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01 Readiness and channel boundary

Siemens 6ES7431-7KF10-0AB0 is an SM 431 eight-channel RTD analog input module with 16-bit resolution. It supports parameterizable Pt and Ni resistance-temperature measurements with diagnostics and hardware-interrupt capability.

Match the exact S7-400 position

Confirm the complete order number, the rack slot and the retained STEP 7 hardware configuration before the connector is moved.

Order number	6ES7431-7KF10-0AB0
Designation	SM 431
Input role	Eight RTD channels

Establish the safe signal boundary

Place every connected temperature loop in its approved maintenance state and record the as-found value before isolation.

Field circuits	Eight resistance-temperature inputs
Module supply	No external supply required
Release	All channels stable and diagnostic-free

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02 Sensor wiring and parameter setup

Configure each channel from the installed RTD circuit, not from a neighboring module or a generic sensor assumption.

Select the resistance thermometer

The documented sensor families are Pt100, Pt200, Pt500, Pt1000, Ni100 and Ni1000. Preserve the selected characteristic for each channel.

Connection	RTD three-wire or four-wire
Sensor current	Typically 1 mA
Cable	Shielded, maximum 200 m

Load the retained channel parameters

Use STEP 7 to restore measuring method, sensor range, diagnostic enables and the configured hardware-interrupt behavior.

Resolution	16 bit
Update rate	25 ms for eight channels
Interrupts	Hardware interrupts supported

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03 Installation and restoration sequence

Keep connector orientation, channel numbering and sensor leads together through the complete replacement sequence.

STEP	MODEL-SPECIFIC ACTION
01	Record the slot, connector keying, cable labels and all eight channel values.
02	Isolate the rack and field circuits, then prove the affected points safe.
03	Inspect the 48-pin connector, shielding and RTD conductor condition.
04	Seat the module and connector without changing three- or four-wire assignments.
05	Restore the retained STEP 7 parameters and compare every channel range.
06	Energize under control and review values, LEDs, diagnostics and interrupts.

Connection integrity

Verify each resistance-temperature path against the preserved channel map; an exchanged sense or current lead invalidates the measurement.

Method	3-wire / 4-wire
Result	Stable engineering value

Mechanical integrity

Confirm module seating, connector retention and cable strain relief before rack power is restored.

Width	25 mm
Module	290 x 210 mm H x D

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04 Diagnostics and functional verification

Use the module indication and the controller diagnostic record together; a plausible temperature value does not by itself clear a fault.

OBSERVATION	MODEL-SPECIFIC RESPONSE
INTF LED	Investigate an internal module fault and read the diagnostic data.
EXTF LED	Inspect sensor wiring, range selection and external circuit condition.
Unstable value	Check RTD lead arrangement, shielding and connector contact.
Range mismatch	Compare the configured sensor characteristic and wiring method.
Interrupt mismatch	Review limits, enable state and the controller event record.
Channel deviation	Compare against a controlled reference or retained process baseline.

Electrical boundary

The channels are isolated from the backplane bus but not from each other. Preserve the documented field-potential arrangement.

Backplane	Isolated
Between channels	Not isolated

Conversion boundary

Confirm 16-bit conversion and the 25 ms eight-channel update behavior in the final functional test.

Resolution	16 bit
Eight-channel update	25 ms

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05 Acceptance and service handover

Release the module only when identity, configuration, every temperature channel, diagnostics and interrupt behavior agree with the controlled record.

RELEASE GATE	PASS CONDITION
Identity	6ES7431-7KF10-0AB0 and SM 431 confirmed
Configuration	Eight sensor types, wiring methods and ranges matched
Values	All eight channels stable and credible
Diagnostics	No unresolved INTF/EXTF fault; configured interrupt response tested

Related SIMATIC S7-400 pages

Siemens 6ES7431-7QH00-0AB0	View product page
Siemens 6ES7432-1HF00-0AB0	View product page
Siemens 6ES7422-1BL00-0AA0	View product page
Siemens 6ES7421-1BL01-0AA0	View product page
Siemens 6ES7416-2XK02-0AB0	View product page
Siemens 6ES7417-4HL04-0AB0	View product page
Siemens 6ES7417-5HT06-0AB0	View product page
Siemens 6ES7417-4XL04-0AB0	View product page

Handover record

Retain the eight channel results, INTF/EXTF state, controller diagnostic result and the final interrupt test with the service record.

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