



DCP 301 TAC Tip

CONDENSED GUIDE TO CONFIGURATION AND PROGRAMMING

INSTRUMENT CONFIGURATION

Before entering programs you must do some basic parameter configuration of the DCP 301 in the following sequence. SETUP, PARAMETERS, PID GROUPS and EVENTS.

Note: The instrument must be in the "ready" (i.e. 'RUN' or 'HLD' LED not lit) mode. To put the instrument in the ready mode, Press the **DISP** key , press the **PROG** and **RUN/HOLD** keys simultaneously. This resets the instrument and prepares the instrument for configuration.

SETUP DATA (See page 7-31 to 39)

Press the **FUNC** and **PARA** keys simultaneously, then press the **PARA** key until **SEt** appears in the display. Press the '**ENT**' **ENTER** key and you are in the SETUP configuration mode. This Defines the instrument range, control action (direct / reverse), setpoint limits, time units, etc. Each configurable unit is identified by a code number, C-01 through C-00 (100), (you won't use them all). The code number is displayed in the upper display when you press the **up** or **down** arrow key. The meaning of the code number currently displayed is defined in the setup data table. For example "C-01 means "Control action(CH1)". You must make a selection for each configurable setup item. Press the **DISP** key to exit configuration.

The available choices for each setup item are listed on page 7-27 through 7-32 of the Product Manual.

Example: Control action 1 is Direct action (cool). To make your selection press "ENT" **ENTER** , (the lower display will flash), enter the number "1" using the arrow keys and press "**Enter** " again to put your choice in to memory. Proceed to the next code by pressing **down** arrow key again

Note: You can scroll through the various setup items in either directions with the up and down keys or scroll by 10's by using the left and right arrow keys. You will follow the same procedure when you enter Parameters, PID Groups, and Events later on.

The "setup code C-64" establishes the program time base; HR:MIN (0) or MIN: SEC (1).

VARIABLE PARAMETERS (See page 7-7 to 7-17)

Press the **FUNC** and **PARA** keys simultaneously, then press the **PARA** key until **PARA** appears in the display. Press the '**ENT**' **ENTER** key and you are in the PARAMETER configuration mode. This area defines keylock, auto-tune, PV bias, etc. Each configurable parameter is identified by a code number 1 through 33 which is displayed in the SEG window when you push up arrow key. The upper display displays the meaning of the code number currently selected. Proceed to enter a selection on the lower display. *The available choices for each setup item are listed on page 7-7 through 7-8 of the Product Manual.*

Follow the same procedures outlined under Setup Data. Press the **DISP** key to exit configuration.



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• **PID GROUPS** C11= 0 PID auto switching OFF (See page5-8)

Press the *FUNC* and *PARA* keys simultaneously, then press the *PARA* key until *Pid* appears in the display. Press the 'ENT' ENTER key and you are in the PID configuration mode. Defines the process tuning, *The available choices for each setup item are listed on page 7-23 through 7-26 of the Product Manual.*

Eight PID sets can be configured and any set can be assigned to any segment of a program. Each configurable parameter is identified by a code number 1 through 80 which is displayed in the SEG window when you push the **up** or **down** arrow key. The upper display prompts you for a Proportional Band value for the first group ("P-1"), the Integral value for the first group ("I-1"), the derivative value for the first group ("D-1"), manual reset for the first group ("RE-1"), you will not be using ("Br-1") leave it 0, and (oL-1, oH-1) output low and high limits, for the first group. Advance through the prompts sequentially by pushing the **down** arrow key.

Enter your values on the lower display per procedure outlined above under Setup. Then proceed with the additional groups, if you plan to use them. Use the **down** arrow key to advance through the prompts. It's not necessary to use all PID sets, so I would only setup the first set as a start. Press the *DISP* key to exit configuration

If you do not know where to set these values, start with a P-1 = 100, I-1 = 120 and D-1 =30. Later in the start up, you can Autotune the unit. This will automatically determine the PID settings. You can add others as needed later, when you have completed entering your program profile. If you have entered more than one you will be able to choose from the PID sets and assign them to various segments to maximise your control. All the segments in a program are defaulted to PID set 1. So if you do not assign any PID group, it will default to PID group 1.

EVENTS (See pages 5-3 to 5-7)

Press the *FUNC* and *PARA* keys simultaneously, then press the *PARA* key until *Ev* appears in the display. Press the 'ENT' ENTER key and you are in the EVENT configuration mode. Defines the event operation, *The available choices, for each event item, are listed on page 7-23 through 7-26 of the Product Manual.*

There are 5 optionally available time events (Open collector outputs). Leave code number 13 "tt" = 0.

In addition there are 3 standard Events (Relay contact outputs), any or all of which can be configured by code numbers to be a certain type of event. For example: Type 0 is a PV direct (high event), and so on. There are many types from which to choose. (Type 0 through Type 117). Not all are used. See pages 7-18 though 7-21 in the Product Manual for a list of the available Event Types.

Note:

- Event types 1 through 50 are "Segment" events and are assigned to segments of a particular program
- Event types 100 through 117 are "Status" events.

