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Guard Safety Status Attributes

The Guard Status attribute is a collection of bits indicating the safety status of the motion axis.

Guard Status

Usage	Access	T	Data Type	Semantics of Values
Optional - D	GSV	T	DWORD	Bitmap
				0 = Guard OK
				1 = Guard Config Locked
				2 = Guard Gate Drive Output
				3 = Guard Stop Input
				4 = Guard Stop Request
				5 = Guard Stop In Progress
				6 = Guard Stop Decel
				7 = Guard Stop Standstill
				8 = Guard Stop Output
				9 = Guard Limited Speed Input
				10 = Guard Limited Speed Request
				11 = Guard Limited Speed Monitor In Progress
				12 = Guard Limited Speed Output
				13 = Guard Max Speed Monitor In Progress
				14 = Guard Max Accel Monitor In Progress
				15 = Guard Direction Monitor In Progress
				16 = Guard Door Control Lock
				17 = Guard Door Control Output
				18 = Guard Door Monitor Input
				19 = Guard Door Monitor In Progress
				20 = Guard Lock Monitor Input
				21 = Guard Enabling Switch Input
				22 = Guard Enabling Switch In Progress
				23 = Guard Reset Input
				24 = Guard Reset Required
				25 = Guard Stop Input Cycle Required
				26 = Reserved - Waiting for Stop Request Removal
				27...31 = Reserved

Guard Status Bit Descriptions

Bit	Name	Description
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Bit	Name	Description
0	Guard OK	Indicates if the drive is free of any Guard Fault conditions.
1	Guard Config Locked	Indicates that configuration data for the drive safety core has been locked and cannot be modified.
2	Guard Gate Drive Output	Indicates the state of the Gate Drive (MP OUT) circuit used to disable the drive power structure.
3	Guard Stop Input	Indicates the current state of the Safe Stop input.
4	Guard Stop Request	Indicates if a safe stop operation has been requested. The safe stop request can be initiated by the Safe Stop Input or in response to a Safety Fault. The bit is only cleared by a successful safety reset.
5	Guard Stop In Progress	Indicates if the Safe Stop (SS) function of the safety core is in progress. This bit is set when the Safe Stop input transitions from on to off and clears at the end of the stop delay or when a safety fault occurs.
6	Guard Stop Decel	Indicates if the Safe Stop (SS) function of the safety core is actively decelerating the axis. This bit is set after the monitoring delay expires and clears at the end of the stop delay or when a fault occurs.
7	Guard Stop Standstill	Indicates if the Safe Stop (SS) function of the safety core is in the safe stopped mode, for example, when it has successfully stopped the axis and is performing zero speed monitoring. This bit is set after the stop delay expires and clears when a fault occurs.
8	Guard Stop Output	Indicates the current state of the Safe Stop output.
9	Guard Limited Speed Input	Indicates the current state of the Safe Limited Speed (SLS) input.
10	Guard Limited Speed Request	Indicates if a safe speed operation has been requested. The safe stop request can be initiated by the Safe Limited Speed input. The bit is only cleared by a successful safety reset.
11	Guard Limited Speed Monitor In Progress	Indicates if the Safe Speed (SLS/SSM) monitoring function of the safety core is actively checking speed. This bit is set when the Safe Limited Speed input transitions from on to off and the associated monitoring delay has expired.
12	Guard Limited Speed Output	Indicates the current state of the Safe Limited Speed (SLS) output.

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13	Guard Max Speed Monitor In Progress	Indicates if the Safe Max Speed (SMS) monitoring function of the safety core is in progress.
14	Guard Max Accel Monitor In Progress	Indicates if the Safe Max Accel (SMA) monitoring function of the safety core is in progress.
15	Guard Direction Monitor In Progress	Indicates if the Safe Direction Monitoring (SDM) function of the safety core is in progress.
16	Guard Door Control Lock	Indicates if the Door Control Output is being commanded to the Locked state.
17	Guard Door Control Output	Indicates the current state of the Safe Door Control output.
18	Guard Door Monitor Input	Indicates the current state of the Door Monitor (DM) input.
19	Guard Door Monitor In Progress	Indicates if the Safe Door Monitoring (DM) function of the safety core is in progress.
20	Guard Lock Monitor Input	Indicates the current state of the Safe Lock Monitoring input.
21	Guard Enabling Switch Input	Indicates the current state of the Safe Enabling Switch Monitor input.
22	Guard Enabling Switch Monitor In Progress	Indicates if the Safe Enabling Switch Monitor (ESM) monitoring function of the safety core is in progress.
23	Guard Reset Input	Indicates the state of the Safety Reset input use to initiate return to normal operational state of the safety core.
24	Guard Reset Required	Indicates that the drive safety function requires a Safety Reset to permit return to normal operational state.

