

MANUFACTURER DOCUMENT PACKAGE

Manufacturer's Manual

Reference package for procurement and maintenance review

ALLEN-BRADLEY

1756-OF6VI

ISOLATED ANALOG VOLTAGE OUTPUT MODULE

Used with the applicable ControlLogix configuration.

REFERENCE PACKAGE

OFFICIAL DOCUMENT

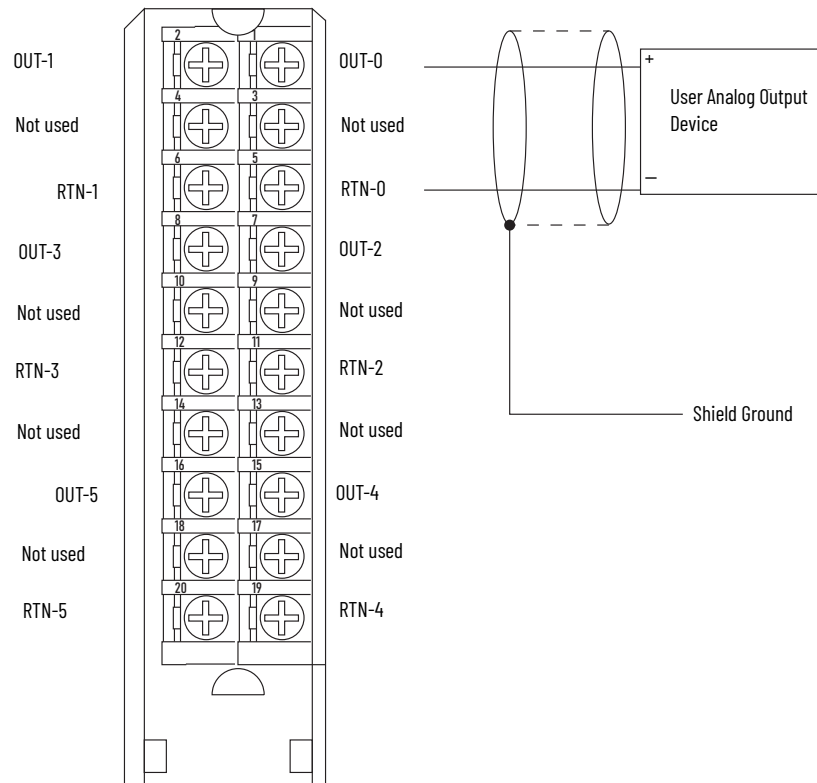
Selected official manufacturer pages follow this cover.

Source: Rockwell 1756-UM009G and 1756-TD002M, ControlLogix Analog I/O

1756-OF6VI Module Wiring

This illustration shows wiring examples for the 1756-OF6VI module.

1756-OF6VI Wiring example



Keep in mind the following:

- Place additional devices anywhere in the loop.
- Do not connect more than two wires to any single terminal.



ATTENTION: If you use a separate power source, do not exceed the specific isolation voltage.

1756-OF6CI and 1756-OF6VI Module Fault and Status Reporting

The 1756-OF6CI and 1756-OF6VI modules multicast status and fault data to the owner and/or listening controller with its channel data. The fault data is arranged in such a manner as to let you choose the level of granularity that is desired for examining fault conditions.

Three levels of tags work together to provide an increasing degree of detail as to the specific cause of faults on the module.

