

**Flomotion Systems  
 K4 – Series  
 Program Settings**

**Programmable Function Groups**

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*Note: (1) IODA Option Board required. (2) DIAC Option Board required.*

**0- Motor and Drive Parameters**

Function Code No.	Description	Range/Code	Flomotion Setting	Field Setting
0.00	Rated Motor Frequency (Hz)	0000: 60 Hz 0001: 50 Hz 0002: Special (Set by 0.05)	0000	
0.01	Motor Nameplate Current (Amps)	—	(1)	
0.02	Motor Type	0000: Inverter Duty, TEFC 0001: External Fan Cooled	0000	
0.03	Torque Mode	0000: Constant Torque (Machinery) 0001: Variable Torque (HVAC)	0000	
0.04	GFCI Operation <sup>(2)</sup>	0000: GFCI Operation Disabled 0001: Standard GFCI Operation 0002: Sensitive GFCI Operation	0000	
0.05	Motor Frequency (Hz) <sup>(3),(4)</sup>	30 – 240	60	
0.06	Motor Nameplate Voltage (% Drive Output) <sup>(5)</sup>	0 – 100.0	100	

**Notes:** (1) Factory Setting is the drive rated output current. (2) GFCI operation overrides the switching frequency set by 3.15. (3) When the drive is set for 50 Hz motors (0.00 set to "0001"), the Motor Frequency factory setting will automatically reset to 50 Hz. (4) The Motor Frequency for standard 50 Hz or 60 Hz motors is set by 0.00. For custom motors (e.g., 100 Hz) set 0.00 to "0002" and 0.05 to the Motor Nameplate Rated Frequency. (5) This function is used for motors with non-standard nameplate rated voltage (e.g., 80 Volts AC). (6) The factory set output of the drive is 100% of the AC line input voltage. In 60 Hz Mode (0.00 set to "0000") the drive output will be 230 Volts, maximum, for 230 Volt motors. In 50 Hz Mode (0.00 set to "0001") the drive output will be 220 Volts, maximum, for 220 Volt motors.

**1- Run/Stop Mode**

Function Code No.	Description	Range/Code	Flomotion Setting	Field Setting
1.00	Run/Stop-Forward/Reverse Control	0000: Keypad – Set for RUN/STOP used w/4-20mA input LOCALLY ONLY 0001: External Contacts <sup>(1)</sup> 0002: Communication <sup>(2)</sup>	0000	
1.01	Forward/Reverse Control	0000: Instant Reverse 0001: Stop Command Must be Given Prior to Reverse Command 0002: Reverse Command Disabled 0003: Forward Command Disabled	0000	
1.02	Motor Direction	0000: Forward 0001: Reverse	0000	
1.03	Start Command	0000: Accelerates to Last Set Frequency 0001: Accelerates to Lower Frequency Limit (See 3.01)	0000	
1.04	Start Mode	0000: Spin Start 0001: Stop Before Restart	0000	
1.05	Auto/Manual Restart Mode	0000: Manual Restart Mode 0001: Manual Start with Ride-Through (Set by 1.06) 0002: Auto Start After Undervoltage Fault Clears 0003: Auto Start All Faults (Except Short Circuit Fault) <sup>(3)</sup> 0004: Auto Start All Faults (Except I <sup>2</sup> t and Short Circuit Faults)	0000	
1.06	Ride-Through Time (Seconds)	0.0 – 2.0	0.5	
1.07	Number of Restart Attempts	0 – 10	3	
1.08	Auto Restart Delay Time (Seconds)	0 – 240	0	
1.09	Stop Mode	0000: Regenerate-to-Stop 0001: Coast-to-Stop 0002: Regeneration with Injection Brake-to-Stop (Set by 1.11 – 1.14)	0000	
1.10	Holding Torque in Stop Mode (%)	0 – 10	1	
1.11 *	Injection Brake Start Frequency (Hz)	0.00 – 240.0	0.00	
1.12 *	Injection Brake Level (%)	0 – 30	0	
1.13 *	Injection Brake Time (Seconds)	0.0 – 25.5	0.0	

**Notes:** (1) IODA Option Board required. (2) DIAC Option Board required. (3) For Auto Start, 1.07 must be set to greater than "0" (factory setting is "2").  
 \*Functions which can be changed while the drive is in the Run Mode.

