

# The Daniel Test

This Test aims to be a general assessment of the software and the reader performance. It should ideally be executed for each major Software update. It measures the performance by grading Noise, SNR, Spikes and anomalies metrics for each mologram and then for the whole chip, which gives a fail/pass note for each mologram and respectively the whole chip.

Note: it is best to use this test with the same chip, dedicated for this test.

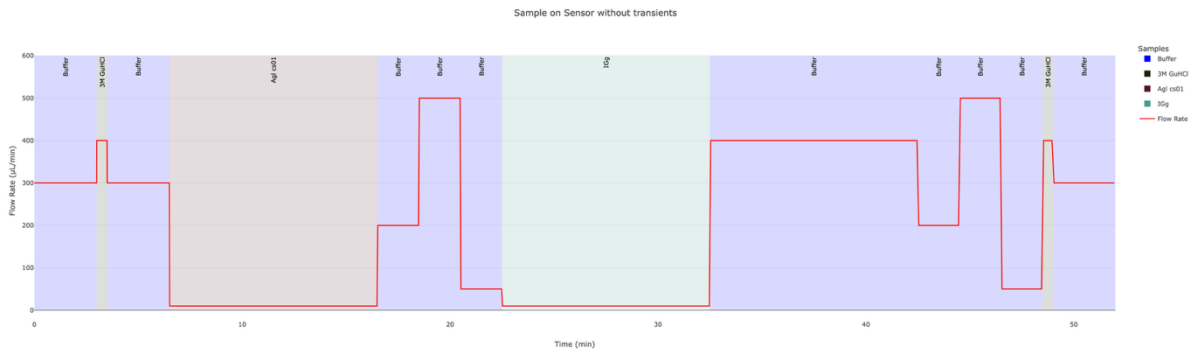
**IMPORTANT** - The name of the experiment downloaded results csv file must start with:


































“YYYY-MM-DD\_HH:MM:SS\_THE\_DANIEL\_TEST\_{reader name} ....”

## The experiment

Regeneration(GuHCl) → Ligand 1 (protein AGL cs01)X → Analyte (IgG)X → Slow Dissociation →  $buffer \frac{400\mu l}{min}$  → Regeneration (GuHCl)

X = Flow rate change in the high signal part



Custom Phase  						
Type	Sample	Vial	Duration	Pickup	Flowrate	
Custom Injections 						
Baseline	Buffer		3 min		300 uL/min	 
Regeneration	3M GuHCl	1-A1	0.5 min	200 μL	400 uL/min	 
Baseline	Buffer		3 min		300 uL/min	 
Association	Agl cs01	1-A2	10 min	100 μL	10 uL/min	 
Baseline	Buffer		2 min		200 uL/min	 
Baseline	Buffer		2 min		500 uL/min	 
Baseline	Buffer		2 min		50 uL/min	 
Association	IgG	1-A3	10 min	100 μL	10 uL/min	 
Dissociation	Buffer		10 min		400 uL/min	 
Baseline	Buffer		2 min		200 uL/min	 
Baseline	Buffer		2 min		500 uL/min	 
Baseline	Buffer		2 min		50 uL/min	 
Regeneration	3M GuHCl	1-A1	0.5 min	200 μL	400 uL/min	 
Baseline	Buffer		3 min		300 uL/min	 
 Add Command						

### Export Settings

☐ Export Fluorescence Images

Every n steps  
100

☒ Export Surface Images

Every n steps  
100

☒ Export Result Images

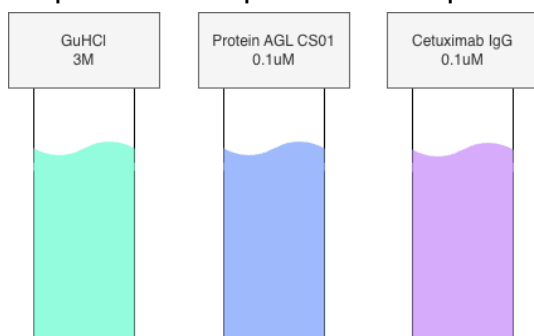
Every n steps  
100

Below are the technical steps on how to conduct it:

1. Use a regular chip with molograms 8x8 oligo1-oligo2-PEG
2. Use an assembly holder with multi-channel configuration
3. Screw tight the chip to the holder assembly
4. Clean the glass surface of the reader