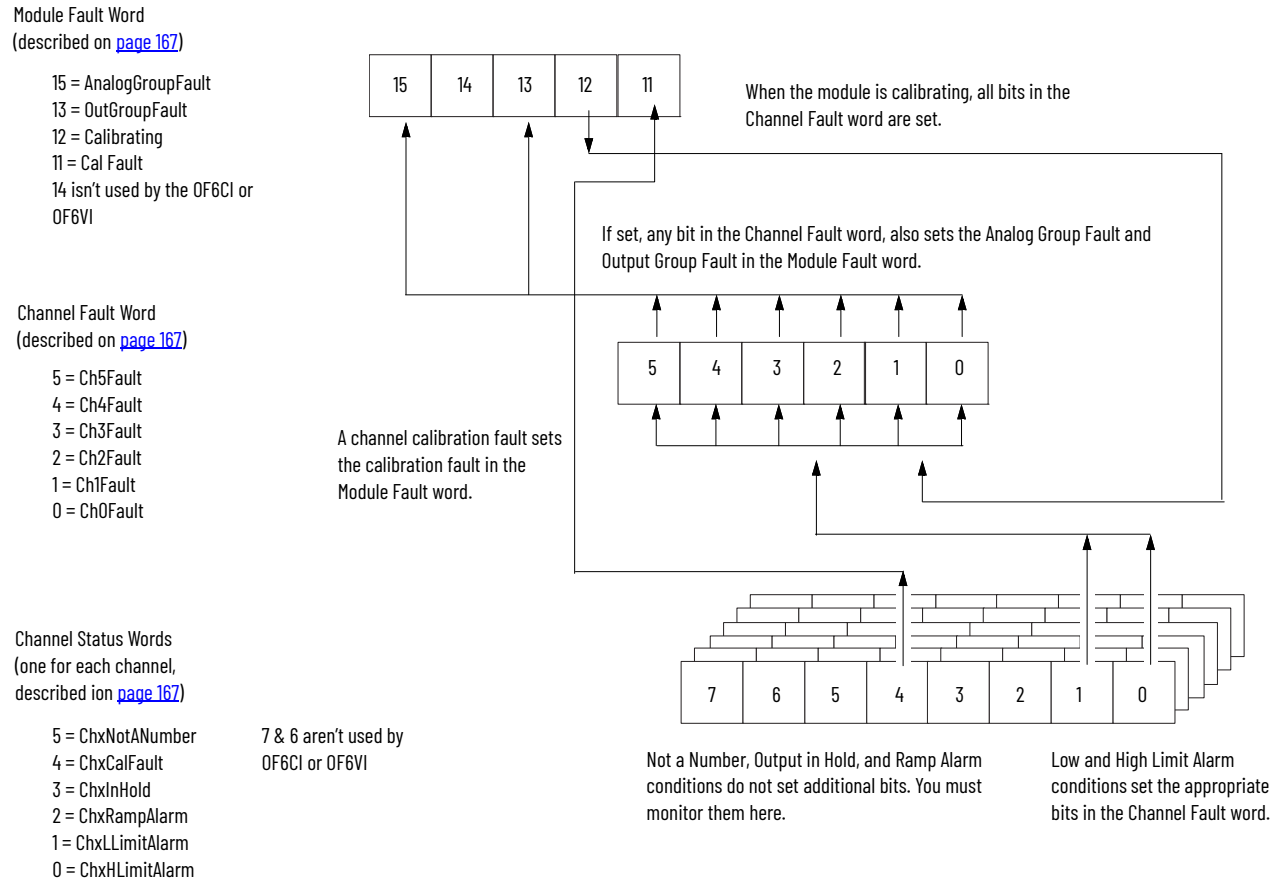
This table lists tags that can be examined in ladder logic when a fault occurs.

Tag	Description
Module Fault Word	This word provides fault summary reporting. Its tag name is ModuleFaults.
Channel Fault Word	This word provides underrange, overrange, and communications fault reporting. Its tag name is ChannelFaults.
Channel Status Words	This word provides individual channel underrange and overrange fault reporting for process alarms, rate alarms, and calibration faults. Its tag name is ChxStatus.

IMPORTANT Differences exist between floating point and integer modes as they relate to module fault reporting. These differences are explained in the following two sections.

Fault Reporting in Floating Point Mode

This illustration provides an overview of the fault reporting process for the 1756-OF6CI or 1756-OF6VI module in floating point mode.



Bits in this word provide the highest level of fault detection. A nonzero condition in this word reveals that a fault exists on the module.

This table lists tags that you can further examine in ladder logic to isolate the fault.

1756-OF6CI, 1756-OF6VI Module Fault Word Bits – Floating Point Mode

Tag	Description	Tag Name
Analog Group Fault	This bit is set when any bits in the Channel Fault word are set.	AnalogGroupFault
Output Group Fault	This bit is set when any bits in the Channel Fault word are set.	OutputGroupFault
Calibrating	This bit is set when any channel is being calibrated. When this bit is set, all bits in the Channel Fault word are set.	Calibrating
Calibration Fault	This bit is set when any individual Channel Calibration Fault bits are set.	CalFault

During normal module operation, Channel Fault word bits are set if any of the respective channels has a High or Low Limit Alarm. A quick way to check for High or Low Limit Alarm condition on a channel is to check this word for a nonzero condition.

