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chromatography data systems

Extending The Reach of Chromatography Data

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

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

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- 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

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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

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The Problem Before Us

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

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A Look At the ACU

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MarkerTrace

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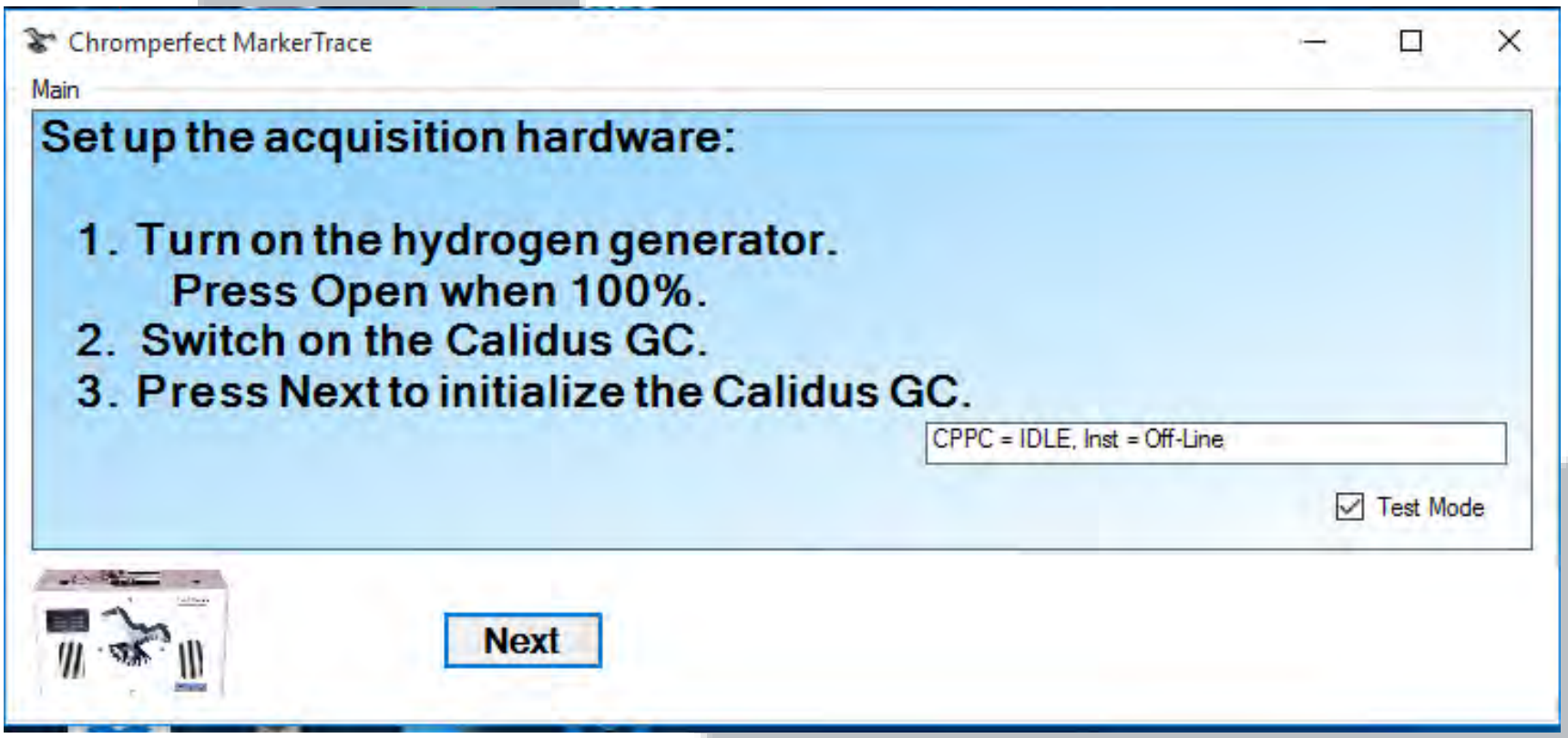
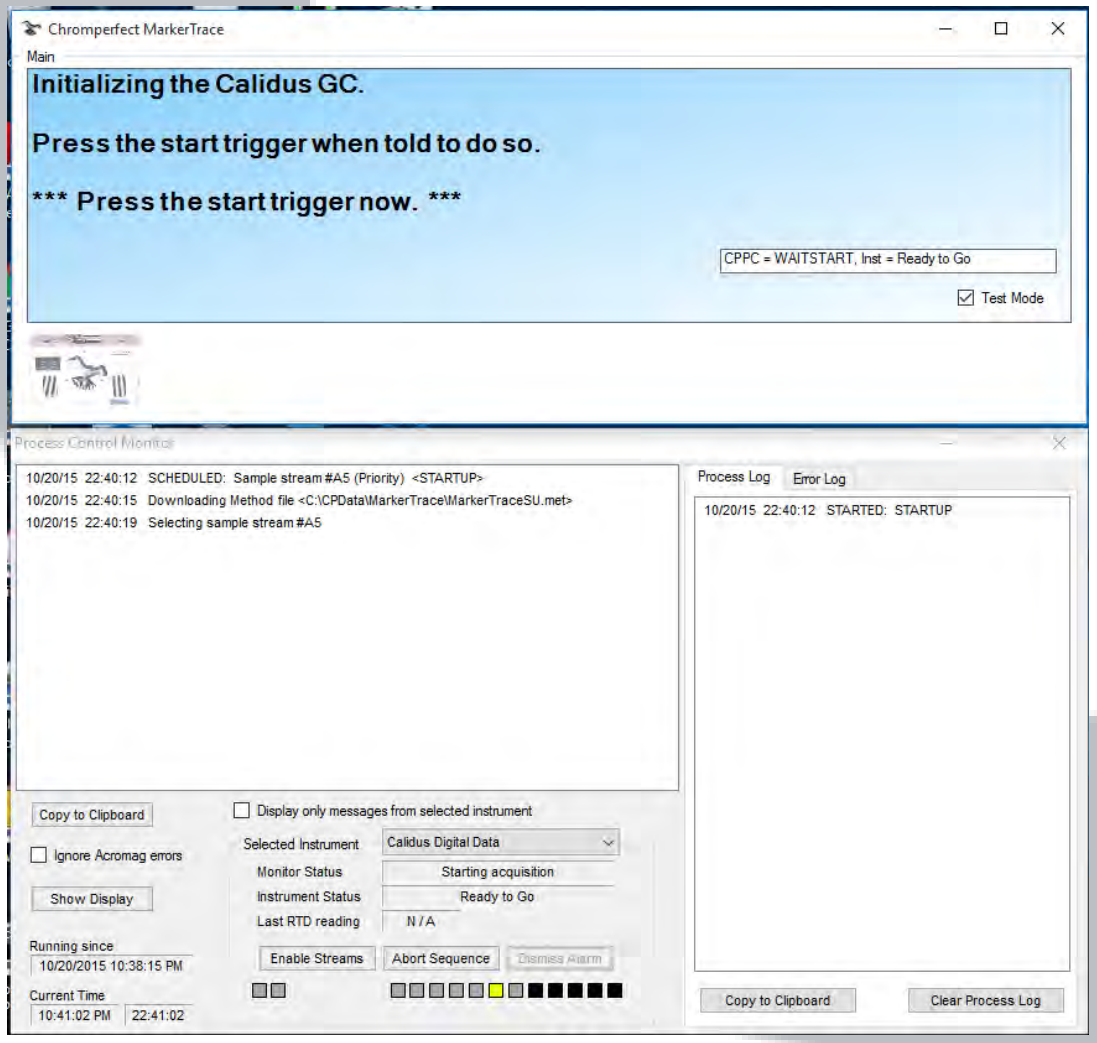
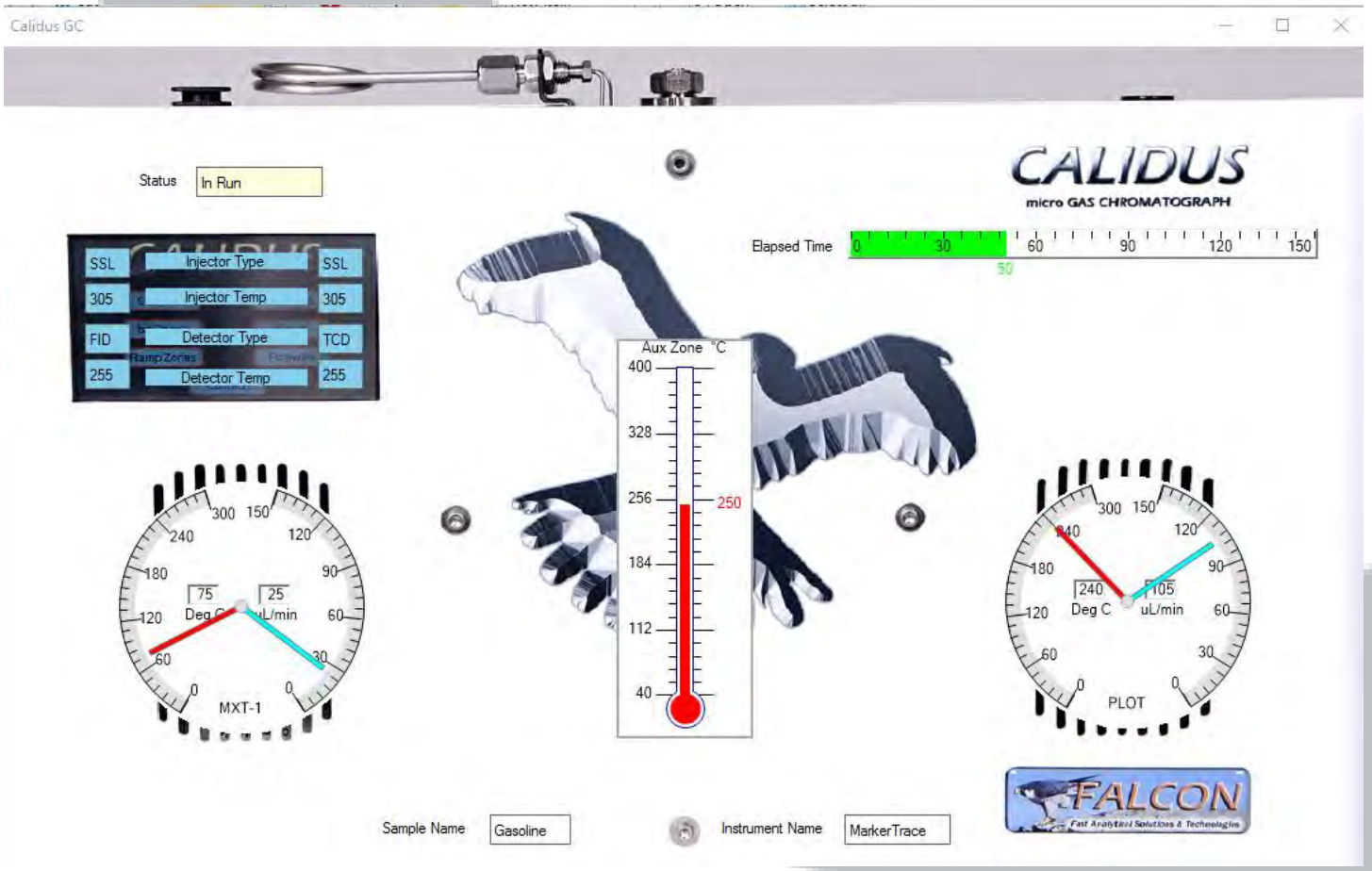
Startup



