Autoblocks Control Block

Technical Specification Sheet

Overview

The Autoblocks Control Block is a robust and general-purpose controller that effortlessly combines logic, safety, and motion control into a single, streamlined platform. It supports up to 6 slave devices including up to 6 axes of linear or rotary absolute motion with single-cable connections. Offering no-code integration, it simplifies the management of diverse industrial robots, vision systems, safety devices, and sensors, making it accessible even for those with limited programming experience. Its modular, flexible design allows for seamless scalability, from small batch processes to fully automated production lines, making it the perfect solution for a wide range of industrial automation requirements. Additionally, the Autoblocks platform includes the AB+ product line, offering highly compatible motors, actuators, and gearboxes that further enhance system versatility and expand automation capabilities across multiple applications.

Hardware Specifications

Form Factor

- Dimensions: Standard 19” x 4U Rack Mount
- ~24” L x 20” W x 6” H
- Weight: ~45 lbs.
- Ventilation: Rear exhaust fan.

Power Supply

- Voltage Input: 120 VAC or 240 VAC
- Amperage Input: Max 15A at 120VAC or 8A at 220V
- 24V Bus (10 terminals) Power Output: 2A Max/50W
- 12V Bus (4 terminals) Power Output: 5A Max/60W
- 0V Bus (14) terminals
- Protection: Overvoltage, short circuit, and reverse polarity protection.

Connectivity

Motor Interfaces:

- Supports NEMA 8, 10, 17, 23, 34 absolute encoder closed-loop stepper motors
- Single M12 cables with absolute encoders for all motor connections
- Programmable brakes available in all sizes (no separate wiring required).
- Home-run architecture from Control Block to motors (6 motors supported natively)

External Ports:

- RJ45 Ports (3)
- (1) USB 2.0 for file management, bar code scanner, camera.
- (1) DB15 for HMI teach pendant with integrated e-stop circuit.
- (4) M12/4 motors
- M12/5 (2) Light curtain transmitter & receiver.
- M12/4 (1) Light Tower
- M12/8 (1) Door Switch - Cascade up to 16 units (including 4 locking)
- M12/8 (1) Remote I/O expansion port
- 14 Pin Output Terminal Block – 10 Transistor (PNP), (2) Relay 6A
- 14 Pin Input Terminal Block – 10 Sink/Source, (2) Analog
- 14 Pin Safety Output Terminal Block – (5) Safety Outputs
- 14 Pin Safety Input Terminal Block - Redundant Remote E-stop in, 7 inputs
- 14 Pin 0 VDC Terminal Block
- 14 Pin 24 VDC Terminal Block

Communication Protocols:

- Ethernet/IP
- MODBUS TCP
- CANopen/CANLayer2
- MQTT Client

I/O Standard Model:

- 10 digital inputs
- 2 analogue Inputs
- 10 transistor outputs
- 2 Relay outputs

I/O Analogue Model (option at time of order):

- 8 digital inputs
- 4 analogue Inputs
- 6 transistor outputs
- 2 Relay outputs
- 3 analogue outputs

Other:

- SQL Client
- WEB Server
- E-Mail & SMS
- VNC
- FTP server/client

Safety Features

- **Safety Controller:** Integrated Programmable Safety Controller
- **Ple, Category 4, SIL3 Safety Standards**
- **Plug and play safety devices** - light curtain, door interlocks, remote E-stop, light tower, and other safety devices
- **Customizable programming**
- **Safety event tracking**
- **Remote Emergency Stop Circuit:** Remote E-stop port to connect field devices.
- **Interlocks:** Plug and play magnetic door interlock/switches. HMI password controlled.

Mechanical and Environmental Specifications

- Operating Temperature: 0°C to 40°C
- Storage Temperature: -20°C to 70°C
- Humidity: 10% to 90% (non-condensing)

Software & Control Capabilities

Software Packages:

- Comes pre-loaded with choice of **AutoCode** or **TurnCode**.
- Simple & free updates from USB/single HMI button press.
- **AutoCode -** software package for generalized automation control
- **TurnCode -** software package specializing in modular rotary control

AutoCode Programming Environment – Linear Control Made Simple

- Table-based command structure compatible with PLC and CAM programming
- Supports custom commands and developer environment.
- Supports AI-generated AutoCode for fast programming
- Recipe Programming: Integrated recipe management for production line reconfiguration
- Machine Master and up to (6) Slave device AutoCode control.

Turn Code Programming Environment – No Code Modular Rotary Control

- Modular Rotary System Support: Controls up to 8 stations with configurable 2, 4, or 8-position setups.
- No-Code Configuration: Simplifies programming with an intuitive, point-and-click interface.
- Error Handling and Diagnostics: Includes real-time error detection, fault history, and troubleshooting tools.
- Integration: Fully compatible with Autoblocks HMI and teach pendant for seamless operation.
- Applications: Ideal for assembly lines, inspection stations, filling operations, and other indexed rotary tasks.
- Efficient Automation: Enhances the Control Block's capabilities for scalable, multi-station rotary control.

