

Customized HMI PLC All in One Programming Manual

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V21.81

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1 Summary

1.1 COOLMAY MX2N PLC HMI All in one main advantage

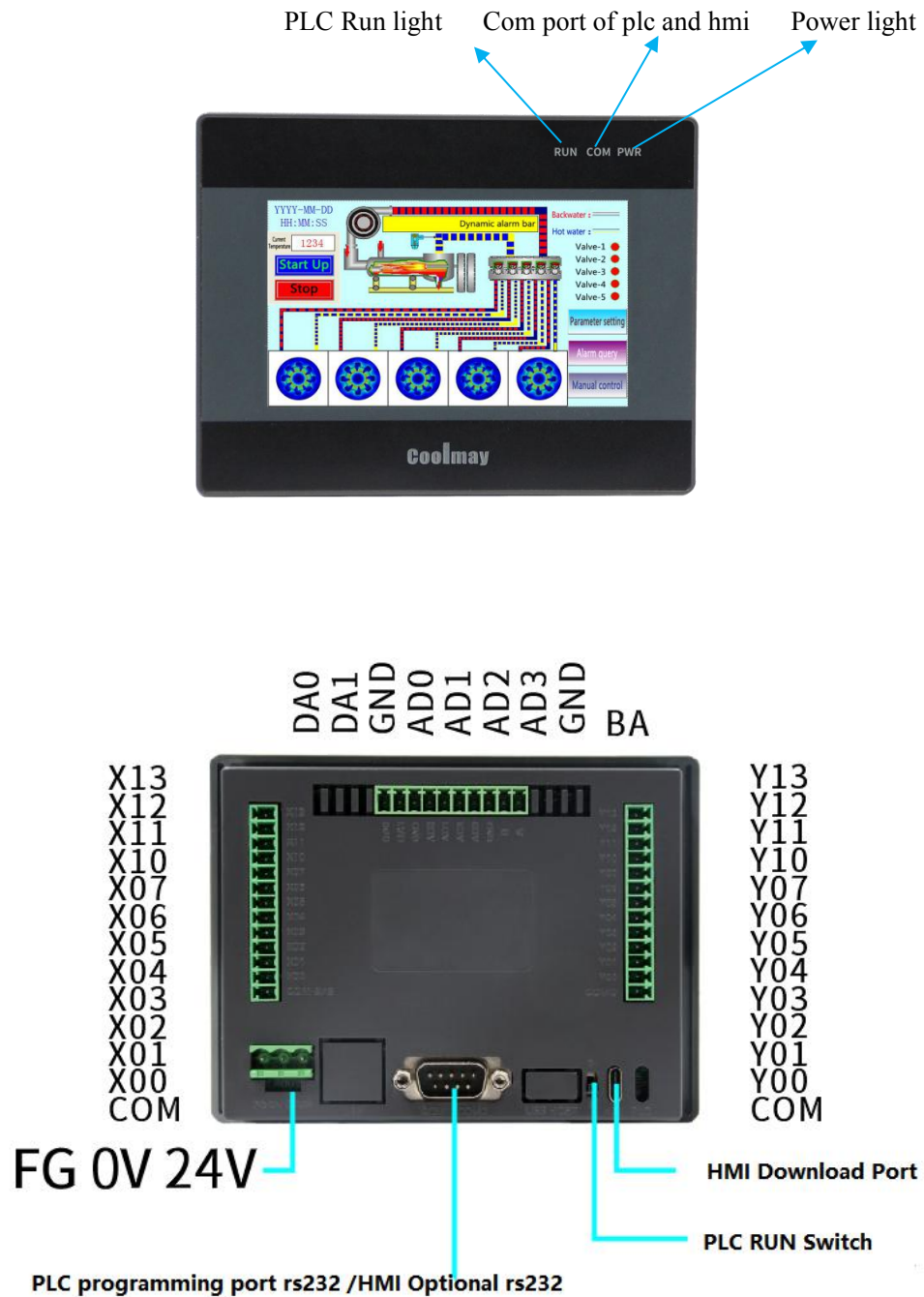
- ◆ MX2N series HMI PLC All in one ,as the first choice for automatic control of small and medium-sized equipment, is with complete functions, stable performance, convenient maintenance, safe and reliable.
- ◆ Could use GX Developer 8.52E and GX Works2 software to program, read, download, verify, diagnose, monitor and process sequence.
- ◆ Could customize 6 channels AD and 2 channels DA, in 12bit precision, use RD3A to read AD data and WRA3 to output DA data.
- ◆ Support optional one RS485 or RS232 COM Port, support Programming port protocol and MODBUS-RTU master-slave protocol. It can be switched in the program through D8120, support communication through RS485 networking and inverter etc.
- ◆ Support RTC function, when password is 12345678, the programming software can't modify clock data.
- ◆ High Speed counter input conventional 6 channels single-phase counting (X0-X5) or 2 channels AB(Z) phase counting 10KHz, it can be customized 6 channels single-phase counting or 2 channels AB(Z) phase counting 60KHz.
- ◆ High speed pulse output conventional 4 channels 10KHz Y0/Y1/Y2/Y3, it can be customized 4 channels Y0/Y1 200KHz, Y2/Y3 100KHz.
- ◆ Support Watch dogs function-compatible with Mitsubishi FX2N.
- ◆ Support external interrupt function-compatible with the original, support pulse capture function, support 6 channels X0-X5.
- ◆ Support super password: When password is 12345678, the program can't read except the soft component data. When password is changed, the program will be cleaned. You can also open the PLC program to disable the read mode on setup software (Once open, no matter what the password is, the program can't be read.)
- ◆ Support Power-down data protection (All power-down is Kept by FLASH, data will be checked when power-on.)
- ◆ Check the downloaded ladder program
- ◆ When the program run in the PLC, it will check the program instructions and the components range, corresponding problem will be reported when being detected.
- ◆ Run light flashes when switch turns to "RUN", run light goes out when to "STOP".
- ◆ During running. If check slight fault, the ERR light flashes. If serious fault, ERR light is on always.
- ◆ Support constant scan: D8039-Constant scan time, M8039-Constant scan mode.
- ◆ 7inch Support CAN port for networking communication function. Support 32 slaves at most, up to 32 registers master-slaves can be shared, communication baud rate could be set.
- ◆ Optional High speed pulse output function, PWM support the highest frequency 900KHz, duty ratio is -100%.
- ◆ 4.3inch Support function of thermocouple temperature measuring: automatic cold junction compensation, could connect 2 channels K/E/J thermocouple at most, could measure negative temperature.
- ◆ Support function of program limit : could select clock date limit, power-up cumulative time limit.
- ◆ Support function of NTC thermistor to measure temperature, support NTC of 10K, 50K, which B value is 3950.
- ◆ 7inch is optional to add 1 channel load cell function (occupy AD0-AD2).

1.2 Type & Specification

Type	4.3 inch	7 inch
Image		
		
Dimension	134*102*34mm	210*146*36mm
Cutout size	120*94mm	192*138mm
HMI		
Features	60K colors resistive panel, can be vertical display	
Display type	4.3"TFT	7.0"TFT
Display size	97*56mm	154*87mm
Resolution	480*272pixels	800*480pixels
RAM	NOR Flash 8MB	NOR Flash 16MB
ROM	64MB	
Operation system	NULL	
CPU	32bit CPU 408MHz	
COM port	Type-C; PLC program can be downloaded through the penetration function of the HMI	
	1 RS232 Optional	1 RS232 or 1 RS485 Optional
Software	mView	
PLC		
Digital I/O	12DI/12DO	24DI/20DO (Up to 17 relay)
I/O level	Output MT: low level NPN, COM connected to negative; output MR: normally open dry contact; Input: Passive NPN, common terminal isolation	
Digital output and load	MT is MOS tube output, MRT is mixed output MOS: 2A/point, 4A/4-point COM, 5A/12-point COM; MR: 2A/point, 5A/12point COM	Y0-Y3 are MOS tubes, and the others are MT. MRT is a mixed output (where Y13, Y14, Y15 are fixed as transistors) MOS tube: 2A/point, 4A/4point COM; MT: 0.5A/point, 0.8A/4point COM; MR: 2A/point, 4A/4 points COM.
High speed Counting	Normally 6 single phase counting (X0-X5) or 2 AB(Z) phase counting 10KHz can be customized as 6 single phase counting or 2 AB(Z) phase counting 60KHz	
High speed Pulse	Normally 4 channels 10KHz, Y0-Y3 can be customized as 2 channels 200KHz and 2 channels 100KHz	
Analog I/O	AI:0-5V/0-10V/0-20mA/NTC10K/ NTC50K/EKJ (NTC type and thermocouple type cannot coexist)	AI:-5-5V/-10-10V/0-5V/0-10V/ 0-20mA/NTC10K/NTC50K
	AO:0-10V/0-5V/0-20mA or mixed	
	Max 4AD/2DA (NTC and thermocouple each analog will occupied 2 channels)	Max 6AD/2DA Optional: 1 channel load cell (occupy AD0-AD2) Optional: Max 3channels NTC
Com port	Default with RS232 programming port	
	Optional: 1 RS485 (can't coexist with built-in RS232)	Optional 1 RS485 (cannot coexist with the built-in RS232) Optional CAN (only for internal networking, not coexist with the load cell)
Software	Compatible with GX Developer8.52 和 GX Works2	
Suggested model: 4.3 inch-24MR/24MT (-4AD2DA-232H) 7 inch-24MR/24MT/44MRT/44MT(-6AD2DA-485P/232H) 485P means optional 485 on PLC; 485H/232H means optional 485/232 on HMI Detailed info. refer to: <Customized HMI PLC all in one Programming Manual> <Customized HMI PLC All In One User Manual> <Coolmay TK series HMI User Manual>		

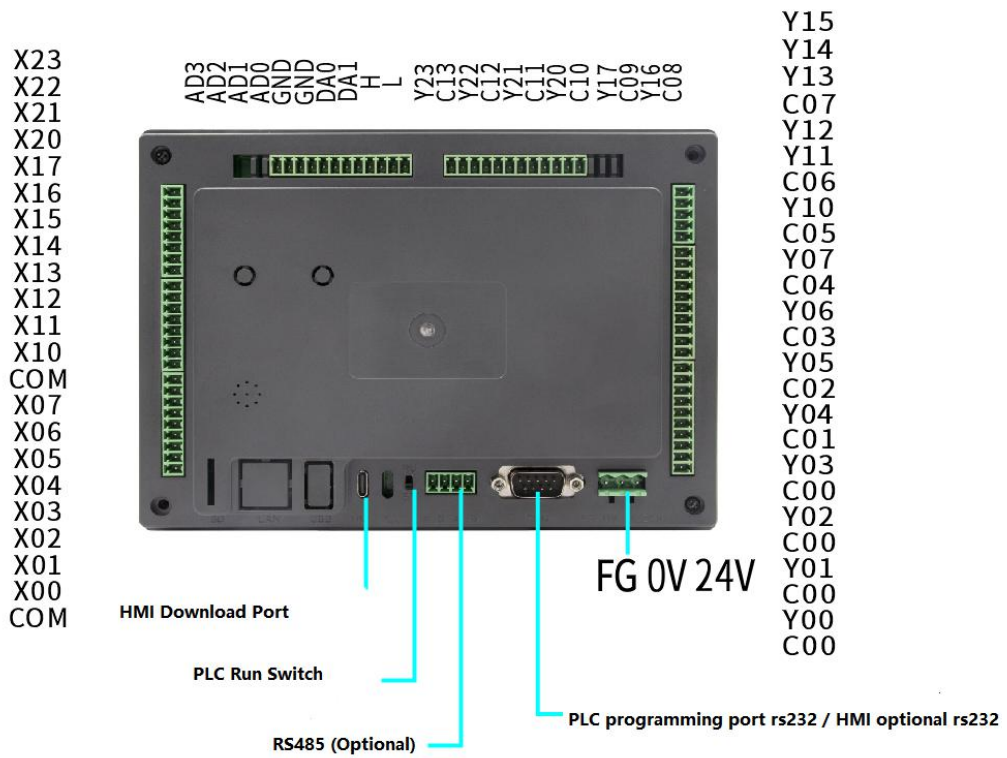
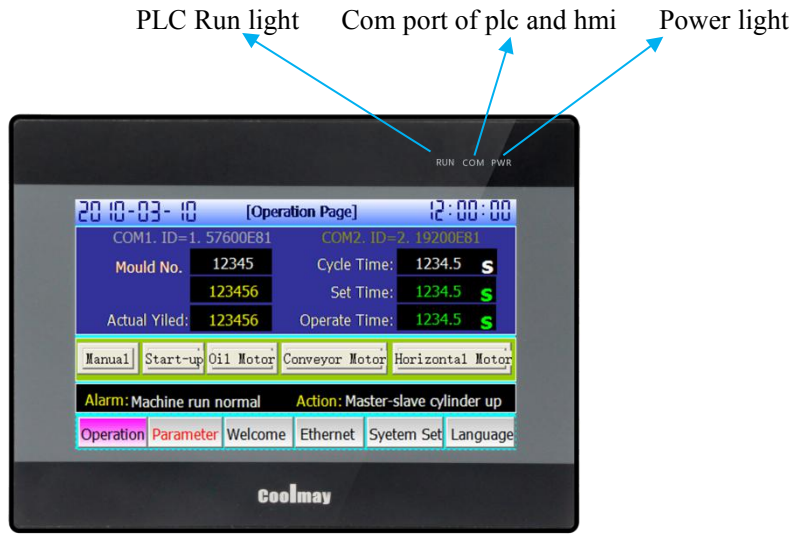
1.3 Hardware description

1.3.1 4.3inch structure description and dimension



- * Dimension(mm): 134*102*34
- * Cutout size(mm): 120*94
- * Display size(mm): 97*56
- * Installation: Clip installation

1.3.2 7inch structure description and dimension



- * Dimension(mm): 200×146×36
- * Cutout size(mm): 192×138
- * Display size(mm): 154×87
- * Installation: Clip installation

1.3.3 Interface and Indicators description

POWER: Power indicator, light on when connected to power

RUN: PLC operating status indicator, the lamp is on when PLC is running

COM: HMI Touch screen and PLC communication status indicator, light on when communicated

Power terminal: The positive and negative poles of the DC24V switch power supply are connected to the DC24V and 0V power terminals.

PLC programming port: download plc program by 232 programming line

HMI programming port: Download hmi touch screen configuration program

1.4 PLC programming notice.

The PLC is compatible with GX 8.52E/Works 2 etc. If you use other versions of the software, incompatibility may occur.

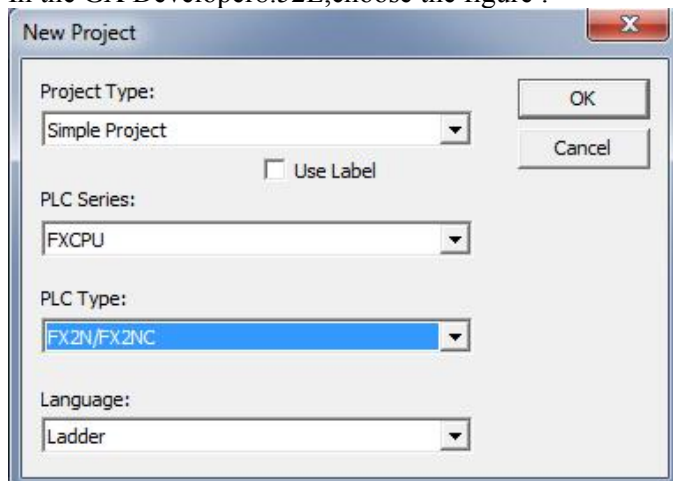
When the PLC program is downloaded, there is a prompt error: Cannot specify the com port,

GX 8.86 software: Online - Transfer settings change com port;

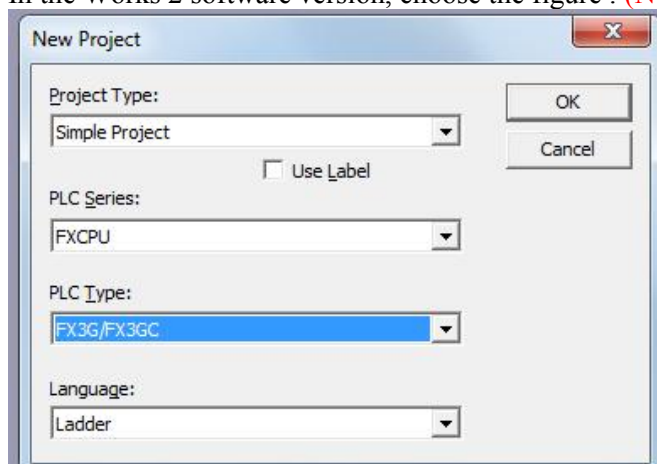
Works 2: All targets - Change the com port in all connected targets;

If communication error occurs, cable is abnormal If prompted, remove it by powering off, detecting the cable, detecting whether the power is normal, or replacing the computer.