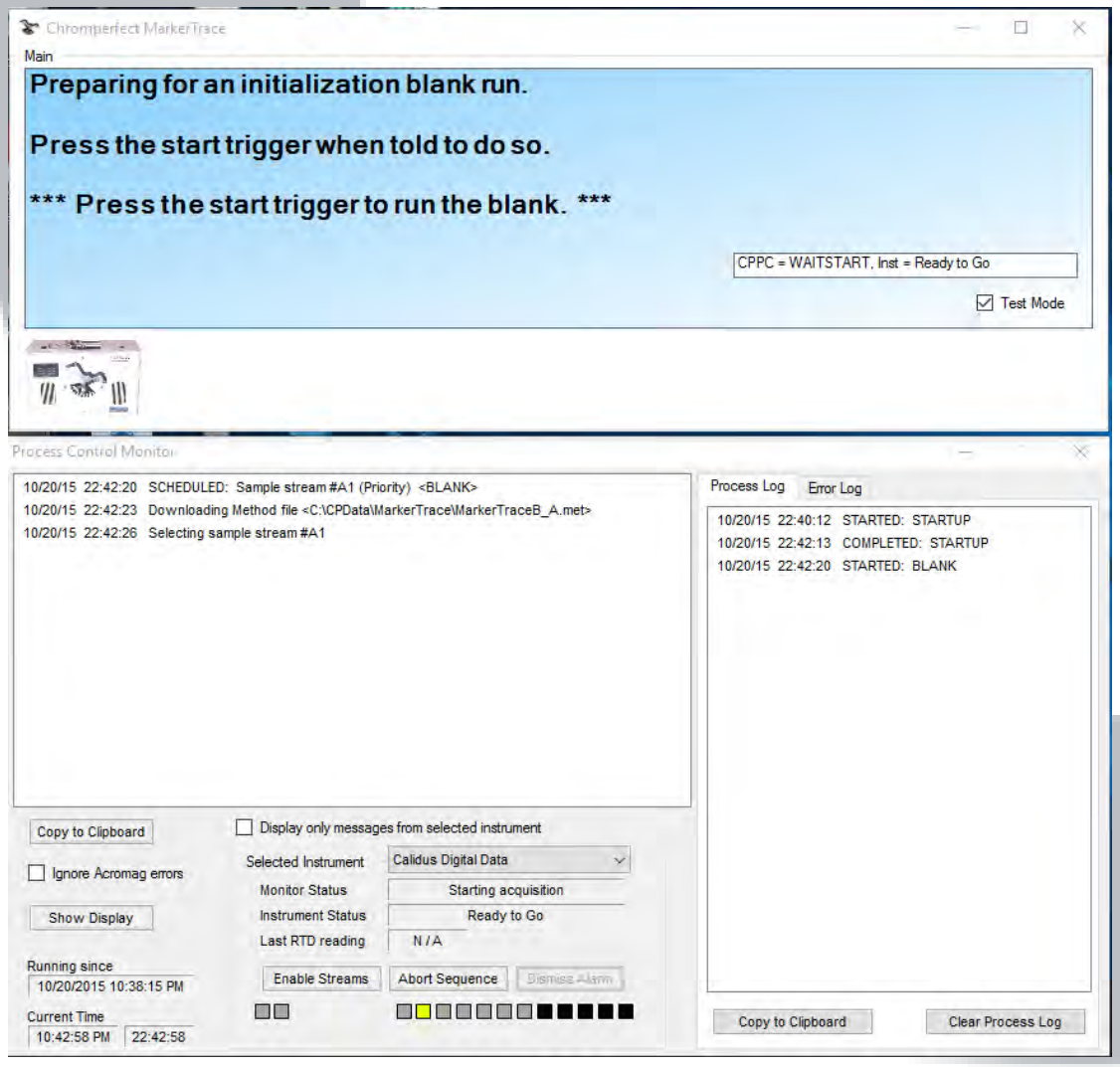
Initialize the ACU System



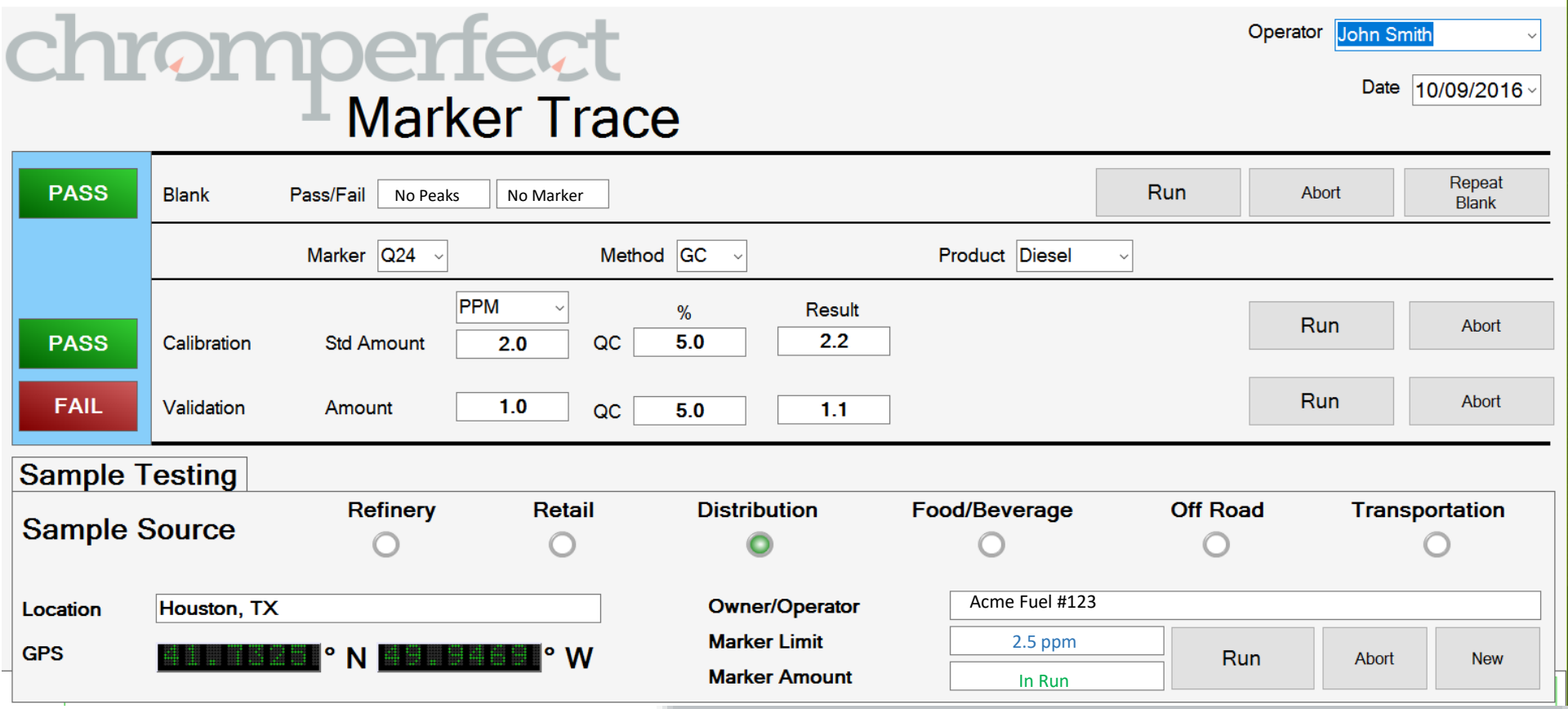
