



Extending The Reach of Chromatography Data

# chromperfect

- ❖ Development of Chromperfect MarkerTrace
- ❖ Specific SOP for application of Specific Testing
- ❖ Creation of the Analyzer Controller Unit, the ACU

# chromperfect

- This is a “Joint Venture” of Instruments and Software
- Consideration of Users that are commissioned for the Project
- The application of revolutionary, unique instrumentation

# chromperfect

- Highly Trained Scientists Begin the Process
- Convert the Identified Requirement into a Chromatographic Solution
  - Method Development
  - Keeping an Eye on Logistics for the Environment of Deployment
- Highly Trained Technicians
  - May not have a “Science” background
  - Trained to adhere to tasks outlined in Software



# Anatomy of the Software Solution

- Begins with a Highly Reliable Instrument
- Chromperfect Marker Trace designed around Calidus
- Micro and Fast Gas Chromatography
- Many Deployment Options
  - Laboratory Environment
  - Mobile Implementation

## Determination of the “Product”

- The Product is the Result of the Entire Process
- Software and Hardware are Only the Vehicle
- The ACU is developed from the Product Down
  - Result Report
  - Method to Get the Result
  - Instrument to Run the Method
  - Software to Knit the Pieces Together
- Software is a Flexible and Dynamic

## The Problem Before Us

- Detection of Fraud of Non-Taxed Fuels for Road Use
- The Tax could be More than the Cost of Fuel Itself
- Reliable Data on a Mobile Basis
- Defined and Strict SOP
- Detection at Low Levels

The background features a large, light gray, stylized letter 'C' that is partially filled with a gradient. In the top right corner, there is a red, triangular shape resembling a pencil tip pointing towards the center.

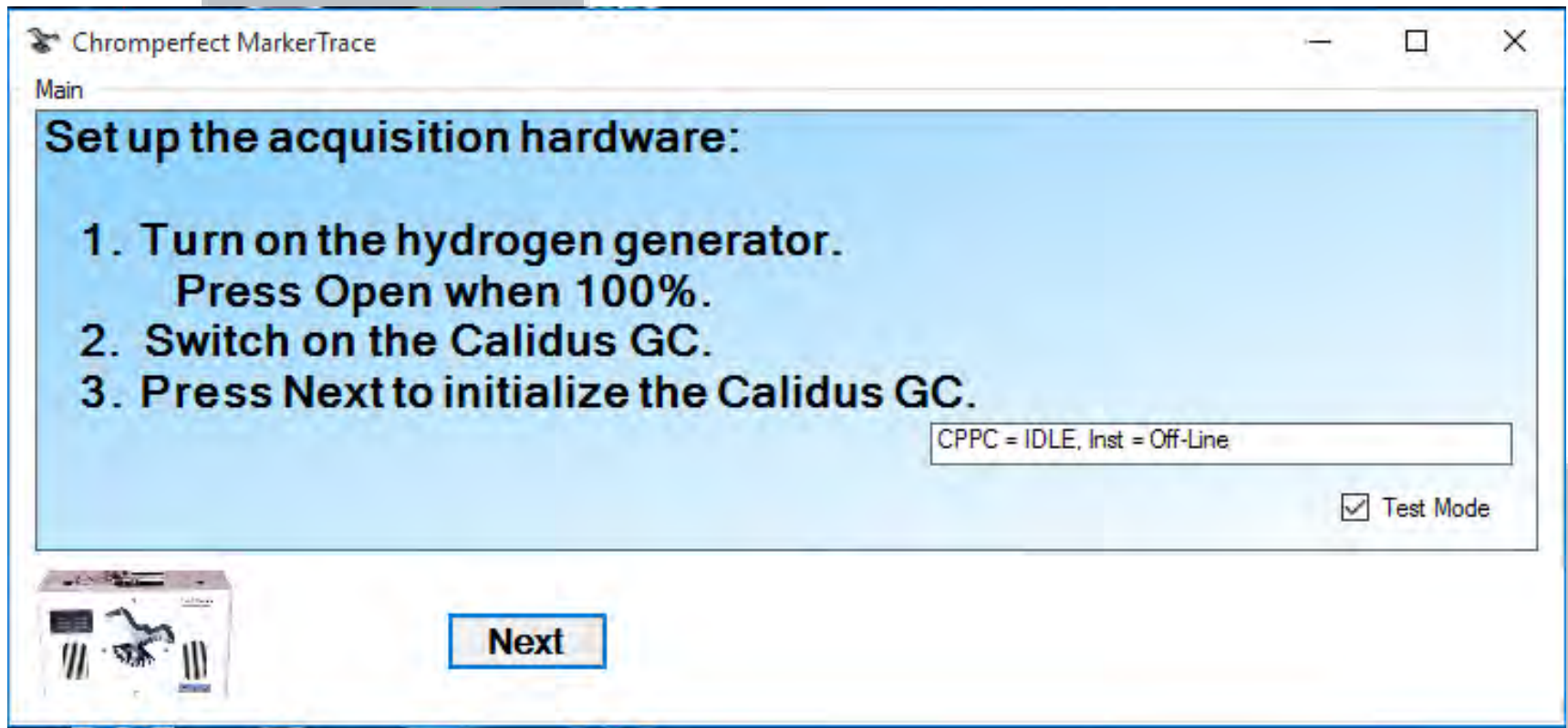
chromperfect

A Look At the ACU

chromperfect  
MarkerTrace



## Startup



The screenshot shows the 'Chromperfect MarkerTrace' software window. The title bar includes the application name and standard window controls (minimize, maximize, close). Below the title bar is a 'Main' menu. The main content area has a light blue background and contains the following text:

**Set up the acquisition hardware:**

- 1. Turn on the hydrogen generator.  
Press Open when 100%.**
- 2. Switch on the Calidus GC.**
- 3. Press Next to initialize the Calidus GC.**

At the bottom right of the blue area, there is a text box containing 'CPPC = IDLE, Inst = Off-Line' and a checked checkbox labeled 'Test Mode'. Below the blue area, on the left, is a small image of a Calidus GC instrument. In the center, there is a 'Next' button.

## Initialize the ACU System

The screenshot displays the Chromperfect MarkerTrace software interface, which is divided into two main sections: a main control panel and a process control monitor.

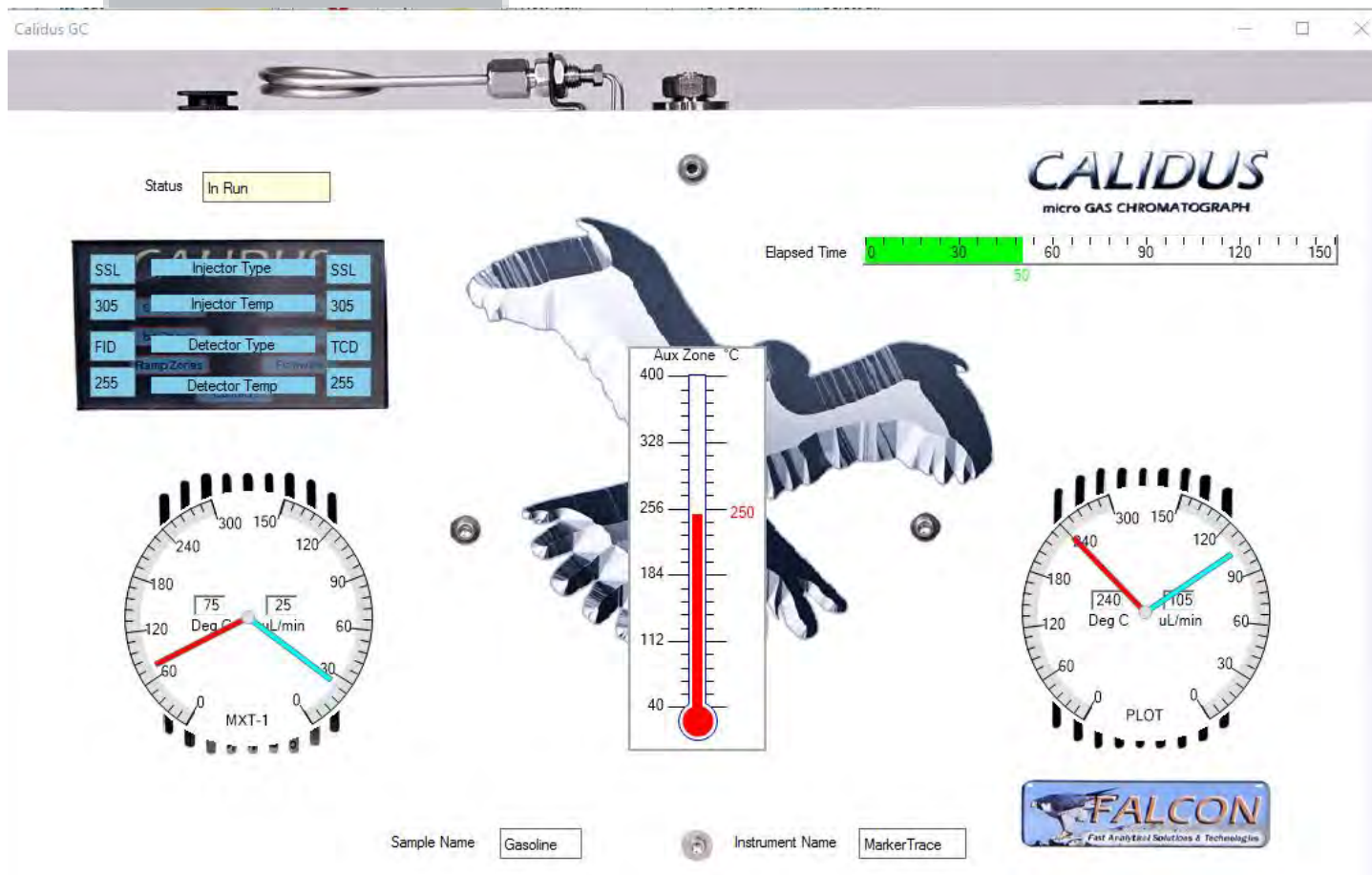
**Main Panel:**

- Title Bar:** Chromperfect MarkerTrace
- Main Area:** A light blue background with the text "Initializing the Calidus GC." and "Press the start trigger when told to do so." Below this, it says "\*\*\* Press the start trigger now. \*\*\*".
- Status Bar:** A text box displays "CPPC = WAITSTART, Inst = Ready to Go".
- Test Mode:** A checkbox labeled "Test Mode" is checked.

**Process Control Monitor Panel:**

- Title Bar:** Process Control Monitor
- Log Area:** A list of events:
  - 10/20/15 22:40:12 SCHEDULED: Sample stream #A5 (Priority) <STARTUP>
  - 10/20/15 22:40:15 Downloading Method file <C:\CPData\MarkerTrace\MarkerTraceSU.met>
  - 10/20/15 22:40:19 Selecting sample stream #A5
- Process Log / Error Log:** A separate log area showing "10/20/15 22:40:12 STARTED: STARTUP".
- Control Panel:** Includes buttons for "Copy to Clipboard", "Ignore Acromag errors", "Show Display", "Enable Streams", "Abort Sequence", and "Dismiss Alarm".
- Instrument Information:** A dropdown menu shows "Selected Instrument: Calidus Digital Data". Below it, "Monitor Status" is "Starting acquisition", "Instrument Status" is "Ready to Go", and "Last RTD reading" is "N/A".
- Running since:** 10/20/2015 10:38:15 PM
- Current Time:** 10:41:02 PM 22:41:02

## Initialize the ACU System



## Preparing a Clean Analyzer

The screenshot displays the Chromperfect MarkerTrace software interface. The main window is titled "Chromperfect MarkerTrace" and contains the following text:

**Preparing for an initialization blank run.**  
**Press the start trigger when told to do so.**  
**\*\*\* Press the start trigger to run the blank. \*\*\***

At the bottom right of the main window, there is a text box containing "CPCC = WAITSTART, Inst = Ready to Go" and a checked checkbox labeled "Test Mode".

