Kit 9-274764 Installation Instructions
MCT4 replacement for Protocol Plus or Protocol3 Controls

Safety First

- ITW EAE designs and builds machines with user safety as a high priority.
- This instruction material is designed to assist the installer, however, it does not supersede safety precautions and guidelines, as specified within the ITW EAE equipment user manuals.

ATTENTION!

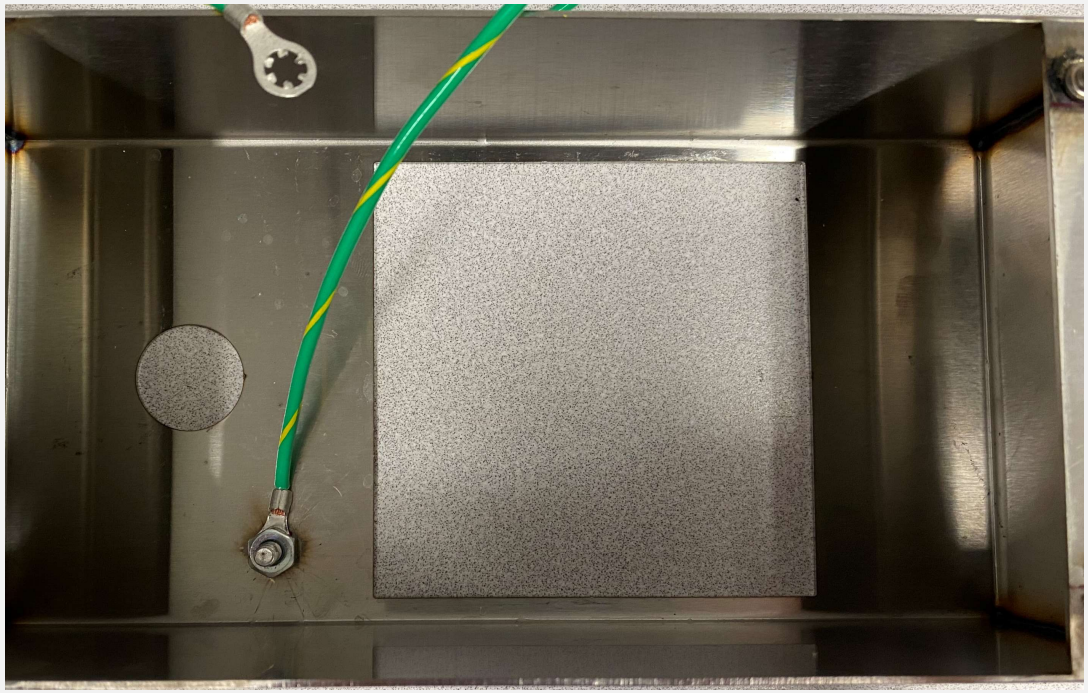
Operation of ITW EAE equipment exposes personnel to potential health and safety hazards. This install should only be performed by qualified technicians, trained on how to safely work on electrical equipment.

Kit part number 9-274764 includes the following parts.

Part Number	Description	Qty
9-008487	NUT HX ZIN #10-32	5
9-017182	WIRE MTW 14GA BLKANIXTER 1015BC-14/19-0	12
9-074078	WSHR LK ZIN #10 SHKPRF EXT	4
9-140097	SW CRL TGCO401-TB-BDPST	1
9-141805	TERM BLK PHNX PLUGMSTB2.5/2-ST-5.08	1
9-143795	DECAL GRAY HEATER	1
9-144772	TERM FSTN ETC BB-2221 14-16GA*	2
9-199334	TERM BLK WAGO SPRING 2P 221-412, 28-12AWG	1
9-350093	CBL USB 2.0 MALE TO FEMALE L-COM WPUSBAX-1M	1
9-350095	USB COVER WPCVR-USB-1394, L-COM NON-SHIEL	1
9-354643	DECAL GRAY USB	1
9-403093	CTL PID FDESIGN MCT4 -014-PC114-P1111-H111-0	1
9-409116	SCW CAPTIVE 4-40X.375 FOR RS485 CONN (409121)	2
9-410239	PLC USB MEMORY STICK MCT4 CONFIGURATION	1
9-410241	KIT PROTOCOL REPLACEMENT MCT4 DWG	1
9-410242	PROTOCOL ADAPT PLT WDMT 3.63 SQ, .875DIA,2.25"T	1
9-WL1538	WIRE LIST LAC/LBB CAB FAN GND WIRE	1

Step 1:
Ground Wire Install

Locate the adapter weldment 9-410242, ground wire 9-WL1528, and one of the #10 nuts 9-008487. Attach the ground wire to the threaded stud inside the adapter weldment using the # 10 nut as shown.



