Motion Control Interface Attributes

The Motion Control Interface attributes are used by the Logix Designer application to support the interface to an axis. Interface attributes are used to customize what choices appear on the properties pages and help you structure a motion axis.

Tip: Remember that the attributes that appear in the Logix Designer application are dependent on the current Control Mode.

Axis Address

Usage	Access	Data Type	Default	Min	Max	Semantics of Values
Required - All	Get	DINT	-	-	-	Absolute Address

Absolute Address of Motion Control Axis Object data structure. The Axis Address attribute is used to return the actual physical address in memory where the axis instance is located.

Axis Instance

Usage	Access	Data Type	Default	Min	Max	Semantics of Values
Required - All	Get/ GSV	DINT	-	-	-	Instance Number

Instance Number assigned to this instance of the Motion Control Axis Object. The Axis Instance attribute is used to return the instance number of an axis. An example of using this attribute is responding to an axis major fault. Major fault records contain the axis instance of the offending axis. Use this attribute to query an axis instance and determine if the instance number matches the fault record.

The Axis Instance attribute is required when accessing an attribute using a MSG instruction.

Group Instance

Usage	Access	Data Type	Default	Min	Max	Semantics of Values
Required - All	Get/ GSV	DINT	-	-	-	Instance Number

Instance Number of the Motion Group assigned to this instance of the Motion Control Axis Object. Use the Group Instance attribute to determine what motion group this axis is assigned to.

Map Instance

Usage	Access	Data Type	Default	Min	Max	Semantics of Values
Required - All	Set/ GSV	DINT	-	-	-	Instance Number

I/O Map Instance Number assigned to this instance of the Motion Control Axis Object. The Map Instance attribute associates an axis to a specific motion compatible module by specifying the I/O map entry representing the module. This value is set to 0 for virtual and consumed data types.

Module Channel

Usage	Access	Data Type	Default	Min	Max	Semantics of Values
Required - All	Set/ GSV	USINT	255	-	-	Channel Number (0, 1, 2, ...) A value of 255 indicates the axis is unassigned.

Channel number of the module assigned to this instance of the Motion Control Axis Object. The Module Channel attribute associates an axis to a specific channel on a motion compatible module by specifying the Module Channel attribute.

Module Class Code

Usage	Access	Data Type	Default	Min	Max	Semantics of Values
Required - All	Set/ GSV	DINT	-	-	-	Object Class Code

Object class code of the motion engine in the module. The Module Class Code attribute is the class code of the object in the motion module which is supporting motion; for example 0xAF is the object ID of the Servo Module Axis residing in the 1756-M02AE module.

C2C Map Instance

Usage	Access	Data Type	Default	Min	Max	Semantics of Values
Required - All	Set/ GSV	DINT	-	-	-	Producer/Consumed axis's associated C2C map instance

Producer/Consumed axis's associated C2C map instance. When the Axis Data Type attribute is specified to be 'Consumed' then this axis is associated to the consumed data by specifying both the C2C Map Instance and the C2C Connection Instance. For all other Axis Data Types if this axis is to be produced then this attribute is set to 1 (one) to indicate that the connection is off of the local controller's map instance.

C2C Connection Instance

Usage	Access	Data Type	Default	Min	Max	Semantics of Values
Required - All	Set/ GSV	DINT	-	-	-	Producer/Consumed axis's associated C2C connection in reference to the C2C map instance

Producer/Consumed axis's associated C2C connection in reference to the C2C map instance. If this axis is to be produced, then this attribute is set to the connection instance under the local controller's map instance (1) that will be used to send the remote axis data through the C2C connection.

Memory Use

Usage	Access	Data Type	Default	Min	Max	Semantics of Values

Required - All	Get/ GSV	UINT	-	-	-	105 (0x69) = I/O space 106 (0x6a) = Data Table space

Controller memory space where this instance of the Motion Control Axis Object exists. This attribute is initialized as part of the create service when you create the axis.

The Logix Designer programming application uses this attribute to create axis instances in I/O memory for axes that are either to be produced or consumed.

