

# SINAMICS G120

Modular. Safe. Rugged.






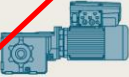



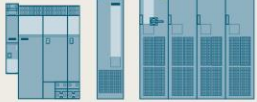

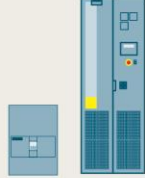
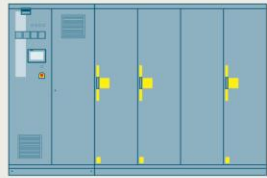


# SINAMICS low voltage converters

## One family, all applications

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Today's focus – SINAMICS G120

Low voltage AC									Direct current DC	Medium voltage AC				
Basic Performance		General Performance							High Performance	For basic applications and demanding applications	For demanding applications with high power ratings			
														
SINAMICS V20	SINAMICS V90	SINAMICS G120C	SINAMICS G120X	SINAMICS G120	SINAMICS G110D/G120D/G110M	SINAMICS G130/G150	SINAMICS G180	SINAMICS S110	SINAMICS S120/S120M	SINAMICS S150	SINAMICS DCM	SINAMICS GL150/SL150	SINAMICS SM120 CM / SM150/GM150	SINAMICS GH150/GH180 (cell-based)
V/f control	Servo control (speed and torque) with encoder	V/f control, vector control without encoder		V/f control, vector control with/without encoder	V/f control (G110D), sensorless vector control (G120D / G110M)	V/f control, vector control with/without encoder	V/f control, vector control with encoder	Servo control	V/f control, vector control with/without encoder, servo control with/without encoder		Speed control, torque control	V/f control, vector control		
0.12–30 kW	0.05–7 kW	0.55–18.5 kW	0.37–630 kW	0.55–250 kW	0.37–7.5 kW	75–2,700 kW	2.2–6,600 kW	0.55–132 kW	0.55–5,700 kW	75–1,200 kW	6 kW–30 MW	2.8–85 MW	0.8–31.5 MW	0.15–28.5 MW
Pumps, fans, compressors, conveyor belts, mixers, mills, spinning machines, textile machines	Handling machines, packaging machines, automatic assembly machines, metal-forming machines, printing machines, winders and unwinders	Pumps, fans, compressors, conveyor belts, mixers, mills, extruders	Pumps, fans, compressors, building technology, process industry, HVAC	Pumps, fans, compressors, conveyor belts, mixers, mills, extruders, single-axis positioning applications in plant and machinery construction	Conveyor technology, single-axis positioning applications (G120D)	Pumps, fans, compressors, conveyor belts, mixers, mills, extruders	Sector-specific for pumps, fans, compressors, conveyor belts, extruders, mixers, mills, kneaders, centrifuges, separators	Single-axis positioning applications in plant and machinery construction	Production machines (packaging, textile and printing machines, paper machines, plastics machines), machine tools, plants, process lines and rolling mills, ships and test stands	Test stands, cross cutters, centrifuges	Rolling mill drives, wire drawing machines, extruders and kneaders, cable railways and lifts, test stand drives	Pumps, fans, compressors, mixers, extruders, mills, rolling lines, mine hoist drives, excavators, test stands, ships' drives, conveyor belts, blast furnace blowers	Pumps, fans, test stands, ore conveying systems, ore mills, compressors, excavators, marine drives	Pumps, fans, compressors, mills, crushers, conveyor systems, retrofit projects
Engineering tools:									Drive Technology Configurator – selection and configuration SIZER – simple planning and engineering STARTER and SINAMICS Startdrive – for fast commissioning*, optimizing and diagnostics					

# Innovative Modular Design

## Configuration Simplicity and Flexibility that Saves Time

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1

Power Module  
supplies voltage  
to the Motor

2

Control Unit  
monitors the PM  
and is the brains  
of the Drive

3

Operator Panel  
is the user  
interface for the  
Drive and Motor

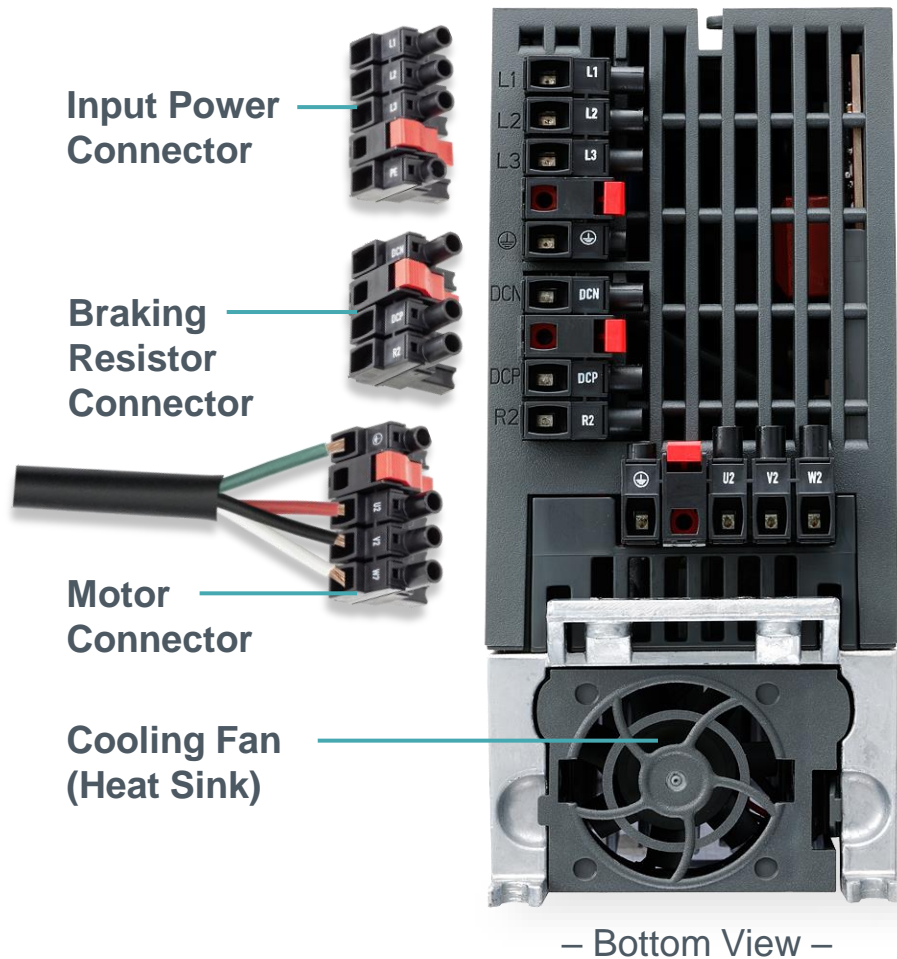
### Removable Terminal Blocks

- Error-free wiring.
- Quickly add/remove power and I/O wires.
- No need to wait for drive to be mounted or for complete installation to start wiring.
- Build wiring harnesses in advance.



