

# **TGATS software**

## **Status and example screen shots**

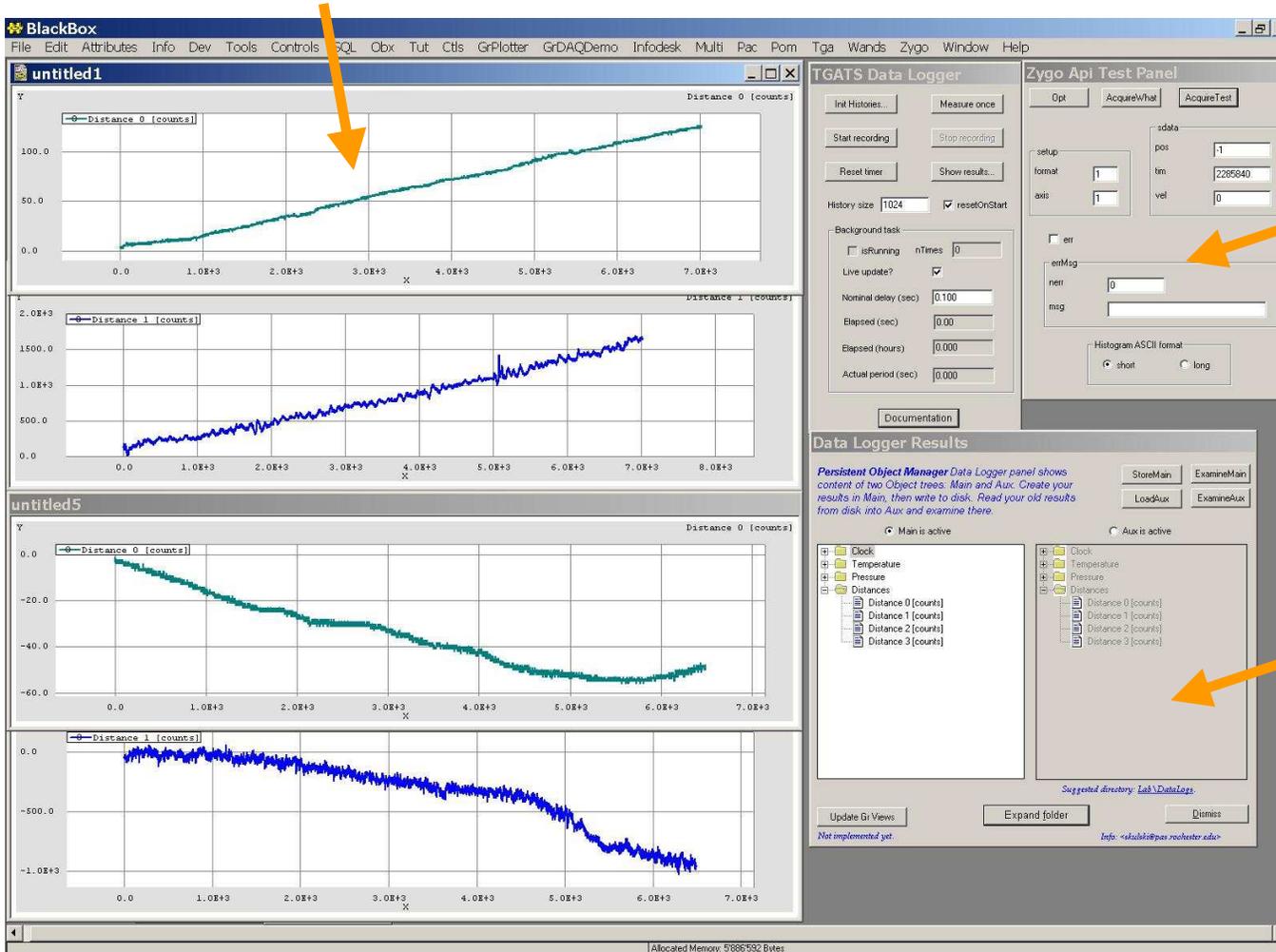
**Feb/07/05**

# TGATS means “data recording”

1. **TGATS SW is organized around recording of arbitrary “data histories”.**  
TGC SW was organized around image processing and SSPD math.
2. **A dedicated BlackBox subsystem has been developed: the POM Data Logger.**  
Arbitrary data histories, in arbitrary numbers, organized in arbitrary ways.
3. **The Data Logger performs arbitrary measurements and records the numbers.**  
The data histories are organized into an Explorer-like window.  
Graphical displays can be popped up by double-clicking.
4. **The first type of histories already recorded: Zygo DMI Interferometer.**  
Two DMI axes have been setup for testing.
5. **Number of problems have been solved.**  
The original DMI drivers had to be installed and made work. Was not easy.  
The DAQ would stop after ~1 hour. The DLL was modified and ran for 3 days.

