Instructions for FX3U series PLC

Version: V1.8

Preface

Thank you for purchasing the FX3U series programmable controller designed by Easycon. This manual mainly introduces the instruction application of FX3U series programmable controller.

FX3U series programmable controller integrates Ethernet network port and can be used for network communication. Combined with the dark horse configurable cloud platform, it can realize remote monitoring and program uploading and downloading.

The controller system adopts the internationally advanced M4 core control system, and is made by purchasing high-quality accessories from international manufacturers such as Omron relay, Yiguang optocoupler, Fenghua, Guoju and other passive components, with fine detection and production.

This series of PLC supports GX series software programming, reading, downloading, inspection, diagnosis, monitoring, multi-channel analog input and analog output functions, RS232 control, RS485 master-slave Modbus RTU function, can expansion function, multi axis step control, PWM function, temperature NTC and PT100 sensors, AB phase encoder input, nixie tube function, touch screen function, watchdog External interrupt function, supporting super password setting, power failure detection data storage function and fault detection.

This series of PLC supports a series of practical functions such as ENET network function, PLC program protection and anti reading. This series of PLC has more powerful functions, more flexible application and more stable performance. It can be widely used in general and special markets. It can be used in electric control cabinet control, automatic production line transformation, multi axis robot, automatic test rack, textile machinery, packaging machine, brick machine and other occasions. It provides highly integrated integrated solutions for equipment

intelligent manufacturing and end customers in monitoring, protection, automatic control, etc., which is of great value in reducing system procurement and operation costs and improving system reliability.

Before installing, using and maintaining PLC, relevant personnel should carefully read this operation manual to ensure that this product can be correctly installed and operated to give full play to its best performance.

If there are any problems or special requirements for the use of PLC, you can contact the company's agent at any time, or directly call the after-sales service center of the company's headquarters. We will serve you wholeheartedly.

Data version: the first edition in 2016

Notes to users

Only operators with certain electrical knowledge can conduct wiring and other operations on the product. If there is any unknown place, please consult the technical department of the company.

The examples listed in the manual and other technical data are only for users' understanding and reference, and do not guarantee certain actions.

When using this product in combination with other products, please confirm whether it conforms to relevant specifications and principles.

When using this product, please confirm whether it meets the requirements and is safe. If the failure of this product may cause machine failure or loss, please set up backup and safety functions by yourself.

Contact information

If you have any questions about the use of this product, please contact with the agent and office who purchased the product, or you can directly contact with the headquarters.

Catalogue

一、Basic description

software	Support software	Support GX software programming, reading, downloading, inspection, diagnosis and monitoring programs
Number of steps	Program steps	32000 steps
Voltage input	Rated voltage	DC24V
	Voltage variation	Voltage variation range: ± 15% voltage unbalance rate <3%; Frequency ± 5%
X point input	Component range	X0~X377 count 256bit
	Hardware range	X0~X77 count 64bit
Y-point output	Component range	Y0~Y377 count 256bit
	Hardware range	Y0~Y77 count 64bit
	High speed pulse	The maximum support is Y0, Y1, Y2, Y3, Y4, Y5, y6 and Y7. Y0-y5 can reach 200kHz at the same time, and y6-y7 can reach 100 kHz at the same time. It supports Plsy and PLSR to send pulses(it supports positioning instructions)
Analog quantity	AD IN	Up to 10 channel, 0-10V/4-20ma/NTC, 12bit
	DA OUT	2 channel, 0-10V,12bit
communication interface	RS422	1 channel, Support ladder diagram download and touch screen communication protocol
	RS485	2 channel, Support master-slave settings , MODBUS-RTU protocol(Support bit component read by word) 、RS、RS2 No protocol communication , Support master station programming protocol.
	CAN	Support module extension function,it supports up to 16 slaves, and supports functions such as extended input, output, analog quantity, weighing, NTC, PT100, thermocouple, etc

communication interface	ENET port	It supports the basic functions of the ENET network interface,the ENET network interface Modbus TCP/UDP server (slave), the ENET network interface Modbus TCP/UDP client (Master), protocols, It supports 8 independent hardware sockets, each channel of communication does not affect each other, and supports remote parameter uploading, downloading and online monitoring functions
clock	Perpetual calendar clock function	Compatible with the original packaging (when the password is 12345678, the programming software cannot modify the clock data)
encoder	Encoder input function	It supports up to two channels of AB phase input, with a maximum response of 100kHz (and AB phase input can select 2-fold frequency and 4-fold frequency - the same encoder can obtain 2-4 times the accuracy), and supports SPD command (x0~x5:6 channels), maximum response frequency of other software high-speed counters: 10kHz
Watchdog	Watchdog function	Compatible with original packaging
Interrupt function	External interrupt function	Compatible with original packaging; It supports pulse capture function, 6 channels of x0-x5, and the maximum response frequency is 10kHz (with filtering)
password	Support super password setting	After the password is 12345678, the program cannot be read, but the software component data can be read, and the password modification program will be cleared

Power down hold	Power down hold data function	All power failures are maintained by flash (more than 10 years), and the data will be checked when power is on
Fault detection	ERR light	When the program is running in PLC, it will check the program instructions and component range, and report corresponding faults if there are problems detected; When running and detecting a fault, slight fault: err light flashes; Serious fault: err light is on for a long time
Running light	RUN light	When the run switch is turned to run, the run lamp flashes
Acceleration and deceleration	PLSV instruction	Support PLSV command to set whether acceleration or deceleration is required through M8338
Constant scan	Constant scan mode	D8039 constant scan time, M8039 constant scan mode
D register		Supports the use of D register bit components: Dn.b
Index register		Supports the use of index register formats: constant: KnZn, HnZn, bit: KnX (YMTC) Zn, word: D (TC) nZn

3、Component range（R extension register not supported）

X0~X377	256bit	hardware：X0~X77 64bit
Y0~Y377	256bit	hardware：Y0~Y77 64bit
M0~M499	500bit	for general use [Variable]
M500~M1023	524bit	for retention [Variable]
M1024~M7679	6656bit	for retention [fixed]
M8000~M8511	512bit	Special use
S0~S9	10bit	Initialization status (for general use [Variable])
S10~S499	490bit	for general use [Variable])
S500~S899	400bit	for retention [Variable]
S900~S999	100bit	For signal alarm (for retention [Variable])
S1000~S4095	3096bit	for retention [fixed]
T0~T199 200bit	200bit	100ms
T200~T245	46bit	10ms
T246~T249	4bit	1ms Cumulative
T250~T255	6bit	100ms Cumulative
T256~T511	256bit	1ms
C0~C99	100bit	for general use/cumulative (16bit)[Variable]
C100~C199	100bit	for retention/ cumulative (16bit)[Variable]
C200~C219	20bit	for general use/Bi-directional (32bit)
C220~C234	15bit	for retention/ Bi-directional (32bit)
C235~C255	20bit	for retention/high speed reader (32bit)
D0~D199	200bit	for general use (16bit)[Variable]

D200~D511	312bit	for retention (16bit)[Variable]
D512~D7999	7488bit	for retention (16位)[fixed]
D8000~D8511	512bit	Special use (16bit)
V0~V7 Z0~Z7	16bit	For address change (16bit)

N0~N7	8bit	For master control
P0~P4095	4096bit	JUMP、CALL For branching
I0□□~I5□□	6bit	Input interrupt
I6□□~I8□□	3bit	timer interrupt
I010~I060	6bit	Counter interrupt
K(10 Decimal)	16bit -32768~32767	32 -2147483648~2147483647
H（16Decimal）	16位 0~FFFF	32位 0~FFFFFFFF
E（real number - floating-point）	$-1.0\times2^{128}\sim1.0\times2^{-126}$、0 、$1.0\times2^{-126}\sim2^{128}$	