Below the main window is the "Process Control Monitor" window, which displays a log of events:

```
10/20/15 22:42:20 SCHEDULED: Sample stream #A1 (Priority) <BLANK>
10/20/15 22:42:23 Downloading Method file <C:\CPData\MarkerTrace\MarkerTraceB_A.met>
10/20/15 22:42:26 Selecting sample stream #A1
```

The "Process Log" window shows the following log entries:

```
10/20/15 22:40:12 STARTED: STARTUP
10/20/15 22:42:13 COMPLETED: STARTUP
10/20/15 22:42:20 STARTED: BLANK
```

The "Process Control Monitor" window also includes several control elements:

- Buttons: Copy to Clipboard, Show Display, Enable Streams, Abort Sequence, Dismiss Alarm.
- Checkboxes: Ignore Acromag errors, Display only messages from selected instrument.
- Selected Instrument: Calidus Digital Data
- Monitor Status: Starting acquisition
- Instrument Status: Ready to Go
- Last RTD reading: N/A
- Running since: 10/20/2015 10:38:15 PM
- Current Time: 10:42:58 PM 22:42:58

## Preparing a Clean Analyzer

### chromperfect Marker Trace

Operator

Date

**PASS**

Blank Pass/Fail

Marker

Method

Product

**PASS**

Calibration Std Amount  PPM QC  %  Result

**FAIL**

Validation Amount  QC

### Sample Testing

Sample Source

Refinery

Retail

Distribution

Food/Beverage

Off Road

Transportation

Location

Owner/Operator

GPS  ° N  ° W

Marker Limit

Marker Amount

## Ready for Testing

The screenshot displays the Chromperfect MarkerTrace software interface, which is divided into several sections:

- Main Panel:** A large blue area with the text "Calidus is initialized and ready for injections. Choose the type of run, or press Quit to shut down the GC." Below this text is a status box showing "CPPC = IDLE, Inst = Ready to Go" and a checked "Test Mode" option.
- Chromperfect Acquisition Panel:** Contains a "Quit" button and four buttons for run types: "Blank", "Calibration", "Sample", and "Validation".
- Process Control Monitor Panel:** A log window with a "Process Log" tab selected. It shows a list of events with timestamps and descriptions, such as "SCHEDULED: Sample stream #A1 (Priority) <BLANK>", "Downloading Method file", "Start of run detected", "End of run detected", and "Processing Raw file".
- Control Panel:** Located at the bottom, it includes a "Copy to Clipboard" button, a "Display only messages from selected instrument" checkbox, a "Selected Instrument" dropdown menu (set to "Calidus Digital Data"), "Monitor Status" (Waiting for next scheduled sampling), "Instrument Status" (Ready to Go), and "Last RTD reading" (N/A). It also features "Enable Streams", "Abort Sequence", and "Dismiss Alarm" buttons, along with a row of status indicator lights.
- Process Log Panel:** A separate log window with a "Process Log" tab selected, showing a list of events with timestamps and descriptions, such as "STARTED: STARTUP", "COMPLETED: STARTUP", "STARTED: BLANK", "No run started in 1 minutes", "Run starts have resumed", and "COMPLETED: BLANK". It includes "Copy to Clipboard" and "Clear Process Log" buttons.

## Calibration

The screenshot displays the Chromperfect software interface, divided into several panels:

- Main Panel:** A blue box with the heading "Prepare for a calibration injection." and a numbered list of instructions:
  1. Wash the syringe with the calibration standard.
  2. Load the appropriate volume on the MicroShot.
  3. Wipe the needle.
  4. Make the injection when told to do so.Below the list, it shows "CPPC = WAITSTART, Inst = Ready to Go" and a "Test Mode" checkbox which is checked. A "Back" button is at the bottom.
- Chrom Perfect Data Acquisition on GEORGESCHREINER [SingleUser-]:** A table showing instrument status:

	Instrument	Control	Detector	Status	Sample Name	Raw File	Method File
1 A	Calidus Digital		FID	Ready	CALIBRATIO	1510202245_C_A.0001.R	MarkerTraceC_A.met
1 B				Ready	CALIBRATIO	1510202245_C_B.0001.R	MarkerTraceC_B.met
2 A	FID Digital			Ready	Test	TestOneNote.0002.RAW	ATEST.MET
- Process Control Monitor:** A log window showing system events:

```
10/20/15 22:45:53 SCHEDULED: Calibration stream #A2 (Priority) <CALIBRATION>
10/20/15 22:45:56 Downloading Method file <C:\CPData\MarkerTrace\MarkerTraceC_A.met>
10/20/15 22:45:59 Selecting calibration stream #A2
```
- Process Log / Error Log:** A log window showing run status:

```
10/20/15 22:40:12 STARTED: STARTUP
10/20/15 22:42:13 COMPLETED: STARTUP
10/20/15 22:42:20 STARTED: BLANK
10/20/15 22:43:00 No run started in 1 minutes
10/20/15 22:43:42 Run starts have resumed
10/20/15 22:44:06 COMPLETED: BLANK
10/20/15 22:44:46 No run started in 1 minutes
10/20/15 22:45:53 STARTED: CALIBRATION
```

## Blending Three Techniques

The screenshot displays the Chromperfect software interface during a calibration standard analysis. The main window shows the text "Beginning calibration standard analysis." and a status indicator "CPPC = INRUN, Inst = In Run" with a "Test Mode" checkbox checked. The Process Control Monitor window provides a detailed log of the run, including scheduled, startup, and calibration events. The chromatogram plot shows a single sharp peak at 0.50 minutes, labeled "Marker 0.50".

**Chrom Perfect Data Acquisition on GEORGESCHREINER [SingleUser-] - [Calidus Digital Data -]**

	Instrument	Control	Detector	Status	Sample Name	Raw File	Method File
1 A	Calidus Digital		FID	1.40	CALIBRATIO	1510202246_C_A.0001.R	MarkerTraceC_A.met
1 B				1.40	CALIBRATIO	1510202246_C_B.0001.R	MarkerTraceC_B.met
2 A	FID Digital			Ready	Test	TestOneNote.0002.RAW	ATEST.MET

**Process Control Monitor**

10/20/15 22:45:53 SCHEDULED: Calibration stream #A2 (Priority) <CALIBRATION>  
 10/20/15 22:45:56 Downloading Method file <C:\CPData\MarkerTrace\MarkerTraceC\_A.met>  
 10/20/15 22:45:59 Selecting calibration stream #A2  
 10/20/15 22:47:39 Start of run detected

**Process Log Error Log**

10/20/15 22:40:12 STARTED: STARTUP  
 10/20/15 22:42:13 COMPLETED: STARTUP  
 10/20/15 22:42:20 STARTED: BLANK  
 10/20/15 22:43:00 No run started in 1 minutes  
 10/20/15 22:43:42 Run starts have resumed  
 10/20/15 22:44:06 COMPLETED: BLANK  
 10/20/15 22:44:46 No run started in 1 minutes  
 10/20/15 22:45:53 STARTED: CALIBRATION  
 10/20/15 22:47:39 Run starts have resumed  
 10/20/15 22:48:39 No run started in 1 minutes