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25	Guard Stop Input Cycle Required Status	Indicates that the drive safety function requires a Stop Input Cycle to permit return to normal operational state.
26	Reserved (Waiting for Stop Request Removal)	
27-31	Reserved	

Guard Faults

Usage	Access	T	Data Type	Semantics

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Optional - D	GSV	T	DWORD	Bitmap
				0 = (Reserved - Combined Faults)
				1 = Guard Internal Fault
				2 = Guard Configuration Fault
				3 = Guard Gate Drive Fault
				4 = Guard Reset Fault
				5 = Guard Feedback 1 Fault
				6 = Guard Feedback 2 Fault
				7 = Guard Feedback Speed Compare Fault
				8 = Guard Feedback Position Compare Fault
				9 = Guard Stop Input Fault
				10 = Guard Stop Output Fault
				11 = Guard Stop Decel Fault
				12 = Guard Stop Standstill Fault
				13 = Guard Stop Motion Fault
				14 = Guard Limited Speed Input Fault
				15 = Guard Limited Speed Output Fault
				16 = Guard Limited Speed Monitor Fault
				17 = Guard Max Speed Monitor Fault
				18 = Guard Max Accel Monitor Fault
				19 = Guard Direction Monitor Fault
				20 = Guard Door Monitor Input Fault
				21 = Guard Door Monitor Fault
				22 = Guard Door Control Output Fault
				23 = Guard Lock Monitor Input Fault
				24 = Guard Lock Monitor Fault
				25 = Guard Enabling Switch Monitor Input Fault
				26 = Guard Enabling Switch Monitor Fault
				27 = Guard Feedback 1 Voltage Monitor Fault
				28 = Guard Feedback 2 Voltage Monitor Fault
				29 = Reserved (RLM Reset Fault)
				30...31 = Reserved

The Guard Faults attribute is a collection of bits indicating the safety faults of the drive axis. When a safety fault condition occurs the safety core processor always requests a Safe Stop operation and notifies the drive controller to set the appropriate Guard Faults bit. This bit remains latched even if the safety fault condition is cleared in the safety core. A Fault Reset Request to the associated axis clears the safety fault bits, but the bits set again immediately if the underlying safety fault condition is still present.

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Bit	Name	Description
0	Reserved - Combined Faults	
1	Guard Internal Fault	An internal fault has been detected by the Safety Core hardware. This can includes safety processor faults, inter-processor communications faults, safety power supply faults, and gate drive circuitry.
2	Guard Configuration Fault	The safety configuration data is invalid.
3	Guard Gate Drive Fault	Indicates that the Gate Drive (MP OUT) circuit used to disable the drive power structure has detected an error.
4	Guard Reset Fault	The Safety Reset input was ON at power up.
5	Guard Feedback 1 Fault	A problem has been detected with the feedback 1 device.
6	Guard Feedback 2 Fault	A problem has been detected with the feedback 2 device.
7	Guard Feedback Speed Compare Fault	A speed miss-compare was detected between the two feedback devices.
8	Guard Feedback Position Compare Fault	A position discrepancy was detected between the two feedback devices.
9	Guard Stop Input Fault	A fault has been detected on the Safe Stop input(s).
10	Guard Stop Output Fault	A fault has been detected on the Safe Stop cascading outputs.
11	Guard Stop Decel Fault	A speed fault was detected during the deceleration monitoring.
12	Guard Stop Standstill Fault	Zero speed was not detected by the end of the stop delay.
13	Guard Stop Motion Fault	Motion was detected after stop was detected and the door unlocked.
14	Guard Limited Speed Input Fault	A fault has been detected on the Safe Limited Speed input(s).

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15	Guard Limited Speed Output Fault	A fault has been detected on the Safe Limited Speed outputs.
16	Guard Limited Speed Monitor Fault	The Safe Limited Speed has been exceeded.
17	Guard Max Speed Monitor Fault	The Safe Maximum Speed has been exceeded.
18	Guard Max Accel Monitor Fault	The Safe Maximum Acceleration has been exceeded.
19	Guard Direction Monitor Fault	Motion in the restricted direction has been detected.
20	Guard Door Monitor Input Fault	A fault has been detected on the Door Monitoring input(s).
21	Guard Door Monitor Fault	The Door Monitoring inputs were detected as OFF when they should have been ON.
22	Guard Door Control Output Fault	A fault has been detected on the Door Control outputs.
23	Guard Lock Monitor Input Fault	A fault has been detected on Lock Monitoring input(s).
24	Guard Lock Monitor Fault	The Lock Monitoring Inputs were detected as OFF when the Door should have been locked or the Lock Monitoring Inputs were detected as ON when the Door was opened.
25	Guard Enabling Switch Monitor Input Fault	A fault has been detected on the Enabling Switch Monitor (ESM) input(s).
26	Guard Enabling Switch Monitor Fault	The Enabling Switch Monitor (ESM) Inputs were detected as OFF when they should have been ON.
27	Guard Feedback 1 Voltage Monitor Fault	Monitored voltage level for the Feedback 1 device is out of allowed range for operation.

28	Guard Feedback 2 Voltage Monitor Fault	Monitored voltage level for the Feedback 2 device is out of allowed range for operation.
29	Reserved (RLM Reset Fault)	
30...31	Reserved	

See also

[Guard Safety Attributes](#)