In the GX Developer8.52E,choose the figure :



In the Works 2 software version, choose the figure : (Note: the label is forbidden)



2 Component Range

Input X	X0~X47 40 points		Out put Y	Y0~Y47 40 points	
Ministrant relay M	M0~M499 500 points (general)	M500~M1535 1036 points (keep)		M8000~M8255 255 points (special)	
State relay S	S0~S9 10 points (State keep)		S10~S999 990 points (keep)		
Timer T	T0~T199 200 points 100ms	T200~T254 46 points 10ms	T246~T249 4points 1ms accumulation	T250~T255 6points 100ms accumulation	
Counter C	16 Bits counter		32 Bits counter		
	C0~C15 16 points (general)	C16~C199 184 points (keep)	C200~C219 20 points (general)	C220~C23 4 15points (keep)	C235~C255 20points (HS keep)
R D.V.Z	D0~D127 128 points (general)	D128~D7999 7872 points (keep)	D8000~D819 5 196 points (special,keep)	D8196~D8 255 59points (special)	V0~V7 Z0~Z7 16points (index)
Nested Pointer	N0~N7 8 points (master)	P0~P127 128 points (jump,subroutine)		IO □□~I5 □□ 6 points (External interrupt)	
Constant	K(10 digits)	16 bits-32768~32767		32bits-2147483648~2147483647	
	H(16 digits)	16 bits O~FFFF		32 bits 0~FFFFFFFF	

3 PLC Supported instruction

3.1 Basic Logic instructions

•The program step for soft element Y and general M is 1,for S and special auxiliary relay M,timer T,counter C is 2, for Data register D ,index register V and Z is 3.

3.2 Step command instructions

Mnemonics	Function	Available soft Elements	Program Step
LD	NO Logic operation begin	X,Y,M,S,T,C	1
LDI	NC Logic operation begin	X,Y,M,S,T,C	1
LDP	Rising Edge detection operation begin	X,Y,M,S,T,C	2
LDF	Falling Edge detection operation begin	X,Y,M,S,T,C	2
AND	NO series connection	X,Y,M,S,T,C	1
ANI	NC series connection	X,Y,M,S,T,C	1
ANDP	Rising edge detects series connection	X,Y,M,S,T,C	2
ANDF	Falling edge detects series connection	X,Y,M,S,T,C	2
OR	NO parallel connection	X,Y,M,S,T,C	1
ORI	NC parallel connection	X,Y,M,S,T,C	1
ORP	Rising edge detects parallel connection	X,Y,M,S,T,C	2
ORF	Falling edge detects parallel connection	X,Y,M,S,T,C	2
ANB	Series connection of parallel circuit blocks		1
ORB	Parallel connection of series circuit blocks		1
OUT	Coils drive	Y,M,S,T,C	Note 1
SET	Action holding	Y,M,S	Note 2
RST	Clear "Action holding", Register to clear zero	Y,M,S,T,C,D,V,Z	
MC	Connection command of common series point	Y,M(Exclude Special M)	3
MCR	Eliminate command of common series points		2
MPS	Operation memory		1
MRD	Memory read		1
MPP	Memory read and reset		1
INV	Inversion of operation result		1
PLS	Rising edge differential output	Y,M(Exclude Special M)	1
PLF	Falling edge differential output	Y,M(Exclude Special M)	1
OUT	Counter coils drive	C	32-bit counter:5

			16- bit counter:3
SET	Action holding	Y,M,S	Y,M: 1 S,Special -M: 2
RST	Clear "Action holding", Current value and Register to zero	Y,M,S,T,C,D, V,Z	Y,M:1 S, Special -M: 2 T,C:2 D,V,Z Special D:3
NOP	No action		1
END	Input,Output and Return to begin		1

●STL (Support 8 branches at most) RET

Mnemonics	Function	Available soft Elements	Program Step
SEL	Step Action begin	S	1
RET	Step Action end	/	1

3.3 Function instruction table(Compared with Mitsubishi PLC)

Sorts	FN C	instruction mnemonics	Function	Support command
	NO			
programming flowchart	00	CJ	Conditional jump	★
	01	CALL	Subroutine call	★
	02	SRET	Subroutine return	★
	03	IRET	Interrupt return	★
	04	EI	Interrupt the license	★
	05	DI	Interruption forbidden	★
	06	FEND	Main program end	★
	07	WDT	Monitor timer	★
	08	FOR	Cycle range begin	★
	09	NEXT	Cycle range end	★
Transmission and comparison	10	CMP	Comparison	★
	11	ZCP	Region comparison	★
	12	MOV	Transfer	★
	13	SMOV	Shift Transfer	★
	14	CML	Reverse transfer	★
	15	BMOV	Transfer together	★
	16	FMOV	Multi-casting	★
	17	XCH	Exchange	★
	18	BCD	BCD exchange	★
19	BIN	BIN exchange	★	
Four logical operations	20	ADD	BIN addition	★
	21	SUB	BIN subtraction	★
	22	MUL	BIN multiplication	★

	23	DIV	BIN division	★
	24	INC	BIN plus 1	★
	25	DEC	BIN minus 1	★
	26	WAND	Logic word and	★
	27	WOR	Logic word or	★
	28	WXOR	Logic word XOR	★
	29	NEG	Complementary code	★
Cyclic shift	30	ROR	Rotate right	★
	31	ROL	Rotate left	★
	32	RCR	Carry rotate right	★
	33	RCL	Carry rotate left	★
	34	SFTR	Shift right	★
	35	SFTL	Shift left	★
	36	WSFR	Word move to right	★
	37	WSFL	Word move to left	★
	38	SFWR	Shift write	★
	39	SFRD	Shift read out	★
Data processing	40	ZRST	Batch reset	★
	41	DECO	Ze code	★
	42	ENCO	Coding	★
	43	SUM	ON digits	★
	44	BON	ON digits determination	★
	45	MEAN	Average value	★
	46	ANS	Signal alarm set	★
	47	ANR	Signal alarm reset	★
	48	SQR	BIN extraction of a root	★
	49	FLT	BIN Integer→floating conversion	★
High-speed processing	50	REF	Input and output refresh	★
	51	REFF	Input refresh (with filter settings)	
	52	MTR	Matrix input	
	53	HSCS	Compare High speed counting set	
	54	HSCR	Compare High speed counting reset	
	55	HSZ	Compare high speed counting zone	
	56	SPD	Pulse density	★
	57	PLSY	Pulse output	★
	58	PWM	Pulse modulation	★
	59	PLSR	Acceleration and deceleration pulse output	★
Convenient instructions	60	IST	Initialization state	
	61	SER	Data retrieval	★
	62	ABSD	Cam control (absolute)	
	63	INCD	Cam control (increment)	
	64	TTMR	Teaching timer	
	65	STMR	Special timer	

	66	ALT	Alternate output	★
	67	RAMP	Ramp signal	★
	68	ROTC	Rotary table control	
	69	SORT	Data arrangement	
Peripheral equipment I/O	70	TKY	Numeric key input	
	71	HKY	16-key input	
	72	DSW	Digital switch	
	73	SEGD	7-segment decoding	★
	74	SEGL	7 segment code time display	
	75	ARWS	Arrow switch	
	76	ASC	ASC II transformation	
	77	PR	ASC II printout	
	78	FROM	BFM readout	**2
	79	TO	BFM write	**2
Peripheral equipment SER	80	RS	Serial data transmission	★
	81	PRUN	8-bit transmission	
	82	ASCI	HEX to ASC II	★
	83	HEX	ASC-HEX exchange	★
	84	CCD	Check code	★
	85	VRRD	Potentiometer readout	
	86	VRSC	Potentiometer scale	
	87			
	88	PID	PID operation	
89				
Floating points	110	DECMP	Binary floating point comparison	★
	111	DEZCP	Binary floating point zone comparison	★
	118	DEBCD	Binary floating point-decimal	★
	119	DEBIN	Decimal floating point-binary	★
	120	DEADD	Binary floating point addition	★
	121	DESUB	Binary floating point subtraction	★
	122	DEMUL	Binary floating point multiplication	★
	123	DEDIV	Binary floating point division	★
	127	DESQR	Binary floating point extraction	★
	129	INT	Binary floating-bin integer conversion	★
	130	SIN	Floating point SIN operation	★
	131	COS	Floating point COS operation	★
	132	TAN	Floating point TAN operation	★
	147	SWAP	Up and down byte conversion	★
Positioning	155	ABS	ABS current value	
	156	ZRN	Origin regression	★
	157	PLSV	Variable speed pulse output	★
	158	DRVI	Relative positioning	★
	159	DRVA	Absolute positioning	★

Clock operation	160	TCMP	Clock data comparison	★
	161	TZCP	Clock data zone comparison ★	★
	162	TADD	Clock data addition	★
	163	TSUB	Clock data subtraction	★
	166	TRD	Clock data readout	★
	167	TWR	Clock data write	★
	169	HOUR	Calculagraph	★
Peripheral equipment	170	GRY	Gray code transformation	★
	171	GBIN	Gray code inverse transformation	★
	176	RD3A	Analog block readout	**1
	17	WR3A	Analog Block Write	**1
Contact comparison	224	LD=	(SI)=(S2)	★
	225	LD >	(SI)>(S2)	★
	226	LD <	(SI)<(S2)	★
	228	LD◇	(SI)◇(S2)	★
	229	LD≥	(SI)≥(S2)	★
	230	LD≤	(SI)≤(S2)	★
	232	AND=	(SI)=(S2)	★
	233	AND >	(SI)>(S2)	★
	234	AND <	(SI)<(S2)	★
	236	AND◇	(SI)◇(S2)	★
	237	AND≥	(SI)≥(S2)	★
	238	AND≤	(SI)≤(S2)	★
	240	OR=	(SI)=(S2)	★
	241	OR >	(SI)>(S2)	★
	242	OR <	(SI)<(S2)	★
	244	OR◇	(SI)◇(S2)	★
245	OR≥	(SI)≥(S2)	★	
246	OR≤	(SI)≤(S2)	★	

Note :

**1--When analog input and output is selected ,read and wrote data is used;

**2--Customized HMI PLC , is optional to add 1 rs485 com port, but it is not coexist to built in rs232 com port.

Remarks :

1)Support 32-bit instructions,and adding P instructions;

2)When unsupported instruction is used,6056 fault will be detected;

3)“★”indicates the function instructions supported by MX2N series HMI PLC All in one;

4)Instruction details refer to 《Coolmay PLC Instructions Programming Manual V20.51》

3.4 Special relay & register function

3.4.1 Special relay function table

No	Content	No	Content
M8000	Operation monitoring contact	M8112	Optional 1 channel weighing function start
M8001	Operation monitoring anti-contact	M8113	Optional 1 channel weighing filter function
M8002	Initialize pulse contact	M8114	Optional 1 channel weighing fault sign
M8003	Initialize pulse anti-contact	M8115	Thermocouple open circuit fault
M8004	Error indication contact	M8116	Optional 2-channel weighing function Channel 1 Data overflow (not available)
M8005	Random number generate relay	M8117	Optional 2-channel weighing function Channel 2 Data overflow (not available)
M8006	Prohibit 6300-6399 fault flash "ERR"	M8235	Drive high speed count C235 :Down counting mode
M8008	Power-failure detection(ON /OFF)	M8121~ M8124	RS and MODBUS use
M8011	10ms clock pulse	M8129	Series 2 communication timeout flag
M8012	100ms clock pulse	M8140	ZRN Instruction clear output is valid
M8013	1s clock pulse	M8145	Prohibit Y0 pulse output
M8014	1m clock pulse	M8146	Prohibit Y1 pulse output
M8015	Set clock	M8147	Y0 in Pulse output
M8016	Clock display stopped	M8148	Y1 in Pulse output
M8017	Clock ±30 s correction	M8149	CAN communication timeout
M8018	Real clock flag	M8150	CAN allowed working flag
M8019	Clock error flag	M8155	Prohibit Y2 pulse output
M8020	Zero flag	M8157	Y2 Pulse in output
M8021	Borrow flag	M8158	Y3 Pulse in output
M8022	CF (carry flag)	M8161	16-bit/8-bit switch flag
M8029	Instruction execution end	M8168	SMOV instruct HEX processing function
M8031	Non-Latch data clear	M8170	X0 Pulse capture
M8032	Latch data clear	M8171	X1 Pulse capture
M8034	Prohibit all outputs	M8172	X2 Pulse capture
M8039	Constant scanning mode	M8173	X3 Pulse capture
M8047	STL Effective monitoring	M8174	X4 Pulse capture
M8048	S900-S999 -"ON "	M8175	X5 Pulse capture
M8049	Valid signal alarms	M8196	C251 C252 C254 2 multiplier
M8050	I0 □ □ Interruption prohibition	M8197	C253 C255 2 multiplier flag
M8051	I1 □ □ Interruption prohibition	M8198	C251 C252 C254 4 multiplier
M8052	I2 □ □ Interruption prohibition	M8199	C253 C255 2 multiplier flag
M8053	I3 □ □ Interruption prohibition	M8200~ M8234	C200-C234 count direction set
M8054	I4 □ □ Interruption prohibition	M8235~ M8345	C235-C245 count direction set
M8055	I5 □ □ Interruption prohibition	M8246~ M8255	C246-C255 count direction flag

3.4.2 Special register function table

No	Content	No	Content
D8000	Monitor timer setting (Default 200)	D8126	MODBUS Master/slave communication delay time (1=1ms)
D8005	Low random number 16 bits	D8127	MODBUS Master station communication real time (1=10ms)
D8006	High random number 16 bits	D8128	MODBUS Master communication maximum time (1=10ms)
D8007	Power-down hold D register end address	D8129	RS/MODBUS Master communication timeout (1=10ms, Default 500)
D8008	Power-down detection time (Setting value:1~100, Default 10ms)	D8136	Y0 Y1 high-speed output count:32 bit
D8010	Scan time current value (0.1ms)	D8140	Y0 pulse output counter register
D8011	Minimum scan time (0.1ms)	D8142	Y1 pulse output counter register
D8012	Maximum scan time (0.1ms)	D8145	ZRN\DRVI\DRVA command Y0 Y1 minimum speed
D8013- D8019	Corresponding to seconds, minutes, hours, days, months, years, and weeks	D8146	ZRN\DRVI\DRVA command Y0 Y1 maximum speed
D8020	X0-X17 filter ratio (Setting: 0~60ms,Default 10)	D8148	ZRN\DRVI\DRVA command Y0 Y1 acceleration and deceleration time
D8021	X20-X47 filter ratio (Setting: 1~60ms,Default 10)	D8149	CAN Master/slave communicate timeout (1=1ms)
D8028	Z0 Index register contents	D8150	Master/Slaver Station No (0~32)
D8029	V0 Index register contents	D8151	Slaves number (1~32,Default: 8)
D8030- D8038	Sampling address of Analog input AD0-AD8	D8152	Shared register number (1~32, Default: 8)
D8050- D8052	Sampling address of Analog input AD9-AD11	D8153	CAN Communication baud rate (20K~100K, Default: 250K)
D8039	Constant scan time (Unit: 1ms, Default 0)	D8154	Y2 Pulse output count register
D8040- D8047	1st to 8th activity STL status	D8156	Y3 Pulse output count register
D8049	Minimum activity STL status	D8159	ZRN\DRVI\DRVA command Y2 Y3 minimum speed
D8058	Optional 2-channel weighing function Divisor of channel 1 data (not available)	D8160	ZRN\DRVI\DRVA command Y2 Y3 maximum speed
D8059	Optional 2-channel weighing function Divisor of channel 2 data (not available)	D8162	ZRN\DRVI\DRVA command Y2 Y3 acceleration and deceleration time
D8090	Sampling filter numbers (0-22, Default 0)	D8166	Y2 Y3 High-speed output count:32 bit
D8091	Thermocouple type (K-0,E-1,J-2)	D8182	Z1 Address register contents
D8093	Thermocouple cold junction temperature	D8183	V1 Address register contents
D8094	1st thermocouple Temperature	D8184	Z2 Address register contents
D8095	Temperature of second thermocouple	D8185	V2 Address register contents
D8096	Analog DA0 Output data(0~4095)	D8186	Z3 Address register contents
D8097	Analog DA1 Output data(0~4095)	D8187	V3 Address register contents
D8112	Optional 1 channel weighing data	D8188	Z4 Address register contents

	low		
D8113	Optional 1 channel weighing data high	D8189	V4 Address register contents
D8114	Optional 1 channel weighing filter	D8190	Z5 Address register contents
D8115	Optional 2-channel weighing function filtering times (0-80) (not available)	D8191	V5 Address register contents
D8116	Optional 2-channel weighing function channel 1 data high (not available)	D8192	Z6 Address register contents
D8117	Optional 2-channel weighing function channel 1 data low (not available)	D8193	V6 Address register contents
D8118	Optional 2-channel weighing function communication 2 data high (not available)	D8194	Z7 Address register contents
D8119	Optional 2-channel weighing function channel 2 data low (not available)	D8195	V7 Address register contents
D8120	Series 2 communication parameter settings	D8196	CAN Slave can't communicate 1~16
D8121	MODBUS RTU of series 2 slave station (1~255)	D8197	CAN Slave can't communicate 17~32
D8122	RS Remaining numbers instruction sent	D8198	CAN Slave summary no communicate 1~16
D8123	RS Instruction received numbers	D8199	CAN Slave summary no communicate 17~32
		D8200	CAN Communication time (1-1ms)

4 Analog Usage

4.1 Analog input type

Input signal type	Range	Register reading value	Resolution	Accuracy total range
E type thermocouple	Environment temperature ~599.9°C	Room temperature~5999	0.1°C	1%
K type thermocouple	Environment temperature ~999.9°C	Room temperature~9999	0.1°C	1%
J type thermocouple	Environment temperature ~999.9°C	Room temperature~9999	0.1°C	1%
Thermistor NTC10K	-19.9~109.9°C	-199~1099	0.1°C	1%
Thermistor NTC50K	-40~199.9°C	-400~1999	0.1°C	1%
Voltage analog	0~10V/0-5V	0~4000	2.5mV	1%
Current analog	0~20mA	0~4000	5uA	1%

4.1.1 Analog input reading

- Analog input could be up to 8 channels, and the precision is in 12 bits.