Initialize the ACU System



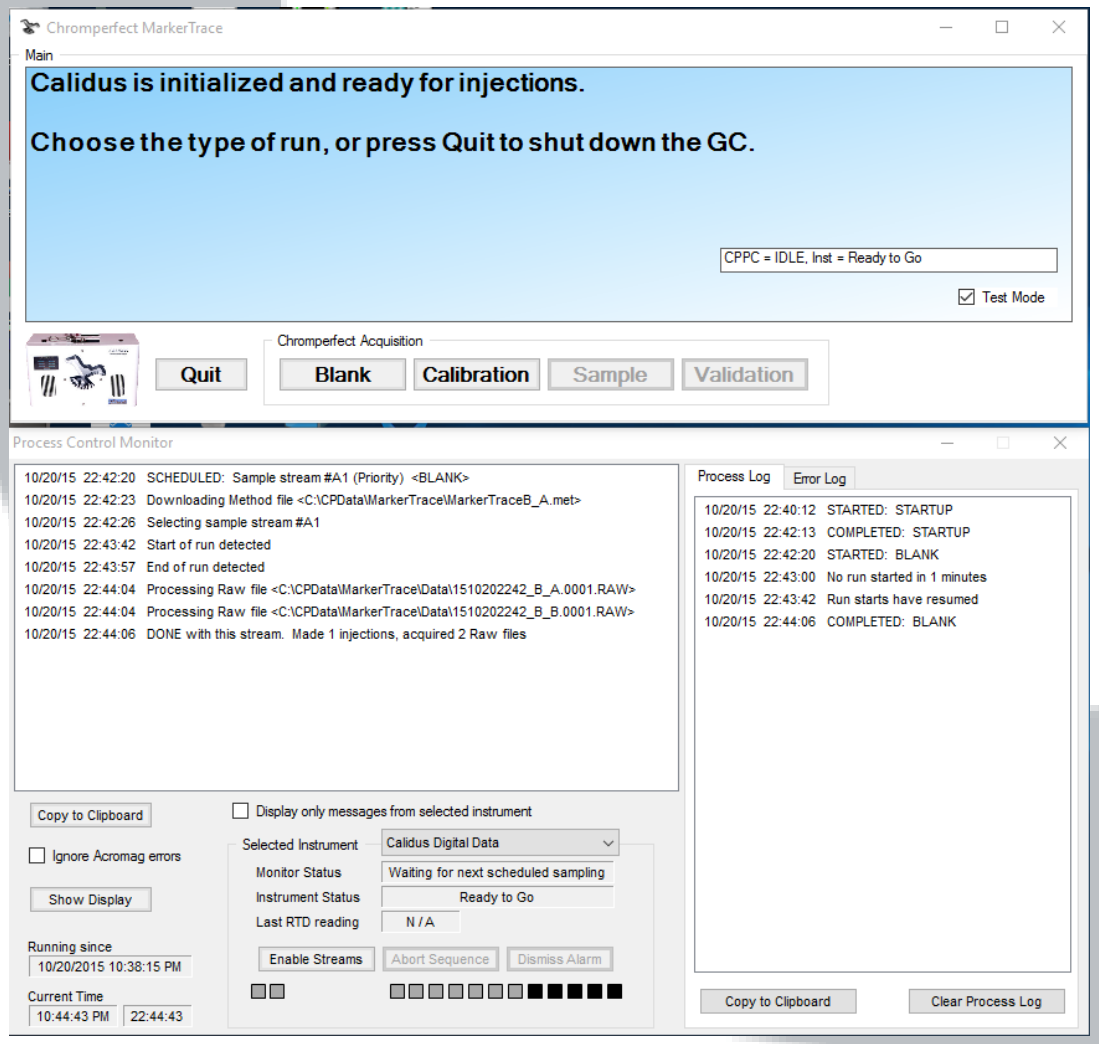
Preparing a Clean Analyzer



