

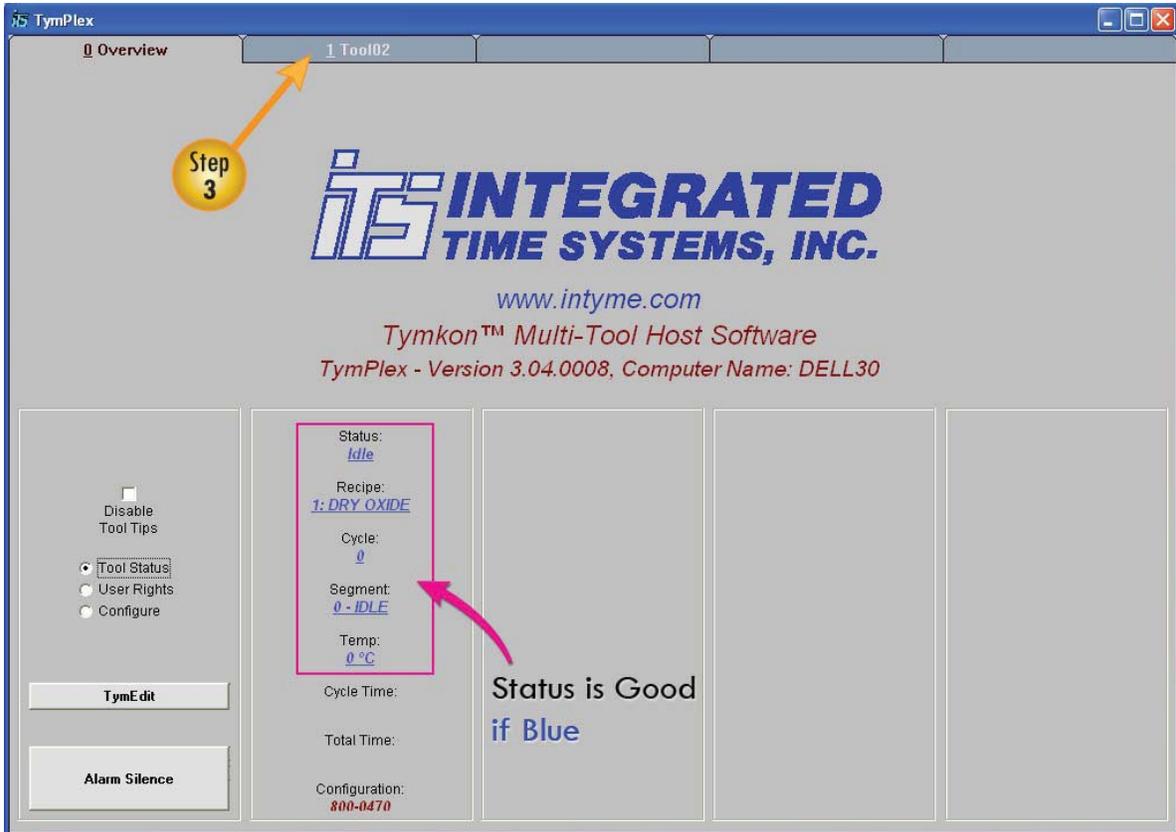
There are two main software components used in the system.

- The **TymEdit** application allows you to create and edit database files, each of which contains an entire set of recipes and segments.
- The **TymPlex** application is used to download recipes to the Chronos and then run them.

RECIPE FILE DOWNLOAD

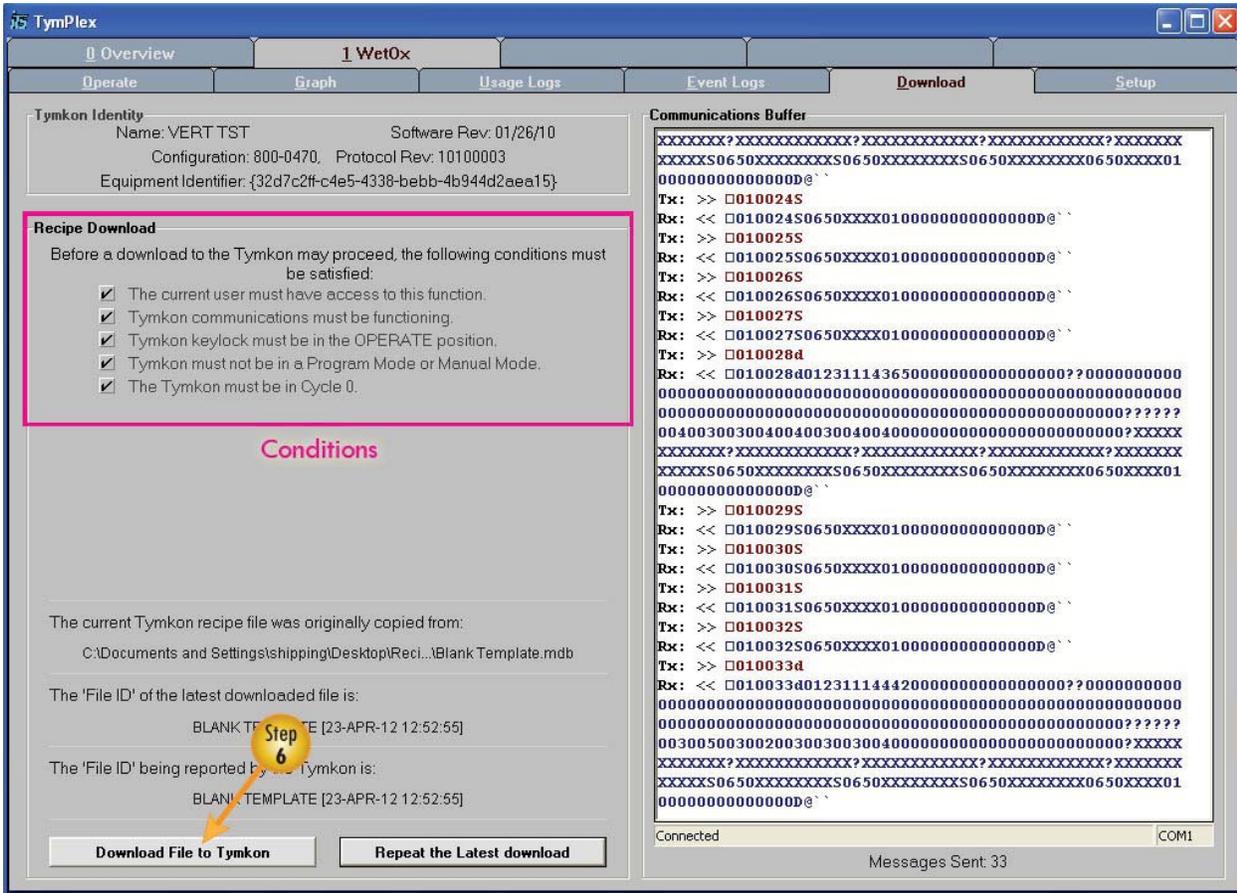
This example downloads a **Recipe File** from the computer to the Chronos computer inside the CTR-125/CTR-200. A recipe file can contain up to 32 individual recipes.

