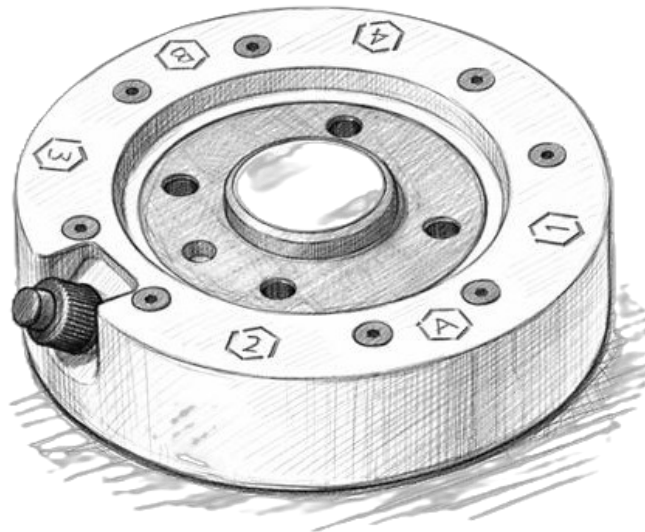




PRODUCT GUIDE

HEXOPUS SYSTEM

SMART SAFETY DEVICE THAT TRANSFORMS ROBOTS INTO HUMAN-AWARE SYSTEMS —
DETECTING OPERATORS IN REAL-TIME AND CREATING AN INVISIBLE, DYNAMIC SAFETY ZONE —
MAKING ROBOTS TRULY COLLABORATIVE



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1 Product Overview

1.1 What is HEXOPUS?

HEXOPUS represents our answer for HRC environments: a smart safety device that transforms robots into human-aware systems — detecting workforce in real-time and creating an invisible, dynamic safety zone.

HEXOPUS mounts directly on the robot between the flange and end-effector, creating a localized safety zone that moves with the tool. This on-robot approach eliminates the need for external infrastructure while providing protection exactly where it's needed: around the hazard zone created by the robot's end-effector.

HEXOPUS makes any tool collaborative, simplifying the risk assessment of the application.

Design to meet SIL2, PL-d cat 3 safety standards, HEXOPUS combines advanced capacitive sensing technology with intelligent signal processing to distinguish between human operators and objects. The system integrates seamlessly with existing robot safety architectures through industrial standard interfaces (CAN bus, OSSD), enabling rapid deployment without extensive system modifications. FSoE interfacing is planned for a future release.

HEXOPUS is an enabling technology for robotics and collaborative environments. By removing barriers while enhancing protection, it allows manufacturers to unlock the full potential of their collaborative robot investments, achieving higher productivity, greater flexibility, and improved safety simultaneously.

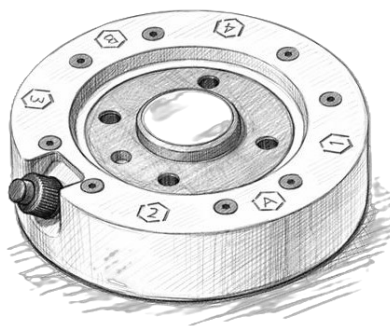


Figure 1 HEXOPUS System



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1.2 Key Value Proposition

Designed as a compact safety module, HEXOPUS delivers several key advantages that distinguish it from current market alternatives:

- Extended Detection Range: 0-2000mm full distance detection.
- Configurable Detection Range: 300-2000mm detection completely adaptable based on the application and environment.
- Flange-Mounted Positioning: ensures localized safety over the most hazardous interaction points within a robot.
- Localized Safety Envelope: creates a smart dynamic safety envelope around the End Of Arm Tool (EOAT) and the product, enabling selective motion inhibition rather than full system shutdowns, minimizing productivity losses and maintaining efficiency.
- Multi-Brand Compatibility: mounts directly on ISO 9409-1-50-4-M6 flanges – cobots up to 16 kg – with no proprietary mechanical adaptation required. HEXOPUS is designed exclusively for ABB robots.
- Seamless Retrofit and Quick Installation: plug-and-play installation, also allowing retrofitting into legacy systems.
- Flexible Safety Outputs: outputs configurable as OSSD for direct communication with safety controllers, or as dry contacts for applications without safety protocols. Ensures reliable integration into certified safety architectures and supporting speed separation monitoring strategies.
- Operational Continuity: supports continuous collaborative operation, enhancing safety without compromising cycle time or task fluidity.



