) Resolution: 24 bit A/D converter Number of channels: up to 16 Sampling rate (simultaneous on 8 channels): 102.5 kS/s
Temperature measurements	Number of channels: up to 8 Winding temperature (if internal RTDs are available): 2/3/4 wire PT100 inputs Bearing temperature (external RTD required): 2/3/4 wire PT100 inputs
Communication	WLAN Wi-Fi 802.11 a/b/g/n/ac Bluetooth® Low Energy 5.0 (IEEE 802.15.4) WWAN Mobile LTE 4G, HSPA+ 3G LAN 10/100 MBPS
Power supply	Voltage range: 110 - 240 VAC Frequency range: 47 - 63 Hz
Environmental	Temperature: -40 oC to +60 oC IP class: IP65 Vibration: MIL810
Certification/standards	CE, RED, FCC, IC Safe areas only; no hazardous area certification
Physical	Dimensions (WxHxD): 459x240x173 mm Data acquisition unit mounting: On or near motor Vibration and temperature sensor mounting: E.g. bearing positions, motor body, driven equipment Magnetic field sensor mounting: Motor body

ABB Drive Connectivity Panel

ABB Drive Connectivity Panel

DRIVES

The ABB Drive Connectivity Panel offers easy plug & play installation and commissioning with built-in connectivity

- Available for ABB low voltage single drives¹
- Built-in NB-IoT wireless module with strong signal penetration even if drive is underground or in cabinet
- Fulfills industrial cyber security requirements and all data to cloud is always encrypted
- High efficiency antenna for reliable connection
- Industrial SIM for best reliability including mobile data plan
- Bluetooth® enables use of Mobile apps and PC tools



1. Not available in all countries and for all drives. Please check availability of panel and services with your local ABB representative.

ABB Drive Connectivity Panel

Available services

Available services

- Condition indexes & digital graphs
- Alarm management
- Asset Health
- Team Support

Monitored

- Faults and alarms
- Operational signals
- Conditions

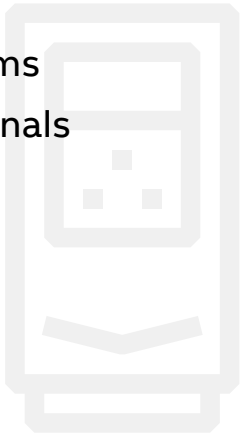


ABB Drive Connectivity Panel specifications

Specifications

Supported drive types and intended use ¹	ACS580 (R1 to R11 LV single drives), ACS880 (R1 to R11 single drives)
Downstream connections	Remote sites, e.g., pumping station
Drives connected to device	Each drive requires one Connectivity Panel
Installation and commissioning	Plug & play cellular cloud connectivity
Upstream connection	Optimal choice for remote locations and sites without internet connection; requires coverage by NB-IoT network
Market availability	Italy, Switzerland, France, Spain, Netherlands, Germany and Finland
Digital Powertrain subscription	Prepaid for 2 years (included in Panel package); renewal via local ABB unit
Cellular data plan	Included in Digital Powertrain subscription
Cyber security	Dedicated connection to the cloud; not possible to change parameters remotely via the Connectivity Panel
Services	Condition monitoring standard package only (except Backup Management)
Local maintenance UI	Supports Drivetune, Drive Composer 2.8 and Mobile Connect

1. Onboarded firmware to be verified

EGW-02

EGW-02

DRIVES

IoT device that gathers data from connected drives and sensors, making the data available for cloud and local backends through industry standard interfaces.