1. Open the *TymPlex* application. The window shown below appears. This is the **Overview** page.



2. The tool Status, Recipe and Cycle attributes in the second panel should be shown in blue lettering, as shown above.
 - Red question marks on this page indicate a communication problem between the Host Computer and Chronos. Check the **COM1** setting, under **Maintenance Parameters**, on the **Setup** page of *TymPlex*.
3. From the **Overview** page, select the **Tool 01** tab.
 - **Note:** “Tool 01” is the default name and your particular tool will most likely be named something else. The tool name can be changed in the *TymPlex* **Setup** page, in the **Engineering Parameters** box.

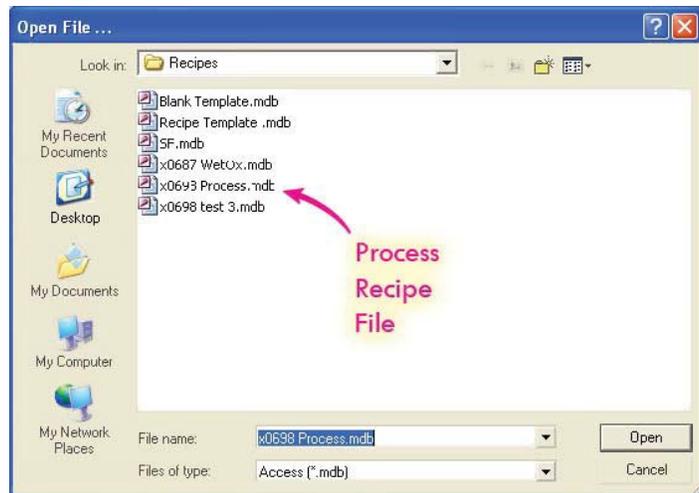
4. Select the **Download** tab. The following window appears.

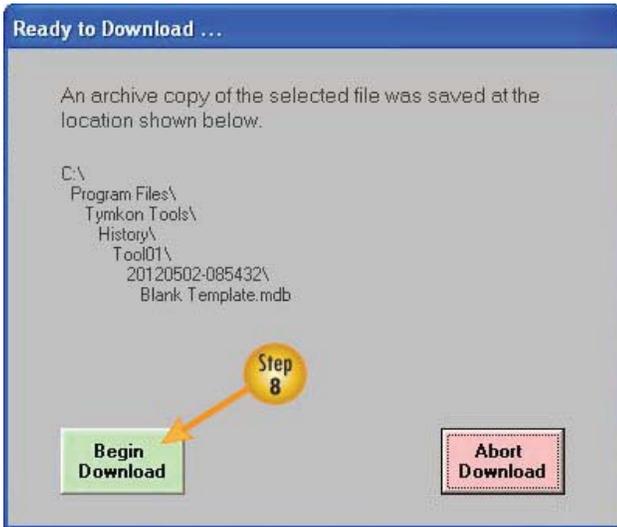


5. Before a recipe file can be downloaded, several conditions must be satisfied. The **Conditions** identified above must be checked and there must not be any red text on the screen. Once the conditions are satisfied, you may proceed to the next step.

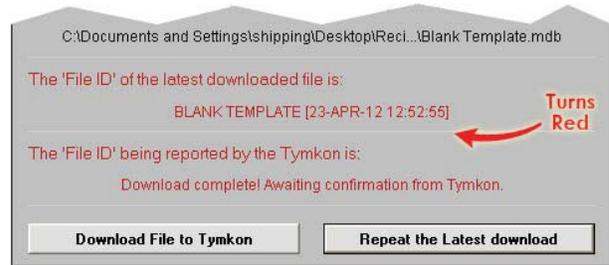
6. Click the **Download File to Tymkon** button. A pop-up dialog box appears asking you to select the recipe file to download.

7. Locate and select the desired recipe file, then click **Open**.

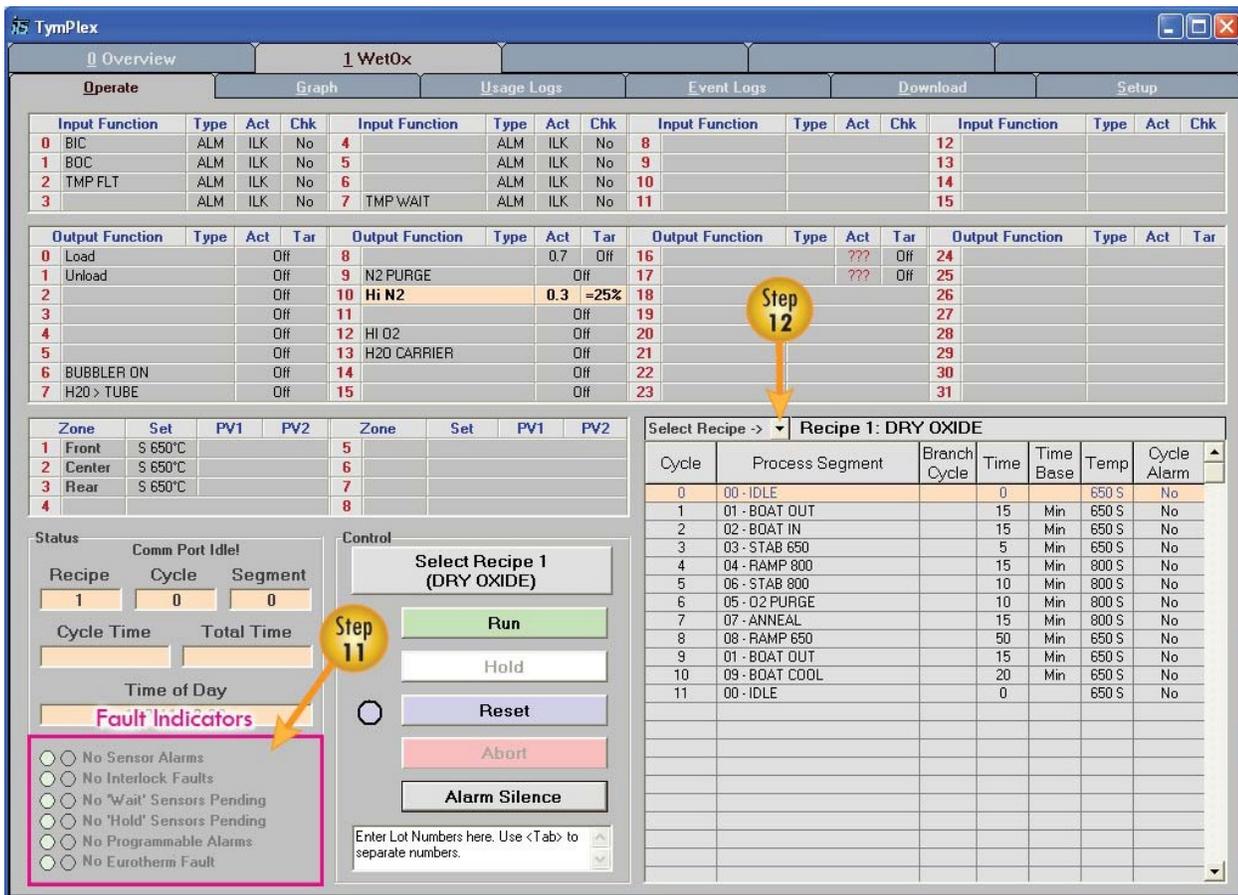




- The “**Ready to Download...**” dialog box appears. Click the green **Begin Download** button and the recipe file downloads into Chronos.
- After downloading, the download information in the lower left corner of the screen turns red for a few seconds and then switches back to black. This is normal.



