

Installation Instructions

Original Instructions



Allen-Bradley

ControlLogix Analog Motion Modules

Catalog Numbers 1756-M02AE, 1756-M02AEK, 1756-M02AS, 1756-M02ASK, 1756-HYD02, 1756-HYD02K

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The 1756-M02AE/K module is a two-axis servo module for drives/actuators that need a $\pm 10V$ velocity or torque reference. Use the 1756-M02AE/K module when your equipment has quadrature encoder feedback.

The 1756-M02AS/K module is a two-axis servo module for drives/actuators that need a $\pm 10V$ velocity or torque reference input. Use the 1756-M02AS/K module when your equipment has Serial Synchronous Input (SSI) position feedback.

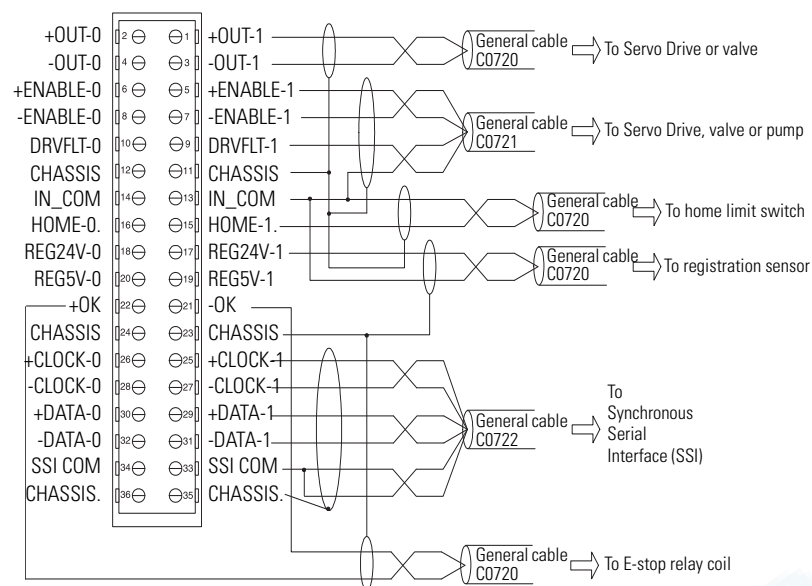
The 1756-HYD02/K module is typically used for accurate positioning and control of a hydraulic cylinder. The module can be wired to a linear displacement transducer (LDT) for feedback and a proportional or servo valve for control of a hydraulic axis and connects to a hydraulic system to close a high-speed position loop.



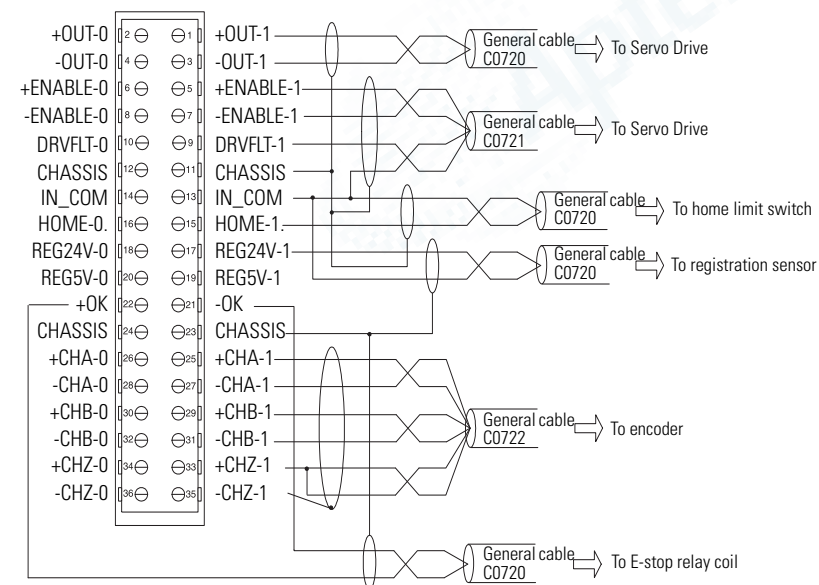
Wiring to a Servo Module

Use the wiring example in the following figures to wire to your module.

Wiring to Servo Module 1756-M02AS, 1756-M02ASK



Wiring to Servo Module 1756-M02AE, 1756-M02AEK



Install or Remove the Removable Terminal Block onto the Module



WARNING: When you connect or disconnect the Removable Terminal Block (RTB) with field side power applied, an electric arc can occur. This could cause an explosion in hazardous location installations. Be sure that power is removed or the area is nonhazardous before proceeding.

