CC-M MULTI-LOOP CONTROLLER

FUJI ELECTRIC

FOUR COMPLEX PROCESSES. ONE SIMPLE SOLUTION.

Fuji Electric brings its extensive knowledge and experience in process control instrumentation into the new, state-of-the-art multi-loop process controller, the CC-M. Intelligent integration of control and communications is the hallmark of this unique controller. It is one of the most compact in the industry for a controller with this much sophistication and flexibility. Get up to four control loops with a variety of control methods, advanced network features, extensive I/O expansion, data-logging with robust storage, and user-friendly 16-color LCD display — all for a price that is unbeatable. CC-M is used in water treatment, combustion furnace, multi-point gas analysis, chemical injection and incineration systems, to name a few.

FEATURES

- **Multiple Loops**
  Up to 4 control loops, with 4 control outputs and 8 PID blocks.
- **Choice of Several Control Methods**
  Single loop, multi-loop, cascade, ratio, PLC.
- **Program Loader**
  Program via PC using exclusive loader software
- **Advanced Network Interface**
  Connect multiple units with PC, PLC or to several I/O modules
- **Data-Logging**
  Sample and store up to 1.35 million data points
- **Colorful Graphical Display**
  16-color back-lit LCD; view trends, bar graphs, parameter menu, process status, etc.
- **Back-Up Operation**
  Back-up unit takes over control if main unit fails

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CC-M SPECIFICATIONS

GENERAL

NUMBER OF LOOPS & PID (Selectable from the following)	1 Loop: 1 control output/2 PID 2 Loops: 2 control outputs/4 PID 4 Loops: 4 control outputs/8 PID
PROGRAMMING METHOD	Control and computation functions are implemented by combining function software modules called Wafers. Configuration could be performed from the keypad or from a PC.
PROGRAM CAPACITY	48 Wafers x 4 loops (max. 192 wafers); 2k steps of ladder. Wafer types include Primary PID, Secondary PID, Arithmetic and Logic operators, Square-root extraction, Ramp function, Averaging, Sample & hold, Pulse width modulation, etc.
PROGRAMMING LOADER SOFTWARE	Wafer connections and operating parameters can be entered, edited, uploaded or downloaded from a PC
SOFT PLC	Using a PC-based configuration software such as ISaGRAF®, PLC control can be implemented. CC-M supports three IEC61131-3-based formats–Ladder, Sequential Function and Function Block, Structured Text, and Instruction List
DISPLAY	16-color graphic LCD with CFL back-light and contrast adjustment. CC-M has three kinds of menu screens for set-up and monitoring. Menu 1: Select from Loop Panel screen, Bar graph display, trend screen, Alarm status display, Analog and digital input/output indication screen. Menu 2: 8 different parameter setting screens Menu 3: 5 different screens for wafer connection, system definition, function definition and communication setting.
BACK-UP OPERATION	An optional back-up unit can be installed. In case of a fault condition in the main unit, a balanceless and bumpless transfer of control from the main unit to the back-up unit can be achieved for manual control of the process outputs.
DATA STORAGE	Data from 32 different trends can be sampled simultaneously and stored on compact flash memory cards.
MEMORY CARD INTERFACE	Capacity: 4, 20, 30 MB (30MB holds 1.35 million data points) Sampling Frequency: 1 second to 2 hrs. Storage Format: ASCII
POWER SUPPLY VOLTAGE RANGE	85 to 26VAC, 47 to 63 Hz. 20 to 30 VDC (option)
POWER CONSUMPTION	60 VA or less(85 to 264 VAC). 30Ω or less (20 to 30 VDC)

INPUT

NUMBER OF INPUTS	8 process inputs, or 6 process inputs and 2 temperature inputs, 10 digital inputs
PROCESS INPUTS	0 to 5 VDC, 1 to 5 VDC (default) and 0 to 10VDC. For mA input, a 250Ω shunt resistor is required
TEMPERATURE INPUTS	Thermocouple: J, K, R, B, T, E, S, N, U, WRe5-26, PL II. RTD: Pt100
INPUT ACCURACY	Process Inputs: ±0.1% of full span (FS) ±1 digit Thermocouple: ±0.2% FS ±1 digit; B type – ±5% for 0-400°C, S; R type – ±1% for 0-500°C RTD: ±0.2% FS ±1 digit
INPUT SAMPLING TIME	100 ms
DIGITAL INPUTS	10 digital inputs available. No-voltage contact or transistor input Contact Rating: 30 VDC, 10mA No-Voltage Contact Resistance: 200Ω or less at ON. 100kΩ or more at OFF Transistor Contact: 0V at ON, 24V at OFF, 8mA

OUTPUT

NUMBER OF OUTPUTS	Up to 4 analog control outputs available, one for each loop. 4 auxiliary analog outputs, 10 digital outputs
CONTROL OUTPUTS	4 to 20mA DC Accuracy: ±0.2% FS Load Resistance: 600Ω or less
AUXILIARY ANALOG OUTPUTS	0 to 5V, 1to 5V, or 0 to 10 VDC Accuracy: ±0.1% FS Load Resistance: 15kΩ or more
DIGITAL OUTPUTS	Transistor open collector 1 V max. at ON, 10 mA max at. OFF Output Rating: 30 VDC, 100mA max. (resistive load)