5. Fill bottles of buffer and water of autosampler, if are not filled.
6. Prepare the samples for the experiment



7. Fill the vials for this experiment

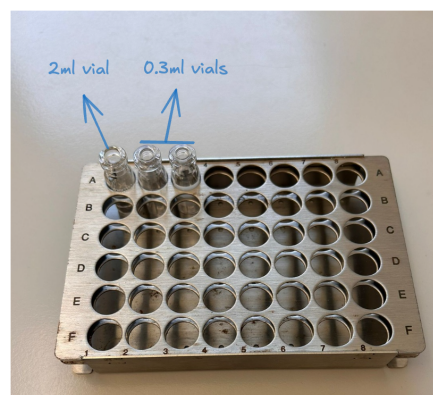
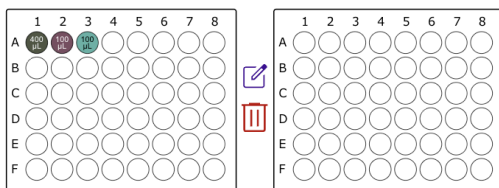
#### Well Plates ⓘ ⓘ

Left Dead Volume  
without dead volume

Right Dead Volume  
without dead volume

Auto Place Vials

Remove Unused Vials



## 8. Settings – SAVE – Save video from experiments

The screenshot displays the 'Settings' window with the 'SAVE' tab selected. The left sidebar contains navigation options: Experiment, Instrument, Advanced, System Control, Health, Import / Export, Fit Results, and Settings (highlighted). The main panel shows the 'Settings' title and a sub-tab bar with EXPERIMENTS, IMAGE, REDUCER, ALGORITHM, EXPORT, and SAVE. Under the 'SAVE' tab, there is a checkbox for 'Upload the Measurements to AWS'. Below this, a large box contains several sections of settings: 'Save measurements' with checkboxes for 'Save Hologram Measurements' and 'Save Liquid Handler commands' (both checked), and a 'Remove' button; 'Save whole images' with checkboxes for 'Save video from experiments' (checked) and 'Save Images'; 'Save Region of Interest (ROIs)' with checkboxes for 'Save ROIs Stencil', 'Save ROIs Series Images', and 'Save ROIs Intensity'; and 'Save others' with checkboxes for 'Save Loop Results' and 'Save Field Tiler'. At the bottom of this box is a 'Frequency' input field with the value '1'. Below the settings box are two buttons: 'Preview Brickline' and '+ Add Settings'. The bottom of the sidebar shows a 'Log Out' button and the 'Mitsubishi Electric' logo.

Settings

EXPERIMENTS IMAGE REDUCER ALGORITHM EXPORT **SAVE**

☐ Upload the Measurements to AWS

Save measurements

☒ Save Hologram Measurements Remove

☒ Save Liquid Handler commands

Save whole images

☒ Save video from experiments

☐ Save Images

Save Region of Interest (ROIs)

☐ Save ROIs Stencil

☐ Save ROIs Series Images

☐ Save ROIs Intensity

Save others

☐ Save Loop Results

☐ Save Field Tiler

Frequency  
1

Preview Brickline + Add Settings

Log Out

Mitsubishi Electric

9. Fill all the unused channels with the buffer solution, make sure to end this step on the channel for which the entry is the same as the experiment one (usually 4). Below are examples with 3 and 4 channels configurations

The screenshots illustrate the process of filling unused channels with buffer solution in the Liquid Handler software. The first screenshot shows the main interface with the 'Liquid Handler' section selected in the sidebar. The 'Select Flow Channel' button is highlighted. The second screenshot shows the 'Select Flow Channel' dialog box with 'Three channel flow chamber' selected. The third screenshot shows the 'Select Flow Channel' dialog box with 'Four channel flow chamber' selected. The fourth screenshot shows the 'Set Flow Rate' dialog box with 'Run' highlighted.

**Liquid Handler**

Experiment  
Instrument  
**Liquid Handler**  
Documentation  
Release Notes  
Advanced  
Log Out

**Liquid Handler**

Pump  
Pump is ready  
Flow Rate: 0.0  $\mu\text{L}/\text{min}$   
Remaining Volume: 2500.0  $\mu\text{L}$

Configuration  
Flow Range: 5.2-1000  $\mu\text{L}/\text{min}$   
Syringe Volume: 2.5 mL  
Edit Configuration

Pump Actions  
Init  
Empty Syringe  
Fill Syringe  
Run Flow Rate  
Stop Pump  
Flush Fluidics  
Clean Fluidic System

Autosampler  
Status: Not running  
Valve position: 4  
Tray Temperature: 22  $^{\circ}\text{C}$

Configuration  
Injection Needle Volume: 15.0  $\mu\text{L}$   
Syringe Volume: 500.0  $\mu\text{L}$   
Buffer Tubing Volume: 1.0 mL  
Sample Loop Volume: 500.0  $\mu\text{L}$   
Delivery Tubing Volume: 35.0  $\mu\text{L}$   
Tray String: 48 vial/48 vial  
Edit Configuration