NO	Register reading value
AD0	D8030
AD1	D8031
AD2	D8032
AD3	D8033
AD4	D8034
AD5	D8035

Calculate the input voltage formula:

Measure voltage = D803n (n = 0-7) * (VRF reference voltage / 4095);

Analog input sampling period: PLC scan cycles is fixed as 22.

- 4.3inch, optional NTC analog read registers (AD0,AD2 are common port)

NO	Register reading value
1 st (AD0,AD1)	D8031
2 nd (AD2,AD3)	D8033

- 7inch, optional NTC analog read registers (Occupy AD0,AD2,AD4 as common port)

NO	Register reading value
1 st (AD0,AD1)	D8031
2 nd (AD2,AD3)	D8033

3 rd (AD4,AD5)	D8035
---------------------------	-------

4. 4.3inch Thermocouple analog read register:

Model	Register reading value	Cold junction temperature	Thermocouple Sampling filter times
4.3inch (AD0,AD2 are common port)			
1 st (AD0,AD1)	D8094	D8093	D8090(0-22,default:0)
2 nd (AD2,AD3)	D8095		

4.2 Analog output type.

Output signal type	Range	Register reading value
Voltage analog	0~10V/0-5V	0~4095
Current analog	0~20mA	0~4095

4.2.1 Analog output reading

Analog output could be up to 2 channels, and the precision is in 12 bits.

NO	Register reading value
DA0	D8096
DA1	D8097

* When PLC is in “STOP”, D8096 D8097 is automatically set as 0 , DA output is also 0.

* When data setting of analog output is incorrect, 6712 fault will be detected, and DA output is 0.

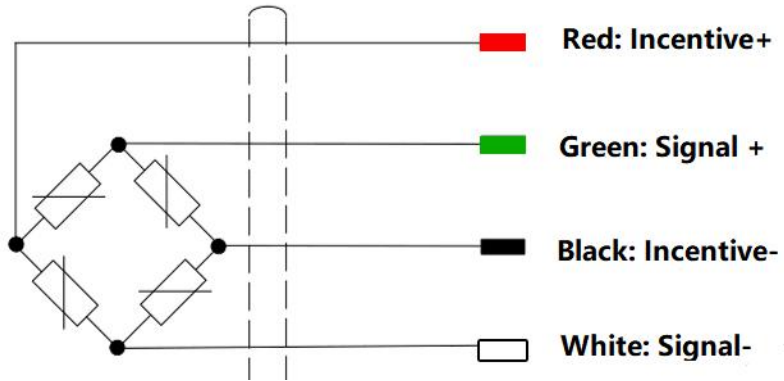
4.3 Weighing function / load cell

●7inch is optional to add 1 channel weighing function (which occupy AD0-AD2), and it is converted into a high-precision 24-bit AD/AI designed by an electronic scale. It supports selection of filtering and setting of filtering times, and has a fault detection relay, 64 gain, and a fixed rate of 80Hz;

●Special Registers as below:

M8112	Optional 1 channel weighing function Start
M8113	Optional 1 channel weighing filter function Start
M8114	Optional 1 channel weighing failure flag
D8112	Optional 1 channel weighing data low bit
D8113	Optional 1 channel weighing data high bit
D8114	Optional 1 channel weighing filter times

●Wiring: _____



●Program, please refer to website: [Weighing Case](#)

5 Random number instructions

- 1) Random number related register: Start convert relay-M8005
Random number save register-D8005 (low) D8006 (high)
- 2) If you need to generate the random number, just need to set M8005 ON in the program. When the random number is generated and be saved to D8005 D8006, M8005 will be set OFF automatically.
- 3) Therefore, M8005 is set from OFF to ON, then start the random number conversion. And M8005 turn from ON to OFF, then the conversion is completed.
- 4)

Example: LDP	M0	M0 non-edge pulse
SET	M8005	SET M8005
LDF	M8005	M8005 's Lower edge — Conversion completed
DMOV	D8005 D0	Extract random numbers to D0 D1

6 High speed counter application

6.1 Inside high speed counter input distribution table

Counter Type	Counter Model	Input assigned							
		X000	X001	X002	X003	X004	X005	X006	X007
Single Phase single count input	C235	U/D							
	C236		U/D						
	C237			U/D					
	C238				U/D				
	C239					U/D			
	C240						U/D		
	C241	U/D	R						
	C242			U/D	R				
	C243					U/D	R		
	C244	U/D	R					S	
	C245			U/D	R				S
Single Phase double count input	C246	U	D						
	C247	U	D	R					
	C248				U	D	R		
	C248(OP)*1				U	D			
	C249	U	D	R				S	
	C250				U	D	R		S
Double phase double count input	C251	A	B						
	C252	A	B	R					
	C253				A	B	R		
	C253(OP)*1				A	B			
	C254	A	B	R				S	
	C254(OP)*1							A	B
	C255				A	B	R		S

U: add counter input
A: A phase input
R: External reset input

D: Delete counter input
B: B phase input
S: External start input

● Input X000~X007, as shown in the above table, corresponding to each high-speed counter number. Inputs X000~X007 cannot be used repeatedly by high-speed counters. They can be used for general input when the input terminals are not used as high-speed counters.

● The input X000~X007 cannot be reused. For example, once C251 is used, X000 and X001 are occupied, so C235, C236, C241, C244, C246, C247, C249, C252, C254 and interrupt input pointers *I00, *I01 and corresponding input SPD instructions cannot be used.

6.2 High speed counter input instructions

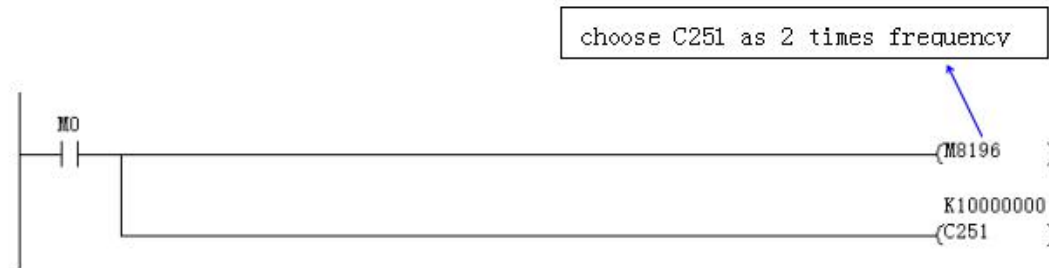
- 1) Maximum response frequency of C251 C252 C254 (AB phase): 60KHz;
- 2) Maximum response frequency of C253 C255 (AB phase): 60KHz;
- 3) Maximum response frequency of C235 C241 C244 C238 (single phase): 60KHz;
- 4) Other high-speed counter's highest response frequency: 10KHz;
- 5) High speed counter of the AB phase can be set to 2 times and 4 times frequency

(setting is valid only for OUT drive same cycle):

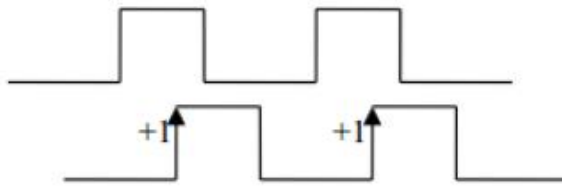
- ** When M8196-ON, C251 C252 C254 pulse is 2 times frequency;
- **When M8197-ON, the C253 C255 count pulse is 2 times frequency;
- ** When M8198-ON, C251 C252 C254 count pulse is 4 times frequency;
- **When M8199-ON, C253 C255 count pulse is 4 times frequency;

For example: If you use an AB phase encoder, it is 1024 pulse inputs in one turn. If not set the frequency multiplier, then adjust the counter count 1024 (the original FX1N does not support frequency multiplier, but the FX3U can set 4 times frequency), If you set 2 times the frequency, then turn the counter to count 2048; if you set 4 times, then turn the counter to count 4096.

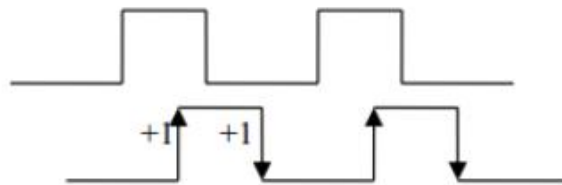
Usage instruction:



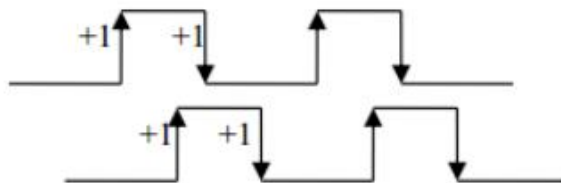
No Multiplier



2 Times Frequency



4 Times Frequency

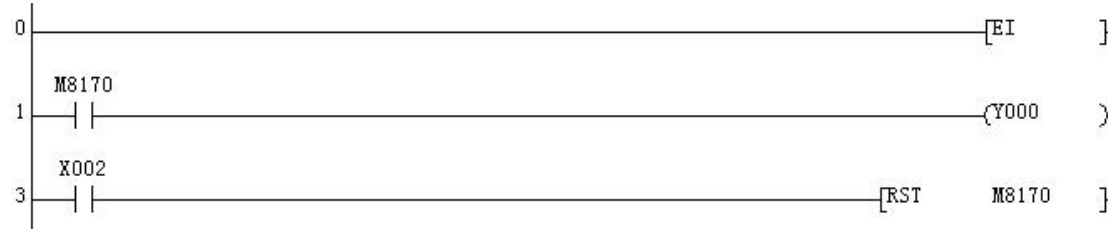


- ** Other usage are consistent with the original FX1N, refer to FX programming manual;
- ** If high-speed input function is not selected, Then SPD, external interrupt, and C235~C255 high-speed counter cannot be used normally.

7 Pulse capture function application

1) Supports the pulse capture function of X0-X5, corresponding to: X0-M8170, X1-M8171, X2-M8172, X3-M8173, X4-M8174, X5-M8175.

2) Using the pulse capture function, firstly you need to use the EI instruction. The example is as follows:



*EI : Interrupt is allowed.

M8170 :After ON It needs to be reset to be ON again.

8 High speed pulse output application

1) Normally with 4 high-speed pulses (Y0- Y3,10khz), Y0 and Y1 can output up tp 200KHZ at the same time, and Y2 and Y3 can output up to 100KHz at the same time;

2) Regarding the positioning command with direction output: after driving, the direction output delay 20ms before outputting the pulse;

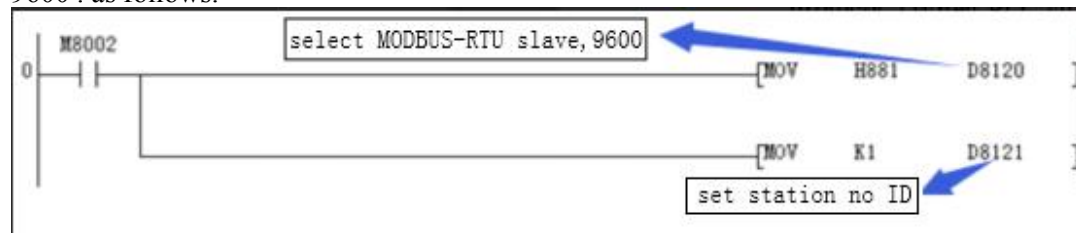
3) Special components used for pulse instructions:

	Y0	Y1	Y2	Y3
Min output frequency(default:0)	D8145	D8145	D8159	D8159
Max output frequency	D8146 D8147	D8146 D8147	D8160	D8160
Acceleration time (default: 100ms)	D8148	D8148	D8162	D8162
Output pulse stops immediately	M8145	M8146	M8155	M8156
In outputting pulse	M8147	M8148	M8157	M8158
Output pulse accumulation	D8140 D8141	D8142 D8143	D8154	D8156
Output pulse accumulation	D8136 D8137		D8166 D8167	

9 Optional com port instructions

9.1 Function Description

- 1) 1 RS485 communication port is optional, but can not coexist with its own 232 port.
- 2) Support exchange between Mitsubishi programming protocol and MODBUS-RTU protocol. (When PLC stops, it will be back to Mitsubishi programming protocol automatically; When PLC start, the protocol depends on D8120.)
- 3) Communication data of optional communication port is set in the D8120 and it will take effect after PLC runs (the second modification could be made until the STOP-RUN is valid again, the D8120 is reset to 0 when the PLC is in STOP), and the MODBUS-RTU slave station number is set in the D8121 (Range 1~255).
- 4) Use **FROM** to read slave data when using MODBUS-RTU master, **TO** to write slave data (supports broadcast sending function)
- 5) Set the optional communication port to MODBUS-RTU protocol. the baud rate of slave is 9600 . as follows:



9.2 Modbus-RTU Protocol special registers & relays

Master:

- M8121-Master data transmission.
- M8122-Master receive Slave data, check error.
- M8123-Master receive completed signal
- M8124-Master receive broadcast signal
- M8129-Communication timeout signal
- D8120-Communication parameter and function
- D8126-Sending interval(1=1ms,default 20ms, interval between two communication)
- D8122-Station number with communication timeout
- D8123-Real receiving time (1=10ms)
- D8124-Max receiving time(1=10ms)
- D8129-Receive timeout setting (1=10ms, default 50=500ms, Time from sending completed to receiving completed)

Slave:

- D8120-Communication parameters and function
 - D8121-Slave address (Range: 1~255)
 - D8126-Respond overtime (1=1ms, Default 5ms)
- Note: 1.M8121, M8122, M8123, M8124 are only for internal use. Don't write using MODBUS-RTU master station.
- 2.When D8129 receives the timeout, please set according to the actual setting. When the setting time is too long, if there is a slave communication failure, the waiting time for re-communication (namely D8129) will be very long.

9.3 D8120 Parameter and Function setting

D8120 Setting function diagram as below: (D8120 communication parameter selection register)

b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
-----	-----	-----	-----	-----	-----	----	----	----	----	----	----	----	----	----	----

Bit number	Name	Content
b0	Data length	0:7 bit 1:8 bit
b2b1	Parity	00:None 01:Odd 11:Even
b3	Stop bit	0:1 bit 1:2 bit
b7b6b5b4	Baud rate	0011:300bps 0100:600bps 0101:1200bps 0110:2400bps 0111:4800bps 1000:9600bps 1001:19200bps 1010:38400bps 1011:57600bps 1100:115200bps
b8	Forbidden	Set 0
b9	Forbidden	Set 0
b12 b11 b10	Protocol selection	000: Mitsubishi Programming port protocol 001: RS Protocol 010: MODBUS-RTU Slave protocol 011: MODBUS-RTU Master protocol
b13	Forbidden	Set 0
b14	Forbidden	Set 0
b15	Forbidden	Set 0

*1: The start and end characters can be set by user

*2: D8121 is MODBUS-RTU slave station number setting

*3: When the data bit is in 7 bit,the parity can't be selected---No checking. (6038 failure).

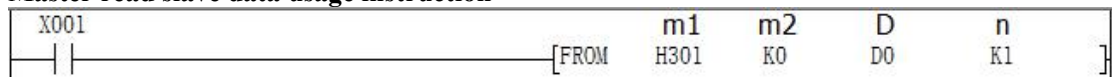
***Mitsubishi Programming port protocol:** Data length 7,stop bit 1,Parity EVEN is fixed,the rate can be set;

***MODBUS-RTU protocol:** data length, stop bit, parity, rate can be set;

***RS instruction:** Data length, stop bit, parity, rate, start character, and end character can all be set.

9.4 Modbus-RTU Master station instructions

Master read slave data usage instruction



* Transfer the data of register from address 0 of 1st station to D0

M1--low 8 bits indicate the slave address, high 8 bits indicate the sent instruction;

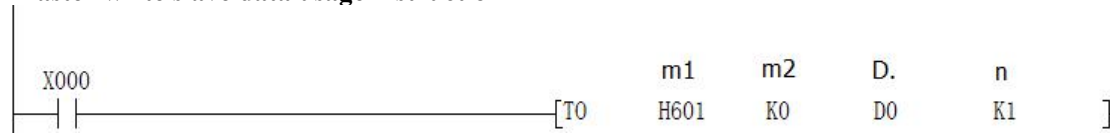
Such as: H301-command 03 (read register instruction), slave address 01; if the high 8 bit is 0, then the command is default as 03;

M2--slave element address; (Slave address , refers to slave element address table);

D - master station data register, this register holds the data which read from the slave station;

N -- read data length (1~64);

Master write slave data usage instruction



* Write the data of D0 to the register with the 1st slave in address 0

M1--low 8 bits indicate the slave address, high 8 bits indicate the sent instruction;
Such as: H601-command 06 (read register instruction), slave address 01; if the high 8 bit is 0, then the command is default as 06;

M2--slave element address; (Slave address, refers to slave element address table);

If the address is set to 0, it means to write data to all slave stations;

D - master station data register, this register holds the data which read from the slave station;

N --written data length;

When using commands 05 (write bit) and 06 (write register), no matter what the length is set, press 1 to operate.

When using H10(K16) to write multi-bit registers, the data length(1~64).