4、Supported instructions

1) Basic instructions (all supported):

LD LDI LDP LDF AND ANI ANDP ANDF ANDB OR ORI ORP ORF ORB MPS MRD MPP MC MCR INV PLS PLF OUT SET RST NOP MEP MEFENDSTL（Maximum support for 8 channel branches）RET

2）Application instruction:

category	Function number	instructions	function	Remarks	category	Function number	instructions	function	Remarks
Procedure flow	00	CJ	conditional Jump		data processing	40	ZRST	Interval reset	
	01	CALL	call subroutine			41	DECO	decoding	
	02	SRET	Subroutine return			42	ENCO	coding	
	03	IRET	Interrupt return			43	SUM	Bits of ON	
	04	EI	on interrupt			44	BON	ON bit judgment	
	05	DI	off interrupt			45	MEAN	average value	
	06	FEND	End of main program			46	ANS	signal alarm Set	

Procedure flow					data processing				
	07	WDT	Watchdog timer refresh			47	ANR	Signal alarm reset	
	08	FOR	Start of circulation area			48	SQR	Square root operation	
	09	NEXT	End of cycle area			49	FLT	BIN integer - Binary floating point conversion	
Transmission and comparison	10	CMP	compare		High speed processing	50	REF	in/out refresh	
	11	ZCP	Interval comparison			51	REFF	Input refresh (with filter setting)	NO
	12	MOV	transfer			52	MTR	Matrix input	NO
	13	SMOV	Bit transfer			53	HSCS	Compare set	
	14	CML	Reverse transfer			54	HSCR	Compare reset	
	15	BMOV	Send together			55	HSZ	Interval comparison	
	16	FMOV	Multicast			56	SPD	Pulse density	
	17	XCH	exchange			57	PLSY	Pulse output	
	18	BCD	BCD conversion			58	PWM	Pulse modulation	

	19	BIN	BIN exchange			59	PLSR	Acceleration and deceleration pulse output	
Four logic operations	20	ADD	BIN addition		Convenience instruction	60	IST	initialization	NO
	21	SUB	BIN subtraction			61	SER	data retrieval	
	22	MUL	BIN multiplication			62	ABSD	Cam control Absolute mode	
	23	DIV	BIN division			63	INCD	Cam control Relative mode	

	24	INC	BIN add 1			64	TIMR	Teaching timer	
	25	DEC	BIN minus 1			65	STMR	Special timer	
	26	WAND	Logical word (and)			66	ALT	Alternate output	
	27	WOR	Logical word (or)			67	RAMP	Ramp signal	
	28	WXOR	Logical XOR			68	ROTC	Rotary table control	NO
	29	NEG	Complement			69	SORT	Data sorting	
Cyclic shift	30	ROR	Right swing		Peripheral instruction	70	TKY	Numeric key input	NO
	31	ROL	Left swing			71	HKY	16 key input	NO
	32	RCR	Carry Right swing			72	DSW	Digital switch	NO
	33	RCL	Carry Left swing			73	SEGD	7-segment decoding	
	34	SFTR	bit shift right			74	SEGL	Seven segment code time sharing display	NO
	35	SFTL	Bit shift left			75	ARWS	Arrow switch	NO
	36	WSFR	Word shift right			76	ASC	ASCII Input	NO
	37	WSFL	Word shift left			77	PR	ASCII Print	NO
	38	SFWR	Shift write			78	FROM	ENET readout	*1
	39	SFRD	Shift readout			79	TO	ENET write	*1

	功能号	指令	功能	备注	类别	功能号	指令	功能	备注
外围设备SER	80	RS	串行数据传		浮点数	130	SIN	浮点SIN运算	
	81	PRUN	8位数据传送			131	COS	浮点COS运算	
	82	ASCI	HEX-ASCII转换			132	TAN	浮点TAN运算	
	83	HEX	ASCII-HEX转换			133	ASIN	2进制浮点数SIN-1 运算	
	84	CCD	检验码			134	ACOS	2进制浮点数COS-1 运算	
	85	VRRD	电位器读出	NO		135	ATAN	2进制浮点数TAN-1 运算2	
	86	VRSC	电位器该度	NO		136	RAD	进制浮点数角度-弧度的转换	
	87	RS2	串行数据传输2			137	DEG	2进制浮点数弧度-角度的转换	
	88	PID	PID运算	NO		138		-	
	89	-				139		-	

数据传送2	100	-			数据处理2	140	WSUM	Calculate data Total value	
	101	-				141	WTOB	Data separation in byte units	
	102	ZPUSH	变址寄存器的成批保存			142	BTOW	字节单位的数据结合	
	103	ZP0P	变址寄存器的恢复			143	UNI	16位数据的4位结合	
	104	-				144	DIS	16位数据的4位分离	
	105	-				145		-	
	106	-				146		-	
	107	-				147	SWAP	上下字节对换	
	108	-				148		-	
	109	-				149	SORT2	数据排序2	
浮点数	110	ECMP	2进制浮点数比较		定位控制	150	DSZR	带DOG搜索的原点回归	
	111	EZCP	2进制浮点数区间比较			151	DVIT	中断定位	NO
	112	EMOV	2进制浮			152	TBL	表格设定	NO

浮点数			点数数据传送		定位控制			定位	
	113	-				153		-	
	114	-				154		-	
	115	-				155	ABS	ABS现在值读出	NO
	116	-				156	ZRN	原点回归	
	117	ESTR	2进制浮点数-字符串的转换	NO		157	PLSV	可变度的脉冲输出	
	118	EBCD	2进制-10进制浮点数转换			158	DRVI	相对定位	
	119	EBIN	10进制-2进制浮点数转换			159	DRVA	绝对定位	
	120	EADD	2进制浮点数加法		时钟运算	160	TCMP	时钟数据比较	
	121	ESUB	2进制浮点数减法			161	TZCP	时钟数据区间比较	
	122	EMUL	2进制浮点数乘法			162	TADD	时钟数据加法	
	123	EDIV	2进制浮点数除法			163	TSUB	时钟数据减法	
	124	EXP	2进制浮点数指数运算			164	HTOS	时、分、秒数据的秒转换	
	125	LOGE	2进制浮			165	STOH	秒数据的	

浮点数			点数自然对数运算		时钟运算			[时、分、秒]转换	
	126	LOG10	2进制浮点数常用对数运算			166	TRD	时钟数据读出	
浮点数	127	ESQR	2进制浮点数开方运算			167	TWR	时钟数据写入	
	128	ENEG	2进制浮点数符号翻转			168		-	
	129	INT	2进制浮点-BIN转换			169	HOUR	计时器	

外围设备	170	GRY	格雷码变换		数据处理3	210	FDEL	数据表的数据删除	
	171	GBIN	格雷码逆变换			211	FINS	数据表的数据插入	
	172	-				212	POP	读取后入的数据	
	173	-				213	SFR	16位数据n位右移(带进位)	
	174	-				214	SFL	16位数据n位左移(带进位)	
	175	-				215		-	

	176	RD3A	模拟量模块的读出	*1		216	-		
	177	WR3A	模拟量模块的写入	*1		217	-		
	178	-				218		-	
	179	-				219		-	
其他指令	180	-			触点比较指令	220	-		
	181	-				221		-	
	182	COMRD	读出软元件的注释数据	NO		NO	222	-	
	183	-				223		-	
	184	RND	产生随机数			224	LD=	(S1)=(S2)	
	185	-				225	LD>	(S1)>(S2)	
	186	DUTY	产生定时脉冲			226	LD<	(S1)<(S2)	
	187	-				227		-	
	188	CRC	CRC运算			228	LD<>	(S1)≠(S2)	
	189	HCMOV	高速计数器的传送			229	LD<=	(S1)<=(S2)	
数据块处理	190		-			230	LD>=	(S1)>=(S2)	
	191	-				231		-	
	192	BK+	数据块的加法运算			232	AND=	(S1)=(S2)	
	193	BK-	数据块的减法运算			233	AND>	(S1)>(S2)	

