

MODEL 861 DEPOSITION CONTROL SOFTWARE

INSTRUCTION MANUAL

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Current version of this manual can be found at <u>https://telemark.com/quartz-crystal-control/861-deposition-controller/</u>

WARRANTY

Telemark products are warranted to be free of defects in materials and/or workmanship for a period of 12 months after shipment from the Telemark factory. This warranty is valid only for normal use, where regular maintenance has been performed. This warranty shall not apply if the product has been repaired or alterations made by anyone other than authorized Telemark service representatives, or if a malfunction or damage occurs through abuse, misuse, negligence, shipping damage, or other accident. No charge will be made for repairs covered by this warranty at a Telemark service facility. Telemark reserves the right to determine if the malfunction was caused by defective materials or workmanship. The customer will be responsible for freight charges to Telemark's service facility.

USER RESPONSIBILITY

The user is responsible for proper operation and ordinary maintenance of the equipment, following procedures described in this manual, including reference documents. Proper operation includes timely replacement of parts that are missing, broken or plainly worn. If the user has a reasonable doubt about understanding the use or installation of a component, Telemark Technical Service should be called.

It is vitally important that the user properly installs the equipment as described in this manual. The warranty will be void if the equipment is improperly installed.

Alteration of the design or any function of the equipment voids the warranty and is entirely the responsibility of the user.

SAFETY WARNING

General Precautions: High (potentially lethal) voltages are present within deposition systems. Great care must be exercised when performing maintenance. Human contact with the voltages can be fatal.

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SYSTEM REQUIREMENTS

The Deposition Control Manager (DCM) Software has the following requirements:

- Windows 7 or newer PC computer with one of the following options:
 - 1- USB port with USB drive.
 - 2- RS-232 port or USB port with a RS-232 adaptor. Null modem cable that is shipped with the 861 Deposition controller.
 - 3- Ethernet connection to the 861 with a crossover cable or with a hub/router.
- 861 Deposition controller.

The DCM software is supplied on the USB drive that comes with the 861 Deposition controller.

For computers that you wish to use that do not have a RS-232 port, a USB to RS232 adaptor is needed. One choice is the Startech part number ICUSB232PRO. It has a static COM port number that makes it easy to connect after a computer reboot.

2 SOFTWARE INSTALLATION

Install from the USB drive folder

\Software\851-861\861DCMRelease

The program setup.exe

Note: previous versions should be uninstalled first

The program will be in the Telemark folder on the Start menu



3 OPERATION

3.1 Required components

The DCM software can be used with a USB drive or with RS-232. When the software is started it first asks for the working directory location. This location can be on a computer hard drive or on the USB drive that will transfer data to the 861. To transfer data to the 861 the working directory must be in the \861 folder.

Browse For Folder		
> 🐂 Libraries	^	
V 🔜 USB DISK (E:)		
> 851		
✓ 861		
FILM		
image		
PROCESS		
recipes		
> release		
results		
> systems	~	
Make New Folder OK Cance	<u>ا</u>	

3.2 Interface

To access the 861 directly the RS-232 port must be connected.

1. Set Controller Address, default is 1.

- 2. Select Serial Port.
- 3. Press the connect button.

For an Ethernet connection the 861 must be connected to the Windows computer with a crossover cable or with a hub/router. The 861 IP address must be entered.

Telemark 861 Deposition Control Manager	– 🗆 🗙
Eile Material Process Interface Run Ø 861 Interface Image: Section of the sectio	
Connect Over: O TCP/IP RS-232 None	Connect
Connection State: Not Connected	
Controller Address 0 Serial Por	t COM1 ~
Traffic Clear	
Select Home Directory: \\marlin\rf\$\peterf\Desktop	
Status:	861 Not Connected

Numbers will appear on the screen. When finished it will report at the bottom the connection state and the Status. It should say "Finished downloading process list from 861" if not it will say "Unable to communicate with 861."

When the program is closed and restarted it will try to reconnect automatically with the 861 using the same settings from the last time it was used.