Special Note:

1. FROM and TO can be used many times in the program. When multiple instructions are executed at the same time, the system will communicate in turns. If the communication is overtime, M8129 set “ON” and reports “6306 fault” and exits from this communication, and records this overtime station number in the D8122 register,execute the next communication instructions;

2. The FROM/TO instruction cannot be used with the RS instruction in the program at the same time, reporting 6609 failure;

3. The data length maximum of the FROM/TO instruction: bit (1~64), register (1~64);

4. The communication parameters of the master station and the slave station must be set same to communicate, such as data length, parity, stop bit, and rate;

5. When using the 05 command to set the slave station component, such as: TO H501 K4000 D0 K1—Set the M0 state of slave No. 1. If D0 is equal to 0, slave M0 is OFF; when D0 is non-zero, slave M0 is ON;

6. When using the TO command, you can send instructions to all slaves, and only need to set the slave address to 0.

For example, TO H600 K0 D0 K3: Write D0, D1, D2 of master station to register addresses 0, 1, 2 of all slaves.

D8129—Communication timeout setting, default 500ms;

setting suggestion: set D8129 larger,when written program communication is normal, run a period, monitor the value of D8124, D8129 equals D8124 plus 3 (only for reference);

Note: 1) The function needs to be enabled in IO setting and activation software, otherwise it will report 6506 fault (unsupported instruction) when using FROM/TO instruction;

9.5 Modbus-RTU Protocol slave station element address

Bit component	Addresses	Bit component	Bit component	Bit component	Addresses	Bit component	Addresses	Bit component	Addresses
X0	0	X40	32	Y0	300	Y40	332	S0-S999	1000-1999
X1	1	X41	33	Y1	301	Y41	333	T0-T255	2000-2255
X2	2	X42	34	Y2	302	Y42	334	C0-C255	3000-3255
X3	3	X43	35	Y3	303	Y43	335	M0-M1535: FX1N	4000-5535
X4	4	X44	36	Y4	304	Y44	336	M0-M3071: FX2N	4000-7071
X5	5	X45	37	Y5	305	Y45	337		
X6	6	X46	38	Y6	306	Y46	338	Bit component	Addresses
X7	7	X47	39	Y7	307	Y47	339	D0-D5999	0-5999
X10	8	X50	40	Y10	308	Y50	340	T0-T255	8000-8255
X11	9	X51	41	Y11	309	Y51	341	C0-C255	8300-8555
X12	10	X52	42	Y12	310	Y52	342	Communication parameters: 1. Communication parameters, refer to above D8120 set; 2. Inspection: N or O or E; 3. Data bit: 8 or 7; 4. Stop bit: 1 or 2; 5. ID is set in D8121 (1~255); MODBUS-RTU	
X13	11	X53	43	Y13	311	Y53	343		
X14	12	X54	44	Y14	312	Y54	344		
X15	13	X55	45	Y15	313	Y55	345		
X16	14	X56	46	Y16	314	Y56	346		
X17	15	X57	47	Y17	315	Y57	347		

X20	16	X60	48	Y20	316	Y60	348	<p>instruction: 1,Read bit operation instruction: 01, 02; 2,Write bit operation instructions: 05; 3. Read register instruction: 03,04; 4, Write register instructions: 06; 5, Write multi-bit register instructions: 16 (H10)</p> <p>Note: The maximum registers could be written and read at the same time is 64.</p>
X21	17	X61	49	Y21	317	Y61	349	
X22	18	X62	50	Y22	318	Y62	350	
X23	19	X63	51	Y23	319	Y63	351	
X24	20	X64	52	Y24	320	Y64	352	
X25	21	X65	53	Y25	321	Y65	353	
X26	22	X66	54	Y26	322	Y66	354	
X27	23	X67	55	Y27	323	Y67	355	
X30	24	X70	56	Y30	324	Y70	356	
X31	25	X71	57	Y31	325	Y71	357	
X32	26	X72	58	Y32	326	Y72	358	
X33	27	X73	59	Y33	327	Y73	359	
X34	28	X74	60	Y34	328	Y73	360	
X35	29	X75	61	Y35	329	Y75	361	
X36	30	X76	62	Y36	330	Y76	362	
X37	31	X77	63	Y37	331	Y77	363	

9.6 RS Protocol special registers & relays instructions

- M8121: RS instruction is being sent
- M8122: RS instruction is in sending
- M8123: RS instruction receiving signal
- M8124: RS instruction is in receiving
- M8129: Communication timeout signal
- D8122: RS instruction sends data remainder
- D8123: Numbers of RS instruction received
- D8127: Real-time receiving time (1=10ms)
- D8128: Max receiving time (1=10ms)
- D8129: RS instruction reception timeout setting (1=10ms, default 50=500ms)

Note:

Max data sent and received by RS Instruction is 140. (If over, report 6706)

9.7 CAN communication protocol instruction

9.7.1 Function description

- 1) CAN function can set 1 master, up to 32 slaves (setting range: 1~32), and the maximum number of registers shared by each station is 32 (setting range: 1~32);
- 2) CAN function communication baud rate can be set: 20K, 50K, 80K, 100K, 125K, 200K, 250K, 400K, 500K, 600K, 800K, 1000K (if the unsupported baud rate is set, the default is 250K automatically) ;
- 3) The shared register of the master and all slaves is shared with each other, and each station can share up to 32 registers. For details, see four (master-slave shared address table);
- 4) Slave/master address repeated fault detection, there is corresponding fault, check the fault description of the main manual
- 5) Current CAN communication function only supports the MX2N series PLCs to be interconnected with each other, and does not support networking with other CANs;
- 6) Using CAN networking is fast, simple and convenient, only need to set a few registers;

9.7.2 Register and relay description

Master

- M8150-CAN allow work
- M8149-Communication timeout flag(CAN occurs “does not communicate” or “timeout flag”. After this flag is ON, it needs to be manually turned OFF in the program).
- D8149-Communication timeout parameter (1=1ms,Default 50ms)
- D8150-Master set (0=master)
- D8151-Slave numbers (1~32,Default 8)
- D8152-Shared register numbers (1~32,Default 8)
- D8153-Communication baud rate (20K~1000K,Default 250K)
- D8196-uncommunicated slave (1~16)
- D8197-uncommunicated slave (17~32)
- D8198-uncommunicated slave summary (1~16)
- D8199-uncommunicated slave summary (17~32)
- D8200-Maximum time to communicate with the slave successfully (1=1ms)

Slave

- M8150-CAN allow work
- M8149-Communication timeout flag(CAN occurs “does not communicate” or “timeout flag”. After this flag is ON, it needs to be manually turned OFF in the program).
- D8149-Communication timeout parameter (1=1ms,Default 60ms)

- D8150-Slave address set (1~32)
- D8152-Shared register numbers (1~32,Default 8)
- D8153-Communication baud rate (20K~1000K,Default 250K)
- D8196-uncommunicated slave (1~16)
- D8197-uncommunicated slave (17~32)
- D8198-uncommunicated slave summary (1~16)
- D8199-uncommunicated slave summary (17~32)
- D8200-Maximum time to communicate with the slave successfully (1=1ms)

Note:

1. Flag of D8196 D8197 can't communicate with slave is 500ms automatic reset once.
2. Uncommunicated Slave summary of D8198 D8199,after power-on,can't communicate with slave summary.
3. CAN related register parameters, after setting,need to be powered off firstly to execute according to the new data ((if the parameters are set by the program, please turn off the power after the PLC is running, and then send power again, then CAN will start or start with new parameters);
4. Communication timeout setting of master and slave: The D8149 of the slave is recommended to be larger 10ms than the master (if master is 50ms, then slave is 60ms).

9.7.3 Description of register can't be communicated

	B15	B14	B13	B12	B11	B10	B9	B8	B7	B6	B5	B4	B3	B2	B1	B0
D8196	#16	#15	#14	#13	#12	#11	#10	#9	#8	#7	#6	#5	#4	#3	#2	#1
D8197	#32	#31	#30	#29	#28	#27	#26	#25	#24	#23	#22	#21	#20	#19	#18	#17

Note:

1. When the corresponding bit of the above register is 1, it indicates that the address corresponding to the bit is not communicated or the communication error occurs.
2. D8198 D8199 is,slave record that has not been communicated after the main board is powered on,reset after power off;

9.7.4 CAN communication speed and distance

Baud rate	Distance (m)	Minimum diameter(m m ²)	Maximum access points
1000Kbps	30	0.3	18
500Kbps	80	0.3	32
250Kbps	150	0.3	63
125Kbps	300	0.5	63
100Kbps	500	0.5	63
50Kbps	1000	0.7	63

9.7.5 Master-Slave shared register table

D8150	Start	End	Description	D8150	Start	End	Description
0	D1000	D1031	Master shared	17	D1544	D1575	#17 shared register

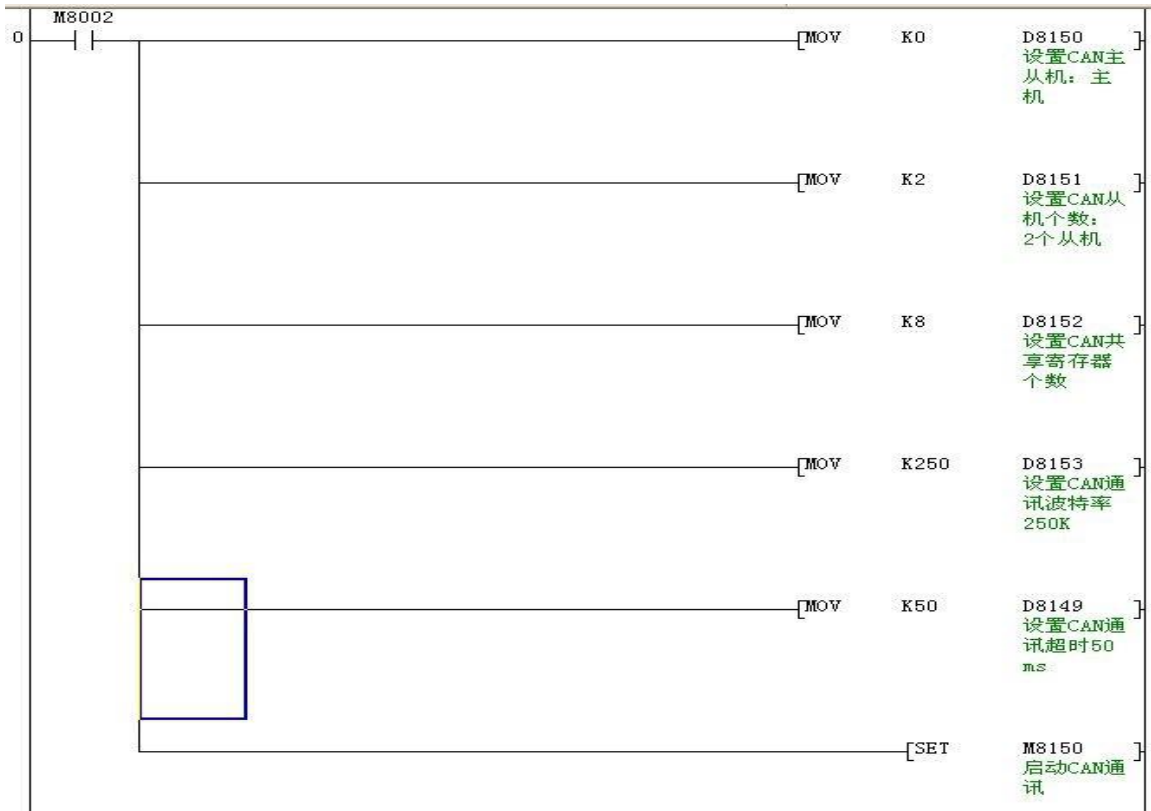
			register				
1	D1032	D1063	#1 shared register	18	D1576	D1607	#18 shared register
2	D1064	D1095	#2 shared register	19	D1608	D1639	#19 shared register
3	D1096	D1127	#3 shared register	20	D1640	D1671	#20 shared register
4	D1128	D1159	#4 shared register	21	D1672	D1703	#21 shared register
5	D1160	D1191	#5 shared register	22	D1704	D1735	#22 shared register
6	D1192	D1123	#6 shared register	23	D1736	D1767	#23 shared register
7	D1224	D1255	#7 shared register	24	D1768	D1799	#24 shared register
8	D1256	D1287	#8 shared register	25	D1800	D1831	#25 shared register
9	D1288	D1319	#9 shared register	26	D1832	D1863	#26 shared register
10	D1320	D1351	#10 shared register	27	D1864	D1895	#27 shared register
11	D1352	D1383	#11 shared register	28	D1896	D1927	#28 shared register
12	D1384	D1415	#12 shared register	29	D1928	D1959	#29 shared register
13	D1416	D1447	#13 shared register	30	D1960	D1991	#30 shared register
14	D1448	D1479	#14 shared register	31	D1992	D2023	#31 shared register
15	D1480	D1511	#15 shared register	32	D2024	D2055	#32 shared register
16	D1512	D1543	#16 shared register				

Note:

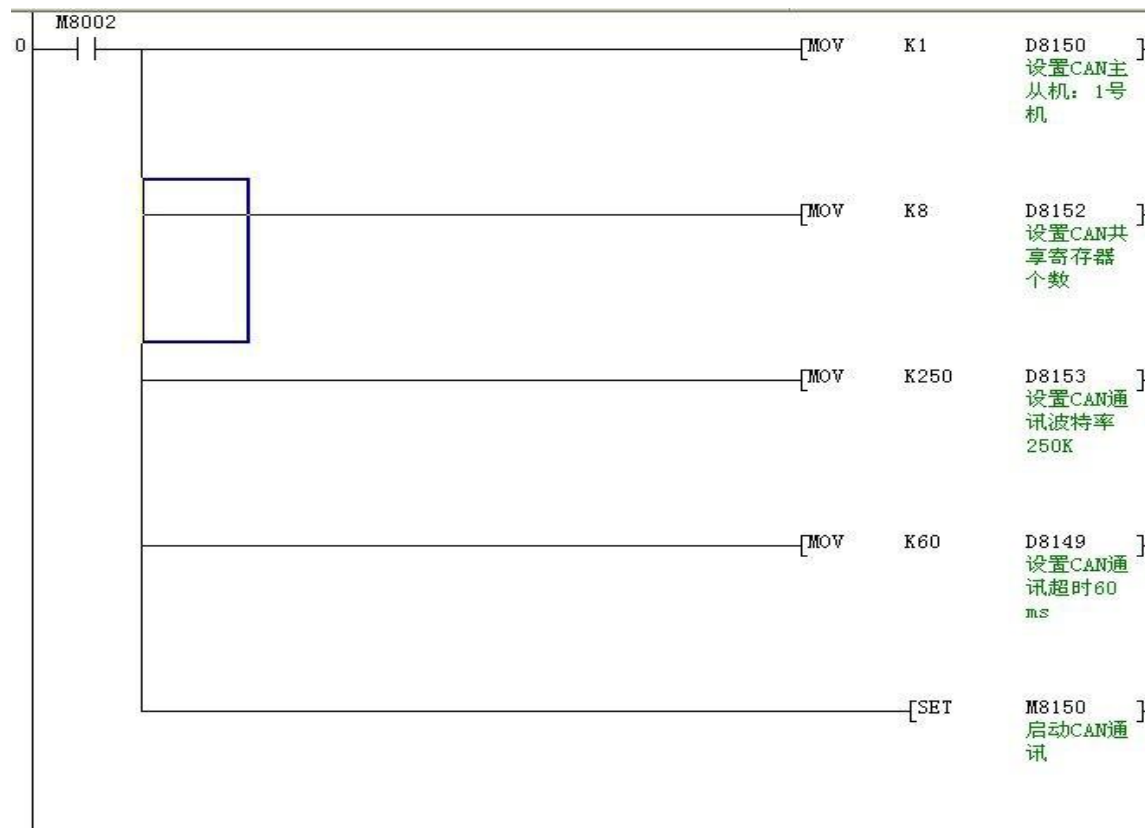
The start address of the register corresponding to the above #number is fixed, and the end address is determined by D8152 (such as D8152=2, then there are only 2 shared registers of the master and slave, master station:D1000-D1001, #1 slave station: D1032-D1033)

9.7.6 Setting example of communication program

1) Master communication program



2) Slave communication program



9.7.7 Test program description

- 1) Require 3 plc,one for master,one for station #1,one for station #2.
Shared registers: 8,
Communication baud rate: 250K;
- 2) If can't communicate,the ERR will flash, please use the "programming software - diagnosis" to check the error code;
- 3) There are three programs in the test program folder,one for master,one for station #1,one for station #2 (after downloading the program, set the PLC to run, power off to update CAN parameters, and then send power on, CAN runs according to the new parameters);
- 4) After the communication cable is connected, after downloading all the programs, all three PLCs are RUN;
- 5) The X0-X3 status of the master is output to the Y0-Y3 of the station #1,#2;
- 6) The X0-X3 status of station #1 is output to the master and the Y4-Y7 of station #2;
- 7) The X0-X3 status of station #2 is output to the master and the Y10-Y13 of station #1;

Test:

After the communication between the three Plcs is normal, disconnect the communication cable of the station #2, monitor the master and the D8196 of the station #1 (should be H0002- indicates that the station #2 is not communicated), and monitor the D8196 of the station #2 (should be H0002- Indicates that itself can't communicate with master)