Configuring events: The prompt in the upper display will read "Et1", meaning: Event # 1 type. The lower display is looking for a # which represents the type of event desired. See page 7-18 in the Product Manual. Enter your selection by following the same procedures as outlined above, under Setup. You will proceed with each step of the event configuration process by pressing the **right** or **down** arrow key sequentially. You can go back to the previous event settings with the **left** or **up** arrow key. Some events require additional setting such as the "HYS1" hysteresis value for "PV HI Event". This prompt appears, after you have entered your event type. Press the *DISP* key to exit configuration



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PROGRAM OPERATION

Entering a Program (See page 5-2)

When you have completed your basic configuration, the DCP 301 is ready to accept a program

A program consists of a series of Soak and Ramp segments. It's a good idea to first sketch out your profile with the soak and ramp values for ready reference, (See programming map form at end of product manual) then simply copy your segment values one step at a time and create your profile on the DCP. Don't worry about the G.Soaks, Events, Etc. at this time. We'll get them later.

Before we start to program for the first time make a habit to check the code C-64 to see what the time "Unit" is set for because once selected all programs will be in that mode. OK it's now time to get into the Program Mode.

The Instrument must be in the Ready Mode, (i.e. 'Run' or 'Hld' LED not lit). Press the "**Prog**" key. Use the "**Prog**" key to increase the program # or the **down** arrow to decrease the program # until you have arrived at the program # you wish to enter a program in.

Note: You can tell if a program is open if the lower display is all "----".

Now press both the "**Func**" **and the "Prog" together** at the same time. The "**PRG**" LED indicator will illuminate, and both upper and lower displays are all dashes. Press '**ENT**' ENTER and the upper display begins to flash. All programs must start with a soak. A good way to program is to use odd # as soaks segments, and all even # as ramps segments. The SEG display shows what segment number you are configuring.

Enter the SP using the **arrow keys** and when the desired start temperature is in the window press "**ENT**" ENTER. The lower display begins to flash all Zero's and is looking for a soak time, since this is a start point no need to enter any time so press "**ENT**" ENTER.

We are now ready for segment #2. Press the **right arrow** and the segment # changes to "2". Press '**ENT**' ENTER We are now ready to enter a ramp, being an even # we know it's a ramp. In the upper display, we must enter the setpoint that we are going to ramp to using the **arrow keys**. In the lower display, we must set the ramp time; The window appears as 00:00. If we have selected the units of time as "Hours" then the leading 00's represent hours and the trailing 00 represent Minutes. If we want the time to complete the ramp to be 30 minutes we would enter 00:30.

Continue to enter your program profile and when you have completed all the soaks and ramps it's time to enter the rest of the program. In most cases all soak segments except #1 will be Guaranteed soaks (G.Soaks). Every segment of the program may have several associated settings that may also be entered. When you have entered the soak and ramp values, press the **down arrow** key to program the following data in the sequence shown below.



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EVENTS (See page 5-3 to 5-7)

All segment events which you have previously configured can be assigned to any segment as required by your program. This is where the sketch of your program profile will be a big help. You will only see the Segment events that you have configured. You forgot one? No problem, just save the program, configure the event you forgot, and then go back into the program mode and continue where you left off.

When the EV1 LED lights, press '**ENT**' **ENTER**, the upper display will flash. It's looking for the trip value for the event. If it's a time event, the upper display shows the on time and the lower shows the off time. Choose the appropriate values and press '**ENT**' **ENTER**. Continue programming configured events. The LEDs next to the event presently being configured will light. Use the **right** and **left** arrows to select LEDs.

Hint:

If you want to have the time event 'on' for the complete segment, enter 0 for the "on" time and make *no entry* (---) in the "off" time. This will prevent a problem when you have a 30 minute soak and a time event set for 0 and "off" set at 30 minutes, and someone decides to add more soak time to the segment and forgets that there is a time event on this segment.

PID SETS (See page 5-8)

This prompt allows you to set the PID group # to any particular segment. If you have previously configured more than one PID set you can now assign them to specific segments. If you assign one to a segment it will remain in effect till another one is assigned in a later segment. If you do not assign a PID set then the DCP uses PID set #1.

If you found at the higher temperature ranges you have better control with a different set of PID settings than you received at lower temperature ranges, you can assign that group to the higher SP segments. Once you enter a group it remains in effect till you enter another group. You have up to 8 different groups you may use.

The first line is "**Pid**" group. Enter the # of the PID group you want to use. If no entry is made, PID 0 will be used, which is PID set 1.

G. SOAK BAND (See page 5-8)

This code allows you to set the soak segments to a guaranteed soak as to opposed to a regular soak.

The second line asks for the G.Soak band. Enter the boundary in degrees of the setpoint you want to reach before you start timing.

Example: If you want to have a guaranteed soak at 300 degrees: A setting of 5 degrees would mean that at 295 degrees the timing would start, or if coming down from a higher temperature to 300 degrees, the timing would start at 305 degrees.