HMI/Teach Pendant Interface:

- 10.1-inch-high resolution capacitive touch screen HMI interface.
- Supports integration of other web interfaces.
- Integrated E-Stop

Motion Control

Axes Control:

- 6 primary axis of control (X,Y,Z,A,B,C)
- 5 axis teach pendant control
- Simplified wiring via a single M12 cables for power and communication.
- High-precision motion with closed-loop control using absolute encoders
- Real-time trajectory planning with coordinated motion control

Safety and Error Handling

- Built-in Fault Detection
- Diagnostic system with real-time error logging
- Automatic motor shutdown in case of fault
- Red, Green, and Yellow HMI/light tower status indicators

System Integration

Modularity:

- Compatible with all types of robots.
- Flexible device integration through Auto-code or drag and drop ladder logic for complex machine control
- Expandable I/O and motor controls for future scalability

Supported Devices

AutoBlocks Smart Motors:

- NEMA 8, 10, 17, 23, 34
- Closed-loop integrated stepper motors with absolute encoders

AutoBlocks Smart Actuators:

- Precision Ball Screw Actuators +/- 0.005mm up to 2000mm
- Belt Drive Actuators +/- 0.05mm up to 3000mm
- Customizable Cartesian Gantries available.

EPSON Robots:

- EPSON Robots are plug & play with simple device selection on the HMI.
- EPSON robot program templates with extensive handshake and error handling prebuilt.

Universal Robots:

- UR robots are plug & play with simple device selection on the HMI.
- UR CAPP with extensive handshake and error handling prebuilt.

Vision Systems:

- Keyence IV3/4
- Keyence VS
- Zebra FS/VS
- Cognex
- Custom devices supported

Servo Drives & VFDs:

- AutoBlocks Smart Servo Drives & VFDs come plug & Play
- Third Party Servo Drives & VFDs available.

Safety:

- Built In Safety Controller to meet strict safety requirements.
- Single M12 cable door interlocks/switches
- Single M12 cable plug & play single cable light curtains
- Single M12 cable plug and play light tower
- Terminal blocks for built in safety I/O
- Expandable field safety I/O

Cloud

- Customizable Cloud Machine monitoring dashboard
- Remote Support
- Remote Software Customization and Support.

Other Devices:

- Control Block is simple to configure for any discrete I/O device
- High level communication devices are simple to add with NRE or development.

Integrator Support

The Autoblocks Control Block is targeted at integrators and machine builders seeking a cost-effective, highly configurable, and easy-to-program machine controller. Its plug-and-play capabilities and AI-driven AutoCode functionality reduce the need for extensive programming, making it ideal for medium complexity machines in industries such as automotive, electronics, medical devices, and precision assembly.

This technical specification sheet provides a detailed overview of the capabilities and components of the Autoblocks Control Block, highlighting its advanced features for motion control, machine safety, and flexibility in industrial automation applications.

Comparison Control Block vs Control Block Mini

Feature	Control Block	Control Block Mini
Capabilities	General Purpose Controller with Plug & Play Motion	General Purpose Controller with External Motion
Motion Control	Up to 6 Axis Plug & Play	Up to 6 Axis w/external power/drive
24V Power Output Bus	190W, 24V DC bus	75W, 24V DC bus
Network Capabilities	3 RJ45 ports Ethernet IP, Modbus TCP, MQTT	3 RJ45 ports Ethernet IP, Modbus TCP, MQTT
PLC	Included	Included
Safety Controller	Keyence safety controller	Keyence safety controller
Plug & Play Safety	Light Curtains, Door Switches (up to 16), Light Tower.	Light Curtains, Door Switches (up to 16), Light Tower.
I/O Configuration	10 digital inputs, 2 analog inputs, 10 transistor outputs (PNP), 2 Relay Outputs 8in/7out safety	10 digital inputs, 2 analog inputs, 10 transistor outputs (PNP), 2 Relay Outputs 8in/7out safety
Optional Analogue Output	8 digital inputs, 4 analog inputs, 6 transistor outputs (PNP), 3 analog outputs, 2 Relay Outputs 8in/7out safety	8 digital inputs, 4 analog inputs, 6 transistor outputs (PNP), 3 analog outputs, 2 Relay Outputs 8in/7out safety
Expandability	Remote I/O up to 2,000 points	Remote I/O up to 2,000 points
Teach Pendant	Optional, industrial-grade design	Optional, industrial-grade design
HMI	Web interface and multi-tab capabilities	Web interface and multi-tab capabilities
Software	AutoCode (Linear Motion/Logic) & TurnCode (Rotary Motion/Logic)	AutoCode (Linear Motion/Logic) & TurnCode (Rotary Motion/Logic)
Programming	Master/6 slave devices/1 motion platform/6 axis/gcode/recipes	Master/6 slave devices/1 motion platform/6 axis/gcode/recipes
Safety Features	Plug-and-play light curtains, light towers, e-stop, safety interlocks	Plug-and-play light curtains, light towers, e-stop, safety interlocks
Dimensions	14x19x4U rack-mount	24x19x4U rack-mount
Weight	~25 lbs	~15 lbs
Power Input	220V/8A or 120V/15A	220V/1A or 120V/1A
Use Case	Complex machines with motion, robots, precision assembly, palletizing, industrial automation	Complex machines, robots, precision assembly, palletizing, industrial automation
Cloud Integration	Cloud dashboards, SQL database support	Cloud dashboards, SQL database support
Target Market	Integrators needing advanced integration, recipes, and safety	Integrators needing advanced integration, recipes, and safety