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**2- Frequency Control**

Function Code No.	Description	Range/Code	Flomotion Setting	Field Setting
2.00	Frequency Control	0000: Keypad 0001: Built-In Potentiometer 0002: Analog Signal 1 <sup>(1)</sup> 0003: Analog Signal 2 <sup>(1)</sup> 0004: Communication <sup>(2)</sup> 0005: Up/Down Using MFITs <sup>(1)</sup>	0003	
2.01	Up Key/Down Key Operation Mode	0000: Frequency Change Requires Enter Command 0001: Direct Frequency Change 0002: Keypad Disable	0001	
2.02	Jog-Local/Remote <sup>(3), (4)</sup>	0000: Jog Enabled 0001: Jog Disabled 0002: Jog Disabled; Local/Remote Enabled (Keypad Operation) <sup>(1)</sup> 0003: Jog Disabled; Local/Remote Enabled (Built-In Speed Pot Operation) <sup>(1)</sup>	0002	

**Notes:** (1) IODA Option Board required. (2) DIAC Option Board required. (3) See 3.12 (Jog Mode), 3.13 (Jog Frequency), and 3.14 (Jog Accel/Decel Time). (4) The Jog function can be reprogrammed for Local/Remote (LCL/REM) Operation. When in Remote Mode Operation, the "JOG/REM" LED will flash.

**3- Drive Operating Parameters**

Function Code No.	Description	Range/Code	Flomotion Setting	Field Setting
3.00 *	Stored Set Frequency (Hz)	0.00 – 240.0	5.00	
3.01 *	Lower Frequency Limit (Hz)	0.00 – 240.0	0.00	
3.02 *	Upper Frequency Limit (Hz) <sup>(1)</sup>	0.00 – 240.0	(3)	60
3.03 *	Accel Time (Seconds)	0.1 – 180.0	5.0	
3.04 *	Decel Time (Seconds)	0.3 – 180.0	5.0	
3.05 *	S-Curve Time Accel (Seconds) <sup>(2)</sup>	0.0 – 30.0	0.0	
3.06 *	S-Curve Time Decel (Seconds) <sup>(2)</sup>	0.0 – 30.0	0.0	
3.07	Skip Frequency (Hz)	0.00 – 240.0	0.00	
3.08	Skip Frequency Bandwidth (±Hz)	0.00 – 2.00	0.00	
3.09	Motor Overload Protection	0000: I <sub>t</sub> with Current Limit Enabled 0001: I <sub>t</sub> with Current Limit Enabled	0000	
3.10	I <sub>t</sub> with Current Limit Trip Time (Seconds)	1.0 – 20.0	7.0	
3.11 *	Boost Value (%)	0.0 – 28.0	7.0	
3.12	Jog Mode	0000: Momentary 0001: Latching	0000	
3.13 *	Jog Frequency Set (Hz)	0.00 – 240.0	5.00	
3.14 *	Jog Accel/Decel Time (Seconds)	0.3 – 10.0	1.0	
3.15	Switching Frequency (kHz)	0000: 8 0001: 10 0002: 12	0000	
3.16 *	Slip Compensation (%)	0.0 – 10.0	5.0	

**Notes:** (1) When the drive is set for 50 Hz motors (0.00 set to "0001"), the Upper Frequency Limit factory setting will automatically reset to 50 Hz. (2) Time set for 3.03 and 3.04 must be equal to or greater than the time set for 3.05 and 3.06, respectively. (3) Upper Frequency setting changes depending on pump model values are preset at factory. Consult factory prior to changing. \*Functions which can be changed while the drive is in the Run Mode.

**4- Digital Display Modes**

Function Code No.	Description	Range/Code	Flomotion Setting	Field Setting
4.00 *	Display Mode	0000: Frequency 0001: RPM <sup>(1)</sup> 0002: Custom Units	0002	
4.01 *	Custom Units (Significant Digits)	0 – 9999	VARIABLES	
4.02 *	Custom Units Display	0000: Whole Numbers 0001: One Decimal Place 0002: Two Decimal Places 0003: Three Decimal Places	0001	
4.03 *	Display in Stop Mode	0000: Displays Last Run Setting 0001: Displays "Stop" when in Stop Mode 0002: Displays "0000"	0001	
4.04 *	Motor Current Display <sup>(2), (3)</sup>	0000: Disabled 0001: Enabled	0000	
4.05 *	Motor Voltage Display <sup>(2), (3)</sup>	0000: Disabled 0001: Enabled	0000	
4.06 *	Bus Voltage Display <sup>(2), (3)</sup>	0000: Disabled 0001: Enabled	0000	

**Notes:** (1) Based on 4-pole motor. (2) The Display Key is used to toggle between displays. (3) If Motor Current Display is enabled, the display will show "XX.XA". If Motor Voltage Display is enabled, the display will show "XXXu". If Bus Voltage Display is enabled, the display will show "XXXU". \*Functions which can be changed while the drive is in the Run Mode.