- Click the Operate tab. The following window appears.



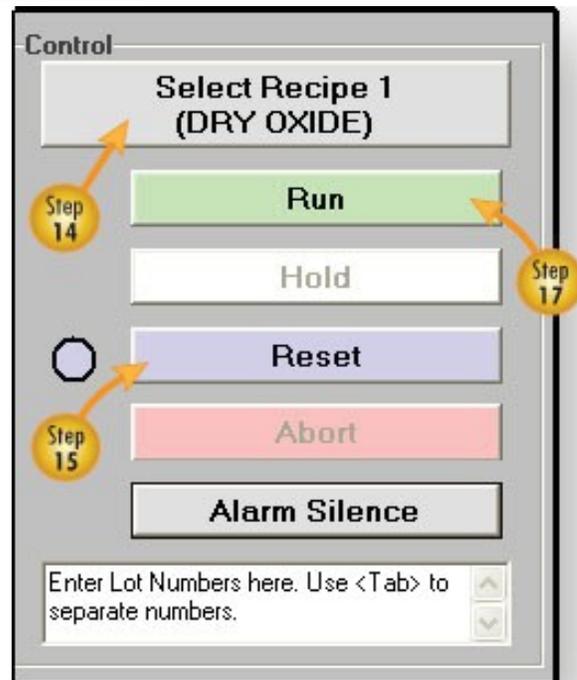
- Check the Fault Indicators in the lower left corner of the screen. All indicators should show pale green for OK.

SELECT AND RUN A RECIPE

- Click the tiny triangle next to the **Select Recipe** field and a drop-down menu appears showing the individual recipes in the recipe file you downloaded.

Recipe	Recipe Name	Time Base	Temp	Cycle Alarm
0	MANUAL		650 S	No
1	DRY OXIDE		650 S	No
2		Min	650 S	No
3		Min	650 S	No
4		Min	650 S	No
5		Min	800 S	No
6		Min	800 S	No
7		Min	800 S	No
8		Min	650 S	No
9		Min	650 S	No
10		Min	650 S	No
11			650 S	No
12				
13				
14				
15				

- Select the desired **Recipe** from the drop-down list. The recipe you selected will now appear on the large **Select Recipe** button in the Control Area. Notice that the Recipe steps are “greyed-out.”
- Click the **Select Recipe** button to make your selection the current recipe. The recipe steps now have black text.
- Click the **Reset** button to make sure you’re starting at the beginning of the Recipe.
- Whenever you’re running an actual process, review your safety checklist and make sure everything is in order one last time before pressing **Run**.
- Click the green **Run** button to start the Recipe.



18. After click on Run, the boat will start to unload. Wait till the boat stops.
19. Load wafers or samples on the boat (see picture below).
20. When all wafers or samples are loaded on the boat. Click on HOLD and “NEXT” to next step to load the boat.
21. After BOAT LOAD is complete, click on “RUN” to resume the step.



Furnace boat

CREATING AND EDITING A RECIPE

The *TymEdit* application is used to create and edit Process Recipes. After a recipe is created, it is downloaded to the Chronos on the Expertech CTR using the **TymPlex** application.

Difference between “New” and “Open”

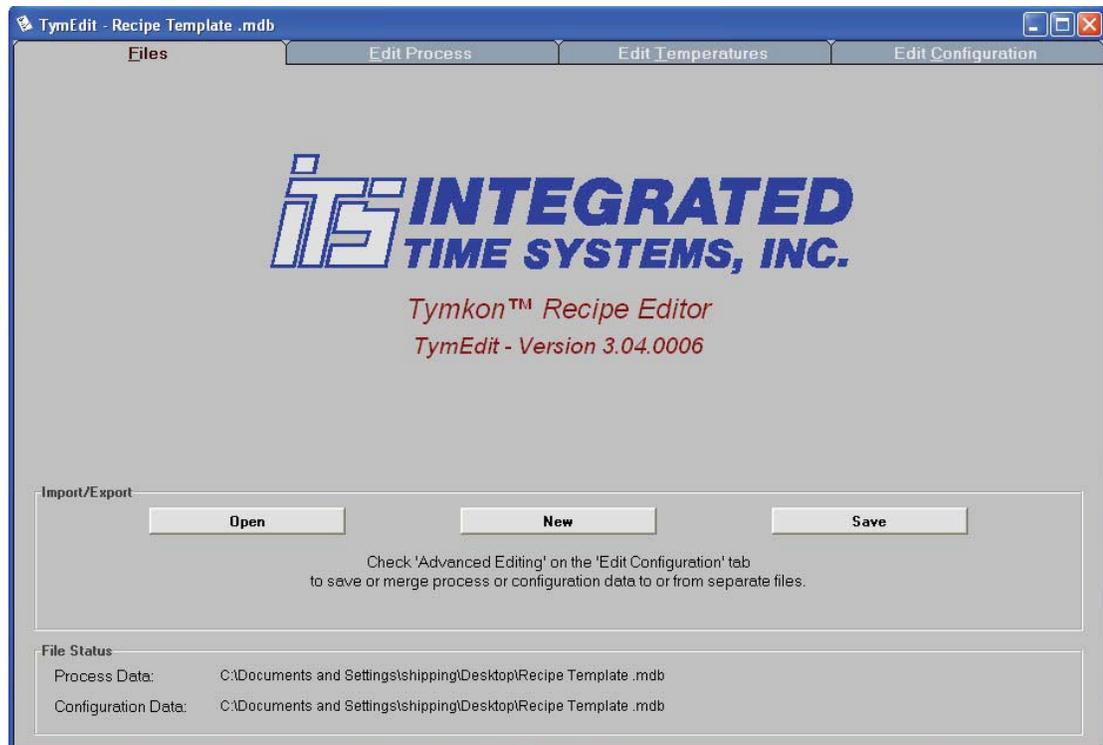
The usual method for creating a new recipe is to **Open** a recipe file as supplied by Expertech. In a **blank** recipe, the *Configuration Data* has been pre-programmed for your specific Expertech tool. This allows you to create custom recipes without having to bother with the low-level

setup details. The **New** function is generally not used, because none of the Configuration Data has been programmed.

In these tutorials, we'll edit the "Blank Recipe" file into a custom recipe.

OVERVIEW OF THE TYMEDIT APPLICATION

1. Open the TymeEdit application. The following window appears.



Open a Template file then Save it

- The **Files...** tab is selected. Click the **Open...** button.
- Locate and select the **Blank Recipe** (template) file.
- Save the Template file (click Save), but be sure to **Rename it** before confirming to keep your original Template intact.
- You now have a blank recipe file ready to be customized.



CAUTION

When creating a new Recipe from a Template, always **Save the Recipe** with a new name to avoid overwriting your blank

The Recipe Editor

- Click the **Edit Process** tab. A screen similar to the one shown below appears.