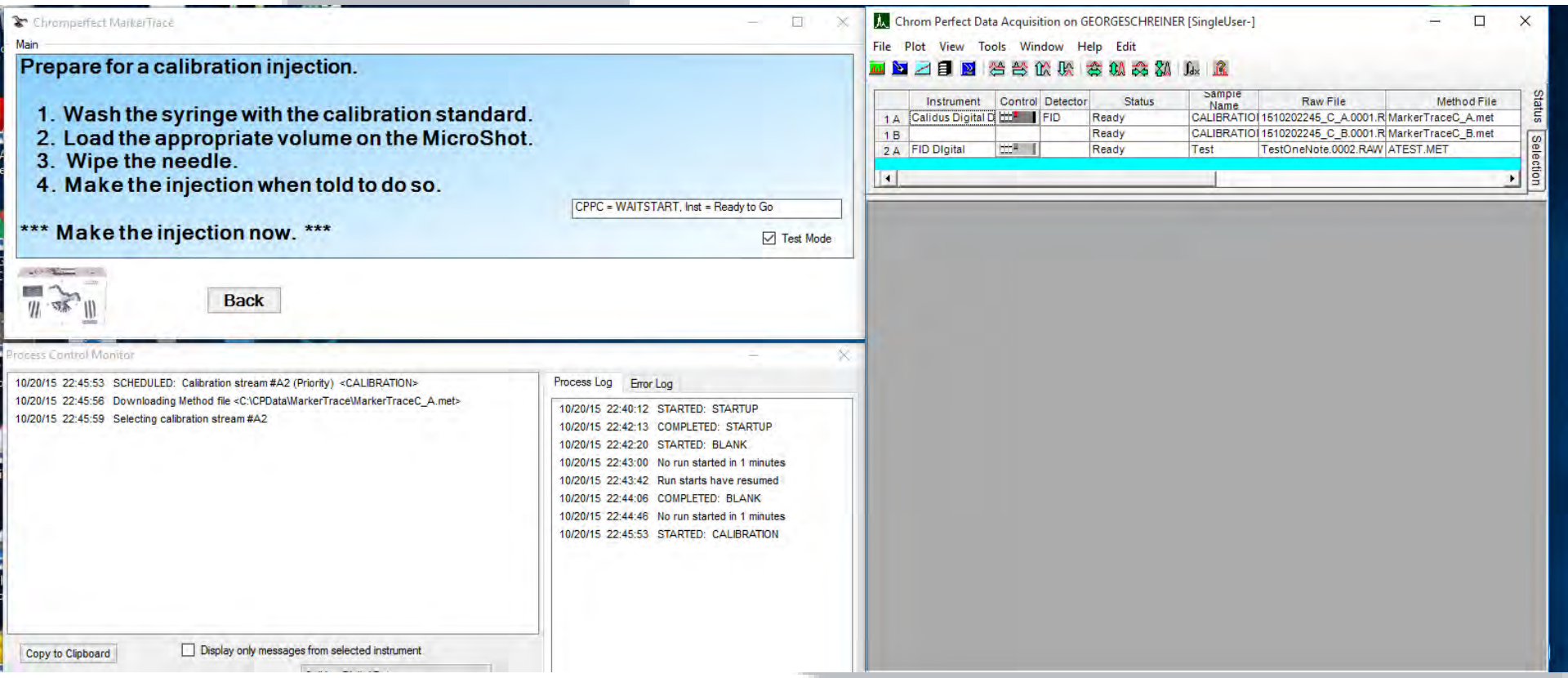
Preparing a Clean Analyzer



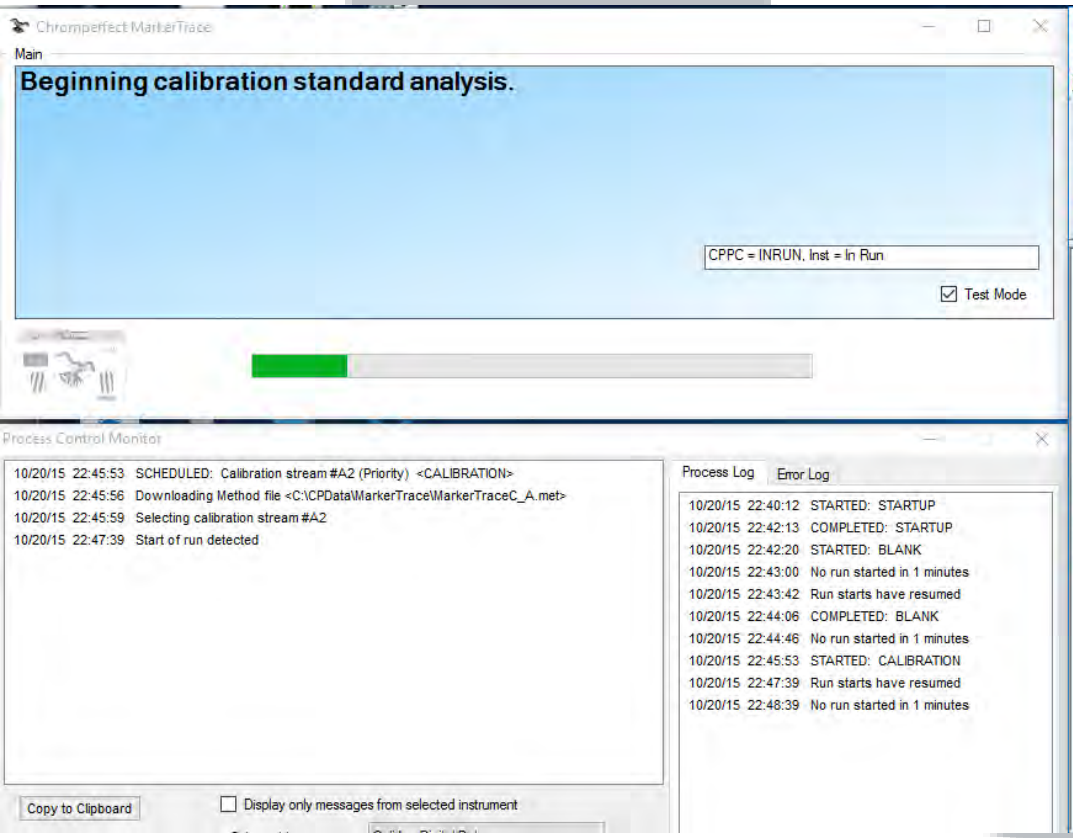