Autosampler Actions  
Init  
Reset  
Load Sample  
Initial Wash  
Autosampler Cooling  
Inject  
Select Flow Channel

**Liquid Handler**

Chip Name: 1st Gen 8 row  
Flow Chamber: Three channel flow chamber

**Liquid Handler**

Chip Name: 1st Gen 8 row  
Flow Chamber: Four channel flow chamber

**Liquid Handler**

Pump  
Pump is ready  
Flow Rate: 0.0  $\mu\text{L}/\text{min}$   
Remaining Volume: 2500.0  $\mu\text{L}$

Configuration  
Flow Range: 5.2-1000  $\mu\text{L}/\text{min}$   
Syringe Volume: 2.5 mL  
Edit Configuration

Pump Actions  
Init  
Empty Syringe  
Fill Syringe  
Run Flow Rate  
Stop Pump  
Flush Fluidics  
Clean Fluidic System

Autosampler  
Status: Not running  
Valve position: 4  
Tray Temperature: 22  $^{\circ}\text{C}$

Configuration  
Injection Needle Volume: 15.0  $\mu\text{L}$   
Syringe Volume: 500.0  $\mu\text{L}$   
Buffer Tubing Volume: 1.0 mL  
Sample Loop Volume: 500.0  $\mu\text{L}$   
Delivery Tubing Volume: 35.0  $\mu\text{L}$   
Tray String: 48 vial/48 vial  
Edit Configuration

Autosampler Actions  
Init  
Reset  
Load Sample  
Initial Wash  
Autosampler Cooling  
Inject  
Select Flow Channel

**Liquid Handler**

Set Flow Rate  
Flow rate ( $\mu\text{L}/\text{min}$ ): 1000  
Duration: 60 s  
Run indefinitely  
Cancel  
Run

10.Prime pump

Liquid Handler Preparation

Select Flow Channel

Prime Pump

Prime Autosampler

Prime Chip

Autosampler Cooling

Reader Preparation

Prepare Reader

Check Coupling

Check Bubbles

Configure Environment

Check Mologram Recognition

Description

1st try for the general software and system test

Start Measurement

11.Prime chip

Liquid Handler Preparation

Select Flow Channel

Prime Pump

Prime Autosampler

Prime Chip

Autosampler Cooling

Reader Preparation

Prepare Reader

Check Coupling

Check Bubbles

Configure Environment

Check Mologram Recognition

Description

1st try for the general software and system test

Start Measurement

PlanPerformInsights

Instrument: Reader Sirius Mock Alias Mock

Pump

Pump is re

Flow Rate

Remaining

Instrument

Liquid

Select

Prime

Autosampler

Prime

Chip

Autosampler

Cooling

Reader

Prepare

Check

Check

Configure

Check

Description

1st try for the general software and system test

Start Measurement

Select Flow Channel

Chip Name  
1st Gen 8 row

Flow Chamber  
Single flow chamber

123456

123456

CancelSave

12.Prepare reader – make sure it passes all

Liquid Handler Preparation

Select Flow Channel

Prime Pump

Prime Autosampler

Prime Chip

Autosampler Cooling

Reader Preparation

Prepare Reader

Check Coupling

Check Bubbles

Configure Environment

Check Mologram Recognition

Description

1st try for the general software and system test

Start Measurement

### 13. System controls – verify values and adjust

The screenshot displays the 'System Control' interface. On the left is a sidebar with navigation options: Home, Experiment, Instrument, Advanced, System Control (highlighted with a red box), Health, Import / Export, Fit Results, and Settings. The main area contains several control panels for different components: Molo Laser, Fluorescence Laser, XY Stage, Molo Mirror (highlighted with a red box), Fluorescence Mirror, and Focus Lens. Each panel includes fields for temperature, power, and position, along with 'Set', 'Optimize Position', and 'Reset' buttons. At the bottom, a 'Power Display' section shows a table of power levels for various components, all of which are currently 'No data'.

Power Display	
Coupling IR:	No data
Coupling RED:	No data
Molo IR:	No data
Surface IR:	No data
Surface RED:	No data

14. Move out of good position for molo (>40k steps), XY (100k steps), focus.
15. Prepare reader again – make sure it passes all
16. Check bubbles – Check that the surface image looks good and that there are no bubbles
17. Check coupling – Check the coupling power profile, intensity and mologram recognition
18. Start the measurement “Daniel General Test”
19. Look at logs and for issues
20. Check metrics from the data: Noise, SNR, Spikes, Anomalies (steps), RMSE to desired model plot (“perfect plot”).
21. Analyze the surface images and the result images
22. Check the video of the experiment by running the following (download it from the reader):  
`scp -r container@READER:/home/container/lino_data/experiment_test_data/YYYY-MM-DD/{name of your experiment}{name of the arrival directory}`