

Machine Programming Guide

Motion. Logic. Safety. HMI. — One Platform.

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Applies to: Control Block · AutoCode™

Companion to: Control Block Manual v2026.5.11

► **MOTION**

6 primary + 4 auxiliary axes. Single M12 cable per motor. Closed-loop absolute encoders. Real-time coordinated trajectory planning.

► **LOGIC**

AutoCode™ — 27-command human-readable language. 8 parallel routines + Master + Motion Program. Table-based PLC environment.

► **SAFETY**

PLe / Category 4 certified. Dual-channel E-stop cuts motor power via safety controller. Three-level role-based access.

► **HMI**

Web HMI at 192.168.1.222. PENDANT or HMI Hub for local touchscreen. Remote support via Autoblocks Studio.

AXES

6 + 4

Primary + auxiliary

SAFETY

PLe

Category 4

ROUTINES

8 + 1

Parallel + Master

HMI

Web

192.168.1.222

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DESIGNED & MANUFACTURED IN THE USA

SECTION 1 System Overview

1.1 WHAT IS THE CONTROL BLOCK?

The Control Block is a unified industrial automation platform that consolidates motion control, PLC logic, safety, and HMI into a single rack-mounted controller. It eliminates the need for separate servo drives, PLCs, safety relays, and HMI panels — one device runs an entire machine.

The Control Block runs **AutoCode™**, a 27-command human-readable programming language designed for machine builders. Programs are auditable, maintainable, and require no prior PLC or CNC experience.

1.2 ABSOLUTE MOTORS

Autoblocks Absolute Motors are integrated steppers with closed-loop absolute multi-turn encoders. Available in NEMA 8, 10, 17, 23, and 34 frames, they connect via a single M12 cable per motor over Custom CAN. The absolute encoder retains position across power cycles — no homing required on startup.

1.3 SOFTWARE ECOSYSTEM

- ▶ **AutoCode™** — runs natively on the Control Block. Programming, HMI, and motion control in one.
- ▶ **Web HMI** — AutoCode interface in any browser at `192.168.1.222`. No software install required.
- ▶ **Autoblocks Studio** — laptop companion for offline programming, diagnostics, and remote support.
- ▶ **HMI Hub** — AutoCode interface on any 1280×800 third-party display via HDMI + USB.

SECTION 2 Hardware Setup

2.1 MOUNTING

Mount the Control Block in a standard rack-mount enclosure (NEMA 12 or better). Allow at least 2 inches of clearance on all sides for airflow. Operating temperature: 0 °C to 40 °C.

2.2 POWER WIRING

WARNING

Use 120 VAC / 15A max on a dedicated circuit. Engage the E-stop before any wiring work. All mains wiring must be performed by a licensed electrician per local electrical codes.

- 1 Connect 120 VAC L/N/G to the power input terminal block (top of unit).
- 2 Connect the E-stop loop to dual-channel safety input terminals.
- 3 Wire 24 VDC output to field devices — max 10A aggregate.
- 4 Ground enclosure panel and all cable shields to a common ground bus.

2.3 MOTOR WIRING (CB ONLY)

Each Absolute Motor connects to a Motor Port (M1–M6) via a single M12 5-pin cable (Custom CAN + 24 VDC). Cables are keyed and cannot be mis-inserted. Maximum cable length is 10 m per axis. Motors may be daisy-chained or wired home-run from any of the four motor bus ports on the Control Block.

2.4 PENDANT CONNECTION

The PENDANT connects to the DB15 port on the Control Block front face and is powered directly from the Control Block — no external supply required. Mount the PENDANT using the 75 mm × 75 mm VESA pattern on the rear of the unit.

SECTION 3 Powering On the System

3.1 FIRST POWER-ON SEQUENCE

- 1 Confirm all wiring is complete and the enclosure door is closed.
- 2 Verify the E-stop is NOT depressed (pulled out / released).
- 3 Switch main power ON. Status LED cycles amber → green within 30–60 s as the system boots.
- 4 The PENDANT display illuminates and shows the AutoCode™ Home screen on boot completion.
- 5 If the LED remains amber or red, check the fault log before proceeding.

