

QM3G-FH HMI PLC All-in-One User Manual

Thank you for purchasing Coolmay QM3G-FH HMI PLC All-in-One products. This manual mainly explains the product features, specifications and wiring methods. Detailed PLC programming, please refer to <Coolmay QM3G-FH HMI PLC All-in-One Programming Manual>. Detailed HMI part, refer to <Coolmay TK series HMI Programming Manual>.

The features are as below.

- 1. Super functions.PLC compatible with FX3G/FX3U/FX3S PLC. It operate fast.
- 2. Highly integration. The digital points are 30 inputs and 30 outputs at most. The digital output can be transistor, relay or mixed output. Analog can reach up to 16 input and 8 output. It has 2 PLC COM port (Rs232 and USB Port), 1 downloading port on HMI.
- 3. Support several high-speed counting and high-speed pulse. Acceleration and deceleration are independent. The total high-speed counting and pulse can not exceed 480KHz.
- 4. 32K steps program capacity,32K power-off retentive registers, support interrupt, linear and circular interpolation, PID self-adjusting.
- 5. Special encryption. Set password as 12345678 to thoroughly prevent reading data. (PLC only supports 8-bit password encryption)
- 6. PLC is compatible with programming software GX Developer8.86Q and GX Works2, and HMI is mView software.
- 7. The network module can be selected according to customer requirements to realize remote control.

More models are supported to customize if bulk order.

Product Details



- 1. Series QM3G: QM3G-FH series
- 2. HMI 43FH: 4.3inch 50FH: 5inch
- 70FH/70HD/70KFH: 7inch t 100FH: 10inch
- 3. Digital input and output (DI/DO) 16: 8DI 8DO 24: 12DI 12DO 38: 20DI 18DO 44: 24DI 20 DO 60: 30DI 30DO
- 4. Module type M: Main module of universal controller
- 5. Digital output (DO) type R: relay; T: trnasistor(MOS tube); RT: both relay and transistor
- 6. Analog input (AD) 4 channels for 43FH/50FH, 12 for 70FH/HD, 16 for 70KFH/100FH
- 7. Analog output (DA) 2 channels for 43FH/50FH, 8 for 70FH/70HD/70KFH/100FH
- 8. Al type E: Thermocouple E(can be customized as type K T, S or J supports negative temperature)
 PT: PT100 PT1000: PT1000 NTC thermistor 10K, 50K, 100K A0: 0-20mA A4: 4-20mA V5: 0-5V
- V:-10~10V(only 7 inch and 10 inch support negative voltage covers 2 channels)
- 10. C1 singe phase high-speed counting, C2 AB phase counting, C3 ABZ phase counting;
- Normally support 6 single phase 60KHz, or 2 AB (Z) 60KHz + 1 AB 10KHz
- 11. P0:10KHz high speed pulse;P:100KHz high speed pulse;Normally 8 channels,Y0-Y3 is 100KHz,Y4-Y7 is 10KHz;That high speed counting plus high speed pulse must be withi 480KHz
- 12. com port optional refers to Chart 1'basic parameter'

Basic parameter

Chart 1: basic parameter

Dasic parameter								mare i.	baolo pa	arriotor
Specifications of	digital analog points points (optional)		COM port	High-speed counting			high speed pulse			
HMI PLC All-in-One	DI	DO	AD	DA	HMI	PLC	single phase	AB phase	ABZ phase	output
QM3G-43FH/50FH-16MR	8	8	4	2	QM3G-	1 RS485 or 2 Rs485 can be		Nomally AB phase single phase 2 channels 60KHz, +1 hannel 10KHz;	normally ABZ phase 2 channels 60KHz;	Normally 8 channels: Y0-Y3is 100KHz, Y4-Y7is 10KHz Acceleration and deceleration are independent. High-speed counting and
QM3G-43FH/50FH-24MT/R	12	12	-	_	43FH/50FH come with	optional on PLC (1 485 port is changed from default 232port) QM3G-43FH/50FH can be added 1XWIFIon PLC (cannot coexist with default 232 on PLC) 7 and 10inch can be added CAN/Etheret/Wi Fi(Occupies the default	port is difform size port is difform size port is difform size port is different por			
QM3G-70FH/HD-24MR	12	12	12	8	1XRS232					
QM3G-70FH/HD-40MR	24	16	8	6	on HMI					
QM3G-70FH/HD-44MT	24	20								
QM3G-70FH/100FH-24MR	12	12								
QM3G-70KFH/100FH-38MR	20	18	16	8	7 and 10 inch					
QM3G-70KFH/100FH-44MT	24	20			1X RS232 on HMI and					
QM3G-70KFH/100FH-48MR	24	24			1X485 is	port 232) on PLC				pulse can't over 480KHz.
QM3G-70KFH/100FH-58MR	30	28	5	2	optional					
QM3G-70KFH/100FH-60MT	30	30								
QM3G-70KFH/100FH-60MT	30	30								

