

# Manual for logger of Pressure, Torque, pH and temperature of Chewing Apparatus, DRT.





Mount the cuvettes. In each cuvette, insert the pH-electrode and connect the cable to the logger.

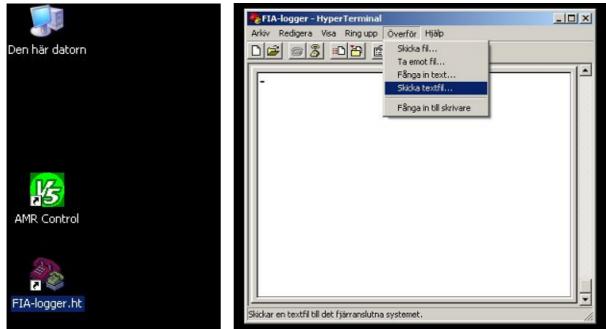


Figure 1. Mounting the electrode.

Fill up with dissolution medium and your test formulation according to your test method. Close the door to the safety cupboard. Power up with the button on the main control box to the left. Elevate the lifts on all cells.

#### Initiation

All units are now ready to start, but the loggers must also be initiated as follows:

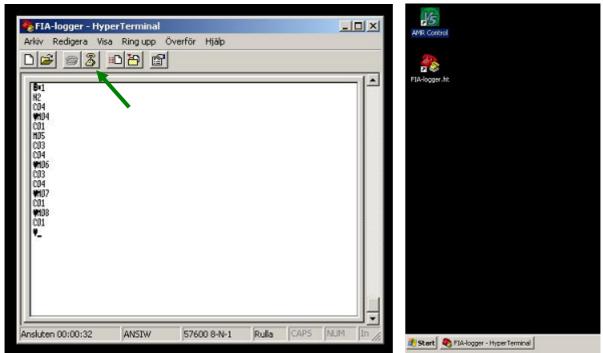


Screen picture 1 and 2. Open the HyperTerminal program "FIA-logger.ht" by double clicking the short cut. In the window that is opened, click on "Överför" and choose "Skicka textfil".



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2010 C	ormat:	Textfiler (*.TXT)		-	Avbryt

Picture 3. Mark the file "FIA-logger.txt" and click on "Öppna".



Picture 4 and 5. A number of commands are performed to initiate the logger. When the event is over and the writing in the window stops, click in the icon shown with green arrow "koppla ifrån" then minimize the window.





Picture 5 (detail). Start the program "AMR Control". Picture 6. Click on "Terminal".

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Termina				
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Cell-1 Cell-2		Limit Press: 50 Limit Press: 100	Limit Press: 200 Limit Press: 300	N/A N/A

Picture 7. If you would like to change the Max limit of the pressure it is possible to do that by clicking on the Cell no concerned (example: Cell-1 down to the left on the screen).



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Cell-2	Limit Act. value	Limit Press: 100	Limit Press: 300	Cell-2	8	Limit Act. value	Limit Press: 100	Limit Press: 300
Cell-3	N/A	Limit Press: 150	Limit Press: 400	Cell-3		N/A	Limit Press: 150	Limit Press: 400
Last send		MO	7H200%CR%	Last se	nd			M07P08

Picture 8 (left). Click on the desired setting in Newton (example: Limit Press: 200 (N)). Picture 9 (right). To verify; click on "Limit Act value" and the setting is displayed (LIMIT MAX: .... + 00200. N). To remove the max-setting completely; click Limit Press: OFF.

Repeat the steps in Pictures 7-9 if you wish to change limits for the other cells.

## Start

Now the initiation is ready and you can start the Chewing machine including the loggers. Set the warming up period according to your method. Press the START button on the main control box of the DRT. Now the warming up period starts, ie the waiting period until the desired temperature is reached in the cells.

The logging actually starts when the chewing starts after the warming up period. After the preset chewing time, the chewing and the logging is also stopped automatically and the lift moves upp and down to mix the dissolution medium thoroughly, after which final values are logged to verify pH and temperature values after mixing.



## Reading and saving

It is necessary to import the data from the loggers to the computer to be able to read them.

		Meas. Points	Output Modules	Setup	Help
	List		F2		
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Т	Macro	ions			
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		1	ſ		
Cell	-1	Limit Press:	OFF Limit Press:	50 L	imit Press: 20
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	2			100 L	imit Press: 30
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Picture 10. Click on "Devices" and "List".