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**5- Onboard Multi-Function Output Relay Operating Mode**

Function Code No.	Description	Range/Code	Flomotion Setting	Field Setting
5.00 *	Relay Operation Mode	<b>0000:</b> Run <b>0001:</b> Fault <sup>(1)</sup> <b>0002:</b> Target Frequency (5.01 ± 5.02) <b>0003:</b> Frequency Threshold Level (> 5.01 + 5.02) <b>0004:</b> Frequency Threshold Level (< 5.01 – 5.02) <b>0005:</b> I <sup>2</sup> t or I-t Fault <b>0006:</b> Load Loss (See 5.03)	0000	
5.01 *	Frequency Reached (Hz)	<b>0.00 – 240.0</b>	0.00	
5.02 *	Frequency Threshold (± Hz)	<b>0.00 – 30.00</b>	1.00	
5.03 *	Load Loss Threshold <sup>(1)</sup> (% Motor Current, set by 0.01)	<b>25 – 90</b>	60	

**Note:** (1) The output relay contacts will change state due to all faults and recovered faults. (2) The Load Loss Threshold function is not operational during acceleration, deceleration, or stop mode.

\*Functions which can be changed while the drive is in the Run Mode.

**6- Drive Status and Reset**

Function Code No.	Description	Range/Code	Flomotion Setting	Field Setting
6.00 **	Software Version	—	—	
6.01 **	Drive Horsepower	—	—	
6.02 **	Fault Log 1	—	—	
6.03 **	Fault Log 2	—	—	
6.04 **	Fault Log 3	—	—	
6.05	Reset Drive to Factory Setting	<b>1110:</b> 50 Hz Operation <b>1111:</b> 60 Hz Operation <b>1010:</b> Flomotion OEM Default Settings	0000	

\*\*Read only.

**7- Multi-Function Input Terminals**

Function Code No.	Description	Range/Code	Flomotion Setting	Field Setting
7.00	Multi-Function Input Terminal 1	<b>0000:</b> Preset Frequency 1 <sup>(1)</sup> <b>0001:</b> Preset Frequency 2 <sup>(1)</sup>	0000	
7.01	Multi-Function Input Terminal 2	<b>0002:</b> Preset Frequency 4 <sup>(1)</sup> <b>0003:</b> Up Frequency Command (See 7.14) <b>0004:</b> Down Frequency Command (See 7.14)	0001	
7.02	Multi-Function Input Terminal 3	<b>0005:</b> Accel/Decel 2 (See 7.16) <b>0006:</b> Forward/Stop Command <b>0007:</b> Reverse/Stop Command	0002	
7.03	Multi-Function Input Terminal 4	<b>0008:</b> External Fault <b>0009:</b> Reset	0010	
7.04	Multi-Function Input Terminal 5	<b>0010:</b> N.O. Start (3-Wire Start/Stop) <b>0011:</b> N.C. Stop (3-Wire Start/Stop)	0013	
7.05	Multi-Function Input Terminal 6	<b>0011:</b> N.C. Stop (3-Wire Start/Stop) <b>0013:</b> Local/Remote Auto Select (Disable to lock manual choice)	0003	
7.06	Multi-Function Input Terminal 7	<b>0010:</b> N.O. Start (3-Wire Start/Stop) <b>0011:</b> N.C. Stop (3-Wire Start/Stop) <b>0013:</b> Local/Remote Auto Select (Disable to lock manual choice)	0008	
7.07 *	Preset Frequency 1 (Hz)	<b>0.00 – 240.0</b>	5.00	
7.08 *	Preset Frequency 2 (Hz)	<b>0.00 – 240.0</b>	10.00	
7.09 *	Preset Frequency 3 (Hz)	<b>0.00 – 240.0</b>	20.00	
7.10 *	Preset Frequency 4 (Hz)	<b>0.00 – 240.0</b>	25.00	
7.11 *	Preset Frequency 5 (Hz)	<b>0.00 – 240.0</b>	30.00	
7.12 *	Preset Frequency 6 (Hz)	<b>0.00 – 240.0</b>	35.00	
7.13 *	Preset Frequency 7 (Hz)	<b>0.00 – 240.0</b>	40.00	
7.14 *	Up/Down Frequency Control Mode	<b>0000:</b> Free-Running <b>0001:</b> Incremental Change (See 7.15)	0000	
7.15 *	Increment of Up/Down Frequency (Hz) <sup>(2)</sup>	<b>0.01 – 30.00</b>	1.00	
7.16 *	Accel/Decel 2 Time (Seconds)	<b>0.3 – 180.0</b>	1.5	

**Note:** (1) Preset Frequencies 3, 5, 6, 7 are selected using any combination of 3 Multi-Function Input Terminals. (2) The incremental rate of change of the “UP” Control for frequency setting, using external contacts, is proportional to the Accel Time setting (3.03). The incremental rate of change of the “DOWN” Control for frequency setting, using external contacts, is proportional to the Decel Time Setting (3.04).

