MCT4
1/4 DIN MULTI-LOOP CONTROLLER

EASY TO USE TOUCH SCREEN INTERFACE

OPERATES LIKE YOUR FAVORITE SMARTPHONE OR TABLET

COMBINES MULTIPLE CONTROL AND MONITOR COMPONENTS INTO A SINGLE, LOW COST SOLUTION

FUTUREDESIGN
CONTROLS

MCT4 -1/4 DIN MULTI-LOOP CONTROLLER

Base Price: $550.00

MTC4 | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦

1 SOFTWARE TYPE

Code	Description	Price
01	FDC MCT4	N/C
XX	Special Order Code	TBD

2 POWER INPUT

Code	Description	Price
4	90-264VAC 50/60 HZ	N/C
5	11-26VAC/VDC (not available 2018)	$25.00

3 MODULE TYPE SLOT 1

Code	Description	Price
0	None	N/C
Pxxxx	Process Control Module (Refer to PCM order matrix)	*

Refer to the PCM order matrix to complete part number above and module slot 1 price

4 MODULE TYPE SLOT 2

Code	Description	Price
0	None	N/C
Pxxxx	Process Control Module (Refer to PCM order matrix)	*
Hxxxx	High Limit Module (Refer to HLM order matrix)	*

Refer to the PCM or HLM order matrix to complete part number above and module slot 2 price

5 MODULE TYPE SLOT 3

Code	Description	Price
0	None	N/C
Pxxxx	Process Control Module (Refer to PCM order matrix)	*
Hxxxx	High Limit Module (Refer to HLM order matrix)	*

Refer to the PCM or HLM order matrix to complete part number above and module slot 3 price

6 DOCUMENTATION

Code	Description	Price
0	None	N/C
C	CD	$25.00
U	USB memory stick	$25.00
P	Printed Manual	$39.00

Note for documentation order code "0": Manual available for download at www.futuredesigncontrols.com

7 SPECIAL ORDER CODE

Code	Description	Price
00	None	
XX	Special Order Code	

MCT4 PART NUMBER AND PRICING EXAMPLE:

MCT4-01-4-P1111-P1111-H111-000
MCT4 with 2 process control modules and a high limit module.

Standard software. 90-250VAC 50/60 HZ. Each process control module (slot #1 and #2 is equipped with 4 relay outputs. Slot 3 has a high limit module installed equipped with 2 relay outputs. No special order code.
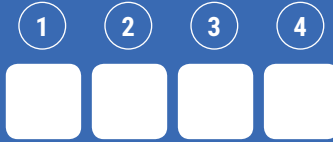
MCT4 BASE	$550.00
PCM #1: P1111	$209.00
PCM #2: P1111	$209.00
HLM : H111	$169.00
TOTAL	**$1,137.00**

FUTUREDESIGN
CONTROLS

Base Price: $149.00

P ① ② ③ ④

PCM modules can be installed in slots 1, 2 or 3

① OUTPUT 1

Code	Description	Price
0	None	N/C
1	Relay 2A/240VAC (Form A)	N/C
2	Pulsed voltage to drive SSR, 5V/30mA	N/C
3	0-20mA/4-20mA isolated output (OM99-3)	$26.00
4	0-10V isolated output (OM99-5)	$26.00
C	Pulse voltage to drive SSR, 14V/40mA (OM99-7)	$26.00

② OUTPUT 2

Code	Description	Price
0	None	N/C
1	Relay 2A/240VAC (Form A)	$20.00
2	Pulsed voltage to drive SSR, 5V/30mA	$11.00
3	0-20mA/4-20mA isolated output (OM99-3)	$30.00
4	0-10V isolated output (OM99-5)	$30.00
7	Transmitter power supply 20VDC/25mA (DC99-1)	$30.00
8	Transmitter power supply 12VDC/40mA (DC99-2)	$30.00
A	Transmitter power supply 5VDC/80mA (DC99-3)	$30.00
C	Pulse voltage to drive SSR, 14V/40mA (OM99-7)	$26.00