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G02	Cell-2	A8590-9 6.30	40	5	050: CS			00.01.00	
G03	Cell-3	A8590-9 6.30	40	5	050: CS			00:01:00	
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Picture 11. All the loggers are shown (here for three cells). Click on Close (here shown with a green arrow).

Cell-1	Limit Press: OFF	Limit Press: 50	Limit Press: 200	N/A	N/A
Cell-2	Limit: Act. value	Limit Press: 100	Limit Press: 300	N/A	N/A
Cell-3	N/A	Limit Press: 150	Limit Press: 400	N/A	N/A

Picture 12. Click on the cell you would like to see data from (example: Cell-1).



	Devices Meas, H	oints Output M	Iodules Setup	Help
	List	F2		
1	Device program	nming		
-	Data Memory .			
121-	Functions			
File	Macro			

Picture 13. Click on "Devices" and then choose "Data Memory ...".

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		C Memory Readout - I	ime Interval		Memory free: 0505.1 kB	
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		End Time			memory external:	
		End Date			MMC file name: Circular Memory: 「	
		C Memory Readout - Number	n List	After readout	ssage with Filename	
		Number	• 000000	755.5	T measurement file to a spreadsheet	
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Cell-2 L	imit: Act. va		,	- Convert in	to a spreadances, remove empty con	annea.
Cell-3	I/A	System with CPU:	~	<u>E</u> xecute	X Close	

Picture 14. Choose

"Memory Readout - All data" "Output Format: Spreadsheet (Excel, WinControl)" "Show message with Filename"

Then, click on "Execute".



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Picture 15. Choose where to save file, and give it a name; Save ("Spara").

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Cell-2	Limit Act. va	Output Format.   adsn	eet (Excelv	C Convert int	o a spreadsheet, re	emove empty columns.	
cell-3	N/A	System with CPU:		Execute	X Close		

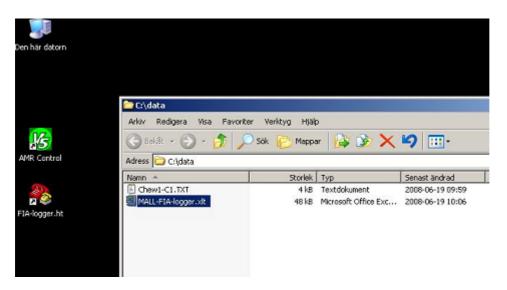
Picture 16. The loggfile is saved and when ready, click OK. After this, the window can be closed (click on Close).

Repeat the procedure i pictures 12-16 for all cells.



## Presenting data

The data loggfiles are difficult to read since the number of datapoints is normally vast. It is necessary to present them diagrams.

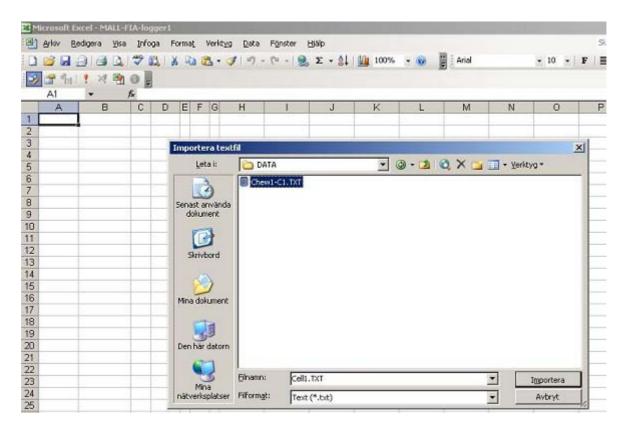


Picture 17. Open "MALL-FIA-logger.xlt".

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Picture 18. Click on the icon "Redigera textimport" (see green arrow).





Picture 19. Choose the loggfile you have saved earlier in steps 12-16. Clck on Import.

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Picture 20. Click on "Slutför" (green arrow).