43FH/50FH: MT is MOS output. 70FH/70HD/70KFH/100FH: MT: Y0-Y3 is MOS transistor output, Y4-Y35 is transistor output; MR is relay output; MRT is mix output, Optional according to customer requirements

Chart 2: electric parameter

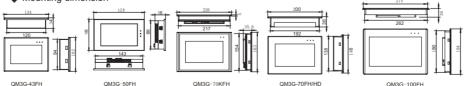
Electric parameter								
Input voltage	DC	DC24V						
Digital input indexes								
Isolation mode	Pho	Photocoupling						
Input impedance	High-speed input 3.3KΩ	Common input 4.3Ω						
Input ON	High-speed input: current>5.8mA/24V	Common input: current >9.9mA/24V						
Input OFF	High-speed input: current<4.5mA/19V	Common input: current >4mA/17V						
Filter function	With filter function, the filter time can b	With filter function, the filter time can be set among 0-60ms, defaulted as 10m						

(Continue to above table)

Continue to above table)	
High-speed counting	Normally 6 channels single phase 60KHz or AB (Z) channel 2 channels 60KHz+AB phaze 1 channel 10KHz
Input level	Passive NPN, common terminal isolation, S/S connected to 24V+
	Digital relay output index
Max current	2A/point, 4A/4 point COM, 5A/8 point COM, 5A/12 point COM
Circuit power voltage	Below DC30V/ Below AC220V
Circuit insulation	Relay mechanical insulation
On response time	Approx. 10ms
Mechanical life without load	10million times
Electric life with rated load	300,000 times
Output level	Dry contact, COM connects positive or negative
	Digital transistor (MOS) output index
Max current	MOS tube: 2A/point, 4A/4 point COM, 5A/12 point COM; MT: 05A/point, 0.8A/4 point COM, 1.6A/12 point COM
Circuit power voltage	DC24V
Circuit insulation	Optocoupler insulation
Isolated voltage (power-terminal)	1500VAC
On response time	High-speed output : 10 μs ; others : 0.5ms
High-speed out put frequency	Normally 8 channels, Y0-Y3 is100KHz, Y4-Y7 is 10KHz The total high-speed counting and pulse can not exceed 480KHz.
Output level	Low level NPN, COM connects negative
	Analog input indexes
Input signal	PT100/PT1000/thermocouple/NTC/0-10V/0-5V/-10~10V/-5~5V/0-20mA/4-20mA/ customizations
Response time	1scanning cycle
Analog input	0-16 channels
Precision	12 bit
	Analog output indexes
Output signal	0-5V/0-10V/-10~10V/-5~5V/0-20mA/4-20mA/customizations
Analog output	0-8 channels
Precision	12 bit
	External port
com port	Refer to " Chart 1: basic parameter "
	Environment
Operating temperature	0°C~50°C
Relative humidity	5%~95%RH
Storage temperature	−20°C~70°C
Vibrational frequency	10-57Hz, amplitude 0.035mm; 57Hz-150Hz,acceleration4.9m/s² (10 times each on X, Y, Z, total 80 minutes each)