Rec #	Recipe Name	Cycle	Process Segment	Branch Cycle	Time	Time Base	Temp	Cycle Alarm
0	MANUAL	0	00 - IDLE		0.0			No
1								
2								
3								
4	Recipe							
5	List							
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								

Seg #	Segment Name	Input	Input	Input	Input
0	IDLE	0 <input type="checkbox"/> BIC	4 <input type="checkbox"/>	8 <input type="checkbox"/>	12 <input type="checkbox"/>
1		1 <input type="checkbox"/> BOC	5 <input type="checkbox"/>	9 <input type="checkbox"/>	13 <input type="checkbox"/>
2		2 <input type="checkbox"/> TMP FLT	6 <input type="checkbox"/>	10 <input type="checkbox"/>	14 <input type="checkbox"/>
3		3 <input type="checkbox"/>	7 <input type="checkbox"/> TMP WAIT	11 <input type="checkbox"/>	15 <input type="checkbox"/>
4	Process	0 <input type="checkbox"/> Load	8 <input type="checkbox"/>	16 <input type="checkbox"/>	24 <input type="checkbox"/> Z1 PWR
5	Segment	1 <input type="checkbox"/> Unload	9 <input type="checkbox"/> N2 PURGE	17 <input type="checkbox"/>	25 <input type="checkbox"/> Z2 PWR
6	List	2 <input type="checkbox"/>	10 <input type="checkbox"/> Hi N2	18 <input type="checkbox"/>	26 <input type="checkbox"/> Z3 PWR
7		3 <input type="checkbox"/>	11 <input type="checkbox"/>	19 <input type="checkbox"/>	27 <input type="checkbox"/>
8		4 <input type="checkbox"/>	12 <input type="checkbox"/> HI O2	20 <input type="checkbox"/>	28 <input type="checkbox"/>
9		5 <input type="checkbox"/>	13 <input type="checkbox"/> H2O CARRIER	21 <input type="checkbox"/>	29 <input type="checkbox"/>
10		6 <input type="checkbox"/> BUBBLER ON	14 <input type="checkbox"/>	22 <input type="checkbox"/>	30 <input type="checkbox"/>
11		7 <input type="checkbox"/> H2O > TUBE	15 <input type="checkbox"/>	23 <input type="checkbox"/>	31 <input type="checkbox"/>

Process Segment Details

Apply Button

The Blank Recipe is just that, a blank slate, except for the Configuration Settings, which are identified in the lower center area as **Process Segment Details**. The configuration settings define all the input and outputs for a specific tool. **The configuration settings for your tool will be different than the ones above.**

Overview of the Edit Process Window

Note:

Recipe #0 is designated as “Manual” and cannot be used as a Process Recipe.

1 – Currently Selected Recipe

Identified by the pointer at the left of the Recipe Name.

2 – Recipe Cycle Number

These are the “Steps” of a Recipe. Up to 63 steps (cycles) can be included in a single Recipe.

3 – Process Segments

Segments are selected from the Segment List and used as the building blocks of Recipes. Up to 63 Segments can be included in a Recipe. The IDLE segment is used to hold the tool in a standby state.

4 – Cycle Time

Allows the time for the cycle to be programmed. Cycles may take longer than the programmed cycle time if “Wait Inputs” are enabled. Cycle times range from 0.0 - 999.9 (minutes or seconds).

5 – Time Base

The time base for each Cycle can be specified in either minutes or seconds. Click inside the field to access the drop-down menu.

6 – Temperature

This field programs the *Temperature Setpoint* for the Cycle. If the entered value is **greater than 31**, the value will be used as the Temperature Setpoint for all furnace zones.

If the entered value is **less than 32**, the number will be treated as a **Link** to an entry in the Temperature Segment Table. This is useful for entering temperature setpoint values that are different from zone to zone. See [page 23](#) for more information about temperature zones.

7 – Segment Input Selection

This area defines the digital inputs that can be monitored during segment execution. Digital inputs can be defined as: **Alarm**, **Abort**, **Interlock**, **Hold** or **Wait** conditions.

Check the box of any alarm that needs to be monitored during execution of that segment. Monitored inputs, when active, light the respective LED on the Chronos and modify the behavior of the recipe operation, depending on the input type.

8 – Segment Output Selection

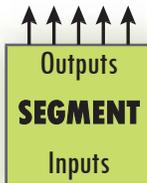
This area defines the digital and analog outputs that can be activated during segment execution.

- a. **Checkbox** – The check box both selects and indicates if the analog or digital output is energized in the particular segment.
- b. **Set Point** – Output functions with analog outputs have a white box to enter a setpoint. The value must be an integer from 0 to 99, indicating the percentage of the full-scale setpoint valve. (i.e. a 30 liter N₂ MFC given a setpoint of “50” is commanding 15 liters of N₂ flow.) An empty box is interpreted as 0.

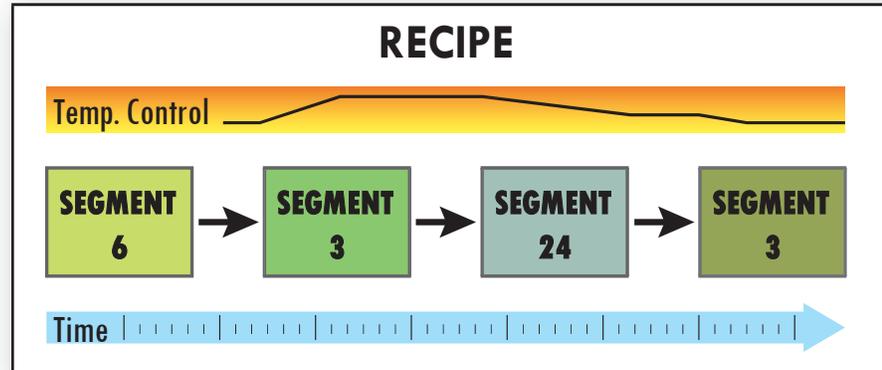


SEGMENTS AND RECIPES

- *DV)ORZV
- 9DOYHV
- %RDW ,Q2XW
- (WF.



- *DV 6HQVRUV
- 'RRU 6HQVRUV
-)DXOW 'HWHEW
- (WF.



Segments control Inputs & Outputs

Recipes control the timing of Segments and Temperature

A **Recipe** may contain up to 64 segments, which are sequentially activated with precise timing in any order. Recipes also control several process temperature zones that can be independently varied and ramped over the desired time range.

Segments define the various analog or digital inputs and outputs that need to be monitored or activated during process execution. Segments control components such as valves, flow controllers, meters, pressure controllers, relays, boat loaders, etc.. Segments also monitor data such as door closures, gas detectors, pressure switches, flow switches and other process-specific devices.

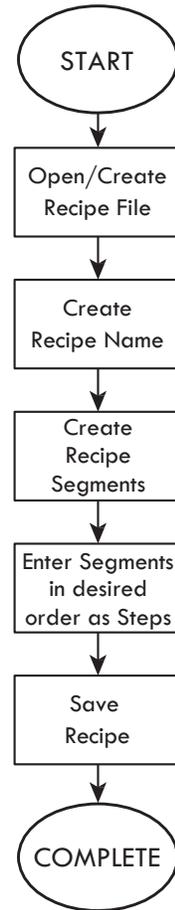
Segments allow you to organize a group of controls and sensors into a manageable building block for creating recipes. Segments do not command process temperature setpoints or timing.