3.2 NORMAL STARTUP

On subsequent power cycles the system reaches Home screen in approximately 20 seconds. Absolute encoder positions are retained — no homing is required unless the machine was mechanically disturbed while unpowered.

NOTE

If any motor was moved by hand while unpowered, run a home cycle before executing motion programs to resynchronize software position with physical axis position.

3.3 E-STOP BEHAVIOR

Pressing the E-stop removes 24 VDC from the motor bus via the onboard safety controller. All motion stops immediately. The HMI remains active. To resume: release the E-stop, acknowledge the fault on the HMI, then re-enable the drives.

SECTION 4 Network & HMI Access

4.1 WEB HMI

The Control Block hosts the AutoCode™ Web HMI at a fixed IP. Connect any browser-equipped device to the same network as the Control Block.

Default IP address: 192.168.1.222 — open <http://192.168.1.222> in any browser.

4.2 NETWORK CONFIGURATION

Set the connecting device to a static IP in the 192.168.1.x subnet (e.g., 192.168.1.100, subnet mask 255.255.255.0). A dedicated Ethernet switch is recommended in production. Do not connect the Control Block to a corporate network without IT consultation — the device uses a fixed IP with no DHCP support by default.

4.3 AUTOBLOCKS STUDIO

Autoblocks Studio is the laptop-side companion for offline programming, live diagnostics, and remote support sessions. Download from autoblocks.co. When connected to the same network, Studio provides full program editing, real-time axis monitoring, I/O status, and the ability to share a live support session with Autoblocks engineering.

SECTION 5 User Roles & Access Control

5.1 ROLE OVERVIEW

AutoCode™ enforces three role levels, each protected by a PIN set during commissioning. Roles are cumulative — Admin has all Operator permissions plus additional access.

Role	Access	Typical User
Operator	Run programs · Jog axes · View faults · Acknowledge alarms	Machine operator
Admin	All Operator + Edit programs · Configure I/O · Adjust machine parameters	Maintenance tech, integrator
Safety	All Admin + Test Mode · Safety Settings · E-stop configuration	Safety engineer

WARNING

The Safety role PIN must be kept confidential. Safety Settings and Test Mode allow bypassing protective functions — unauthorized access is a safety hazard.

5.2 CHANGING PINS

Change PINs in **Settings** → **Access Control** (Safety-level login required). Default factory PINs must be changed before the machine is placed in service.

SECTION 6 HMI Navigation

6.1 MAIN SCREEN

The AutoCode™ Main screen is the primary operator view. The **Status Bar** at the top of the screen displays the current machine state: **STOPPED**, **RUNNING**, **PAUSED**, or **FAULTED**. Routine tiles are shown in the center panel; tap a tile to select and run the associated routine. The header area shows the machine PIN field, a **RESET** button, and a **MACHINE LOGS** button for accessing the Machine Events log.

6.2 MAIN NAVIGATION AREAS

Area / Button	Function	Min. Role
Status Bar (top)	Displays machine state: STOPPED · RUNNING · PAUSED · FAULTED	Operator
Routine tiles	Select and run individual AutoCode™ routines	Operator
RESET button	Clear active faults and return to STOPPED state	Operator
MACHINE LOGS	Open Machine Events log — timestamped faults, warnings, operator messages	Operator
Settings → ROUTINES	Create, edit, and manage AutoCode™ routines	Admin
Settings → IO	View and configure I/O map; real-time I/O state	Admin
Settings → MOTION	Axis configuration, motion parameters, Motion Program editor	Admin
Settings → SAFETY	E-stop config, safety inputs, Test Mode enable	Safety
Settings → EXTERNAL DEVICES	AB_RIO modules, motor bus, communication status	Admin
Lock icon	Machine Lock — restricts to Operator access; prevents settings changes	Admin

6.3 JOG MODE

Select an axis, choose incremental (0.001–100 mm) or continuous mode, then press and hold the direction key. The axis will not move unless the E-stop is released and Operator role or higher is active.