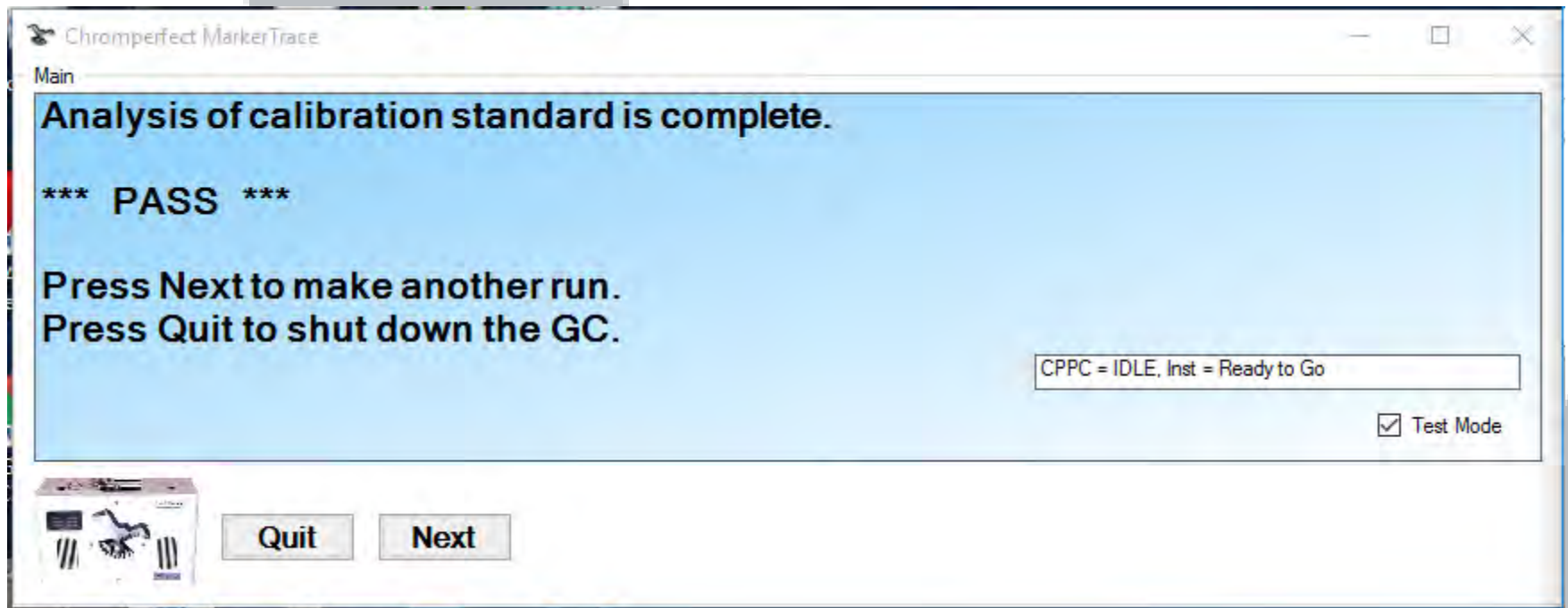
**Chromatogram Plot**

Response - Millivolts vs Time - Minutes

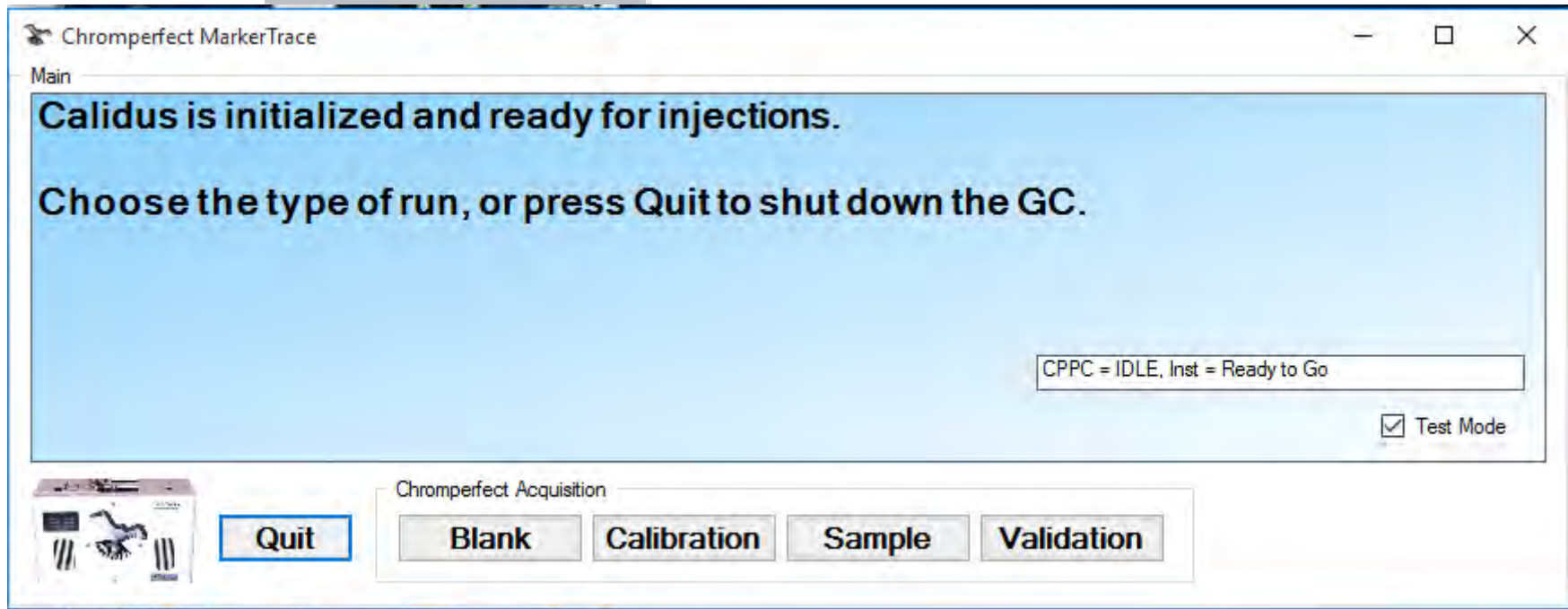
Marker 0.50



## Evaluation to Standard

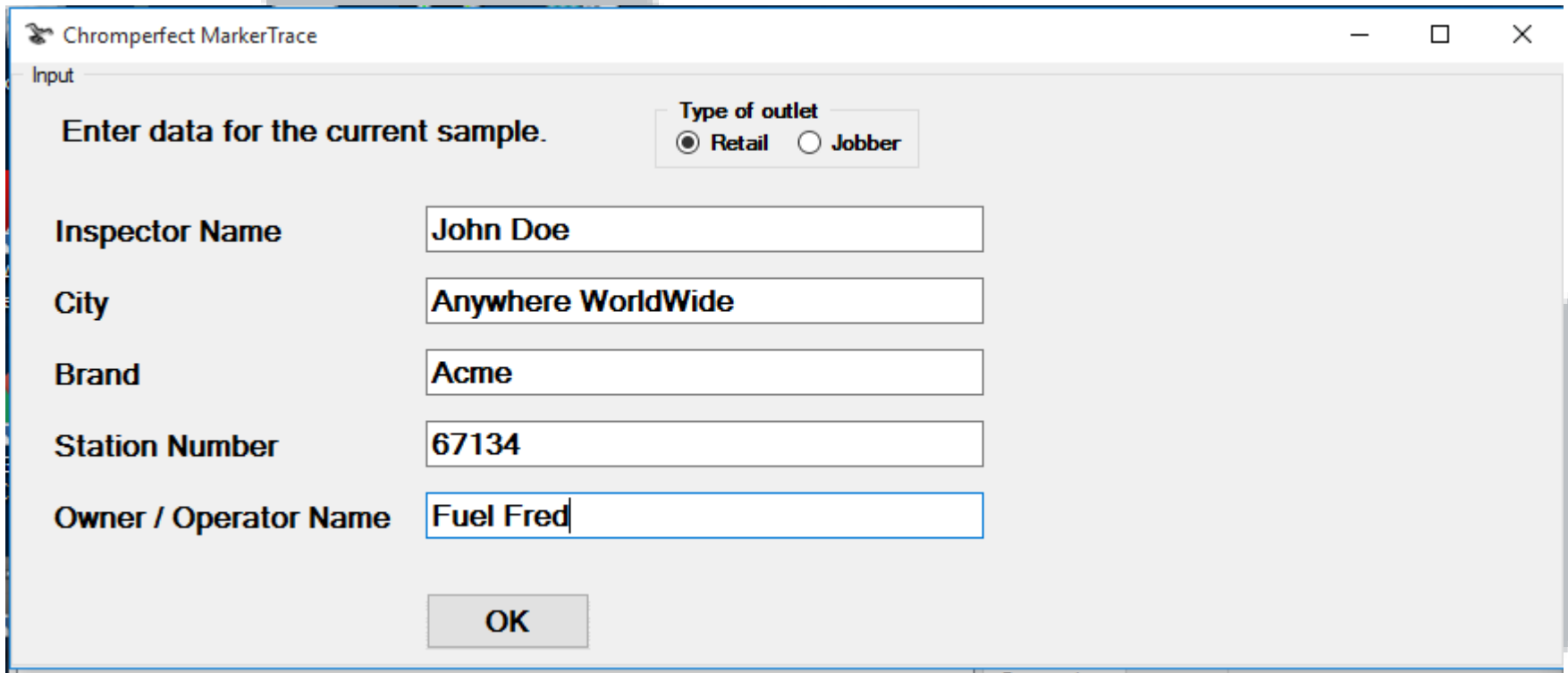


## ACU Ready for Sample Unknown



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- Once ACU is Ready for Testing the Sample Button is Pressed
- Information is Entered and Becomes Part of the Testing Result Record



The screenshot shows a software window titled "Chromperfect MarkerTrace". The window contains an "Input" section with the instruction "Enter data for the current sample." To the right of this instruction is a "Type of outlet" section with two radio buttons: "Retail" (which is selected) and "Jobber". Below this are five text input fields with the following labels and values: "Inspector Name" (John Doe), "City" (Anywhere WorldWide), "Brand" (Acme), "Station Number" (67134), and "Owner / Operator Name" (Fuel Fred). At the bottom of the form is an "OK" button.

Field Label	Value
Inspector Name	John Doe
City	Anywhere WorldWide
Brand	Acme
Station Number	67134
Owner / Operator Name	Fuel Fred

## Detailed Instructions Adhere to the Developed SOP

The screenshot displays two windows from the Chromperfect software. The left window, titled 'Chromperfect MarkerTrace', shows a 'Main' section with a blue background containing instructions for sample injection. Below the instructions is a status box showing 'CPPC = WAITSTART, Inst = Ready to Go' and a 'Test Mode' checkbox. A 'Back' button is located at the bottom of the instruction area. The right window, titled 'Chrom Perfect Data Acquisition on GEORGESCHREINER.[SingleUser-]', shows a table of instrument data and a 'Process Log' section.

**Chromperfect MarkerTrace - Main**

Prepare for a sample injection.

1. Wash the syringe with the sample.
2. Load the appropriate volume on the MicroShot.
3. Wipe the needle.
4. Make the injection when told to do so.

\*\*\* Make the injection now. \*\*\*

CPPC = WAITSTART, Inst = Ready to Go

Test Mode

Back

10/20/15 23:00:33 SCHEDULED: Sample stream #A3 (Priority) <SAMPLE>  
10/20/15 23:00:36 Downloading Method file <C:\CPData\MarkerTrace\MarkerTraceS\_A.met>  
10/20/15 23:00:39 Selecting sample stream #A3

Copy to Clipboard  Display only messages from selected instrument

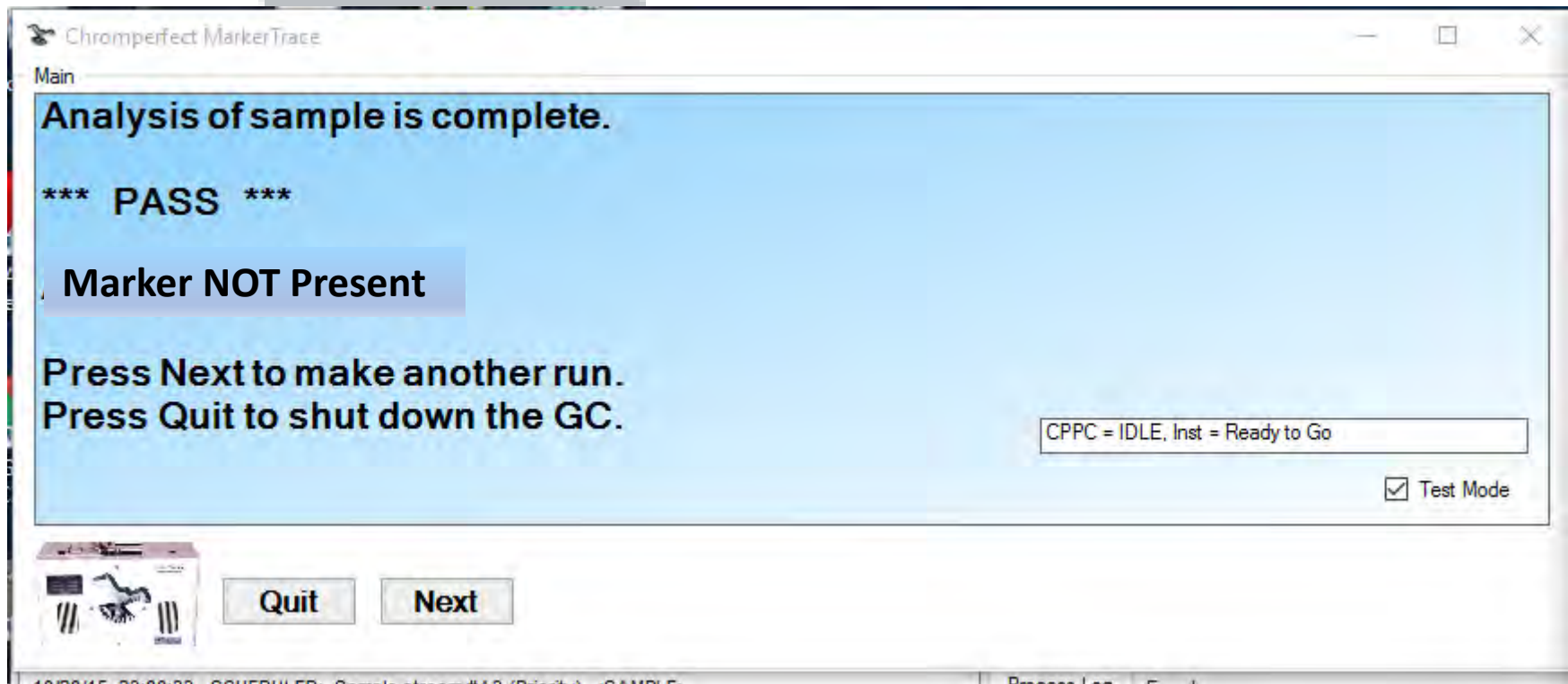
**Chrom Perfect Data Acquisition on GEORGESCHREINER.[SingleUser-]**

	Instrument	Control	Detector	Status	Sample Name	Raw File	Method File
1 A	Calidus Digital		FID	Ready	SAMPLE	1510202300_S_A.0001.R	MarkerTraceS_A.met
1 B				Ready	SAMPLE	1510202300_S_B.0001.R	MarkerTraceS_B.met
2 A	FID Digital			Ready	Test	TestOneNote.0002.RAW	ATEST.MET