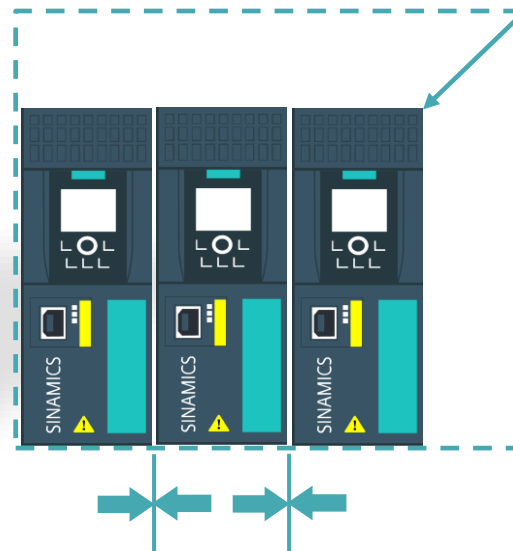
# Power Module (PM)

## Increased Power Density in a Space-Saving Design



### Powerful and Compact:

- Space-saving as a result of the same frame size, with and without integrated filter.
- **Integrated energy recovery** enables excess energy to be directly regenerated to the line supply which, eliminates the need for braking resistors.
- Side-by-side mounting saves space in control cabinet and reduces costs without derating.



25% less panel space due to higher power density versus the competition

No space required between drives



# Control Unit (CU)

## Selectable Control Configurations, Optimized for your Applications

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Memory Card

OP Interface

Analog I/O

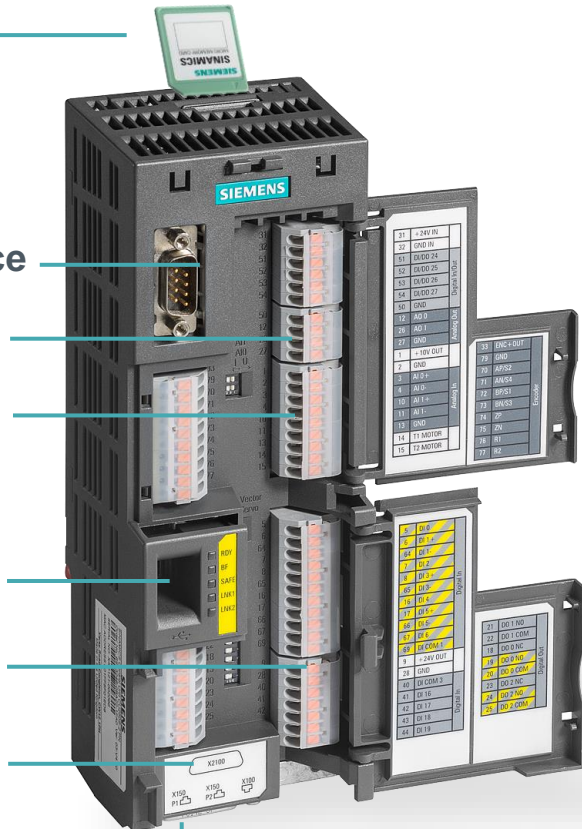
Encoder

USB Port

Digital I/O

24 VDC

Ethernet Dual Port



### Flexible, Selectable Configurations

- **Standard Dual Port Ethernet**
  - Supports EtherNet/IP and Profinet
  - Seamlessly integrates into TIA Portal and Third Party Controllers
- **24 VDC Terminals** allow brains and communication of the drive to continue functioning even if the 480v power is removed. This means you can safely program the drive from the front without the risk of arc flash.
- **Integrated Encoder** incremental / high resolution feedback.
- **Memory card** quickly back up parameters or recover a program.
- **Integrated Safety Functions** protects machinery and personnel for maximum uptime.



*More about safety?*



# Operator Panels (OP)

## Wizards and Menu-driven Setup and Configuration

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**SAM / Wireless**



**IOP 2 / Intelligent**



### Simple Commissioning

- Setup and configure using wizards with integrated plain text help functions.
- Quick access to all parameters.
- Displays fault codes without scrolling
- Simple, individualized local drive operation and visualization.
- Easy access to all parameters displays fault codes without scrolling through multiple screens.

**BOP 2 / Basic**



### Siemens Industry Online Support App




Identification and analysis of drive configuration:

1. Generate a QR code once drive is configured
2. Scan QR code for P/N, S/N, firmware version, etc
3. Links you to videos, manuals, support personnel (local or abroad)