6.4 MACHINE EVENTS AND FAULT ACKNOWLEDGMENT

When a fault occurs, the **Status Bar** changes to **FAULTED** and the machine stops. Tap **MACHINE LOGS** to open the Machine Events log, which shows all faults, warnings, operator messages, and program events with timestamps. Resolve the root cause, then press **RESET** to clear the fault and return to STOPPED state. Do not reset without resolving the underlying condition — the fault will recur immediately.

SECTION 7 Machine Configuration

7.1 AXIS CONFIGURATION

Set axis parameters in **Settings → Axes** (Admin login required). For each axis configure:

- ▶ **Motor frame** — NEMA 8, 10, 17, 23, or 34
- ▶ **Steps per unit** — based on leadscrew pitch or belt drive ratio
- ▶ **Velocity and acceleration limits** — set conservatively during commissioning
- ▶ **Software travel limits** — define the safe operating envelope for each axis

- ▶ **Home position** — set after first manual home cycle

7.2 I/O ASSIGNMENT

All I/O points are assigned in **Settings** → **I/O Map**. Each point gets a descriptive tag name used throughout AutoCode™ programs. Use function-based names (`PART_DETECT` , `CLAMP_EXTEND`) — not generic names (`IN1` , `OUT3`) — for maintainability.

7.3 MACHINE PARAMETERS

Global parameters (units, coordinate system, default feed rates) are set in **Settings** → **Machine**. These persist across power cycles and program changes. Document all settings in the machine build record before leaving the site.

7.4 CONFIGURATION BACKUP

Export a full backup from **Settings** → **Backup / Restore**. Save to USB and store with the machine documentation package. In the event of a Control Block replacement, configuration restores in under five minutes.

BEST PRACTICE

Create a configuration backup after every commissioning session and before any firmware update.

SECTION 8 AutoCode™ Programming

8.1 PROGRAM STRUCTURE

An AutoCode™ application consists of up to **8 parallel Routines**, a **Master Program**, and a **Motion Program**. All run simultaneously when the program is started.

- ▶ **Master Program** — the primary sequential logic program. Controls I/O, calls routines, manages flow.
- ▶ **Routines (R1–R8)** — independent parallel programs running concurrently with the Master.
- ▶ **Motion Program** — dedicated motion coordinator for real-time trajectory planning across all axes.

8.2 COMMAND CATEGORIES

Category	Commands
Output (3)	SET OUTPUT · SET VALUE · TOGGLE OUTPUT
Messaging (1)	POST MESSAGE
Timing (4)	WAIT · WAIT UNTIL INPUT · WAIT UNTIL VALUE · WAIT UNTIL ONESHOT
Conditional (4)	IF INPUT · IF VALUE · IF ONESHOT · END IF
Looping (3)	LOOP · BREAK LOOP · END LOOP
Counting (5)	COUNT · COUNT PASS · COUNT FAIL · IF COUNT · CYCLE INCREMENT
Program Flow (5)	INITIALIZE · END INITIALIZE · PAUSE · PAUSE UNTIL · END PROGRAM
Process (2)	START PID · END PID

Motion commands (RAPID, MOVE) are entered in the **Motion Program** table — a separate editor accessed via Settings → MOTION. Motion commands do not appear in the Routine command set above.

8.3 CREATING A NEW ROUTINE

- 1 Log in as Admin or Safety.
- 2 Navigate to **Settings** → **ROUTINES** .
- 3 Tap **New Routine** and enter a routine name (alphanumeric, underscores: `CYCLE_AUTO`).
- 4 The routine editor opens showing a table with **COMMAND** , **VALUE** , **OUTPUT** , and **NOTES** columns.
- 5 Tap an empty row in the **COMMAND** column and select a command from the dropdown. Fill in **VALUE**, **OUTPUT**, and **NOTES** fields as required by the command.
- 6 Add rows to build the routine sequence. Use **INITIALIZE / END INITIALIZE** at the top for one-shot startup logic.
- 7 Routines run concurrently when the machine is started — the system supports up to 8 parallel routines simultaneously.

