APTER POWER / ALLEN-BRADLEY

1746-HSCE

Installation & Commissioning Guide

Apter Power installation guide

Inspect the chassis and encoder circuit

Pre-installation decision sequence

1 Isolate the equipment

Follow the site isolation procedure before handling the chassis, the module, the removable terminal block or field wiring. Treat a disconnected encoder cable and a de-energized load supply as separate checks.

2 Establish the control point

Record the slot number, SLC processor, counter operating mode, field wiring and the expected count direction. Confirm the assembly is not a 1747-ASB remote I/O application.

3 Inventory the interfaces

Identify the A, B and Z signals, the reset or limit circuit, and each output load. Check the electrical output type of the actual encoder instead of relying on its mechanical model name.

4 Record the program baseline

Capture the original setup and control words and the output ownership of each channel. A physical replacement does not reconstruct these controller settings.

Before work

- ☐ **A/B/Z signal type**
  Terminal mapping agrees with the installed encoder output.
- ☐ **Chassis reference**
  Slot and processor records agree with the physical assembly.
- ☐ **Isolation boundary**
  Backplane and external load circuits have separate verified isolation.

Set the hardware before wiring

Switch and jumper checks

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1 A/B/Z interface

Set switch 1 for differential or single-ended signals as the installation requires. Differential inputs and single-ended inputs have different thresholds; apply the specified input circuit instead of wiring the two forms interchangeably.

2 External output supply

Use the switch 2 range that corresponds to the actual external output voltage. The documented ranges are 4.5 to 10 V DC with switch 2 on and 10 to 30 V DC with it off.

3 Limit input filter

JW1 selects 300 us or 10 ms filtering for the limit input. Choose the value from the switch response and the required reset timing, then record the setting for service.

4 Backplane capacity

Include 320 mA at +5 V DC in the chassis power calculation. The module does not draw current from the +24 V DC backplane rail.

Switch acceptance

- [ ] **SW1**
  Record differential or single-ended and confirm against the encoder.
- [ ] **SW2**
  Match the selected voltage range to the external load circuit.
- [ ] **JW1**
  Record 300 us or 10 ms and verify reference response.

Prove inputs and reference events

Test at a controlled speed

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1 Count direction

Move in the defined positive direction with process outputs inhibited. Compare observed count direction with the machine reference and confirm that reversing motion reverses count direction.

2 Signal timing

Measure pulse width and A/B phase separation at the input if count integrity changes with speed. The input calls for a minimum pulse width of 10 us and minimum phase separation of 4.5 us.

3 Reset event selection

Exercise only the Z input, limit switch or soft-reset inputs that are configured. Verify that an unselected source does not disturb the reference.

4 Input indication

Compare field signals with the input LEDs and the accumulated value. An input transition can be present even when the selected mode and reset action prevent the expected accumulated count.

Observed behavior

- [ ] **Positive and negative travel**
  Count sign reverses with known mechanical direction.
- [ ] **Selected reset event**
  The reference event produces only the programmed reset action.
- [ ] **Pulse timing at speed**
  Field signals meet both minimum widths and the selected mode limit.

Commission the program and loads

Mode-specific acceptance sequence

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1 Setup and Control Word

Confirm the slot, M-file mapping and Setup and Control Word. Apply the Function Control transition only after the intended configuration words are ready.

2 Range test

Drive the count across each boundary in both permitted directions. Verify output behavior at the boundary and after a reference event.

3 Rate test

Compare actual speed to the measured rate at the slowest required speed and near the control threshold. Test response using the selected rate period.

4 Sequencer test

Exercise the configured preset crossings with the process loads inhibited. Compare each output pattern with the documented machine sequence.

5 Release

After sign-off, reconnect only the approved load circuits. Confirm external supply and current limits and record the first complete sequence under site procedures.

Release criteria

- ☐ **Configuration**
  Program slot and setup file match the maintenance record.
- ☐ **Output verification**
  Each controlled load state agrees with the tested counter condition.
- ☐ **Retest requirement**
  Repeat reference, direction and load checks after any setup change.

Record handover and fault isolation

Maintenance checkpoints

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1 Count absent

Start at the encoder supply, channel wiring and input-selection switch. Compare the encoder circuit with the actual module terminals and verify the module status in the processor.

2 Count intermittent

Check cable continuity, pulse widths, A/B phase separation and the configured mode limit. Compare a controlled low-speed trial with the actual operating speed.

3 Count correct, load inactive

Identify which controller or module function owns the output. Compare the indicator and program status with the actual output voltage and return path.

4 Repeatable handover

Keep the catalog and series, slot mapping, switch and jumper settings, reset sources, rate period, and the proved output sequence in the maintenance record.

Manufacturer references

High-Speed Counter Module User Manual | 1746-UM006B-EN-P

High-Speed Counter Module Installation Instructions | 1746-IN011C-EN-P

Related Apter Power listings

Allen-Bradley 1746-A4

Allen-Bradley 1746-P2

Allen-Bradley 1747-L532

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