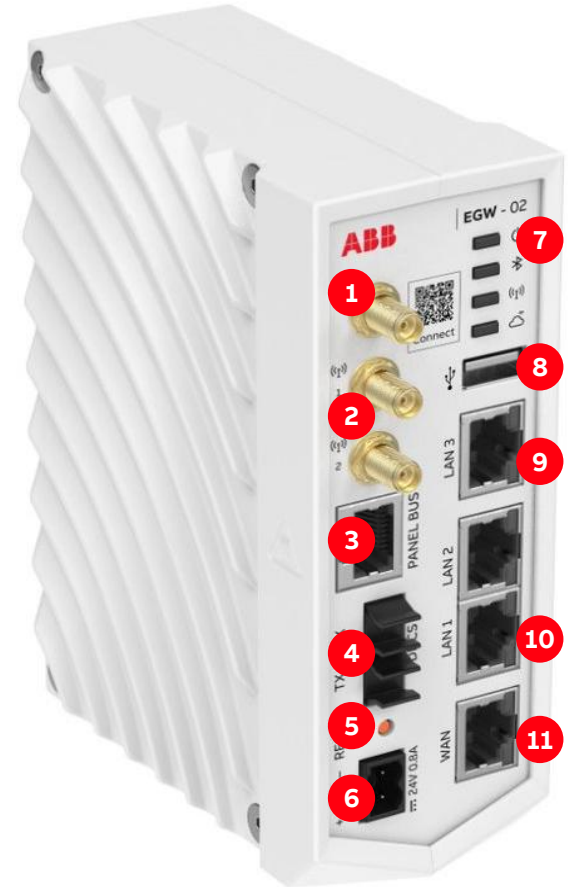
- Available for medium and low voltage system drives and single drives
- Up to 10 drive control units can be connected to one EGW-02
- State-of-the-art cyber security, keeping drives protected while connected
- Easy installation and commissioning
- Remote device management
- Flexible software architecture



EGW-02

Features

- 1 Bluetooth® 5*
- 2 LTE antenna
- 3 RS485/Panel bus*
- 4 DDCS connector
- 5 Reset button
- 6 Power 24 V
- 7 LEDs for power, cloud, BT and LTE
- 8 USB 2.0 for environmental sensors
- 9 LAN/PC tool (10/100)
- 10 Tool network/drive (10/100)
- 11 WAN/Internet (10/100)



* Will be available later

EGW-02

Available services

Available services

- ABB Ability™ Condition Monitoring for drives
- ABB Ability™ Monitoring Service
- ABB Ability™ Asset Expert Report for drives

Feature Examples

- Condition indexes & digital graphs
- Alarm management
- Asset Health
- Event Management
- Backup Management
- Condition-Based Maintenance





EGW-02 specifications

Specifications	
Supported drive types and intended use ¹	ACQ580, ACH580, ACS800, ACS880, ACS580, ACS580MV, ACS1000, ACS2000, ACS5000, ACS6000, ACS6080, ACS8080, DCS800, DCS880 Note! EGW-02 can be connected to all drive control units which communicate over Phloem / Ethernet or DDCS / optical. In addition, drives and their firmware versions needs to be onboarded to the ABB Ability™ Digital Powertrain
Downstream connections	Connection to a large number of drives in a plant
Drives connected to device	Up to 10 drive control units can be connected to one EGW-02
Installation and commissioning	After subscriptions are in place, EGW-02 is plug and play for connection to the Digital Powertrain and mobile connectivity. Close to zero touch commissioning, with device and fleet management from the cloud.
Upstream connection	Cloud connection via WAN (Ethernet cable) to customer network or LTE/4G via embedded eSIM or external modem
Market availability	54 markets globally, please ask your ABB representative if available in your market
Digital Powertrain subscription	Subscription and renewal via local ABB unit
Cellular data plan	Not included in Digital Powertrain subscription. ABB Plug & Play Connectivity service needs to be purchased
Cyber security	Top in class cyber security. Certified for: IEC 62443-4-1 ML3 (development processes), IEC 62443-4-2 SL2 (device security), TPM2 based root or trust
Services	Condition monitoring packages (standard and optional) Embedded LTE/4G connectivity
Local maintenance UI	Web browser UI for EGW configuration (no possibility for drive configuration) , Drive Composer through connect. EGW-02 registration and device management through Motion CIAM/DMS cloud.
Connectivity	In-built LTE modem
Drive parameter changes	Zero touch drive data monitoring for Powertrain portal, EGW-02 is only made for collecting and sharing data.
Flexibility	Customizable application platform, managed from the cloud. E.g. data processing, customers own data backends