Step 2:
USB Cable Install

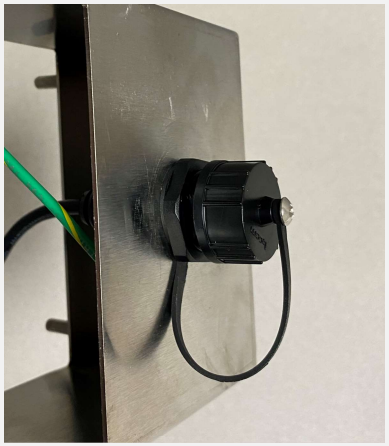
Locate the USB cable, 9-350093 and USB cover 9-350095.

Remove the plastic nut from the USB cable

Insert the threaded portion of the cable through the round hole in the adapter weldment from the inside out.

Slide the ring on the USB cover over the threaded portion of the cable.

Reinstall the plastic nut to secure cable and cover in place.



Step 3:
Mounting the control in the adapter weldment

Locate the MCT4 control and mounting clamps.

Slide the control into the square hole in the adapter weldment from the front.

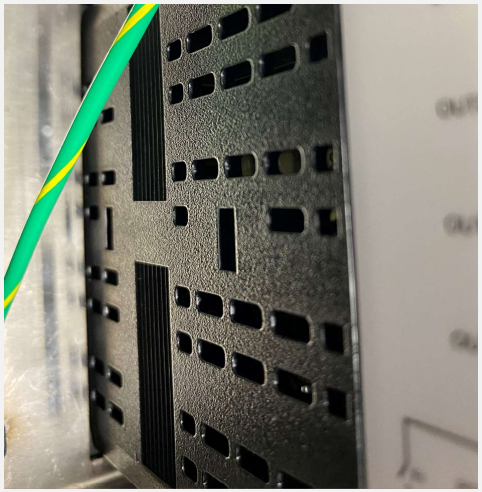
Step 3 Continued:

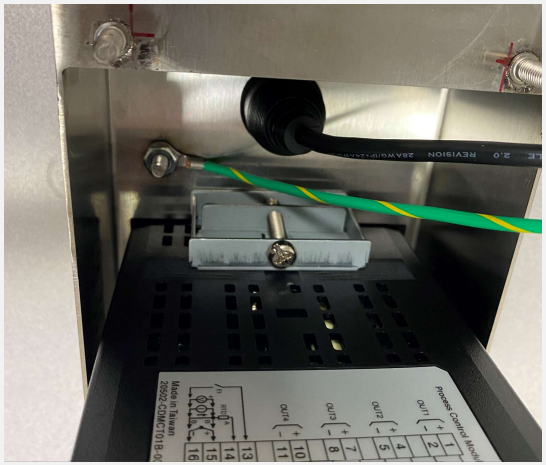
Mounting the control in the adapter weldment

From the back you will see a rectangle hole on each side of the control.

Insert the hook on the mounting hardware into the hole and tighten the screw to hold the control in place. Only 2 of the 4 mounting clamps will be used.

Insert the USB cable into the USB port on the back of the control.

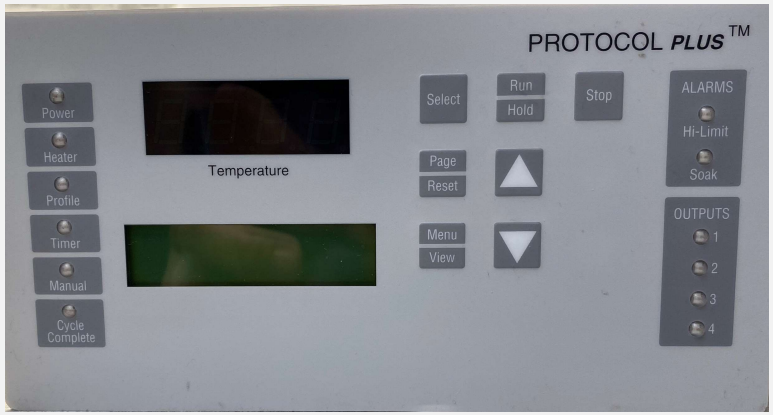




Step 4:
Preparing for wiring

Identify what model control is being replaced, the Protocol Plus or the Protocol3.

Protocol Plus



Protocol3

Step 4 Continued:

Preparing for wiring

Find the two tables in the bottom left corner of page 1 on the instruction drawing.

The table on the left is used when replacing a Protocol Plus, and the table on the right is used when replacing a Protocol3.