10 Fault detection

Sorts	Error	Error contents	Resolution
PLC hardware error M8061(D8061) Running stop	0000	No abnormality	
	6101	Power failure data error	Check the power failure detection circuit, CPU internal FLASH is
	6105	Monitor action (Internal watchdog act)	Increase D8000 setting value, or check procedures
	6106	Logical error	Contact supplier
Serial 2/CAN Error M8063(D8063) Running continue	0000	No abnormality	
	6306	Receive data timeout	Detect communication line and D8129 setting
	6307	Unopened serial 2 use RS, FROM, TO instructions	Open serial 2 communication in IO parameter software
	6308	D8120 data bit/ check bit selection error	7-bit data can't select "No test"
	6309	D8120 check selection error	Check the selection value error
	6322	D8120 doesn't open RS instructions	Pls set D8120 Reuse RS instruction correctly
	6330	D8120 Parameter setting error	
	6331	MODBUS-RTU Master doesn't support function code	Reset FROM and TO Function code
	6332	D8120 doesn't open MODBUS-RTU Master station	Set D8120 reuse FROM and TO instruction correctly
	6333	FROM/TO receive slave data check error	Check whether the communication parameters of the master and slave stations are
	6334	FROM/TO receive slave station number is inconsistent with function code	
	6335	FROM slave address error	FROM slave address can't be 0
	6336	FROM/TO instruction's read/write data length error	Read/Write length should be 1- 64
	6340	Serial 1 DMA transmission error	
	6341	Serial 1 DMA receive error	
	6345	Serial 2 DMA transmission error	
6346	Serial 2 DMA receive error		
Parameter error M8064(D8064) Running stop	0000	No abnormality	
	6401	Program and number check error	1, The program is modified maliciously or downloaded is unfinished; 2,CPU internal program FLASH
	6409	IO function parameter and number check error	IO function parameter download is incomplete or FLASH is

	6410	MODBUS master function is not opened on using TO/FROM instruction	Please enable the MODBUS master function in the setup
	6411	Using the RD3A/WR3A instructions can't open AD/DA enhancement function	Please enable AD/DA enhancement in the setup
Grammatical error	0000	No abnormality	
	6504	Pn/In/High speed label repeat	
	6505	Component range is exceeded	
	6506	Use unsupported instructions	
	6507	Use incorrect labels (like, P63)	
	6510	MC number size is incorrect	
Loop error M8066(D8066) Running stop	0000	No abnormality	
	6603	Use MPS more than 12 times	
	6605	1,STL continue use times is over 9 times 2,RET appears without using STL	
	6606	1, I (interrupt) IRETSRET in the main program 2,No IRETSRET in the program.	
	6609	Others	Whether to use FROM/TO and RS instructions at same time
	6614	Less MPS	
	6615	Less MPP	
	6619	I MC MCR IRET STL RST in FOR~NEXT	
	6623	No MC instruction	
	6625	1,The initialization step is out of range (S0-S9) 2, The number of STL Sn used is more than 2 3, The range of STL Sn Sn is more than S899	
	6626	MC, MCR, SRET, I (interrupt), IRET in STL	
6627	No RET instruction after STL		
6630	CALL SRET relationship is incorrect		
Mathematical error OM8067(D8067) Running continue	0000	No abnormality	
	6701	CALL、CJ have no objects	
	6706	The instruction component address or value range is exceeded	
	6710	SFWR (P) instruction component 1 and component 2 is same	
	6711	Analog input AD range setting error	
	6712	Analog output DA range or data setting error	
	6713	Thermocouple open circuit	No connect thermocouple
	6715	NTC open circuit	No connect NTC Thermistor

****When an error occurs, use the diagnostics on the PLC programming software GX Developer and GX Works2 software menu to diagnose the PLC error code and program steps;**

Note:

When the power is turned off, the ERR light is long on and the program is not allowed to be downloaded.

**If you need to reset the ERR light, after troubleshooting:

1. Turn the RUN switch to STOP and pull it back to RUN;
2. After the main board is powered off, send power until ERR light is off.

11 HMI (Human Machine Interface)

11.1 How to install mView software

(Please go to the official website :WWW.COOLMAY.COM to download the latest version)

This chapter will detaily introduce the installation process of mView software.

■ Hardware requirements

Basic hardware requirements for installing mView editing software are as follows:

1. Personal computer host: It is recommended to use a CPU of 80486 or higher.
2. Memory: It is recommended to use more than 128MB RAM to expand the memory.
3. Hard disk: The hard disk must have more than 100MB of space.
4. Display: General VGA or SVGA display card.
5. Mouse: Use a Windows compatible mouse.
6. Printer: Use a Windows compatible printer.

Before you install it, please check whether the computer hardware is as above or higher. In order to avoid problems with hardware incompatibility, please use the recommended specifications as much as possible. If you have any questions, please contact our customer service.

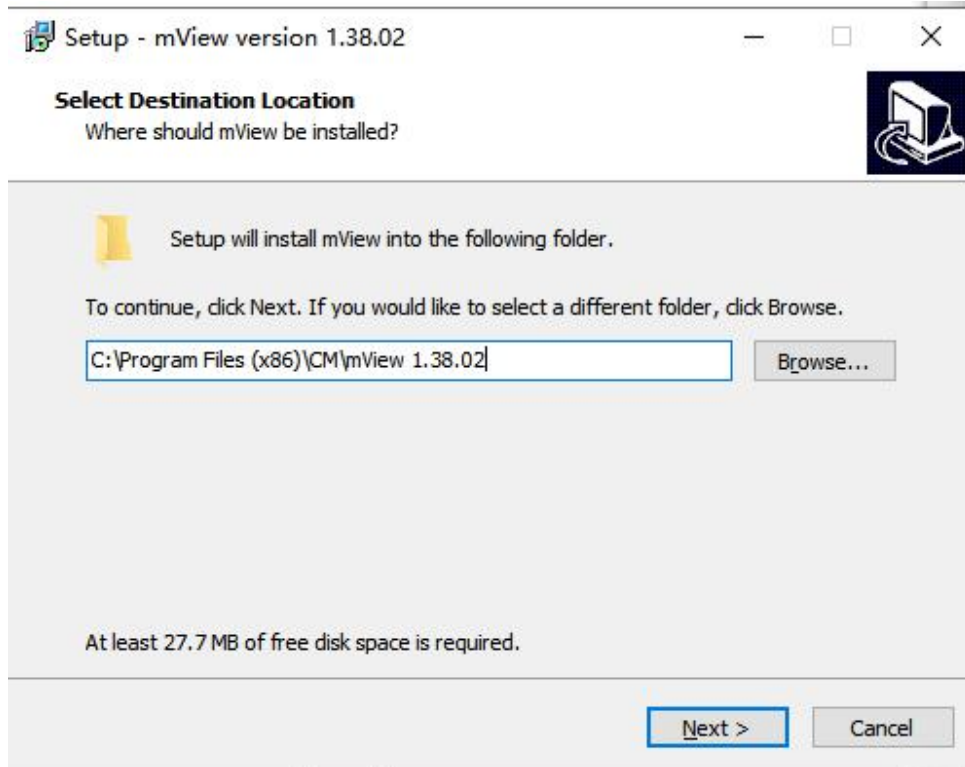
■ Software source

You can enter our company's website WWW.COOLMAY.COM to obtain the latest version of the software.

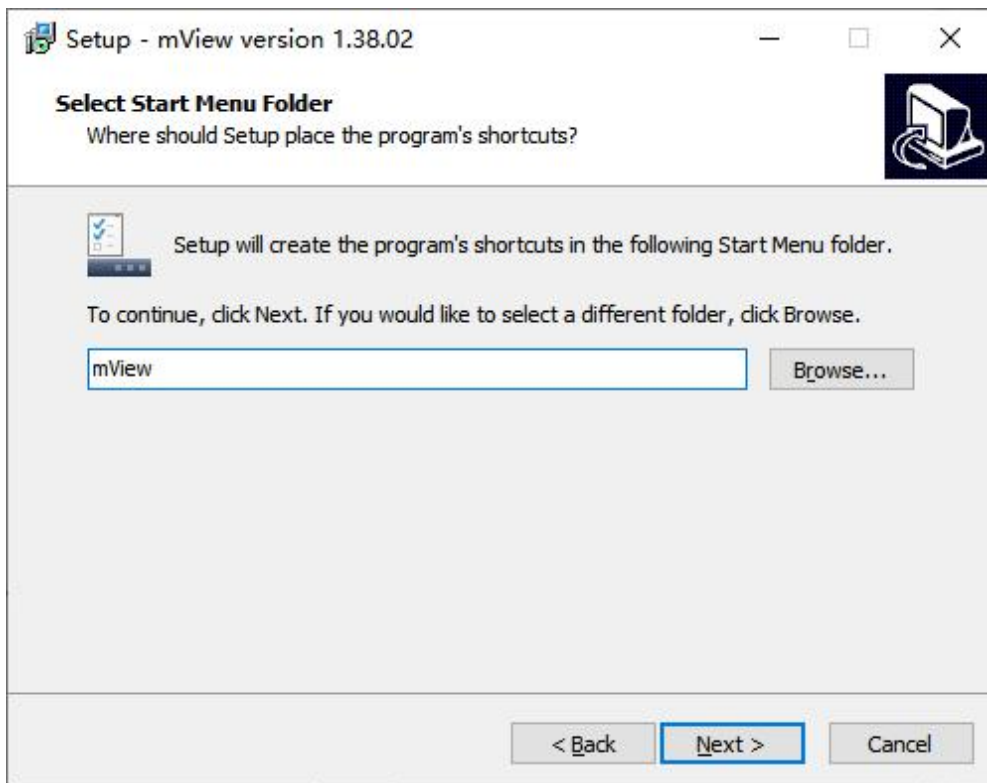
■ **Installation steps** (take the simplified Chinese version of mView as an example), note that "mView ***" software version is subject to the official website.

Select mView 13802.exe in the installer window to start the installer and start the installation;

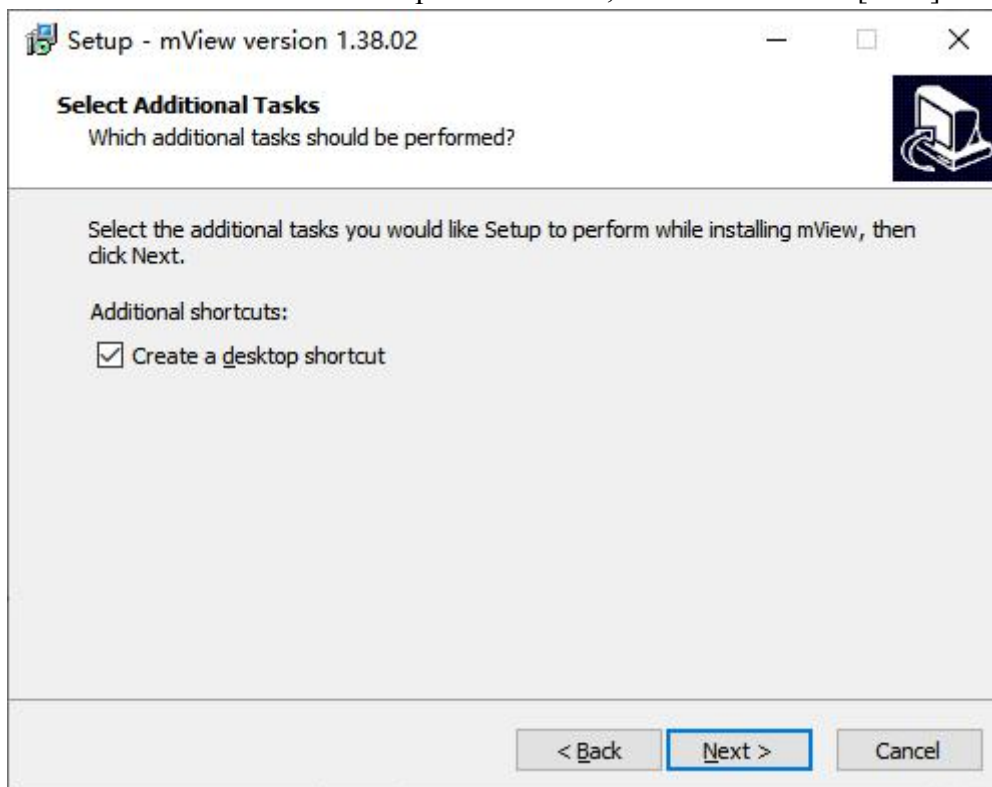
- Set the storage path of the installation file, select the default, or enter the address, or click the [Browse ...] button to select the address, and then click the [Next] button;



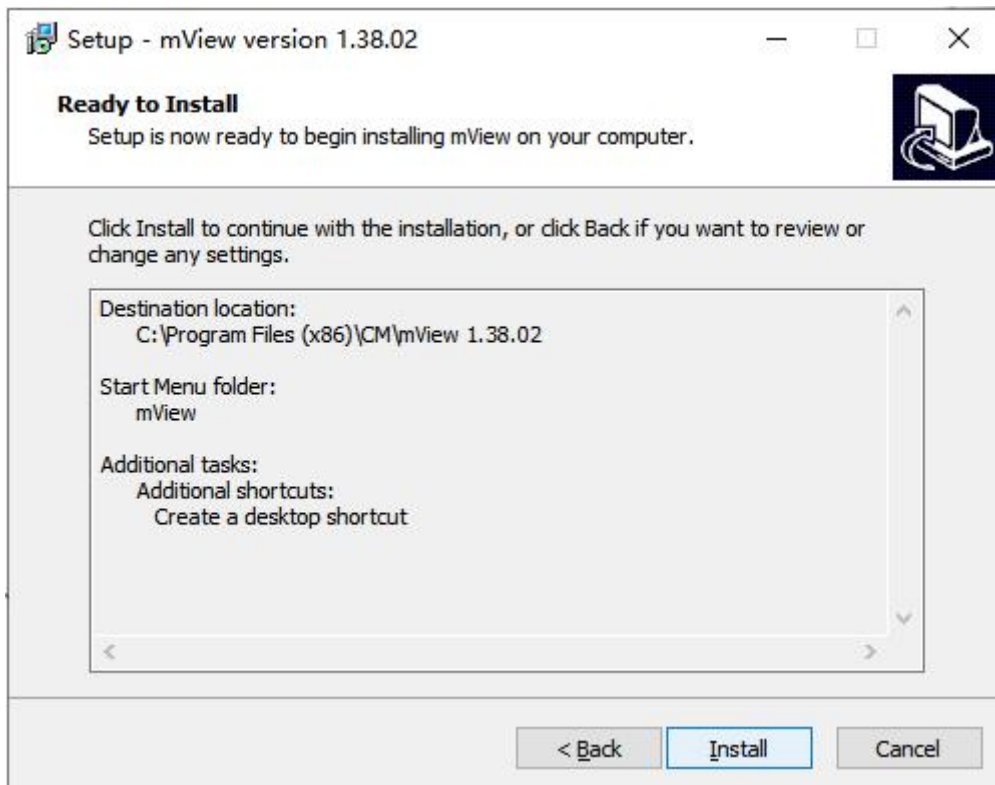
- Set the name of the saved folder. It is recommended to select the default and click the [Next] button directly.



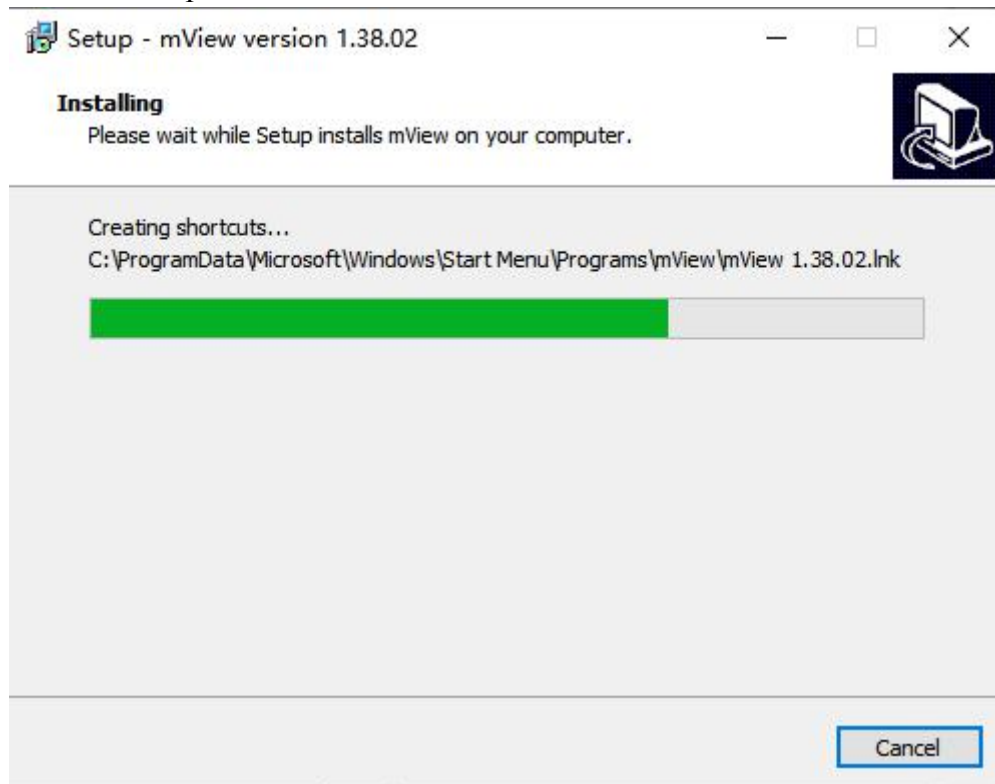
- Choose whether to create a desktop shortcut icon, and then click the [Next] button.