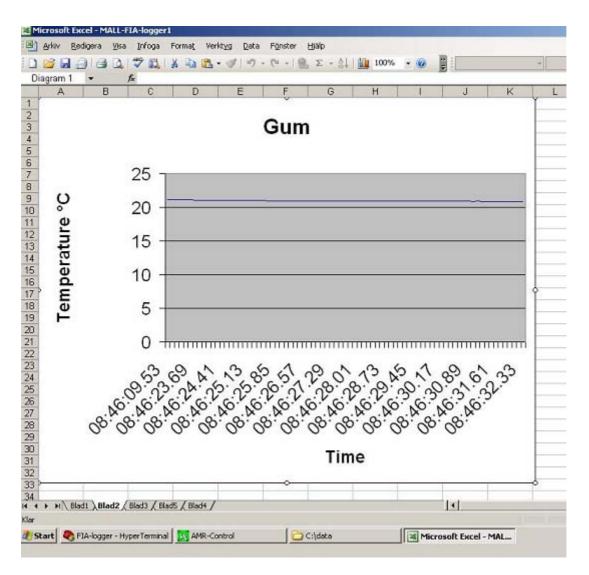
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2	17.05.08	08:46:13.85	0	21,16	7	46	0				
3	17.06.08	08:46:13.97	0	21,15	7	46	0				
4	17.06.08	08:46:23.33	0	21,11	7	0	0				
5	17.06.08	08:46:23.45	0	21.1	7	0	0				
6	17.06.08	08:46:23.57	0	21.1	7	0	0				
7	17.06.08	08:46:23.69	0	21,09	7	43	0				
8	17.06.08	08:46:23.81	0	21,08	7	46	0				
9	17.06.08	08:46:23.93	0	21,08	7	46	0				
10	17.06.08	08:46:24.05	0	21,07	7	46	0				
11	17.06.08	08:46:24.17	0	21,06	7	46	0				
12	17.06.08	08:46:24.29	0	21,05		46	0				1
13	17.06.08	08:46:24.41	0	21,04		15	0				
14	17.02.08	69.46-24.63	0	21.03	7	7	0				

Picture 21. All data are imported to the Excel sheet.

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251	17.06.08	08:46:52.97	0	20,7	7	-2	0				
252	17.06.08	08:46:53.09	0	20,7	7	42	0				
253	17.06.08	08:46:53.21	0	20,69	7	- 44	0				
254	17.06.08	08:46:53.33	0	20,7	7	45	0				
255	17.06.08	08:46:53.45	0	20,7	7	45	0				
256	17.06.08	08:46:53.57	0	20,69	7	45	0				
257	17.06.08	08:46:53.69	0	20,7	7	45	0				
258	17.06.08	08:46:53.81	0	20,7	7	13	0				
259	17.06.08	08:46:53.93	0	20,7	7	3	0			1	
260	17.06.08	08:46:54.05	0	20,7	7	1	0				
261	17.06.08	08:46:54.17	0	20,7	7	-1	0				
262	17.06.08	08:46:54.29	0	20,7	7	-1	0				
263	17.06.08	08:46:54.41	0	20,7	7	-1	0				
264	17.06.08	08:46:54.53	0	20,7	7	41	0				
265	17.06.08	08:46:54.65	0	20,71	7	43	0				
266	17.06.08	08:46:54.77	0	20,7	7	44	0				
267	17.06.08	08:46:54.89	0	20,7	7	45	0				
268	17.06.08	08:46:55.01	0	20,71	7	45	0				
269	17.06.08	08:46:55.13	0	20,7	7	45	0				
270	17.06.08	08:46:55.25	0	20,7	7		0				
271	17.06.08	08:47:11.21	100	20,79	7	12	0				
272		1		1		1					
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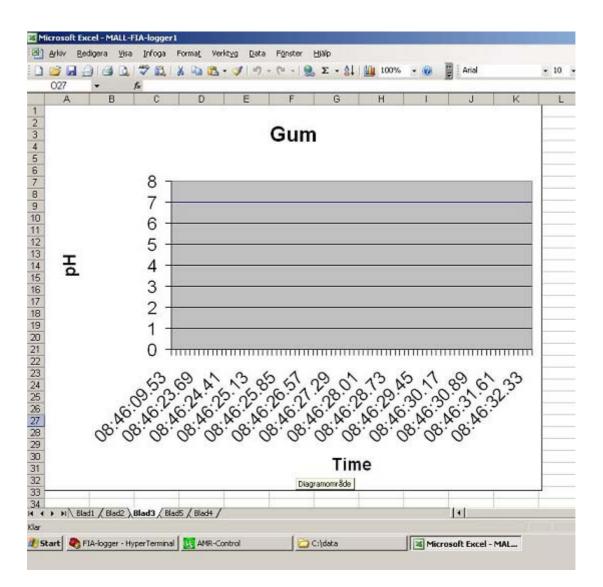
Picture 22. The last row of data is the measurements that were performed after the mixing movements of the lift. That row will is not presented in the diagrams. If they differ from the rest, they should be noted specially due to their importance.