PROTOCOL PLUS TO MCT4

PROTOCOL PLUS	MCT4	ACTUAL
1	UNUSED	
2	UNUSED	
3	DB9/1	
4	DB9/4	
5	DB9/5	
6	UNUSED	
7	UNUSED	
8	UNUSED	
9	UNUSED	
10	UNUSED	
11	SLOT 1/10	
12	SLOT 1/11	
13	SLOT 1/15	
14	SLOT 1/16	
15	SLOT 3/15	
16	SLOT 3/16	
17	SLOT 1/1	
18	SLOT 1/2	
19	SLOT 3/3	
20	SLOT 3/2	
21	SLOT 3/1	
22	SLOT 1/4	
23	SLOT 1/5	
24	SLOT 1/7	
25	SLOT 1/8	
26	SLOT 2/4	
27	SLOT 2/5	
28	SLOT 2/7	
29	SLOT 2/8	
30	POWER/3	
31	POWER/2	
32	POWER/1	

PROTOCOL 3 TO MCT4

PROTOCOL 3	MCT4	ACTUAL
1	POWER 3	
2	POWER 2	
3	POWER 1	
4	SLOT 1/5	
5	SLOT 1/4	
6	SLOT 1/8	
7	SLOT 1/7	
8	SLOT 2/5	
9	SLOT 2/4	
10	SLOT 2/8	
11	SLOT 2/7	
12	SLOT 2/11	
13	SLOT 2/10	
14	SLOT 1/10	
15	SLOT 1/11	
16	UNUSED	
17	SLOT 1/15	
18	SLOT 1/16	
19	DB9/1	
20	DB9/4	
21	UNUSED	
22	UNUSED	
23	UNUSED	
24	UNUSED	
25	UNUSED	
26	SLOT 1/1	
27	SLOT 1/2	
28	SLOT 3/3	
29	SLOT 3/2	
30	SLOT 3/1	
31	UNUSED	
32	SLOT 3/15	
33	SLOT 3/16	

NOTE: ON ALL MCT4, JUMPER SLOT 2/15 TO SLOT 2/16

8 7 6

Step 4 Continued:

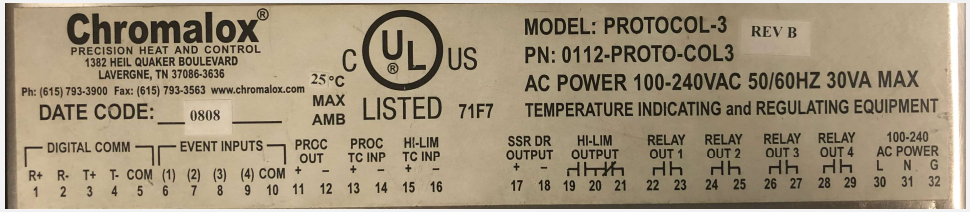
Preparing for wiring

Confirm that power has been turned off and locked out to the oven.

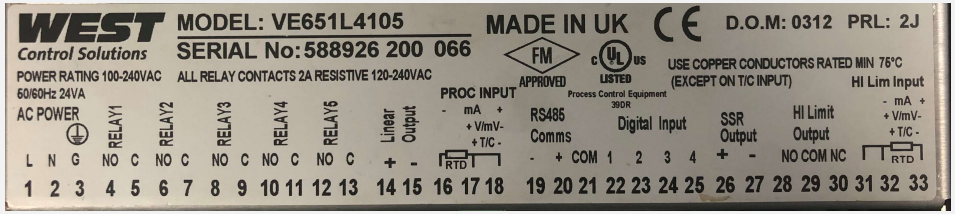
Open the control panel on the oven and look at the wiring at the back of the control. Record the wire numbers connected to each terminal on the back of the control in the actual column of the table.

If any wire labels are missing, be sure to label with a unique wire number so the wire can be recorded on the table.

Protocol Plus



Protocol3



Step 4 Continued:

Preparing for wiring

For this example, we are replacing a Protocol3 control on a model LAC oven.

In the table shown, the wire numbers have been recorded in the actual column.