8.4 MOTION PROGRAMMING

Coordinated axis motion is programmed in the **Motion Program**, a separate table editor accessed via **Settings** → **MOTION**. The Motion Program table uses dedicated columns for each axis (X/Y/Z/A/B/C-AXIS), **VELOCITY**, and **SKIP**. Each row defines a move step. Available motion commands include **RAPID** (move at maximum speed) and **MOVE** (move at specified velocity). Motion parameters — velocity limits, acceleration, software travel limits — are configured in Settings → MOTION → Axis Config before programming. Routine programs coordinate with motion via **WAIT UNTIL INPUT**, **PAUSE UNTIL**, and **SET OUTPUT** commands that synchronize I/O events with motion completion.

8.5 PROGRAM VALIDATION AND TESTING

Before running at full speed: (1) Enter Test Mode (Safety role) to enable I/O forcing and reduced-speed motion. (2) Step through the program one command at a time. (3) Verify each I/O transition and axis move. (4) Exit Test Mode and run at 10% speed before full speed.

8.6 MACHINE EVENTS

AutoCode™ does not use numeric fault codes. All system events — faults, warnings, operator messages, and program events — are recorded as descriptive text entries in the **Machine Events** log. Access the log by tapping **MACHINE LOGS** on the main screen. Each entry includes a timestamp, event type, and plain-language description of the condition (e.g., "E-stop activated", "Motor bus communication lost — check M12 cable on M3", "WAIT UNTIL INPUT timeout — PART_PRESENT input did not activate").

Routines can post custom messages to Machine Events using the **POST MESSAGE** command. WAIT UNTIL INPUT commands that time out automatically log a warning with the input tag name and NOTES field content. This makes Machine Events the primary diagnostic tool for understanding what the program was doing when a fault occurred.

SECTION 9 I/O Configuration

9.1 SYSTEM I/O CAPACITY

I/O Type	System Capacity	Notes
Digital Inputs	300	Includes onboard + AB_RIO expansion points
Digital Outputs	300	Includes onboard + AB_RIO expansion points
Data Inputs	150	Analog / data channel inputs
Data Outputs	150	Analog / data channel outputs
Safety Inputs	54	Dual-channel safety-rated inputs
Safety Outputs	54	Safety-rated outputs

9.2 I/O MAP SETUP

- 1 Navigate to **Settings** → **I/O Map** (Admin login required).
- 2 For each physical I/O point, enter a descriptive tag name: `PART_PRESENT` , `CLAMP_FWD` , `VACUUM_ON` .
- 3 Set the logic sense (Active High / Active Low) for each input.
- 4 For analog points, configure the engineering unit range (e.g., 0–100 PSI).
- 5 Save the I/O Map. Tags are immediately available in the program editor.

9.3 REMOTE I/O (AB_RIO)

AB_RIO expansion modules connect via the onboard expansion bus. Up to 8 modules per system, each adding up to 32 digital I/O points. Modules are auto-detected on power-up and appear in the I/O Map automatically.

NOTE

AB_RIO modules use the Autoblocks expansion bus protocol — not Modbus, RS-485, or Ethernet/IP. No additional network configuration is required.

9.4 TESTING I/O

Use **Diagnostics** → **I/O** to verify physical wiring in real time. Output forcing requires Test Mode (Safety role) enabled in Safety settings.

SECTION 10 Safety Configuration

SAFETY-CRITICAL SECTION

All steps require a **Safety-level** login. Changes must be validated by a qualified safety engineer and documented in the machine's safety plan before the machine is placed in service.

10.1 E-STOP CONFIGURATION

Configure E-stop behavior in **Safety** → **E-stop Settings**:

- ▶ **Stop category** — Category 0 (immediate power removal) or Category 1 (controlled stop then power removal). Default is Category 0.