1. Onboarded firmware to be verified



NETA-21

NETA-21

DRIVES

NETA-21 connects the drive to the cloud via the Internet or local Ethernet network

- Available for medium and low voltage system drives and single drives
- Up to nine drives can be connected to one module
- The module comes with a built-in web server
- In the absence of a customer local area network, it can be connected via a mobile network router (either Ethernet or USB network adapter)



NETA-21

Available services

Available services

- ABB Ability™ Condition Monitoring for drives
- ABB Ability™ Monitoring Service
- ABB Ability™ Asset Expert Report for drives

Feature Examples

- Condition indexes & digital graphs
- Alarm management
- Asset Health
- Event Management
- Backup Management
- Condition-Based Maintenance
- Offline Data Collection



NETA-21 specifications

Specifications

Supported drive types and intended use	ACQ580, ACH580, ACS800, ACS880, ACS580, ACS580MV, ACS1000, ACS2000, ACS5000, ACS6000, ACS6080, MEGADrive-LCI
Downstream connections	Connection to large no. of drives in a plant
Drives connected to device	Up to 9 drives can be connected to one NETA-21
Installation and commissioning	Expert/training required to install it (modem/Internet connectivity not included)
Upstream connection	Cloud connection via LAN (to customer network) or 4G modem
Market availability	Globally
Digital Powertrain subscription	Subscription and renewal via ABB Ability Marketplace™ or via local ABB unit
Cellular data plan	Not included in Digital Powertrain subscription. SIM card and cost of transmission to be purchased separately
Cyber security	Installation behind firewall Read only; not possible to change parameters
Services	Condition monitoring packages (standard and optional)
Local maintenance UI	Web browser UI, Drive Composer, Drive Window

Cyber security



Cyber security

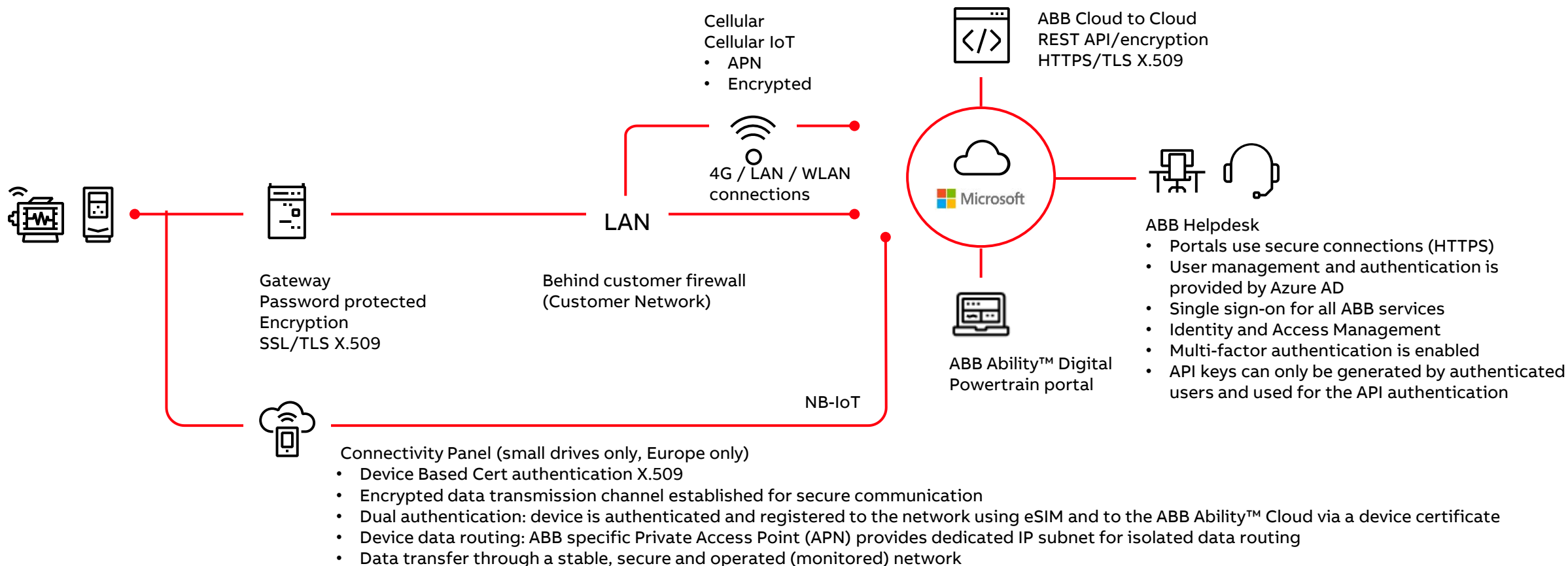
Secure by design. Trusted by industry.

