Spectrum Controls 1746SC-CTR4

01 Four-Channel High-Speed Counter and Flowmeter Input Module / system role

Product function

Spectrum Controls 1746SC-CTR4 keeps pulse acquisition separate from the controller scan while configuration words determine how counts, direction and rate become application data.

Selected configuration

The module supports four differential counting inputs or two quadrature channels. Selecting quadrature changes how the physical inputs are paired and interpreted; it is not four independent quadrature encoders.

Integration checkpoints

- Pulse accumulation
- Turbine-flow measurement
- Quadrature position feedback
- Rate supervision

Processing modes	Count, rate and quadrature
Configuration	Class III image-table exchange
Application focus	Pulse qualification, scaling and overflow handling

The CTR4 reserves sixteen input and sixteen output registers and uses Class III operation. SLC 5/01 processors do not support that mode, and ASB remote-rack applications are unsuitable for this module because of its image size.

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02 Technical operating envelope

Differential inputs	4
Quadrature channels	2
External enable inputs	2
Maximum input frequency	50 kHz
Selectable DC levels	5, 12 or 24 V DC
Module ID	10200

Image allocation	16 input and 16 output words
Rack current, 5 V	175 mA
Rack current, 24 V	75 mA
Isolation, channel to rack	1000 V DC
Isolation, channel to channel	None
Operating temperature	0-60 degrees C

Apply the 1746SC-CTR4 execution and the stated configuration-dependent limits; shared family material does not assign features from another variant.

Processor compatibility

Use module ID 10200 with a processor that supports the required Class III image exchange. Do not use the CTR8 identity or assume compatibility with an SLC 5/01 or an ASB remote rack.

Timing and scaling

The count and instantaneous-rate update is 4.0 ms per channel with scaling off and 5.6 ms with scaling on. Average-rate mode updates at one second per channel; select the mode according to response and resolution requirements.

Isolation boundary

Channel-to-rack isolation does not provide channel-to-channel isolation. Review the field common-mode and grounding arrangement for all connected pulse sources.

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03 System integration and applications

Pulse accumulation

Count qualified pulses from a compatible DC source.

Turbine-flow measurement

Convert the accepted pulse rate using the calibrated meter factor.

Quadrature position feedback

Interpret paired pulse phases for direction and count.

Rate supervision

Use configured rate, limit and status values in a compatible controller program.

Application and compatibility boundary

Input-level selection, filters, external enables and scaling factors determine the reported count or rate. Faster filtering does not repair poor pulse shape, and a correct raw count does not establish the application engineering-unit scale.

Available unit verification

Check the Spectrum Controls label, CTR4 identity, terminal block, slot assignment and processor support. Confirm the counter module, removable terminal block, field encoders or flowmeters, signal cables and any interface accessories in the quotation. Evaluate the actual interfaces and included accessories against the installed arrangement.

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04 Engineering selection decisions

Why is 1746SC-CTR4 unsuitable for an SLC 5/01 processor?

It requires Class III operation and a larger image exchange than the SLC 5/01 supports. A physical fit in the chassis does not establish processor compatibility.

Can 1746SC-CTR4 be placed behind an ASB remote-I/O adapter?

The module is unsuitable for ASB remote-rack applications because of its input/output word requirement. Use a supported local architecture and confirm processor support.

What changes when 1746SC-CTR4 is switched from pulse counting to quadrature?

Inputs are paired to interpret phase and direction, giving two quadrature channels. Recheck wiring, direction convention and channel allocation rather than retaining four independent input assumptions.

How can filtering on 1746SC-CTR4 cause missed pulses?

A filter setting that rejects valid short pulses can reduce the accepted count. Choose the filter from signal frequency and pulse width, then validate it with representative waveforms.

Why does a correct raw count on 1746SC-CTR4 not prove the displayed flow rate?

The conversion also depends on pulse-per-unit scaling and the selected rate mode. Check the source calibration and engineering-unit conversion independently of counting continuity.

How does enabling scaling change response time on 1746SC-CTR4?

Count and instantaneous-rate update time increases from 4.0 to 5.6 ms per channel. Include that processing time and the controller update path in the response assessment.

Does the isolation rating of 1746SC-CTR4 isolate one pulse source from another?

No. The specified isolation is between the input circuitry and rack; the channels are not isolated from each other. Review common-mode voltage and grounding across the field sources.

Why should rollover and overrange status be tested on 1746SC-CTR4?

The application must interpret counts and flags correctly near the selected numeric limits. A short low-rate test can pass while overflow handling or sign interpretation remains wrong.

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05 Configuration boundary and references

Lifecycle and support

The current manufacturing and manufacturer-support stage for this exact model is not confirmed.

Replacement assessment

Match the CTR4 image allocation and processor compatibility before considering a higher-channel replacement. Rework channel maps and configuration deliberately if changing to CTR8.

Available unit details

Offered reference: Spectrum Controls 1746SC-CTR4. Condition: New, original product. Check the Spectrum Controls label, CTR4 identity, terminal block, slot assignment and processor support. Confirm the counter module, removable terminal block, field encoders or flowmeters, signal cables and any interface accessories in the quotation; companion equipment is included only when itemized.

Document roles: The original excerpt retains manufacturer tables and drawings; this brief addresses selection and system context; the separate installation guide covers field procedures and acceptance.

Technical basis: Spectrum Controls SLC 500 Counter/Flowmeter Input Module User Manual, 0300181-09 Rev. A0.

Related product navigation

- Allen-Bradley 1746-P4
- Allen-Bradley 1746-IA16
- Allen-Bradley 1746-IB16

Related products for separate application assessment; verify the platform and interface. No interchangeability is implied.

Product enquiries