③ OUTPUT 3

Code	Description	Price
0	None	N/C
1	Relay 2A/240VAC (Form A)	$20.00
2	Pulsed voltage to drive SSR, 5V/30mA	$11.00
7	Transmitter power supply 20VDC/25mA (DC99-1)	$30.00
8	Transmitter power supply 12VDC/40mA (DC99-2)	$30.00
A	Transmitter power supply 5VDC/80mA (DC99-3)	$30.00
C	Pulse voltage to drive SSR, 14V/40mA (OM99-7)	$26.00

④ OUTPUT 4

Code	Description	Price
0	None	N/C
1	Relay 2A/240VAC (Form A)	$20.00
2	Pulsed voltage to drive SSR, 5V/30mA	$11.00
3	Retransmit 0-20mA/4-20mA isolated output (OM99-3)	$30.00
4	Retransmit 0-10VDC (OM99-5)	$30.00
7	Transmitter power supply 20VDC/25mA (DC99-1)	$30.00
8	Transmitter power supply 12VDC/40mA (DC99-2)	$30.00
A	Transmitter power supply 5VDC/80mA (DC99-3)	$30.00
C	Pulse voltage to drive SSR, 14V/40mA (OM99-7)	$26.00

PCM Modules support Universal Analog Signal Inputs T/C-RTD, mA and VDC.

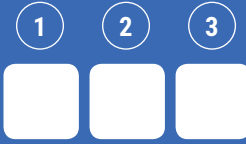Hardware configuration is via board DIP switch.

Default hardware configuration is T/C-RTD.

HIGH LIMIT MODULE (HLM)

Base Price: $149.00

H [1] [2] [3]

HLM modules can be installed in:
• Slot 2 with 2-loop system
• Slot 3 with 3-loop system

1 SIGNAL INPUT*

Code	Description	Price
1	Thermocouple: J, K, T, E, B, R, S, N, L, C, P, PT100, JIS, 0-60mV	N/C
2	Voltage 0-1VDC	N/C
3	Voltage 0-10VDC	N/C
4	Current 0-20mA (4-20mA)	N/C
5	Voltage 0-5VDC (1-5VDC)	N/C

2 OUTPUT 1

Code	Description	Price
0	None	N/C
1	Relay 2A/240VAC (Form C)	N/C
2	Pulsed voltage to drive SSR, 5V/30mA	N/C
3	Pulse voltage to drive SSR, 14V/40mA (OM99-7)	$26.00

3 OUTPUT 2

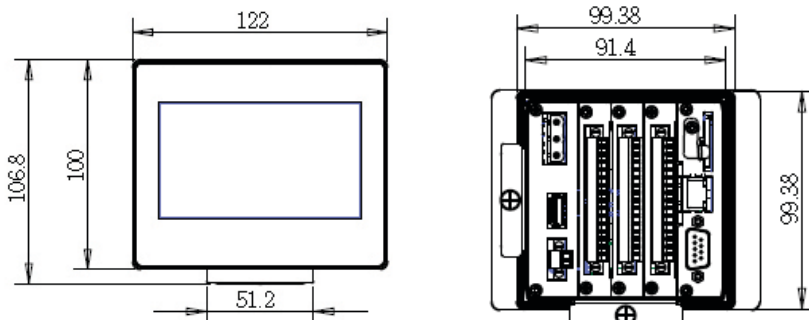| Code	Description	Price
0	None	N/C
1	Relay 2A/240VAC (Form C)	$20.00
2	Pulsed voltage to drive SSR, 5V/30mA	$11.00
7	Transmitter power supply 20VDC/25mA (DC99-1)	$30.00
8	Transmitter power supply 12VDC/40mA (DC99-2)	$30.00
A	Transmitter power supply 5VDC/80mA (DC99-3)	$30.00
C	Pulse voltage to drive SSR, 14V/40mA (OM99-7)	$26.00

HLM signal input order code #1 supports analog input types T/C-RTD, mA, 0-10 VDC, 4-20/0-20mA.

Hardware configuration for each input type is via DIP switch.

