

DIGITAL AND ANALOG I/O
PARAMETER MAPS



APPENDIX
B

TABLE OF CONTENTS

Appendix B: Digital and Analog I/O Parameter Maps

Introduction **B-2**

GS10 Digital Inputs – Main Control Board B-3

GS10 Digital Outputs – Main Control Board B-4

GS10 Analog Common Parameters B-5

GS10 Analog Input AI-V Parameters B-5

GS10 Analog Input (AI-C) Parameters B-6

GS10 Analog Output 1 Parameters B-8

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	P02.00=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 1: Multi-step speed command 1 2: Multi-step speed command 2 3: Multi-step speed command 3 4: Multi-step speed command 4 5: Reset 6: JOG [by external control or GS4-KPD (optional)] 7: Acceleration / deceleration speed inhibit 8: 1st and 2nd acceleration / deceleration time selection 9: 3rd and 4th acceleration / deceleration time selection 10: External Fault (EF) Input (P07.20) 11: Base Block (B.B.) input from external source 12: Output stop 13: Cancel the setting of autoacceleration / auto-deceleration time	15: Rotating speed command from AI-V 18: Force to stop (P07.20) 19: Digital up command 20: Digital down command 21: PID function disabled 22: Clear the counter 23: Input the counter value (DI4) 24: FWD JOG command 25: REV JOG command 27: ASR1 / ASR2 selection 28: Emergency stop (EF1) 29: Signal confirmation for Y-connection 30: Signal confirmation for δ-connection 38: Disable writing EEPROM function 39: Torque command direction 40: Force coasting to stop 41: HAND switch 42: AUTO switch 49: Enable drive	50: Slave dB action to execute 56: Local / Remote selection 58: Enable fire mode (with RUN command) 59: Enable fire mode (without RUN command) 70: Force auxiliary frequency return to 0 71: Disable PID function, force PID output return to 0 72: Disable PID function, retain the output value before disabled 73: Force PID integral gain return to 0, disable integral 74: Reverse PID feedback 83: Multi-motor (IM) selection bit 0 94: Programmable AUTO RUN 95: Pausing AUTO RUN 97: Multi-pumps switch by Hand / Auto mode 98: Simple positioning stop by forward limit 99: Simple positioning stop by reverse limit

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 1: Indication during RUN 2: Operation speed reached 3: Desired frequency reached 1 (P02.22) 4: Desired frequency reached 2 (P02.24) 5: Zero speed (Frequency command) 6: Zero speed including STOP (Frequency command) 7: Over-torque 1 (P06.06–06.08) 8: Over-torque 2 (P06.09–06.11) 9: Drive is ready 10: Low voltage warning (Lv) (P06.00) 11: Malfunction indication 13: Overheat warning (P06.15) 14: Software brake signal indicator (P07.00) 15: PID feedback error (P08.13, P08.14) 16: Slip error (oSL) 17: Count value reached, does not return to 0 (P02.20) 18: Count value reached, return to 0 (P02.19)	19: External interrupt B.B. input (Base Block) 20: Warning output 21: Over-voltage 22: Over-current stall prevention 23: Over-voltage stall prevention 24: Operation mode 25: Forward command 26: Reverse command 29: Output when frequency ≥ P02.34 30: Output when frequency < P02.34 31: Y-connection for the motor coil 32: δ-connection for the motor coil 33: Zero speed (actual output frequency) 34: Zero speed including STOP (actual output frequency) 35: Error output selection 1 (P06.23) 36: Error output selection 2 (P06.24) 37: Error output selection 3 (P06.25) 38: Error output selection 4 (P06.26) 40: Speed reached (including STOP)	42: Crane function 43: Motor speed detection 44: Low current output (use with P06.71–06.73) 45: UVW output electromagnetic valve switch 46: Master dEb output 51: Analog output control for RS-485 interface 53: Fire mode indication 67: Analog input level reached 69: Indication of Preheating 75: Forward RUN status 76: Reverse RUN status 77: Program Running Indication 78: Program Step Completed Indication 79: Program Running Completed Indication 80: Program Running Paused Indication 81: Multi-pump system error display (only master)

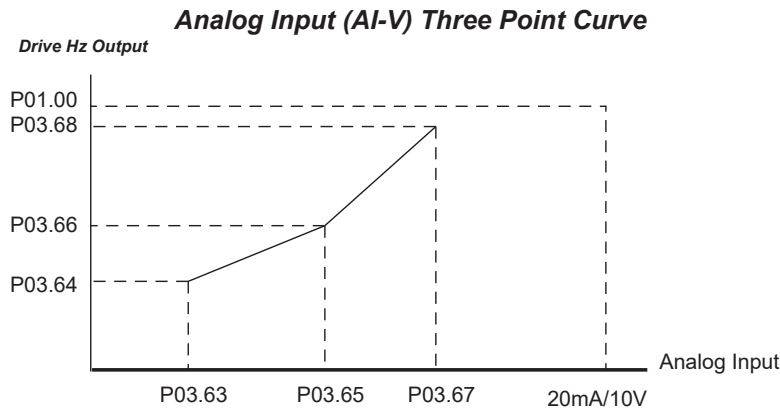
GS10 ANALOG COMMON PARAMETERS

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 voltage 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

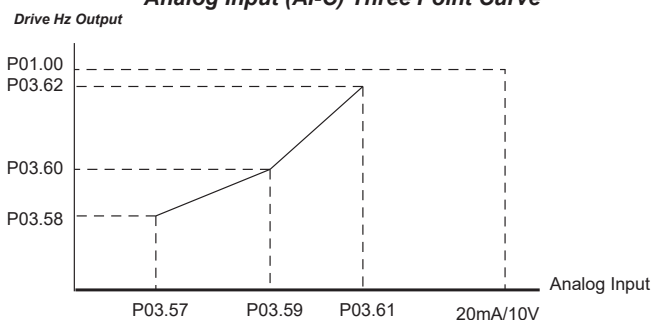
GS10 – AI-C Specific Parameters				
Parameter		Selection / Value	Default	User Selection
Terminals		AI – ACM	N/A	N/A
P03.00	Analog input selection (AI)	1: Frequency command 4: PID target value 5: PID feedback signal 6: Thermistor (PTC) input value 11: PT100 RTD input value 12: Auxiliary frequency input 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	