

YASKAWA AC Drive Option JOHB-SMP3 Communication Protocol ModbusTCP/IP Supplemental Technical Manual

Introduction

This supplemental technical manual describes the functions added with a JOHB-SMP3 software upgrade S8210(ModbusTCP/IP:Ver2005)^{※1}, and should be read to ensure proper usage. Read this manual together with the "Quick Installation Procedure (TOBP C730600 0H)" included with the product and the "JOHB-SMP3 ModbusTCP/IP Technical Manual (SIEP C730600 0I)" that can be found on our documentation website. Always observe the safety messages and precautions to ensure correct application of the product.

※1: JOHB-SMP3 option cards have an overall software version and a separate software version for each communication protocol. Check the PRG number on the purchased box for the overall software version. Start the ModbusTCP/IP communication protocol and check U6-97 to check the ModbusTCP/IP software version.

Modified Contents

This supplemental manual explains newly added functions.

1. Support for FSDrive-LIPV and FSDrive-LIPC

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Support for FSDrive-LIPV and FSDrive-LIPC. Added explanations related to compatible drives. (Underlined parts are added items.)

◆ Compatible Products

You can use the option with these products:

Product Series	Models	Software Version
FSDrive-LIPV	CIPR-LIPVxxxx	>= 1014
FSDrive-LIPC	CIPR-LIPCxxxx	>= 3013

◆ Related Drive Parameters

The following are the parameters that differ when using FSDrive-LIPV, FSDrive-LIPC and when connecting other drives.

For other parameters, refer to the "JOHB-SMP3 ModbusTCP/IP Communication Technical Manual (SIEP C730600 0I)".

No. (Hex)	Name	Description	Default (Range)
F6-06 (03A7)	Torque Reference/Limit by Comm	Selects whether to enable or disable the torque reference and torque limit received from the communication option. 0 : Disabled 1 : Enabled Note: • Control method availability of this parameter is different for different product series. <u>-FSDrive-LIPV</u> <u>Parameter is available when A1-02 = 2, 3, 4[Control Method Selection = OpenLoop Vector, Closed Loop Vector, Advanced Open Loop Vector].</u> <u>When you enable this parameter, d5-01 [Torque Control Selection] sets the drive to read the value as the Torque Limit value or the Torque Reference value.</u> <u>d5-01= 0 [Speed Control]: Torque Limit</u> <u>d5-01= 1 [Torque Control]: Torque Reference</u> <u>When A1-02 = 2[Control Method Selection = Open Loop Vector],the drive reads this value as the Torque Limit.</u> <u>• This parameter is not supported by FSDrive-LIPC.</u>	0 (0, 1)
F6-07 (03A8)	Multi-Step Ref @NetRef/ComRef	0 : Disable Multi-Step References 1 : Enable Multi-Step References Note: <u>• This parameter is not supported by FSDrive-LIPC.</u>	0 (0, 1)

■High Speed Access Drive Modbus TCP/IP Option Registers

Many of the registers required for control have been specially mapped to provide higher speed access to increase network performance. Use these registers for the best response times.

●Command Data

Register No. (Hex.)	Description	
0001	Operation Commands and Multi-function Inputs	
	bit 0	1: Forward Run 0: Stop (※ 1)
	bit 1	1: Reverse run 0: Stop (※ 2)
	bit 2	External Fault (EF0 [Option Card External Fault])
	bit 3	Fault Reset
	bit 4	Multi-Function Input 1
	bit 5	Multi-Function Input 2
	bit 6	Multi-Function Input 3
	bit 7	Multi-Function Input 4
	bit 8	Multi-Function Input 5
	bit 9	Multi-Function Input 6
	bit A	Multi-Function Input 7
	bit B	Multi-Function Input 8
	bit C-F	Reserved
0002	Frequency Reference (※ 2)	Units are determined by parameter o1-03 [Frequency Display Unit Selection].
0003	Output voltage gain (※ 2) Unit: 0.1% Setting range: 20 (2.0%) - 2000 (200.0%) Default value at energize: 1000 (100.0%)	
0004	Torque reference/torque limit (0.1% signed) (※ 3)	
0005	Torque compensation (0.1% signed) (※ 2)	
0006	PID setpoint (0.01% signed) (※ 2)	
0007	Multi-Function Analog Output Terminal 1 Setting (10 V/4000 (Hex.))	
0008	Multi-Function Analog Output Terminal 2 Setting (10 V/4000 (Hex.))	
0009	MFDO setting	
	bit 0	Multi-Function Contact Output 1
	bit 1	Multi-Function Contact Output 2
	bit 2	Multi-Function Contact Output 3
	bit 3 - 5	Reserved
	bit 6	Enables the function in bit 7
	bit 7	Fault Relay Output
	bit 8 - F	Reserved
000A	Pulse train output (Units: 1/1 Hz, setting range: 0 - 32000) (※ 2)	
000B - 000C	Reserved	
000D	DC Bus Voltage Reference 1V/1 (※ 4)	
000F	Command selection setting (※ 2)	
	bit 0	Reserved
	bit 1	Input for the PID setpoint
	bit 2	Torque reference/torque limit input (enables the setting from MEMOBUS/Modbus)
	bit 3	Torque compensation input (enables the setting from MEMOBUS/Modbus)
	bit 4	Reserved
	bit 5	PID feedback from the MEMOBUS/Modbus 1: Enables PID feedback (15FF (Hex.)) from MEMOBUS/Modbus
	bit 6-B	Reserved
	bit C	Terminal S5 input of broadcast message
	bit D	Terminal S6 input of broadcast message
	bit E	Terminal S7 input of broadcast message
	bit F	Terminal S8 input of broadcast message

(※ 1)...With FSDrive-LIPC, the function is "1: Forward, 0: Stop".