	194	BKCMP=	数据块的比较(S1)=(S2			234	AND<	(S1)<(S2)	
	195	BKCMP>	数据块的比较(S1)>(S2			235		-	
	196	BKCMP<	数据块的比较(S1)<(S2			236	AND<>	(S1)≠(S2)	
	197	BKCMP<>	数据块的比较(S1)<>(S2)			237	AND<=	(S1)<=(S2)	
	198	BKCMP<=	数据块的比较(S1)<=(S2)			238	AND>=	(S1)>=(S2)	
	199	BKCMP>=	数据块的比较(S1)>=(S2)			239		-	
	200	STR	BIN→字符串的转换	NO		240	ORD=	(S1)=(S2)	
	201	VAL	字符串→	NO		241	ORD>	(S1)>(S2)	

字符串处理			BIN的转换						
	202	$+	字符串的结合	NO		242	ORD<	(S1)<(S2)	
	203	LEN	检测出字符串的长度	NO		243	-		
	204	RIGHT	从字符串的右侧开始取出	NO		244	ORD<>	(S1)≠(S2)	
	205	LEFT	从字符串的左侧开始取出	NO		245	ORD<=	(S1)<=(S2)	
	206	MIDR	从字符串中的任意取出	NO		246	ORD>=	(S1)>=(S2)	
	207	MIDW	字符串中的任意替换	NO		247	-		
	208	INSTR	字符串的检索	NO		248	-		
	209	$MOV	字符串的传送	NO		249	-		
	250	-			290	LOADR	读出扩展文件寄存器		NO
	251	-			291	SAVER	成批写入扩展文件寄存器		NO

数据表处理	252	-			292	INITR	扩展寄存器的初始化	NO
	253	-			293	LOGR	登录到扩展寄存器	NO
	254	-			294	RWER	扩展文件寄存器的删除・写入	NO
	255	-			295	INITER	扩展文件寄存器的初始化	NO
	256	LIMIT	上下限限位控制		296	-		
	257	BAND	死区控制		297	-		
	258	ZONE	区域控制		298	-		
	259	SCL	定坐标(不同点坐标数据)		299	-		
	260	DABIN	10进制ASCII→BIN的转换		300	FLCRT	文件的制作・确认	NO
	261	BINDA	BIN→10进制ASCII的转换		301	FLDEL	文件的删除・CF卡格式化	NO
	262	-			302	FLWR	写入数据	NO
	263	-			303	FLRD	数据读出	NO

	264	-			304	FLCMD	对FX 3U -CF-ADP的动作指示	NO
	265	-			305	FLSTRD	FX 3U -CF-ADP的状态读出	NO
	266		-		306			-
	267		-		307			-
	268		-		308			-
	269	SCL2	定坐标2(X/Y 坐标数据)		309	-		
外部设备通信	270	IVCK	变频器的运转监视		273	IVWR	变频器的参数写入	NO
	271	IVDR	变频器的运行控制	NO	274	IVBWR	变频器的参数成批写入	NO
	272	IVRD	变频器的参数读取	NO	276	ADPRW	MODBUS读出·写入	*1
数据传送	277		-		279	WBFM	BFM分割写入	NO
	278	RBFM	BFM分割读出	NO				
高速处理2	280	HSCT	高速计数器的表格比较					
	281		-					
	282		-					

Note:

1) Supports 32-bit instructions and plus P instructions;

2) When an unsupported command is used, a 6506 fault is detected;

3) Yellow indicates FX3U instruction; *Note that grey instructions are not supported for the time being

5、Functional description of special relays and registers

M8000：Operation monitoring contact　　M8001：Operation monitoring anti contact

M8002：Initialize pulse contact　　M8003：Initialize pulse back contact

M8004：Error indication contact　　M8005：

M8006：M8008：Power down detection (On during power down, off after power down)

M8011：10 ms clock pulse　　M8012：100 ms clock pulse

M8013：1 second clock pulse　　M8014：1 minute clock pulse

M8015：set clock　　M8016：Clock display stop

M8017：Clock plus or minus 30 seconds correct

M8018：Real time clock flag

M8019：Clock error flag

M8020：0 bit flag

M8021：Borrow flag　　M8022：Carry flag

M8029：Command execution end flag

M8031：Nonlatching data clearing　　M8032：Latch data clear

M8034：Disable all outputs　　M8039：Constant scan mode

M8047：STL monitoring is effective　　M8048：S900-S999 With on status

M8049：Signal alarm is effective

M8050：I0 port interrupt prohibition　　M8051：I1 port interrupt prohibition

M8052：I2 port interrupt prohibition　　M8053：I3 port interrupt prohibition

M8054：I4 port interrupt prohibition

M8055：I5 port interrupt prohibition

M8059：I010,I020,I030,I040,I050,I060 Count interrupt inhibit

M8129: Serial port 1 communication timeout flag

M8139: HSCS、HSCR、HSZ、HSCT High speed counter compare instruction execution CAN Function (Now it is only used for system IO point extension)

M8149: CAN Communication timeout flag M8150: CAN allow work flag high speed six axis

M8152: User interrupt input instruction Y4

M8153: User interrupt input instruction Y5 High speed eight axis

M8154: User interrupt input instruction y6

M8155: User interrupt input instruction Y7

M8161: 16 bit /8 bit switching flag

M8168: SMoV instruction hex processing function

M8170: X0 pulse capture M8171: X1 pulse capture

M8172: X2 pulse capture M8173: X3 pulse capture

M8174: X4 pulse capture M8175: X5 pulse capture

M8196: C251 c252 c254 double frequency mark

M8197: C253 c255 double frequency mark

M8198: C251 c252 c254 quadruple frequency mark

M8199: 4-octave mark of c253 and c255

M8200:

M8234: Count direction setting of c200-c234

M8235-M8345: C235-c245 count direction setting

M8246: M8255: Counting direction mark of c246-c255

M8329: Abnormal end of instruction execution

M8330: DUTY(FNC 186) instruction Timing clock output 1

M8331: DUTY(FNC 186) instruction Timing clock output 2

M8332: DUTY(FNC 186) instruction Timing clock output 3

M8333: DUTY(FNC 186) instruction Timing clock output 4

M8334: DUTY(FNC 186) instruction Timing clock output 5

M8336: Interrupt input specified function Yes

M8338: PLSV command acceleration and deceleration action

M8340-M8349: High speed output Y0 function

M8350-M8359: High speed output Y1 function High speed four axle

M8360-M8369: High speed output Y2 function

M8370-M8379: High speed output Y3 function

High speed six axis

M8440-M8449: High speed output Y4 function

M8450-M8459: High speed output Y5 function

High speed eight axis

M8470-M8479: High speed output y6 function

M8480-M8489: High speed output Y7 function

MODBUS/RS Function

M8401: RS command sending (M8121)

M8402: RS command sending (M8122)

M8403: RS Command receiving flag (M8123)

M8404:

M8409: Communication timeout flag (M8129)