Mechanical Design

♠ Mounting dimension



Graph 1 Mounting dimension

Chart 3: mounting dimension

Model	Max digital	Max analog	Mounting dir	mension	Boundary dimension	
Model	points			B(mm)	W*H*D(mm)	
QM3G-43FH	12DI12DO	4AI2AO	120	94	134*102*34	
QM3G-50FH	12DI12DO	4AI2AO	143	86	151*96*36	
QM3G-70FH/HD	24DI20DO	12A8AO	192	138	200*146*36	
QM3G-70KFH	30DI30DO	16AI8AO	217	154	2 26*163*35.6	
QM3G-100FH	30DI30DO	16AI8AO	262	180	275*194*36	

More specs can be customized if bulk order

Electric Design

Product structure



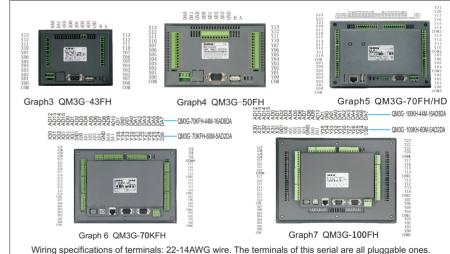
- Four side mounting holes
- ② Terminal block of power supply FG:cover protection GND 0V: 24V negative
- 24V: 24V positive

 (3) Terminal block of DO
- 4 Terminal block of DI5 USB port(under developing)
- PWR: power indicator
 RUN: PLC operating indicator
 COM: flash when PLC
 communicates with HMI
- THMI programming port 43FH/50FH/70FH/70HD is Type-C port; 70KFH/100FH is Type-B port
- 8 PLC programming RS232/RS485
- PLC operating switch RUN/STOP
- analog input [Note: A/B, A1/B1] analog output is RS485]
- ① HMI RS232/RS485/PLC-CAN
- ① LCD
- Ethernet port optional
- (i) WIFI optional
- © PLC USB programming port 43FH/50FH/70FH/70HD Is Type-C port; 70KFH/100FH is mini USB port
- ① SD card optional (under developing)
- (ander developing)

 (B) PLC/HMI RS485
- WiFi switch optional

Chart 2 Product structure

Hardware Interface



Please refer to the product silkscreen for special model interface identification.

Definition of communication interface: Refer to Chart 4:Pin definition

	QM3G	-43FH/50FH A	II-in-One COM Po	ort Description	n
COM1 Db9 port	Optional, cannot coexist with default 232 and WIFI (optional)	optional	default	default	Optional, cannot coexist with default 232 and 485-2 (optional
PIN#	PLC-485-2 serial port3	PLC-485-1 serial port 2	PLC-232 serial port3	HMI-232	PLC-WIFI
1	√(485+)				√
6	√ (485-)				√
2			√ (RXD)		√
3			√(TXD)		√
5			√(GND)	√(GND)	√
4				√ (TXD)	
7				√(RXD)	
8					
9					
terminal 485		√			

Chart 4: Pin definition



Chart 8 COM1/COM2



Chart 9 PLC485 port

(Continue to above table)

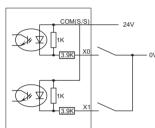
(00:::::	to u	oove tar	,											
	QM3G	-70FH/HD	All-in-On	e com po	ort			QM3G	-70KFH	/100FH <i>A</i>	All-in-On	e com po	ort	
COM1 Db9 port	PLC optional with default 232 and HMI optional 485	PLC optional	PLC default	PLC optional With default 232,Optional	HMI optional	COI	M2(DB9 por	t near the p	ower supply	()		(DB9 port fa the power su		Ethernet port
BB0 port	Cannot coexist	.,		485-2 cannot coexist		DB 9 port	optional	Optional and default 232, Optional WIFI	default	Optional and default 232, Optional 485	optional	optional	default	optional
PIN#		PLC-CAN	PLC-232 serial port3	PLC-WIFI	HMI-232(default) cannot coexsit with 485 on HMI	PIN#	PLC-485-1	cannot coexist PLC-485-2	PLC-232	cannot coexist	PLC-CAN	11841 405	11111 000	
2			√(RXD)	√		PIN#	serial port2	serial port 3	serial port 3	PLC-WIFI	PLU-UAN	HMI-485	HMI-232	
3			√ (TXD)	√		1	√(485+)					√(485+)		Optional
5			√(GND)	1	√ (GND)	6	√ (485-)					√ (485-)		PLC Network
			V (GND)	· ·	V (GIVD)	2			√(RXD)	√			√(RXD)	port not Occupy
4					√ (TXD)	3			√(TXD)	√			√(TXD)	Serial
7					√(RXD)	5			√ (GND)				√(GND)	port signal
8		√ (H)				4				<u> </u>				
9		√(L)				7								
terminal A B		PLC-485-1 serial port 2				8		√ (485+)		√	√ (H)			
terminal A1 B1	PLC-485-2 serial port3			√	HMI-485	9		√ (485-)		√	√ (L)			