Security means much more than protection against cybercrime. Connections must be safe but so must the value of the data they carry. Over the years, cybersecurity has become an integral part of ABB's digital solutions.

With over 40 years of industrial experience, ABB builds security into everything we design. Our multi-layered approach protects your data and operations through:

- Secure design from development to deployment, using Microsoft Azure's certified cloud platform
- Global and local compliance, including China's MLPS 2.0 Level 3 and CE's Radio Equipment Directive (RED)
- Readiness for new EU regulations, including the Cyber Resilience Act (CRA) and NIS2

Cyber security across the Digital Powertrain



Addressing cyber security concerns

Hardware

- All hardware is fully tested and approved by ABB DSAC labs
- Gateway use encrypted communications
- Firmware updates are digitally signed
- Firmware image security scanning and signing

Data in Transit

- LAN and Wireless LAN behind customer firewall, customer IT will have to take necessary actions to enable data transmission to the cloud
- Bluetooth® Low Energy communication is encrypted (128-bit Advanced Encryption Standard) shared with Commissioning APP and Cassia GW at time of connection
- Communication GW to cloud is via HTTPS Protocol and X.509 TLS 1.2 encryptions
- Industry standard bulk data encryption algorithm based on TLS 1.2 specification: AES GCM

Data at Rest

- Cloud platform security based on Microsoft Azure cloud security best practices
- Automated geo-redundant backups using Azure availability zones
- Network traffic & audit logging for traceability
- Data is encrypted using AES 256 and isolated based on customer organizations
- GDPR / ABB Privacy Governance / Data Residency
- Data residency compliance (servers in the Netherlands and / or Ireland (EU)) – more regions in preparation (India, MEA)
- Multi-tenancy system (“trusted organization”) to logically separate customer data

Data access and sharing

- Access control and authentication
- API keys generated by authenticated users

Supported by ABB processes

It is possible to view and subscribe to **ABB cyber security alerts and notifications** at: [LINK](#)

- Reports can be submitted directly to **ABB's Cyber Security Response Team (CERT)**, that acts as the official ABB CERT, using the email address: cybersecurity@ch.abb.com
- **Patch management and vulnerability monitoring** is done continuously for the software versions, more info on [ABB cyber security — ABB Group \(global.abb\)](#)
- Management processes and controls are based on several international standards, such as **ISO/IEC 27001**
- **Secure Development Lifecycle (SDL)** practices are followed and **IEC 62443-4-1 certified**
- All software is checked by several malware scanning programs before release

- A key feature of ABB's offering is the independent **Device Security Assurance Center (DSAC)**, where all ABB products undergo state-of-the-art security testing before they are released to the market. This process measures robustness and security integrity, and includes port scanning, network flooding, vulnerability scanning and protocol fuzzing. **The test center is officially IEC 62443-4-1 certified**
- **Cloud environment monitoring** via Azure Monitor/APP insights & Azure defender for cloud
- **Cyber security training** is mandatory for all users involved in the development and operation of services
- ABB requires its suppliers to follow a set of rules, and internally ABB follows even stricter ones

For more information see: [LINK](#)

ABB