\*Functions which can be changed while the drive is in the Run Mode.

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**8- Multi-Function Output Relays and Output Signal Operation**

Function Code No.	Description	Range/Code	Flomotion Setting	Field Setting
8.00	Multi-Function Output Relay 1 (Terms. 23 – 25)	0000: Run 0001: Fault <sup>(1)</sup>	0001	
8.01	Multi-Function Output Relay 2 (Terms. 26 – 28)	0002: Target Frequency (8.04 ± 8.05) 0003: Frequency Threshold Level (> 8.04 + 8.05) 0004: Frequency Threshold Level (< 8.04 – 8.05) 0005: I <sup>2</sup> t or I.t 0006: Load Loss 0007: External Fault 0008: Motor Overload <sup>(2)</sup> 0009: Local/Remote	0009	
8.02	Multi-Function Open Collector Output 1 (Terms. 11, 12)		0002	
8.03	Multi-Function Open Collector Output 2 (Terms. 13, 14)		0004	
8.04 *	Frequency Set Point (Hz)	0.00 – 240.0	0.00	
8.05 *	Frequency Bandwidth (± Hz)	0.00 – 30.00	1.00	
8.06 *	Analog Output 1 Mode (Terms. 15, 16) (0 – 5 VDC)	0000: Motor Frequency 0001: Set Frequency 0002: Motor Voltage 0003: Bus Voltage 0004: Motor Current	0000	
8.07 *	Analog Output 1 Gain (%)	0 – 200	100	
8.08 *	Analog Output 2 Mode (Terms. 17, 18) (0 – 5 VDC)	0000: Motor Frequency 0001: Set Frequency 0002: Motor Voltage 0003: Bus Voltage 0004: Motor Current	0000	
8.09 *	Analog Output 2 Type	0000: 0 – 5 VDC 0001: 0 – 20 mA DC 0002: 4 – 20 mA DC	0000	
8.10 *	Analog Output 2 Gain (%)	0 – 200	100	

**Notes: (1)** The Output Relay contacts will change state due to all Faults and Recovered faults. **(2)** The Output Relay will change state when the I<sup>2</sup>t or I.t Timer starts.

\*Functions which can be changed while the drive is in the Run Mode.

**9- Analog Input Signal Operation**

Function Code No.	Description	Range/Code	Flomotion Setting	Field Setting
9.00 *	Analog Input 1 Gain (%)	0 – 500	100	
9.01 *	Analog Input 1 Slope	0000: Positive 0001: Negative	0000	
9.02 *	Analog Input 1 Offset	0 – 100	0	
9.03 *	Analog Input 1 Type	0000: Unidirectional 0001: Bidirectional	0000	
9.04 *	Analog Input 1 Response Time (mSec)	2 – 100	2	
9.05 *	Analog Input 2 Gain (%)	0 – 500	100	
9.06 *	Analog Input 2 Slope	0000: Positive 0001: Negative	0000	
9.07 *	Analog Input 2 Offset	0 – 100	20	
9.08 *	Analog Input 2 Type	0000: Analog Voltage <sup>(1)</sup> 0001: PWM <sup>(2)</sup>	0000	
9.09 *	Analog Input 2 Response Time (mSec)	2 – 100	2	

**Notes: (1)** Current signal input is jumper selected on the IODA. **(2)** 0.15 – 1 kHz (0 – 100% duty cycle).

\*Functions which can be changed while the drive is in the Run Mode.

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**10- Communication Mode (DIAC Option Board Required)**

Function Code No.	Description	Range/Code	Flomotion Setting	Field Setting
10.00	Assigned Communication Station Number	1 – 247	30	
10.01 *	Communications Watchdog Timer	0000: Disabled 0001: Enabled	0000	
10.02 *	Watchdog Timeout (Seconds)	0.50 – 2.00	0.50	
10.03	Operational Command	0	—	
		1		
		2		
		3		
		4		
		5		
		6		
		7		
		8		
		9		
		10		
10.04	Drive Status	11 – 15	—	
		0		
		1		
		2		
		3		
		4		
		5		
		6		
		7		
		8		
		9		
		10		
		11		
		12		
		13		
10.05	Drive Status Description	14, 15	—	
		00		
		01		
		02		
		03		
		04		
		05		
		06		
		07		
		08		
		09		
		10		
		11		
12				
10.06	Communications Error Count	—		
10.07	Motor Voltage	—		
10.08	Motor current	—		
10.09	Bus Voltage	—		
10.10	Motor Frequency	—		

\*Functions which can be changed while the drive is in the Run Mode. \*\*Read only.

**11- Reserved Functions**

Function Code No.	Description	Range/Code	Flomotion Setting	Field Setting
11.00 to 11.09	Reserved	—	—	