Ready for Testing

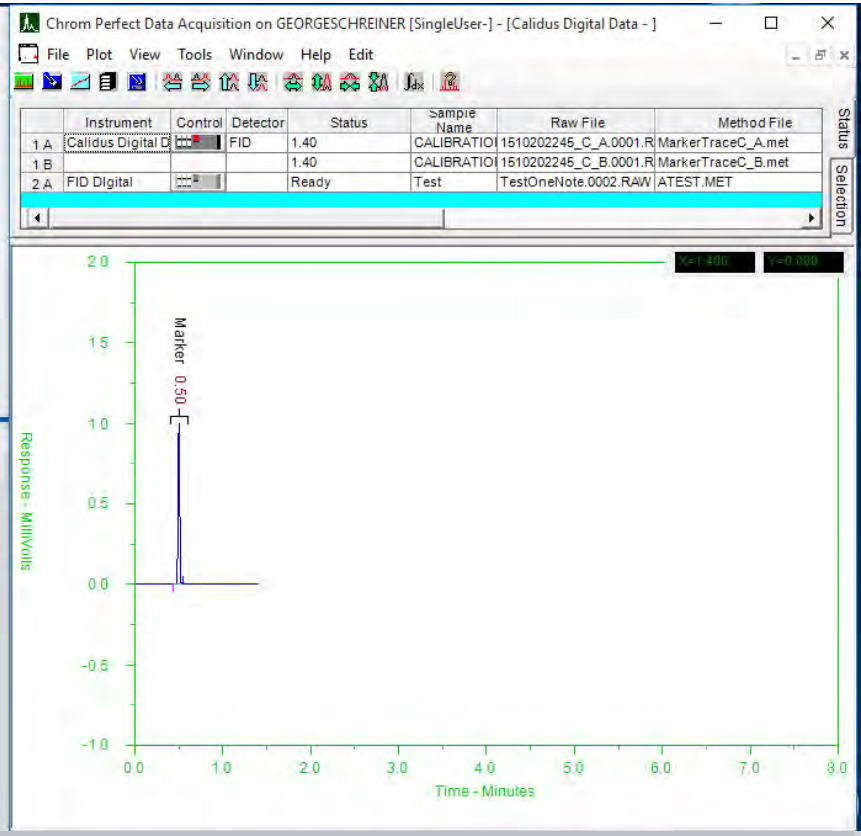


Calibration

