Allen-Bradley 1762-IQ16

01 Signal path and common-group architecture

Allen-Bradley 1762-IQ16 adds discrete DC sensing to a compatible MicroLogix expansion system. Its sink/source input circuitry, grouped commons and per-point indication support conventional switches and powered field sensors.

Field switch or sensor	Assigned bank common	Input filter + status	Controller word / bit

Common groups and sensor current

The two input banks use their own commons. Decide whether the field devices source or sink current before terminating either bank; separate group commons do not create isolation between every individual channel. The field supply, sensor output and module input must form a complete compatible circuit.

The address follows the expansion position

Input data is presented as a read-only word whose bits follow the physical terminal numbers. Expansion position is part of the address, so moving a module can change the meaning of existing logic even when all its field wires remain attached. Match the retained hardware configuration before commissioning.

Thermal and timing boundaries

The upper operating temperature is not an unconditional all-inputs-on rating. Input voltage and simultaneous active points determine the thermal allowance. Budget expansion-bus demand separately from field-device current, and allow for controller scan timing when assessing short sensor pulses.

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02 Switching limits and electrical loading

Digital inputs	16
Input voltage category	24 V DC, sinking/sourcing
Input voltage envelope	10–30 V DC; 10–26.4 V DC subject to thermal point-count limits
Isolated input groups	Two groups of eight: 0–7 and 8–15
Maximum expansion-bus demand	70 mA at 5 V DC; 0.35 W
Maximum on-delay	8 ms
Maximum off-delay	8 ms
Maximum off-state voltage	5 V DC
Maximum off-state current	1.5 mA
Minimum on-state voltage	10 V DC
Minimum on-state current	2.0 mA at 10 V DC
Nominal on-state current	8.0 mA at 24 V DC
Maximum on-state current	12.0 mA at 30 V DC
Nominal input impedance	3 kΩ
Input-group/backplane test	1200 V AC for 1 s or 1697 V DC for 1 s
Working isolation voltage	75 V DC, IEC Class 2 reinforced insulation
Input data allocation	One read-only word; bits 0–15
Maximum heat dissipation at 30 V	5.4 W
Maximum heat dissipation at 26.4 V	4.3 W

Two different current paths

Expansion-bus current powers module electronics. Field-supply current passes through connected sensing circuits. Add each load to its own source budget; a bus calculation alone cannot establish sensor-supply capacity.

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03 Environmental envelope and thermal allowance

Operating temperature	−20 to +65 °C; simultaneous-point derating applies
Nonoperating temperature	−40 to +85 °C
Relative humidity	5–95%, non-condensing
Maximum operating altitude	2000 m
Operating vibration	5 g, 10–500 Hz
Operating shock	30 g
Nonoperating shock	50 g panel-mounted; 40 g DIN-mounted
Terminal screw torque	0.90 N·m
Solid conductor range	0.34–2.5 mm² copper, 90 °C
Stranded conductor range	0.34–1.5 mm² copper, 90 °C
Required ventilation space	50.8 mm on all sides of the assembly
Mounting orientation	Horizontal only
Protection rating	IP20; installation enclosure required
Pollution degree	2
Overvoltage category	II
ESD immunity	4 kV contact/indirect; 8 kV air
Radiated RF immunity	10 V/m, 80–2700 MHz, 80% AM at 1 kHz
EFT immunity, signal ports	±2 kV at 5 kHz
Surge immunity, signal ports	±1 kV differential; ±2 kV common mode
Conducted RF immunity	10 V rms, 150 kHz–80 MHz, 80% AM at 1 kHz