M8401: Channel 1-MODBUS communication

M8421: Channel 2-MODBUS communication

MODBUS Function

M8402: Channel 1-MODBUS communication error

M8422: Channel 2-MODBUS communication error

M8403: Channel 1-MODBUS communication error latch

M8423: Channel 2- MODBUS communication error latch

M8408: Channel 1- retry occurred
M8428: Channel 2- retry occurred
M8409: Channel 1- timeout occurred
M8429: Channel2- timeout occurred
M8410: Channel 1/2 is switched with ADPRW command

ENET Function

M8404: ENET Ready M8406: Executing time setting

M8411: Execution time setting

M8492: IP save area write requirement

M8493: End of IP save area writing

M8494: IP save area write error

M8495: IP storage area clearing requirement

M8496: End of clearing IP saving area

M8497: IP save area clear error

M8498: Change the flag bit during IP function operation

M8460: User interrupt input instruction Y00

M8461: User interrupt input instruction Y01

High speed four axle

M8462: User interrupt input instruction Y02

M8463: User interrupt input instruction Y03

M8464: DSZR、ZRN Command Y00 clear signal assignment is valid

M8465: DSZR、ZRN Command Y01 clear signal assignment is valid

M8466: DSZR、ZRN Command Y02 clear signal assignment is valid

M8467: DSZR、ZRN Command Y03 clear signal assignment is valid

D8000：Monitoring timer setting（default 200）

D8008：Power down detection time（Set value：1~100，默认10ms）

D8009：

D8010：Current value of scan time（0.1ms）

D8011：Minimum scanning time（0.1ms）

D8012：Maximum scan time（0.1ms）　　D8013：RTC Clock second

D8014：RTC Clock minute　　D8015：RTC Clock hour

D8016：RTC Clock day　　D8017：RTC clock moon

D8018：RTC Clock year　　D8019：RTC Clock week

D8020：X0-X17 Filter coefficient（Set value：0~60ms，default 10）

D8021：X20-X77 Filter coefficient（Set value：1~60ms，default 10）

D8028：Z0 Index register contents

D8029：V0 Index register contents

D8030：Enable sampling data of analog quantity 0*

D8031：Enable sampling data of analog quantity 1*

D8032：Enable sampling data of analog quantity 2*

D8033：Enable sampling data of analog quantity 3*

D8034：Enable sampling data of analog quantity 4*

D8035：Enable sampling data of analog quantity 5*

D8036：Enable sampling data of analog quantity 6*

D8037：Enable sampling data of analog quantity 7*

D8038：Enable sampling data of analog quantity 8*

D8039：Constant scan time（unit：1ms，default 0）

D8040：1st active STL status　　D8041：2nd active STL status

D8042：3rd active STL status　　D8043：4th active STL status

D8044：5th active STL status　　D8045：6th active STL status

D8046：7th active STL status　　D8047：8th active STL status

D8048：　　D8049：Minimum active STL status

D8050：Enable sampling data of analog quantity 9

D8051：Enable sampling data of analog quantity 10

D8052：Enable sampling data of analog quantity 11

D8053：Enable sampling data of analog quantity 12

D8054：Enable sampling data of analog quantity 13

D8055：Enable sampling data of analog quantity 14

D8056：Enable sampling data of analog quantity 15

D8112：Analog dac0 output data (0~4095)

D8113：Analog dac1 output data (0~4095)

D8136：Y0 Y1 High speed output count accumulation:32bit

D8139：HSCS、HSCR、HSZ、HSCT command Number of instructions in execution (cannot be greater than 4)

D8140：Y0 Pulse output count register

D8142：Y1 Pulse output count register

D8145：Y2 Pulse output count register

D8146：Y3 Pulse output count register

High speed six axis

D8156：DSZR、ZRN Command specifies Y04 to clear signal element

D8157：DSZR、ZRN Command specifies Y05 to clear the signal element

High speed eight axis

D8158：DSZR、ZRN Command specifies Y06 to clear the signal element

D8159：DSZR、ZRN Command specifies Y07 to clear signal element

High speed six axis

D8170：Y04 pulse output count register

D8172：Y05 pulse output count register

High speed eight axis

D8174：Y06 pulse output count register

D8176：Y07 pulse output count register

D8182：Z1 index register contents

D8183：V1 index register contents

D8184: Z2 index register contents D8185: V2 index register contents

D8186: Z3 index register contents D8187: V3 index register contents

D8188: Z4 index register contents D8189: V4 index register contents

D8190: Z5 index register contents

D8191: V5 index register contents

D8192: Z6 index register contents

D8193: V6 index register contents

D8194: Z7 index register contents D8195: V7 index register contents

D8196: For Can function D8197: For Can function

D8198: For Can function D8199: For Can function

D8310: random number (32bit)

D8330: DUTY command Timer clock output 1 scan count counter

D8331: DUTY command Timer clock output 2 scan count counter

D8332: DUTY command Timer clock output 3 scan count counter

D8333: DUTY command Timer clock output 4-scan counter

D8334: DUTY command Timer clock output 5-scan counter

D8336: DVIT Interrupt input assignment Y0-Y3

D8337: DVIT Interrupt input assignment Y4-Y7

D8340-D8349: High speed output Y0 register

D8350-D8359: High speed output Y1 register

D8360-D8369: High speed output Y2 register

D8370-D8379: High speed output Y3 register

High speed four axis function

MODBUS function

D8400: Serial port 1 communication parameter setting

D8402: RS Remaining data after instruction sending

D8403: RS Number of instructions received

D8409：RS/MODBUS Master station communication timeout

（1=10ms，default 500）

D8400：Channel 1- communication format setting

D8420：Channel 2 communication format setting

D8401：Channel 1-protocol

D8421： Channel 2-protocol

D8402：Channel 1- communication error code

D8422：Channel 2- communication error code

D8403：Channel 1 error details

D8423：Channel 2 error details

D8404：Channel 1- step where communication error occurs

D8424：Channel 2- steps for communication errors

D8407：Channel 1- step number in communication

D8427：Channel 2- step number in communication

D8408: Channel 1 current number of retries

D8428: Channel 2 current number of retries

D8409: Channel 1- slave station response timeout

D8429: Channel 2 slave station response timeout

D8410: Channel 1-transmit delay

D8431: Channel 2-transmit delay

D8412: Channel 1- number of retries
D8432: Channel 2- number of retries

D8414: Channel 1- slave station number

D8434: Channel 2- slave station number

D8419: Channel 1 action mode display

D8439: Channel 2 action mode display

D8405: Connection status of Ethernet port

D8406: Save Ethernet adapter status ENET Function

D8411: Time setting function action result

D8413: W5500 Program version

D8415: MAC address of this station

D8416: MAC address of this station

D8417: MAC address of this station
D8418: Error code for Ethernet adapter

D8470: IP address (low order)

D8471: IP address (high bit)

D8472: Subnet mask (low order)

D8473: Subnet mask (high bit)

D8474: Default router IP address (low order)

D8475：Default router IP address (high bit)

D8492：IP address setting (low order)

D8493：IP address setting (high bit)

D8494：Subnet mask setting (low order)

D8495：Subnet mask setting (high bit)

D8496：Default router IP address setting (low order)

D8497：Default router IP address setting (high bit)

D8498：IP address save area error code

High speed six axis function

D8440-D8449: High speed output Y04 register

D8450-D8459: High speed output Y05 register

High speed eight axis function

D8470-D8479: High speed output Y06 register

D8480-D8489: High speed output y07 register

D8464：DSZR、ZRN Command specifies that Y00 clears the signal element

D8465：DSZR、ZRN Command specifies that Y01 clears the signal element

High speed four axle

D8466：DSZR、ZRN Command specifies that Y02 clears the signal element

D8467：DSZR、ZRN Command specifies Y03 to clear the signal element

6、Use of high speed counter

1） C251 C252 C254（AB phase）Maximum response frequency：120KHz

2） C253 C255（AB phase）Maximum response frequency：120KHz

3） C235 C241 C244 C238（single-phase）Maximum response frequency：120KHz

4） Maximum response frequency of other high-speed counters：10KHz；

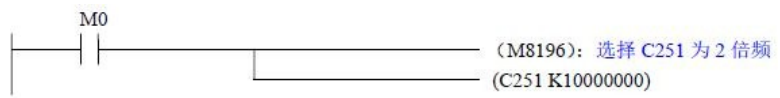
5） The high-speed counter of phase AB can be set with frequency doubling and frequency doubling（The setting is only valid in the current cycle of OUT drive）：