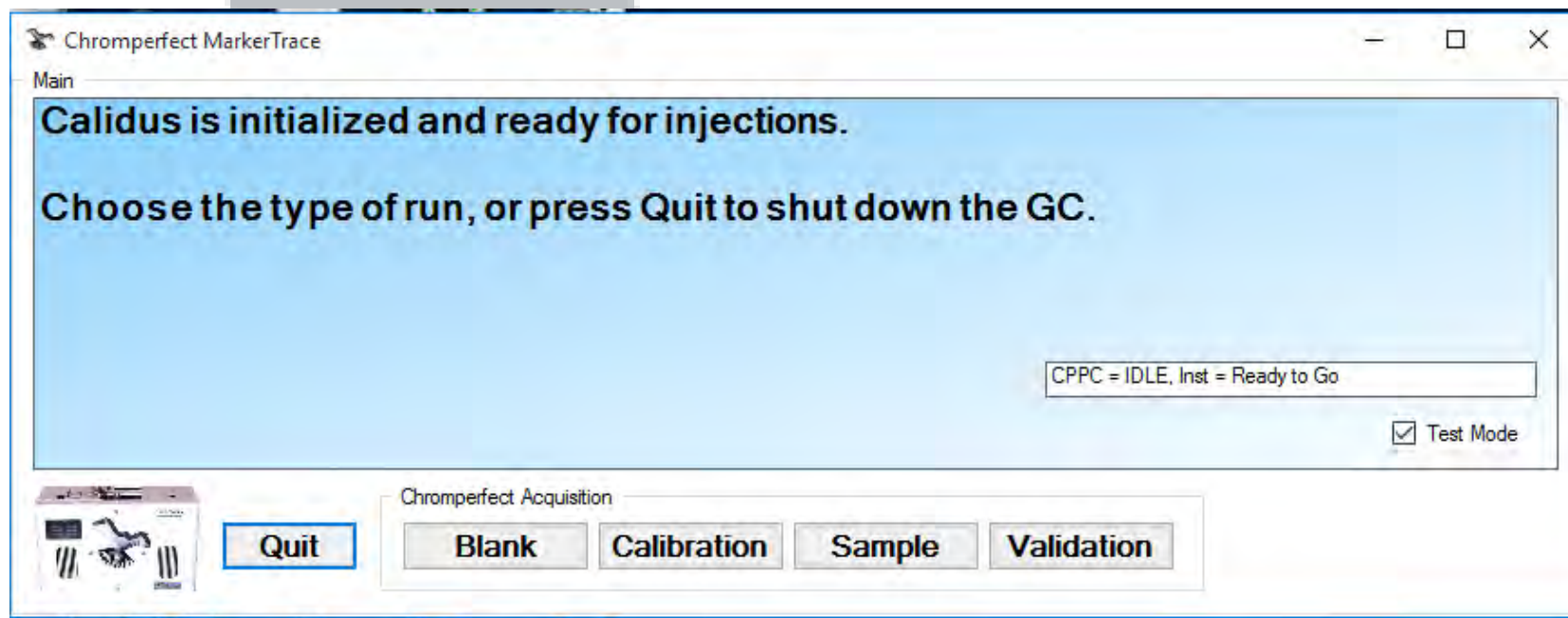
Process Log Error Log

10/20/15 22:40:12 STARTED: STARTUP  
10/20/15 22:42:13 COMPLETED: STARTUP  
10/20/15 22:42:20 STARTED: BLANK  
10/20/15 22:43:00 No run started in 1 minutes  
10/20/15 22:43:42 Run starts have resumed  
10/20/15 22:44:06 COMPLETED: BLANK  
10/20/15 22:44:46 No run started in 1 minutes  
10/20/15 22:45:53 STARTED: CALIBRATION  
10/20/15 22:47:39 Run starts have resumed  
10/20/15 22:48:39 No run started in 1 minutes  
10/20/15 22:49:57 COMPLETED: CALIBRATION  
10/20/15 23:00:33 STARTED: SAMPLE

## Automatic Results Real Time

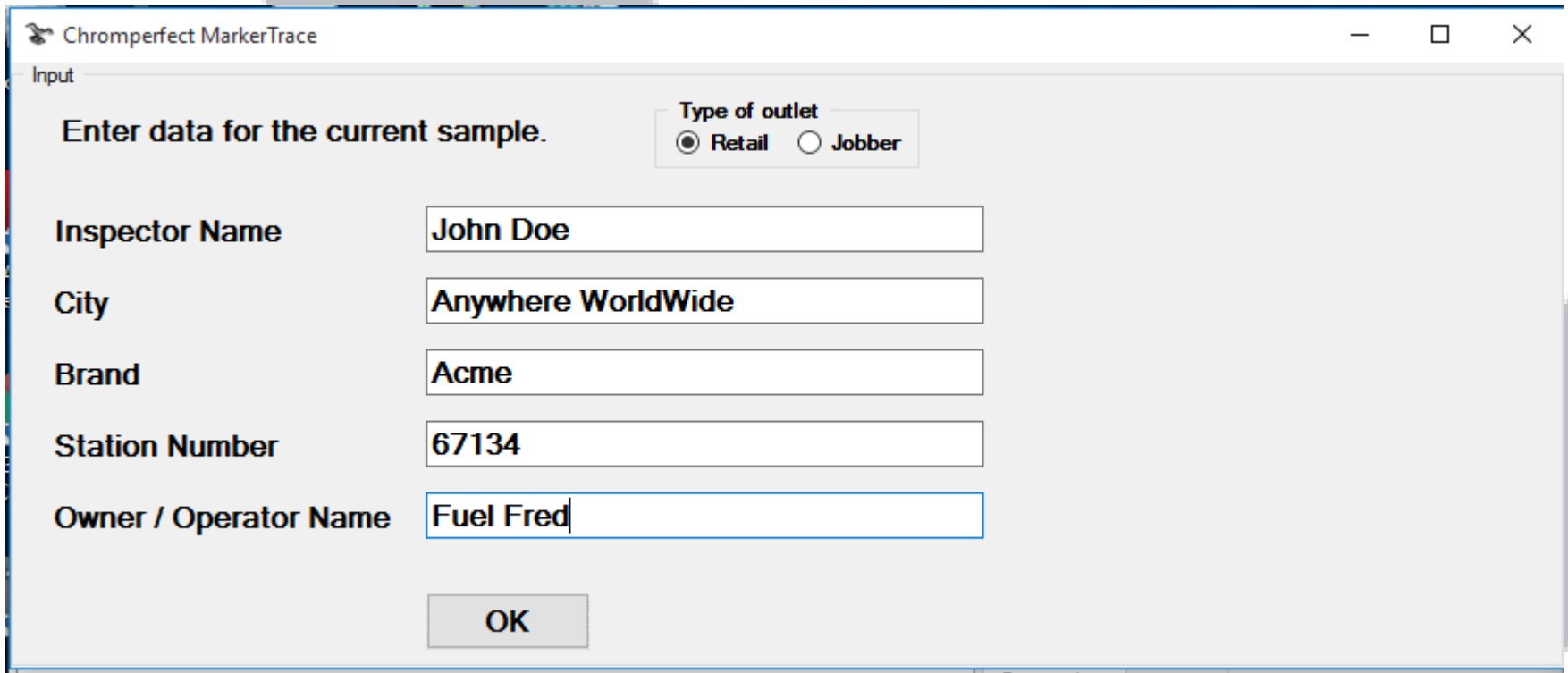


# Press Next for Additional Samples



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- Once ACU is Ready for Testing the Sample Button is Pressed
- Information is Entered and Becomes Part of the Testing Result Record



The screenshot shows a software window titled "Chromperfect MarkerTrace" with standard Windows window controls (minimize, maximize, close). The window contains an "Input" section with the instruction "Enter data for the current sample." To the right of this instruction is a "Type of outlet" section with two radio buttons: "Retail" (which is selected) and "Jobber". Below this are five text input fields, each with a label to its left: "Inspector Name" (containing "John Doe"), "City" (containing "Anywhere WorldWide"), "Brand" (containing "Acme"), "Station Number" (containing "67134"), and "Owner / Operator Name" (containing "Fuel Fred"). At the bottom of the form is an "OK" button.

Field Label	Value
Inspector Name	John Doe
City	Anywhere WorldWide
Brand	Acme
Station Number	67134
Owner / Operator Name	Fuel Fred

## Automatic Results Real Time

The screenshot displays the Chromperfect MarkerTrace software interface. The main window shows a blue message box with the following text: "Analysis of sample is complete.", "\*\*\* FAIL \*\*\*", "Marker Present", "Press Next to make another run.", and "Press Quit to shut down the GC." Below this message are "Quit" and "Next" buttons. A status bar at the bottom right of the message box indicates "CPPC = IDLE, Inst = Ready to Go" and a checked "Test Mode" option.

Below the main message box is a small icon of a chromatogram and two buttons labeled "Quit" and "Next".

The bottom section of the interface is divided into two panels. The left panel shows a log of events:

```
10/20/15 23:03:54 SCHEDULED: Sample stream #A3 (Priority) <SAMPLE>
10/20/15 23:03:57 Downloading Method file <C:\CPData\MarkerTrace\MarkerTraceS_A.met>
10/20/15 23:04:00 Selecting sample stream #A3
10/20/15 23:04:09 Start of run detected
10/20/15 23:05:34 End of run detected
10/20/15 23:05:41 Processing Raw file <C:\CPData\MarkerTrace\Data\1510202303_S_A.0001.RAW>
10/20/15 23:05:41 Processing Raw file <C:\CPData\MarkerTrace\Data\1510202303_S_B.0001.RAW>
10/20/15 23:05:42 DONE with this stream. Made 1 injections, acquired 2 Raw files
```

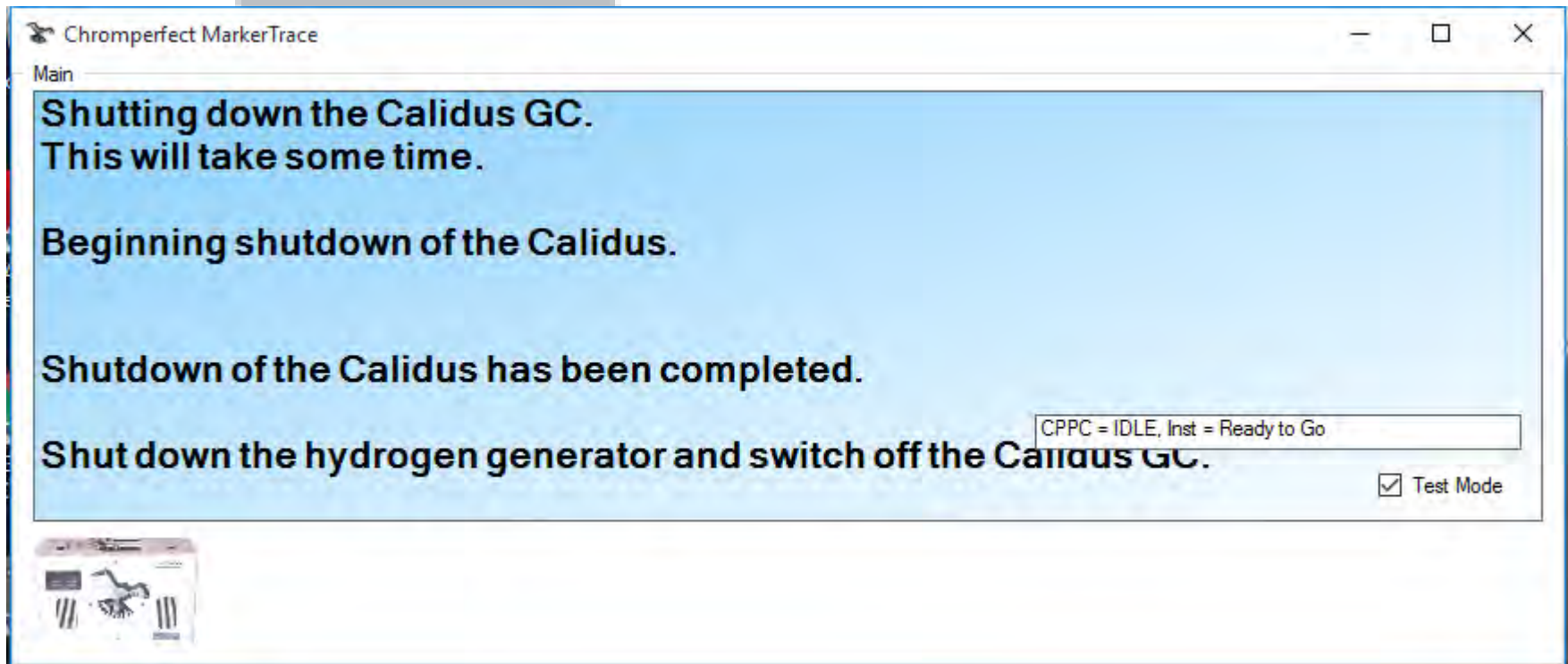
The right panel shows a "Process Log" and "Error Log" section with the following entries:

```
10/20/15 22:40:12 STARTED: STARTUP
10/20/15 22:42:13 COMPLETED: STARTUP
10/20/15 22:42:20 STARTED: BLANK
10/20/15 22:43:00 No run started in 1 minutes
10/20/15 22:43:42 Run starts have resumed
10/20/15 22:44:06 COMPLETED: BLANK
10/20/15 22:44:46 No run started in 1 minutes
10/20/15 22:45:53 STARTED: CALIBRATION
10/20/15 22:47:39 Run starts have resumed
10/20/15 22:48:39 No run started in 1 minutes
10/20/15 22:49:57 COMPLETED: CALIBRATION
10/20/15 23:00:33 STARTED: SAMPLE
10/20/15 23:01:39 Run starts have resumed
10/20/15 23:02:00 COMPLETED: SAMPLE
10/20/15 23:02:41 No run started in 1 minutes
10/20/15 23:03:54 STARTED: SAMPLE
10/20/15 23:04:09 Run starts have resumed
10/20/15 23:05:09 No run started in 1 minutes
10/20/15 23:05:42 COMPLETED: SAMPLE
```