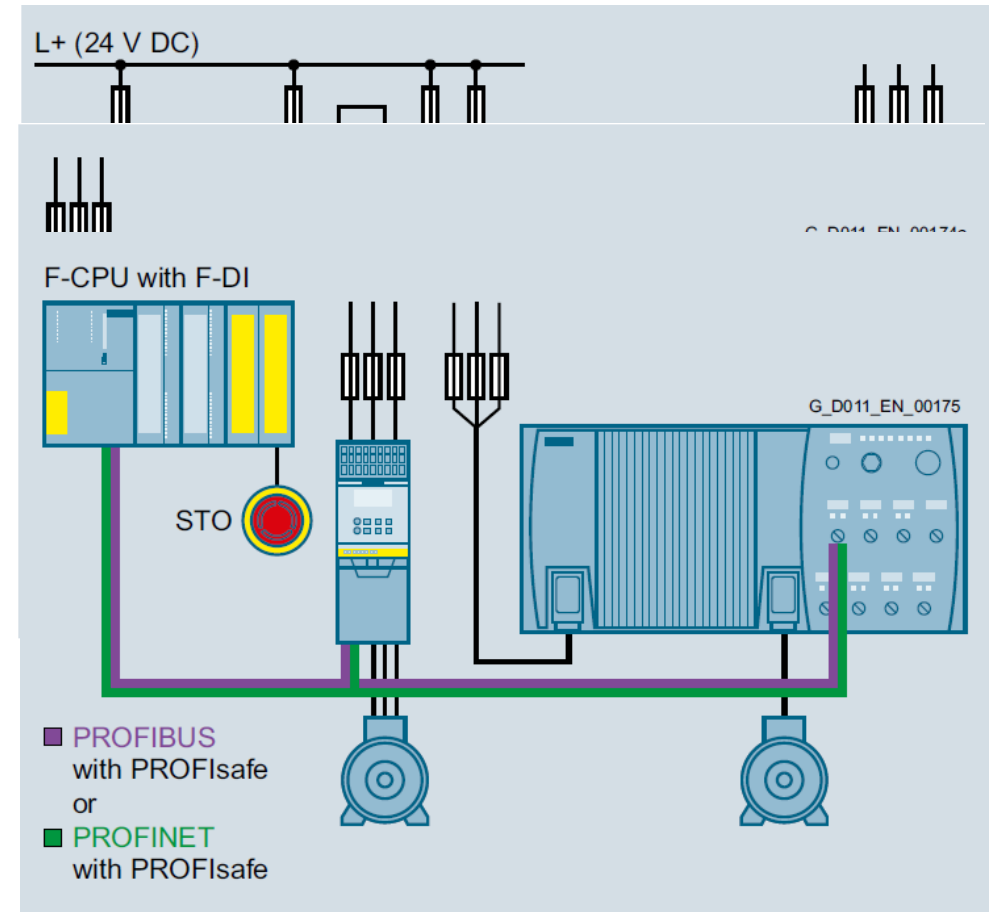
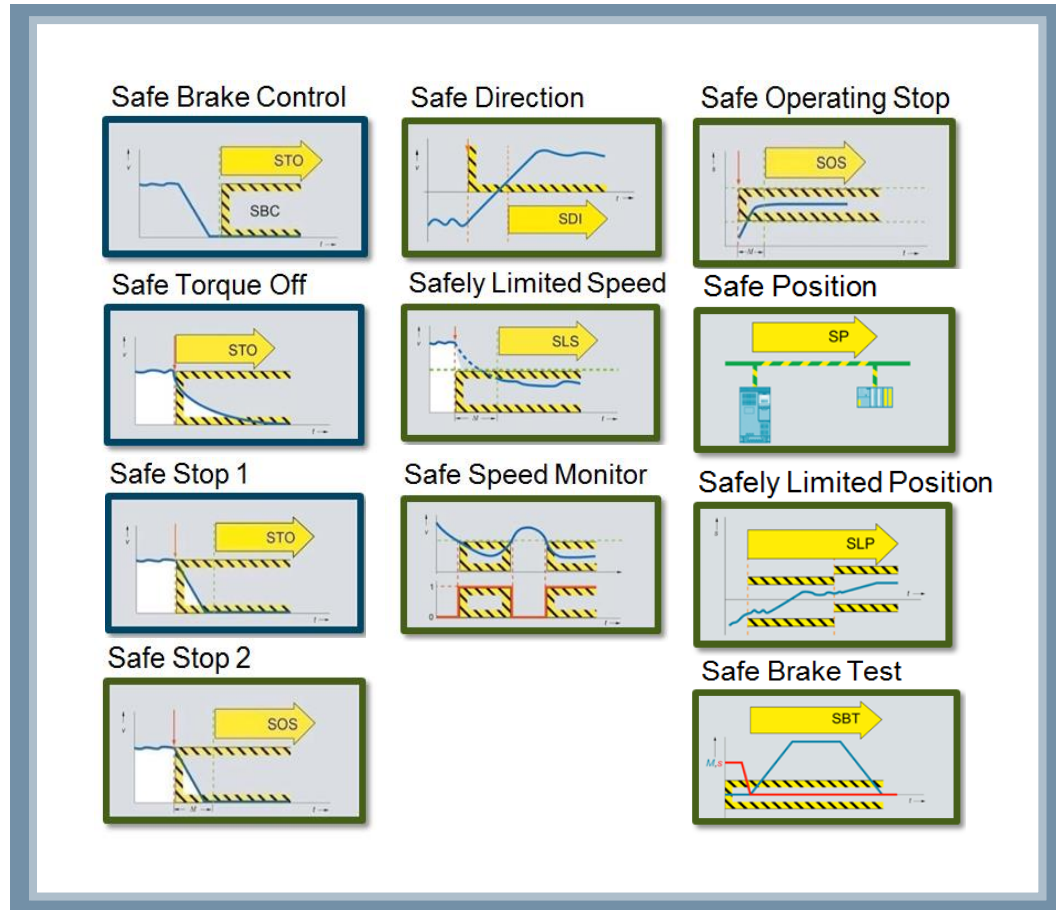


# SINAMICS G120

## Efficiency through modularity

Operator Panel		<b>BOP-2</b>	<ul style="list-style-type: none"> <li>• Display for commissioning and diagnostics</li> </ul>
		<b>IOP-2</b>	<ul style="list-style-type: none"> <li>• ...+ intuitive menu guidance due to Application Wizard and graphics. Also available as handheld version</li> </ul>
		<b>SAM</b>	<ul style="list-style-type: none"> <li>• ...+ Wi-Fi enabled for wireless operation</li> </ul>
Control Unit		<b>CU240E-2</b>	<ul style="list-style-type: none"> <li>• General machinery constructions with basic I/O structure and safety.</li> </ul>
		<b>CU250S-2</b>	<ul style="list-style-type: none"> <li>• General machinery constructions with extended I/O structure, encoder interface, Epos Positioning and extended safety functions.</li> </ul>
Power Module		<b>PM240-2</b>	<ul style="list-style-type: none"> <li>• Multiple applications in general machinery constructions.</li> </ul>
		<b>PM250</b>	<ul style="list-style-type: none"> <li>• ... + energy feed back into the line supply.</li> </ul>