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2 Technical Specifications

2.1 Detailed Specifications

MECHANICAL	VALUE
Overall dimensions (ø x H)	110 x 30 mm
Weight	280 g
Robot-side Flange interface	ISO 9409-1-50-4-M6
Tool-side Flange interface	ISO 9409-1-50-4-M6
Housing Material	Polycarbonate Flame Retardant
IP Rating	67

ELECTRICAL AND INTERFACES	VALUE
Supply Voltage	9 V DC
Current Draw	250 mA
Communication Interfaces	3x OSSD, FSoE (upcoming version)
Connector Type(s)	4-pole connection
Cable length	5 metres

SENSING AND PERFORMANCE	VALUE
Sensing Technology	Capacitive
Safe Detection Range	0 – 2000 mm
Configurable Detection Range	300 – 2000 mm
Field of View	360°
Detection Zone Coverage	Full Coverage (sphere shape)



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Response Time	15 ms
Human/Object Discrimination	Yes
Configurability of Zones	Yes
Output behaviour	Speed Separation Monitoring

SAFETY AND CERTIFICATIONS	VALUE
Functional Safety (ISO 13849)	PL-d category 3
Functional Safety (IEC 61508)	SIL 2
Mechanical Interface Standard	ISO 9409-1-50-4-M6
Other Certifications	CE, UL

ENVIRONMENTAL	VALUE
Operating Temperature Range	0 – 40 °C
Humidity Range	Up to 70%
IP Rating	67
Flame resistance	UL94 - V2
Other	Oil and refrigerant compatibility

COMPATIBILITY AND INTEGRATION	VALUE
Compatible Robot Brand	ABB exclusive
Compatible Robot Models	ABB Cobots
Compatible End-Effectors	All
Controller Integration	OSSD/SDO – SDI – Dry contacts – FsoE (upcoming version)
Configuration Tool	WebApp on FlexPendant, GUI (during installation)



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2.2 System Architecture

The system consists of the following components:

- Perimetral sensing unit – HEXtraSENSE sensor
- Supplementary sensing unit – SATELLITE sensors
- Perception module – EVALUATION unit – HEXOPUS unit
- Control module and robot controller interface – CONTROL unit
- Emitting module – MAT
- Ground detector – RECEIVER module

