

X-306/S Oven Commander

A Program for X-REFLOW306/S Ovens to create/run programs and monitor/store in real time the temperatures of the oven thermocouples and the additional two thermocouples connected to the TC-T and TC-B sockets.

Version 9

Revision 46

P/NX-DOC230 May 19/2020 Rev.3

Bokar International 650 Scranton Pocono Hwy Covington Twp., PA 18444, USA Tel: (570) 842-2812 Fax: (570) 842-4290 E-Mail: bokar@bokar.com www.bokar.com www.X-1003.com www.ZeroCharge.net www.ESDmeters.com www.BestBatchOven.com www.ESDcarts.net www.FineRework.com www.SMTreballing.net



Introduction

The X306/S Oven Commander allows the operator to easily program, run and document work done with the X-Reflow306/S Oven.

Major Oven Commander Features and User Benefits:

- Programming and controlling the X-Reflow306/S oven from a PC
- Monitoring in real time the air or N2 temperatures inside the oven and the two temperatures of the object to which the TC-T and TC-B thermocouples are connected
- Storing on a PC the four monitored temperature/time profiles
- Printing the stored time/temperature graphs and Programs
- Exporting to Excel the stored information in the time/temperature graphs
- · Observing in real time of time/temperature characteristics of the process in progress
- Changing the program with "on the fly" modifications using a computer mouse or keyboard
- Documenting and storing additional information (like PCB number, PCB description, etc.) related to tasks performed (entered manually when running a profile)



I. Installation instructions

- Download the latest firmware version from the server ("X-Reflow306-S_firmware_v5.247.zip" or later from <u>http://www.bokar.us/downloads/X-Reflow306-S_firmware.zip</u>) and load it into to the oven (the Oven Commander program requires that the oven has installed firmware v5.247 or later for proper communication with the Oven Commander). You can find the instructions for the firmware upgrades on: <u>http://www.bokar.us/downloads/Firmware-upgrade_X-Reflow306.doc</u>
- 2. Download the latest X-306/S Oven Commander program from http://www.bokar.us/downloads/X-306-S-OvenCommander.zip)
- 3. Unpack the zip file to a Hard Disc of your PC or copy it from the CD received with the Oven.

All the unpacked files must be placed together in the same folder (the password for unpacking is: Oven).

The files which you should have in one folder on your PC are listed below:

DocumentFormat.OpenXml.dll

FTD2XX_NET.dll

OvenCommander.exe

Keyxxxxx.lic (this is the license key file – It is on a CD included with the Oven if you have purchased the X-306/S Oven Commander or it can be sent by email after providing the oven serial number)

4. Run the file: OvenCommander.exe





- 5. Connect the X-Reflow306/S Oven to a PC using the X485-USB Converter.
- 6. Turn ON the Power Switch of the **X-Reflow306/S** and log in.
- 7. Return to the Oven Commander program and enter the location of the license key file with the oven serial number (file with the extension.lic). Choose from the Top Menu: **Tools** and then **Options.** Click on the **Directories** tab and then **Edit**. Find the license key file(keyxxxxx.lic) and then click Open. Click the OK button.







Figure 2

Figure 3

Figure 4

Oven Commander	Philip Alexa	
File Tools Program Pro	Device ×	夏 〒 ③ 🏠 🏲 🗎
Connect	🔍 🕀 👷 🏢 🕂 📈 Setup	
Modified		
	340°C	
Restore Store	320'C	
	d, 300°C	
	280°C	
Standby	260°C	
	240°C	
	220°C	cted
ven status —	200°C	co after 2 [c]
	180°C	Se aller 2 [3]
rogram:	. 160°C OK Cancel	
	140'C	
igram time:/	120°C	
ive zone		
ne time:/_	80 C	
	40°C	
	20"C	Upload from Downle the Oven the C
	00:01:00 00:02:00 00:03:00 00:04:00 00:05:	0 00:06:00 00:07:00 00:08:00 00:09:00
	Time (hr.mi	usec]
Disconnected		

8. Press Connect (Top/Left corner of the program). This will connect the oven to your PC.

Figure 5

Note:

If your computer will not connect to the oven via X485-USB Converter, unzip the file "X485-USB converter_driver.zip" and run the file "CDM20600.exe".

If the message "Unable to open license file" is displayed, check and perform step 7 again.





Figure 7



Control buttons:

START – Starts the process. If the process is active, you can control it by clicking on the Control Buttons.