COMMUNICATIONS

SIMULTANEOUS NETWORK INTERFACE	CC-M can have two kinds of network interfaces simultaneously — High-level and Low-level
HIGH-LEVEL NETWORK INTERFACE	Allows CC-M to communicate with PC, PLC or other controllers Communication Protocol: Modbus® Mode: EIA RS-485, multi-drop, half-duplex, bit-serial, 19.2kbps. Number of Connectable Units: Max. 31 units
LOW-LEVEL NETWORK INTERFACE	Allows CC-M to expand the number of inputs/outputs Communication Protocol: OPTO22® MISTIC Mode: EIA RS-485, half-duplex, bit-serial, 57.6kbps. I/O Expansion: Max. 4 analog I/O; Max. 32 digital I/O I/O Modules: OPTO22 SNAP I/O® series. Total number of connectable units depend on the number of I/O points.

STRUCTURE

DIMENSIONS	72 x 144 x 280 mm (panel cutout: 68 x 138 mm)
WEIGHT	1.9 kg
PROTECTION	IP54 (front face)
FLAME RESISTANCE	UL94V-0
GENERAL SAFETY	Conforms to IEC 1010-1 (1990), EN 61010-1 (1993)
EMC	Emission EN 50081-2 (1994), Immunity EN 50082-2 (1995)

CC-M ORDERING INFORMATION

P	D	A	3	A	2	B	1	–	C	C	D	E	E	–	F	0

To create a part number fill in the boxes above with the appropriate number and/or letter from the corresponding box below.

Box A: Number of Control Loops

1 = 1 Loop	$ 1,450
2 = 2 Loops	1,950
4 = 4 Loops	2,700

Number of control loops is the number of 4-20mA 'control' outputs.

Box B: Input Signal

A = DC 1–5V/4–20mA DC*	N/C
C = Thermocouple**	180
D = RTD/Pt100**	180

** For current input, a precision 250Ω shunt resistor is used, one per loop is included. Additional resistors are available.*

*** Thermocouple or RTD inputs are optional. If more are desired, external transducers should be used.*

Box C: Power Supply Voltage

A = 100–240 VAC	N/C
B = 24 VDC	N/C

Box D: Hard Manual Back-Up Unit

Y = None	N/C
A = 1 Loop	180
B = 2 Loops	295
C = 4 Loops	355

Box E: Communications/Memory Card Interface

Code = MODBUS RS-485 / OPTO22 / Memory Card Interface	
Y = Without / Without / Without	N/C
M = Without / Without / With	$ 85
C = RS485 / Without / Without	74
U = RS485 / Without / With	158
D = RS485 / RS485 / Without	279
R = RS485 / RS485 / With	355

- *Communication cable and impedance terminators are optional items.*
- *RS-485 communications uses Modbus protocol. OPTO 22 option does not include modules. These are sold separately. To use OPTO 22 equipment, a brain module, module rack, and at least one module must be purchased.*
- *Memory Card option only records trend data using standard compact-flash type memory cards. Cards up to 32MB can be used and are available as COMPACT FLASH_MB.*

Box F: Programming Method

1 = Wafer	N/C
2 = Soft PLC Function (ISaGRAF)*	60

** ISaGraf conforms to IEC1131. ISaGRAF programming tool is optional item. Soft PLC and Wafer programming cannot function simultaneously. To change programming method between 'Wafer' and 'Soft PLC', hardware modification is required.*

CC-M ACCESSORIES

COMPACT FLASH CARD 16MB		$ 85
COMPACT FLASH CARD 32MB		160
COMPACT FLASH CARD READER: PARALLEL PORT		90
CC-M LOADER SOFTWARE*		N/C
CC-M LOADER CABLE (SERIAL PORT CONNECTION)*		35
SNAP-B3000-ENET	OPTO 22 BRAIN**	695
SNAP-B8M	OPTO 22 8-Module Rack	94
SNAP-B16M	OPTO 22 16-Module Rack	161
SNAP-AOA-3	OPTO 22 Single-Channel 4–20mA AO	150
SNAP-AIV	OPTO 22 2-Channel -10 to +10 VDC AI	182
SNAP-ODC5SRC	OPTO 22 4-Channel DC Out. 5–60 VDC, 5 VDC logic source	42
SNAP-ODC5SNK	OPTO 22 4-Channel DC Out. 5–60 VDC, 5 VDC logic source	42
SNAP-IDC5	OPTO 22 4-Channel Input. 10–32 VDC, 5 VDC logic	42

** CC-M Loader Cable to be used with software for uploading and downloading programs from the PC to the CC-M.*

*** To use the OPTO 22 functions, customers must purchase at the minimum, a brain, a rack, and an input or output module.*