* HLM configured with Signal Inputs 0-60mV, 0-1VDC, 0-5VDC, 0-10VDC or 4-20/0-20mA are NOT FM approved

SPECIFICATION AND FEATURE REVIEW

DIMENSIONAL DRAWINGS AND PCM/HLM WIRING DIAGRAMS

FUTUREDESIGN
C O N T R O L S

MCT CONTROL MODULE PARTS PRICING

PCM & HLM OUTPUT COMPONENTS
OUTPUT TYPE: PCM OUT #1, #2, #3 & #4/HLM OUT #1 & #2

Description	Price
Relay 2A/240VAC (Form A R70417Q)	$20.00
0-20mA/4-20mA isolated (OM99-3)	$30.00
0-10VDC isolated (OM99-5)	$30.00
SSRD 5V/30mA Kit: (SSRD-5V/30mA)	$10.00
Pulse voltage to SSR 14V/40mA (OM99-7)	$26.00

PCM & HLM TRANSMITTER POWER SUPPLY COMPONENTS
PCM OUTPUT #2, #3 AND #4/HLM OUTPUT #2

Description	Price
20VDC/25mA Supply (DC99-1)	$30.00
12VDC/40mA Supply (DC99-2)	$30.00
5VDC/80mA Supply (DC99-3)	$30.00

DOCUMENTATION

Description	Price
MCT4-UserManual-CD	$25.00
MCT4-UserManual-USB	$25.00
MCT4-UserManual-Printed	$39.00

TERMINAL BLOCKS FOR MCT4 ENCLOSURE, PCM & HLM

Description	Price
POWER INPUT - Part #: 10343-1203A-01-10	$5.00
COMMS - Part #: 10343-1202B-10-00	$4.00
PCM - Part #: 10343-1216B-03-00	$20.00
HLM - Part #: 10343-1216B-10-00	$20.00

## MISC. HARDWARE AND MOUNTING SCREWS

Description	Price
SD card holding clamp (10451-MTMCT45B-00)	$5.00
SD card mounting screw (10483-00300600701)	$5.00
Screws used to hold PCM, HLM, SD Mounting screw and the right / left end slots into enclosure (common to all) Part #: 10483-00300400701 (package of 12)	$5.00

SPECIFICATION AND FEATURE REVIEW

DIMENSIONAL DRAWINGS AND PCM/HLM WIRING DIAGRAMS
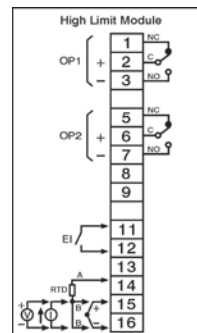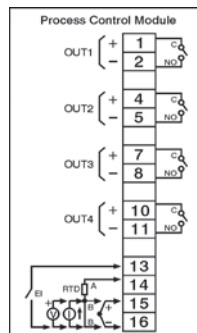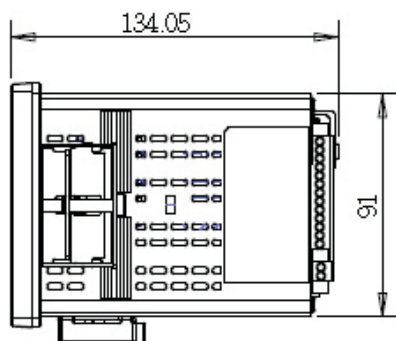
COMMAND BAR ICONS NAVIGATION, HELP & HOME

The Master Command Bar located on the top of the display provides easy & intuitive 1-touch access from anywhere in the system to System Navigation, Help and configured Home view

Home brings the user back to the system "Home View". The Home icon can be configured for the following standard views;

- Loop view: includes PV & SP digital display, PV min/max, PID % Output, Auto-Manual, event & profile access and more.
- Overview: all loops, profile and event status
- Chart View (trend up to the last 24 hours from system RAM) supporting 4 Trend View charts with up to 6 values per chart
- Alarm View or Alarm File.

Help offers content sensitive text for every view /page in the user configured language.

Navigation provides access to the configured menu system, traditional drop down or icon.

SECURITY AND AUDIT TRAIL

- Supports up to 30 users over four user groups with access to 40+ functions restricted by user group.
- Supports password aging and verification.
- Operator Audit Trail provides history for all user activity that includes date, time, user name and action; i.e. Loop SP change from 55.2 to 103.5.