Note: Detailed settings, please refer to "Coolmay QM3G-FH series All-in-One Programming Manual"

Equivalent Circuit

Diagram10 Input wiring

The PLC input (X) is an externally powered DC24V sinker (passive NPN) and the input signal is isolated from the power supply. Connect COM to positive 24V of external power supply while using.



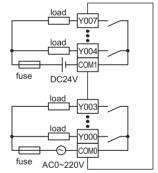
PLC digital inputs wiring:

Ports short circuit: The COM (S/S) of the PLC input terminal is connected to 24V, and the X terminal is connected to the power supply 0V, that is, the input has a signal

Two-wire system (magnetic control switch): The positive pole of the magnetic switch is connected to PLC X terminal, and the negative pole is connected to 0V. Three-wire system (photoelectric sensor or encoder): The PLC switch is connected to a three-wire photoelectric sensor or encoder, the power supply of the sensor or encoder is connected to the positive electrode of the power supply, and the signal line is connected to the X terminal. The encoder and photoelectric sensor are required to be NPN type (PNP needs special customization

Transistor: Output is NPN, COM is connected to the negative pole, and Y is connected to the positive pole of the power supply with a load. Relay: Diry contact output, COM can be connected to the positive or negative

Diagram 11 shows the equivalent circuit diagram of the relay output module. The output terminals are several groups. Each group is electrically isolated. Different groups of output contacts are connected to different powercircuits



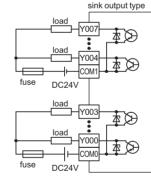


Diagram 11 Relay output equivalent circuit

Diagram 12 Transistor output equivalent circuit

The equivalent circuit of the PLC output part of the transistor output type is shown in Diagram 12. As know from the figure, the output terminal are several groups, each group is electrically isolated, and different groups of output can be connected to different power circuits; the transistor output stage can only be used for DC24V load circuits. Output wiring is NPN, COM common cathode

For the inductive load connected to the AC circuit, the external circuit should consider the RC transient voltage absorption circuit; corresponding to the inductive load of the DC loop, consider adding a freewheeling diode, as shown in Diagram 13.

 $Stepping \ or \ servo \ motor \ wiring \ as \ shown \ in \ Diagram \ 14, 3G \ series \ PLC \ default \ Y0-Y7 \ is \ pulse \ point, \ direction \ can$

Note: 5V drive must be connected to 2KQ resistor on DC24V

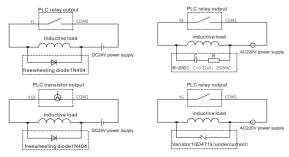


Diagram 13 Inductive load absorption circuit schematic

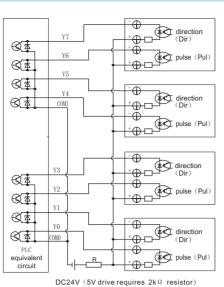


Diagram 14 Pulse output wiring diagram

Diagram 15 PLC analog wiring X Note: The internal circuit in all diagrams is for reference only

PLC analog wiring

Two-wire system: the positive pole of the power supply is connected to the positive pole of the transmitter; the negative pole of the transmitter is connected to the AD side; the negative pole of power supply is connected to GND, which normally it is wring way of 4-20mA/0-20mA transmitte

Three-wire system: the positive pole of the power supply is connected to the positive pole of the transmitter; the negative pole of the power supply and the negative pole of the signal output are the same terminal and transmitter signal output is connected to the

If the analog input is unstable please add 104p porcelain as appropriate chip capacitor or external magnetic loop filter increase the ability to interfere

