

DIGITAL AND ANALOG I/O PARAMETER MAPS



APPENDIX

B

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INTRODUCTION

This section contains worksheets to help with designing and programming the physical inputs and outputs of the GS10 (digital, analog, and frequency interfaces). These worksheets provide the GS10 parameters and addresses associated with each input and output. For detailed parameter descriptions, please see Chapter 4 “AC Drive Parameters”. For more detailed wiring information, please see Chapter 2 “Installation and Wiring”.

Digital and analog I/O parameter maps begin on the following page.

GS10 DIGITAL INPUTS

GS10 Digital Inputs						
GS10 Terminals	FWD/DI1	REV/DI2	DI3	DI4	DI5	Comments
Parameter	P02.00 if ≠ 0, else:		(P02.00 if=3 or 6) else P02.03	P02.04	P02.05	See Digital Input Configurations Below
	P02.01	P02.02				
Default Setting	P2.00=1, P02.01=0	P02.00=1, P02.02=0	1	2	3	
Default Configuration	2 wire mode: FWD/STOP	2 wire mode: REV/STOP	Multi Spd 1	Multi Spd 2	Multi Spd 3	
User Defined Selection / Value						
DI - N.C. / N.O. Select P02.12 - Bit #	0	1	2	3	4	0 = N.O. 1 = N.C.
Default Configuration	0 = Normally Open					
User Defined Selection / Value						
DI - Response Time	P02.11					0 to 30.000 seconds
Default Configuration	0.005 seconds					
User Defined Selection / Value						
DI - Active Status Monitor P02.50 - Bit #	0	1	2	3	4	Read Only!

Digital Input Configurations – Parameters P02.01~P02.05		
0: No function	15: Rotating speed command from AI-V	50: Slave dB action to execute
1: Multi-step speed command 1	18: Force to stop (P07.20)	56: Local / Remote selection
2: Multi-step speed command 2	19: Digital up command	58: Enable fire mode (with RUN command)
3: Multi-step speed command 3	20: Digital down command	59: Enable fire mode (without RUN command)
4: Multi-step speed command 4	21: PID function disabled	70: Force auxiliary frequency return to 0
5: Reset	22: Clear the counter	71: Disable PID function, force PID output return to 0
6: JOG [by external control or GS4-KPD (optional)]	23: Input the counter value (DI4)	72: Disable PID function, retain the output value before disabled
7: Acceleration / deceleration speed inhibit	24: FWD JOG command	73: Force PID integral gain return to 0, disable integral
8: 1st and 2nd acceleration / deceleration time selection	25: REV JOG command	74: Reverse PID feedback
9: 3rd and 4th acceleration / deceleration time selection	27: ASR1 / ASR2 selection	83: Multi-motor (IM) selection bit 0
10: External Fault (EF) Input (P07.20)	28: Emergency stop (EF1)	94: Programmable AUTO RUN
11: Base Block (B.B.) input from external source	29: Signal confirmation for Y-connection	95: Pausing AUTO RUN
12: Output stop	30: Signal confirmation for δ-connection	97: Multi-pumps switch by Hand / Auto mode
13: Cancel the setting of autoacceleration / auto-deceleration time	38: Disable writing EEPROM function	98: Simple positioning stop by forward limit
	39: Torque command direction	99: Simple positioning stop by reverse limit
	40: Force coasting to stop	
	41: HAND switch	
	42: AUTO switch	
	49: Enable drive	

GS10 DIGITAL OUTPUTS

GS10 Digital Outputs			
GS10 Terminals	R1-R1C-R1O	DO1-DOC	Comments
Parameter	P02.13	P02.16	See Digital Output Configurations Below
Default Setting	11	0	
Default Configuration	Malfunction Indication	No Function	
User Defined Selection / Value			
DO - N.C. / N.O. Select P02.18 - Bit #	0	3	0 = N.O. 1 = N.C.
Default Configuration	0	0	
User Defined Selection / Value			
DO - Active Status Monitor P02.51 - Bit #	0	3	Read Only!