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PV START "P.StA" (See page 5-9)

This prompt allows you to make a *"hot start"*. If you wrote a program and the first segment called for a starting SP at say 75 degrees, the oven or furnace might be at room temperature on the first run of the day, but after the first run it might be warmer. The next run would again start ramping at 75 degrees which would be a waste of time since the oven or furnace might be at 150 degrees. With this prompt, the programmer would automatically start ramping at 150 degrees or the current PV, thus saving the wasted time ramping to the current PV. From segment #1, press the *down arrow* till **"P.StA"** appears in the window. Enter your choice in the lower display, then press **"ENT" ENTER**.

PROGRAM CYCLE "CyCL" (See page 5-9)

This prompt allows you to cycle a complete program up to 9999 times. At segment #1 press the *down arrow* till **"CyCL"** appears in the window. Enter the number of time you want to cycle this program, then press **'ENT' ENTER**.

PROGRAM LINK "P.LI n" (See page 5-10)

This prompt allows you to link one program to another. From the last segment of the first program you want to run, press the *down arrow* till **"P.LI n"** appears, then press **'ENT' ENTER**. The lower line begins to flash. Enter the program # which you wish to link to the first program, then press **'ENT' ENTER**. When the first program finishes, the second program will run .



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START UP PROCEDURE

Tuning / Auto Tuning (Page 6-5)

Before placing the programmer in full production, proper tuning values are needed for the unit to control at the desired SP. If you have no idea where to set the PID values, use Auto Tune. In the Parameter section set code **PA09 (At)** to **1 (normal)** or **2 (conservative)**. Run a program, which has a SP near the operating range of the system. While the program is running, press the “**AT**” key. The AT LED will flash indicating that the unit is self tuning. When the 'AT' LED has stopped flashing, the PID values have been stored.

EDIT PROCEDURES

COPY A PROGRAM (Page 8-14)

Select the program you wish to copy (The Source Program). Press and hold the **up** arrow, then press the **Prog** key. "Copy" will appear in upper display. The lower display begins to flash and the next available open program appears. You can select this one, or by using the **up** or **down** arrows select the one of your own choosing. Only unused programs will appear. Press '**ENT**' **ENTER** and the program is copied. This is very handy because it's much quicker to edit an existing program than enter one from scratch.

DELETE A PROGRAM (Page 8-12)

Select the program you wish to Delete. Enter the program mode (**Func/Prog**). Select segment #1 using the arrow key. Press '**ENT**' **ENTER** and the upper display begins to flash. Hold down "**Func**" and press "**Clr**". "Clear" now appears in the upper display. Press '**ENT**' **ENTER** and your program is deleted.

INSERT A SEGMENT (Page 8-13)

Put instrument into the program mode, "**Func**" / "**Prog**". Advance to the desired segment using the arrow key. Hold down "**Func**" and press "**ENT**" **ENTER**. The upper display shows "**INS**". Press "**ENT**" **ENTER** and proceed to enter the segment values per normal procedure.

Note: all segments advance one position. If you want to insert a Soak segment, then two segments would be needed.



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DELETE A SEGMENT (Page 8-21)

Put instrument into program mode, "*Func*"/ "*Prog*". Advance to the desired segment using the arrow key. Hold down "*Func*" and press "*ENT*" *ENTER*. The upper display shows "INS". Push the *down arrow*. The display reads "DEL". Push "*ENT*" *ENTER*. Your segment will be deleted. Be aware that by deleting a Ramp segment, now make the next segment a Ramp segment.

DELETE AN EVENT FROM A SEGMENT

Choose a program number and enter the program mode, "*Func*"/ "*Prog*". Using the arrow keys, select the event in a particular segment that you wish to delete, then press "*ENT*" *ENTER*. The Upper display will flash. Hold down "*Func*" and press "*Clr*". The event will be removed from the segment.

VERIFY A PROGRAM IN READY MODE

Choose the program you wish to Verify in program display, then press "*ENT*" *ENTER*. Now enter the program mode "*Func*"/ "*Prog*"... Sound familiar? Yes you are in the program mode and you can verify, change anything, add anything. Practically do any thing you want. When done press "*Disp*" and all your changes are stored in memory.

VERIFY A PROGRAM IN THE RUN MODE

At any point during a program run, you may enter the program mode by pressing the "*Func*"/ "*Prog*" keys. You can now verify the program you are now running and make changes to the program. All this while the program continues to run. When finished press "*Disp*" and all indications return to normal and the program never skipped a beat.

VERIFY A DIFFERENT PROGRAM THEN THE ONE YOU ARE RUNNING

During a run of a program ,enter the program mode as if you were going to verify the program you are presently running. Now press the "*Func*"/ "*Prog*" keys a second time and the program # begins to flash. Using the arrow keys place the program you wish to Verify in the program window and press "*ENT*" *ENTER*.

You can now verify this program and make any changes you wish .When done, just press "*Disp*" to store to memory and again you never missed a beat on the running program.

ENTER A PROGRAM WHILE RUNNING A PROGRAM

The same as above the next empty program will be displayed. To select another empty program, press the "*Func*"/ "*Prog*" keys again. When you selection is in the program window start programming!!