Siemens 6ES7416-2XK02-0AB0

01 Programmable Logic Controller Central Processing Unit

Siemens 6ES7416-2XK02-0AB0 supports a structured control program with distinct working, load and system memory resources. Its MPI/DP and dedicated DP paths allow programming access and distributed I/O to be planned as separate parts of the automation system.

1. **Project + load memory**
2. **CPU working memory**
3. **MPI/DP and DP**
4. **Configured process I/O**

Physical and functional arrangement

Working memory contains runtime code and data, while load memory retains the project blocks used to establish that runtime state. An expanded memory card does not increase the fixed working-memory capacity. Preserve the correct project and backup arrangement when replacing the CPU.

Signal path and configuration

The two interfaces have different distributed-I/O resource limits. Their configured bus role, addresses, baud rate and process-image assignment must agree with the installed network. Consistent data transfer is a program-design decision, particularly for drives or multi-byte process values.

Application boundary

The CPU provides diagnostic and test resources for controlled commissioning. Forcing or modifying variables can affect actual outputs, so restore normal program ownership after testing. A successful RUN transition alone does not prove that retained data, communication partners or process interlocks are correct.

Ratings apply to the stated hardware execution and operating conditions. Installed firmware, companion modules and configured functions must match the application.

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02 Technical data and engineering limits

Code working memory	0.8 Mbyte
Data working memory	0.8 Mbyte
Integrated load memory	256 Kbyte RAM
Load-memory expansion	Up to 64 Mbyte RAM or FLASH card
Bit-operation time	0.08 µs minimum
Floating-point operation	0.48 µs minimum
S7 timers / counters	512 / 512
Memory markers	16 Kbyte
Process-image partitions	Up to 8
Interfaces	MPI/DP and PROFIBUS DP
Maximum bus rate	12 Mbit/s
5 V bus current	1.5 A typical; 1.6 A maximum

Additional interface data

Data blocks	Up to 4095; up to 64 Kbyte each
Function blocks / functions	Up to 2048 FB / 2048 FC
Local data	Up to 32 Kbyte; 16 Kbyte preset
Diagnostic buffer	Up to 3200 entries; 120 preset
MPI/DP master slaves	Up to 32
Dedicated DP master slaves	Up to 125
Process image	16 Kbyte input / 16 Kbyte output maximum; configurable
Power dissipation	7.5 W typical

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03 Application map and integration boundaries

01 Distributed machine control

Execute a configured S7-400 program with PROFIBUS I/O.

02 Multi-rate processing

Allocate cyclic and interrupt work with the intended process-image updates.

03 Drive data exchange

Handle consistent multi-byte process data through the configured communication path.

04 Legacy controller replacement

Restore the exact project, memory and network arrangement during service.

Memory budgeting

Assess code, data and load memory separately; memory-card expansion does not expand the working-memory partitions.

Data consistency

Keep the chosen process-image or system-function access method coherent throughout each multi-byte data path.

Interface allocation

Apply separate MPI/DP and DP resource limits and verify the assigned master/slave role before download.

Configuration scope: Review project compatibility, firmware, memory, I/O allocation and communication partners before selecting an S7-400 replacement.

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04 Technical questions that affect operation

Does a larger memory card expand working memory on 6ES7416-2XK02-0AB0?

No. Load memory and runtime working memory are different resources. Check code and data working-memory use independently of card capacity.

Why should process-image consistency be reviewed when migrating a project to 6ES7416-2XK02-0AB0?

Multi-byte values must be transferred consistently. Do not mix a process-image method with SFC14/15 access without reviewing the resulting data semantics.

Can both ports of 6ES7416-2XK02-0AB0 be treated as identical DP-master resources?

No. The MPI/DP path and dedicated DP interface have different slave and I/O-area limits. Allocate each network using its own resource envelope.

What can invalidate a replacement test even if 6ES7416-2XK02-0AB0 reaches RUN?

Unrestored retained data, wrong bus addresses, missing partners or incorrect output interlocks can remain. Verify the process behavior as well as the CPU operating state.

How should forcing be handled during commissioning of 6ES7416-2XK02-0AB0?

Track every force and modification, assess its physical effect and remove it before returning normal program ownership. Retain the final force-status check in the handover.

Why must battery and load-memory arrangements be recorded for 6ES7416-2XK02-0AB0?

They determine which program and data state survive loss of supply. A CPU replacement must preserve the intended startup and retention behavior.

When does distributed-I/O allocation shrink with 6ES7416-2XK02-0AB0?

Clock-synchronous operation halves the distributed address area for each strand assigned to OB61/62. Include that condition in the hardware configuration review.

How can diagnostic-buffer sizing improve fault investigation on 6ES7416-2XK02-0AB0?

Retain enough events for the application and capture the buffer before clearing or restarting. More entries do not replace timestamp and process-context review.

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05 Selection, service planning and related equipment

Match the installed arrangement

Match the complete Siemens 6ES7416-2XK02-0AB0 marking and installed configuration. Confirm the complete CPU order number, firmware, memory card and interface markings.

Support and migration

Cancelled legacy product; replacement planning should retain the installed S7-400 hardware and software requirements. Review project compatibility, firmware, memory, I/O allocation and communication partners before selecting an S7-400 replacement.

Equipment boundary

Confirm the CPU, memory card, backup accessories and connectors actually itemized. Companion hardware and accessories are included only when itemized; the function of the complete installed arrangement depends on the correct combination.

Engineering review before intervention

Capture the running project	Archive the project and record firmware, memory-card type, retained-data requirements and diagnostics. Identify the CPU operating mode and approved output state before stopping the process.
Rebuild network identity	Record both interface roles, addresses, rates and connected partners. Compare the intended slave counts and I/O allocation with the resources of the selected interface, including clock-synchronous restrictions.

Related equipment navigation

Siemens 6ES7153-2BA02-0XB0

Siemens 6ES7321-1BL00-0AA0

Siemens 6ES7332-8TF01-0AB0

Related references support separate application assessment and do not imply replacement compatibility. Technical basis: Siemens S7-400 CPU Specifications, A5E00165965-01.