Siemens 6ES7214-1BG40-0XB0

01 Retain the project and electrical execution

Capture the installed configuration

Record the complete article number, hardware and firmware versions, module order, device name and IP configuration before replacement.

Separate three circuit functions

Identify the AC CPU supply, DC sensor/input circuits and each relay load common. Trace them against the approved machine drawing.

CPU execution	AC/DC/Relay
Project record	Hardware configuration, communication settings and application backup
Hold point	Resolve any mismatch between terminal wiring and the retained configuration

Why cannot the onboard relays of 6ES7214-1BG40-0XB0 drive a high-speed pulse receiver directly?

Mechanical contacts have a maximum switching frequency of 1 Hz and a finite switching delay. The relay CPU requires a suitable digital signal board for pulse outputs; transistor-output CPU specifications must not be transferred to the onboard relay contacts.

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02 Establish the power and load budgets

Check the line supply

Measure the planned AC source against its voltage and frequency range. Account for startup inrush and the connected expansion arrangement.

Calculate sensor allocation

Subtract active input consumption and every sensor load from the 24 V output budget. Keep the 5 V expansion calculation separate.

CPU input	85–264 V AC; 47–63 Hz
Onboard inputs active	14 × 4 mA = 56 mA nominal
Sensor allowance before other loads	400 − 56 = 344 mA nominal

Does a 13824 analog value on 6ES7214-1BG40-0XB0 guarantee an exact 5.000 V input?

13824 is the nominal midpoint of the 0–27648 scale, corresponding to 5 V. Input accuracy, quantization, source loading and filtering still affect the actual measurement; the scale conversion is not an accuracy certificate.

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03 Review relay and voltage-input circuits

Protect the switched load

Confirm load voltage, current, suppression and external protection for each relay circuit. Do not assume the CPU protects a contact against overload.

Check analog reference wiring

Use the assigned single-ended voltage input and reference terminals. Compare field-source impedance and grounding with the intended acquisition path.

Relay point limit	2 A; 5–30 V DC or 5–250 V AC
Maximum switching frequency	1 Hz for mechanical relays
Analog acquisition	0–10 V; 0–27648 nominal data range

Can 6ES7214-1BG40-0XB0 preserve a relay output state after a transition from RUN to STOP?

The configured behavior can retain the last value or use a substitute value, with zero as the default substitute. Test the project setting against the required machine response; STOP is not a substitute for electrical isolation.

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04 Prove application and network behavior

Restore the configured hardware

Load the compatible retained project and confirm that local modules and PROFINET devices are assigned to the intended process points.

Compare actual process values

Apply controlled input conditions and check the application outputs. Allow analog integration and smoothing to settle before judging a value.

Nominal analog midpoint	5 V → 13824
Pulse-output requirement	Appropriate digital signal board for this relay CPU
Network check	Device identity, communication status and configured I/O response

Why must a replacement 6ES7214-1BG40-0XB0 be checked against the project even when its article number matches?

Firmware and hardware context can affect available capacities and supported functions. Compare the retained project, installed version, communication settings and actual I/O configuration before restoring control.

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05 Validate STOP response and handover

Test the intended output state

Under the approved test procedure, verify the configured last-value or substitute-value behavior for each affected relay output.

Remove commissioning overrides

Restore field wiring, remove forces or temporary substitutions and retain the tested project version and observed results.

Output behavior record	RUN-to-STOP response and recovery
Final configuration	No unintended force, bypass or temporary address remains
Handover evidence	Measured values, load checks and retained hardware/firmware identity

Other Siemens product references

Siemens 6ES7138-7EC00-0AA0

Siemens 6ES7155-6BU00-0CN0

Siemens 6ES7405-0KA02-0AA0

Separate product references; no substitution or compatibility is implied.