fr-e720

SIM800C	ESP32
TXD	GPIO **16** (RX2)
RXD	GPIO **17** (TX2)
GND	GND
VCC	**5V, 2A external**

MAX485	ESP32
RO	GPIO **26** (RX1)
DI	GPIO **27** (TX1)
RE and DE	GPIO **25**
VCC	5V external
GND	GND

Pr. 79, 340

Operation mode selection

Pr. 79 Operation mode selection *Pr. 340 Communication startup mode selection*

● Used to select the operation mode of the inverter.
Mode can be changed as desired between operation using external signals (external operation), operation from the PU (FR-PU04/FR-PU07), combined operation of PU operation and external operation (external/PU combined operation, and network operation (when RS-485 communication or a communication option is used)

Pr. 79 Setting	Description	LED Indication ■: OFF ■: ON
0 (initial value)	Use external/PU switchover mode (press PU/EXT to switch between the PU and external operation mode. At power on, the inverter is placed in the external operation mode.	External operation mode EXT PU operation mode PU
1	Fixed to PU operation mode	PU
2	Fixed to external operation mode Operation can be performed by switching between the external and Net operation mode.	External operation mode EXT NET operation mode NET
3	External/PU combined operation mode 1 **Running frequency**: Operation panel and PU (FR-PU04/FR-PU07) setting or external signal input (multi-speed setting, across terminals 4-5 (valid when AU signal turns on)). **Start signal**: External signal input (terminal STF, STR)	PU EXT
4	External/PU combined operation mode 2 **Running frequency**: External signal input (terminal 2, 4, JOG, multi-speed selection, etc.) **Start signal**: Input from the operation panel and the PU (FR-PU04/FR-PU07) (RUN)	
6	Switchover mode Switch among PU operation, external operation, and NET operation while keeping the same operating status.	PU operation mode PU External operation mode EXT NET operation mode NET
7	External operation mode (PU operation interlock) X12 signal ON Operation mode can be switched to the PU operation mode. (output stop during external operation) X12 signal OFF Operation mode can not be switched to the PU operation mode.	PU operation mode PU External operation mode EXT

● Specify the operation mode at power on *(Pr. 340)*
- When power is switched on or when power comes back on after instantaneous power failure, the inverter can be started up in the network operation mode.
After the inverter has started up in the network operation mode, parameter write and operation can be performed from a program. Set this mode for communication operation using the inverter RS-485 communication or communication option.
- You can set the operation mode at power on (reset) according to the *Pr. 79* and *Pr. 340* settings.

Pr. 340 Setting	*Pr. 79* Setting	Operation Mode at Power-on, Power Restoration, Reset	Operation Mode Switching
0 (initial value)	As set in *Pr. 79*.		
1	0	NET operation mode	Can be switched to external, PU or NET operation mode*1
	1	PU operation mode	Fixed to PU operation mode
	2	NET operation mode	Switching between the external and NET operation mode is enabled Switching to PU operation mode disabled
	3, 4	External/PU combined operation mode	Operation mode switching disabled
	6	NET operation mode	Switching among the external, PU, and NET operation mode is enabled while running.
	7	X12 (MRS) signal ON ..NET operation mode	Can be switched to external, PU or NET operation mode*1
		X12 (MRS) signal ON ..External operation mode	Fixed to external operation mode (forcibly switched to external operation mode)
10	0	NET operation mode	Switching between the PU and Net operation mode is enabled*2
	1	PU operation mode	Fixed to PU operation mode
	2	NET operation mode	Fixed to NET operation mode
	3, 4	External/PU combined operation mode	Operation mode switching disabled
	6	NET operation mode	Switching between the PU and NET operation mode is enabled while running*2
	7	External operation mode	Fixed to external operation mode (forcibly switched to external operation mode)

*1 Operation mode can not be directly changed between the PU operation mode and network operation mode
*2 Operation mode can be changed between the PU operation mode and network operation mode with PU/EXT key of the operation panel and X65 signal.