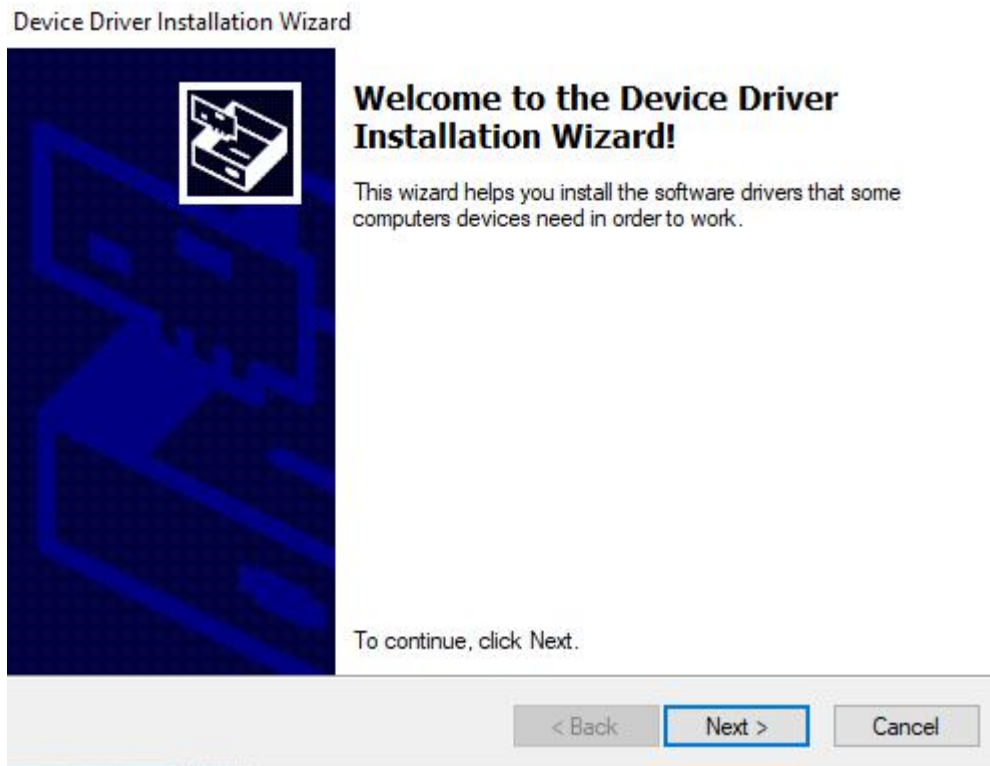
- Confirm the installation path and other installation information, and then click the [Install] button to install.



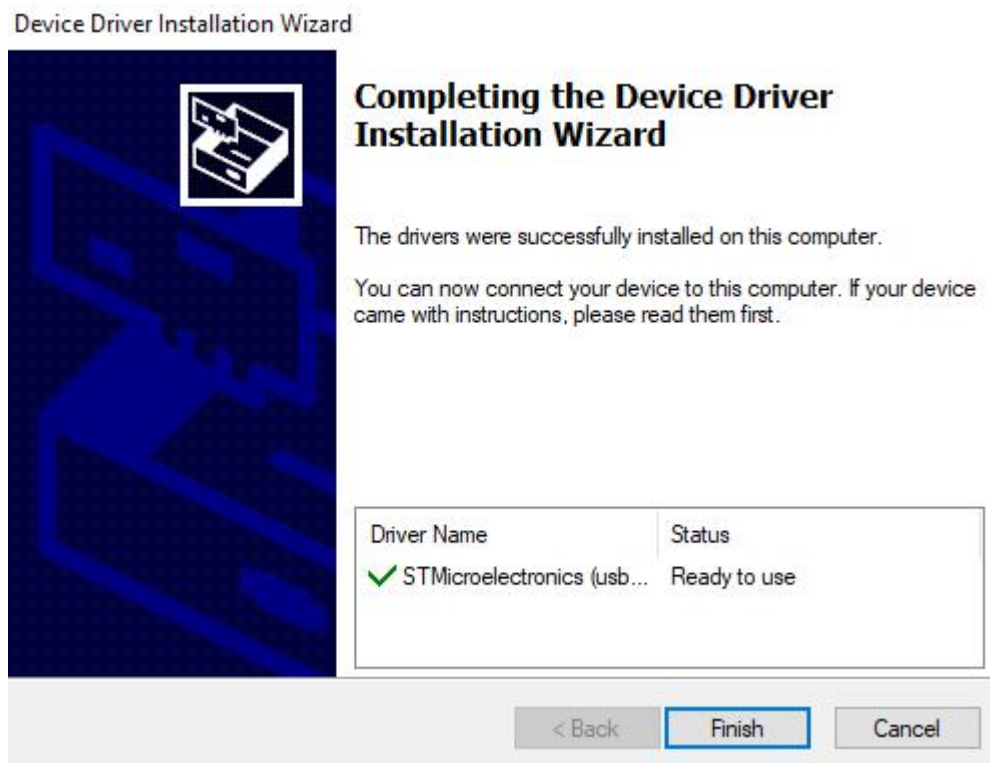
- The installation process is shown below:



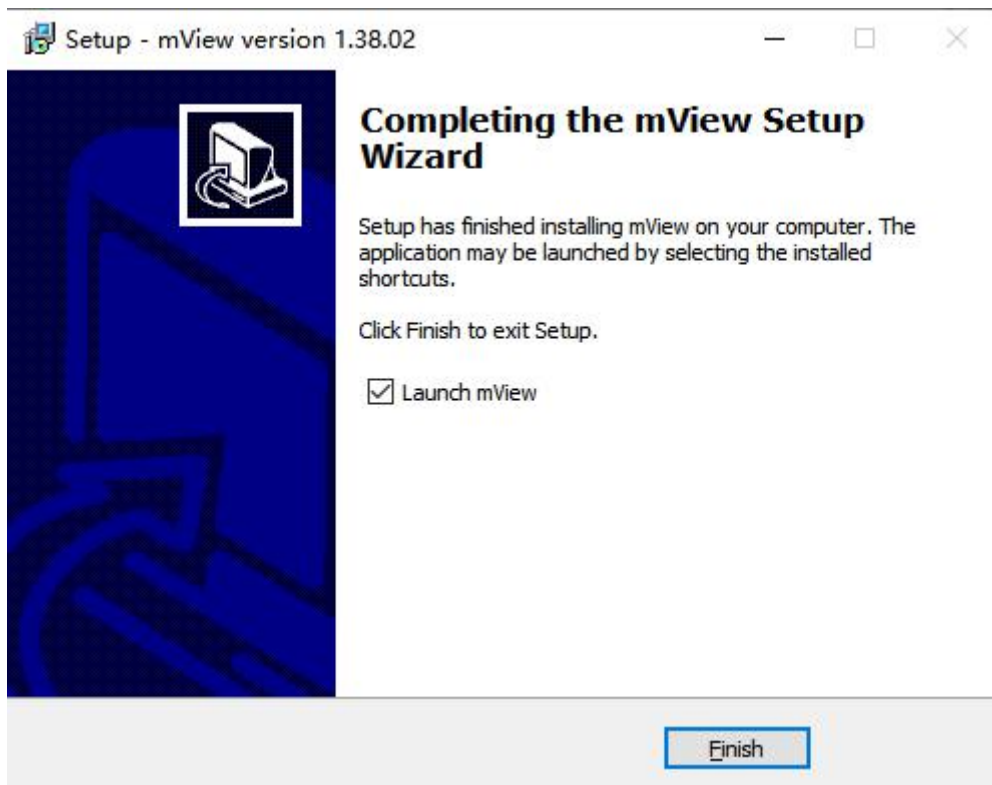
- Click [Next] to install the driver wizard



- The driver installation is completed



- Finally,click [Finish] to complete the installation.

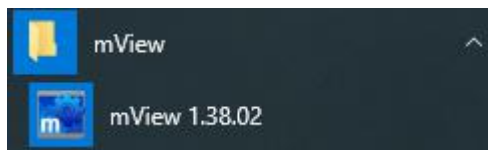


11.2 How to open mView software

After the installation of mView software is completed, a shortcut will be placed on the



desktop. At the same time, the corresponding mView program group has been added to the Windows start menu:




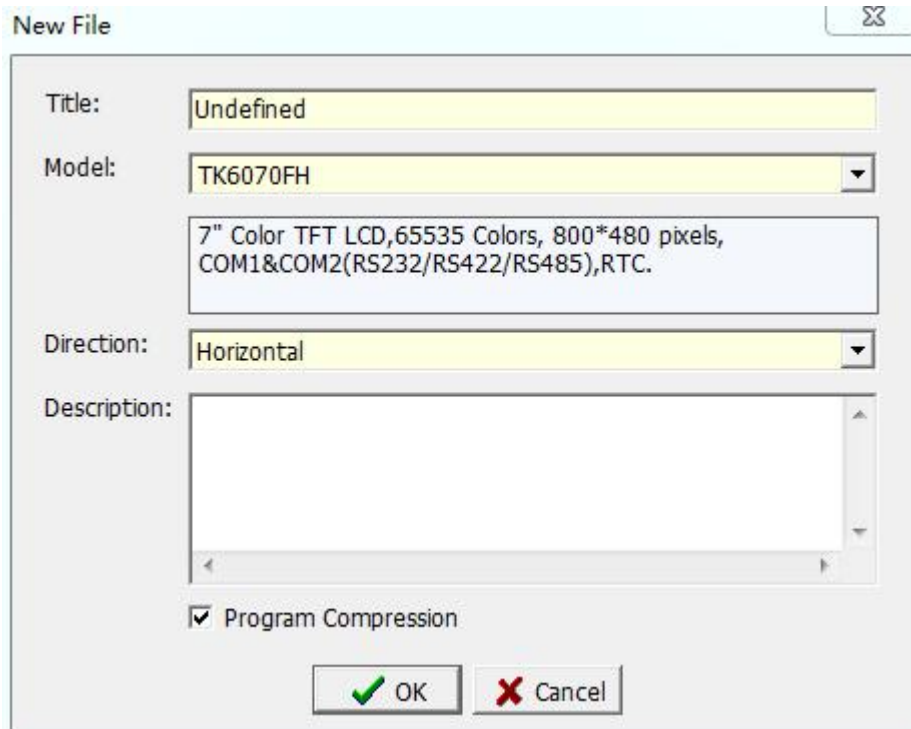
Choose one of the above two methods to open the mView programming software. When the application is started, a startup window will pop up, as shown in the following figure.

After the software is opened, it will be checked according to the menu bar [View]->[Option...]->[File]->Program start automatically open file, to determine whether to start the last project file when the software is opened, or not to open any file.



11.3 Build New HMI Program

To create a new project, you can directly click [New File] under [File] menu, Or click the icon  in the toolbar, Or use the hot key Ctrl + N set by the system. The dialog box shown below is displayed:



Title: Enter the name of the new project;

Model: select the model of the human-machine interface (HMI), (4.3inch is TK6043FH; 7inch is TK6070fh);

Direction: select whether the editing screen is displayed horizontally or vertically;

Description: Enter a help description for the newly created project, or choose not to enter it.

After completing the project-related information input, click the [OK] button to enter the communication information setting dialog box, as shown in the following figure. For specific settings, please refer to section 2.4.2 Communication Management in [Coolmay TK Series HMI User Manual](#).

Add Protocol ✕

Protocol: Mitsubishi FX3U Series

Controller:

Company	Model	Des...
Mitsubishi	FX3U Series	PLC

Electric: Auto Detect(RS232/RS422/RS485)

Buad Rate: 9600 Data Bit: 7Bits

Parity: Even Stop Bit: 1Bit

Delay: 0ms TimeOut: 1sec

Multi-Station Smart Link Retry Count: Repeat 3

Add Controller ✕

Controller:

ID: 0

Station: 1

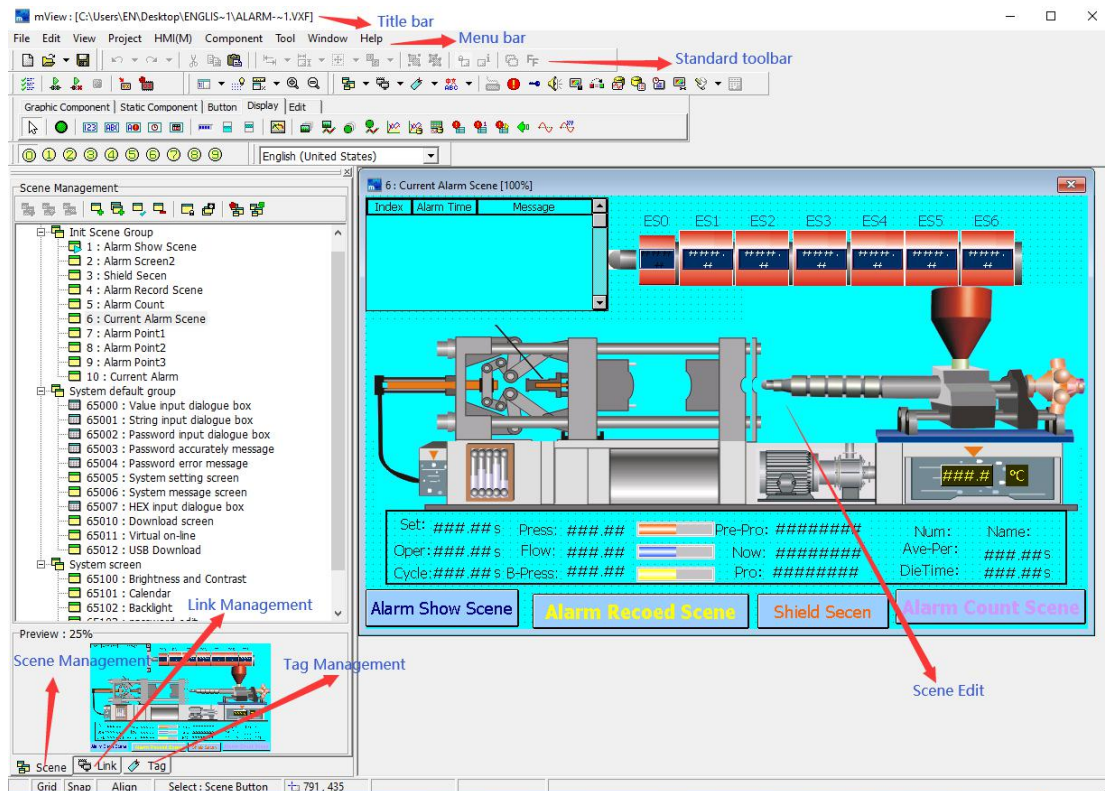
Controller:

Company	Model	Description
Mitsubishi	FX3U Series	PLC

Description:

11.4 Introduction of mView software interface

mView editing interface layout:

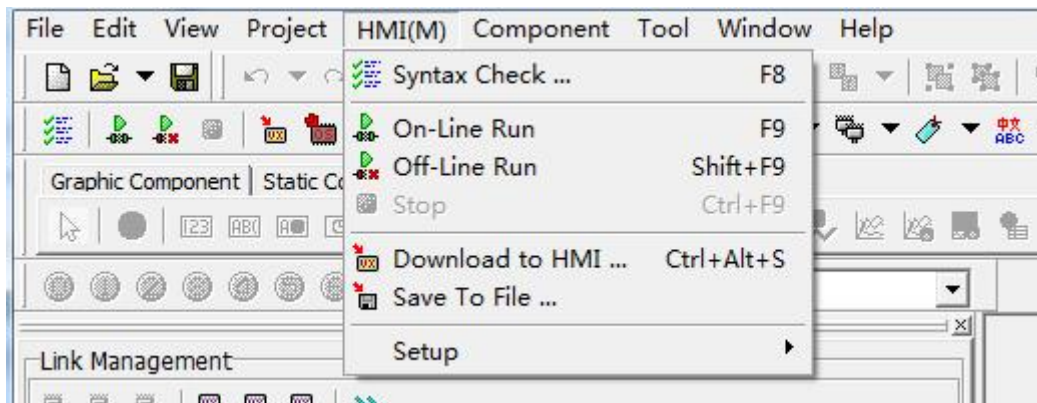


- Title bar: Displays the currently opened project path and file name, window number, and window name.
- Menu bar: A menu that displays various commands of CoolMayView. These menus are pull-down menus.
- Standard toolbar: Shortcut buttons for placing some commands. Corresponding buttons and editing tools for displaying files, editing, printing and other functions.
- Design components: Command buttons for component objects.
- Screen management: The management window of the screen used by the project.
- Communication management: engineering designers to manage, set up a window to communicate with PLC or other serial devices.
- Label management: Set labels for system variables and external variables to facilitate users to quickly find the corresponding variables.
- Status bar: Displays the current operation status, human-machine interface parameters, and communication equipment.

