FC5A-D12 with MRAM Memory

Key Features

- Permanent data backup with MRAM memory
- Embedded Ethernet port
- Support Modbus TCP, RTU and ASCII
- 1MB Interactive Web Pages
- Email & Text Messages with dyanmic data
- USB mini-B programming port
- Integrated 100 KHz high speed counters and outputs
- Up to 7 Communciation Ports
- Max. 492 I/Os

Specifications

General Specifications

Part Number	FC5A-D12K1E-DS0838	FC5A-D12S1E-DS0838
Rated Power Voltage	24V DC	
Allowable Voltage Range	20.4 to 26.4V DC (including ripple)	
Maximum Input Current	700mA (26.4V DC)	
Maximum Power Consumption	125mA (24V DC) 19W (26.4V DC)	
Allowable Momentary Power Interruption	10ms (at 24V DC)	
Dielectric Strength	Between power and ⏚ terminals: 500V AC, 1 minute Between I/O and ⏚ terminals: 500V AC, 1 minute	
Insulation Resistance	Between power and ⏚ terminals: 10MΩ minimum (500V DC megger) Between I/O and ⏚ terminals: 10 MΩ minimum (500V DC megger)	
Noise Resistance	DC power terminals: 1.0 kV, 50ns to 1µs. I/O terminals (coupling clamp): 1.5 kV, 50ns to 1µs	
Inrush Current	50A maximum (24V DC)	
Power Supply Wire	UL1015, AWG22, UL1007 AWG18	
Operating Temperature	0 to 55°C	
Storage Temperature	−25 to +70°C (no freezing)	
Relative Humidity	10 to 95% (no condensation)	
Altitude	Operation: 0 to 2,000m, Transport: 0 to 3,000m	
Pollution Degree	2 (IEC60664)	
Corrosion Immunity	Free from corrosive gases	
Degree of Protection	IP20 (IEC60529)	
Grounding Wire	UL1015, AWG22, UL1007, AWG18	
Vibration Resistance	When mounted on a DIN rail or panel surface: 5 to 9Hz amplitude 3.5 mm, 9 to 150 Hz acceleration 9.8 m/s^2 (1G), 2 hours per axis on each of three mutually perpendicular axes (IEC61131-2)	
Shock Resistance	147 m/s^2 (15G), 11ms duration, 3 shocks per axis on three mutually perpendicular axes	
Weight	200g	

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Functional Specifications

Part Number		FC5A-D12K1E-DS0838	FC5A-D12S1E-DS0838
Control System		Stored program system	
Instruction Words		42 basic, 152 advanced	
Program Capacity *1		127.8KB (21,300 steps)	
User Program Storage		Flash ROM (10,000 times rewritable)	
Processing Time	Basic Instruction	83µs (1,000 steps)	
	END Processing *2	0.35ms	
Expandable I/O Modules		7 modules + additional 8 modules using the expansion interface module	
I/O Points	Input	8	Expansion: 224
	Output	4	Additional: 256
Internal Relay		2,048 points	
Shift Register		256 points	
Data Register		42,000 points	
Expansion Data Register / Counter		6,000 points / 256 points	
Timer (1-sec, 100-ms, 10-ms, 1-ms)		256 points	
RAM Backup	Backup Data	Internal relay, shift register, counter, data register, expansion data register	
	Backup Method	Non-volatile memory (MRAM)	
	Backup Retention	Approx. 10 yrs without Backup Cycle	
Self-diagnostic Function		Power failure, watchdog timer, data link connection, user program ROM sum check, timer/counter preset value sum check, user program RAM sum check, keep data, user program syntax, user program writing, CPU module, clock IC, I/O bus initialize, user program execution, memory cartridge program transfer	
Input Filter		Without filter, 3 to 15ms (selectable in increments of 1ms)	
Catch Input/Interrupt Input		(I2 and I5) Min. turn on pulse width: 40µs max., Min. turn off pulse width: 150µs max., (I3 and I4) Min. turn on pulse width: 5µs max, Min. turn off pulse width: 5µs max.	
High-speed Counter	Max Counting Frequency & High-speed Counter Points	Total 4 points Single/two-phase selectable: 100kHz (2 points) Single-phase: 100kHz (2 points)	
	Counting Range	0 to 4,294,967,295 (32 bits)	
	Operation Mode	Rotary encoder mode and adding counter mode	
Analog Pot.	Quantity (Range)	1 point (0 to 255)	
Analog Voltage Input	Quantity	1 point	
	Input Voltage Range	0 to 10V DC	
	Input Impedance	Approx. 100kΩ	
	Data Range	0 to 255 (8 bits)	
Pulse Output	Quantity (Max. Freq.)	3 points (100kHz)	
Ethernet Port	Ethernet Specifications	Electrical Characteristics: Complies with IEEE802.3 Transmission Speed: 10BASE-T/100BASE-TX	
	Function	see table on right	
	User Web Data Storage	FROM	
	User Web Data Capacity	1MB	
	Compliant Browser	Internet Explorer 7 and 8, Firefox 3.0	
	Protocol	Data Link Layer: IP, ARP, Network Layer: UDP, TCP, ICMP Application Layer: SMTP, DHCP, HTTP, NBNS, DNS, SNTP	
Port 1		USB mini-B (USB 2.0), Maintenance Communication *3	