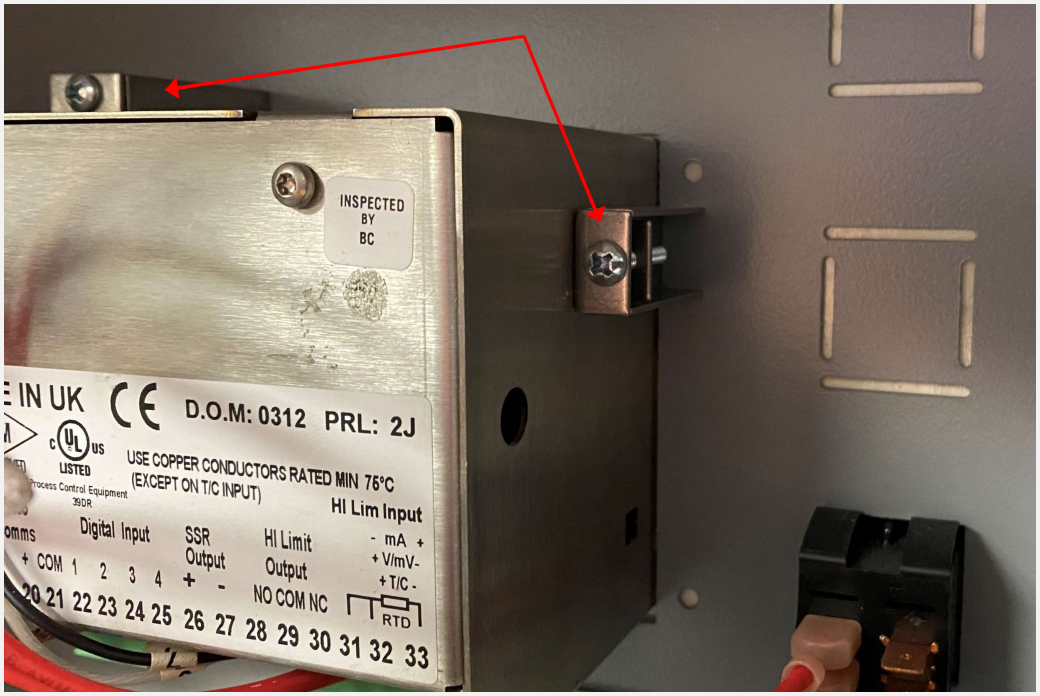
PROTOCOL 3 TO MCT4		
PROTOCOL 3	MCT4	ACTUAL
1	POWER 3	4
2	POWER 2	2
3	POWER 1	G
4	SLOT 1/5	
5	SLOT 1/4	
6	SLOT 1/8	4
7	SLOT 1/7	21
8	SLOT 2/5	
9	SLOT 2/4	
10	SLOT 2/8	
11	SLOT 2/7	
12	SLOT 2/11	
13	SLOT 2/10	
14	SLOT 1/10	31
15	SLOT 1/11	32
16	UNUSED	
17	SLOT 1/15	T/C W
18	SLOT 1/16	T/C R
19	DB9/1	
20	DB9/4	
21	UNUSED	
22	UNUSED	
23	UNUSED	
24	UNUSED	
25	UNUSED	
26	SLOT 1/1	35
27	SLOT 1/2	36
28	SLOT 3/3	8
29	SLOT 3/2	15
30	SLOT 3/1	21
31	UNUSED	
32	SLOT 3/15	T/C W
33	SLOT 3/16	T/C R

Step 5:

Remove the Existing control from the panel

Unplug the wiring connectors from the back of the control

Remove the mounting clamps and slide the control out the front of the control panel.



Step 6:
Adding a heater switch if needed

If your oven already has a heater switch, skip this step.