This table lists the conditions that set **all** Channel Fault word bits in floating point mode.

1756-OF6CI, 1756-OF6VI Channel Fault Word Bits – Floating Point Mode

Condition	Display
A channel is being calibrated	'003F' for all bits
A communications fault occurred between the module and its owner-controller	'FFFF' for all bits

Set your logic to monitor the Channel Fault bit for a particular output, if you either:

- set the high and low limit alarms outside your operating range.
- disable output limiting.

Any of the six Channel Status words, one for each channel, displays a nonzero condition if that particular channel has faulted for the conditions that are listed below. Some of these bits set bits in other Fault words.

When the High or Low Limit Alarm bits (bits 1 and 0) in any of the words are set, the appropriate bit is set in the Channel Fault word.

When the Calibration Fault bit (bit 4) is set in any of the words, the Calibration Fault bit (bit 11) is set in the Module Fault word.

This table lists the conditions that set each of the word bits.

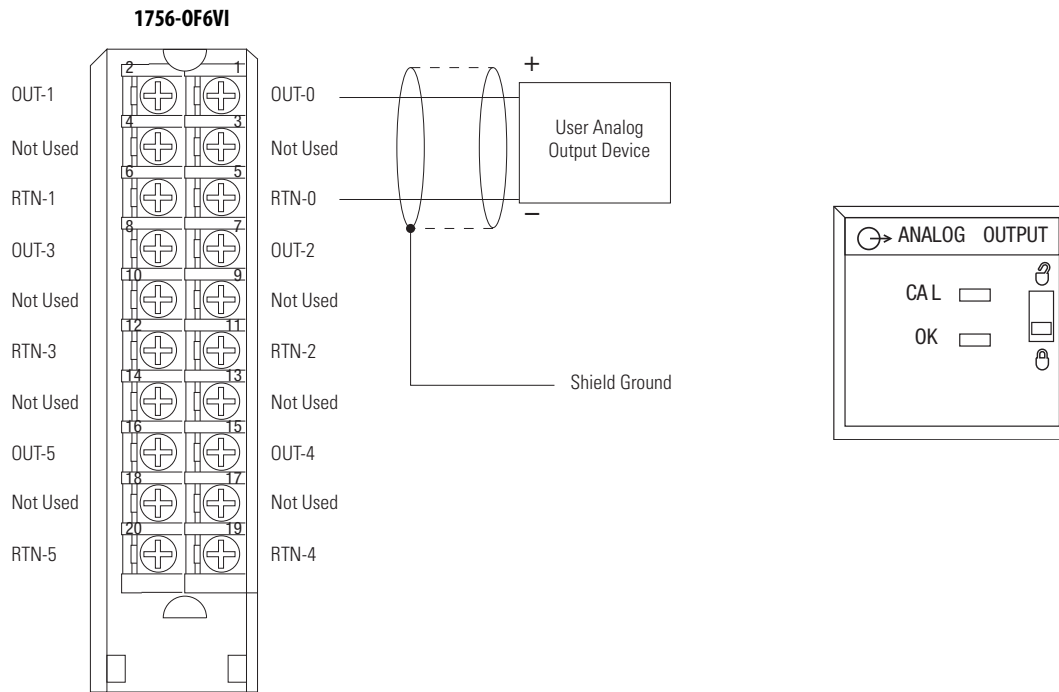
1756-OF6CI, 1756-OF6VI Channel Status Word Bits – Floating Point Mode

Tag (Status word)	Bit	Event that sets this tag
ChxNotaNumber	Bit 5	This bit is set when the output value that is received from the controller is NotaNumber (the IEEE NAN value). The output channel holds its last state.
ChxCaFault	Bit 4	This bit is set when an error occurred when calibrating. This bit also sets the appropriate bit in the Channel Fault word.
ChxInHold	Bit 3	This bit is set when the output channel is holding. The bit resets when the requested Run mode output value is within 0.1% of the current full-scale echo value.
ChxRampAlarm	Bit 2	This bit is set when the output channel's requested rate of change would exceed the configured maximum ramp rate requested parameter. It remains set until the output reaches its target value and ramping stops. If the bit is latched, it remains set until it's unlatched.
ChxLLimitAlarm	Bit 1	This bit is set when the requested output value is beneath the configured low limit value. It remains set until the requested output is above the low limit. If the bit is latched, it remains set until it's unlatched.
ChxHLimitAlarm	Bit 0	This bit is set when the requested output value is above the configured high limit value. It remains set until the requested output is below the high limit. If the bit is latched, it remains set until it's unlatched.