*1: 1 step equals 6 bytes..
*2: Not including expansion I/O service time, clock function processing time, data link processing time, and interrupt processing time.
*3 Maintenance communication (change monitor device values, upload/download user programs, download system program).
Notes: The maximum number of relay outputs that can be turned on simulatneously is 54 including those on the CPU module.
Options include Port 2 Communication Adapter/Module (maintenance, user and modem communication; data link; Modbus ASCII/RTU master/slave communication.), Clock Cartridge, Memory Cartridge, HMI Module

Ethernet Port Main Features

Maintenance Communication Server	Downloading, uploading, and monitoring the user program using WindLDR via Ethernet
TCP server	8 connections maximum. Each connection can be configured as Modbus TCP server, user communication server, or maintenance communication server.
TCP Client	3 connections maximum. Each connection can be configured as Modbus TCP client or user communication client.
Acquire Current Time from SNTP Server	Timezone can be specified.
Sending Email	Send email containing data register values. Number of emails: 255, To address: 512 characters max *1, cc address: 512 characters max *1 Subject :256 characters max, Body: 1,500 characters max, Supported encoding: ASCII, ISO-2022-JP, GB2312, ISO-8859-1, UTF-8
Web Server	Monitoring PLC status and data register values using web browser.User web page area: 1 MB, Authentication: Basic Authentication, Compliant browser: Internet Explorer 7 & 8, Firefox 3
PING	Number of remote hosts can be registered: 255

*1: If the email address length is 40 characters, 12 email addresses can be configured.

Input Specifications

Part Number	FC5A-D12K1E-DS0838	FC5A-D12S1E-DS0838
Input Points	8 (8/1 common)	
Rated Input Voltage	24V DC	
Input Voltage Range	20.4 to 26.4V DC	
Rated Input Current	X2 and X5: 7mA/point X0, X1, X3, X4, X6, X7: 4.5mA/point (24V DC)	
Input Impedance	X2 and X5: 3.4kΩ X0, X1, X3, X4, X6, X7: 4.9kΩ	
Turn ON Time	X2 and X5: 35μs + filter value X0, X1, X3, X4, X6, X7: 5μs + filter value	
Turn OFF Time	X2 and X5: 5μs + filter value X0, X1, X3, X4, X6, X7: 150μs + filter value	
Connector — on Mother Board	MC1.5/16-G-3.81BK (Phoenix Contact)	
Connector — Insertion Durability	100 times minimum	
Isolation	Input terminals & internal circuit: opto-coupler Internal circuit: not isolated	
Input Type	Type 1 (IEC61131)	
External Load for I/O Interconnection	Not needed	
Single Determination Method	Static	
Effect of Improper Input Connection	Both sinking and sourcing input signals can be connected. If any input exceeding the rated value is applied, permanent damage may be caused.	
Cable Length	3m in compliance with electromagnetic immunity	

Output Specifications

Part Number	FC5A-D12K1E-DS0838	FC5A-D12S1E-DS0838
No. of Outputs	4 (4/1 common)	
Output Type	Transistor Sink	Transistor Source
Rated Load Voltage	24V DC	
Operating Load Voltage Range	20.4 to 28.8V DC	
Rated Load Current	0.3A per output point	
Maximum Load Current	1A per common line	
Voltage Drop	1V maximum	
Leakage Current	0.1mA maximum	
Inductive Load	L/R=10ms (28.8V DC, 1Hz)	
Turn ON Time	Q0 to Q2: 5μs maximum Q3: 300μs maximum	
Turn OFF Time	0 to Q2: 5μs maximum Q3: 300μs maximum	
Isolation	Output terminals & internal circuit: opto-coupler Internal circuit: not isolated	
Minimum Switching Load	0.1 mA/0.1V DC (reference value)	
Initial Contact Resistance	30 mΩ maximum	
Electrical Life	100,000 operations minimum (rated load 1,800 operations/hour)	
Mechanical Life	20,000,000 operations minimum (no load 18,000 operations/hour)	
Rated Load	240V AC/2A (resistive load, inductive load cos ø = 0.4) 30V DC/2A (resistive load, inductive load L/R =7 ms)	
Connector — on Mother Board	MC1.5/16-G-3.81BK (Phoenix Contact)	
Connector — Insertion/Remocal Durability	100 times minimum	

Dimensions (mm)

47.5   14.6   70.0   90.0   4.5 ※

USB   Ethernet