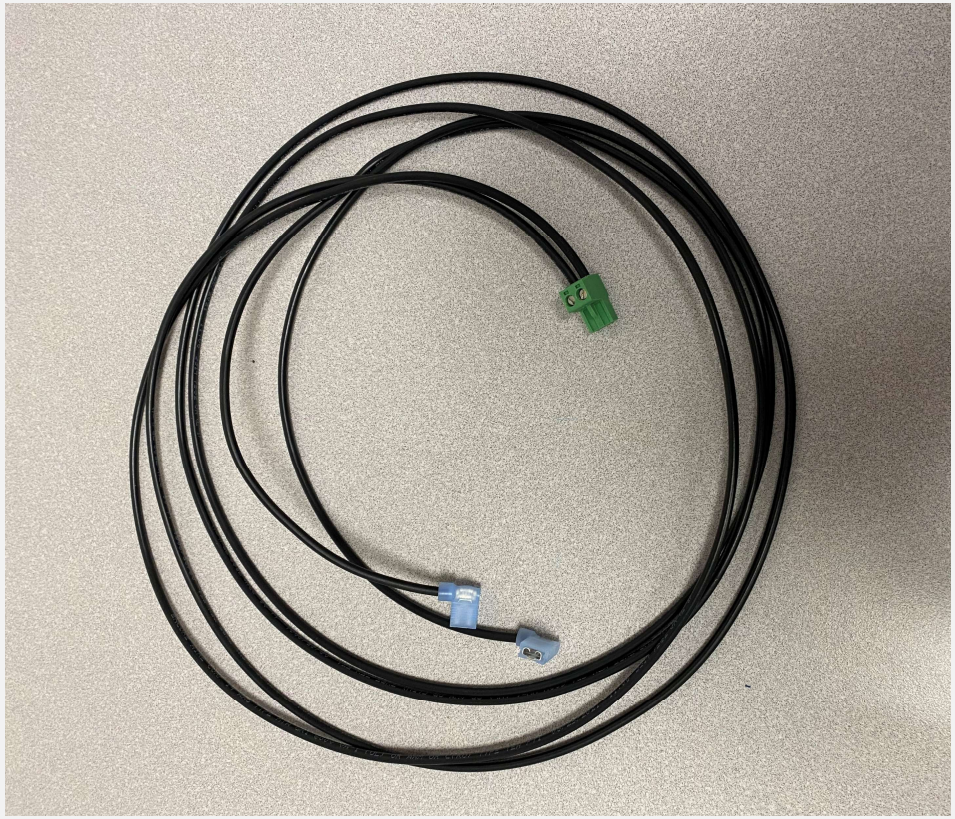
If your oven does not have a heater switch, then one needs to be added.

Locate the wire 9-017182, Female stake on terminals 9-144772, 2 position phoenix connector 9-141805, and switch 9-140097.

Cut a 2" piece of the wire off to be used later.

Cut the remaining wire into two equal lengths.

Strip both ends of both wires. Crimp a female stake on connector on one end of each wire and connect the other end of each wire into the two position Phoenix connector.



Step 6 Continued:

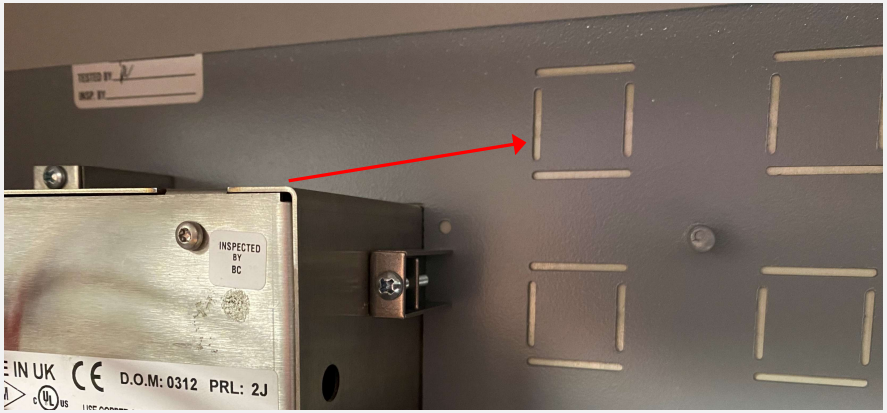
Adding a heater switch if needed

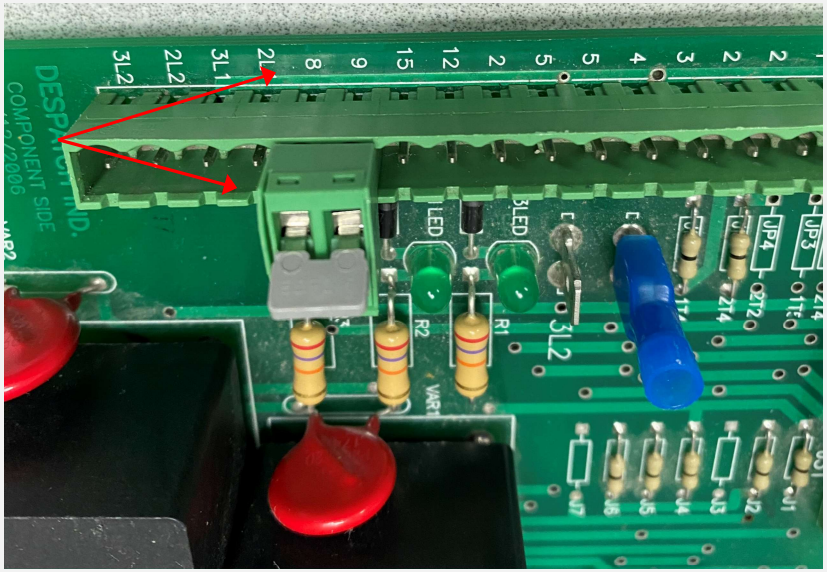
Most control panels have holes partially cut out for mounting optional switches.