PLANNING A RECIPE

Before starting to program a recipe, it should always be thoroughly planned out and reviewed for errors. Charting and graphing the sequence of events and temperature curves is a useful tool for creating a recipe.

The charts below illustrate the steps of an example recipe.

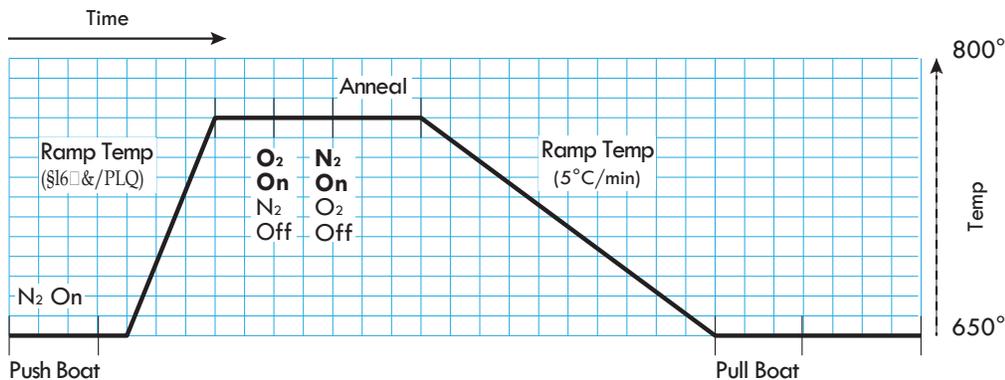
Step	Name	Time (min:sec)	Zone 1 °C	Zone 2 °C	Zone 3 °C	O ₂ (ccm)	N ₂ (ccm)
1	IDLE	1:00				0	8000
2	BOAT OUT	15:00	650°	650°	650°	0	8000
3	BOAT IN	15:00	650°	650°	650°	0	8000
4	Stab. 650	5:00	650°	650°	650°	0	8000
5	Ramp 800	15:00	800°	800°	800°	0	8000
6	Stab. 800	10:00	800°	800°	800°	0	8000
7	O ₂ Purge	10:00	800°	800°	800°	6000	0
8	Anneal	15:00	800°	800°	800°	0	8000
9	Ramp 650	50:00	650°	650°	650°	0	8000
10	BOAT OUT	15:00	650°	650° <td 650°	0	8000	
11	Boat Cool	20:00	650°	650°	650°	0	8000
12	IDLE	1:00	650°	650°	650°	0	4000



Creating a Recipe

The steps required to create a Recipe are shown above.

Diagram of the Example Recipe



Each of the above steps will need to have a segment created, and a time and temperature defined in the recipe step.

RECIPE CREATION

New Recipe

1. In the Recipe List select an unused (green) recipe.
2. Click inside the Recipe Name area and type in a appropriate name. We'll choose the name, **"DRY OXIDE"** for this example.
3. Click the **Insert** button (located in the column of buttons on the right side of the window) to insert cycles into the selected recipe. A pop-up dialog box asks how many cycles you wish to enter.
4. The example recipe has 12 steps, including the beginning and ending IDLE cycles. (See *"The IDLE Cycle"* on the next page.) **Choose 11** for now, then click **OK**. The number of cycles can be adjusted later as the recipe develops.

Rec #	Recipe Name
0	MANUAL
1	DRY OXIDE
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	

The recipe area should now look like the screen below.

Cycle	Process Segment	Branch Cycle	Time	Tim B
0	00 - IDLE		0.0	
1	00 - IDLE		0.0	
2	00 - IDLE		0.0	
3	00 - IDLE		0.0	
4	00 - IDLE		0.0	
5	00 - IDLE		0.0	
6	00 - IDLE		0.0	
7	00 - IDLE		0.0	
8	00 - IDLE		0.0	
9	00 - IDLE		0.0	
10	00 - IDLE		0.0	
11	00 - IDLE		0.0	

Recipes:

Erase

Copy

Move

Swap

Import

Print

Validate

Cycles:

Insert

Delete

Segments:

Clear

Copy

Print

Cancel

Apply

The IDLE Cycle

Cycle 0 (IDLE) is always the first segment in any recipe and is defined as a Idle or Stand-by cycle. If a recipe is selected, but not started, Cycle 0 determines the stand-by behavior. The main idea is that the IDLE cycle will set the condition of the tool before processing begins.

Another IDLE cycle should be inserted at the END of your recipe to return the tool to the stand-by condition. The IDLE cycle can be programmed to your exact specifications, just like any other cycle.

CREATING A NEW SEGMENT

Before adding steps (cycles) to the recipe, we first have to create the segments, which are the building blocks of a recipe. We'll start off by creating a segment with a single output command to move the Automatic Boat Loader out.

Seg #	Segment Name
0	IDLE
1	PULL BOAT
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	

5. Click the **Edit Process** tab.
6. In the Process Segment List, select an unused (green) Process Segment.
7. Click in the Segment Name column and enter a name—BOAT OUT.
8. Left-click on the right edge of the Segment pane and drag to the right to expose the hidden Segment Alarm (Seg Alm) column.
9. Setting this field to **Yes** causes an audible alarm to sound whenever this segment is active. Unless you want an alarm to sound whenever you move the boat out, leave this field set to **No**.

Seg #	Segment Name	Seg Alm
0	IDLE	No
1	BOAT OUT	No
2		No
3		No
4		No
5		No
6		No
7		No
8		No
9		No
10		No
11		No
12		No
13		No

- The **Segment Alarm** sounds as long as the segment is active!
10. Check the **Input check boxes** for all inputs that should be monitored in this Process Segment. We'll skip setting inputs for now.

Sizing Panes

Click and drag at the edge of any pane to change its size.

- Check the **Output check boxes** for all outputs that should be energized in this Process Segment. For this segment, there is only one output - **Unload**. **Check this box.**

Input		Input		Input		Input	
0	<input type="checkbox"/> BIC	4	<input type="checkbox"/>	8	<input type="checkbox"/>	12	<input type="checkbox"/>
1	<input type="checkbox"/> BOC	5	<input type="checkbox"/>	9	<input type="checkbox"/>	13	<input type="checkbox"/>
2	<input type="checkbox"/> TMP FLT	6	<input type="checkbox"/>	10	<input type="checkbox"/>	14	<input type="checkbox"/>
3	<input type="checkbox"/>	7	<input type="checkbox"/> P WAIT	11	<input type="checkbox"/>	15	<input type="checkbox"/>
Output	Set	Output	Set	Output	Set	Output	Set
0	<input type="checkbox"/> Load	8	<input type="checkbox"/>	16	<input type="checkbox"/>	24	<input type="checkbox"/> Z1 PWR
1	<input checked="" type="checkbox"/> Unload	9	<input type="checkbox"/> N2 PURGE	17	<input type="checkbox"/>	25	<input type="checkbox"/> Z2 PWR
2	<input type="checkbox"/>	10	<input type="checkbox"/> HI N2	18	<input type="checkbox"/>	26	<input type="checkbox"/> Z3 PWR
3	<input type="checkbox"/>	11	<input type="checkbox"/>	19	<input type="checkbox"/>	27	<input type="checkbox"/>
4	<input type="checkbox"/>	12	<input type="checkbox"/> HI O2	20	<input type="checkbox"/>	28	<input type="checkbox"/>
5	<input type="checkbox"/>	13	<input type="checkbox"/> H2O CARRIER	21	<input type="checkbox"/>	29	<input type="checkbox"/>
6	<input type="checkbox"/> BUBBLER ON	14	<input type="checkbox"/>	22	<input type="checkbox"/>	30	<input type="checkbox"/>
7	<input type="checkbox"/> H2O > TUBE	15	<input type="checkbox"/>	23	<input type="checkbox"/>	31	<input type="checkbox"/>

- Certain outputs (like this one) have an *Analog Setpoint*, which controls the amount of the output. Setpoints have a range from 1-99. **Type in a Setpoint of 99** (max. speed) to pull the Boat Out.
- We want Nitrogen to be flowing when the door is open, so turn it on by selecting the checkbox and setting a the Setpoint.

