1746-HSCE

Allen-Bradley / SLC 500 High-Speed Counter Module

Allen-Bradley 1746-HSCE counts encoder and switch pulses in an SLC 500 chassis and controls local outputs against configured count or rate conditions.

Product details

Manufacturer part number	1746-HSCE
Shipping	Swift global dispatch
Condition	New, original product
Shipping size (est.)	3.5cm × 13cm × 14.5cm
Country of origin	USA
Weight	0.26 kg

Overview

A dedicated module captures motion pulses and updates its local outputs independently of the normal SLC program scan. The controller reads the module's status and accumulated value for the rest of the machine sequence.

Select Range mode when the required action depends on count windows, Rate mode when pulse frequency is the controlling variable, or Sequencer mode when crossing preset values must advance an output pattern. Choose the mode from the machine's timing and reset behavior before assigning output ownership.

The Setup and Control Word in the M0 file selects the operation. The Function Control transition triggers the selected module function. A replacement therefore requires the original slot configuration and setup data in addition to matching the terminal wiring.

Use the module's indication and controller status together during commissioning. The input LEDs show field transitions, while the output LEDs show output state. Verify the machine sequence against the accumulated counter and the assigned output owner before enabling normal operation.

Technical specifications

Allen-Bradley / 1746-HSCE

Counter architecture	One bidirectional accumulated counter with rate measurement
Operating modes	Range, Rate and Sequencer
Encoder inputs	A, B and Z; differential or single-ended
Quadrature multipliers	×2 and ×4
Maximum input frequency	50 kHz in Sequencer/Range; 32.767 kHz in Rate
Minimum pulse width	10 µs
Minimum phase separation	4.5 µs
Backplane current	320 mA at +5 V DC; 0 mA at +24 V DC
Output circuit	Four open-collector current-sinking outputs
Input-to-backplane isolation	1500 V
Operating temperature	0 to +60 °C
Humidity	5 to 95% RH, noncondensing
Maximum cable length	305 m with Belden 9503 or equivalent

Technical notes

Input configuration

Select differential or single-ended A/B/Z connections to match the encoder, then compare the observed count direction with the machine reference.

Rate behavior

The rate measurement accumulates pulses over a configured period. Select the period to balance low-speed resolution against response time.

Technical reference

High-Speed Counter Module User Manual 1746-UM006B-EN-P and Installation Instructions 1746-IN011C-EN-P.

Applications and precautions

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Applications / Compatibility

Position monitoring

Use the A/B direction relationship to track movement in either direction. Confirm the expected sign of travel with a controlled test.

Reference and reset

Use the encoder Z, configured limit switch or controller soft reset to establish the intended reference. Enable only the reset sources required by the process.

Rate threshold control

Compare the rate measurement with the process threshold and choose an appropriate rate period for the required response.

Output sequence

Use Sequencer mode for preset-driven changes in output patterns. Verify each transition independently before connecting active loads.

Product Precautions

Match the input interface

Check the encoder output type and configure the input selection for differential or single-ended wiring before connecting the field circuit.

Preserve quadrature polarity

Identify A and B at both ends of the cable. Test one known movement direction before releasing the system.

Verify reset filtering

Select the JW1 limit-switch filter for the mechanical switch response and the machine's reset timing.

Budget chassis current

Include the module's +5 V backplane demand in the chassis supply calculation, using the installed slot and other modules.

Use the correct output load

Treat the four outputs as sinking open-collector circuits. Check the external load supply, return and current before energizing.

Test without production loads

Prove count, reset and output behavior under controlled conditions. Reconnect the process only after the commissioning checks are complete.

Product support

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Lifecycle Status

1746-HSCE status

Rockwell Automation discontinued Allen-Bradley 1746-HSCE on September 30, 2024.

Support and replacement

Rockwell classifies the replacement path as an engineering replacement. Check the full catalog marking, series, processor, slot configuration and encoder interface when reviewing support or a migration.

Apter Power availability

Unit availability and dispatch timing are confirmed in the Apter Power quotation, independently of the manufacturer lifecycle status.

Available Unit Details

Offered reference

Allen-Bradley 1746-HSCE. Condition: New, original product.

Identity check

Check the 1746-HSCE catalog marking, terminal block and the existing chassis configuration. Review the series marking and the A/B/Z input arrangement.

Included items

Confirm whether the removable terminal block and associated wiring hardware are included. The encoder and SLC chassis are separate unless itemized.

Alternative Names

1746 HSCE | Allen-Bradley 1746-HSCE

Downloads on the product page

Technical Reference: Rockwell Automation excerpt. Installation & Commissioning Guide: Apter Power guide.

Related Apter Power listings

Allen-Bradley 1746-IB16

Allen-Bradley 1746-OW16

Allen-Bradley 1746-NIO4I

Frequently asked questions

Allen-Bradley / 1746-HSCE

How can I verify count direction after replacing a 1746-HSCE?

Move the encoder slowly in the machine's defined positive direction and observe the accumulated count. If the sign is wrong, compare the A/B channel assignment and the configured count direction with the original wiring and program.

Can a 1746-HSCE be used behind a 1747-ASB remote I/O adapter?

The 1746-HSCE user manual excludes the 1747-ASB. Confirm the actual chassis and processor arrangement before allocating a slot. The SLC form factor alone does not establish support.

How does the rate-period setting affect a 1746-HSCE application?

A longer sampling interval captures more pulses at low speed and updates less often. Test both the slowest expected speed and the fastest acceptable response before finalizing the period.

What should I check if the 1746-HSCE counts but its physical outputs do not switch?

Verify the selected output owner and active mode, compare the output LEDs and status to the expected pattern, then verify the external supply and return for the sinking load circuit.

How can I diagnose an unexpected counter reset on a 1746-HSCE?

Review the enabled Z, limit switch and soft-reset sources. Compare their transitions and the configured reset action with the machine sequence, including the selected limit-switch filter.

What should be preserved from the SLC program when a 1746-HSCE is replaced?

Keep the slot configuration, M-file mapping and setup/control data. Check that the intended Function Control transition occurs after the configuration words are ready.

How should the 1746-HSCE be commissioned when the encoder is already installed?

Confirm the electrical input type and channel assignment first. Record the response to slow positive and negative motion, then exercise the configured reference input before testing the machine's normal sequence.

Why can an encoder signal look valid at low speed yet fail at full speed on a 1746-HSCE?

Check pulse width and A/B phase separation at the actual field interface at operating speed. Verify the selected mode's frequency limit and the installed cable before changing program logic.

Apter Power sourcing enquiries

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