At the bottom of the interface, there are several control elements: "Copy to Clipboard", "Ignore Acromag errors", "Show Display", "Running since" (10/20/2015 10:38:15 PM), "Current Time" (11:06:07 PM, 23:06:07), "Selected Instrument" (Calidus Digital Data), "Monitor Status" (Waiting for next scheduled sampling), "Instrument Status" (Ready to Go), "Last RTD reading" (N/A), "Enable Streams", "Abort Sequence", "Dismiss Alarm", and "Copy to Clipboard" and "Clear Process Log" buttons.



## ACU Completion Control



## The Future Will Need More ACU Units

- Software to meet new Challenges
- Distributed and Centralized Software
- Centralized Computing

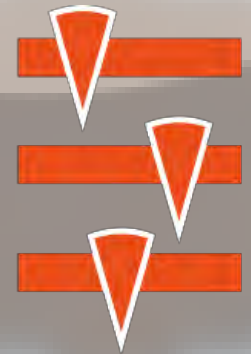


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## chromperfect process control



## chromperfect modbus



## **ANALYZER CONTROL UNITS**

- **GENERAL TOOL BETWEEN  
PLANT AND LABORATORY**
- **LEARNING CURVE SHORTENED  
SIGNIFICANTLY**
- **EASY CHANGE CONTROL**

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## COMBINE ELEMENTS OF ACQUISITION AND ANALYSIS

The screenshot displays the Chrom Perfect File Editor interface, divided into four main panels:

- Component List (CAL):** A table listing 10 components with their retention times and window widths.
- Detector Settings (MXT):** Configuration for two detectors, including temperature, hydrogen pressure, and air pressure.
- Chromatogram Processing (MET):** Options for smoothing, baseline subtraction, and peak detection.
- Report Layout (FMT #1):** Configuration for the report structure, including header, plot, table, and footer elements.

In Plot	Component Name	Retention Time, min.	Window Width, min.	Ref. Comp. #	Proxy Comp. #	Group #	Low Alarm
1	PEN	1.536	0.1	0	0	0	0
2	n-HEX	2.204	0.1	0	0	0	0
3	Benzene	2.689	0.1	0	0	0	0
4	cy-HEX	3.09	0.1	0	0	0	0
5	n-Heptane	3.357	0.1	0	0	0	0
6	Toluene	4.125	0.1	0	0	0	0
7	n-octane	4.542	0.1	0	0	0	0
8	m,p-xylene	6.096	0.1	0	0	0	0
9	o-xylene	6.413	0.1	0	0	0	0
10	p-benzene	7.164	0.1	0	0	0	0

**Detector #1 Settings:**  
Temperature, deg. C: 250  
Hydrogen pressure: 25  
Air pressure (ignite): 10  
Air pressure (run): 25

**Detector #2 Settings:**  
Temperature, deg. C: 350  
Hydrogen pressure: 26  
Air pressure (ignite): 13  
Air pressure (run): 26

**Chromatogram Processing (MET):**  
Type of Smoothing: None  
Smoothing Time (sec): 0  
Subtract Baseline Chromatogram:   
Initial peak detect threshold: -4  
Initial peak width, minutes: 0.1  
Calibration File Name: Atest.cal

**Report Layout (FMT #1):**  
New Element: Header, Include File, Include Image, Printout, Chrom Plot, Cal Plot, SEC Plot, SEC CAL Plot, Peak Table, Group Table, Slice Table, MW Table, InStep Report, Entry Table  
Layout Width:  Page Width,  Report Width  
Orientation:  Portrait,  Landscape  
Report width in: [ ]

Version = 2    Format: CP32    Modified on 10/15/2013 6:20:08 AM    test

## COMMUNICATE TO THE UNIVERSE

- MAKE DATA AVAILABLE TO ALL CUSTOMERS
- CREATE STANDARD PDF FILES ON THE FLY
- E-MAIL REPORTS AND PLOTS
- EVALUATE ANALYSIS AND PRODUCE ALARMS
- CONVERSE WITH SCADA

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## SYMMETRIC INSTRUMENT CONTROL

THE ANALYZER INSTRUMENT IN THE PLANT OR AT THE SAMPLE SITE

THE ANALYTICAL INSTRUMENT IN THE LABORATORY

Detector #1

Temperature, deg. C	250
Hydrogen pressure	25
Air pressure (ignite)	10
Air pressure (run)	25
<input type="checkbox"/> Invert data	

Detector #2

Temperature, deg. C	350
Hydrogen pressure	26
Air pressure (ignite)	13
Air pressure (run)	26
<input type="checkbox"/> Invert data	

Oven Temperature, deg C 250

Delay time, seconds 5

Spiltless time, seconds 0

Split vent time, seconds 30

Loop injection time, seconds 10

Idle Flow fraction, percent 33

Initial Time, seconds 0

Initial temperature, C 35

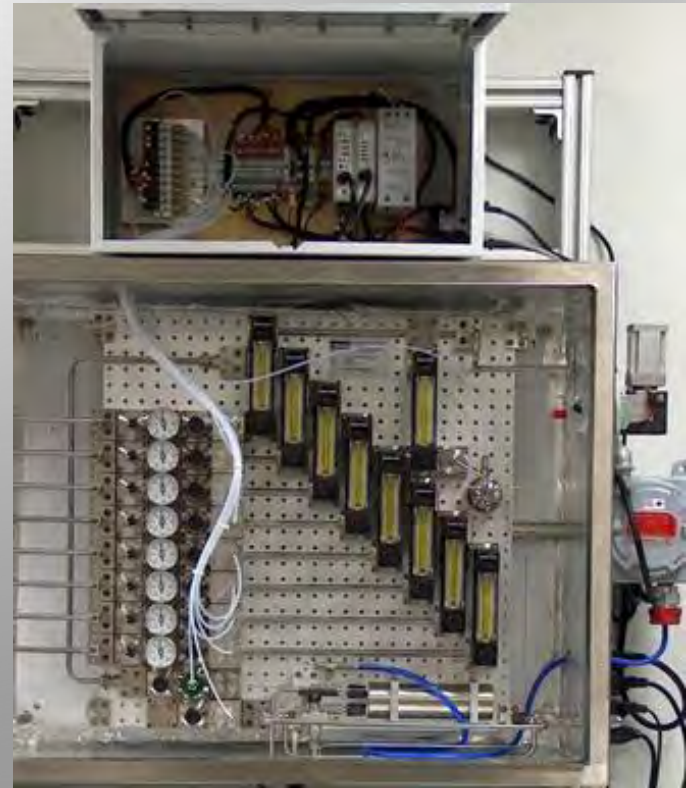
Program time = 531.00 seconds

Ramp #	Rate Deg C/sec	Final Temp.	Final Time, sec	Ramp Start, sec	Ramp End, sec
1	0.5	300	1	0	530
2	0	375	0	0	530

## SAMPLING CONTROL

### AUTOMATED SAMPLE STREAMS

- OFF THE SHELF DEVICES
- CUSTOM CONFIGURED





## PROCESS CONTROL

- OPC

- CHROMPERFECT OLE FOR PROCESS CONTROL

- ANALOG OUTPUT

- CHROMPERFECT ANALOG OUTPUT
- UNLIMITED SPECIATED COMPONENT VALUES

- MODBUS REPOSITORY

- CHROMPERFECT PROCESS CONTROL
- CUSTOM BUILT REPOSITORY THAT'S LOCAL OR CLOUD BASED
- SUPPORT FOR MODBUS RTU AND TCP

# ANALOG OUTPUT

- CURRENT LOOP -- 4-20MA
- VOLTAGE OUTPUT -- VARIOUS
- PLC

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## DATA CONTROL

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modbus



**MODBUS Configuration**

IP Address: 10.1.1.90

Controller ON

OK Cancel

**MODBUS Repository Configuration**

Name
1
2
3
4 IBP
5
6 10 %
7
8 20 %
9
10 30 %
11
12 50 %
13
14 70 %
15
16 90 %
17
18 FBP