- ▶ **Reset mode** — Manual reset (operator must press Reset after E-stop release) or automatic. Manual reset is required for PLe compliance.
- ▶ **Monitoring outputs** — configure the safety relay outputs that cut motor power on E-stop.

10.2 SAFETY INPUTS

The four dedicated safety inputs support light curtains, area scanners, interlocked guards, and two-hand controls. Each input is dual-channel and monitored independently. Assign functions in **Safety** → **Safety Inputs**.

10.3 TEST MODE

Test Mode enables output forcing and reduced-speed motion for commissioning and maintenance. Safety-level users only. A persistent red banner is displayed while Test Mode is active — always exit Test Mode before returning the machine to production.

SECTION 11 Motor Commissioning

11.1 MOTOR DETECTION

Absolute Motors are detected automatically when connected to an active Motor Port (M1–M6). On first connection, the Control Block reads the motor's embedded ID and frame size. Navigate to **Settings** → **Axes** to confirm detection and assign axis names.

11.2 MOTOR FRAME SELECTION

Frame	Holding Torque	Common Application
NEMA 8	0.06 N·m	Light-duty positioning, feeders
NEMA 10	0.12 N·m	Small actuators, compact assemblies
NEMA 17	0.45 N·m	General-purpose positioning, conveyor
NEMA 23	1.2 N·m	Medium-duty linear axes, rotary tables
NEMA 34	4.0 N·m	Heavy-duty axes, high-force applications

11.3 STEPS-PER-UNIT CALIBRATION

$$\text{Steps/Unit} = (\text{Motor Full Steps} \times \text{Microstepping Factor}) / (\text{Leadscrew Pitch or Drive Ratio})$$

Example: 200 steps/rev, 8× microstepping, 5 mm/rev leadscrew = $(200 \times 8) / 5 = 320 \text{ steps/mm}$.

11.4 VELOCITY AND ACCELERATION TUNING

Start at 50% of rated maximum velocity and acceleration of 3–5× the velocity value. Test at low speed, then increase gradually. Watch for resonance, position error events in Machine Logs, and mechanical noise.

11.5 SETTING THE HOME POSITION

- 1 Jog the axis to its mechanical home position.
- 2 Navigate to **Settings** → **Axes** → **[Axis Name]** → **Set Home**.
- 3 The current encoder position is stored as the home reference (reads 0.000).
- 4 On all future power cycles, position is retained without a homing move.

SECTION 12 Diagnostics & Troubleshooting

12.1 DIAGNOSTICS DASHBOARD

- ▶ **Fault Log** — timestamped history with fault code, axis/I/O context, and program line number.
- ▶ **Axis Status** — position, velocity, current, encoder status, and following error per axis.
- ▶ **I/O Monitor** — live state of all onboard and expansion I/O.
- ▶ **Communication Status** — CAN bus health, AB_RIO module status, network link status.

12.2 COMMON ISSUES

Symptom	Likely Cause	Action
Axis not detected	M12 cable not seated; motor unpowered	Reseat M12; verify 24 VDC on motor bus
Program won't start	E-stop active; fault not cleared	Release E-stop; clear faults; re-enable drives
HMI not loading	Network misconfiguration; IP mismatch	Verify device on 192.168.1.x; ping 192.168.1.222
Erratic motion	Steps/unit wrong; binding; resonance	Verify steps/unit; inspect mechanism; reduce speed
I/O not responding	Tag name mismatch; AB_RIO offline	Check I/O Map tags; verify 24 VDC supply; check AB_RIO LEDs

12.3 REMOTE SUPPORT

Connect Autoblocks Studio over the local network, then initiate a support session from **Help** → **Remote Support**. The Autoblocks team can view live system state, fault log, and program in real time — no VPN or remote desktop setup required.

SECTION 13 Go-Live Checklist

Complete all items before signing off on a new installation or returning a machine to service after a major change.