Before installing the RTB, make certain:

- Field-side wiring of the RTB has been completed.
- The RTB housing is snapped in place on the RTB.
- The RTB housing is closed.
- the locking tab at the top of the module is unlocked.

Check Status Indicators

The module uses a single bi-colored light-emitting diode to indicate module OK status and bi-colored light-emitting diode indicators to show individual feedback (FDBK) and drive (DRIVE) status for both axes.

During power-up, the module completes an indicator test. The OK indicator turns red for 1 second and then turns to flashing green if the module passes all its self-tests.

The module status indicators are shown in the table.

Module Indicators

1756-M02AE, 1756-M02AEK Indicators	1756-M02AS, 1756-M02ASK Indicators	1756-HYD02, 1756-HYD02 K Indicators
2 AXIS SERVO CH 0 CH 1 FDBK FDBK DRIVE DRIVE OK	2 AXIS SERVO / SSI CH0 CH1 FDBK FDBK DRIVE DRIVE OK	HYDRAULIC AX 0 AX 1 FDBK FDBK DRIVE DRIVE OK

Module Ok Indicators

1756-M02AE, 1756-M02AEK OK Indicator

If OK Indicator Displays:	The Module Status Is:	Take This Action:
Off	The module is not operating.	- Apply chassis power. - Verify that the module is completely inserted into the chassis and backplane.
Flashing green light	The module has passed internal diagnostics, but it is not communicating axis data over the backplane.	- None, if you have not configured the module. - If you have configured the module, check the slot number in the 1756-M02AE Properties dialog box.
Steady green light	Axis data is being exchanged with the module. The module is in the normal operating state.	None. The module is ready for action.
Flashing red light	A major recoverable failure has occurred. A communication fault, timer fault, or NVS update is in progress. The OK contact has opened.	- If an NVS update is in progress, complete the NVS update. - If an NVS update is not in progress: - Check the Servo Fault word for the source of the error. - Clear the servo fault condition using the Motion Axis Fault Reset instruction. - Resume normal operation. - If the flashing persists, reconfigure the module.
Solid red light	A potential nonrecoverable fault has occurred. The OK contact has opened.	Follow these steps: - Restart the module. - If the solid red persists, replace the module.

1756-M02AS, 1756-M02ASK OK Indicator

If OK Indicator Displays:	The Module Status Is:	Take This Action:
Off	The module is not operating.	- Apply chassis power. - Verify that the module is completely inserted in chassis and backplane.
Flashing green light	The module has passed internal diagnostics, but it is not communicating axis data over the backplane.	- None, if you have not configured the module. - If you have configured the module, check the slot number in the 1756-M02AS Properties dialog box.
Steady green light	One of the following: Module is exchanging axis data. The module is in the normal operating state.	None
Flashing red light	One of the following: A major recoverable failure has occurred. A communication fault, timer fault, or nonvolatile memory storage (NVS) update is in progress. The OK contact has opened.	- If an NVS update is in progress, complete the NVS update. - If an NVS update is not in progress: - Check the Servo Fault word for the source of the error. - Clear the servo fault condition via Motion Axis Fault Reset instruction. - Resume normal operation. - If the flashing persists, reconfigure the module.
Steady red light	One of the following: A potential non-recoverable fault has occurred. The OK contact has opened.	Follow these steps: - Restart the module. - If the solid red persists, replace the module.

1756-HYD02, 1756-HYD02K OK Indicator

If OK Indicator Displays:	The Module Status Is:	Take This Action:
Off	The module is not operating.	- Apply chassis power. - Verify that the module is completely inserted into the chassis and backplane.
Flashing green light	The module has passed internal diagnostics, but it is not communicating axis data over the backplane.	- Configure the module to begin communications. - If you have configured the module, check the slot number in the 1756-HYD02 Properties dialog box.
Steady green light	One of the following: Axis data is being exchanged with the module. The module is in the normal operating state.	None
Flashing red light	One of the following: A major recoverable failure has occurred. A communication fault, timer fault, or NVS update is in progress. The OK contact has opened.	- If a Non-Volatile Storage (NVS) update is in progress, complete the NVS update. - If an NVS update is not in progress, follow these steps: - Check the Servo Fault word for the source of the error. - Clear the servo fault condition using the Motion Axis Fault Reset instruction. - Resume normal operation. - If the flashing persists, reconfigure the module.
Steady red light	One of the following: A potential non-recoverable fault has occurred. The OK contact has opened.	Follow these steps: - Restart the module. - If the solid red persists, replace the module.