Insert Move Up Copy Down  
Delete Move Down

Modbus ID: 57 Save Configuration

## DATA CONTROL

- OPC
  - OLE FOR PROCESS CONTROL
  - OPEN PLATFORM COMMUNICATIONS
  - INTEGRATE INTO EXISTING DCS SYSTEMS

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## AUTOMATED ANALYSIS

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natural gas 

### NatGas

**Instrument**

Selected Instrument: Digital Data

Instrument Status: Free

**Method**

Governing Method file name: C:\CPData\SampleData\Atest.smt

**Sample**

Sample Name: NatGas 7AM

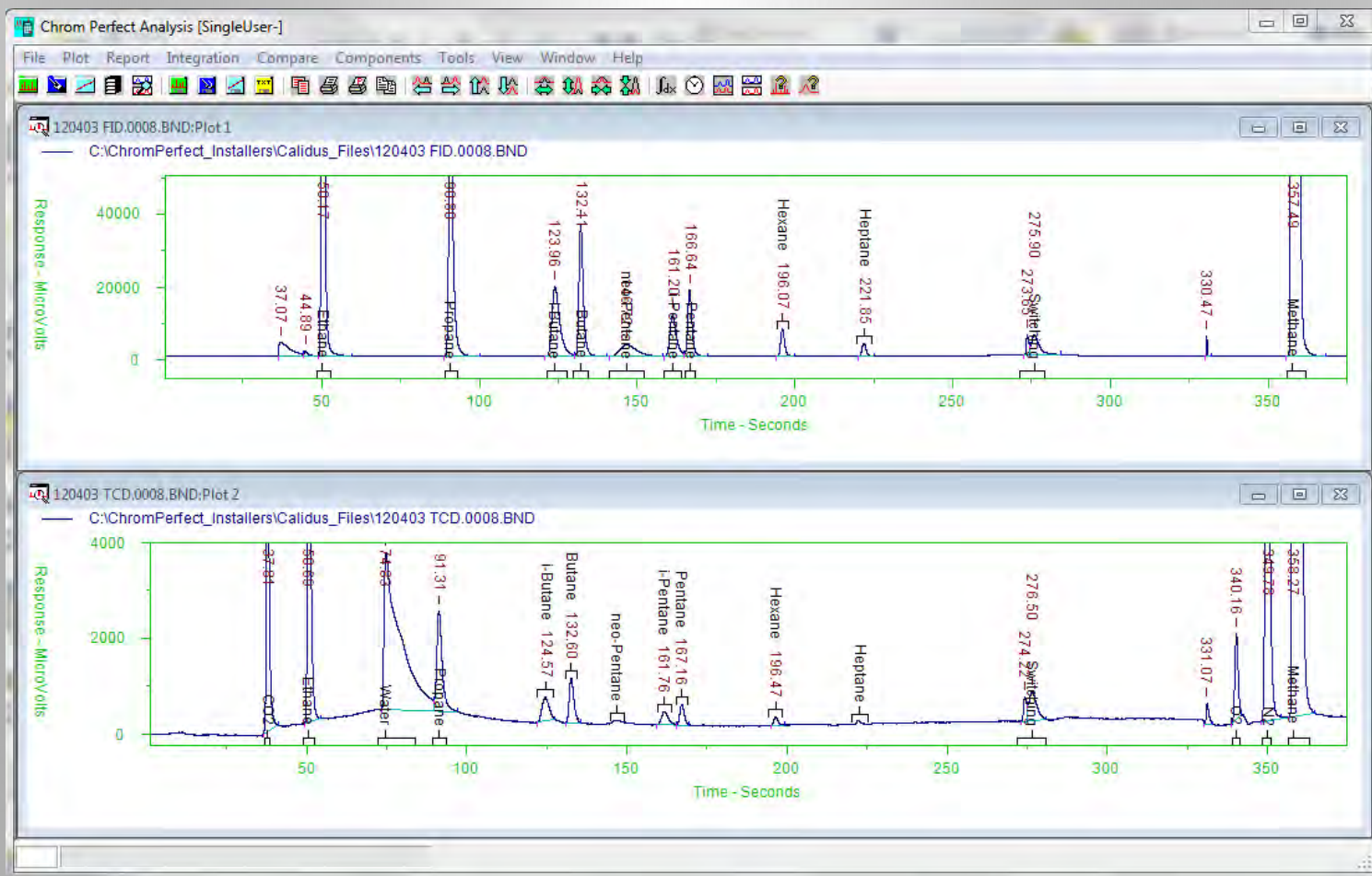
Disk File Base Name: NatGas7

Calibration run      Calibration Level: 1

Download      Start      Stop

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## PLANT TO LABORATORY



# chromperfect

Raw File Name = C:\CPData\NatGasTest\NatGasStd.1.raw  
Sample Name = NatGas Standard  
Method File Name = C:\CPData\NatGasTest\NatGas.MET

Name	RT	Amt	W Amt
N2	1.000	5.000	5.000
O2	1.500	1.000	1.000
CO2	2.000	1.000	1.000
C1	3.000	63.000	63.000
C2	4.000	9.000	9.000
C3	5.000	6.000	6.000
C4	6.000	3.000	3.000
ic4	6.500	3.000	3.000
C5	7.000	1.000	1.000
ic5	7.500	1.000	1.000
C6	8.500	0.500	1.000
C7	9.500	0.500	1.000
C8	10.500	0.500	1.000
C9	11.500	0.500	1.000
C10	12.500	0.500	1.000
C11	13.500	0.500	1.000
C12	14.500	0.500	1.000

Total Amount = 100  
Total Table Amt = 96.5  
Total Table W Amt = 100

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Name	Mole %	Normalized Mole %
C1	63.00	63.00
C2	9.00	9.00
C3	6.00	6.00
C4	3.00	3.00
ic4	3.00	3.00
C5	1.00	1.00
ic5	1.00	1.00
C6	1.00	1.00
C7	1.00	1.00
C8	1.00	1.00
C9	1.00	1.00
C10	1.00	1.00
C11	1.00	1.00
C12	1.00	1.00
N2	5.00	5.00
O2	1.00	1.00
CO2	1.00	1.00

Total Mole % 100.00 PASS

BTU/CF at 14.65 PSI  
 Ideal, Dry 1,708.03  
 Ideal, wet 1,678.14  
 Real, Dry 1,723.07  
 Real, wet 1,692.92

Specific Gravity  
 Ideal 1.089  
 Real 1.098

Z for sample 0.99127  
 Z for air 0.99963

WOBBE Index  
 Ideal, Dry 1,637.09  
 Ideal, wet 1,608.45  
 Real, Dry 1,651.50  
 Real, wet 1,622.60

Reid vapor Pressure 934.08  
 Mass % in liquid phase 54.550  
 Mass % in gas phase 45.450  
 Calculated sample density 0.607  
 Z for gas phase 0.79763

AdjVolumeRatio 3.94  
 SampleVolG 233.29

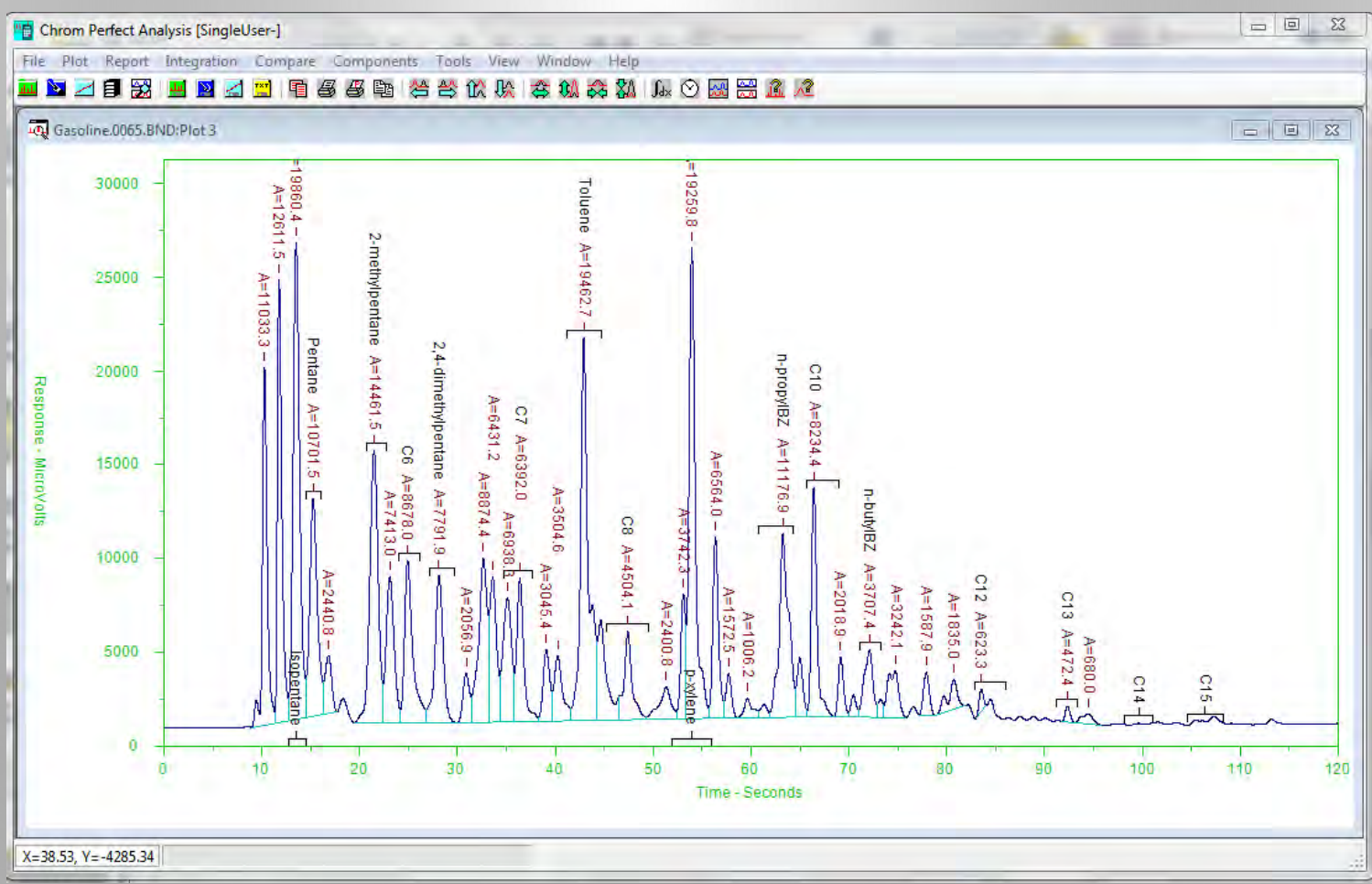
Name	Liq Mole%	Gas Mole%	VP 100	Partial Pressure
C1	18.81	79.46	4,947.31	930.50
C2	11.85	7.94	784.87	92.97
C3	15.29	2.54	194.59	29.75
C4	9.84	0.45	53.63	5.28
ic4	9.43	0.61	75.42	7.11
C5	3.56	0.05	14.81	0.53
ic5	3.50	0.07	22.74	0.80
C6	3.65	0.01	3.73	0.14
C7	3.68	0.00	0.96	0.04
C8	3.68	0.00	0.27	0.01
C9	3.68	0.00	0.06	0.00
C10	3.68	0.00	0.02	0.00
C11	3.68	0.00	0.00	0.00
C12	3.68	0.00	0.00	0.00
N2	0.84	6.55	9,140.19	76.70
O2	0.15	1.32	10,553.77	15.43
CO2	0.97	1.01	1,215.11	11.83

Average MW Mn Mw P. I.  
 Sample 31.53 61.61 1.954  
 Liquid phase 63.38 93.74 1.479  
 Gas phase 19.67 23.04 1.171