PROFILE RAMP/SOAK

- Loop 1 and/or 2; loop 3 always static
- Start: via touch screen or Event input
- Profile Name: Free form 16 character naming convention.
- Global Profile Configuration:
  - Start from PV or static SP
  - Guaranteed Soak & Ramp band
  - Power Fail / Recovery: Continue from last SP value, PV or static mode.
- Profile Segments: (maximum of 64)
- Guaranteed Soak & Ramp per step
- Events: up to 3 or 6 events per step (1 or 2 loop).

Jump-To Step: configurable per step

- Profile End Alarm
- Configurable Profile End Logic:
  - Current (Static) Control SP: the Set Point & Event status prior to Profile Start is loaded at end of the Profile.
  - Final SP of Profile with all Events off

ALARMS

- Up to 19 alarms, 10 soft configurable to PCM & HLM, up to 3 alarm outputs per PCM and HLM up to 2 alarm outputs.
- Loop* Alarm Types: Process High & Low, Deviation High & Low, Deviation Band, Event Input and End of Profile.
  - * PCM configured as Monitor Input (no PID control configurable only with Process alarms.

    Alarm Mode:
    Normal or Hold (on start-up Hold mode will not activate if in alarm condition and arm once out of alarm condition). Silent Alarm, activation does not indicate alarm or write to alarm log file.

    Alarm outputs configurable as latching or nonlatching.

DATA ACQUISITION

- Data log PV, SP and PID percent output.
- File name: Free form 16 character appended by time/date or the profile name if started with a profile.
- File Start/Stop: user on-demand, on system boot or profile ramp-soak start/end.
- Data Log interval: configurable 1-second to 31-minutes.
- File Interval: configurable to set time in days (1 to 31) to end and start a new file. This allows syncing files to match product cycles as well as keeping file size manageable.
- ID#1 and ID#2 fields allow user to enter specific information such as a batch and/or lot information that is associated with the data file.
- Operator Comments/Events: Unlimited operator comments/events linked to each file
- File Type: Data Log files are saved in .csv format.
- Digital Signatures: Automatic system as well as user entered signatures.
- Historical Data Viewer: View data log files on the display. Chart is auto-scaled on an X & Y axis for time and units.
- Meets the requirements for:
  - CFR21 Part 11
  - AMS2750E

EVENT INPUTS

- PCM / HLM each have 1 event input configurable for one of the following functions.
- PCM: Profile Run, Hold, Run/Hold, Abort, Step Advance, Failure Transfer (Outputs), Alarm Input (indication only) and Loop Status Input
- HLM: Remote Reset

PROCESS CONTROL (PCM) AND HI-LIMIT (HLM) MODULE SPECIFICATION

INPUT SPECIFICATIONS*

Type	Range	Accuracy @ 24 C	Input Impedance
J	-120 C 1000 C (-184 F 1832 F)	+/-2 C	2.2 Mohms
K	-200 C 1370 C (-328 F 2498 F)	+/-2 C	2.2 Mohms
T	-250 C 400 C (-418 F 752 F)	+/-2 C	2.2 Mohms
E	-100 C 900 C (-148 F 1652 F)	+/-2 C	2.2 Mohms
B	0 C 1820 C (-32 F 3308 F)	+/-2 C (200-1820 C)	2.2 Mohms
R	0 C 1767.8 C (-32 F 3214 F)	+/-2 C	2.2 Mohms
S	0 C 1767.8 C (-32 F 3214 F)	+/-2 C	2.2 Mohms
N	-250 C 1300 C (-418 F 2372 F)	+/-2 C	2.2 Mohms
L	-200 C 900 C (-328 F 1652 F)	+/-2 C	2.2 Mohms
C	0 C 2315 C (32 F 4199 F)	+/-2 C	2.2 Mohms
P	0 C 1395 C (32 F 2543 F)	+/-2 C	2.2 Mohms
PT100 (DIN)	-210 C 700 C (-346 F 1292 F)	+/-0.4 C	1.3 Kohms
PT100 (JIS)	-200 C 600 C (-328 F 1112 F)	+/-0.4 C	1.3 Kohms
MV	-8MV 70MV	+/-0.05%	2.2 Mohms
MA	-3MV 27MA	+/-0.05%	70.5 Ohms
V	-1.3V 11.5V	+/-0.05%	302 Kohms

* When subject to the necessary field calibration, the MCT4 is suitable for use in Nadcap applications in all furnace classes as defined in AMS2750E clause 3.3.1.