The Memory Use attribute can only be set as part of an axis create service and is used to control which controller memory the object instance is created in.

Memory Usage

Usage	Access	Data Type	Default	Min	Max	Semantics of Values
Required - All	Get	DINT	-	-	-	Bytes

Amount of memory consumed for this instance of the Motion Control Axis Object. The Memory Use attribute can be used to determine the amount of memory the created instance consumes in bytes.

Axis Data Type

Usage	Access	Data Type	Default	Min	Max	Semantics of Values
Required - All	Get	USINT	-	-	-	Enumeration: 0 = Feedback 1 = Consumed 2 = Virtual 3 = Generic 4 = Servo 5 = Servo Drive 6 = Generic Drive 7 = CIP Drive

Associated tag data type for this instance of the Motion Control Axis Object. This attribute is initialized as part of the create service when you create the axis.

The Axis Data Type attribute and is used to determine which data template, memory format, and set of attributes are created and applicable for this axis instance. This attribute can only be set as part of an axis create service.

Axis Configuration State

Usage	Access	Data Type	Default	Min	Max	Semantics of Values

Required - All	Get/ GSV	USINT	-	-	-	Enumeration 0 = Axis Instance Created 1 = Connection Created 126 = Axis Inhibited 128 = Axis Configured

State of the configuration state machine for this instance of the Motion Control Axis Object. The Axis Configuration State attribute is used for troubleshooting purposes to indicate where in the axis configuration state-machine this axis presently is. Even consumed and virtual axes will utilize this attribute. This attribute is valid for all physical and non-physical data types.

Axis State

Usage	Access	Data Type	Default	Min	Max	Semantics of Values
Required - All	Get	USINT	-	-	-	Enumeration 0 = Ready 1 = Drive Enable, (direct drive control) 2 = Servo Control 3 = Faulted 4 = Shutdown 5 = Inhibited 6 = Ungrouped 7 = No Module 8 = Configuring (FW default)

State of this instance of the Motion Control Axis. Indicates the operating state of the axis. Examples of possible states include: axis-ready, drive enable, servo control, axis faulted, axis shutdown, axis inhibited, and axis unassigned.

Watch Event Task

Usage	Access	Data Type	Default	Min	Max	Semantics of Values
Required - E	Get	DINT	-	-	-	-

User Event Task that will be triggered to execute when a Watch event occurs.

This attribute is set through internal communication from the user Task object to the Axis object when the Task trigger attribute is set to select this attributes of an Axis. It cannot be set directly by an external device. It is available to be read externally for diagnostic information.

The Watch Event Task attribute indicates which user Task will be triggered when a watch event occurs. An instance value of 0 indicates that no event task has been configured to be triggered by the Watch Event.

The user Task is triggered at the same time that the Process Complete bit is set for the instruction that armed the watch event.

Registration 1 Event Task

Usage	Access	Data Type	Default	Min	Max	Semantics of Values
Required - E	Get	DINT	-	-	-	-

User Event Task that will be triggered to execute when a Registration 1 event occurs.

This attribute is set through internal communication from the user Task object to the Axis object when the Task trigger attribute is set to select this attributes of an Axis. It cannot be set directly by an external device. It is available to be read externally for diagnostic information.

The Registration 1 Event Task attribute indicates which user Task will be triggered when a Registration 1 event occurs. An instance value of 0 indicates that no event task has been configured to be triggered by the Registration 1 Event.

The user Task is triggered at the same time that the Process Complete bit is set for the instruction that armed the registration event.

Registration 2 Event Task

Usage	Access	Data Type	Default	Min	Max	Semantics of Values
Required - E	Get	DINT	-	-	-	-

User Event Task that will be triggered to execute when a Registration 2 event occurs.

This attribute is set through internal communication from the user Task object to the Axis object when the Task trigger attribute is set to select this attributes of an Axis. It cannot be set directly by an external device. It is available to be read externally for diagnostic information.

The Registration 2 Event Task attribute indicates which user Task will be triggered when a Registration 2 event occurs.An instance value of 0 indicates that no event task has been configured to be triggered by the Registration 2 Event.