Note: If you press START during the process, the process will restart.

STOP – Stops the process

PAUSE – Pauses the process. Press the PAUSE button again to continue the process.

NEXT ZONE – Clicking on this button ends the zone in progress and starts the following zone.

This is an override of the preset program if the timing of the zone in the preset program was too long.

COOL- Clicking on this button stops the process and the system starts cooling the board.

It can be pressed at any time during the process to stop it.

Base ON/OFF button - After this option is selected, the oven will maintain the preset temperature inside the heating chamber at all times.

IV. STARTING A PROGRAM

1. Choose a program from the program list:



Figure 10



Note:

The Operator has two ways to edit the Program: graphical (using the mouse and modifying the graph) and by modifying temperatures and zone times in the Program Zones List via keyboard entry (Fig. 11).

Editing using the graph.

- 1 Changing zone temperature:
 - a Place the mouse cursor on the horizontal line of the Program Graph
 - b Press and hold the left mouse button
 - c Move the line up or down to the desired temperature
 - d Release the mouse button to set the temperature
- 2 Changing the zone time:
 - a Place the cursor on the vertical line indicating zone shifts on the Program Graph
 - b Press and hold the left mouse button
 - c Move the cursor left or right to the required timing
 - d Release the mouse button to set the zone time



Editing the Program by keyboard entry in Program Zone List. 1 Changing zone temperature:

a. Place the cursor on the temperature of the zone which you wish to modify



b. With the right mouse button, click on the existing value and click edit

Heat 1	
- 🔥 90 edit	
Heat 2	Figure 14

c. Enter the new value from the keyboard and press enter

CREATE NEW PROGRAM

1. Choose from the Main Menu "Program" and then "New"



2. Select the zone count and if the process will be controlled by an external thermocouple



- 3. Press "OK"
- 4. Write the program Name and Description

	Temperature		Min/Max	12011		2.23		Time above	temp.				TE 👬 🛈 🖿 🖬	1
Disconnect	Temp.["C]: dT[*C/s];		min.T.[*C]: 1	nax.T.["C]:	min.dT.:	max.dT.:	300.0	Time;					
	Hont 0.	0.0	Front					Front	00:00:00					
Modified		0.0	TET					TET	00.00.00					
empty 👻	FITCB 0	0.0	TC-B					TC-B	00-00-00					
Restore														
	Device	×												
Cod-			Satur	C										
	-		a scrop	- Program	n name									
Standby	T			-					1000	T		11		
	340°C			Name										
	320°C-				6									
	300°C			-										
n status Off	280°C				peon									
	260°C-													
direct_5	240°C-													
pram 7	220*0-													
gm/am time: 0/0	20010								· .					
	19010													
-	160*0	contractor in the	000000000							Sector Sector Sector				
e time:	14010				0	$\langle \rangle$	Can	cel						
a new second	140 0													
	120.0			-	_			-						
	100°C -					-							Source: Oven	
	80°C					1								
	60°C-					1						1	C	
	40°C												Upload from the Oven	the Ov
	20°C													
		00:01:0	00.02	00 00:05	00 0	101-00	00.05.00	00.06.0	0 00:07:0	00.08.0	0 00	09.00	Auto update	
		00.01.0	00.02	.00 00.00		.04.00	00.05.00	00.00.0	0 00.07.0	,	··· · · · · · · · · · · · · · · · · ·	00.00	Synchronized =	dh aven
						T	ime (nr min s	ecj					Show on chart	

Figure 17

5. Edit the program's parameters on the default graph



6. Press "Download to the Oven" to copy the program to the oven and then press "Store" on the Control Panel in order to run it





7. Now press "Start" to run the program

VI. Editing the program in progress

You can change the current program parameters through either of the methods outlined in section 5. Note that you can edit the program while it is running.

VII. Saving profiles

When you have a profile on the screen and you want to save it, select from the Menu

"File" and then "Save"



Figure 21

Select where you want to save it on your computer, enter the file name, add an additional description if needed, and save it by clicking the Save button.