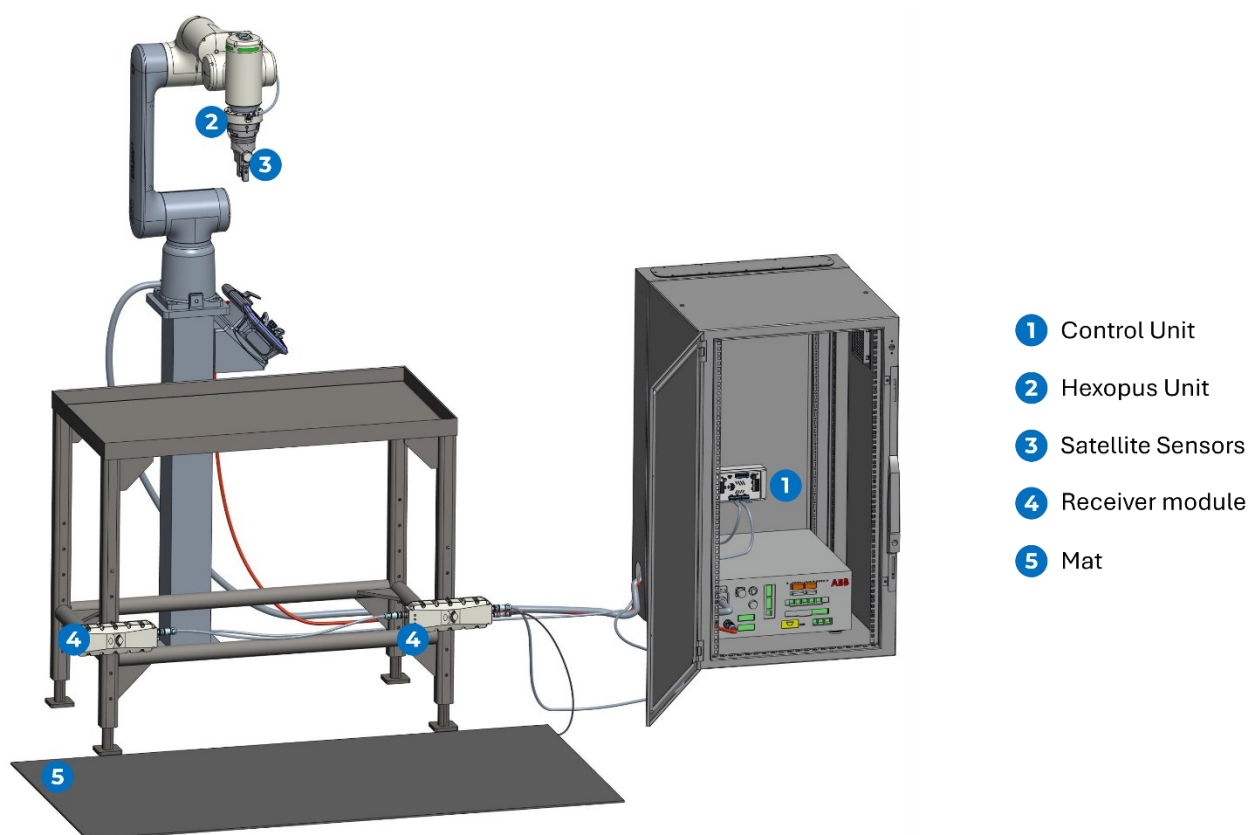


Figure 2 General Architecture

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	Control	Hexopus	Satellites	Mat	Receiver
Dimensions	90 x 160 x 60 mm	110 x 30 mm	30 x 15 mm	Custom	220 x 50 mm
Weight	680 g	280 g	20 g	Custom	200g
IP	20	67	67	67	67
Flame Resistance	-	UL94-V2	UL94-V2	-	UL94-V0



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2.2.1 Videos

- **Hexopus Video:** <https://youtu.be/Mx7NV0u9lr0>

Showcase quality control on an electronic screwing application. The GoFa robot has a screwdriver tool with the axis 90°. The Hexopus still protects and detects the user during the quality control procedures.

- **Hexopus Video (with sphere):** <https://youtu.be/LH6ftT7wgd4>

Same as Hexopus video but including the safety sphere generated by the Hexopus solution.

- **Collision Avoidance:** <https://youtu.be/es0oyjxvqW0>

A preliminary test to evaluate how FSoE output could support collision-avoidance strategies. The FSoE output can provide information about the surrounding environment, including the position, movement, and potential trajectory of nearby objects.

Availability note: Collision avoidance based on FSoE output is not available in the current product release.



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3 Installation and Configuration

3.1 Installation

3.1.1 Hexopus Installation

Hexopus is installed between the robot flange and the tool. The flange complies with ISO 9409-1-50-4-M6 and is mechanically fixed using four (4) M6 screws. Thanks to precision machining, the flange guarantees a precise fit with the robot, ensuring optimal positioning with every assembly.

This standard interface allows Hexopus installation across the entire GoFa family, and PoWa up to PoWa 16.

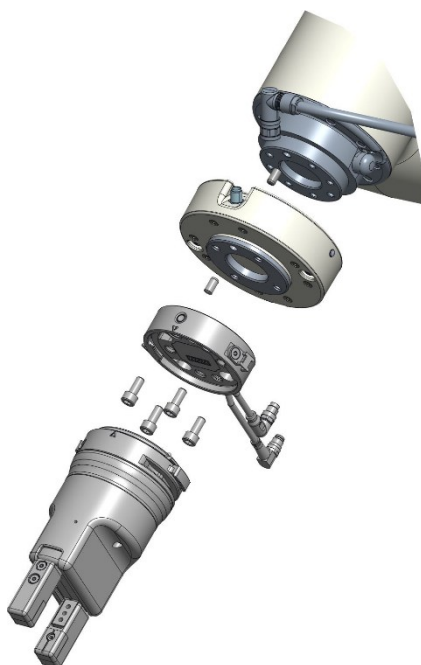


Figure 3 Hexopus mechanical installation

3.1.1.1 Satellites Installation

The satellites are installed on the underside of the Hexopus unit and connected using 4-pole connectors.