Pr. 117 to 124, 342, 343, 502, 549

Communication initial setting

Pr. 117 PU communication station number	*Pr. 118 PU communication speed*
Pr. 119 PU communication stop bit length	*Pr. 120 PU communication parity check*
Pr. 121 Number of PU communication retries	*Pr. 122 PU communication check time interval*
Pr. 123 PU communication waiting time setting	*Pr. 124 PU communication CR/LF selection*
Pr. 342 Communication EEPROM write selection	*Pr. 343 Communication error count*
Pr. 502 Stop mode selection at communication error	*Pr. 549 Protocol selection*

(1) Initial settings and specifications of RS-485 communication *(Pr. 117 to Pr. 124)*

Used to perform required settings for RS-485 communication between the inverter and personal computer.

- Use PU connector of the inverter for communication.
- You can perform parameter setting, monitoring, etc. using the Mitsubishi inverter protocol or Modbus-RTU protocol.
- To make communication between the personal computer and inverter, initialization of the communication specifications must be made to the inverter.

  Data communication cannot be made if the initial settings are not made or there is any setting error.

Pr. Number	Setting Range	Description	
117	0 to 31 (0 to 247) *1	Specify the inverter station number. Set the inverter station numbers when two or more inverters are connected to one personal computer.	
118	48, 96, 192, 384	Set the communication speed. The setting value × 100 equals the communication speed. For example, the communication speed is 19200bps when the setting value is 192.	
119		Stop bit length	Data length
	0	1bit	8bit
	1 (initial value)	2bit	
	10	1bit	7bit
	11	2bit	
120	0	Without parity check	
	1	With odd parity check	
	2 (initial value)	With even parity check	
121	0 to 10	Set the permissible number of retries at occurrence of a data receive error. If the number of consecutive errors exceeds the permissible value, the inverter will come to an alarm stop.	
	9999	If a communication error occurs, the inverter will not come to an alarm stop.	
122	0 (initial value)	RS-485 communication can be made Note that a communication error (E.PUE) occurs as soon as the inverter is switched to the operation mode with control source.	
	0.1 to 999.8s	Sets the interval of communication check time. If a no-communication state persists for longer than the permissible time, the inverter will come to an alarm stop.	
	9999	No communication check	
123	0 to 150ms	Set the waiting time between data transmission to the inverter and response.	
	9999 (initial value)	Set with communication data.	
124	0	Without CR/LF	
	1 (initial value)	With CR	
	2	With CR/LF	

Pr. Number	Setting Range	Description			
502	0 (initial value) 3	At alarm occurrence: Coasts to stop.	Indication: E.PUE	Error output: Output	At error removal: Stop (E.PUE)
	1	Decelerates to stop	After stop E.PUE	Output after stop	Stop (E.PUE)
	2	Decelerates to stop	After stop E.PUE	Without output	Automatic restart functions

*1 When making communication through Modbus-RTU protocol (*Pr. 549* = "1"), the setting range within parenthesis is applied.

(2) Communication EEPROM write selection *(Pr. 342)*

Parameters written via the inverter's PU connector or from the communication option can be written to the RAM. When performing parameter change frequently, set "1" in *Pr. 342*.

(3) Modbus-RTU communication specifications *(Pr. 343, Pr. 549)*

Pr. Number	Setting Range	Description
343	—	Displays the number of communication errors during Modbus-RTU communication. (Reading only)
549	0 (initial value)	Mitsubishi inverter (computer link operation) protocol
	1	Modbus-RTU protocol

Parameter	Value	Description
Pr.549	**1**	**Enable Modbus RTU protocol** (most important!)
Pr.117	1	Station address (must match code)
Pr.118	3	Baud rate = 9600
Pr.119	0	8 data bits, 1 stop bit
Pr.120	2	Even parity
Pr.79	2	External operation mode
Pr.340	1	Enable communication start

Overall Flow:

Website → Internet → SIM800C (GPRS) → ESP32 → MAX485 → FR-E720 VFD