HARDWARE & WIRING

- | | |
|--|--|
| <input type="checkbox"/> Enclosure meets NEMA 12 or better rating | Documented in machine build record |
| <input type="checkbox"/> 120 VAC on dedicated 15A circuit | Verified by licensed electrician |
| <input type="checkbox"/> E-stop wired dual-channel to safety inputs | Both channels verified open/closed correctly |
| <input type="checkbox"/> All M12 motor cables fully seated (CB only) | Positive lock confirmed per connector |
| <input type="checkbox"/> PENDANT connected to DB15 port | Screen illuminates on power-up |
| <input type="checkbox"/> All cable shields grounded to common bus | |

SYSTEM POWER-ON

- | | |
|--|------------------------------------|
| <input type="checkbox"/> System boots to Home screen within 60 s | No amber/red LEDs on steady-state |
| <input type="checkbox"/> No active faults on power-up | Fault log reviewed and clear |
| <input type="checkbox"/> All axes detected — correct frame sizes (CB only) | Settings → Axes verified |
| <input type="checkbox"/> All AB_RIO modules detected | I/O Map shows correct point counts |

NETWORK & HMI

- | | |
|---|--|
| <input type="checkbox"/> Web HMI loads at 192.168.1.222 | Tested from at least one external device |
| <input type="checkbox"/> Autoblocks Studio connects to controller | Live axis and I/O data visible |
| <input type="checkbox"/> PENDANT matches Web HMI (same program/positions) | |

I/O VERIFICATION

- | | |
|---|--|
| <input type="checkbox"/> All input tags verified in I/O Monitor | Each input toggled physically; state confirmed |
| <input type="checkbox"/> All output tags verified via Test Mode (Safety role) | Each output forced; field device responds |
| <input type="checkbox"/> Analog input scaling verified | Engineering unit range matches sensor spec |

SAFETY VALIDATION (SAFETY ROLE REQUIRED)

- | | |
|---|--|
| <input type="checkbox"/> E-stop tested — both channels verified | Motor bus power confirmed removed |
| <input type="checkbox"/> E-stop reset mode confirmed (Manual) | Machine does not auto-restart after E-stop release |
| <input type="checkbox"/> All safety inputs tested with actual devices | Light curtains, guards, two-hand controls verified |
| <input type="checkbox"/> Safety PINs changed from factory defaults | All three role PINs updated |

MOTION COMMISSIONING (CB ONLY)

- | | |
|---|---|
| <input type="checkbox"/> Steps/unit verified for each axis | Physical measure matches commanded distance |
| <input type="checkbox"/> Software travel limits set for each axis | Machine moves to limit; stop confirmed |

Home position set and power-cycle tested Position retained correctly after power cycle

Velocity and acceleration tested at full speed No position error events in Machine Logs; motion smooth

PROGRAM VALIDATION

Program tested in Test Mode step-by-step Each command verified at reduced speed

Program tested at 10% speed (full cycle) Completed without fault

Program tested at 100% speed (≥ 10 cycles) No faults; cycle time within spec

DOCUMENTATION & HANDOVER

Machine configuration backup saved to USB Stored with machine documentation package

AutoCode™ program source saved to USB Program name, version, and date documented

Operator training completed Operators can start/stop, jog, clear faults

Autoblocks support contact provided to customer autoblocks.co · 866-783-6148

SIGN-OFF

Commissioning technician: _____ Date: _____

Safety engineer (if applicable): _____ Date: _____

APPENDIX A AutoCode™ Command Reference

All 27 commands are entered in the Routine editor via dropdown. The COMMAND, VALUE, OUTPUT, and NOTES columns define each step. Motion commands (RAPID, MOVE) are entered separately in the Motion Program editor (Settings → MOTION).