The user Task is triggered at the same time that the Process Complete bit is set for the instruction that armed the registration event.

Home Event Task

Usage	Access	Data Type	Default	Min	Max	Semantics of Values
Required - E	Get	DINT	-	-	-	-

User Event Task that will be triggered to execute when a Home event occurs.

This attribute is set through internal communication from the user Task object to the Axis object when the Task trigger attribute is set to select this attributes of an Axis. It cannot be set directly by an external device. It is available to be read externally for diagnostic information.

The Home Event Task attribute indicates which user Task will be triggered when a home event occurs. An instance value of 0 indicates that no event task has been configured to be triggered by the Home Event.

The user Task is triggered at the same time that the Process Complete bit is set for the instruction that armed the home event.

Inhibit Axis

▷ Select/Limit Instructions
▷ Sequential Function Chart (SFC) Instructions
▷ Statistical Instructions
▷ Safety Instructions
▷ Studio 5000 Logix Designer Glossary

Usage	Access	Data Type	Default	Min	Max	Semantics of Values
Required - All	Set/ SSV	SINT	0	-	-	0 triggers an uninhibit. 1 triggers an inhibit. Setting to any non-zero value is treated the same as a value of 1, and results in the attribute being set to a 1.

Used to initiate putting an axis into the inhibit state.

This feature is designed for the following situations:

- To park an unused or faulted axis so that the application program can continue to run without the unused or faulted axis.
- To allow a 'generic' application program to be developed for a family of similar machines that may vary in axis count such that it can be configured during runtime to match the configuration of the specific machine.

The on-line inhibit process is an intrusive operation in that it impacts all axes associated to the same motion module as the one being inhibited. As such it is expected that the users will trigger this operation with the machine in a safe, non-operating, state. The inhibit process includes breaking connection to the associated motion module and then allowing the module to be reconfigured with or without (depending if you are inhibiting or un-inhibiting) this axis.

The inhibit/un-inhibit operation will also stop all motion on all axes associated to the same motion module including breaking all gearing relationships. This stop operation follows that of the shutdown fault action; servo action is immediately disabled as is the drives power structure. Unless some external form of braking capability is applied the axis will generally coast to a stop.

Axis ID

Usage	Access	Data Type	Default	Min	Max	Semantics of Values
Required - All	Set/ GSV	DINT	-	-	-	ID

Unique number assigned to axis on creation by configuration software.

The Axis ID is used by the Absolute Position Recovery feature during a configuration software download to determine if a given axis is a new axis or pre-existing axis. If the axis existed prior to the download, the controller saves critical absolute position data associated with the axis before continuing the download. Using the Axis ID, the controller is able to match the saved absolute position data with the pre-existing axis and recover absolute position. Using the saved data, absolute position will be recomputed to account for any motion that occurred while the download was in process or while power was off.

Axis Update Schedule

Usage	Access	Data Type	Default	Min	Max	Semantics of Values

Required - All	Set/ GSV	USINT	-	-	-	Enumeration: 0 = Base 1 = Alternate 1 2 = Alternate 2 3-255 = Reserved

Determines the update schedule for the associated axis instance.

The default schedule setting of Base results in the axis being updated with every scan of Motion Task, or the Base Update Period of the Motion Group. Alternate 1 and Alternate 2 schedule selections result in the axis being updated at multiples of the Base Update Period given by the Alternate 1 and Alternate 2 Update Multiplier attribute values of the Motion Group, or Alternate 1 Update Period and Alternate 2 Update Period, respectively.

Axis Data Type

Usage	Access	Data Type	Default	Min	Max	Semantics of Values
Required - All	GSV	USINT	-	-	-	Enumeration: 0 = Feedback 1 = Consumed 2 = Virtual 3 = Generic 4 = Servo 5 = Servo Drive 6 = Generic Drive 7 = CIP Drive

Associated tag data type for this instance of the Motion Control Axis Object.

The Axis Data Type attribute and is used to determine which data template, memory format, and set of attributes are created and applicable for this axis instance.

See also

CIP Axis Attributes

Motion Control Axis Behavior Model

How are we doing?