Figure 22

Disconnect	- Save As	201 at 121 at 121 at 121	- x - r	e temp. Time:	
	O V Cocuments	AQ-X-Reflow Profiles	earch AQ-X-Reflow Profiles	00:01:34	100
ext to 6	Organize 👻 New folder		≣ - 0	00-00-00	-N ₂ 0
Restore	🚖 Favorites 📃 Desktop	Documents library AQ-X-Reflow Profiles	Arrange by: Folder -	00:00:00	120
	Downloads	II Name	Date modified		Heat 3
Church	M Recent Places	Program 3-TC from library-heavy Object.pf	16/12/2019 12:54		
Standby	🧊 Libraries	Run on program 3-TC from library.pf	16/12/2019 12:54		Reflow
	Documents	2-nd /-11.pf	07/11/2019 2:35 PM		
	J Music	- 1-36 /-11-pi	07/11/2019 1.39 PW		
en status	Videos				
	Jul Hamman				
gram	eo Homegroup				
gmram time:	File name: Program	3-TC from library-heavy Object.pf	•		90
	Save as type: Profile (*.	.pt}	•		
ive zone	Alida Folder		Save Cancel		N ₂ 0
ie time:	Inde Folders				
	120°C				
	100°C				Source: Oven
	80°C-				Process controlled by external TC
	60°C-				Upload from Download t
	40 C	P			the Oven the Oven
	2001				Auto update
		00:01:00 00:02:00 00:03:00	00:04:00 00:05:00 00	0:06:00 00:07:00 00:08:00	Synchronized with oven
			Time [hr:min:sec]		ER CO. I. I.

Figure 23

VIII. Reviewing saved profiles

To open a saved profile: chose from the Menu "File" and then "Open"



Figure 24

Chose "profile1.pf" or another file and open it:

1			The local sector is a sector in the sector is a sector is a sector in the sector is a sect	temp	
Disconnect	- Open	ATTIN ANTING ANTING		Time:	
	O Ad	Q-X-Reflow Profiles	earch AQ-X-Reflow Profiles	00:00:00	Heat 1
Modified				00:00:00	
ext_tc_6	Organize 🔻 New folder		SII 🔹 🛄 🔞	00.00.00	N2 0 Heat 2
Restore	🔆 Favorites 💻 Desktop	Documents library AQ-X-Reflow Profiles	Arrange by: Folder -	00.000	
• 🔳 🖬 🛉	Downloads Recent Places	Name	Date modified		Heat 3
Standby	詞 Libraries	2-nd /-11.pf	07/11/2019 2:3		N₂ 0 ⊟ Reflow
	Documents Music		-		
n <mark>statu</mark> s	 Pictures Videos 		-		
ram	🤞 Homegroup				
mram time:	📜 Computer				90
	File name:	- Pri	ofile (*.pf) 👻		
ve zone			Open - Cancel		N ₂ 0
e time:					
	120°C				
	100°C				
	80°C				Process controlled by external
	60°C				
	40°C				Upload from Downloa the Oven the Ov
	20°C				
	+	00.01.00 00.02.00 00.03.00 0	00.04.00 00.02.00 00.06.0		9:00 Auto update
			Time Reserved		Synchronized with oven

Figure 25

The profile shows four thermocouples:

_

- Two thermocouples: Located above the Front and Rear heaters.
- Two thermocouples: connected to the TC-T and TC-B on the left side panel and possibly attached to the PCB heated in the oven.



Figure 26

IX. Load program file from a PC to the Oven

1. Expand Program List and choose empty program



Figure 27



Figure 28

2. Choose "File" from Menu and then "Load program"



Figure 29

3. Choose the desired program and open it by clicking the "Open" button



Then click the "Download to the Oven" button to save the program to the oven.

X. Saving a program file from the Oven to the PC

1. Choose "File" and then "Save program"



Figure 31

2. Choose where you want to save the program and the file name. Then press "Save".

File Tools Prog	ram Profile info About				
Disconnect	Save As	5 ma	×	rye temp. Time:	
	OO - 📕 « Documents)	AQ-X-Reflow Profiles	← ← Search AQ-X-Reflow Profiles	00:00:00	
Modified	Organize - New folder		8≣ ▼ 0	00:00:00	
7 ext_tc_6		Decumenta library		00:00:00	i⊟Heat 2 130
Restore	V Favorites	AQ-X-Reflow Profiles	Arrange by: Folder 🔻		
	Downloads	E Name	Date modified		Heat 3
	Recent Places	No items n	natch your search.		
Standby	词 Libraries				Reflow
	Documents				
	Music Dictures				N_2 0
Oven status	Videos				
Program	K Homegroup			F	
Progmram time:	File name: program1	_ext_tc_6			
	Save as type: Program fi	iles(*.prg)	•		
Active zone			Sava Cancel		N ₂ 0
Zone time:	Hide Folders		Save		
	120°C			F	
	100°C-				Source: Oven
	60°C				Process controlled by external TC
	40°C				Upload from Download to
	20°C				the Oven the Oven
					Auto update
		00:01:00 00:02:00 00:	U3:00 00:04:00 00:05:00 00	00:08:00 00:07:00 00:08:00 00:09:	.00 Synchronized with oven
			Time [nr:min:sec]		Show on chart
Connected					