Digital Output Configurations – Parameters P02.13 and P02.16		
0: No function	19: External interrupt B.B. input (Base Block)	42: Crane function
1: Indication during RUN	20: Warning output	43: Motor speed detection
2: Operation speed reached	21: Over-voltage	44: Low current output (use with P06.71–06.73)
3: Desired frequency reached 1 (P02.22)	22: Over-current stall prevention	45: UVW output electromagnetic valve switch
4: Desired frequency reached 2 (P02.24)	23: Over-voltage stall prevention	46: Master dEb output
5: Zero speed (Frequency command)	24: Operation mode	51: Analog output control for RS-485 interface
6: Zero speed including STOP (Frequency command)	25: Forward command	53: Fire mode indication
7: Over-torque 1 (P06.06–06.08)	26: Reverse command	67: Analog input level reached
8: Over-torque 2 (P06.09–06.11)	29: Output when frequency \geq P02.34	69: Indication of Preheating
9: Drive is ready	30: Output when frequency $<$ P02.34	75: Forward RUN status
10: Low voltage warning (Lv) (P06.00)	31: Y-connection for the motor coil	76: Reverse RUN status
11: Malfunction indication	32: δ -connection for the motor coil	77: Program Running Indication
13: Overheat warning (P06.15)	33: Zero speed (actual output frequency)	78: Program Step Completed Indication
14: Software brake signal indicator (P07.00)	34: Zero speed including STOP (actual output frequency)	79: Program Running Completed Indication
15: PID feedback error (P08.13, P08.14)	35: Error output selection 1 (P06.23)	80: Program Running Paused Indication
16: Slip error (oSL)	36: Error output selection 2 (P06.24)	81: Multi-pump system error display (only master)
17: Count value reached, does not return to 0 (P02.20)	37: Error output selection 3 (P06.25)	
18: Count value reached, return to 0 (P02.19)	38: Error output selection 4 (P06.26)	
	40: Speed reached (including STOP)	

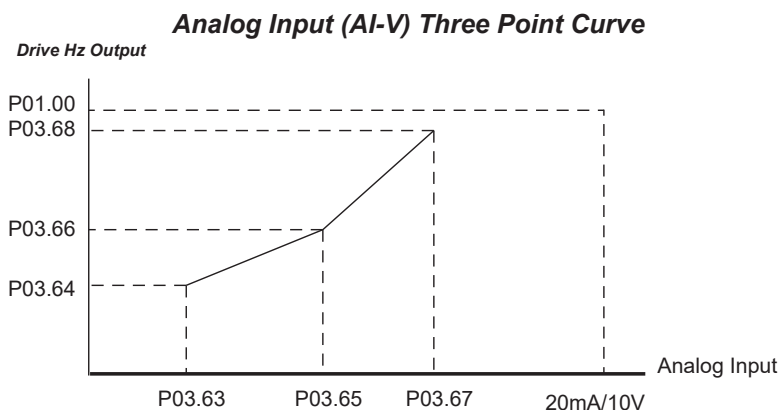
GS10 ANALOG COMMON PARAMETERS

GS10 – AI – Common Parameters				
Parameter		Selection / Value	Default	User Selection
P00.20	Master frequency command source (AUTO, REMOTE)	0: Digital keypad 1: RS-485 communication input 2: External analog input (Refer to P03.00) 3: External UP / DOWN terminal (digital input terminals) 4: Pulse input (DI5) without direction command 6: Not used 7: Digital keypad VR/potentiometer dial (GS10 only) 9: PID controller	0	
P00.30	Master frequency command source (HAND, LOCAL)		0	

GS10 ANALOG INPUT (AI-V) PARAMETERS

GS10 – AI Specific Parameters				
Parameter		Selection / Value	Default	User Selection
Terminals		AI – ACM	N/A	N/A
P03.00	Analog input selection (AI)	1: Frequency command 4: PID target value 5: PID feedback signal 6: Thermistor (PTC) input value 11: PT100 RTD input value 12: Auxiliary frequency input 13: PID compensation value	1	
P03.28	AI-V terminal input selection	0: 0–10 V (P03.63–P03.68 is valid)	0	
P03.03	Analog input bias (AI-V)	-100.0% to +100.0%	0	
P03.07	Positive / negative bias mode (AI-V)	0: No bias 1: Lower than or equal to bias 2: Greater than or equal to bias 3: The absolute value of the bias voltage while serving as the center 4: Bias serves as the center	0	
P03.10	Reverse setting when analog signal input is negative frequency	0: Negative frequency input is not allowed. The digital keypad or external terminal controls the forward and reverse direction. 1: Negative frequency input is allowed. Positive frequency = run in a forward direction; negative frequency = run in a reverse direction. The digital keypad or external terminal control cannot change the running direction.	0	
P03.11	Analog input gain (AI-V)	-500.0% to +500.0%	100.0	
P03.15	Analog input filter (LPF) time (AI-V)	0.00~20.00 sec	0.01	
P03.50	Analog input curve calculation selection	0: Normal curve 1: Three-point curve of AI-V 2: Three-point curve of AI-C	0	
Parameters below are used to characterize the GS10 drive output frequency with three point curve parameters if using AI-V for speed reference (bias and gain parameters above are not used when P03.50 ≠ 0).				
P03.63	AI-V votage lowest point	0.00~10.00V	0	
P03.64	AI-V proportional lowest point	-100.00~100.00%	0	
P03.65	AI-V voltage mid-point	0.00~10.00V	5	
P03.66	AI-V proportional mid-point	-100.00~100.00%	50.00	

