

HOW DO I USE THE INSTRUMENT CLOCK AND COUNTERS IN A RECIPE?

This set of version 3 recipe programs is used to control the startup and shutdown sequence for four cooling fans. Additional fans turn on or off at four different temperature ranges. The fans are connected to the Dualpro's internal events 0, 1, 2, 3.

The main clock is used to count down from 24 hours. When the clock times out, the reference number is incremented to call another set of subroutines used to turn on or off the same set of fans in a different sequence. This distributes the ware on the fans so one fan does not run long than any of the other fans.

The reference number and clock are preset at the beginning of the main program to make sure they are set to the correct values. The following table shows the relationship between the temperature set points, the sequence number, and the fans.

	Sequence Number				
Temp F°	100	101	102	103	
129	1	2	3	4	FAN
134	2	3	4	1	#
139	3	4	1	2	
144	4	1	2	3	

The follow table shows the relationship between the sequence number and the subroutines that run to turn on or off the fans.

Seq Num	Fan ON	Fan OFF
100	100	104
101	101	105
102	102	106
103	103	107

The reference number is used to call the **FAN ON** programs. That is way they are sequential. They jump to the **FAN OFF** routines and then return to the main program.

Many of these programs are the same with only the event numbers changed. That means you can enter program 100 and copy it to programs 101, 102, and 103 with minor editing. Program 104 can be used for 105, 106, and 107.

Here is the listing for each program used to run the fans.

PROGRAM 1

Main program that sets Timer for 24 hrs

Checks Temp on Cooler and increments Ref Number as counter

01	n	0100	Preset Ref Num = 100
02	T	24:00	Set timer = 24 hours
03	G	0201	Goto program that = Ref Num
04	t	00:00	Is Elapsed Timer = 00:00?
05	b	03.06	If no goto 3 yes goto 6 !LOGIC REVERSED ON THIS TEST!
06	q	0102	Ref number > 102?
07	b	08.09	If yes goto 8 no goto 9
08	n	0099	Reset Ref number
09	d	0001	Increment Ref number
10	b	02.02	Restart timer

PROGRAM 100

SEQ 100 FOR FANS ON COOLER.

CHECK TEMP

01	h	0129	Is temp above 129?
02	b	03.16	Yes goto step 3; no goto 16
03	E	000.1	Turn on Fan 1
04	h	0134	Is temp above 134?
05	b	06.16	Yes goto step 6; no goto 16
06	E	001.1	Turn on Fan 2
07	h	0139	Is temp above 139?
08	b	09.16	Yes goto step 9; no goto 16
09	E	002.1	Turn on Fan 3
10	h	0144	Is temp above 144?
11	b	12.16	Yes goto step 12; no goto 16
12	E	003.1	Turn on Fan 4
13	h	0155	Is temp above 155?
14	b	15.16	Yes goto 15 no goto 16
15	A	0010	Alarm "TEMP TOO HIGH"
16	i	0004	4 Second Delay for fan contactor
17	J	0104	Check Temp < 144

PROGRAM 101

SEQ 101 FOR FANS ON COOLER.

CHECK TEMP

01	h	0129	Is temp above 129?
02	b	03.16	Yes goto step 3; no goto 16
03	E	001.1	Turn on Fan 2
04	h	0134	Is temp above 134?
05	b	06.16	Yes goto step 6; no goto 16

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06	E	002.1	Turn on Fan 3
07	h	0139	Is temp above 139?
08	b	09.16	Yes goto step 9; no goto 16
09	E	003.1	Turn on Fan 4
10	h	0144	Is temp above 144?
11	b	12.16	Yes goto step 12; no goto 16
12	E	000.1	Turn on Fan 1
13	h	0155	Is temp above 155?
14	b	15.16	Yes goto 15 no goto 16
15	A	0010	Alarm "TEMP TOO HIGH"
16	i	0004	4 Second Delay for fan contactor
17	J	0105	Check Temp < 144

PROGRAM 102

SEQ 102 FOR FANS ON COOLER.