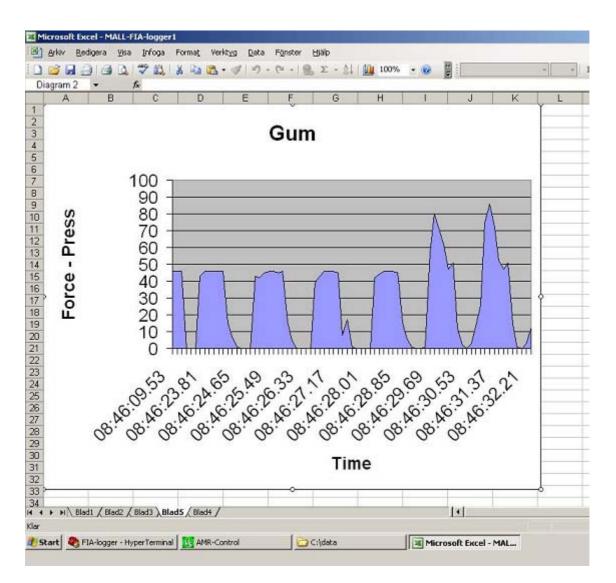
Picture 23. Diagram showing temperature in the cell vs time ("Blad 2").





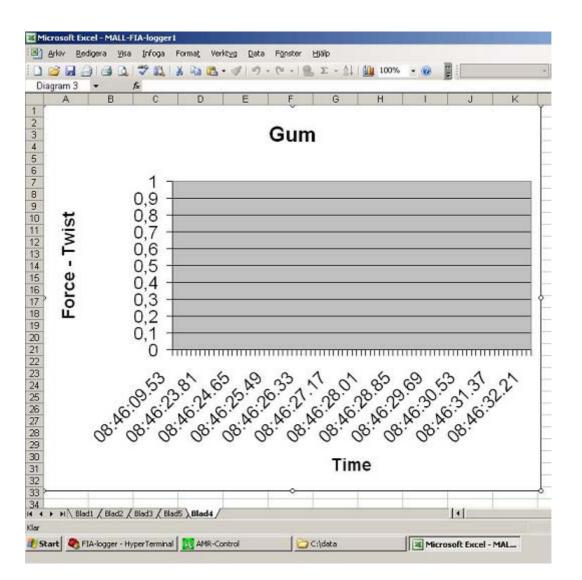
Picture 24. Diagram showing pH in the cell vs time ("Blad 3").





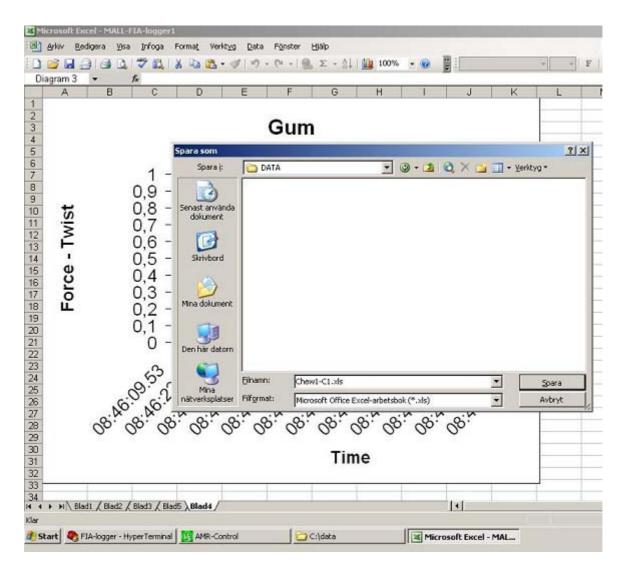
Picture 25. Diagram showing pressure in Newton (N) on the formulation vs time ("Blad 5").





Picture 26. Diagram showing torque in Newtoncentimeter (Ncm) on the formulation vs time ("Blad 4").





Picture 27. Save the document.

## Finish

To finish: with the control switches, move the lifts down. Shut off main power on the left control box, open the door of the safety cupboard and then take out liquid samples.

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