# Safety Integrated Functions G120 has them!



Integrated safety via PROFI-safe

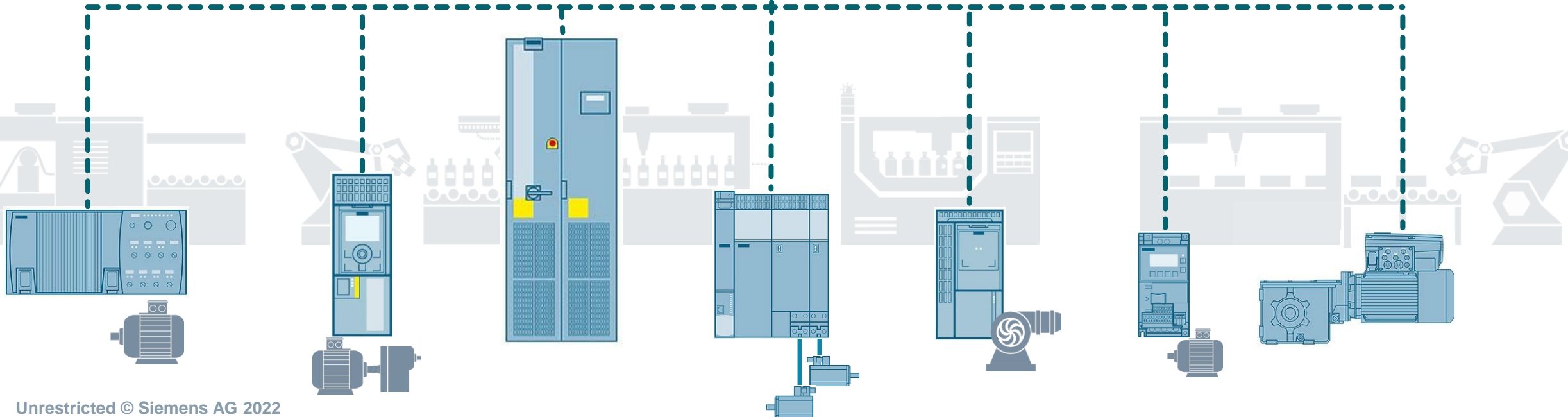


# Common Parameters for all Drives

## Common Parameters

Sinamics drives use common parameters

- From the basic V/Hz drive like the V20 to more complex coordinated drives like the S120, parameter 100 will have the same function in all families
- Easier to program
- Easier to remember
- Less reliant on user manuals
- Learn it once and apply it to every product



# Configuration Management

## Flexible, Intuitive Backup and Recovery of Drive Information

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**SD Card**  
(Micro Memory Card)



**Operator Panel**  
(BOP-2, IOP-2, SAM)

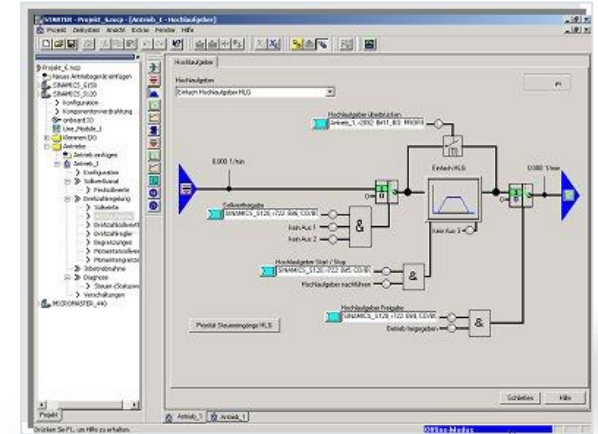


**Control Unit**

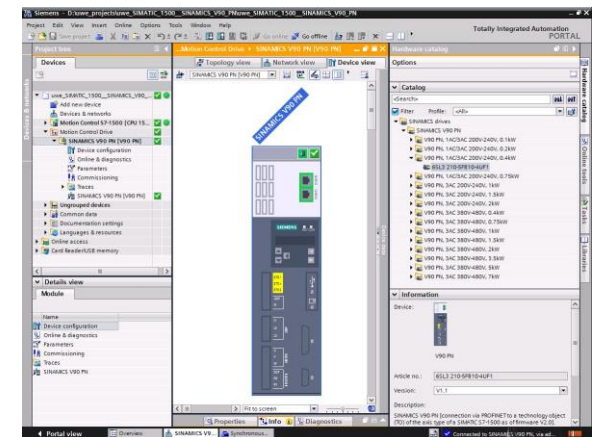


**SINAMICS Starter**

**SINAMICS StartDrive**



**FREE**



**FREE**

# Drive Technology - Push Through Design

Heat pushed outside the control cabinet

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## Push Through Design

- **Reduction in cabinet cost**
  - Heat Sync and power unit fans now located outside the enclosure
  - Size the enclosure for control unit heat watt loss
- **Reduce or eliminate AC units**
  - AC Unit sized solely for control unit heat watt loss
  - Many cases circulating fans can replace AC units
- **Reduction in total cost of ownership**
  - Lower energy bill to condition the panel
  - Smaller shop floor footprint
  - Lower cost for AC unit maintenance

# Drive Technology – UL Type 1 Kits

Solution for 'outside-the-cabinet' installations

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## UL Type 1 Kits

- **Accommodates all G120C / G120 Modular drive platforms**
- **UL type 1 is greater than or equal to NEMA type 1**
  - Conforms to NEMA/UL Type 1 standards for interior installations
  - Designed and tested in accordance with the latest UL 61800-5-1 standards for AC drives (additional requirements with respect to electrical, thermal and energy safety considerations)
  - Standardized design for optimum space utilization and for efficient side-by-side mounting with minimal clearances
  - Multiple conduit knockout holes are provided for separate power, motor, I/O and network cabling

# SINAMICS G120 Smart Access Module

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# SINAMICS G120 Smart Access Module

Commissioning, operation and diagnostics at your fingertips

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## Convenient access

- To the drive even if installed in difficult-to-access areas
- No cable necessary due to wireless one-to-one connection to mobile device or PC

## Set up in less than one minute

- No apps/downloads required
- Operates with any of the common browsers and with any end device

## All-in-one solution

- All functions are provided by the integrated web server
- One module support most of the G120 series
- 6 languages support/ Upgradable language packages
- IP55 protection level

## Simple operation

- Due to intuitive/guided user interface
- Look & feel of an app
- Higher functionality than BOP

## Information security

- Point to point connection/ No internet need
- WAP-2 encryption
- Support HTTPS communication protocol



# SINAMICS G120 smart access module

## scope and compatibility



- **Current SINAMICS smart access module firmware version V01.06.01**  
*As of February 2022*
- **Available for SINAMICS**
  - G120X** (FW 1.0 or later)
  - G115D** (FW 4.7 SP13 or later)
  - G120C** (FW 4.7 SP6 or later)
  - G120 CU230P-2/CU240E-2/CU250S-2\*** (FW 4.7 SP6 or later)