GND $\frac{1}{\frac{1}{2} + 104p} + \text{(analog input1)}$

AD1 □

AD15

GND [

DA0

DA7

AO DA1

:

:

-(analog input common

+ (analog input 2)

+ (analog input 16)

-+ (analog output 1)

+ (analog output 2)

+ (analog output 8)

(analog output common)

Four-wire system: the positive and negative poles of the power supply are respectively connected to the positive and negative poles of the power supply of the transmitter, and the positive and negative poles of the transmitter signal output are respectively connected to the AD and GND terminals;

The analog line of the temperature is connected to the AD terminal and the GND terminal respectively, if I is a three-wire Pt100, it needs to be connected in two lines. The GND common terminal of the analog input and output can be sl

PLC anti-interference processing
1. Strong and weak currents should be separated and wired, and not common ground;
when there is strong electric interference,magnetic rings should be added on the power supply side;
and properly and effectively grounded according to the type of the chassis.
2. when the analog quantity is disturbed, 104 ceramic capacitors can be added for filtering, and a correct
and effective grounding can be performed.

Note: more details please refer to <Coolmay >

Programming Reference

Devices Distribution and Statement of Power-down Save

max digi	tal points	QM3G-43FH/50FH-24M	QM3G-7	0FH/HD-44M	QM3G-70KFH/100FH-60M				
digital	input X	X00~X13 12 points	X00~X2	7 24 points	X00~X35 30 points				
digital c	output Y	X00~X13 12 points	Y00~Y2	3 20 points	Y00~Y35 30 points				
Δυvilian	Relay M	[M0~M383] 384point general /	M384~M1535] 1152	point holding / [M1	536~M7679] 6144point general				
Auxiliary	riciay ivi		[M8000~M8511] 5	12point special					
Sta	ate S	[S0-S9] 10point initial state/ [S	S0-S9] 10point initial state/ [S10~S999] 990point holding/ [S1000~S4095] 3096point general						
		[T0~T199] 200	[T0~T199] 200point 100ms general / [[T250~T255] 6点 100ms holding						
Time	er T	[T246~T249] 4point 1ms grand total holding / [T256~T319] 64 points 1ms general							
		[T200~T245] 46point 10ms General XThe 10ms timer will be affected by the scan period. If the scan period is 12ms, the timer becomes 12ms and executes once.							
		16bit up counter	32bit up and down	counter h	nigh-speed counter				
Coun	ter C	[C0~C15] 16point General [C200~C219] 20point General [C235~C245 single phase single counting] [C246~C250single phase dual counting]							
		[C16~C199] 184point holding	[C220~C234] 15point		[C251~C255 dual phase dual counting]				
Data Re	egister D	[0~D127] 128point general/ [D128~D7999] 7872point Holding/ [D8000~D8511] 512point Special							
Data Re	gister V, Z	[V0~V7] [Z0~Z7] 16point indexing							
Extended file	e register R	[R0~R22999] 23000points support power outage/[R23000~R23999] 1000points internal use							
pointer JUMP	CALL branch	[P0~P255] 256points/[P0~P1280] 1281 points (26232 version or above)							
Nested	Pointer	[N0~N7] 8points Master control							
Interru	ption	[I0 - 15]6points input interru	otion/[16□□~18□□]3p	oints timer interruption/	[I010~I060]6points counter interruption				
constant	K	16bit -32,768~32	,767	32bit -2,14	7,483,648~2,147,483,647				
Constant	Н	16 bits 0~FF	FFH	32bit	s 0~FFFFFFFH				

Analog input register(AD means analog input precision is 12 bit); supports FROM instructions or register direct assignment operation

FROM instruction can read directly: FROM K0 K0 D400 K16, reads 16 channel analog input.

register read directly: D[8030]~D[8045]is the input value corresponding to the analog quantity [AD0~AD15]. The constant scan time scan time is changed to D8059, which is started by M8039 (this function is available on version 26232) when the analog input has thermocouple type You can only do up to 15 channels, of which AD4 (D8034) is the ambient temperature of the thermocouple. You can do 16 channels without the thermocouple type.]