Complete the cut out of one of these mounting holes and mount the switch and wire pigtail in the panel.

Find terminals 8 and 9 on the short edge of the main circuit board.

If there is a jumper as shown on terminals 8 and 9, remove the jumper and terminal block, and insert the terminal block from the switch pigtail.





Step 6 Continued:

Adding a heater switch if needed

If there is a terminal block with wires connected to terminals 8 and 9, the heater switch will need to be wired in series with the existing wires.

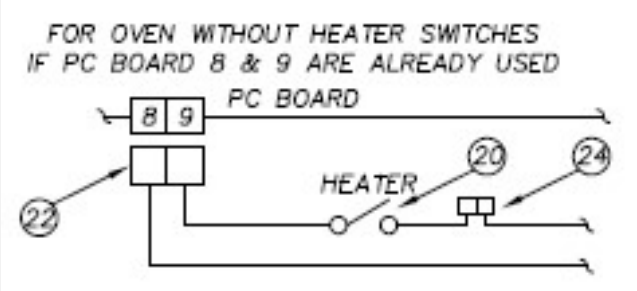
If this is the case, remove the phoenix connector from the heater switch pigtail.

Remove the wire from terminal 9 on the circuit board.

Connect one of the wires from the heater switch pigtail to terminal 9 on the circuit board.

Connect the wire that was removed from terminal 9 on the circuit board to the other wire on the heater pigtail using the two-position spring connector 9-199334.

Reference page 2 of instruction drawing.



Step 7:

Installing the Control Assy. Into Control Panel.

Mount the control/adapter weldment assembly into the control panel using the mounting tabs and #10 nuts.

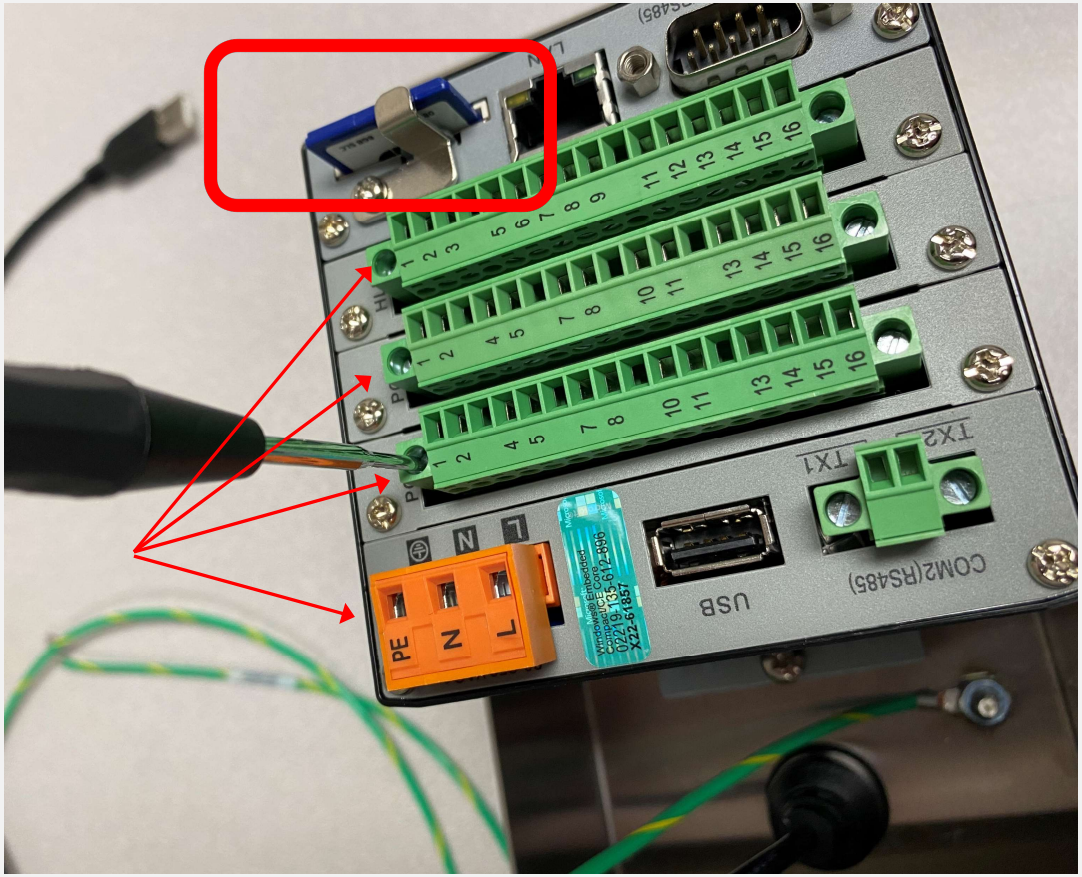
Step 8:
Wiring the MCT4 Control

Remove the power connector, and green wiring connectors from the back of the control. Do not remove the entire card from the control.