Telemark 861 Deposition Control Manager	-	- 🗆 X
<u>File Material Process</u> Interface Run Settings About		
💋 861 Interface 🔟 🎢 Run		
Connect Over: OTCP/IP		Disconnect
Connection State: Connected		
Controller Address 0	Serial Port	COM1 ~
Traffic Clear		
255 254 001 253 002 030 000 226		^
255 254 001 030 035 032 048 046 048 048 046 049 048 048 032 048		
046 048 048 058 048 048 058 048 048 032 048 032		
Sent:		
255 254 000 200 002 000 001 052		
255 254 000 030 000 225		
Received:		
032 049 032 048 046 048 014 003 001 001 001 004 136		
255 254 001 031 030 032 048 046 048 048 046 049 048 048 032 048		
046 048 032 032 049 032 048 046 048 053 057 057 056 048 056 057		
046 051 049 070		
255 254 001 253 002 200 000 056		
255 254 001 200 006 000 001 024 000 002 000 022		
255 254 001 253 002 030 000 226		
255 254 001 030 035 032 048 046 048 048 046 049 048 048 032 048		
046 048 048 058 048 048 058 048 048 032 048		~
Select Home Directory: \\marlin\rf\$\peterf\Desktop		
Status:		861 Connected

3.3 Settings

The Settings tab controls the RS-232 or Ethernet connection, Directories, and if Frequencies are recorded in the results text files that are automatedly generated in the RESULTS folder in the working directory.

Telemark 861 Deposition Control Manager				
File Material Process Interfa	ace Run Settings About			
🗘 Settings 🗷 💋 861 Interfa	ace			
861 Connection	TCP/IP	~		
IP Address	12.123.233.1			
RS232 Port	COM1			
Controller Address	0			
Home Directory	\\marlin\rf\$\peterf\Desktop			
Other Working Directory				
Log Frequencies	Disabled	~		

3.4 File Manager

First select the display of Process or Material

File N	Į	
Display	Processes ~	

The file manager has three columns of Process or Material locations. The first column usually used for saving files on a computer hard disk. The Select button is used to change the location. The first column is not shown if not directory is selected.

E:\861			Select
	7_AR		
		ac. a	

ExSouce2Sn2 new1

The second column is the Working Directory.

Working	Directory
	Directory

7_AR	
ExSouce2Sn2	
new1	

The working directory is set when the program is started. It can be changed at any time by pressing the Select button next to the Working Directory location

Select	Working Directory:	E:\861
Status:		

The third column is active when the RS232 link to an 861 is made then it will show "Connected". The third column is not shown when the 861 is not connected.

861: Connected		
ExSource1_2		
ExAllState		

ExAllState DEFAULT

To transfer files click on one or more (hold the shift key to select multiple files) and click on the arrow to move the direction you want.

	Working Directory	861: Connected	
<>	7_AR ExSouce2Sn2 new1 test1 test222 TiO2	ExSource1_2 ExAllState DEFAULT ExSouce2Sn2	

Process and materials can be edited by double clicking.

3.5 Material Edit

Materials can be edited in the material screen. Use the scroll bar or tap to navigate.

Telemark 861 Deposition Cor	-		×	
<u>File Material Process</u> Interfa	ace <u>R</u> un <u>S</u> ettings About			
💋 861 Interface 🛛 🛪 Run	🔚 File Manager 🛛 🕂 861 - Pt 🛛 🖞 Pt 🖾			
Name	Pt			
Thickness (KÅ)	0.000			
Sensor #	1			
Crystal #	1			
Source #	1			
Pocket #	2			
Material Density (gm/cm³)	21.40			
Acoustic Impedance (gm/cm ²)	36.04			
Tooling Factor	100.0			
Proportional Gain	1000			
Integral Time constant	99.9			
Derivative Time constant	0.0			
Rise to Soak Time	00:00:30			
Soak Power (%)	33.0			
Soak Time	00:00:55			
Select Home Directory: \\ma	rlin\rf\$\peterf\Desktop			
Status:			861 Conr	nected

3.6 Process Edit

Processes can be edited in the process screen. "Add Layer" will add a new layer after the last layer. "Insert Layer" will add a new layer above the current layer

where the curser is. "Delete All" will clear all layers. The X box to the right of the layer number will delete the layer.

"Pocket Override" is only filled in if you want to override the pocket number that is stored in the material.

Telemark 861 Deposition Contro	ol Manager —	
<u>File Material Process</u> Interface	Run <u>S</u> ettings About	
💋 861 Interface 🛛 🛠 Run	i≣ File Manager 🔨 861 - Pt 🗵	
Index Material	Thickness (KÅ) Pocket Override	
🖬 1 Pt	0.5	
2 Pd	0.5	
3 Pd	0.1	
Add Layer Insert Layer	Delete All	
Select Home Directory: \\marlin	\rf\$\peterf\Desktop	
Status:		861 Connected

3.7 Run

After the DCM is connected to the 861 the Run screen can be used. A process or film can be selected. The six buttons from the 861 touchscreen can be pressed on the bottom of the screen.