12 HMI program simulation and download

12.1 Program simulation

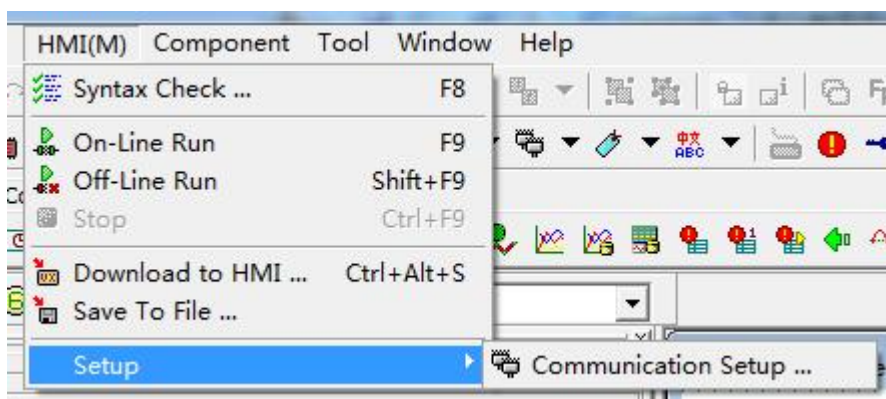
mView provides the function of simulating directly on the PC. You can use this function to simulate the actions performed on HMI after planning HMI. On the one hand, it increases the convenience of finding program errors, and on the other hand, it can save downloading to the time HMI can connect to the controller. The simulation function of mView is divided into two types: [On-Line Run] and [Off-Line Run], as shown in the figure below.

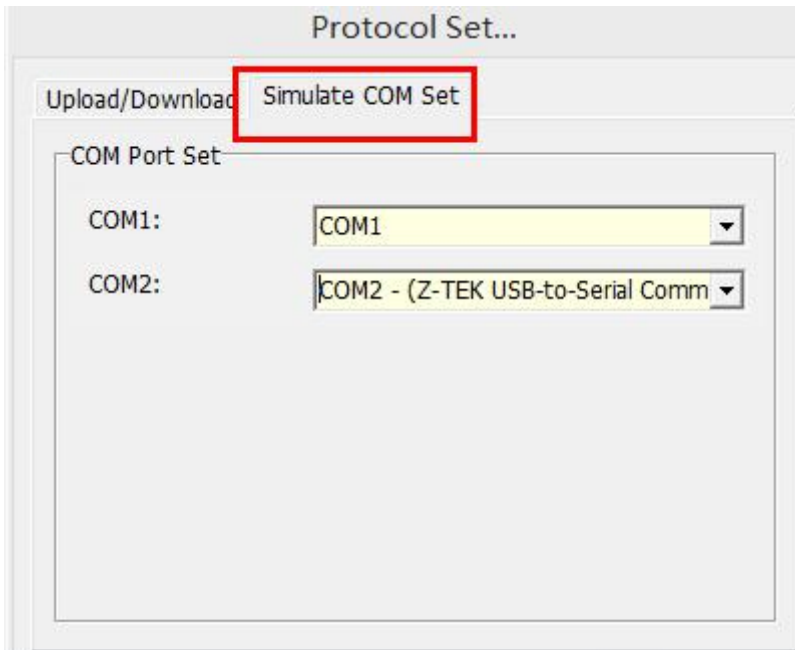


12.1.1 On-Line Run

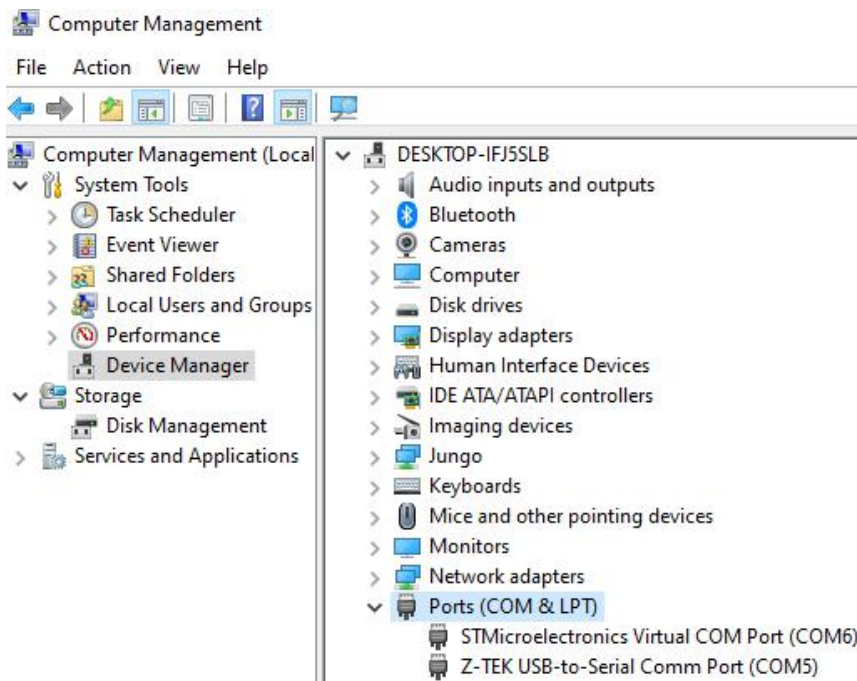
This function needs to be connected to the controller, and the program will modify the corresponding contacts and registers set by the controller during execution. It can be used to verify whether the planned program can normally act on the controller.

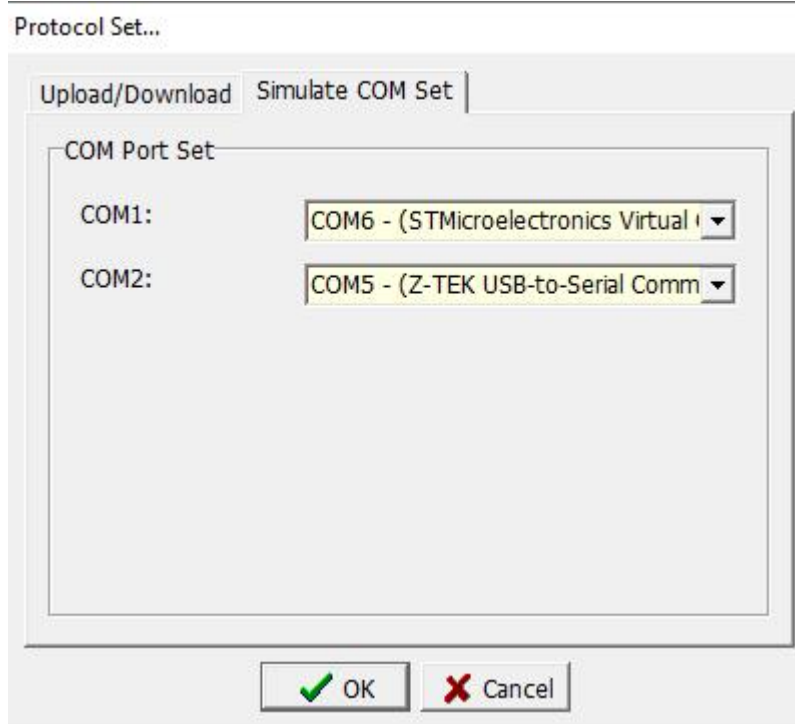
Before [On-Line Run], you need to set up the communication, as shown in the figure below:





Among them, COM1 and COM2 on the left of [Communication Setup] refer to the communication ports on HMI, and the setting on the right is the set of communication ports designated by the user on the PC side to simulate the sex-corresponding communication ports of HMI side ,As shown below:





12.1.2 Off-Line Run

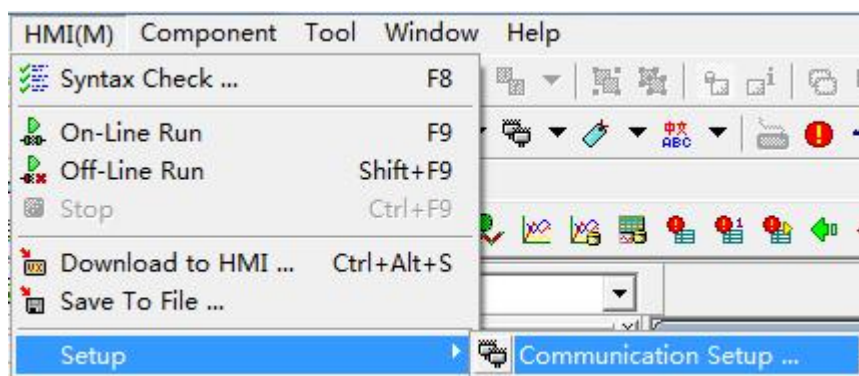
This function does not need to be actually connected to the controller, it can be used to test the normal operation of the program and the verification of various functions.

12.2 Program download and update O.S. version

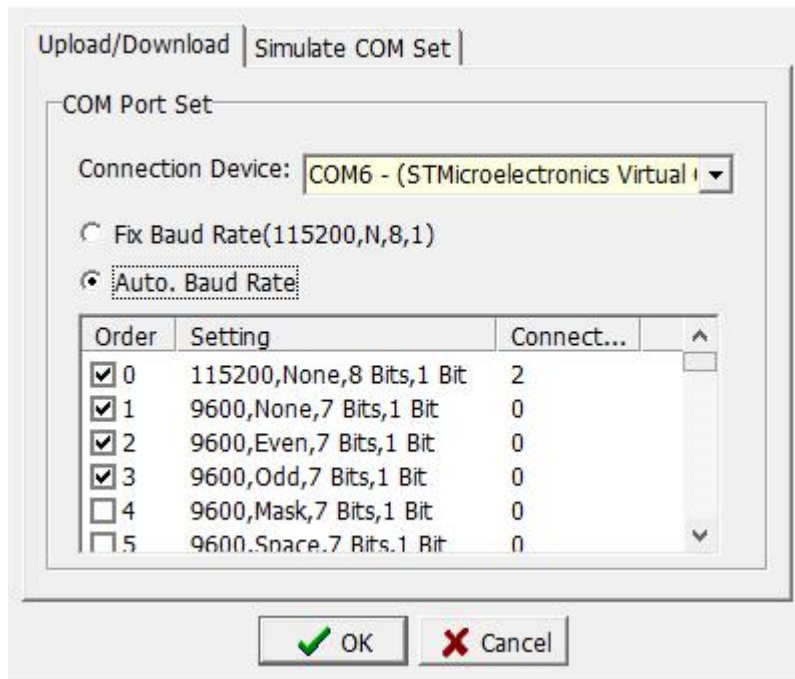
After using the PC to simulate and verify that the program is correct, you can start downloading to the HMI and directly use HMI to connect to the controller.

12.2.1 Download to HMI

Before downloading the program to HMI, you need to make communication settings first, please select [HMI]→[Setup]→[Communication Setup], as shown in the figure below:

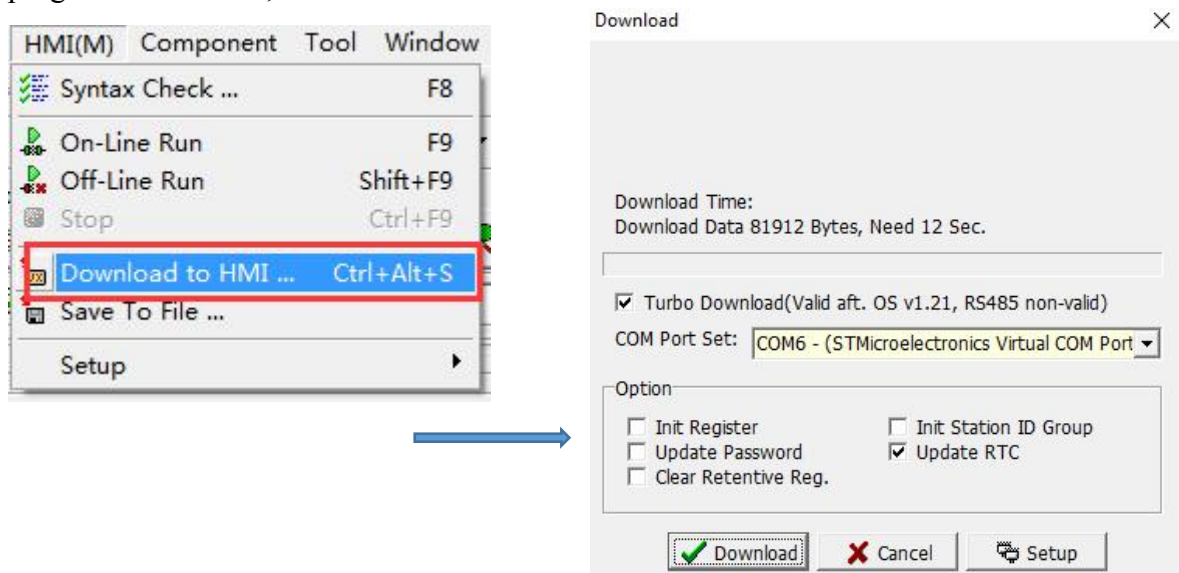


Protocol Set...



Specify the communication port of the PC in the [Upload/Download] of the communication setting window, that is, the port where the download cable is connected to the PC. For example, COM3, you can select [Use fixed communication rate] in conjunction with HMI [download screen], or let the PC automatically try to download at different rates.

Then select [HMI] → [Download to HMI], and then start to download the HMI program to the HMI, as shown below:

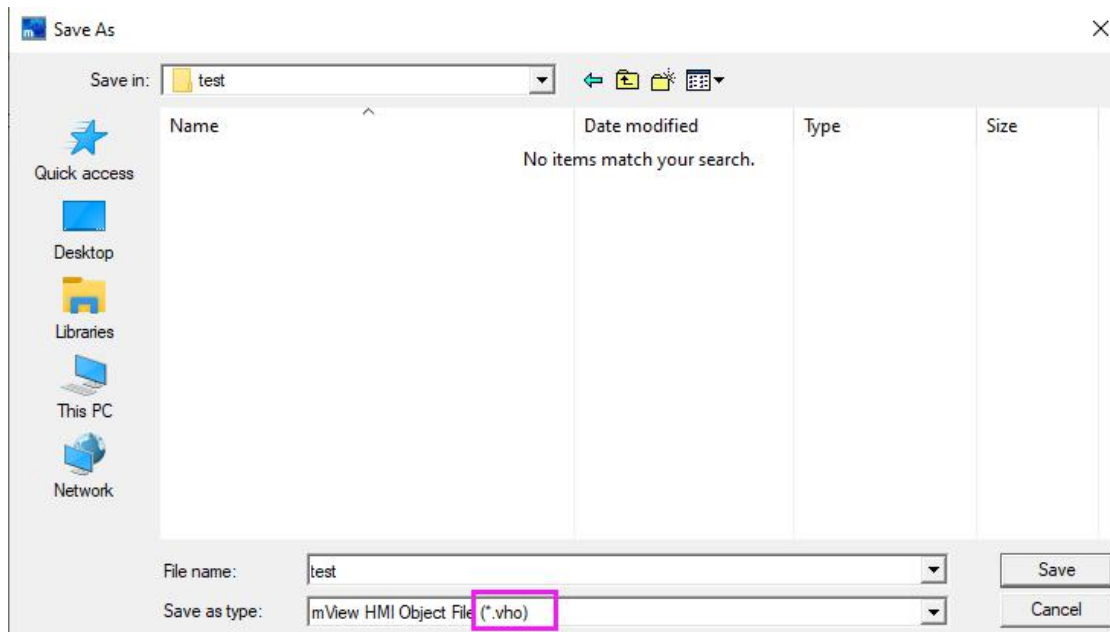
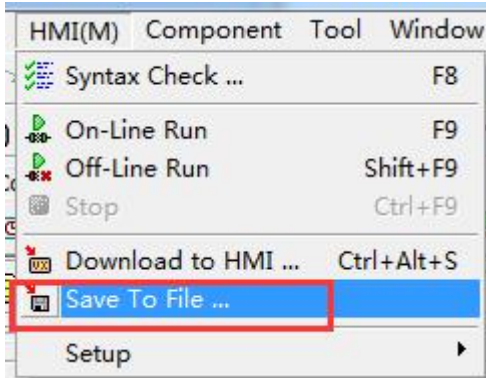


12.2.2 Save as HMI program

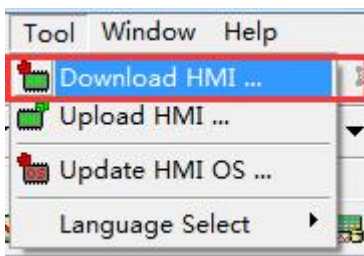
In addition to directly downloading the planned program to HMI, mView also provides the user to save the planned program into a specific file (*.vho). For downloading and using in the future, it should be noted that this file is only for

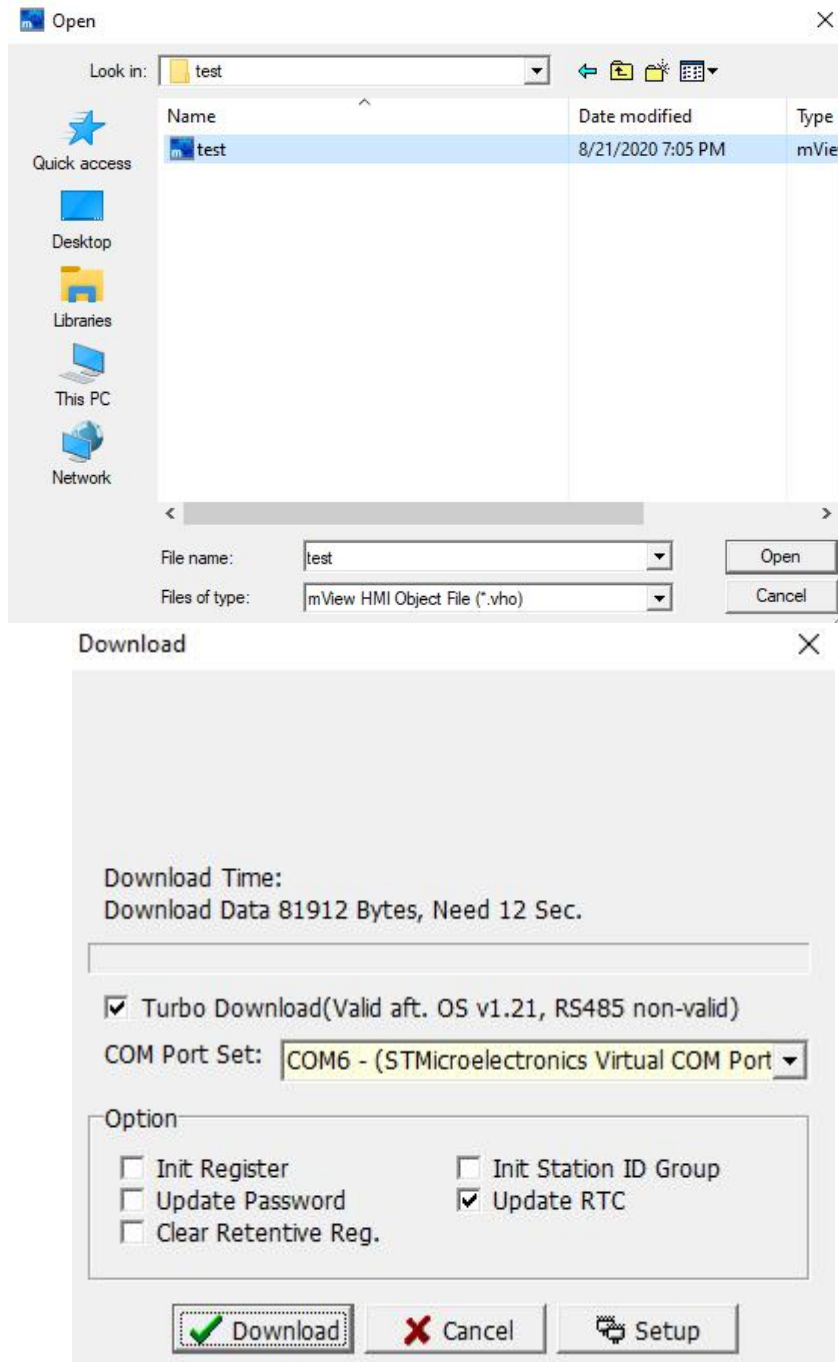
downloading and its content cannot be modified.