GS10 – AI-V Specific Parameters (continued)				
Parameter		Selection / Value	Default	User Selection
P03.67	AI-V voltage highest point	0.00~10.00V	10	
P03.68	AI-V proportional highest point	-100.00~100.00%	100.00	



GS10 ANALOG INPUT (AI-C) PARAMETERS

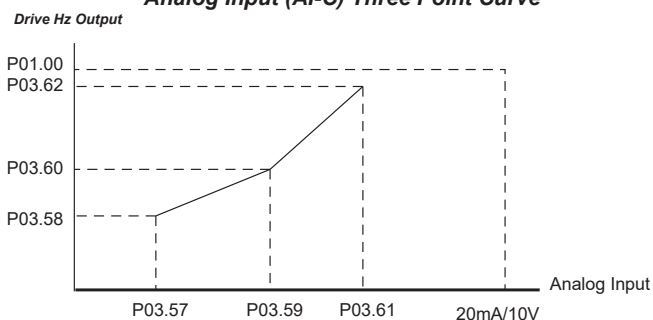
GS10 – AI-C Specific Parameters				
Parameter		Selection / Value	Default	User Selection
Terminals		AI – ACM	N/A	N/A
P03.00	Analog input selection (AI)	1: Frequency command 4: PID target value 5: PID feedback signal 6: Thermistor (PTC) input value 11: PT100 RTD input value 12: Auxiliary frequency input 13: PID compensation value	1	
P03.28	AI-C terminal input selection	0: 0-10V 1: 0-20mA 2: 4-20mA	0	
P03.04	Analog input bias (AI-C)	-100.0% to +100.0%	0	
P03.08	Positive/negative bias mode (AI-C)	0: No bias 1: Lower than or equal to bias 2: Greater than or equal to bias 3: The absolute value of the bias voltage while serving as the center 4: Bias serves as the center	0	
P03.10	Reverse setting when analog signal input is negative frequency	0: Negative frequency input is not allowed. The digital keypad or external terminal controls the forward and reverse direction. 1: Negative frequency input is allowed. Positive frequency = run in a forward direction; negative frequency = run in a reverse direction. The digital keypad or external terminal control cannot change the running direction.	0	
P03.12	Analog input gain (AI-C)	-500.0% to +500.0%	100.0	
P03.16	Analog input filter (LPF) time (AI-C)	0.00~20.00 sec	0.01	

GS10 – AI-C Specific Parameters (continued)				
Parameter		Selection / Value	Default	User Selection
P03.50	Analog input curve calculation selection	0: Normal curve 1: Three-point curve of AI-V 2: Three-point curve of AI-C	0	
Parameters below are used to characterize the GS10 drive output frequency with three point curve parameters if using AI-C for speed reference (bias and gain parameters above are not used when P03.50 ≠ 0).				
P03.57	AI-C lowest point	P03.28=1: 0.00~20.00mA P03.28=2: 4.00~20.00mA	P03.28=1: 0.00mA P03.28=2: 4.00mA	
P03.58	AI-C proportional lowest point	-100.00~100.00%	0	
P03.59	AI-C voltage mid-point	P03.28=1: 0.00~20.00mA P03.28=2: 4.00~20.00mA	P03.28=1: 10.00mA P03.28=2: 12.00mA	
P03.60	AI-C proportional mid-point	-100.00~100.00%	50.00	
P03.61	AI-C voltage highest point	P03.28=1: 0.00~20.00mA P03.28=2: 4.00~20.00mA	P03.28=1: 20.00mA P03.28=2: 20.00mA	
P03.62	AI-C proportional highest point	-100.00~100.00%	100.00	



P03.19 (Loss of AI-C) determines the drive behavior if the 4~20mA signal is lost.

Analog Input (AI-C) Three Point Curve



GS10 ANALOG OUTPUT 1 PARAMETERS

GS10 – AO1 Specific Parameters				
Parameter		Selection / Value	Default	User Selection
Terminals		AO1 – ACM	N/A	N/A
P03.20	Multi-function output (AO1)	0: Output frequency (Hz) 1: Frequency command (Hz) 2: Motor speed (Hz) 3: Output current (rms) 4: Output voltage 5: DC bus voltage 6: Power factor 7: Power 8: Output torque 9: AI percent 12: Iq current command 13: Iq feedback value 14: Id current command 15: Id feedback value 16: Vq-axis voltage command 17: Vd-axis voltage command 21: RS-485 analog output 23: Constant voltage output	0	
P03.21	Analog output gain (AO1)	0.0~500.0%	100.0	
P03.22	Analog output in REV direction (AO1)	0: Absolute Value 1: 0V When Negative 2: Offset 5V = 0 Value	0	
P03.27	AO1 output bias	-100.00~100.00%	0.00	
P03.32	AO1 DC output setting level	0.00~100.00%	0.00	
P03.35	AO1 output filter time	0.00~20.00 sec.	0.01	