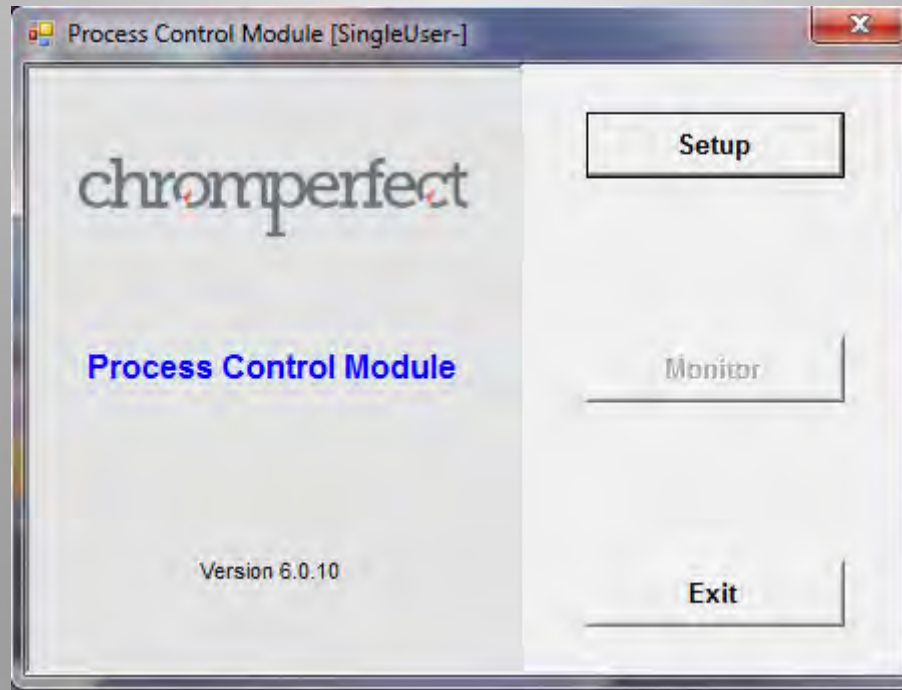
## PLANT TO LABORATORY



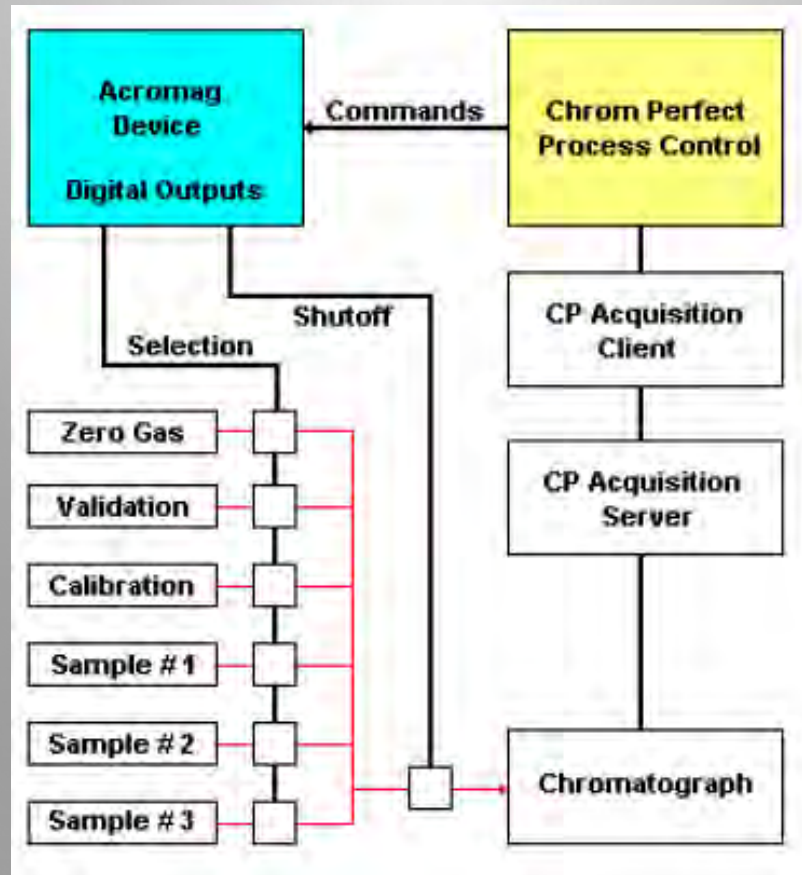
## LABORATORY TO PLANT

- ANALYTICAL METHODS
- FILE COMPATIBILITY
- RESULT CORRELATION
- CHROMPERFECT PROCESS CONTROL

# chromperfect process control



# chromperfect process control





Instrument #1 Configuration

General | AcroMag | Special Ports | Scheduled Streams | Temperature Sensing and Control | External Alarms | Internal Alarms

Instrument Name: Digital Data

Injection Delay Time, sec.: 2

Recovery Delay Time, sec.: 4

Message Background Color: White

OK Cancel

## General Instrument Selection

Instrument #1 Configuration

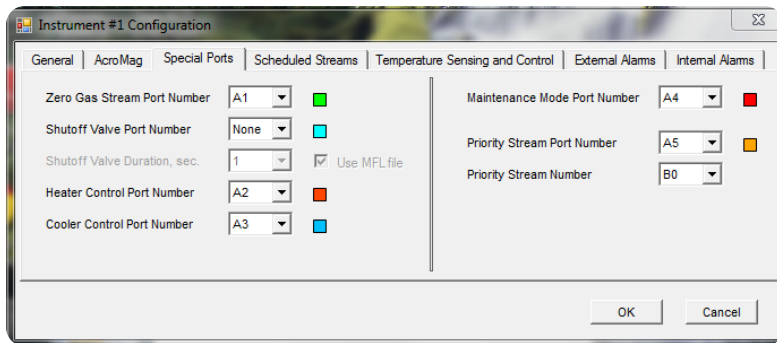
General | AcroMag | Special Ports | Scheduled Streams | Temperature Sensing and Control | External Alarms | Internal Alarms

	Model	IP Address
Digital I/O "A" (required)	983EN	192.168.20.101
Digital I/O "B" (optional)	951EN	192.168.20.102
RTD Module (optional)	966EN-6006	192.168.20.103

OK Cancel

chromperfect  
process control 

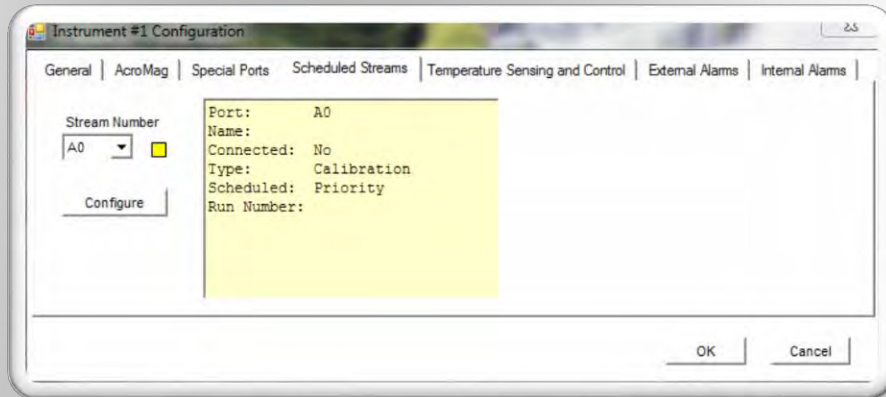
# I/O GEAR CONFIGURATION



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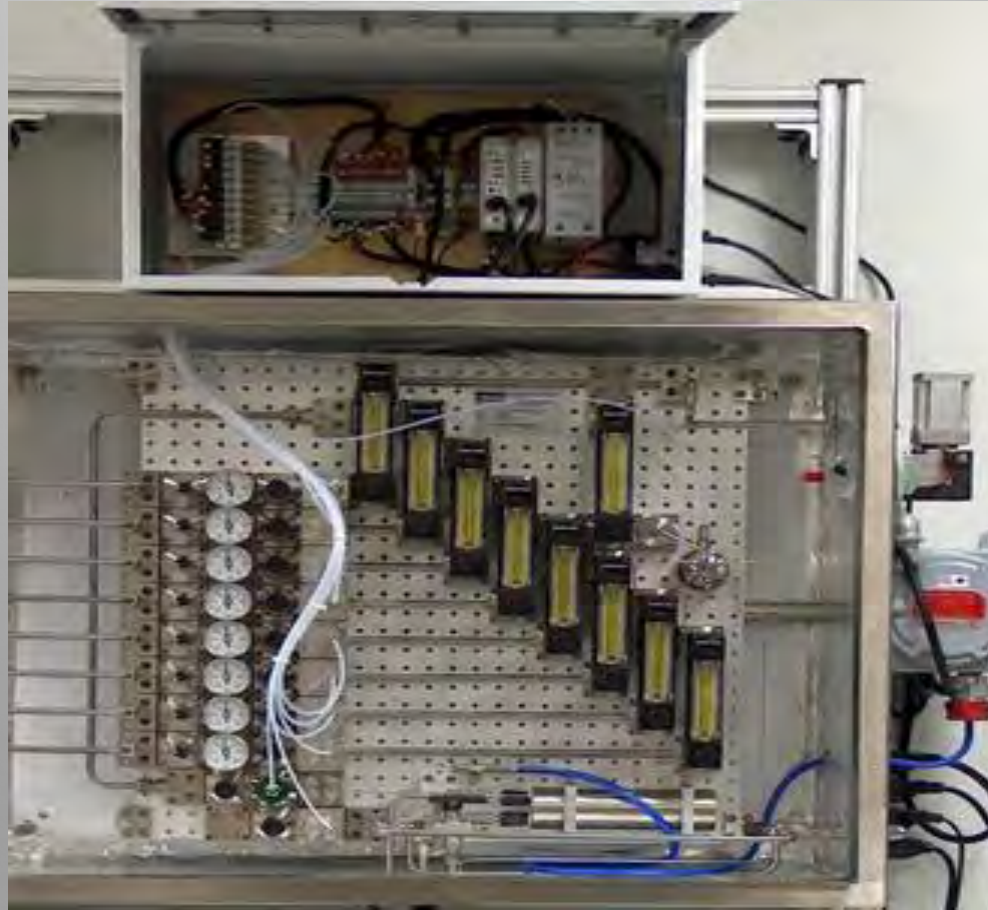
# SPECIALIZED PORTS





# SCHEDULED STREAM CONFIGURATION

# chromperfect process control



Instrument #1 Configuration

General | AcroMag | Special Ports | Scheduled Streams | Temperature Sensing and Control | External Alarms | Internal Alarms

RTD Port Number (Main)	0	(Backup)	1	<input checked="" type="checkbox"/> Controller ON	
Upper Alarm Limit	65	Upper Threshold (cool ON)	55		
Lower Alarm Limit	35	HR Addr	200	Lower Threshold (heat ON)	45
				Refractory Time, min.	1

OK Cancel

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process control 

# ANALYZER ENCLOSURE CONDITIONS

# chromperfect process control



Instrument #1 Configuration

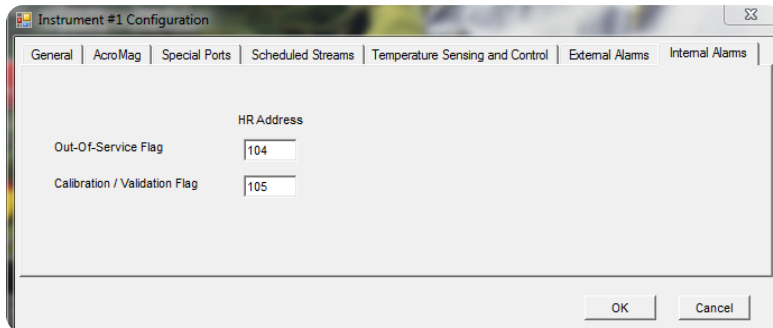
General | AcroMag | Special Ports | Scheduled Streams | Temperature Sensing and Control | External Alarms | Internal Alarms

	Port Number	HR Addr	Function
Alarm A	B1	101	Validation
Alarm B	B2	102	Calibration
Alarm C	None	0	
Alarm D	None	0	

OK Cancel

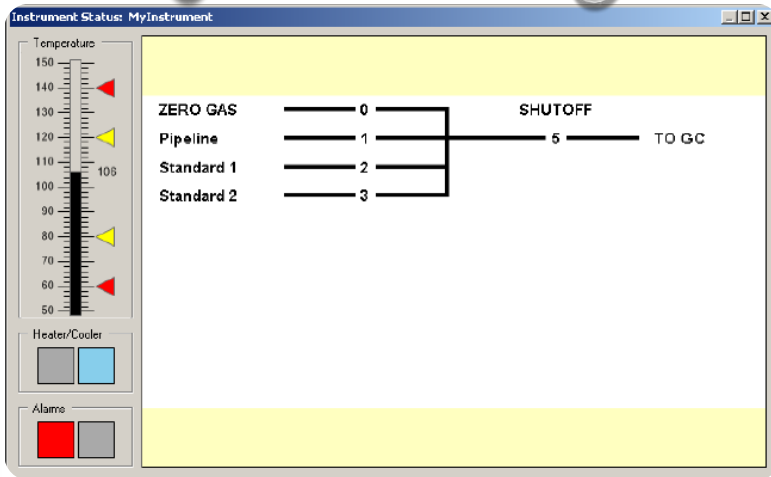
chromperfect   
process control

# EXTERNAL ALARMS FROM SCADA



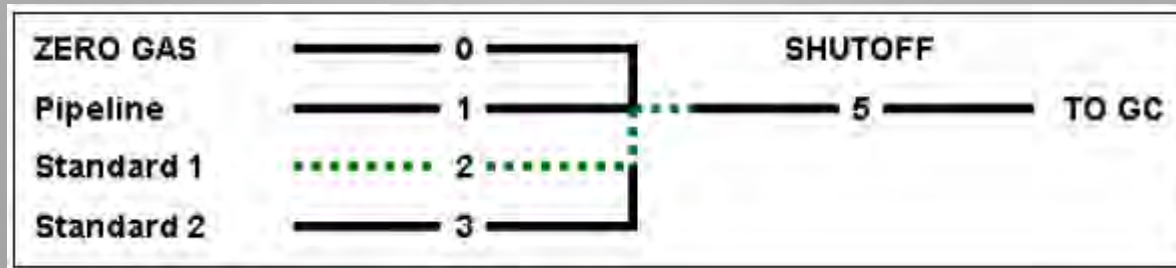
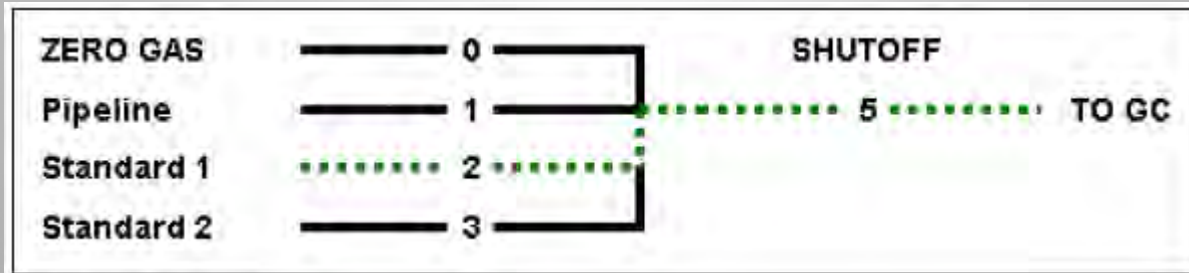
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# INTERNAL ALARMS VISIBLE TO SCADA



