Allen-Bradley 1756-OF8

01 Analog demand and shared field reference

Allen-Bradley 1756-OF8 converts controller commands into eight voltage or current outputs in a ControlLogix chassis. The non-isolated output group uses a removable terminal block and supports configured output behavior during operating-state changes.

Controller demand	Format and output rules	VOUT / IOUT and RTN	Receiver response

Signal and shared return

Each channel must be connected to the appropriate voltage or current terminal and configured for the intended signal. The removable terminal block makes field wiring serviceable, but its common return structure does not provide individual channel isolation. Review load references before combining separately grounded equipment on the output group.

Format-dependent behavior

Communication format affects available functionality. In the Series A reference configuration, floating-point mode supports engineering-unit scaling, run-mode ramping and clamps with limit alarms. Integer mode retains selected program/fault transition and initialization functions but must not be assumed to offer every floating-point feature.

Command versus physical result

A command value, the module’s data echo and the physical actuator position represent different points in the control path. Commissioning must compare them under stable loading and during agreed program, fault and restart transitions. Hold-for-initialization can intentionally retain an output until the controller command matches the held value; this should be distinguished from a broken output circuit.

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02 Conversion, loading and electrical accuracy

Output channels	8 voltage or current
Selectable output ranges	±10 V; 0–20 mA
Current resolution	15 bit across 21 mA; 650 nA/bit
Voltage resolution	15 bit across 10.4 V; 320 µV/bit
5.1 V backplane current	150 mA
24 V backplane current	210 mA
Backplane power	5.8 W
Voltage load	>2000 Ω
Current load	0–750 Ω
Resistive-load settling	<2 ms to 95% of final value
Calibrated accuracy at 25 °C	Better than 0.05% of range, 4–21 mA and −10.4 to +10.4 V
Typical calibration interval	12 months
Typical voltage offset drift	50 µV/°C
Typical current offset drift	0.1 µA/°C

Current-load allowance

At 20 mA, 750 Ω corresponds to 15 V across the external load. Include series instruments and cable resistance in that total; this calculation is a loading check, not a separate supply specification.

Resolution versus accuracy

A 650 nA nominal current step is much smaller than some total error contributions. Quantization, calibration accuracy, temperature drift and field-device error must not be treated as the same quantity.

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03 Installation envelope and timing boundaries

Maximum voltage gain drift	25 ppm/°C
Maximum current gain drift	50 ppm/°C
Voltage module error	0.15% of range
Current module error	0.3% of range
Minimum scan, floating point	12 ms
Minimum scan, integer	8 ms
Output data formats	Integer; IEEE 32-bit floating point
Channel isolation	No individual output-channel isolation
Output-to-backplane insulation	250 V continuous, reinforced
Removable terminal blocks	1756-TBNH or 1756-TBSH
TBNH terminal torque	1.36 N·m
Operating ambient	0 to +60 °C
Storage temperature	−40 to +85 °C
Relative humidity	5–95%, non-condensing

Ramping example

With a 2 V/s maximum ramp rate, an ideal 6 V requested change takes at least 3 s from the ramp constraint alone. Other control-path delays remain additional.

Transition acceptance

Run-mode response does not prove the configured program or communications-fault response. Exercise each approved transition separately and record the terminal signal and process result.

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04 Project compatibility and diagnostic interpretation

Analog actuator commands

Drive supported current or voltage receivers after matching their burden and signal reference to the selected channel.

Engineering-unit control

Use a supported floating-point configuration to relate controller engineering values to the intended analog endpoints.

Managed state transitions

Apply the configured program, fault and initialization response as part of the approved process-control design.

ControlLogix output replacement

Retain the exact RTB assignment, output type, project profile and operating-state behavior when restoring an installed channel.

Open-circuit detection

Detection applies to current operation and requires an output above 0.1 mA. A zero-current command is not a reliable open-wire proving condition.

Initialization hold

The Series A reference behavior holds the output until the commanded value matches the held terminal value within 0.1% of full scale. Inspect InHold when an output appears unresponsive after a transition.

Terminal practices

1756-TBNH permits at most two appropriately sized conductors per terminal; 1756-TBSH uses a single conductor per terminal. Apply the selected RTB’s wire-size and temperature requirements.

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05 State-transition decisions and service scope

Lifecycle and replacement scope

1756-OF8 is Active. Hardware-series compatibility and installed project configuration still govern replacement selection; the catalog lifecycle status does not establish availability of a particular Series A unit. Confirm the installed series, firmware and supported project profile. Retain the signal type, RTB wiring and program/fault behavior when evaluating a replacement.

Why might 1756-OF8 retain its old output after a return to Run mode?

Hold for Initialization may be active. Check the channel InHold status and reconcile the controller command with the held output within the specified matching tolerance before treating the condition as a hardware failure.

Can an open-wire test at a zero-current command validate 1756-OF8?

No. Current-mode open-circuit detection needs an output above 0.1 mA. Use an approved nonzero test condition and verify both channel status and the actual field circuit.

Technical basis

Rockwell Automation ControlLogix I/O Specifications, 1756-TD002M-EN-E; ControlLogix Analog I/O Modules, 1756-UM009B-EN-P. Electrical values below follow the Series A reference arrangement shown in the product photographs. Confirm the supplied hardware series and project profile before applying these values to another execution. All returns are common; channels are not individually isolated.

Other Allen-Bradley product references

Allen-Bradley 1756-N2

Allen-Bradley 1756-EN2F

Allen-Bradley 1756-IF8

Separate product references; no substitution or compatibility is implied.