**M8196－ON，C251 C252 C254 Counting pulse frequency doubling；

**M8197－ON，C253 C255 Counting pulse frequency doubling；

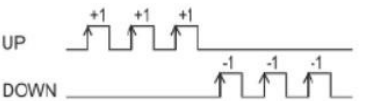
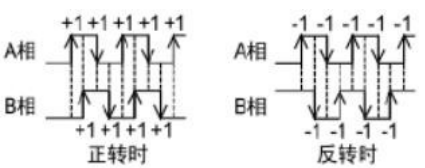
**M8198－ON，C251 C252 C254 Counting pulse 4 times frequency；

**M8199－ON，C253 C255计 Digital pulse frequency doubling；



For example: if an ab phase encoder is used, 1024 pulses are generated in one revolution. If frequency doubling is not set, the counter counts 1024 (the original FX3U does not support frequency doubling). If frequency doubling is set, the counter counts 2048 in one revolution; If 4 times frequency is set, the counter counts 4096 once;

Instructions for use:

		Input signal form	Counting direction
single-phase Single count input			To specify the increment / decrement count by M8235~ M8245 ON/OFF ON: Minus count OFF: Increment count
Single-phaseDouble count input			Increase / decrease count。The counting direction can be through M8246 ~ M8250 setting。 ON: Minus count OFF: Increment count
Two-phase Double count input	1x		According to the change of A/B phase input state, the increase / decrease counting is automatically carried out, and the counting direction can be through the M8251 ~ M8255 to set。 ON: Minus count OFF: Increment count
	4x		

	Counter number	Distinguish	Input terminal assignment							
			X000	X001	X002	X003	X004	X005	X006	X007
Single phase/ Single count input	C235	H/W	U/D							
	C236	S/W		U/D						
	C237	S/W			U/D					
	C238	H/W				U/D				
	C239	S/W					U/D			
	C240	S/W						U/D		
	C241	H/W	U/D	R						
	C242	S/W			U/D	R				
	C243	S/W					U/D	R		
	C244	H/W	U/D	R					S	
	C245	S/W			U/D	R				S
Single phase/ Double count input	C246	S/W	U	D						
	C247	S/W	U	D	R					
	C248	S/W				U	D	R		
	C249	S/W	U	D	R				S	
	C250	S/W				U	D	R		S
Two-phase/ Double count input	C251	H/W	A	B						
	C252	H/W	A	B	R					
	C253	H/W				A	B	R		
	C254	H/W	A	B	R				S	
	C255	H/W				A	B	R		S

H/W: Hardware counter S/W: Software counter U: Increment counter input D: Minus counter input

A: Phase A input B: Phase B input R: External reset input S: External start input

Only x0-x5 high-speed function is supported,
while X6 and X7 do not support high-speed function

Instructions for DHSCS, DHSCR And DHSZ instructions:

** Three high-speed comparison commands are driven at the same time: two times for x0 hardware counter, two times for X3 hardware counter and four times for software counter (greater than 6705);

**When the hardware high-speed counter is used for comparison, the response frequency will not change. DHSCS and DHSCR perform real-time comparison, but the interval comparison of DHSZ hardware is not real-time, but about 5us;

**When using hardware high-speed counters, as long as DHSCS, DHSCR and DHSZ are driven, the comparison results will be output

7、Instructions for communication interface

7.1 RS422 Interface instructions

RS422 protocol is supported, and FX programming port protocol is used by default when power on; It can be used to connect to the touch screen of RS422 protocol.

7.2 RS485 Interface instructions

*RS485-1 The power on default is FX programming port protocol;

*RS485-1 Support switching between Mitsubishi FX programming port protocol and MODBUS-RTU protocol;

*RS485-1 Communication parameters are set at D8400, The communication parameters of RS485-2 are set in D8420, Support ADPRW switching between RS485-1 and RS485-2;

* ADPRW maximum read and write data length is 520, 6343 or 6363 fault is reported in case of exceeding the limit;

* If D8400 or D8420 does not start the MODBUS-RTU master station function and ADPRW command is used, 6706 fault is reported;

RS485-1	RS485-2	name	Effective station	Details	R/W
D8400	D8420	Communication format setting	Master / slave station	Set the communication format. See the following for details	R/W
D8401	D8421	MODBUS Protocol selection	Master / slave station	Select MODBUS master protocol when the value is H0, and select MODBUS slave protocol when the value is H10 (K16)	R/W
D8402	D8422	Communication error code	Master / slave station	The latest error code in Modbus communication is stored	R
D8403	D8423	Error details	Master / slave station	The details of the latest error are stored	R

RS485-1	RS485-2	Name	Effective station	Details	R/W
D8404	D8424	Step with communication error	master station	The step number of the first adprw command in error is stored.	R
D8407	D8427	Step No. in communication	master station	The step number of the ADPRW command in Modbus communication is stored (0 is stored when the instruction is not executed.) The step number of the last ADPRW instruction executed is maintained	R
D8408	D8428	Current retry count	master station	When the communication is retried due to the response timeout of the slave station, the current retry times will be stored	R
D8409	D8429	Slave response timeout	master station	After the master station sends the request, if the slave station does not respond within the set time, the master station will send the text again, or judge the timeout error according to the set retry times (D8412, D8432), and then end the processing of the instruction Setting range: 0 ～ 32767,1=10ms, when it is 0, 3 seconds will be timeout	R/W

D8410	D8431	transmission delay	master / slave station	This delay refers to the delay in returning data after receiving data .Setting range: 0 ～ 16382 [MS], default: 10ms	R/W

RS485-1	RS485-2	name	Effective station	Details	R/W
D8412	D8432	retry count	master station	When the slave station does not respond within the time set in the slave station response timeout, the master station will end the instruction processing due to the timeout error after sending the text until the set number of retries is reached. Setting range: 0 ~ 20 [times]. When the value above 20 is set, the number of retries is 20	R/W
D8414	D8434	Slave station' home station number	Slave station	Storage slave' s home station, Setting range: 1 ~ 247	R/W
D8063	D8438	Serial communication error code	Master/ Slave station	In case of communication error, the error code corresponding to the error in Modbus communication will be stored	R
D8419	D8439	Action mode display	Master/Slave station	0- FX Programming port communication 4- RS command 5- RS2 command 19-MODBUS Communication master station 29-MODBUS Communication slave station	R

Special relay

RS485-1	RS485-2	name	Effective station	Details	R/W
M8410		Rs485-1/2 switch with ADPRW command	Master station	OFF： Rs485-1 uses ADPRW command ON： Rs485-2 uses ADPRW command	R/W
M8029		End of instruction execution	Master station	OFF:The instruction is not in execution or the instruction has not been completed . ON: Instruction execution completed .	R
M8401	M8421	MODBUS In communication	Master station	Modbus, set to on in communication	R
M8402	M8422	MODBUS Communication error	Master/Slave station	ON is displayed when Modbus communication error occurs	R
M8403	M8423	MODBUS Communication error latch	Master/Slave station	Set to on in case of Modbus communication error	R
M8408	M8428	Retry occurred	Master	When the slave station fails to respond on time, it is displayed as ON during the period when the master station sends a retry	R
M8409	M8429	Timeout occurred	Master	The response timeout is displayed as ON	R