# Data Logger and DMI histories

DMI history recordings



Data acquisition panels

Data management panel

# A document with a live experimental record

Lab report

with embedded live plots

Data acquisition panels

Data management panel

The screenshot displays the BlackBox software interface, which is divided into several functional panels. On the left, a text document titled "Exp\_020105a" contains a report about DMI recordings at TGATS lab. The report includes two line graphs: "Axis 1 [counts]" showing a linear increase in count value over time, labeled "Wavelength compensator", and "Axis 2 [counts]" showing a similar linear increase, labeled "Interferometer axis". Below the graphs, there is a code block showing Zygo API calls for data acquisition. The right side of the interface features the "TGATS Data Logger" panel with controls for recording and history, and the "Zygo Api Test Panel" with fields for setup parameters like position, time, and velocity. At the bottom right, the "Data Logger Results" panel shows a tree view of data objects, including "Clock", "Temperature", "Pressure", and "Distances".

**BlackBox**  
File Edit Attributes Info Dev Tools Controls SQL GBox Tgt Cts GPlotter GrDAQDemo Infodesk Multi Pac Pom Tga Wands Zygo Window Help

Exp\_020105a

The first DMI recording at TGATS lab  
WS 02/01/05

**Progress.** Over the past few weeks we have advanced the software and hardware in the TGATS lab to the point that we could take the first time-correlated recording of two DMI channels. The software is brand-new and tested for the first time under lab conditions.

Count value Axis 1 [counts]  
150.0  
100.0  
50.0  
0.0  
0.0 1.0E+3 2.0E+3 3.0E+3 4.0E+3 5.0E+3 6.0E+3 7.0E+3  
Sample number (0.38 s/sample)

Wavelength compensator

Count value Axis 2 [counts]  
2.0E+3  
1500.0  
1000.0  
500.0  
0.0  
0.0 1.0E+3 2.0E+3 3.0E+3 4.0E+3 5.0E+3 6.0E+3 7.0E+3  
Sample number (0.38 s/sample)

Interferometer axis

Figure 1. The first recording of the DMI histories shows a correlation between the wavelength compensator in channel 1 and the interferometer in channel 2. The recordings were taken with all brand-new BlackBox software: the ZygoDll interface module, ZygoApi, and TgaDataLogger.

The data taking of the recorder interrogated the Zygo DMI twice per measurement cycle with the following ZygoApi calls, as advised in the PomDataLogger documentation:

```
dist [0] . AddSample ( ZygoApi. GetCountsOneAxis ( 1 ) ); (*note axis number 1 *)  
dist [1] . AddSample ( ZygoApi. GetCountsOneAxis ( 2 ) ); (*note axis number 2 *)
```

where dist [\*] are two DataLogger histories. The nominal waiting time between the measurements was set to 0.1 second. The loop turnaround time turned out to be 0.378 second. Internally, the system calls the DLL function SAMPLE which performs the readout of all three measurements from a single Zygo board. It is the simplest of the several data-acquisition DLL functions provided by the Zygo's PCI\_VME DLL library. The fact that each readout is performed individually may account for a relatively long loop turnaround time.

**TGATS Data Logger**  
Init Histories... Measure once  
Start recording Stop recording  
Reset timer Show results...  
History size: 1024  resetOnStart  
Background task  
 isRunning nTimes: 0  
Live update?   
Nominal delay (sec): 0.100  
Elapsed (sec): 0.00  
Elapsed (hours): 0.000  
Actual period (sec): 0.000

**Zygo Api Test Panel**  
Opt AcquireWhat AcquireTest  
sddata  
pos: -1  
tim: 0.05840  
vel: 0  
formal: 1  
axis: 1  
 err  
enMsg  
ner: 0  
msg:  
Histogram ASCII format  
 short  long

**Data Logger Results**  
Persistent Object Manager Data Logger panel shows content of two Object trees: Main and Aux. Create your results in Main, then write to disk. Read your old results from disk into Aux and examine there.  
StoreMain ExamineMain  
LoadAux ExamineAux  
 Main is active  Aux is active  
Clock  
Temperature  
Pressure  
Distances  
Distance 0 [counts]  
Distance 1 [counts]  
Distance 2 [counts]  
Distance 3 [counts]  
Suggested directory: Lab\DataLogs  
Update Gt Views Expand folder Dismiss  
Not implemented yet. Info: wskulski@pas.rochester.edu