(※ 2)...Not supported by FSDrive-LIPC.

(※ 3)...With FSDrive-LIPC, the function is "Active Current Limit (Positive) 100.0%/1000".

(※ 4)...Not supported by FSDrive-LIPV.

●Monitor Data

Modbus Register No. (Hex.)	Drive Registers (Hex.)	Register Name	Bit	Description
2000	004B	Drive Status (U1-12)	0	1: During Run
			1	1: During zero speed (※5)
			2	1: During reverse (※5)
			3	1: During reset signal input
			4	1: During Speed Agree (※6)
			5	1: Drive operation ready
			6	1: Alarm
			7	1: Fault
			8	1: During Operation Error (oPExx)
			9	1: Momentary power loss recovery 0: Power loss recovery
			A	1: Motor 2 Selection (※5)
			B	Reserved
			C	Reserved
			D	Reserved
			E	ComRef status/ NetRef status
			F	ComCtrl status/ NetCtrl status
2001	0044	Motor Speed Monitor (U1-05) (※5)		
2002	0048	Torque Reference Monitor (U1-09) (※5)		
2003	00F0	PG Count Channel 1 (※5)		
2004	0040	Frequency Reference Monitor (U1-01) (※7)		
2005	0041	Output Frequency Monitor (U1-02) (※8)		
2006	0026	Output Current (U1-03) (units: 1 A) (※9)		
2007	004F	Terminal A2 Input Level Monitor (U1-14)		
2008	0046	DC Bus Voltage Monitor (U1-07) (※8)		
2009	00C0	Error Signal 1	0	Reserved
			1	Undervoltage (Uv1)
			2	Control Power Supply Undervoltage (Uv2)
			3	Soft Charge Circuit Fault (Uv3)
			4	Short Circuit/IGBT Failure (SC)
			5	Ground Fault (GF)
			6	Overcurrent (oC)
			7	Overvoltage (ov)
			8	Heatsink Overheat (oH)
			9	Heatsink Overheat (oH1)
			A	Motor Overload (oL1) (※5)
			B	Drive Overload (oL2) (※10)
			C	Overtorque Detection 1 (oL3) (※5)
			D	Overtorque Detection 2 (oL4) (※5)
			E	Dynamic Braking Transistor Fault (rr) (※5)
			F	Braking Resister Overheat (rH) (※5)
200A	00C1	Error Signal 2	0	External Fault (Terminal S3) (EF3)
			1	External Fault (Terminal S4) (EF4)
			2	External Fault (Terminal S5) (EF5)
			3	External Fault (Terminal S6) (EF6)
			4	External Fault (Terminal S7) (EF7)
			5	External Fault (Terminal S8) (EF8)
			6	Cooling fan Error (FAn)
			7	Overspeed (oS) (※5)
			8	Excessive Speed Deviation (dEv) (※5)
			9	PG Disconnected (PGo) (※5)
			A	Input Phase Loss (PF) (※5)
			B	Output Phase Loss (LF) (※5)
			C	Motor Overheat (PTC input) (oH3) (※5)
			D	Digital Operator Connection Fault (oPr)
			E	EEPROM Write Error (Err)
			F	Motor Overheat Fault (PTC input) (oH4) (※5)
200B	00C2	Error Signal 3	0	MEMOBUS/Modbus Communication Error (CE)
			1	Option Communication Error (bUS)

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			2	Reserved
			3	Reserved
			4	Control Fault (CF) (※ 5)
			5	Zero Servo Fault (SvE) (※ 5)
			6	Option External Fault (EF0)
			7	PID Feedback Loss (FbL) (※ 5)
			8	Undertorque Detection 1 (UL3) (※ 5)
			9	Undertorque Detection 2 (UL4) (※ 5)
			A	High Slip Braking Overload (oL7) (※ 5)
			B	Reserved
			C	Reserved
			D	Reserved
			E	Reserved
			F	Hardware Fault (includes oFx)
200C	004E	Terminal A1 Input Level Monitor (U1-13)		
200D	0049	Digital Input Terminal Status (U1-10)		
200E	0050	Terminal A3 Input Level Monitor (U1-15)		
200F	00F1	PG Count Channel 2 (※ 5)		
2010	004D	Drive Software Number (Flash) (U1-25)		

(※ 5)...Not supported by FSDrive-LIPC.

(※ 6)...With FSDrive-LIPC, the function is "1: During Voltage Agree".

(※ 7)...With FSDrive-LIPC, the function is " U1-51:DC Bus Voltage Reference (Before SFS)(Hex.1080)".

(※ 8)...With FSDrive-LIPC, the function is " U1-52:DC Bus Voltage Feedback (Hex.1081)".

(※ 9)...With FSDrive-LIPC, the function is " U1-53:DC Bus Side Current (Hex.1082)". The response data is not the value confirmed by the operator for U1-53, but the value converted to $8192 = \text{power supply rated current (A)}$. Therefore, U1-53 (DC Bus Side Current) is " $\text{response data} \div 8192 \times \text{power supply rated current}$ " (A).

(※ 10)...With FSDrive-LIPC, the function is "Converter Overload (oL2)".