IMPORTANT The 1756-OF6CI and 1756-OF6VI modules do not use **bits 6 or 7** in this mode.

1756-0F6VI

ControlLogix voltage loop output analog module



Place additional devices anywhere in the loop.

Signal and User Counts - 1756-0F6VI

Range	Low Signal and User Counts	High Signal and User Counts
$\pm 10V$	-10.517V -32768 counts	10.517V 32767 counts

Technical Specifications - 1756-0F6VI

Attribute	1756-0F6VI
Outputs	6 individually isolated
Output range	$\pm 10.5V$
Resolution	14 bits across 21V (1.3 mV) (13 bits across 10.5V +sign bit)
Current draw @ 5.1V	250 mA
Current draw @ 24V	175 mA
Total backplane power	5.5 W
Power dissipation, max	4.85 W
Thermal dissipation	16.54 BTU/hr
Output impedance	$<1 \Omega$
Open circuit detection	None
Overvoltage protection	24V DC
Short circuit protection	Electronically current limited
Drive capability	$> 1000 \Omega$ loads, 10 mA

Technical Specifications - 1756-OF6VI (continued)

Attribute	1756-OF6VI
Settling time	< 2 ms to 95% of final value with resistive loads
Calibrated accuracy @ 25 °C (77 °F)	Better than 0.1% of range
Calibration interval	6 months typical
Offset drift	60 μ V/ °C typical
Gain drift with temperature, nom	50 ppm/°C
Gain drift with temperature, max	80 ppm/°C
Module error	0.5% of range
Module scan time, max	25 ms floating point 10 ms integer
Data format	Integer mode (left justified, 2 s complement) IEEE 32-bit floating point
Module conversion method	R-Ladder DAC, monotonicity with no missing codes
Isolation voltage	250V (continuous), basic insulation type, output channels-to-backplane, and output channel-to-channel
Module keying	Electronic, software configurable
Removable terminal block	1756-TBNH 1756-TBSH
RTB keying	User-defined mechanical
Slot width	1
Wire category	2 ⁽¹⁾
Enclosure	None (open-style)
North American temperature code	T4A
IEC temperature code	T4

(1) Use this conductor category information for planning conductor routing as described in the system-level installation manual. See the Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

Environmental Specifications - 1756-OF6VI

Attribute	1756-OF6VI
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0...60 °C (32...140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...+85 °C (-40...+185 °F)
Relative humidity IEC 60068-2-30 (Test dB, Unpackaged Damp Heat)	5...95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10...500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	IEC 61000-6-4

Environmental Specifications - 1756-0F6VI (continued)

Attribute	1756-0F6VI
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz
EFT/B immunity IEC 61000-4-4	±2 kV at 5 kHz on shielded signal ports
Surge transient immunity IEC 61000-4-5	±2 kV line-earth (CM) on shielded signal ports
Conducted RF Immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz on shielded signal ports

Certifications - 1756-0F6VI

Certification (when product is marked) ⁽¹⁾	1756-0F6VI
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2014/30/EU EMC Directive, compliant with: • EN 61326-1; Meas./Control/Lab., Industrial Requirements • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions • EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) European Union 2014/35/EU LVD, compliant with: EN 61131-2; Programmable Controllers (Clause 11)
RCM	Australian Radiocommunications Act, compliant with: EN 61000-6-4; Industrial Emissions
Ex	European Union 2014/34/EU ATEX Directive, compliant with: • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X Gc
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3
EAC	Russian Customs Union TR CU 020/2011 EMC Technical Regulation Russian Customs Union TR CU 004/2011 LV Technical Regulation

(1) See the Product Certification link at rok.auto/certifications for Declarations of Conformity, Certificates, and other certification details.