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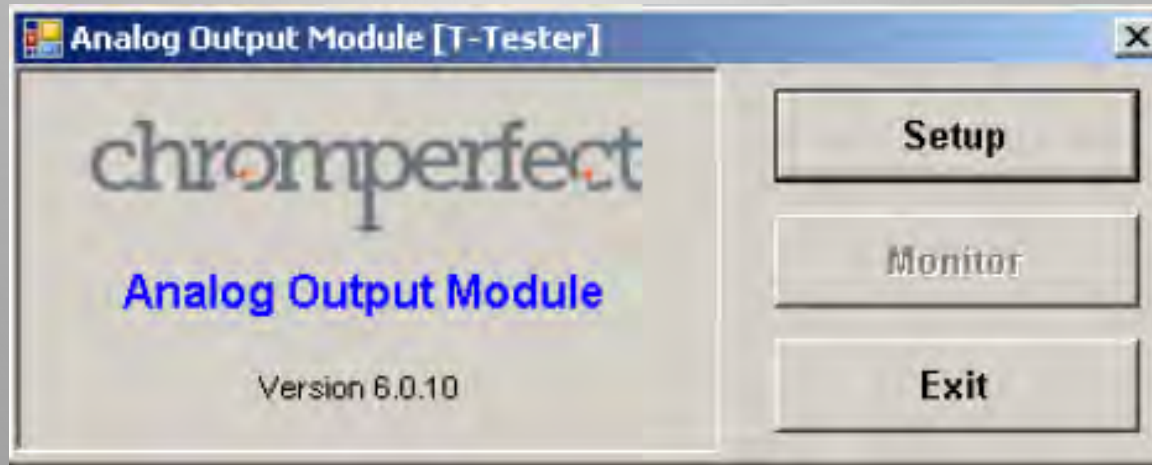
# chromperfect process control

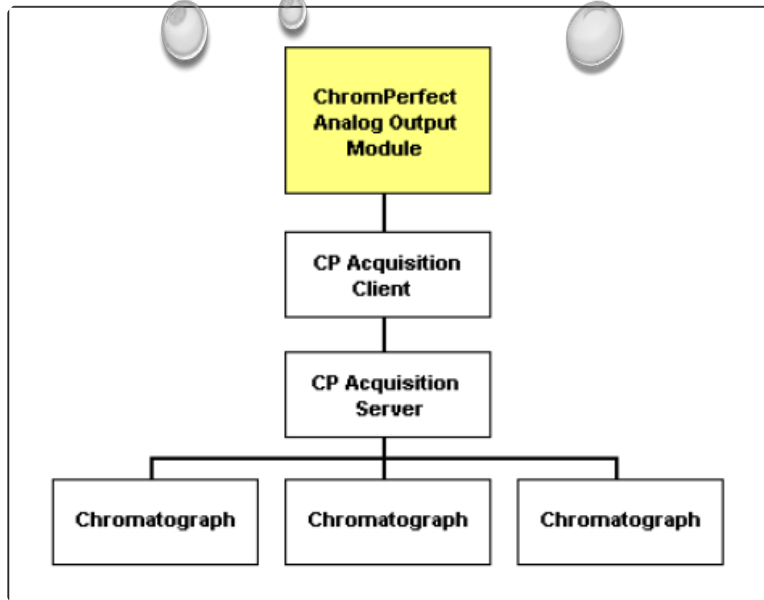




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## CHROMPERFECT ANALOG OUTPUT CPAO

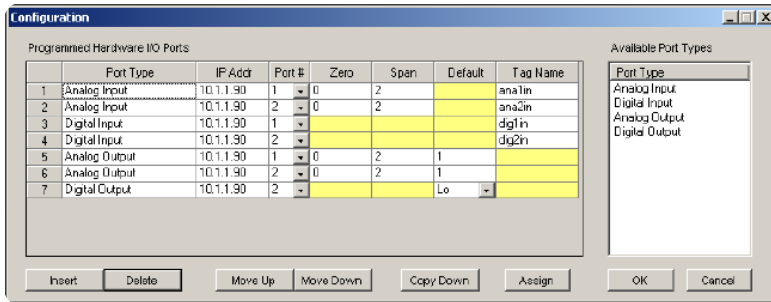




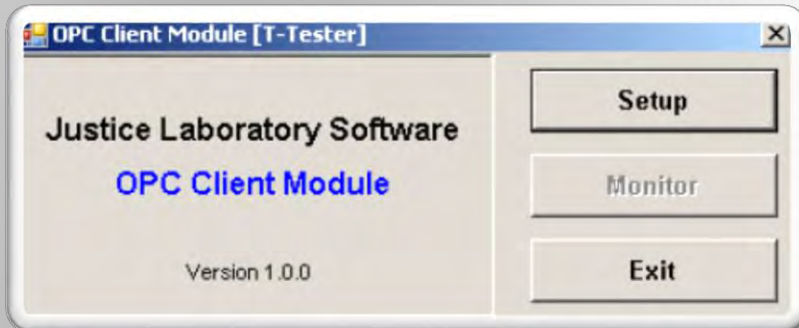
chromperfect

# CHROMPERFECT ANALOG OUTPUT

# chromperfect



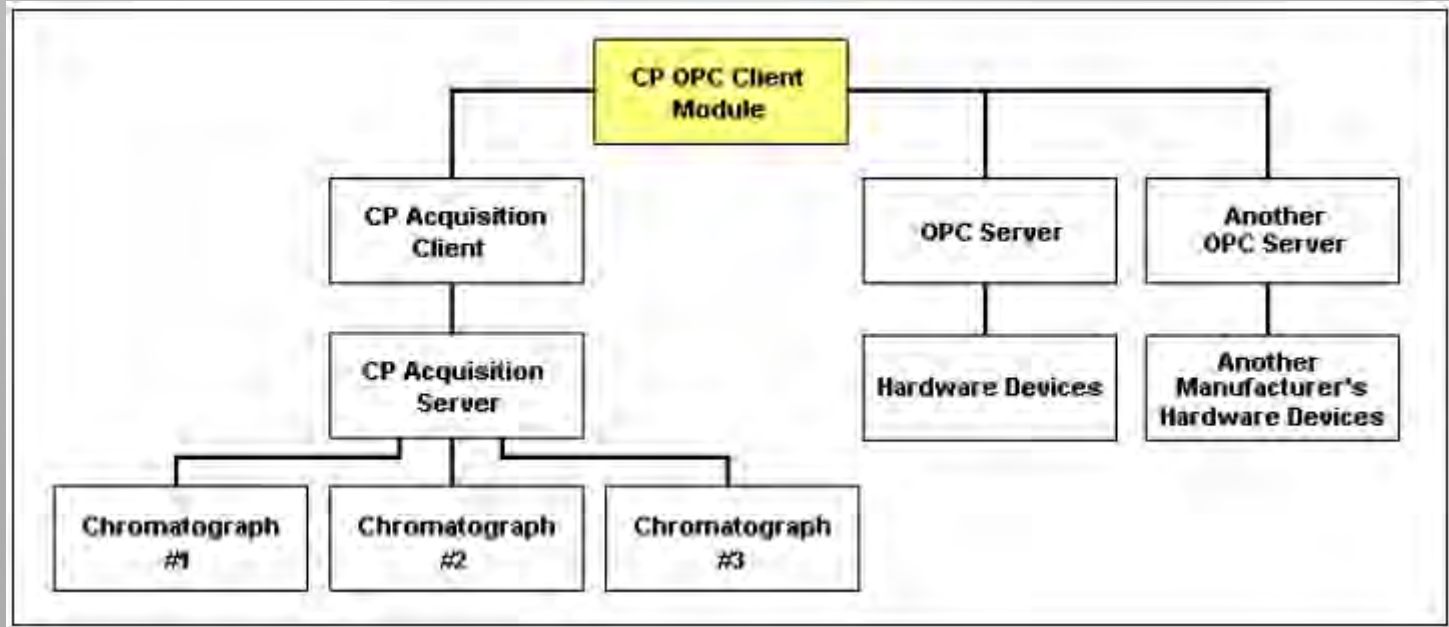
## CHROMPERFECT ANALOG OUTPUT



# CHROMPERFECT OPEN PLATFORM COMMUNICATIONS

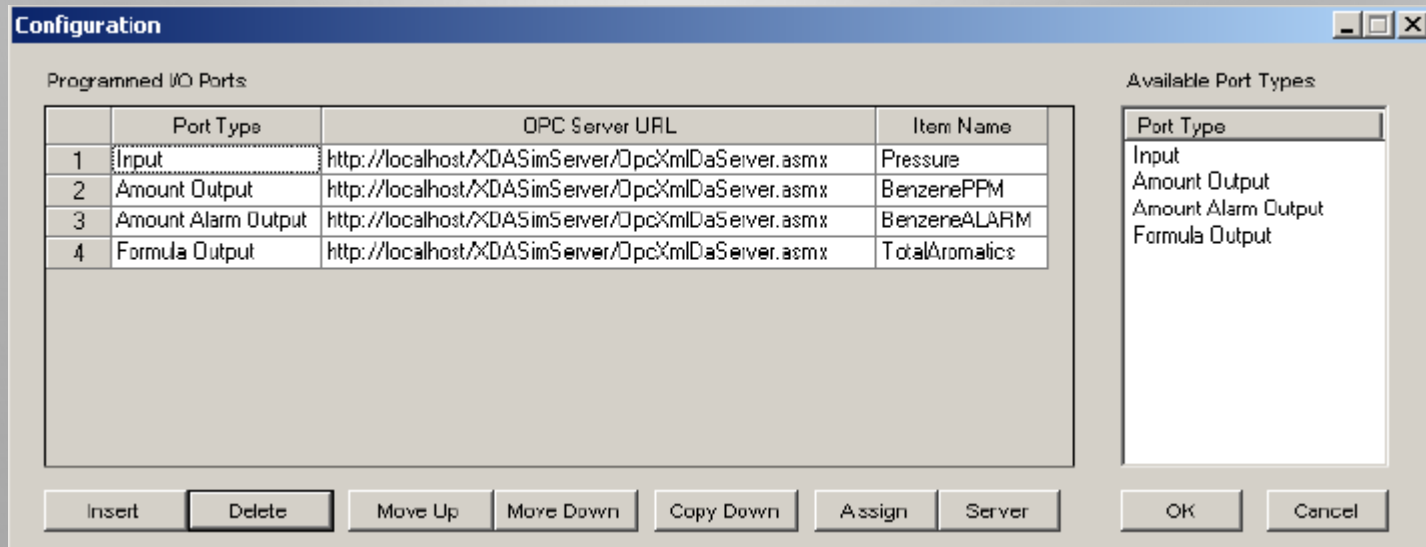
# chromperfect

## CHROMPERFECT OPEN PLATFORM COMMUNICATIONS



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## CHROMPERFECT OPEN PLATFORM COMMUNICATIONS



Configure Client

## CHROMPERFECT OPEN PLATFORM COMMUNICATIONS









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Thank You

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