\*CU250S-2 does not support “Quick Setup” with the smart access module

### System requirements


Device with wireless network adapter installed	Operating system	Recommended Web browser <sup>1)</sup>
PC	Windows 7	<ul style="list-style-type: none"> <li>• Google Chrome version 67.0 or later</li> <li>• IE version 11.0 or later</li> <li>• Firefox version 68.0 or later</li> </ul>
	Windows 10	<ul style="list-style-type: none"> <li>• Google Chrome version 67.0 or later</li> <li>• IE version 11.0 or later</li> <li>• Firefox version 68.0 or later</li> <li>• Edge version 42.0 or later</li> </ul>
	Mac OS 11.1	<ul style="list-style-type: none"> <li>• Google Chrome version 90.0 or later</li> <li>• Safari</li> </ul>
Smart phone/tablet	Apple iOS 14.1 or later	<ul style="list-style-type: none"> <li>• Google Chrome version 73.0 or later</li> <li>• Firefox version 16.0 or later</li> <li>• Safari</li> </ul>
	Android 10.0 or later	<ul style="list-style-type: none"> <li>• Google Chrome version 78.0 or later</li> <li>• Firefox version 88.0 or later</li> </ul>

# SINAMICS G120 Smart Access

Connect your mobile device in less than one minute

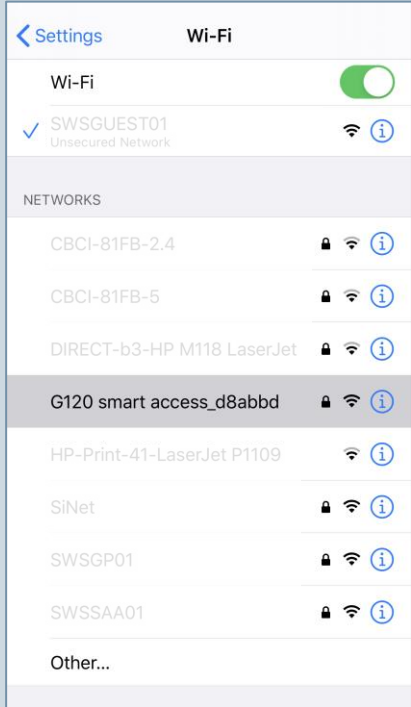
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**1**



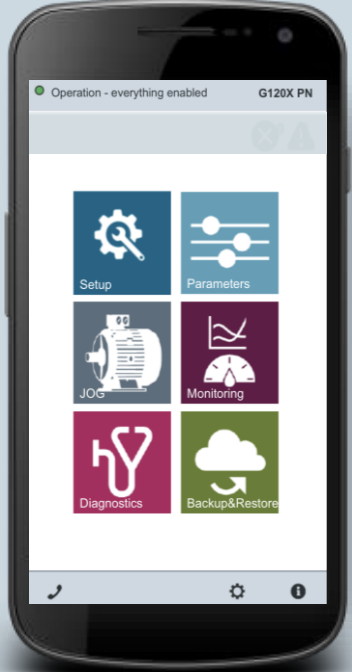
Mount the SAM onto SINAMICS G120, and switch on the module.

**2**



Search SINAMICS G120 Smart Access\_XXXXX in your Wi-Fi networks. The default password: 12345678.

**3**



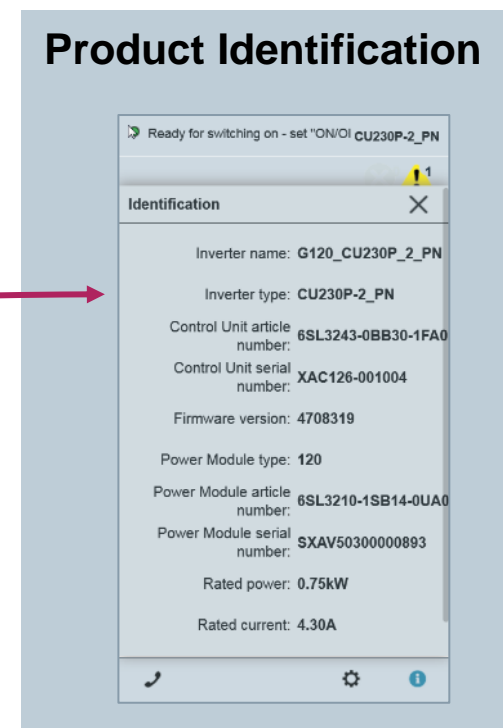
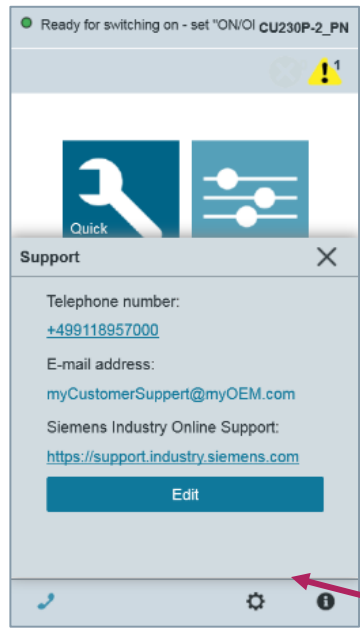
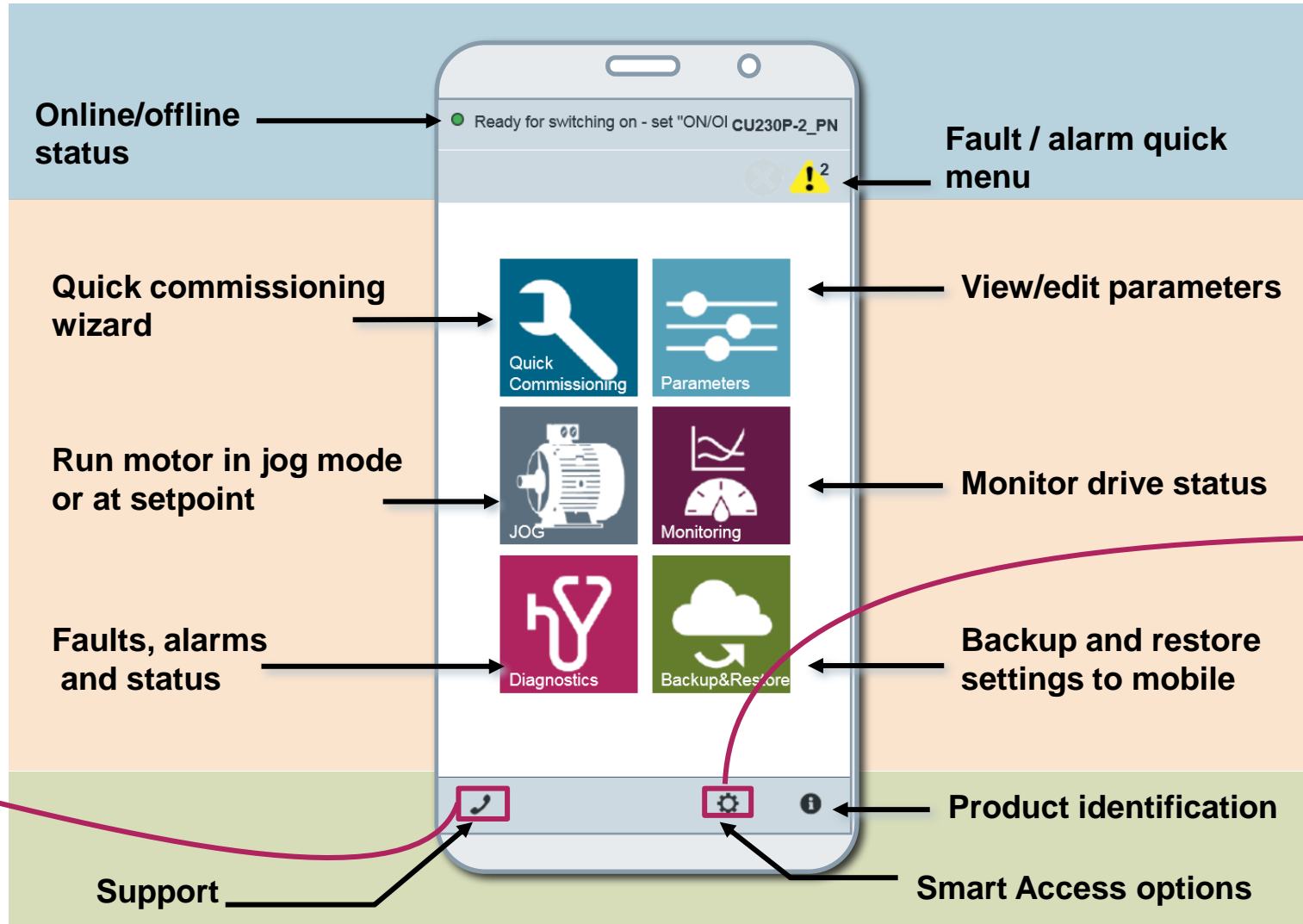
Open a browser to access the page (<https://192.168.1.1>).