Note slot 3 connector is different than the other two. Be sure to keep track of which connector was on what slot.

Move the wires from the terminal strips that were on the old control, to the terminal strips on the new control.

Warning: Do not remove the SD card. Removing the SD card disables the control and voids the warranty.



Step 8 Continued:
Wiring the MCT4 Control

The MCT4 column gives the slot number and terminal number for each wire recorded previously in step 4.

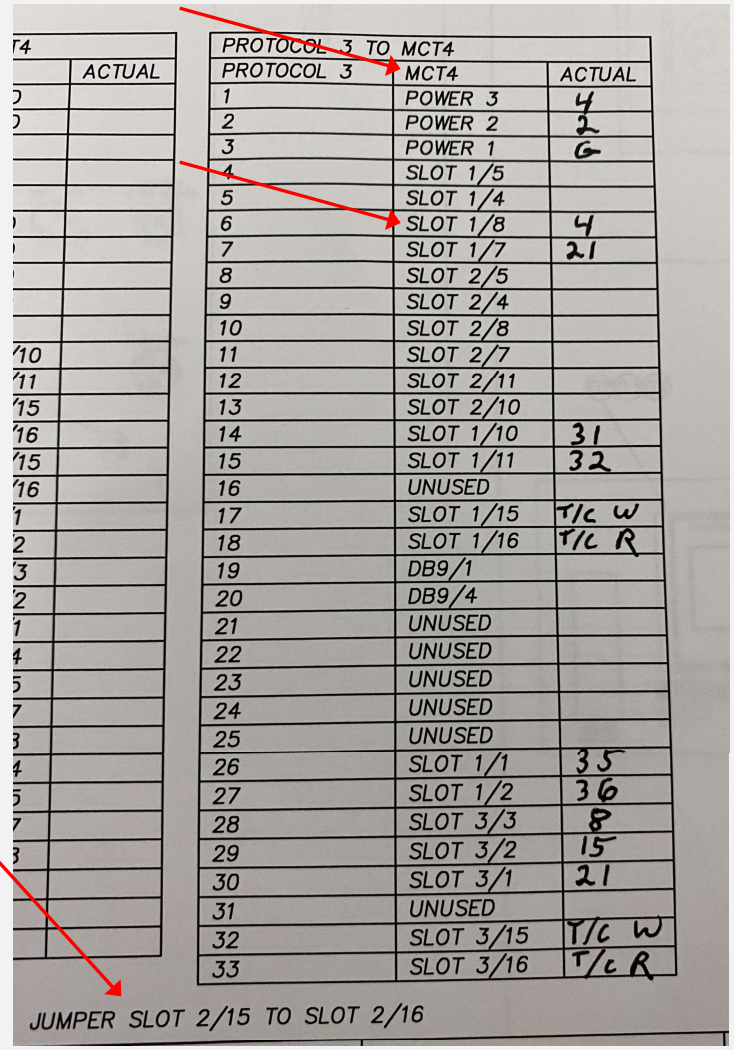
Example SLOT 1/8 means SLOT number 1, terminal 8.

Move the wires to the terminals as shown in the table.

Also strip both ends of the 2-inch piece of wire cut previously and connect between terminals 15 and 16 on SLOT 2 as shown in the note on the instruction drawing.

Reinstall the connectors to the back of the control.

Reinstall or close the control panel.



T4	ACTUAL
0	
0	
10	
11	
15	
16	
15	
16	
1	
2	
3	
2	
1	
4	
5	
7	
3	
4	
5	
7	
3	

PROTOCOL 3 TO MCT4

PROTOCOL 3	MCT4	ACTUAL
1	POWER 3	4
2	POWER 2	2
3	POWER 1	G
4	SLOT 1/5	
5	SLOT 1/4	
6	SLOT 1/8	4
7	SLOT 1/7	21
8	SLOT 2/5	
9	SLOT 2/4	
10	SLOT 2/8	
11	SLOT 2/7	
12	SLOT 2/11	
13	SLOT 2/10	
14	SLOT 1/10	31
15	SLOT 1/11	32
16	UNUSED	
17	SLOT 1/15	T/C W
18	SLOT 1/16	T/C R
19	DB9/1	
20	DB9/4	
21	UNUSED	
22	UNUSED	
23	UNUSED	
24	UNUSED	
25	UNUSED	
26	SLOT 1/1	35
27	SLOT 1/2	36
28	SLOT 3/3	8
29	SLOT 3/2	15
30	SLOT 3/1	21
31	UNUSED	
32	SLOT 3/15	T/C W
33	SLOT 3/16	T/C R

JUMPER SLOT 2/15 TO SLOT 2/16

Step 9:
Load the configuration file into the control

The configuration USB Memory stick has many different configuration files for different model ovens, and different options. In order to choose the correct configuration file, you need to know a little about your oven.