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3.1.1.2 Hexopus-to-Control Unit connection

The Hexopus unit connects to the Control Unit via a single cable. On the Control Unit side, the cable connects to the XSU port using a 4-pole terminal block connector. On the Hexopus side, the cable's M8 socket connects directly to the Hexopus.

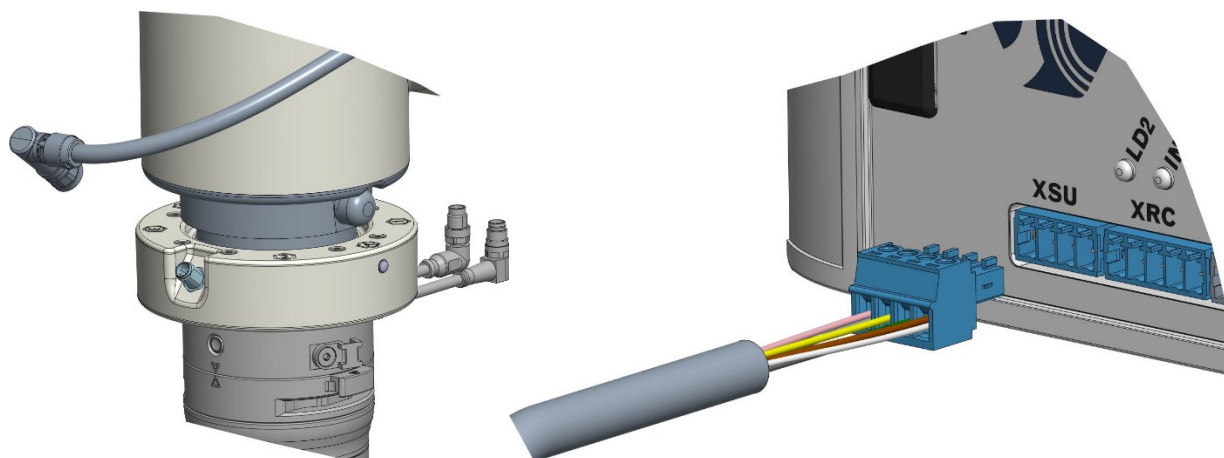


Figure 4 Hexopus-to-Control Unit connections

3.1.2 Receiver Connections

3.1.2.1 Receiver-to-Receiver connection

Receivers can be daisy-chained to other receivers using a 5-pole connector, extending functionality across the different areas where they're installed. This connection uses a cable with a connector on both ends.

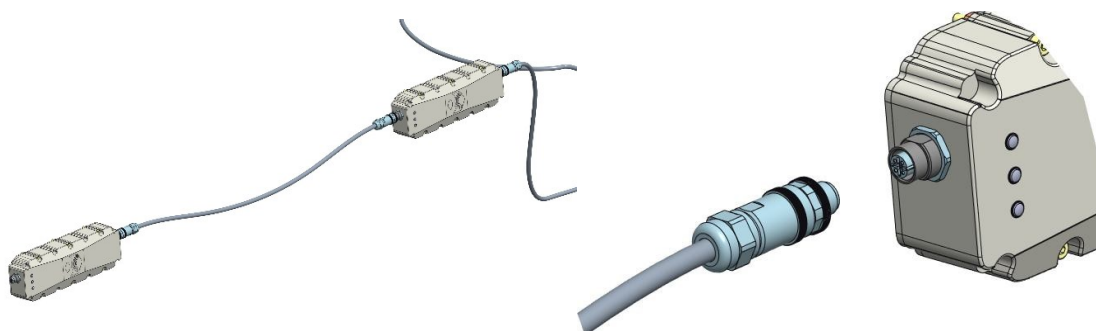


Figure 5 Receiver-to-Receiver connection

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3.1.2.2 Mat-to-Receiver connection

The mat connects to a receiver module via a 3-pole connector. This cable is permanently fixed to the mat, with the connector on the free end plugging into the receiver.