Press the "Select Process" button to bring up the Process/Film list. Select a Process or Film and press OK. All the layers will be loaded on the screen with the Layer number, Material, and Thickness Target.

Press Start and the process will start. As each layer is finished the Rate, Power and Final KA will be displayed.

🔳 Telema	rk 861 Deposition Control M	lanager				_	□ ×
File Mater	rial Process Interface	Run Settings About		=			
🎢 Run 🗵							
$ \cap ($)	\cap ((1150	
Rate - Å/Sec	0.0	Power - %	,		Т	hickness - KÅ 0.150	
Select Pro	cess ProcExSimple	- Layer #4				(Sim) Proces	s Complete
Display: Status							
Layer #	Material	Rate Target A/s	Ave Å/s	Power Start %	End %	Thickness Target KÅ	Final KA
1	ExSimple	5.0	12.6	30.0	24.2	0.100	0.100
2	ExSimple_2	5.0	11.3	30.0	20.1	0.200	0.201
3	ExSimple	5.0	13.3	30.0	26.8	0.050	0.051
4	ExSimple_	Select Active 861 Provide 10 P	ocess/Film		× ^{-0.0}	0.150	0.150
					~		
		Process Film			_		
		ExSource1_2 ^					
		ExAllState					
		Processimple					
		In prod					
		In prod 2					
		abcd					
		ExSouce2Sn2					0.00.00
1 1 Source P	ExSimple_	Proc] – Sensor Health	0:00:00 Time
Mar	nual Sta	testwait OK		Cancel		Zero	Shutter
Status:							861 Connected

🔳 Telema	ark 861 Deposition Control Ma	nager				_	
File Mate	erial Process Interface Ri	un Settings About					
0.0 Rate - A/Sec 0.0 Power - %				0.150 Thickness - KA 0.150			
Select Pro	ProcExSimple -	Layer #4				(Sim) Proces	ss Complete
Display: 🖲) Status						
Layer #	Material	Rate Target Å/s	Ave Å/s	Power Start %	End %	Thickness Target KÅ	Final KÅ
1	ExSimple	5.0	12.6	30.0	24.2	0.100	0.100
2	ExSimple_2	5.0	11.3	30.0	20.1	0.200	0.201
3	ExSimple	5.0	13.3	30.0	26.8	0.050	0.051
4	ExSimple_2	5.0	12.0	30.0	22.0	0.150	0.150
1 Source	1 ExSimple_2 Pocket Material				538 Run #	1 – Sensor Health	0:00:00 Time
Ma	anual Start	Abor	t	Reset		Zero	Shutter
Status:							861 Connected

3.8 Results Files

Result files are text files that are automatedly generated in the RESULTS folder in the working directory. There are two files generated each time the 861 is run when the DCM software is running and connected to a 861. The first is the info file. The file is named with the process name, run number and "info" at the end. It is formatted as shown below.

```
[Process]
File Version = 1.0
Process Name = ExAllState
Process File =
\\marlin\rf$\peterf\Desktop\RESULTS\ExAllState 0020.txt
Run Number = 20
Start Date (MM/DD/YYYY) = 01/16/2018
Start Time (HH:MM:SS) = 09:49:36
Data Points/Minute = 600
[Layer001 = Pd]
Layer Start Time (HH:MM:SS) = 09:49:36
Starting Crystal Health = 90%
Deposit #1 End Thickness = 0.011 kÃ...
Deposit #1 Average Rate = 1.84 Ã.../s
Deposit #1 Average Power = 19.05%
Deposit #1 Starting Power = 20.00%
Deposit #1 Ending Power = 18.30%
. . .
Layer End Time (HH:MM:SS) = 10:58:12
Ending Crystal Health = 89%
Layer End Thickness = 0.011 kÃ...
Log Final Status = Finished
```

The second file is the run data file that can be used for charting and logging.

```
[Telemark 861 DCM Process Data Log]
File Version = 1.0
Time(sec), Rate(Ã.../sec), RateDev(%), Power(%), Thickness(kÃ...)
0.1,,0.0,0.0,
0.2,,0.0,0.0,
...
```

Frequencies are recorded if on the Setting tab the option for Frequencies is selected.