CHECK TEMP

01	h	0129	Is temp above 129?
02	b	03.16	Yes goto step 3; no goto 16
03	E	002.1	Turn on Fan 3
04	h	0134	Is temp above 134?
05	b	06.16	Yes goto step 6; no goto 16
06	E	003.1	Turn on Fan 4
07	h	0139	Is temp above 139?
08	b	09.16	Yes goto step 9; no goto 16
09	E	000.1	Turn on Fan 1
10	h	0144	Is temp above 144?
11	b	12.16	Yes goto step 12; no goto 16
12	E	001.1	Turn on Fan 1
13	h	0155	Is temp above 155?
14	b	15.16	Yes goto 15 no goto 16
15	A	0010	Alarm "TEMP TOO HIGH"
16	i	0004	4 Second Delay for fan contactor
17	J	0106	Check Temp < 144

PROGRAM 103

SEQ 103 FOR FANS ON COOLER.

CHECK TEMP

01	h	0129	Is temp above 129?
02	b	03.16	Yes goto step 3; no goto 16
03	E	003.1	Turn on Fan 4
04	h	0134	Is temp above 134?
05	b	06.16	Yes goto step 6; no goto 16
06	E	000.1	Turn on Fan 1
07	h	0139	Is temp above 139?
08	b	09.16	Yes goto step 9; no goto 16
09	E	001.1	Turn on Fan 2

10	h	0144	Is temp above 144?
11	b	12.16	Yes goto step 12; no goto 16
12	E	002.1	Turn on Fan 3
13	h	0155	Is temp above 155?
14	b	15.16	Yes goto 15 no goto 16
15	A	0010	Alarm "TEMP TOO HIGH"
16	i	0004	4 Second Delay for fan contactor
17	J	0107	Check Temp < 144

PROGRAM 104

SEQ 100 FANS OFF FOR COOLER.

CHECK TEMP < 144

01	h	0144	Is temp above 144?
02	b	13.03	Yes goto step 13; no goto 3
03	E	003.0	Turn off Fan 4
04	h	0139	Is temp above 139?
05	b	13.06	Yes goto 13 no goto 6
06	E	002.0	Turn off Fan 3
07	h	0134	Is temp above 134?
08	b	13.09	Yes goto 13 no goto 9
09	E	001.0	Turn off Fan 2
10	h	0129	Is temp above 129?
11	b	13.12	Yes goto 13 no goto 12
12	E	000.0	Turn off Fan 1
13	i	0004	4 Second Delay for fan contactor

PROGRAM 105

SEQ 101 FANS OFF FOR COOLER.

CHECK TEMP < 144

01	h	0144	Is temp above 144?
02	b	13.03	Yes goto step 13; no goto 3
03	E	000.0	Turn off Fan 1
04	h	0139	Is temp above 139?
05	b	13.06	Yes goto 13 no goto 6
06	E	003.0	Turn off Fan 4
07	h	0134	Is temp above 134?
08	b	13.09	Yes goto 13 no goto 9
09	E	002.0	Turn off Fan 3
10	h	0129	Is temp above 129?
11	b	13.12	Yes goto 13 no goto 12
12	E	001.0	Turn off Fan 2
13	i	0004	4 Second Delay for fan contactor

PROGRAM 106

SEQ 102 FANS OFF FOR COOLER.

CHECK TEMP < 144

01	h	0144	Is temp above 144?
02	b	13.03	Yes goto step 13; no goto 3
03	E	001.0	Turn off Fan 2
04	h	0139	Is temp above 139?
05	b	13.06	Yes goto 13 no goto 6
06	E	000.0	Turn off Fan 1
07	h	0134	Is temp above 134?
08	b	13.09	Yes goto 13 no goto 9
09	E	003.0	Turn off Fan 4
10	h	0129	Is temp above 129?
11	b	13.12	Yes goto 13 no goto 12
12	E	002.0	Turn off Fan 3
13	i	0004	4 Second Delay for fan contactor

PROGRAM 107

SEQ 103 FANS OFF FOR COOLER.

CHECK TEMP < 144

01	h	0144	Is temp above 144?
02	b	13.03	Yes goto step 13; no goto 3
03	E	002.0	Turn off Fan 3
04	h	0139	Is temp above 139?
05	b	13.06	Yes goto 13 no goto 6
06	E	001.0	Turn off Fan 2
07	h	0134	Is temp above 134?
08	b	13.09	Yes goto 13 no goto 9
09	E	000.0	Turn off Fan 1
10	h	0129	Is temp above 129?
11	b	13.12	Yes goto 13 no goto 12
12	E	003.0	Turn off Fan 4
13	i	0004	4 Second Delay for fan contactor