Slave protocol software component address (bit component address)

MODBUS-RTU Slave software component address		Software component address
read out Dedicated	Read / write	
0x0000～0x1DFF	0x0000～0x1DFF	M0～M7679
0x1E00～0x1FFF	0x1E00～0x1FFF	M8000～M8511
0x0000～0x2FFF	0x0000～0x2FFF	S0～S4095
0x3000～0x31FF	0x3000～0x31FF	TS0～TS511
0x3200～0x32FF	0x3200～0x32FF	CS0～CS255
0x3300～0x33FF	0x3300～0x33FF	Y0～Y377
0x3400～0x34FF	——	X0～X377

Word element address

MODBUS-RTU Slave software component address		Software component address
read out Dedicated	Read / write	
0x0000～0x1F3F	0x0000～0x1F3F	D0～D7999
0x1F40～0x213F	0x1F40～0x213F	D8000～D8511
0xA140～0xA33F	0xA140～0xA33F	TN0～TN511
0xA340～0xA407	0xA340～0xA407	CN0～CN199
0xA408～0xA477	0xA408～0xA477	CN200～CN255(32 bit)
0xA478～0xA657	0xA478～0xA657	M0～M7679
0xA658～0xA677	0xA658～0xA677	M8000～M8511
0xA678～0xA777	0xA678～0xA777	S0～S4095
0xA778～0xA797	0xA778～0xA797	TS0～TS511
0xA798～0xA7A7	0xA798～0xA7A7	CS0～CS255
0xA7A8～0xA7B7	0xA7A8～0xA7B7	Y0～Y377
0xA7B8～0xA7C7	——	X0～X377

RS485-1/RS485-2 Communication parameter setting

D8400/D8420 Setting description

Bit NO.	Name	content	
		0(bit=OFF)	1(bit=ON)
b0	Data length	7bit*α	8bit
b1 b2	Parity	b2 b1 (0 0) -No verification (0 1)--ODD (1 1)--EVEN	
b3	Stop bit	1 bit	2 bit
b4 b5 b6 b7	rate	b7 b6 b5 b4 (0 0 1 1):300 (0 1 0 0):600 (0 1 0 1):1200 (0 1 1 0):2400 (0 1 1 1):4800	b7 b6 b5 b4 (1 0 0 0):9600 (1 0 0 1):19200 (1 0 1 0):38400 (1 0 1 1):57600 (1 1 0 1):115200
b8～b11	Disable	Set to 0	
b12 b13 b14		b14 b13 b12 (0 0 0):FX Programming port protocol (0 0 1): RS No protocol communication (0 1 0): RS2 No protocol communication (0 1 1): MODBUS protocol (D8401/D8421 Setting master and slave stations)	
b15	disabled	set to 0	

*α: When the data bit is 7 bits, parity cannot be selected - no check (6304 fault is reported);

* FX programming port protocol: data length 7, stop bit 1, parity even is fixed, and the rate can be set;

* MODBUS-RTU protocol: data length, stop bit, ODD can EVEN be set;

* RS command: data length, stop bit , ODD and EVEN can be set;

* RS2 instruction: data length, stop bit , ODD and EVEN can be set;

* Select MODBUS master station protocol when the d8401/d8421 value is H0;When the d8401/d8421 value is H10, select MODBUS slave cooperation议. RS485-1/RS485-2

The following commands are supported:

function	command	Supported software component types	
		Bit element	Word element
Bit read command	1(H1)、2(H2)	X、Y、M、S、T、C、特 M	——
Bit write command	5(H5)	Y、M、S、T、C、特 M	——
Register read command	3(H3)、4(H4)	X、Y、M、S、T、C、特 M	D、T、C、特 D
Register write command	6(H6)	Y、M、S、T、C、特 M	D、T、C、特 D
Register batch	16(H10)	Y、M、S、T、C、特 M	D、T、C、特 D

* Using registers to read bits, a register will read 16 bit element status;

* Using registers to write bits, one register will write, which will affect the status of 16 bit components;

RS485-1 RS The command function elements are as follows:

M8401-RS Command sending M8402-RS Command sending

M8403-RS Command receiving flag

M8409- Communication timeout flag

M8161-8 Bit processing mode (ON-8 bit,OFF-16 bit)

D8400- Communication parameters and protocol selection

D8402-RS Instruction send data remainder

D8403-RS Number of instructions received

D8409-RS Instruction receiving timeout setting (1=10ms, default 50=500ms)

D8419- Flag for performing communication

*RS The maximum data sent and received by the instruction is 520 (exceeding 6343\6363)

RS485-2 RS The command function elements are as follows:

M8421-RS2 Command sending M8422-RS2 Command sending

M8423-RS2 Command receiving flag M8429- Communication timeout flag

D8420- Communication parameters and protocol selection

D8422-RS2 Instruction send data remainder

D8423-RS2 Number of instructions received

D8429-RS2 Instruction receiving timeout setting

（1=10ms，default 50=500ms）

D8439- Flag for performing communication

* The maximum data sent and received by the RS2 command is 520 (exceeding 6706).

7.3 Use of CAN, IO module expansion only

CAN Module extension site assignment

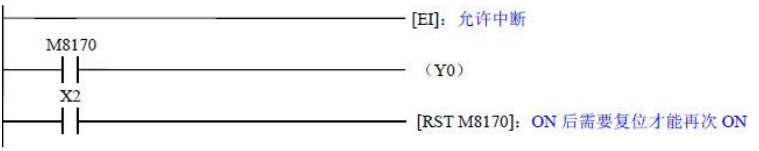
name	type	station	Address segment
Analog	4AD4DA	0-2	station 0:D7100-D7107, station 1:D7110-D7117, station 2:D7120-D7127
	8AD	3	station 3: D7130-D7137
temperature	6PT	4-5	station 4: D7140-D7145, station 5: D7150-D7155
	8NTC	6	station 6: D7160-D7167
	6TC	7-8	station 7: D7170-D7175, station 8: D7180-D7185
weighing	4WT	9-10	station 9: D7200-D7207, station 10: D7210-D7217
Input / output	8X8Y	11-12	station 11: X100-X107,Y100-Y107 station 12: X110-X117,Y110-Y117
	16X16Y	13-14	station 13: X120-X137,Y120-Y137 station 14: X140-X157, Y140-Y157

Note: the station selection is set through the internal dial switch on the expansion module. It is set internally by the manufacturer and cannot be set by the user.