When setpoints are associated with gases, they represent the percentage of maximum flow, which varies according to the tool. For this example, set the Nitrogen setpoint to 80 (or 80% of max.).

Calculating the Setpoint

- If the maximum N₂ flow for the tool is 10 standard liters-per-minute, and ...
- We want 8 liters-per-minute.
- 80% of 10 LPM = 8 LPM.

Tip:

The gas flow standards for your tool are usually listed here:

Edit Configuration, Outputs.

Input		Input		Input		Input	
0	<input type="checkbox"/> BIC	4	<input type="checkbox"/>	8	<input type="checkbox"/>	12	<input type="checkbox"/>
1	<input type="checkbox"/> BOC	5	<input type="checkbox"/>	9	<input type="checkbox"/>	13	<input type="checkbox"/>
2	<input type="checkbox"/> TMP FLT	6	<input type="checkbox"/>	10	<input type="checkbox"/>	14	<input type="checkbox"/>
3	<input type="checkbox"/>	7	<input type="checkbox"/> TMP	11	<input type="checkbox"/>	15	<input type="checkbox"/>
Output	Set	Output	Set	Output	Set	Output	Set
0	<input type="checkbox"/> Load	8	<input type="checkbox"/>	16	<input type="checkbox"/>	24	<input type="checkbox"/> Z1 PWR
1	<input checked="" type="checkbox"/> Unload	9	<input type="checkbox"/> N2 PURGE	17	<input type="checkbox"/>	25	<input type="checkbox"/> Z2 PWR
2	<input type="checkbox"/>	10	<input checked="" type="checkbox"/> HI N2	18	80	26	<input type="checkbox"/> Z3 PWR
3	<input type="checkbox"/>	11	<input type="checkbox"/>	19	<input type="checkbox"/>	27	<input type="checkbox"/>
4	<input type="checkbox"/>	12	<input type="checkbox"/> HI O2	20	<input type="checkbox"/>	28	<input type="checkbox"/>
5	<input type="checkbox"/>	13	<input type="checkbox"/> H2O CARRIER	21	<input type="checkbox"/>	29	<input type="checkbox"/>
6	<input type="checkbox"/> BUBBLER ON	14	<input type="checkbox"/>	22	<input type="checkbox"/>	30	<input type="checkbox"/>
7	<input type="checkbox"/> H2O > TUBE	15	<input type="checkbox"/>	23	<input type="checkbox"/>	31	<input type="checkbox"/>

- Now we'll add an **Input** condition to the segment—**BOC**, which stands for "Boat Out Complete." BOC causes a *Wait Condition* until it senses that the Boat is completely out. Until the Boat Out condition is satisfied, the recipe cannot continue past this segment.

Input		Input		Input		Input	
0	<input type="checkbox"/> BIC	4	<input type="checkbox"/>	8	<input type="checkbox"/>	12	<input type="checkbox"/>
1	<input checked="" type="checkbox"/> BOC	5	<input type="checkbox"/>	9	<input type="checkbox"/>	13	<input type="checkbox"/>
2	<input type="checkbox"/> TMP FLT	6	<input type="checkbox"/>	10	<input type="checkbox"/>	14	<input type="checkbox"/>
3	<input type="checkbox"/>	7	<input type="checkbox"/> TMP WAIT	11	<input type="checkbox"/>	15	<input type="checkbox"/>

Output	Set	Output	Set	Output	Set	Output	Set
0	<input type="checkbox"/> Load	8	<input type="checkbox"/>	16	<input type="checkbox"/>	24	<input type="checkbox"/> Z1 PWR
1	<input checked="" type="checkbox"/> Unload	9	<input type="checkbox"/> N2 PURGE	17	<input type="checkbox"/>	25	<input type="checkbox"/> Z2 PWR
2	<input type="checkbox"/>	10	<input checked="" type="checkbox"/> Hi N2	18	<input type="checkbox"/>	26	<input type="checkbox"/> Z3 PWR
3	<input type="checkbox"/>	11	<input type="checkbox"/>	19	<input type="checkbox"/>	27	<input type="checkbox"/>
4	<input type="checkbox"/>	12	<input type="checkbox"/> HI O2	20	<input type="checkbox"/>	28	<input type="checkbox"/>
5	<input type="checkbox"/>	13	<input type="checkbox"/> H2O CARRIER	21	<input type="checkbox"/>	29	<input type="checkbox"/>
6	<input type="checkbox"/> BUBBLER ON	14	<input type="checkbox"/>	22	<input type="checkbox"/>	30	<input type="checkbox"/>
7	<input type="checkbox"/> H2O > TUBE	15	<input type="checkbox"/>	23	<input type="checkbox"/>	31	<input type="checkbox"/>

Create Another Segment

15. Let's make another segment to bring the Boat back in. Choose the next unused Segment space in the Process Segment List and type "BOAT IN."

Seg #	Segment Name	Seg Alr
0	IDLE	No
1	BOAT OUT	No
2	BOAT IN	No
3		No
4		No
5		No
6		No
7		No
8		No
9		No
10		No
11		No
12		No
13		No

Input		Input		Input	
0	<input checked="" type="checkbox"/> BIC	4	<input type="checkbox"/>	8	<input type="checkbox"/>
1	<input type="checkbox"/> BOC	5	<input type="checkbox"/>	9	<input type="checkbox"/>
2	<input type="checkbox"/> TMP FLT	6	<input type="checkbox"/>	10	<input type="checkbox"/>
3	<input type="checkbox"/>	7	<input type="checkbox"/> TMP WAIT	11	<input type="checkbox"/>