Module FDBK Indicators

1756-M02AE, 1756-M02AEK FDBK Indicator

If FDBK Indicator Displays:	The Module Status Is:	Take This Action:
Off	The axis is not used.	- None, if you are not using this axis. - If you are using this axis, make sure that the module is configured and an axis tag has been associated with the module.
Flashing green light	The axis is in the normal servo loop inactive state.	None. The servo axis state can be changed by executing motion instructions.
Steady green light	The axis is in the normal servo loop active state.	None. The servo can may be changed by executing motion instructions.
Flashing red light	The axis servo loop error tolerance has been exceeded.	- Correct the source of the problem. - Clear the servo fault condition using the Motion Axis Fault Reset instruction. - Resume normal operation.
Solid red light	An axis encoder feedback fault has occurred.	- Correct the source of the problem by checking the encoder and power connections. - Clear the servo fault condition using the Motion Axis Fault Reset instruction. - Resume normal operation.

1756-M02AS, 1756-M02ASK FDBK Indicator

If FDBK Indicator Displays:	The Module Status Is:	Take This Action:
Off	The axis is not used.	- None, if you are not using this axis. - If you are using this axis, make sure that the module is configured and an axis tag has been associated with the module.
Flashing green light	The axis is in the normal servo loop inactive state.	None. The servo axis state can be changed by executing motion instructions.
Steady green light	The axis is in the normal servo loop active state.	None. The servo axis state can be changed by executing motion instructions.
Flashing red light	The axis servo loop error tolerance has been exceeded.	- Correct the source of the problem. - Clear the servo fault condition using the Motion Axis Fault Reset instruction. - Resume normal operation.
Steady red light	An axis SSI feedback fault has occurred.	- Correct the source of the problem by checking the SSI device and power connections. - Clear the servo fault condition using the Motion Axis Fault Reset instruction. - Resume normal operation.

1756-HYD02, 1756-HYD02K FDBK Indicator

If FDBK Indicator Displays:	The Module Status Is:	Take This Action:
Off	The axis is not used.	If you are using this axis, make sure that the module is configured and an axis tag has been associated with the module.
Flashing green light	The axis is in the normal servo loop inactive state.	None. The servo axis state can be changed by executing motion instructions.
Steady green light	The axis is in the normal servo loop active state.	None. The servo can may be changed by executing motion instructions.
Flashing red light	The axis servo loop error tolerance has been exceeded.	Follow these steps: - Correct the source of the problem. - Clear the servo fault condition using the Motion Axis Fault Reset instruction. - Resume normal operation.
Steady red light	An axis LDT feedback fault has occurred.	Follow these steps: - Correct the source of the problem by checking the LDT and power connections. - Clear the servo fault condition using the Motion Axis Fault Reset instruction. - Resume normal operation.

Module Drive Indicators

1756-M02AE, 1756-M02AEK DRIVE Indicator

If DRIVE Indicator Displays:	The Module Status Is:	Take This Action:
Off	The axis is not used. The axis is a position-only axis type.	- None, if the axis is not used or is a position-only type. - Otherwise, make sure that the module is configured, an axis tag has been associated with the module, and the axis type is servo.
Flashing green light	The axis drive is in the normal disabled state.	None. The servo axis state can be changed by executing motion instructions.
Steady green light	The axis drive is in the normal enabled state.	None. The servo axis state can be changed by executing motion instructions.
Flashing red light	The axis drive output is in the shutdown state.	- Check for faults that may have generated this state. - Execute the Shutdown Reset motion instruction. - Resume normal operation.
Solid red light	The axis drive is faulted.	- Check the drive status. - Clear the Drive Fault condition at the drive. - Clear the servo fault condition using the Motion Axis Fault Reset instruction. - Resume normal operation. - Check the configuration for the Drive Fault. - If configured to be normally open and there is no voltage, this is the normal condition. - If configured to be normally closed and 24V is applied, this is the normal condition.