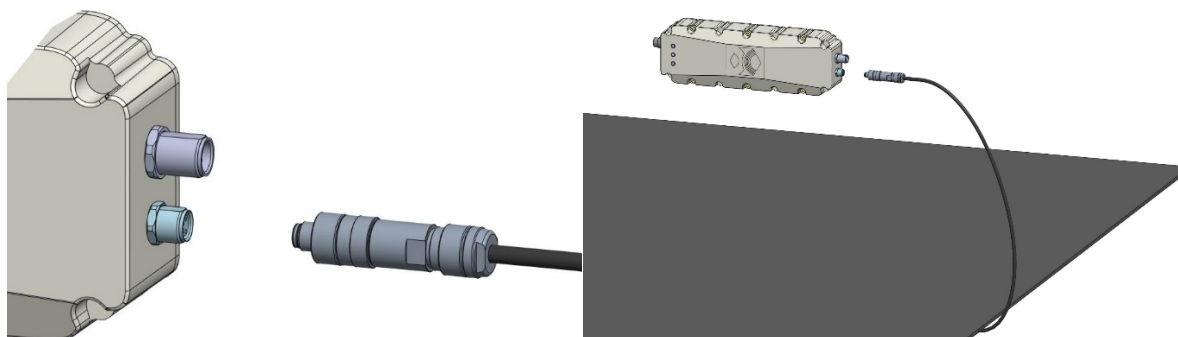


Figure 6 Mat-to-Receiver connection

3.1.2.3 Receiver-to-Control Unit connection

The Receiver connects to the Control Unit's XRC port using a 5-pole cable. The connector end plugs into the Receiver, while the terminal block end connects to the Control Unit.

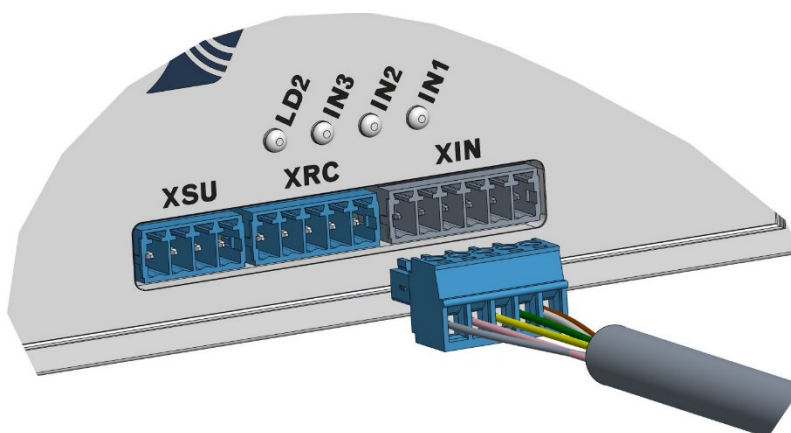


Figure 7 Receiver-to-Control Unit connection

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3.1.3 Safety inputs connection

The XIN port enables safety communication between the robot controller and the Control Unit, used to activate extra safety functions such as muting or automatic configuration of safety distances. Three inputs are evaluated in combination to produce up to eight possible decisions/configurations.



Figure 8 Safety inputs connection

3.1.4 Connection to Robot Controller

The Control Unit connects to DSQC1042 safety module via a cable at port XOUT. Power is supplied through port XP.

In future versions, FSoE will be supported through a dedicated port on the Control Unit.

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3.1.5 WebApp Installation

The WebApp provides the GUI and runs on the FlexPendant. To install it:

1. In the FlexPendant's main directory, create a folder named webapp.
2. Copy the AuraSensae WebApp folder into it.

The Robot Controller must be connected to the Control Unit: this connection keeps the distance values, and any parameter changed in the GUI is applied directly to the Control Unit.



Figure 9 Hexopus distance configuration

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3.1.6 Connector Reference Tables

Connector / Port	Connects To	Type
XSU	Hexopus unit	4-pole
XRC	Receiver	5-pole
XOUT	DSQC1042 safety module	8-pole
XP	Power supply	2-pole
XIN	Safety inputs	6-pole
ETH	Robot Controller (Web App)	Ethernet

Connector / Port	Connects To	Type
Hexopus underside	Satellites	4-pole
Hexopus Socket	Control Unit XSU port	4-pole

Connector / Port	Connects To	Type
Receiver	Control Unit XRC port	5-pole
Receiver	Receiver	5-pole
Receiver	Mat	3-pole