**4\*** First Access: A password change is mandatory.



# SINAMICS G120 Smart Access

All necessary functions in one location

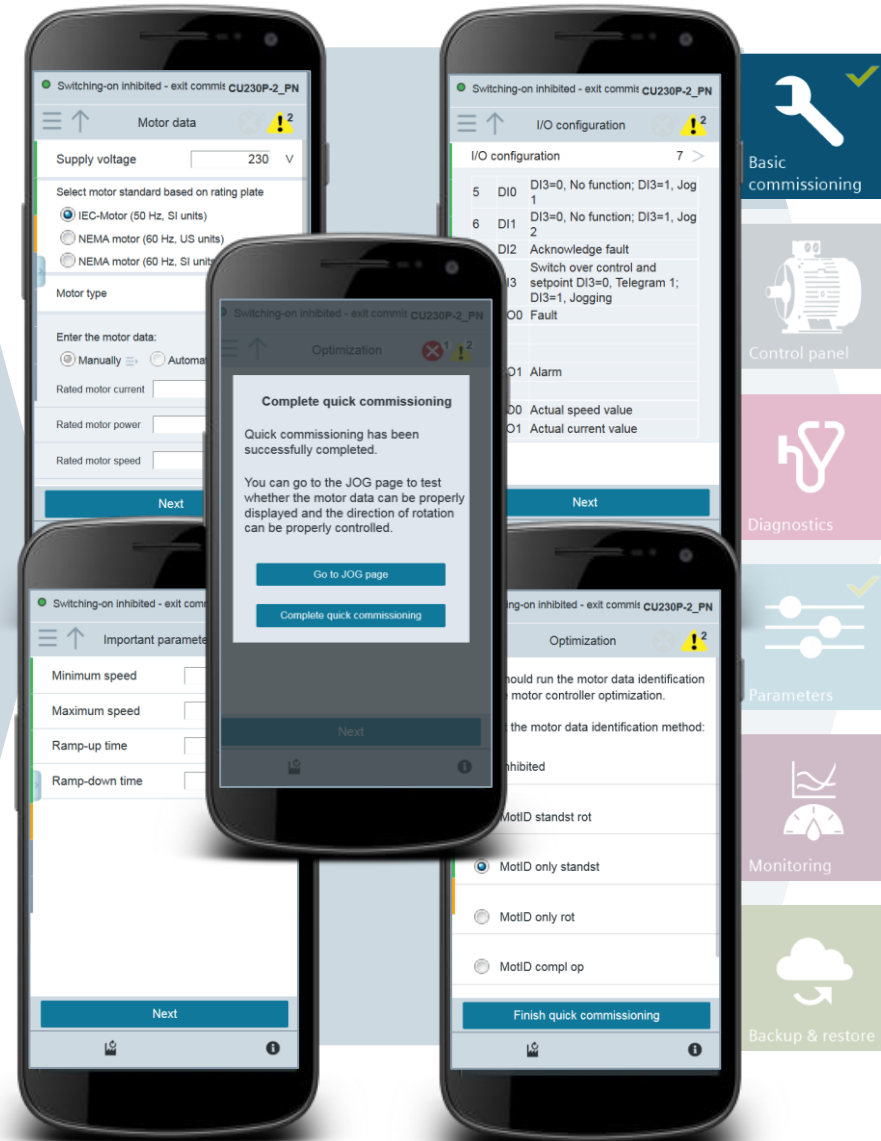
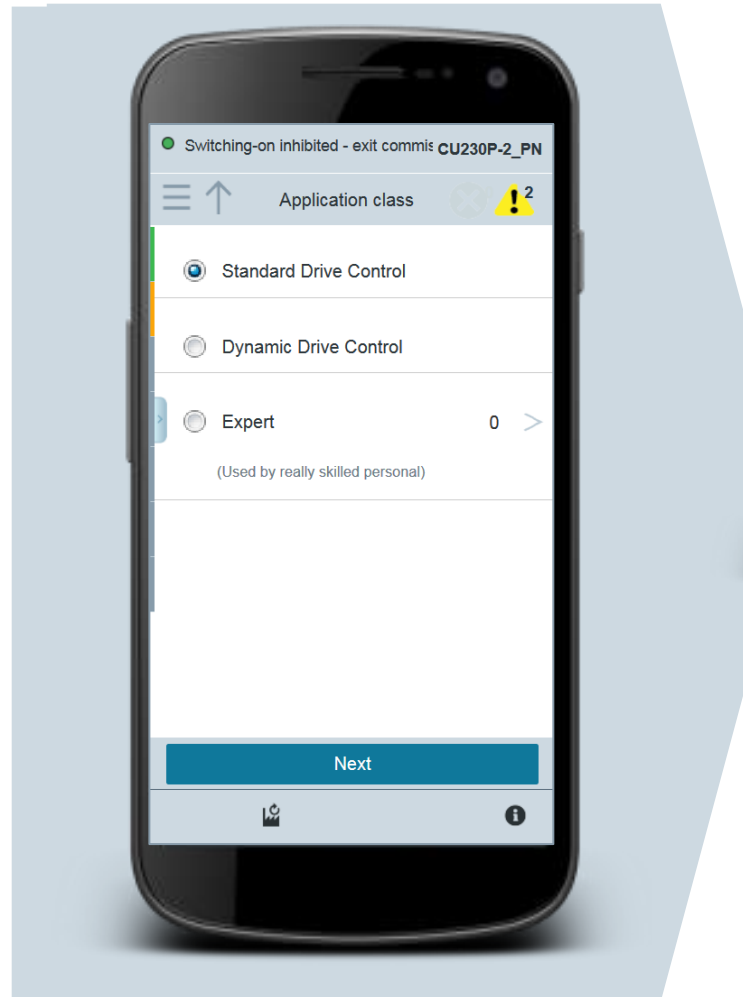
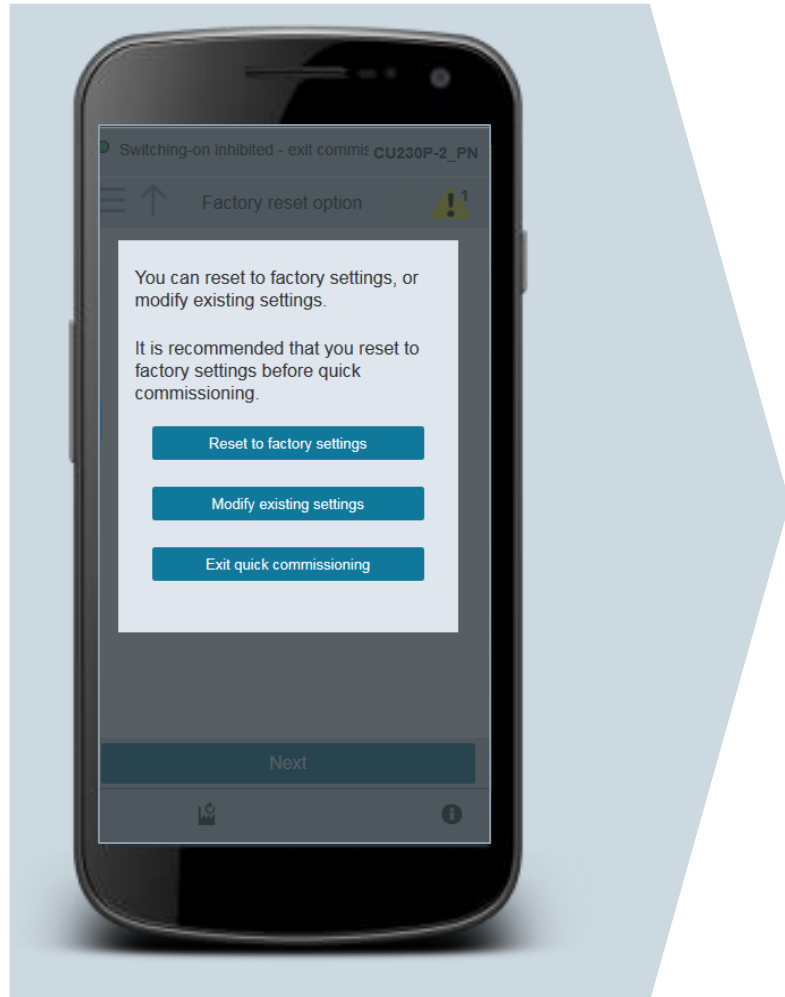