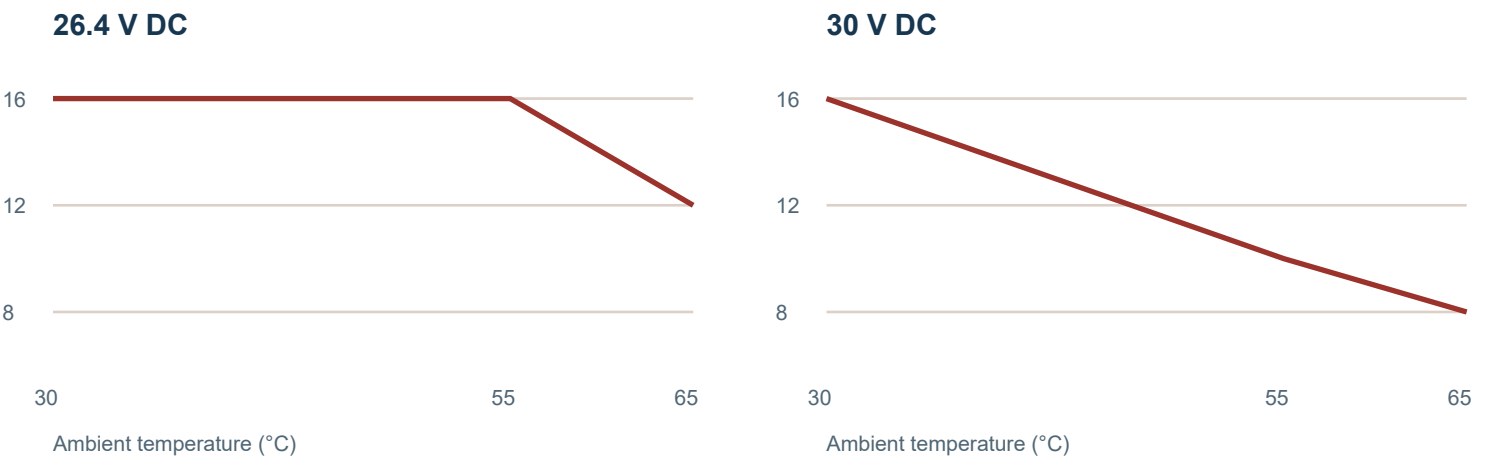
Environment is an installation condition

The IP20 rating does not replace the required industrial enclosure. Cabinet temperature, conductor routing, horizontal mounting and ventilation must be considered together with the active-point thermal allowance.

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04 Engineering implications for sensor circuits

Simultaneous active-point limits



Reconstructed from the manufacturer input-derating chart. The full sixteen-point rating is available up to 55 °C at 26.4 V DC, but only up to 30 °C at 30 V DC. Do not extrapolate the plotted operating limits.

Separate the two power budgets

Three modules at the stated 70 mA bus maximum require 210 mA from the 5 V bus, or 1.05 W. This illustrative sum excludes the controller and all other expansion modules. Sixteen inputs drawing the nominal 8 mA each represent 128 mA of field-input demand at 24 V; add the sensors’ own consumption.

Treat pulse duration as a system property

An input event passes through the electrical circuit, input filter, data update and program execution. The 8 ms maximum module delay is not a guaranteed 8 ms event-capture specification. Determine the application minimum from the supported controller timing and test it.

Assess leakage at the terminals

A nominal sensor output voltage does not establish its off-state compatibility. Compare measured residual voltage and current with both off-state limits. Avoid adding arbitrary shunt resistors without checking sensor loading, dissipation and the approved circuit design.

Keep dielectric and signal limits separate

The 75 V DC working-isolation rating concerns the isolation boundary; it is not a permitted input signal. The same distinction applies to the higher short-duration dielectric test voltages. Use the switching envelope for field-circuit selection.

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05 Lifecycle, applications and acceptance boundary

Lifecycle and continuity

Active Mature. Plan continued use around the installed MicroLogix controller, available spare modules and supported engineering tools. A platform migration requires a separate review of wiring, I/O addressing and application behavior.

Powered sensor interfaces

Connect compatible sourcing or sinking DC sensors after checking off-state leakage and on-state voltage at the input terminals.

Sequence supervision

Observe discrete conditions used by the controller sequence. Include input delay and scan timing in the minimum event-duration assessment.

Scope of the offered input module

Check the complete catalog marking, series, bus connector and terminal condition. A separately supplied controller, field sensor or enclosure is not included unless itemized. Preserve the accepted input-address mapping when planning replacement.

Technical basis

Rockwell Automation 1762-IN010D-EN-P installation instructions and 1762-IQ16 product data. Electrical, mounting and environmental limits apply to 1762-IQ16. The simultaneous-input allowance depends on input voltage and ambient temperature. Confirm the installed series and host-controller power budget.

Other automation product references

Emerson KJ2005X1-BK1 12P4688X052 SE3007

Foxboro FBM232 P0926GW

Honeywell DCOM-232/485

Independent references; no substitution or compatibility is implied.