Figure 32

XI. Export the graph to the Excel file

If you want to export the graph to an Excel file, chose from the menu "File" and then "Export to Excel". Enter the file name and chose the place to save the Excel file.

Click the "Save" button and the Excel version of your graph will be saved to your specified location.







Figure 34

1	А	В	С	D	E	F	G	Н
1							Date	2019-12-15
2	Time [s]	Front [°C]	Rear [°C]	TC-T [°C]	TC-B [°C]			
3	0	27,60	28,80	34,20	35,80			
4	1	27,80	29,00	34,20	35,80			
5	2	33,60	33,60	34,60	35,80			
6	3	41,10	40,60	38,40	36,00			
7	4	50,60	50,30	43,80	36,60			
8	5	74,00	75,50	60,60	38,30			
9	6	87,10	90,00	71,10	39,40			
10	7	113,70	120,00	89,40	41,40			
11	8	127,10	135,20	97,50	42,60			
12	9	149,10	161,10	109,10	44,70			
13	10	156,00	170,20	112,20	45,70			
14	11	160,50	176,40	113,80	46,60			
15	12	164,30	181,70	110,00	47,90			
16	13	164,40	181,70	108,30	48,30			
17	14	162,20	178,70	102,50	49,20			
18	15	160,20	176,00	100,20	49,60			
19	16	155,40	169,60	95,40	50,00			
•	< → → 3	Sheet 🥂	1/	Figu	re 35			

When you open the Excel file, it will look like Figure 35 shown below:

XII. Printing the graphs and profile:

If you want to print the graph and profile: select "Print" from the Menu.



Select the printer which you want to use to print your graph. Click "Print"



Figure 37

XIII. OPTIONS

From the Main Menu, choose Tools and Options



Figure 38

Temperature scale: Choice of Celsius or Fahrenheit

Flow unit: Choice of LPM or SCFM



Figure 39

XIV. OVEN SETTINGS

From the Main Menu, choose "Tools" and then "Oven Settings".

Optio	ns	Temperatu	re		Min/Max					Time above t	temp.				II 🕶 🖬 🔂 🖬
Oven	settings		Temp.[*C]	dT[°C/s]		min.T.[*C]:	max.T.[*C]:	min.dT.:	max.dT.:	300.0	Time:				
	-	Front	0.0	0.0	Front					Front	00:00:00				Heat 1
lified		Rear	0.0	0.0	Rear					Rear	00:00:00				
- 6		TC-T		0.0	TC-T					TC-T					N ₂ 0
0	Gen	🗹 ТС-В	0.0	0.0	TC-B				77	TC-B	00:00:00				Heat 2
ore	Store	Device		ĸ											
	Cody			#P+	Setup										Heat 3
Stan	dhu														
Stan	uby	3	40°C												Reflow
															240
		3.												-	N ₂ 0
		3	00 C												Fast cool
atus	Off	2	вu.с												170
		2	60°C												
	ext_tc_6	2	40°C												-N2 0
	7	2	20°C												E Cool
m time:	0/465	2	00°C												90
		1	80°C												₩ 0
70ne		1	50°C												N ₂ 0
10.	,		40*0												
	/		10 0												
		1	20.0												
		1	00°C											+	D DIGIN
			80°C											+	Source: DISK
			60°C												Process controlled by extern
			40°C												Upload from Down
			2010												the Oven the (
				T											Auto update
				00:01:	00 00:02	00 00:	03:00 0	0:04:00	00:05:00	00:06:00	00:07:0	0:00:08:0	0 00:0	09:00	Supplemented with own
								т	ime fhr:min:s	ecl					Synchronized with ove
															Show on chart