1756-M02AS, 1756-M02ASK DRIVE Indicator

If DRIVE Indicator Displays:	The Module Status Is:	Take This Action:
Off	One of the following: The axis is not used. The axis is a position-only axis type.	- None, if the axis is not used or is a position-only type. - Otherwise, make sure that the module is configured, an axis tag has been associated with the module, and the axis type is servo.
Flashing green light	The axis drive is in the normal disabled state.	None. The servo axis state can be changed by executing motion instructions.
Steady green light	The axis drive is in the normal enabled state.	None. The servo axis state can be changed by executing motion instructions.
Flashing red light	The axis drive output is in the shutdown state.	- Check for faults that may have generated this state. - Execute the Motion Axis Shutdown Reset instruction. - Resume normal operation.
Steady red light	The axis drive is faulted.	- Check the drive status. - Clear the Drive Fault condition at the drive. - Clear the servo fault condition using the Motion Axis Fault Reset instruction. - Resume normal operation. - Check the configuration for the Drive Fault. - If configured to be normally open and there is no voltage, this is the normal condition. - If configured to be normally closed and 24V DC is applied, this is the normal condition.

1756-HYD02, 1756-HYD02 K DRIVE Indicator

If the DRIVE Indicator Displays:	The Module Status Is:	Take This Action:
Off	One of the following: The axis is not used. The axis is a position-only axis type.	If the axis is being used and is not a position-only axis type, make sure that the module is configured, an axis tag has been associated with the module, and the axis type is servo.
Flashing green light	The axis drive is in the normal disabled state.	None. The servo axis state can be changed by executing motion instructions.
Steady green light	The axis drive is in the normal enabled state.	None. The servo axis state can be changed by executing motion instructions.
Flashing red light	The axis drive output is in the shutdown state.	Follow these steps: - Check for faults that may have generated this state. - Execute the Shutdown Reset motion instruction. - Resume normal operation.
Steady red light	The axis drive is faulted.	Follow these steps: - Check the drive status. - Clear the Drive Fault condition at the drive. - Clear the servo fault condition using the Motion Axis Fault Reset instruction. - Resume normal operation. - Check the configuration for the Drive Fault. - If configured to be normally open and there is no voltage, this is the normal condition. - If configured to be normally closed and 24V is applied, this is the normal condition.

Specifications

Attribute	1756-M02AE, 1756-M02AEK	1756-M02AS, 1756-M02ASK	1756-HYD02, 1756-HYD02K
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, storage IEC 60068-2-1 (Test Allen-Bradley, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test N/A, Unpackaged Nonoperating Thermal Shock)	-40...85 °C (-40...185 °F)		
Temperature, surrounding air, max.	60 °C (140 °F)		
EFT/B immunity IEC 61000-4-4	—	±1 kV at 5 kHz on shielded signal ports	
Surge transient immunity IEC 61000-4-5	—	±1 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	
Enclosure Type Rating	None (open-style)	None (open-style)	
Voltage and Current Ratings	Backplane: 5.1V DC, 700 mA max. 24V DC, 2.5 mA max. Input: Registration 5/24V DC, 2 mA Encoder: 5V DC, 80 mA Home/Ready: 24V DC, 3.4 mA Output: Servo: +/- 10V DC, 50 mA Relay: 24V DC, 2VA, CL2	Backplane: 5.1Vdc, 0.7 A; 24V DC, 2.5 mA Input: Registration - 5V DC, 5 mA; 24V DC, 5 mA SSI - 5V DC, 30 mA All others: 24V DC, 3.2 mA Output: Servo - +/-10V, 2 mA SSI - 5.5V DC, 50 mA All other: 24V DC, 75 mA	Backplane: 5.1V DC, 0.7 A; 24V DC, 2.5 mA Input: Registration - 5V DC, 5 mA; 24V DC, 5 mA LDT - 5V DC, 30 mA All others: 24V DC, 3.2 mA Output: Servo - +/-10V, 2 mA LDT - 5.5V DC, 50 mA All other: 24V DC, 75 mA
Isolation Voltage	30V (continuous), Basic insulation type, Inputs to Backplane. No isolation between individual field side outputs and Inputs.	30V (continuous), Basic insulation type, Inputs to Backplane. No isolation between individual field outputs and Inputs.	
Wire Size	1756-TBCH Single wire connection: 0.33...2.1 mm ² (22...14 AWG) solid or stranded shielded copper wire that is rated at 105 °C (221 °F), or greater, 1.2 mm (3/64 in.) insulation max 1756-TBS6H Single wire connection: 0.33...2.1 mm ² (22...14 AWG) solid or stranded shielded copper wire that is rated at 105 °C (221 °F), or greater, 1.2 mm (3/64 in.) insulation max		
Terminal Block Torque Specs	1756-TBCH: 0.5 Nm (4.4 pound-inches)		
Pilot Duty Rating	Relay: 24V DC, 2VA	—	—
North American Temp Code	T4A		