Resolution	18 bits
Sampling Rate	5 times / second
Maximum Rating	-2VDC minimum, 12VDC maximum (1 minute for mA input)
Temperature Effect	A1.5uV/ C for all inputs except mA input A3.0uV/ C for mA input
Sensor Lead Resistance Effect	T/C: 0.2uV/ohm 3-wire RTD: 2.6 C/ohm of resistance difference of two leads 2-wire RTD: 2.6 C/ohm of resistance sum of two leads
Sensor Break Responding Time	Within 4 seconds for TC, RTD and mV inputs, 0.1 second for 4-20 mA and 1 - 5VDC inputs.
Burn-out Current	200 nA
Common Mode Rejection Ratio (CMRR)	120dB
Normal Mode Rejection Ratio (NMRR)	55dB
Sensor Break Detection	Sensor open for TC, RTD and mV inputs, Sensor short for RTD input below 1 mA for 4-20 mA input, below 0.25VDC for 1 - 5VDC input, unavailable for other inputs.
Electrical Isolation	Optical isolation; 1500V~ (ac) minimum, between input signals and power supply circuit.

OUTPUT SPECIFICATIONS:

Relay Rating	2A/240 VAC, life cycles 200,000 for resistive load
Pulsed Voltage	Source Voltage 5V @30mA, current limiting resistance 66 ohms Source Voltage 14V@40mA, current limited at 70mA

Linear Output (PCM)	
Resolution	15 bits
Output Regulation	0.02% for full load change
Output Settling Time	0.1 sec. (stable to 99.9%) Isolation
Breakdown Voltage	1000 VAC
Temperature Effect	+/- 0.01% of span per degree C
Analog Retransmission (PCM)	
Output Signal	4-20 mA, 0-20 mA, 0 - 5VDC, 1 - 5VDC, 0 - 10VDC
Resolution	15 bits
Accuracy	+/-0.05% of span +/-0.0025%/ C Load
Resistance	0 - 500 ohms (for current output) 10K ohms minimum (for voltage output)
Output Regulation	0.01% for full load change
Output Settling Time	0.1 sec. (stable to 99.9%)
Isolation Breakdown Voltage	1000 VAC min. Integral
Linearity Error	+/-0.005% of span
Temperature Effect	+/-0.0025% of span per degree C
Saturation Low	0 mA (or 0 VDC)
Saturation High	22.2 mA (or 5.55VDC, 11.1VDC min)
Linear Output Range	0-22.2mA (0-20mA or 4-20mA)
Volts DC	0 - 5.55VDC (0 - 5VDC, 1 - 5VDC), 0 - 11.1VDC (0 - 10VDC)

CONTROL FUNCTION (PCM):

Control Action	Direct and reverse
Proportional Band	Temperature: 0.1 to 500C (0.1 to 900F) Linear Input: 0.1 to 900.0
Reset (Auto)	0 to 3600 seconds
Rate (Derivative)	0 to 900.0 seconds
PB Offset	0 to 100%
Dual PID Heat/Cool (bimodal)	Cool Proportional Band: 50 to 300% of heat PB Proportional Deadband: -36.0% to +36.0% of heat PB
Time Proportioning Cycle Time	0.1 to 90 seconds
On-Off / Alarm Hysteresis (PCM/HLM)	0.1 to 50C (0.1 to 90.0F)

EVENT INPUT SPECIFICATIONS:

Logic Low	-10V minimum, 0.8V maximum
Logic High	2V minimum, 10V maximum

APPROVAL STANDARDS:

UL / cUL	UL 61010C-1
EN	EN 61010-1 (IRC-1010-1)
EMC	EMC 61326
RoHS	RoHS 2.0 Compliant, W.E.E.E.
FM (HLM)	FM temperature limit switch - indicating

FUTURE DESIGN CONTROLS

P.O. Box 1196

Bridgeview, IL 60455

888.751.5444

888.307.8014 Fax