Figure 40

		Our cetting			×	II
Disconr	nect 2	Oven settings	m100 m100 m	e mail	Time:	Burn Heat 1
		0 m			00:00:27	- 100
Modified		Settings System Hestore			00:00:31	
st_tc_6	-	Offsets	N2		00:00:23	Heat 2
Restore	Store	Front left heater 0.0	Addition mode	N2C continous 👻	00:00:00	
		Rear left heater 0.0	Purging time	120	00:00:00	N ₂ 0
- 🔳 🛙	Cod.	Front right heater 0.0	Purging flow	1132		Heat 3
		Bear tight heater 0.0				
Stan	dby					
		Venice ractory orsets				240
		Overshoot	Circulating Fan			
		Time 30	Object control			E Fast cool
		Temperature 30.0	Max diff. heater to ob	j. 160.0		
n status:	Off	2 Enabled	Object type	Light -		100
ogram:	5	Other				90
	ext_tc_6		Ventilation			
yram time:	0/494	Base temperature 30.0	Circul. fans off time	0		N ₂ 0
			Open exhaust va	ve during process		
ve zone		Cooling to temp, of Circulating air	•	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		
e time:	/					
		Cooling air flow control				Source: Oven
						Process controlled by external
						Upload from Downloa the Oven the Oven
		OK Save	Reload	Cancel		
						Auto update
					00:06:00 00:07:00	00:08:00 Synchronized with oven
				lime [hr:min:sec]		Show on chart

Figure 41

Settings - You can adjust the following oven settings from a PC (to save new values in the oven, use the "Save" button):

Offsets		N2		Official		102	
Front left heater	0.0	Addtion mode	N2C continous ·	Fort left heater	0.0	Addition mode	05
Rear left heater	0.0	Purging time	120	Rear left beater	0.0		
Front right heater	0.0	Purging flow	1132	Errot sold heater	0.0		
Rear right heater	0.0	A CONSISTENCIAL		Rear right heater	0.0		
V Override factory o	offsets			Veride factory	offsets		
Ouenhout		Circulating Fan					
Time	30	Object control		Overshoot	30	Chierd cost	
Temperature	30.0	Max dff heater to obi	160.0	Tanaanta	30.0		×
1000000000		Object hos	Lint •	renperaure	30.0	Max on	
V Enabled		and the state of t		C Enabled		Ubject Co	nfiguration is saved
Other				Other			
		Ventilation	·			Ventilation	ОК
Base temperature	30.0	Circul fans off time	0	Base temperature	30.0	Croul A	
		🔄 Open exhaust val	ve during process			Coren exha	ust valve during process
Cooling to temp. of	Croulating air +		2002/06/2010/07	Cooling to temp. of	Circulating air 👻		
😢 Cooling air flow of	ontrol			Cooling air flow	control		
ОК	Save	Reload	Cancel	OK	Save	Reload	Cancel

- **Offsets:** Front heater: 0.0 °C. Possible range: from -20.0 °C to 90.0 °C (Celsius). Rear heater: 0.0 °C. Possible range: from -20.0°C to 90.0°C (Celsius).
- **Overshoot:** Time: Recommended time is 10s to 30s (seconds). Temperature: Recommended Overshoot is 10 °C to 30 °C

Base temperature: Possible range: 0.0 °C (i.e. OFF) or from +50 °C to +300 °C.

Purging time: Length of time for Nitrogen to purge the oven before the process starts
Cooling to temp. of: Adjusts whether oven cools to Circulating air, TC-T or TC-B temperature
N2: Addition mode:
Possible range: OFF or N2C continues or N2R periodic fill or N2P proportional.
Object control: Max diff. heater to obj.: 140.0 °C, possible range: from 40.0 °C to 160.0 °C.

Object type: Light or Heavy

System		
Temperature scale	* v	
Cooling air flow scale	- Internet	
Date / time	May -12-20 -	
Sound	12	
LCD Contrast	160	

Figure 44

Temperature scale: °C (Celsius) or °F (Fahrenheit) Cooling air flow scale: L/min. or SCFM Date / Time

Sound

LCD Contrast (on the display on the oven)

Restore - You can reset the oven to factory settings from your PC:

System - You can adjust the following oven settings from a PC:

Settings System	Restore
	All extings (excluding analog)
	Reset to factory
	Analog
	Reset to factory

All settings (excluding analog) –This option allows an administrator to restore all settings to the factory-set values.

Analog -This option allows an administrator to restore the analog settings to the factoryset values

Figure 45



XV. Icons to adjust the chart

Press "Setup" to adjust axis range

Note:

The operator can also click and drag the axis to adjust the values.



Figure 47