# SINAMICS G120 Smart Access

Quick, easy commissioning through guided wizard

# SIEMENS

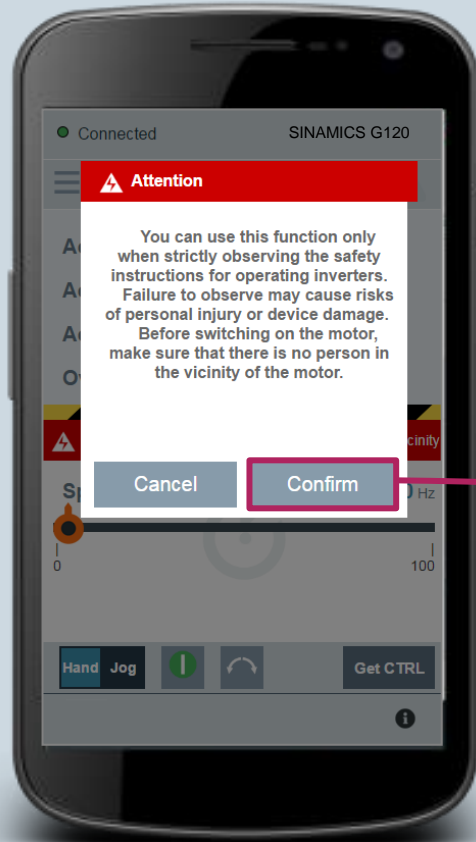
*Ingenuity for life*



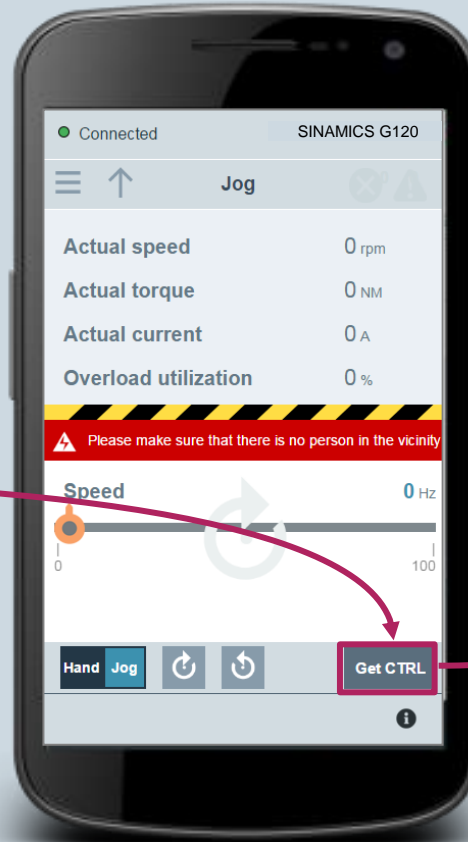
# SINAMICS G120 Smart Access

## Manual control from your mobile device

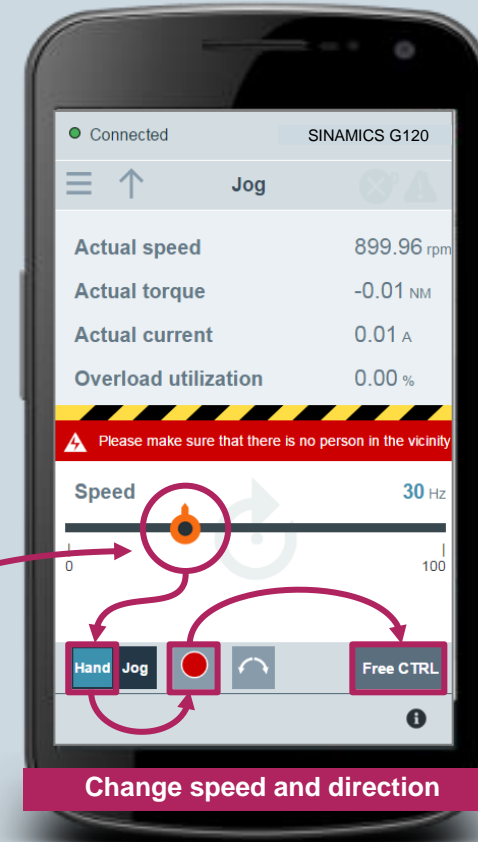
### Safe operation check



### Get control of motor



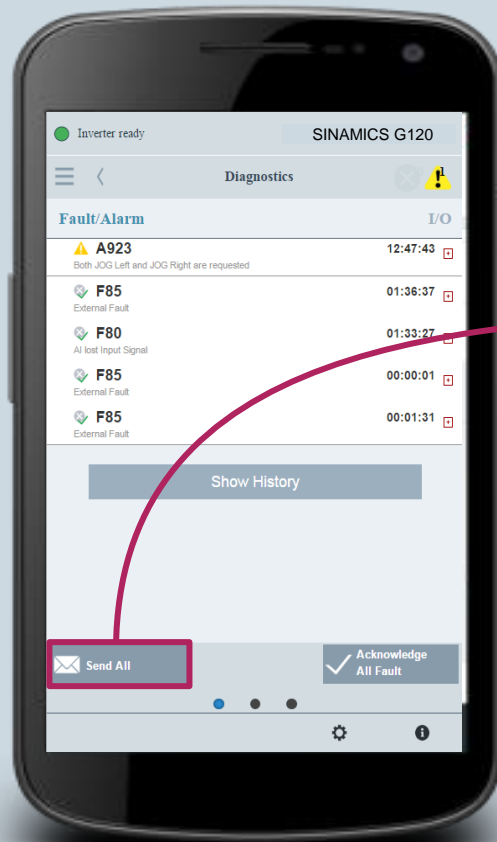
### Control the motor



# SINAMICS G120 Smart Access

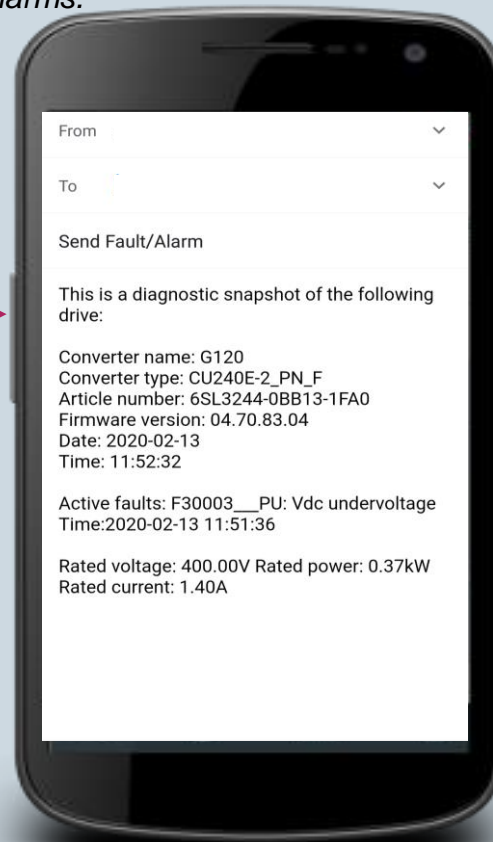
## View and send faults, alarms and status

### Overview of active faults and alarms

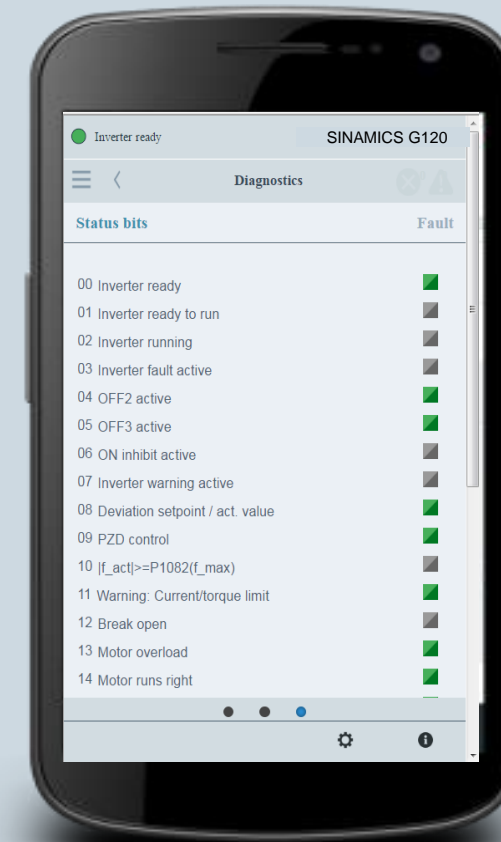


### Send drive status via email

*Contains information about the drive, faults and alarms.*



### Quickly monitor I/O status, etc.



# SINAMICS G120 demonstration – commissioning, operation, and diagnostics

## Smart Access reset


To begin, we will reset the Smart Access Module.

**1**




Power on the G120 demo and mount the Smart Access Module on the Control Unit

**2**



Power on the demo. Once COM is solid green, press and hold RESET for 3 seconds. Wi-Fi light will flash amber confirming action

**3**



Restart Smart Access Module by removing and mounting it back to G120. Wait for COM light to turn solid green and Wi-Fi light to turn solid amber

Thank you for your time and attention!

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