1. Thermocouple type
   Red and White wires = J
   Red and Yellow wires = K
   Most Despatch ovens use type J
2. Desired units of measure ºC or ºF
3. Max operating temp of your oven
   See third digit of the oven model number
   B=400ºF (204ºC), C=500ºF (260ºC), D=650ºF (343ºC), E=850ºF (454ºC), F=1000ºF (538ºC)
4. What output relay is used for end of cycle signal

Step 9 Continued:

Load the configuration file into the control

All the configuration file names start with MCTA_

The next three digits for this kit are always PEA

The fourth digit selects the thermocouple type and selects if the temperature is displayed in ºC or ºF.

The fifth digit is the max temp of the oven.

The sixth digit for this kit should always be 2.

The seventh digit selects the end of cycle relay.

The eighth digit should be 0.

MCT4/B Configuration

1|2	3	4	5	6	7	8	9	10

1|2 - Loop/slot configuration

- E1; Heat (1 loop); 2 relays; With retransmit 0-10V
- E2; Heat (1 loop); 5 relays; With retransmit 0-10V
- E3; Heat/Cool (1 loop); 5 relays; Without retransmit
- E4; Heat/Cool (1 loop); 4 relays; With retransmit 0-10V
- E5; Heat (cascade); 5 relays; With oven TC retransmit 0-10V
- E6; Heat (cascade); 5 relays; With part TC retransmit 0-10V
- E7; Heat (cascade); 4 relays; With part and oven TC retransmit 0-10V
- PE; Protocol Plus/Protocol 3 replacement (electric heat)

3 - Hardware options

- 0; None
- A; Integrated limit
- B; 8TC(J)
- C; 8TC(K)
- D; Integrated limit + 8TC(J)
- E; Integrated limit + 8TC(K)

4 - Process input unit

- 0; TC type J (°F) – also applies to limit TC input if present
- 1; TC type J (°C) – also applies to limit TC input if present
- 2; TC type K (°F) – also applies to limit TC input if present
- 3; TC type K (°C) – also applies to limit TC input if present

5 - Operating limit

- B; Max temp 400°F (204°C)
- C; Max temp 500°F (260°C)
- D; Max temp 650°F (343°C)
- E; Max temp 850°F (454°C)
- F; Max temp 1000°F (538°C)

6 - Process variable retransmit (Slot1/Slot2/Slot3)

- 0; None (E1 to E7)
- 1; 0-10V/None/None (E1, E2, E4, E6, PE)
- 2; 0-5V/None/None (E1, E2, E4, E6, PE)
- 3; None/0-10V/None (E5)
- 4; None/0-5V/None (E5)
- 5; 0-10V/0-10V/None (E7)
- 6; 0-10V/0-5V/None (E7)
- 7; 0-5V/0-10V/None (E7)
- 8; 0-5V/0-5V/None (E7)

7 - End of program

- 0; None
- 1; EV1
- 2; EV2 (PE only)
- 3; EV5 (PE only)

8 - Alarm event

- 0; None
- 1; High process alarm – EV4
- 2; Low process alarm – EV4
- 3; High deviation alarm – EV4
- 4; Low deviation alarm – EV4
- 5; Deviation band (High deviation alarm OR Low deviation alarm) – EV4

9, 10 - TBD

Step 9 Continued:

Load the configuration file into the control

Write down your configuration file name according to your oven's requirements.

See link below for instructions on importing the configuration file.

https://support.itweae.com/support/solutions/articles/42000093814-mct4-export-import-configuration

Also see link below for helpful training videos on the MCT4 control.

https://support.itweae.com/support/search?term=MCT4

MCTA_	PE	A	X	X	2	X	0
			0= Type J, °F	B=400°F (204°C)		0=None	
			1= Type J, °C	C=500°F (260°C)		1=EV1	
			2=Type K, °F	D=650°F (343°C)		2=EV2	
			3=Type K, °C	D=850°F (454°C)		3=EV5	
				E=1000°F (538°C)			