8、Pulse capture (Input interrupt) Function instructions

1） Support pulse capture function of X0-X5, corresponding: X0—M8170, X1—M8171, X2—M8172, X3—M8173, X4—M8174, X5—M8175;

2) To use the pulse capture function, you need to use the EI command first. Examples are as follows



九、PLSY PLSR ZRN DRVI DRVA Instructions for equal pulse transmission and positioning command

1） Maximum support for pulse transmission Y0、Y1、Y2、Y3、Y4、Y5、Y6、Y7 8 channel, Y0-Y5 Maximum 200kHz at the same time,Y6-Y7 Maximum 100kHz at the same time

Special auxiliary relay

Y0	Y1	Y2	Y3	Y4*α	Y5*α	Y6*α	Y7*α	name	Read/ write	Object directive
M8029								Instruction execution end flag bit	R	PLSY/PLSR/DSZR/ DVIT/ZRN/DRVI/ DRVA etc.
M8329								Instruction execution abnormal end flag bit	R	PLSY/PLSR/DSZR/ DVIT/ZRN/PLSV/ DRVI/DRVA
M8338								Acceleration and deceleration action	R/W	PLSV
M8336								Interrupt input specified function is valid	R/W	DVIT
M8340	M8350	M8360	M8370	M8440	M8450	M8470	M8480	Monitoring during pulse output	R	PLSY/PLSR/DSZR/ DVIT/ZRN/PLSV/ DRVI/DRVA

Y0	Y1	Y2	Y3	Y4*α	Y5*α	Y6*α	Y7*α	name	Read/write	Object directive
M8341	M8351	M8361	M8371	M8441	M8451	M8471	M8481	Clear signal output function is effective * - β	R/W	DSZR/ZRN
M8342	M8352	M8362	M8372	M8442	M8452	M8472	M8482	Origin regression direction assignment	R/W	DSZR
M8343	M8353	M8363	M8373	M8443	M8453	M8473	M8483	Forward rotation limit	R/W	PLSY/PLSR/DSZR/ DVIT/ZRN/PLSV/ DRVI/DRVA
M8344	M8354	M8364	M8374	M8444	M8454	M8474	M8484	Reversal limit		
M8345	M8355	M8365	M8375	M8445	M8455	M8475	M8485	Logic inversion of near point signal	R/W	DSZR
M8346	M8356	M8366	M8376	M8446	M8456	M8476	M8486	Zero signal logic inversion		

Y0	Y1	Y2	Y3	Y4*α	Y5*α	Y6*α	Y7*α	name	Read/ write	Object directive
M8347	M8357	M8367	M8377	M8447	M8457	M8477	M8487	Interrupt signal logic inversion	R/W	DVIT
M8348	M8358	M8368	M8378	M8448	M8458	M8478	M8488	Positioning command driving	R	PLSY/PWM/PLSR/ DSZR/DVIT/ZRN/ PLSV/DRVI/DRVA
M8349	M8359	M8369	M8379	M8449	M8459	M8479	M8489	Pulse stop command	R/W	PLSY/PLSR/DSZR/ DVIT/ZRN/PLSV/ DRVI/DRVA
M8460	M8461	M8462	M8463	M8152	M8153	M8154	M8155	User interrupt input instruction	R/W	DVIT
M8464	M8465	M8466	M8467	M8156	M8157	M8158	M8159	The specified function of the reset signal software component is valid	R/W	DSZR/ZRN

*α When the software high-speed output is 2-4 axes, when the designated function of the clear signal soft element is invalid, the clear signal Y0-Y4, Y1-Y5, Y2-Y6, Y3-Y7,

*β When the software high-speed output is 6-8 axes, when the designated function of the clear signal device is invalid, the clear signal Y0-Y10, Y1-Y11, Y2-Y12, Y3-Y13, Y4-Y14,

Y5-Y15, Y6-Y16, Y7-Y17

Special register

Software component NO								name	length	Initial value	Object directive
Y0	Y1	Y2	Y3	Y4*α	Y5*α	Y6*α	Y7*α				
D8336				D8337				Interrupt input assignment	16bit	0	DVIT
D8340	D8350	D8360	D8370	D8440	D8450	D8470	D8480	Locate current value register	32bit	0	DSZR/DVIT/ZRN/ DSZR/ PLSV/DRVI/DRVA
D8341	D8351	D8361	D8371	D8441	D8451	D8471	D8481				
D8342	D8352	D8362	D8372	D8442	D8452	D8472	D8482	Base speed [hz]	16bit	0	
D8343	D8353	D8363	D8373	D8443	D8453	D8473	D8483	Maximum speed [hz]	32bit	100000	
D8344	D8354	D8364	D8374	D8444	D8454	D8474	D8484				
D8345	D8355	D8365	D8375	D8445	D8455	D8475	D8485	Creeping speed [hz]	16bit	1000	DSZR
D8346	D8356	D8366	D8376	D8446	D8456	D8476	D8486	Origin return speed [hz]	32bit	50000	
D8347	D8357	D8367	D8377	D8447	D8457	D8477	D8487				

Software component NO								name	length	Initial value	Object directive
Y0	Y1	Y2	Y3	Y4*α	Y5*α	Y6*α	Y7*α				
D8348	D8358	D8368	D8378	D8448	D8458	D8478	D8488	Acceleration time [ms]	16bit	100	DSZR/DVIT/ZRN/ PLSV*β/DRVI /DRVA
D8349	D8359	D8369	D8379	D8449	D8459	D8479	D8489	Deceleration time[ms]	16bit	100	
D8464	D8465	D8466	D8467	D8156	D8157	D8158	D8159	Clear signal soft component assignment	16bit	0	DSZR/ZRN
D8140	D8142	D8144	D8146	D8170	D8172	D8174	D8176	Pulse current value register	32bit	0	PLSY/ PLSR*δ
D8141	D8143	D8145	D8147	D8171	D8173	D8175	D8177				

Note:

*α high speed output enhanced;

*β needs to set m8338 on to make the acceleration and deceleration function of PLSV effective

*δ When using Plsy and PLSR commands; The pulses sent by the axis accumulate the corresponding registers

10、enhance P W M

1) The two component parameter functions of PWM command are changed to frequency (32 bits - it is necessary to specify that the word component is 32 bits) and duty cycle (16 bits);

2) Maximum frequency of enhanced PWM: 900K for y0-y5, 10K for y6-y7 (exceeding 6707), duty cycle: 1.0%-99.0% (the higher the frequency, the larger the error of duty cycle, and the actual output frequency varies with different hardware)

3) The axes that support the addition of PWM function are Y0-Y1、Y2-Y3、Y4-Y5、Y6-Y7;

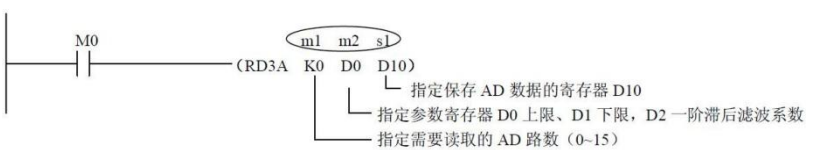
```
    X0              S1        S2      D
|--||----------------(PWM D0 D2  Y0)
```

S1 -- PWM specified frequency, 32bit (Y0-Y5 up to 9 0 0 K, Y6-Y7 up to 10K, excess alarm 6 7 0 6);

S2--P W M Specified duty cycle, 16bit (0 — 1 0 0 0 : corresponding 0%-100%, excess alarm 6 7 0 6)

D---P W M Output specified Y number (Only supported Y 0 - Y 7)

11、Instructions for analog AD



a) Explain:

b) m1- Specify the number of ad channels to be read (the maximum number is the number of channels opened by the setting software, exceeding 6706)

m2- Specify upper and lower range (-32767—32767) registers, m2 is the upper range limit, m2+1 is the lower range limit, Only the D register can be specified as the range address, M2+2 is the first-order lag filter coefficient (0-128), and other datagrams are 6706

c) Above program principle: When M0 is on, read the first channel of ad data (the upper range is d0 and the lower range is D1) to D10 for saving

d) e.g.: Follow the above procedure

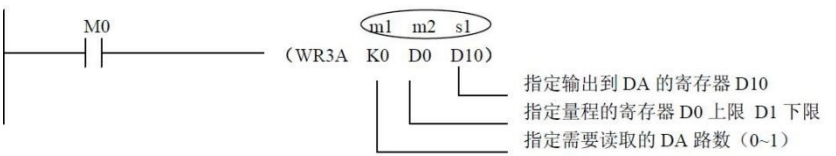
1) e.g.: D0=1000, d1=0, ad input is 0~10v, current input is 5V, then d10=500