#	Command	Category	Description
1	SET OUTPUT	Output	Set a digital output ON or OFF; TIME field specifies pulse duration in ms
2	SET VALUE	Output	Apply a math operation to a Data Output or Internal Data channel
3	TOGGLE OUTPUT	Output	Flip a digital output to its opposite state
4	POST MESSAGE	Messaging	Post a text message to the HMI operator display and Machine Events log
5	WAIT	Timing	Pause routine execution for a fixed duration (ms)
6	WAIT UNTIL INPUT	Timing	Hold until a digital input reaches the specified state; timeout posts a Machine Events warning with NOTES content to the Status Bar
7	WAIT UNTIL VALUE	Timing	Hold until a data channel crosses a specified threshold
8	WAIT UNTIL ONESHOT	Timing	Hold until a one-shot edge event fires
9	IF INPUT	Conditional	Begin a conditional block based on a digital input state; close with END IF; up to 10 nested levels
10	IF VALUE	Conditional	Begin a conditional block based on a data channel value
11	IF ONESHOT	Conditional	Begin a conditional block based on a one-shot edge event
12	END IF	Conditional	Close the innermost open IF block; required for every IF command
13	LOOP	Looping	Begin a loop; VALUE = 0 runs indefinitely, VALUE > 0 runs exactly N times
14	BREAK LOOP	Looping	Exit the current loop immediately and continue after END LOOP
15	END LOOP	Looping	Close the loop block; execution returns to the matching LOOP command
16	COUNT	Counting	Operate on the routine's own cycle counter via the ACTION field
17	COUNT PASS	Counting	Operate on the global PASS counter (displayed in the main screen quality widget)
18	COUNT FAIL	Counting	Operate on the global FAIL counter (displayed in the main screen quality widget)
19	IF COUNT	Counting	Conditional block based on the routine's current cycle count value
20	CYCLE INCREMENT	Counting	Increment the global machine cycle counter by one
21	INITIALIZE	Program Flow	One-shot initialization block executed once at routine start; outputs set here remain ON through start/stop cycles
22	END INITIALIZE	Program Flow	Close the INITIALIZE block; normal cyclic execution begins after this command
23	PAUSE	Program Flow	Pause the routine; outputs are NOT reset; resume by pressing START on the HMI

24	PAUSE UNTIL	Program Flow	Pause and automatically resume when the specified input condition becomes true
25	END PROGRAM	Program Flow	Terminate the routine early; use only for conditional or error-exit paths
26	START PID	Process	Start a configured PID control loop channel
27	END PID	Process	Stop an active PID loop; the output holds at its last commanded value

APPENDIX B Product Specifications

CONTROL BLOCK

Input power	120 VAC, 15A max
Onboard axes (CB)	6 primary, 4 auxiliary
Digital I/O	300 in / 300 out (system)
Analog I/O	4 in / 2 out
Safety inputs	4 dual-channel
Safety rating	PLe / Category 4
Operating temp	0 °C to 40 °C
Mounting	Rack-mount
HMI access	Web HMI (192.168.1.222)
Programming	AutoCode™ (27 commands)

PENDANT

Power	Powered from the Control Block
Connection	DB15 to Control Block front panel
VESA mount	75 mm × 75 mm
Housing	Reinforced nylon, ~1 lb
Dimensions	13" × 10" × 1.5"
Operating temp	-20 °C to 50 °C

ABSOLUTE MOTORS

Available frames	NEMA 8, 10, 17, 23, 34
Encoder type	Closed-loop absolute multi-turn
Homing required	No — position retained across power cycles
Communication	Custom CAN (single M12 cable)
Bus topology	Daisy-chain or home-run (4 CB ports)
Max cable length	10 m per axis
Power	24 VDC via M12 cable
Step angle	1.8° (200 full steps/rev)

AB_RIO REMOTE I/O

Connection	Autoblocks expansion bus
Max modules per system	8
Points per module	Up to 32 digital I/O
Configuration	Auto-detected; no IP setup required
Protocol	Proprietary (not Modbus/Ethernet)

SUPPORT

For integration assistance or warranty service, contact Autoblocks at info@autoblocks.co or 866-783-6148. Live remote support available via Autoblocks Studio.



Product page & documentation
autoblocks.co/product/control-block

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