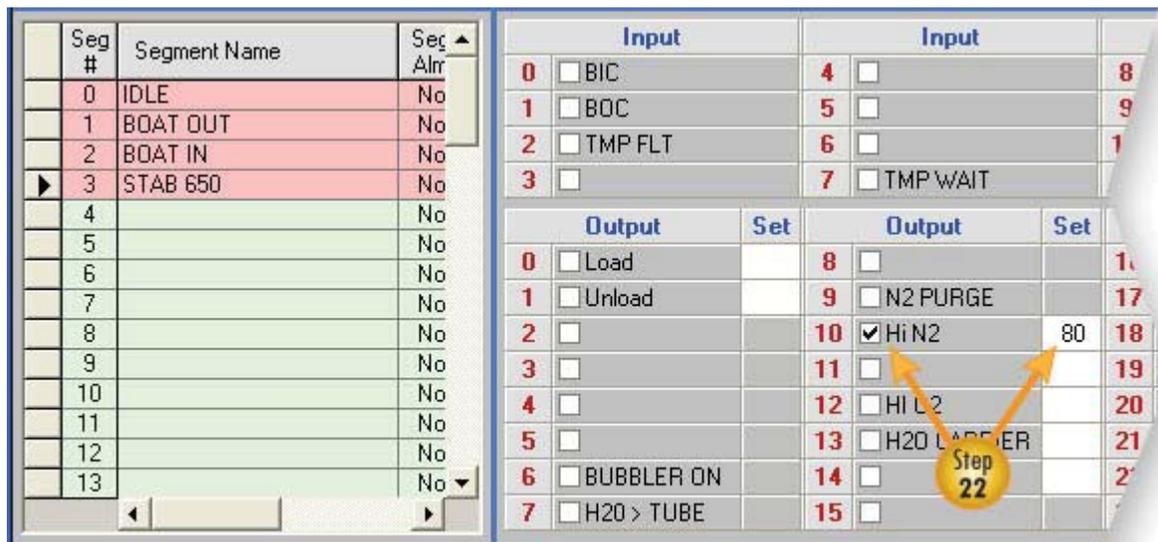
Output	Set	Output	Set
0	<input checked="" type="checkbox"/> Load	99	10
1	<input type="checkbox"/> Unload		17
2	<input type="checkbox"/>		18
3	<input type="checkbox"/>		19
4	<input type="checkbox"/>		20
5	<input type="checkbox"/>		21
6	<input type="checkbox"/> BUBBLER ON		22
7	<input type="checkbox"/> H2O > TUBE		23

16. Check the **Load** checkbox in the Output section. Type **99** into the Setpoint field as shown above.
17. According to the chart for the example recipe on [page 13](#), we should have Nitrogen flowing during the BOAT IN segment. **Click the checkbox for HiN2** to turn it on.
18. The white **Set** field to the right of the HiN2 checkbox indicates that this output has an analog Setpoint. In this case, the Setpoint controls the amount of Nitrogen flow. **Type 80 into the Setpoint field.**

19. Click the checkbox for BIC (Boat In Complete). This is a Wait Condition, which prevents the recipe from proceeding until the Boat is completely in.
 - Notice the little **pencil icon** to the left of the BOAT IN segment. This indicates that the changes to the new Segment haven't been applied yet.
20. **Click the green Apply button** (located at the bottom of the right-hand column of buttons), to apply the changes. Note that the pencil icon disappears.

Temperature Segments

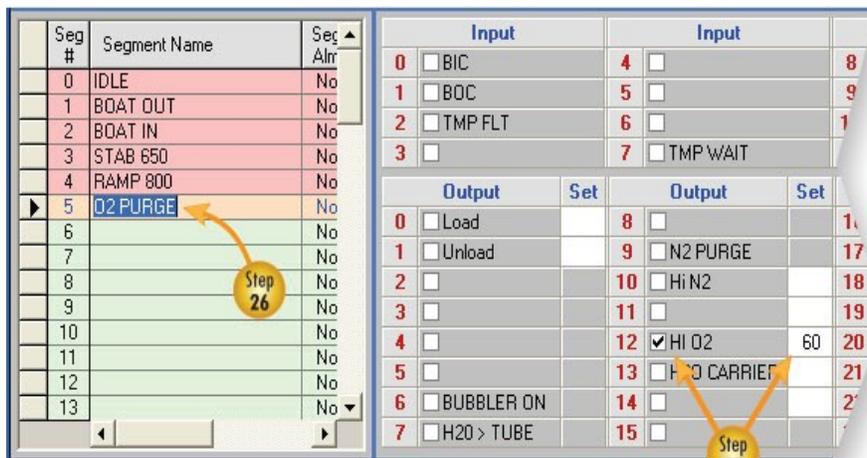
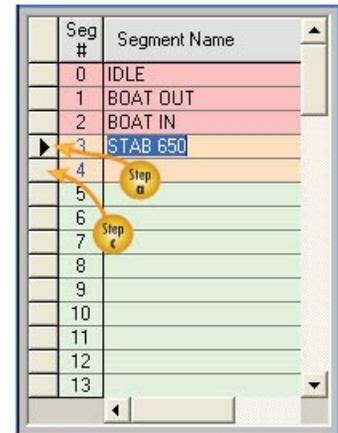
21. Choose the next unused Segment space in the Process Segment List and this time type "STAB 650" (for stabilize at 650°).
22. This segment will be used to keep the nitrogen flowing while the temperature stabilizes, so **turn on N2** with a **Setpoint of 80**.
23. Make sure everything else is unchecked.



24. Now we'll create a new segment using the **Copy Segment** function. This new segment will be identical to STAB 650 except for the name. It's really just a label for the temperature setting that will be programmed in the recipe cycle.
 - Since the inputs and outputs are the same as STAB 650, we could simply insert STAB 650 into two consecutive recipe cycles, but this would make the recipe more confusing. It's often better to create a new segment to make the recipe easier to read and modify.

To Copy a Segment

- Click inside the **left-most box** of the Segment to be copied.
 - Hold the **Ctrl** key (or the Shift key to copy multiple times).
 - Click inside the **left-most box** of the Segment number where you want the new Segment to go. Both fields are now highlighted.
 - Click the **Copy Segment** button.
 - A pop-up dialog box appears asking you to “Please Confirm” the operation. Click **OK** to confirm, or **Cancel** to cancel the operation.
- You should now have two STABILIZE segments. Rename the lower STABILIZE segment “**RAMP 800,**” then click **Apply**.
 - We’ll make one more segment before moving on to recipe creation. Type “**O2 PURGE**” into the Segment Name field of segment 5, then click **Apply**.
 - Select the **HIO2** checkbox with a **Setpoint of 60.** No other details should be checked in this segment. Click **Apply**.



Calculating the Setpoint

- If the maximum O₂ flow for the tool is 10 standard liters-per-minute, and...
- We want 6 liters-per-minute.
- 60% of 10 LPM = 6 LPM.

Tip:

The gas flow standards for your tool are usually listed here:

Edit Configuration, Outputs.

- We now have enough segments to begin assembling our recipe.

EDITING A RECIPE CYCLE

1. Click anywhere within Cycle 1 and a menu button appears.

	Cycle	Process Segment	
	0	00 - IDLE	
▶	1	00 - IDLE	
	2	00 - IDLE	
	3	00 - IDLE	Click here
	4	00 - IDLE	
	5	00 - IDLE	
	6	00 - IDLE	Menu button appears

2. Click on the menu button to reveal the drop-down menu of segments.
3. Select a Process Segment from the drop-down list that appears. Looking at our recipe plan, the first cycle should contain the BOAT OUT segment. Select **BOAT OUT** and release the mouse button.
4. The BOAT OUT cycle has been added, but we still have to add time and temperatures parameters for the action. The recipe plan says 15 minutes to pull the boat, at a temperature of 650° C. Enter **15.0** in the **Time** field and **650** in the **Temp** field.
 - If the entered temperature value is greater than 31, it will be treated as the **Setpoint** for all installed furnace zones.
 - If the temperature controllers are configured with dual thermocouples, a 'P' (Process) or 'S' (Spike) in this field determines which thermocouples are used for temperature control.
 - If the entered temperature value is less than 32, it will be treated as a **Link** to an entry in the Temperature Segment Table. Please see [“Edit Temperatures” on page 23](#), for more information on temperature zones.
5. Add the next segment, BOAT IN. Again, click on Cycle 2 to reveal the menu button, then click on the menu button for the drop down list of segments. Next, enter the **Time** and **Temperature** settings for the cycle—15 minutes and 650° C.