Select [HMI]→[Save project as file...] to save the project as a special file for man-machine of type vho, as shown in the figure below:



Then you need to download this program to the HMI, select [Tool]→[Download HMI Program], as shown below, you can download this program to HMI.

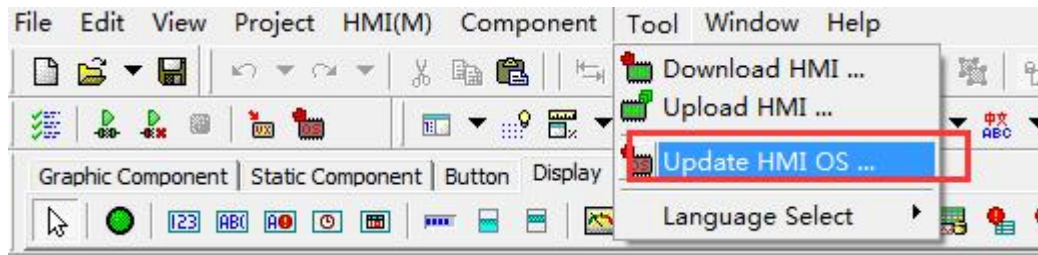




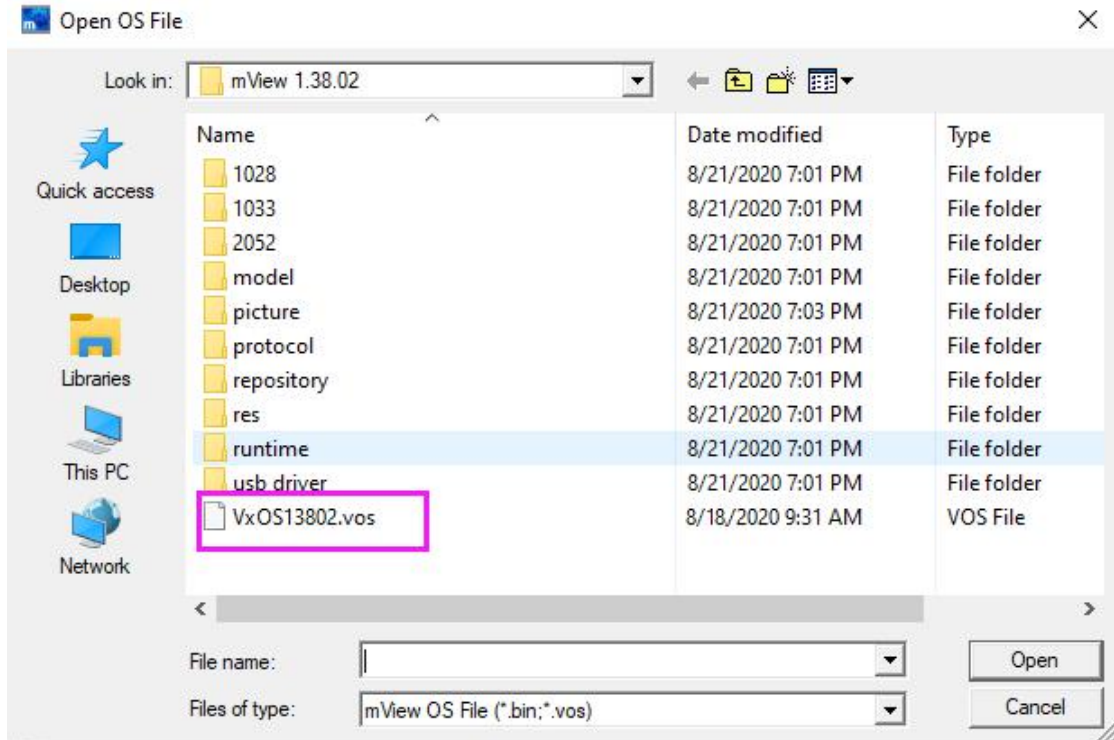
12.2.3 Update HMI OS

Generally speaking, when the new version of mView software is updated, it will be matched with the corresponding version of the OS. This OS supports the old version of the planning software downwards, but if the user wants to use the functions provided by the new version of the planning software, the new version must be matched OS and HMI OS are updated as follows.

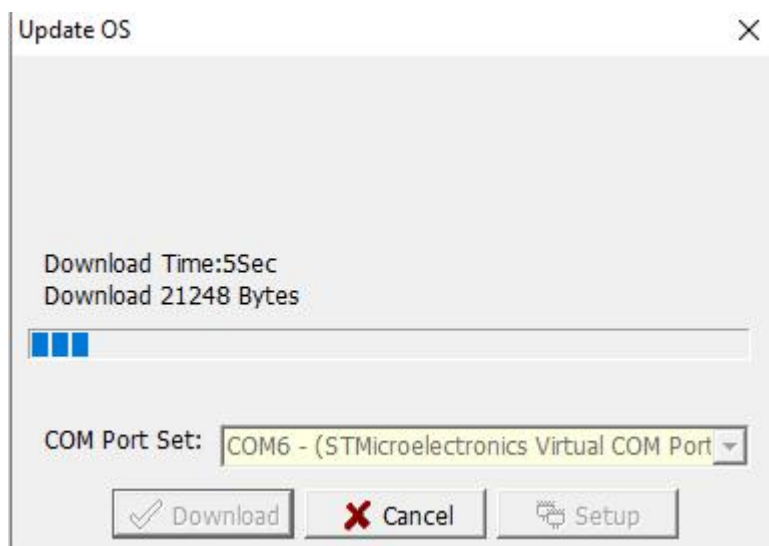
Step 1: Select [Tools]→[Update HMI OS].



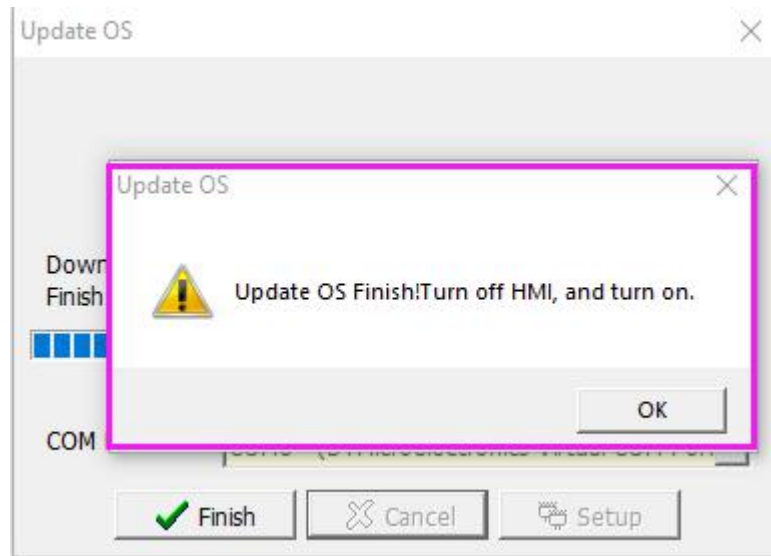
Step 2: Select the OS version to be updated (it is recommended to update with the planning software version used).



Step 3: Start downloading. (Note: During the OS download process, the HMI must not be powered off!)



Step 4: After the download is complete, restart the power of the HMI.

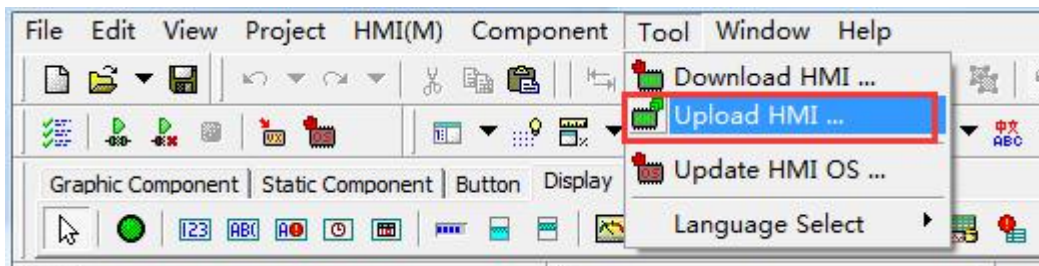


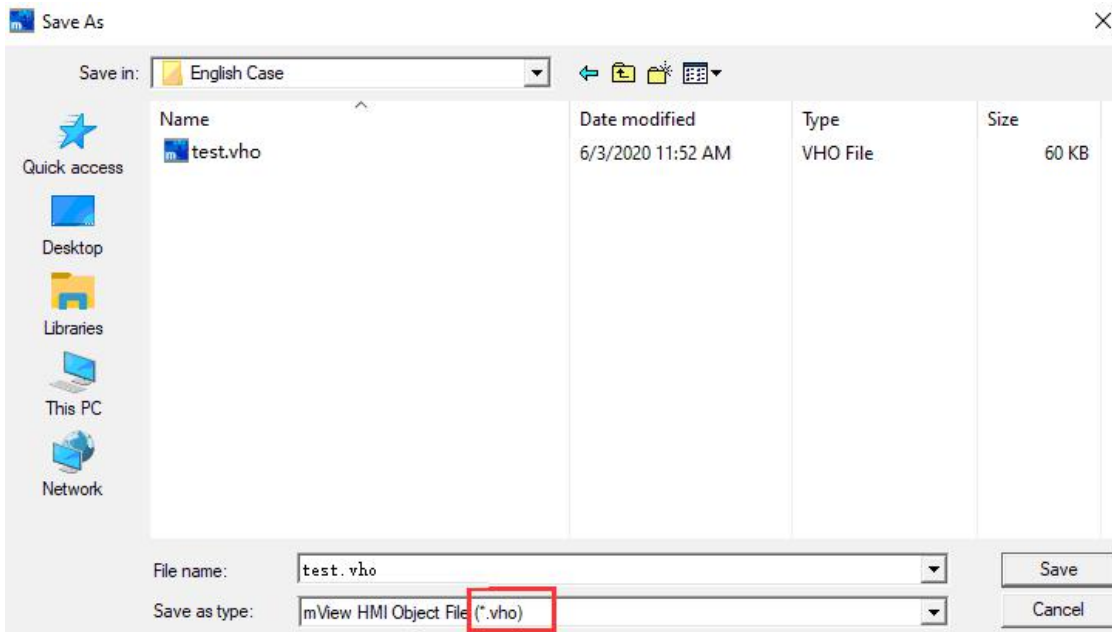
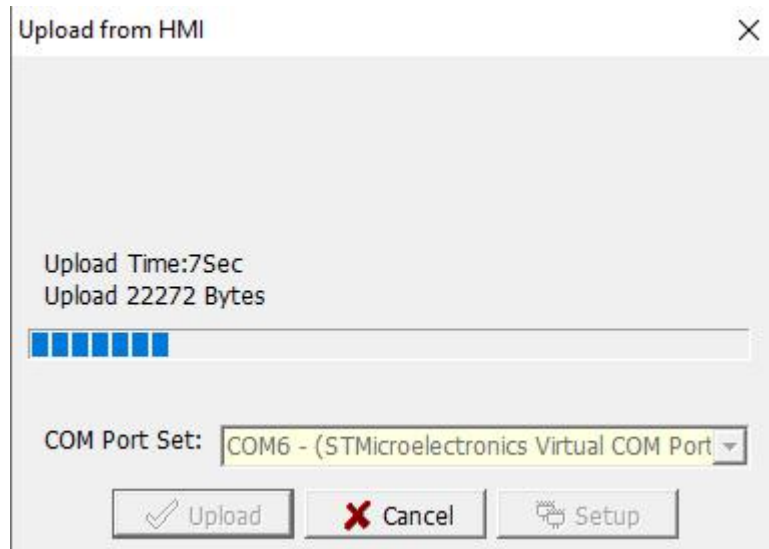
12.3 Program upload

Use this function to upload the program in the man-machine back to the PC and save it as an HMI program for later downloading or editing by the user.

12.3.1 Upload HMI program

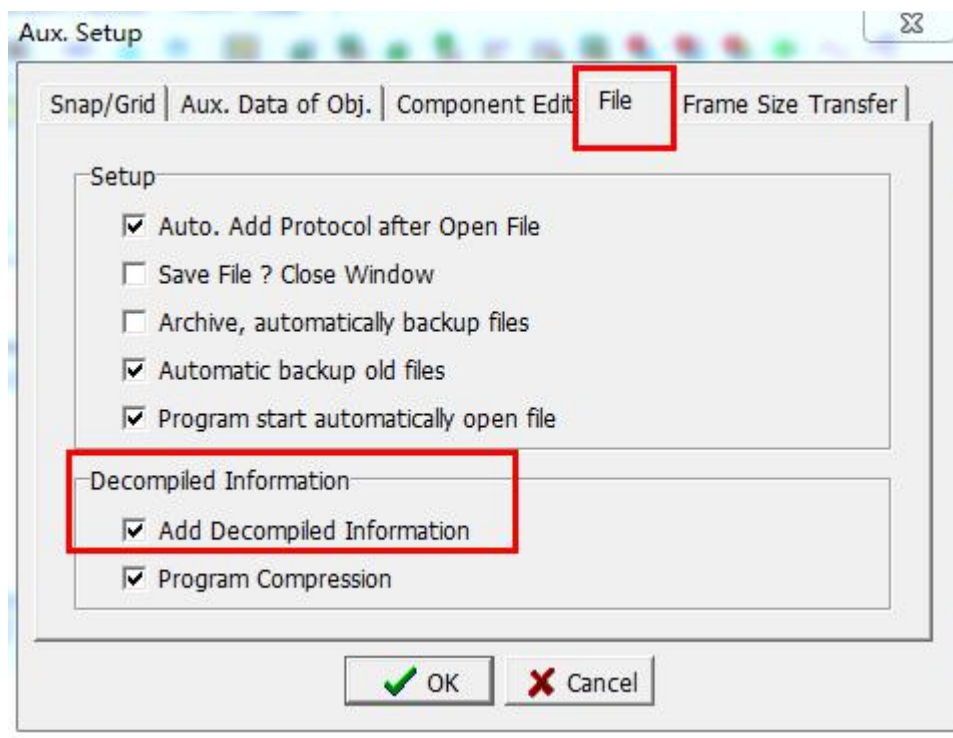
Select [Tool]→[Upload HMI Program] to upload the program from the HMI back to the PC. After the transfer is complete, the user will be asked to save the file as a dedicated file named who, as shown in the figure below:





To make the uploaded program editable, you must add the decompiled information before downloading the program, otherwise the uploaded program can only be used for downloading, and the user cannot edit it.

Select [View]→[Option(H)]→[File], and tick [Add Decompiled Information].
As shown below:



12.4 More details, refer to [Coolmay TK](#)

[Series HMI User Manual](#)

Appendix Version Change Record

Date	Version after change	Content changes
August 2021	V21.81	◆ 1.2 Model specifications Updated the table content ◆ 1.3 Structure description and dimensions Modified