2) e.g.: D0=4000, d1=0, ad input is 0~10v, current input is 5V, then d10=2000

3) e.g: D0=1000, d1=-1000, ad input is 0~10v, current input is 5V, then d10=0

12、Use of analog quantity DA

Explain:



a) M1- specify the number of Da (range 0-32767) channels to be output (the maximum number is the number of channels opened by the setting software, exceeding 6712)

b) M2 -- the register that specifies the upper and lower range, M2 is the upper range, m2+1 is the lower range, only D register can be specified as the range address, and other datagrams 6712

c) Principle of the above procedure: when M0 is on, output the data of D10 (upper range at D0 and lower range at D1) to DA0

e.g.:

Follow the above procedure,

1) e.g.: D0=1000, d1=0, Da output voltage is 0~10v, D10 data is 500, Da output is 5V

2) D0=4000, d1=0, Da output voltage is 0~10v, D10 data is 2000, Da output is 5V

3）e.g,：D0=1000, d1=-1000, Da output voltage is 0~10v, D10 data is 0, Da output is 5V

Note：

The upper and lower ranges can be set to negative numbers. The upper range must be greater than the lower range. If both the upper and lower ranges are 0, the data conversion of the corresponding range will not be carried out

1) When both the upper and lower ranges are 0, the input range of DA data is 0~4095; conversely, the input range of DA data is: > = lower range, < = upper range; When the data is outside the above data, PLC reports 6706 fault

2) Error detection is performed on the data converted from AD and DA. AD reports 6706 and DA reports 6706 fault

3) When RD3A is used to read ad data, first-order lag filtering is supported (range: 0-128, 0 means that first-order lag filtering is not enabled. The larger the coefficient, the greater the lag. It is recommended to set the value of 50)

十三、Use of Real-Time Clock RTC

1) M8018- if the RTC function is enabled, the power on detection is normally set to on, otherwise it is off (if the RTC crystal oscillator is abnormal, m8018 is off)

2) M8016- when on, D8013-D8019 display clock data stops; when off, d8013-d8019 Display RTC clock data

Note: if the PLC password is set to 12345678, the clock cannot be set using the programming software

14、Fault detection

category	Error code	Error content	Treatment method
PLC hardware error m8061 (d8061) operation stop	0000	No abnormality	
	6101	Power down data inspection error	Check the power down detection circuit and the CPU internal flash is damaged
	6102	External flash detection error	Flash model error, IO error on setting software
	6103	Error in external flash verification ID	If flash is replaced, please download the parameters again
	6105	Monitor action (internal watchdog action)	Increase the setting value or check procedure of D8000
	6106	Logic error	Contact the manufacturer
Can extension error M8062 (D8062) operation continues	6206	Parameter validation error	
	6210	CAN initialization error	
	6211	Incorrect address to receive extension	
	6212	Received data is disturbed	
	6213	Extended return error flag	
	6214	Receive timeout flag	See D8196 and D8197 for details
	6215	Receiving illegal slave address	
	6216	The receiving slave extension function is inconsistent with the host configuration	For example, the host is configured with input and output, but the analog quantity is connected
	0000	No abnormality	
	6306	Receive timeout during data wrap	Check the setting of communication line or d8400 and d8409

	Error code	Error content	Treatment method
串口1、2/CAN/ENET出错M8063(D8063)运行继续	6307	RS, RS2 and adprw commands are used when the serial port is not opened	Open serial port communication in io parameter software
	6308	D8400 baud rate out of range	
	6309	D8400 selects 7-bit data and cannot select no inspection	
	6310	RS and RS2 commands are used but d8400 is not turned on	
	6314	D8420 baud rate out of range	
	6315	D8420 selects 7bit data and cannot select no inspection	
	6340	D8400 does not enable MODBUS master station function	Serial port 1
	6341	MODBUS ADPRW slave address error	
	6342	MODBUS ADPRW function code error p	
	6343	MODBUS ADPRW command length error	
	6344	Modbus receive data verification error	
	6345	Incorrect station number and command for receiving data	
	6346	receive timeout during data wrap	
	6360	D8420 does not enable MODBUS master station function	Serial port 2
	6361	MODBUS ADPRW slave address error	
	6362	MODBUS ADPRW function code error	
	6363	MODBUS ADPRW command length error	
	6364	MODBUS receive data verification error	
	6365	Incorrect station number and command for receiving data	
	6366	receive timeout during data wrap	
	6368	Modbus TCP server / client function is not enabled or Ethernet function is not enabled	ENET Ethernet
	6380	initialization failed	CAN

	Error code	Error content	Treatment method
	6381	The returned slave ID is inconsistent with the read ID	CAN
	6382	Receive length error	
	6383	Incomplete received data	
	6384	The slave has the same ID	
	6385	receive timeout during data wrap	
	6386	The host has the same ID	
Serial port 1, 2/can/enet error m8063 (D8063) operation continues	6390	Ethernet parameter verification error	ENET Ethernet
	6391	Port initialization failed (see D8406.B8-B15)	
	6392	Communication timeout with Ethernet w5500	
	6393	IP address conflict	
	6399	ENET is faulty (see D8418 for details)	
Parameter error m8064 (D8064) operation stop	0000	No abnormality	
	6401	Program and number verification error	1. Malicious modification or incomplete download of the program; 2. CPU internal program Flash is damaged;
	6409	IO function parameter and number verification error	Incomplete downloading of IO function parameters or damaged flash

	6411	Using RD3A/WR3A command does not enable the AD/DA enhanced function	Please enable the AD/DA enhancement function in the setting software

	error code	Error content	Solution
Parameter error M8064 (D8064) stop running Parameter error M8064 (D8064) stop running Parameter error M8064 (D8064) stop running Parameter error M8064 (D8064) stop running	0000	No abnormality	
	6401	Program and number check errors	1. The program is maliciously modified or the download is not completed; 2. The internal program FLASH of the CPU is damaged;
	6409	IO function parameter and number check error	IO function parameter download is incomplete or FLASH is damaged
	6411	使用RD3A/WR3A指令没有开通AD/DA增强功能	Please enable AD/DA enhancement function in the setup software
Syntax error M8065 (D8065) stop running	0000	No abnormality	
	6504	Pn or In or high-speed counter label repetition;	
	6505	Component range exceeds	
	6506	using unsupported directive	
	6507	Incorrect use of labels (P63 used)	
	6510	MC's number size is wrong	
Loop error M8066 (D8066) stop running	0000	No abnormality	
	6603	Use MPS more than 12 times	
	6605	RET occurs when STL is used more than 9 times in a row without using STL	
	6606	There is an I (interrupt) in the main program IRET SRET No IRET SRET in the program	
	6609	Other	

	error code	Error content	Solution
	6614	MPS is missing	
	6615	MPP is missing	
	6619	I MC MCR IRET STL RST in FOR~NEXT	
	6623	No MC command	
	6625	1. The initialization step is out of range (S0-S9) 2. The number of STL Sn used is more than 2 3. STL Sn Sn range is greater than S899	
	6626	There are MC, MCR, SRET, I (interrupt), IRET in STL	
	6627	No RET instruction after STL	
	6630	Incorrect CALL SRET relationship	
Operation error M8067 (D8 067) operation continues	0000	No abnormality	
	6701	1. CALL, CJ have no object	
	6706	The command element address or the value range of the element is out of range	
	6710	SFWR(P) command element 1 is the same as element 2	
	6711	Analog AD input range setting error	
	6712	Analog DA output range or data setting error	
	6715	NTC resistor may be open	Please connect NTC resistor

** When an error occurs, please use the diagnosis on the PLC programming software GX software menu

- PLC diagnosis function to check PLC error codes and program steps;