- ** The temperature type is one after the decimal point is reserved.like 182°C=18.2
- * Note: The analog input range and the corresponding value of the register can be found in <Coolmay QM3G-FH

Sampling of analog inputs

The number of filtering cycles = (R23600 ~ R23615) * PLC scan time, the default is 100, the data can not be less than or equal to 0. If RS23600 = 1, a PLC scan cycle is sampled once, and the first analog input is changed once. The larger the value of R23600~R23615 is set, the more stable the result is. D8073 is the smoothing filter coefficient of all analog inputs. Setting range: 0~999

increase the ability to interfere analog input is AD0-AD15, analog output is DA0-DA7. The negative terminals are respectively connected to the GND of the analog input/output terminals. 7 inch and 10 inch negative voltage output can be optional. One of the negative voltage outputs occupies two DAs, that is, up to 4 negative voltage outputs can be selected (the wiring can be connected to DAx and GND, such as DA0 and GND, DA2 and GND, etc. The actual output terminal is subject to the product factory test report) Analog output register(DA means analog input, precision is 12 bit); support TO instructions or register direct assignment operation

> TO instruction direct output: TO K0 K0 D500 K8, output 8 channels analog Register direct assignment operation :D[8050]~D[8057] corresponding to the analog output value of [DA0~DA7], which optional two-way DA is used when the negative output is selected, the set value range is as follows

Serial No.	register address	setting range	output type
DA0	D8050	0-4000	
DA1	D8051	0-4000	
DA2	D8052	0-4000	when D8058.0~D8058.7=0
DA3	D8053	0-4000	type is 0~20mA;
DA4	D8054	0-4000	when D8058.0~D8058.7=1
DA5	D8055	0-4000	type is 4~20mA _o
DA6	D8056	0-4000	
DA7	D8057	0-4000	

HMI_PLC_All-in-one's device power-off maintenance is permanently maintained, that is, all the devices in the holding area are not lost after the module is powered off.

The real-time clock uses a rechargeable battery to ensure that the clock is the current time. All power-off hold functions must ensure DC 24V. The voltage after the source is loaded is 23V or more, and the PLC power-on time is longer than 2 minutes, otherwise the power-off function will be abnormal.

programming software PLC: compatible with PLC programming software GX Developer 8.86Q and GX Works2 HMI: mView HMI programming software

Detailed refers to <Coolmay QM3G-FH series HMI PLC All-in-One Programming Manual> 〈Coolmay QM3G-FH series All-in-One User Manual> <Coolmay TK series HMI User Manual> <FX3G series PLC Programming User Manual>

Tips

QM3G-FH series HMI PLC All-in-One User Manual

- Before using this product, please read the relevant manual Carefully use the product under the environmental conditions specified in the manual.
- In case of damaging the product, please confirm power supply range first (the regular power supply only limited to 24V DC, we suggest you to use the power supply which output voltage is 18W or higher than 18W), and wiring correctly, then electrify it.
- Before installing the product, please tighten the screw and clamp guide to avoid falling.
- Please do not wiring or plug cable when the power is on, otherwise it may cause electric shock or circuit damagement. Disconnect the power switch immediately when the product smells or sounds abnormal. Do not drop metal shavings and wire tips into the control vent holes during screwing hole and wiring, which may cause product malfunctions and faults.
- Please do not tie the power cord and communication cable together or let them too close, you should keep them for more than 10cm distance. The strong and weak electricity should be separated and properly grounded. If the interference is serious the communication and high frequency signal input and output cables should be the shielded cables to improve anti-jamming performance.
- The digital input is an externally powered DC24V leakage type (passive NPN) with the input signal isolated from the power supply. When you use it, you need to connect COM to the 24V positive pole of the external power supply
- The COM of the binary input/output (transistor) is common to the cathode
- Do not disassemble the product or modify the wiring optionally . Otherwise it may cause fault, malfunction, loss, or fire.
- Please make sure to turn off the all power when you install or dismantle the product, otherwise it may cause malfunction or fault.

Shenzhen Coolmay Technology Co., Ltd

Tel: 0755-86950416 86960332 26051858 26400661

QQ: 1687435500 Email: m3@coolmay.com

Website: en.coolmay.com

catalog

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