Time Base:

The Time for each cycle can be programmed in either Minutes or Seconds by selecting the appropriate Time Base.

Click inside the field then select minutes or seconds from the drop-down list.



6. The next cycle calls for the **STAB 650** segment we created earlier. As you'll recall, this segment doesn't change anything; it just keeps the Nitrogen flowing and is mainly used as a label for this temperature step.

Since temperature is a Recipe function and not part of the Segment, we'll program it now. Set the **Temperature** of this cycle to **650** and the **Time** for **5 minutes**.

7. The **RAMP 800** segment is next. This segment is identical to STAB 650 except for the name. After inserting the segment, set the **Temp** to **800**, and the **Time** to **15 minutes**. This will ramp the temperature from 650° to 800° over 15 minutes (10° per minute).

8. You should have the idea by now. Continue adding cycles to match the recipe plan on [page 13](#) until your recipe looks like the one shown below. You'll have create a few additional Segments along the way as you build your recipe.

Cycle	Process Segment	Branch Cycle	Time	Time Base	Temp	Cycle Alarm
0	00 - IDLE		0.0		650 S	No
1	01 - BOAT OUT		15.0	Min	650 S	No
2	02 - BOAT IN		15.0	Min	650 S	No
3	03 - STAB 650		5.0	Min	650 S	No
4	04 - RAMP 800		15.0	Min	800 S	No
5	06 - STAB 800		10.0	Min	800 S	No
6	05 - O2 PURGE		10.0	Min	800 S	No
7	07 - ANNEAL		15.0	Min	800 S	No
8	08 - RAMP 650		50.0	Min	650 S	No
9	01 - BOAT OUT		15.0	Min	650 S	No
10	09 - BOAT COOL		20.0	Min	650 S	No
11	00 - IDLE		0.0		650 S	No

Step 6

9. One step we've forgotten to program is the IDLE Cycle! According to our Example Recipe, we should be idling at 650° C. It's easy enough to change. Just type **650** into the **Temp** field.

10. Go ahead and program the temperature of the **End IDLE** cycle now if you haven't already done so.

11. When you're finished building the recipe, click the **Validate** button. The Validate command essentially 'cleans up' the recipe details:
 - Superfluous time and temperature set points are removed from any cycles that reference an Auxiliary Command instead of a Process Segment.
 - The Time Field of Cycle 0 is cleared, since Cycle 0 is not timed.
 - The Time Field in the Count-up cycle at the end of the recipe is cleared.
 - Additional Data Validation is performed. (Most user-entered data is validated as it is entered.)
 - The total time of the recipe is calculated and displayed.

Time to Save...

Whenever you have done enough work that you would hate to lose it, it's time to save.

Note:

The Recipe File you just saved only contains one process recipe, but a Recipe File can contain up to (32) Process Recipes, (64) Process Segments and (32) Temperature Segments.

12. Click the **Files** tab at the top-left side of the screen.
13. Click **Save**. A pop-up dialog box appears.
14. The name and location you chose when the Recipe File was first saved will be automatically selected. Change the name and/or location if you so desire.
15. Click **Save** to save the Recipe File, or **Cancel** to cancel the operation.

Congratulations! You've just completed your first recipe.

We've only covered the basics here, so be sure to read the TymPlex and TymEdit operation manuals to learn all the details.

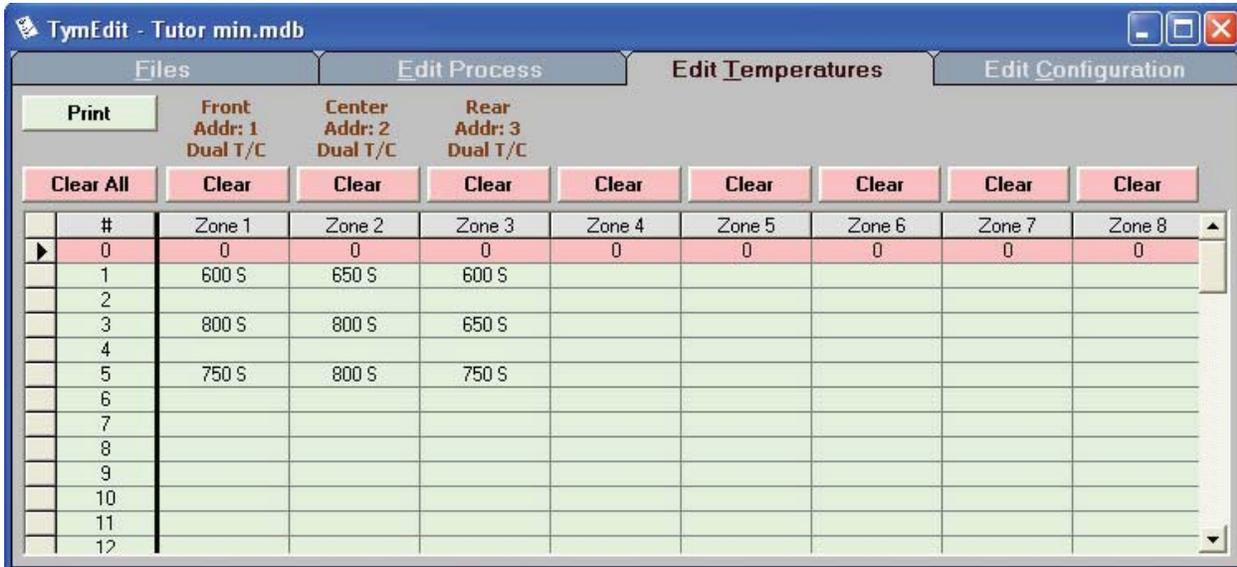
TO RUN YOUR RECIPE...

Use the **TymPlex** application to run your recipe. See [“Recipe File Download” on page 4](#) for step-by-step instructions.

OTHER FEATURES OF THE RECIPE EDITOR

Edit Temperatures

The Edit Temperatures screen allows up to 31 temperature segments to be programmed with a unique temperature Set-Point for each zone. You can also specify whether the Spike or the Profile (*if installed*) thermocouples will be used for control.



To use a Temperature Segment in a Recipe

1. Enter the number of the desired Temperature Segment (0-31) in the Temperature field of a recipe cycle.
2. Select the Edit Temperature tab to view the screen shown above.
3. Enter the desired temperatures for the temperature zones installed on your Expertech tool.
4. If the temperature controllers are configured with dual thermocouples, a 'P' (Profile) or 'S' (Spike) in this temperature field determines which thermocouples are used for temperature control.

Note:

Both the temperature controllers and the installed Chronos must support dual thermocouples for the Spike/Profile feature to function.