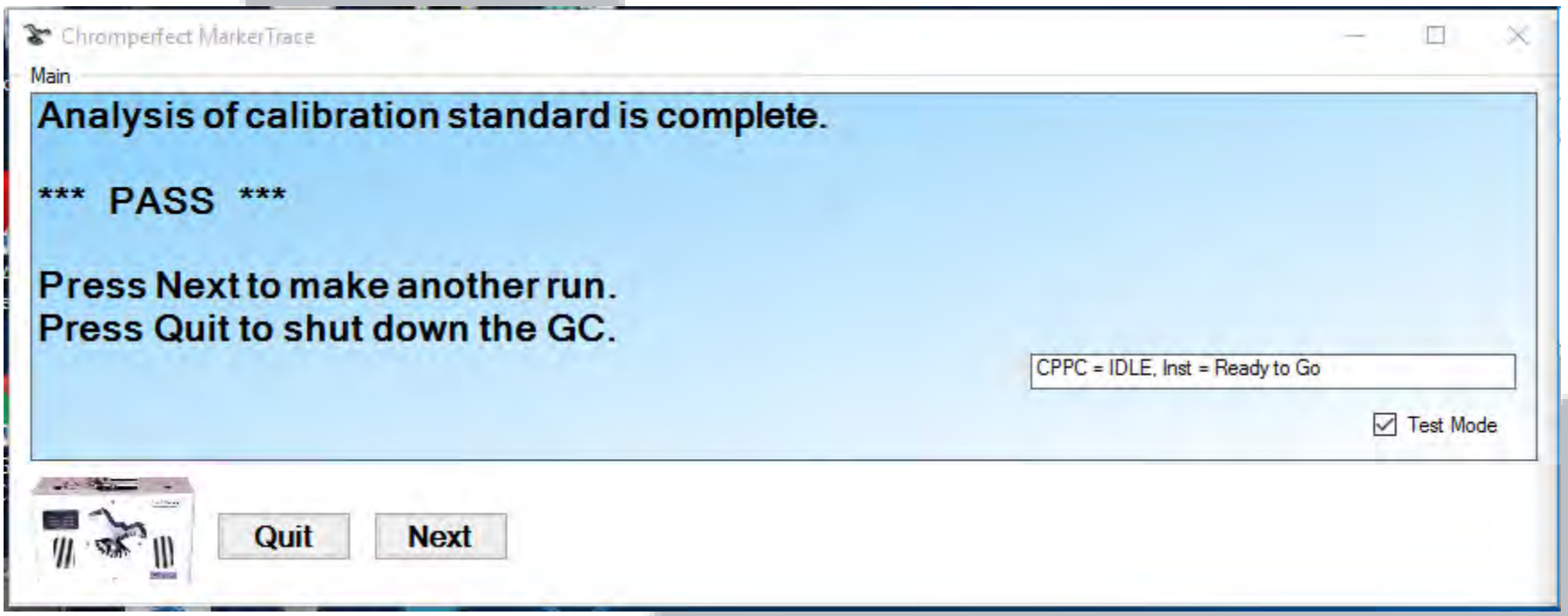


Blending Three Techniques

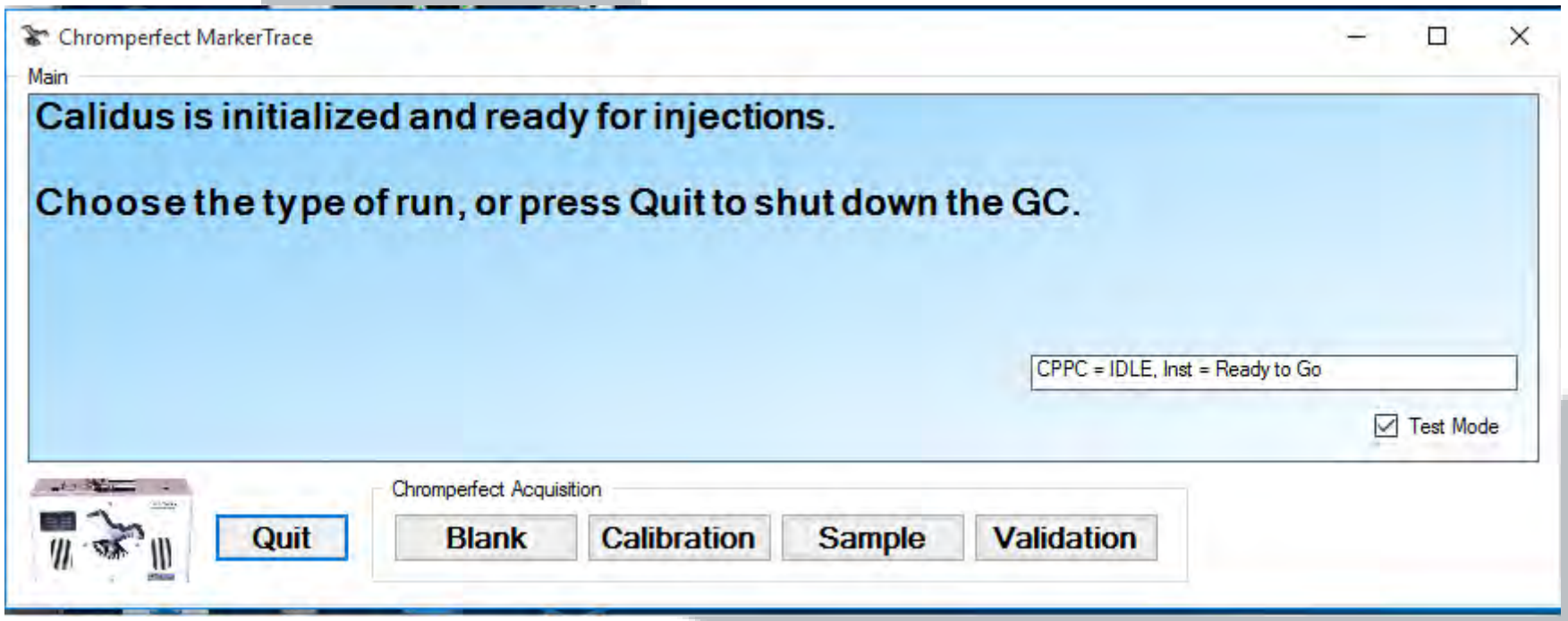




Evaluation to Standard



ACU Ready for Sample Unknown



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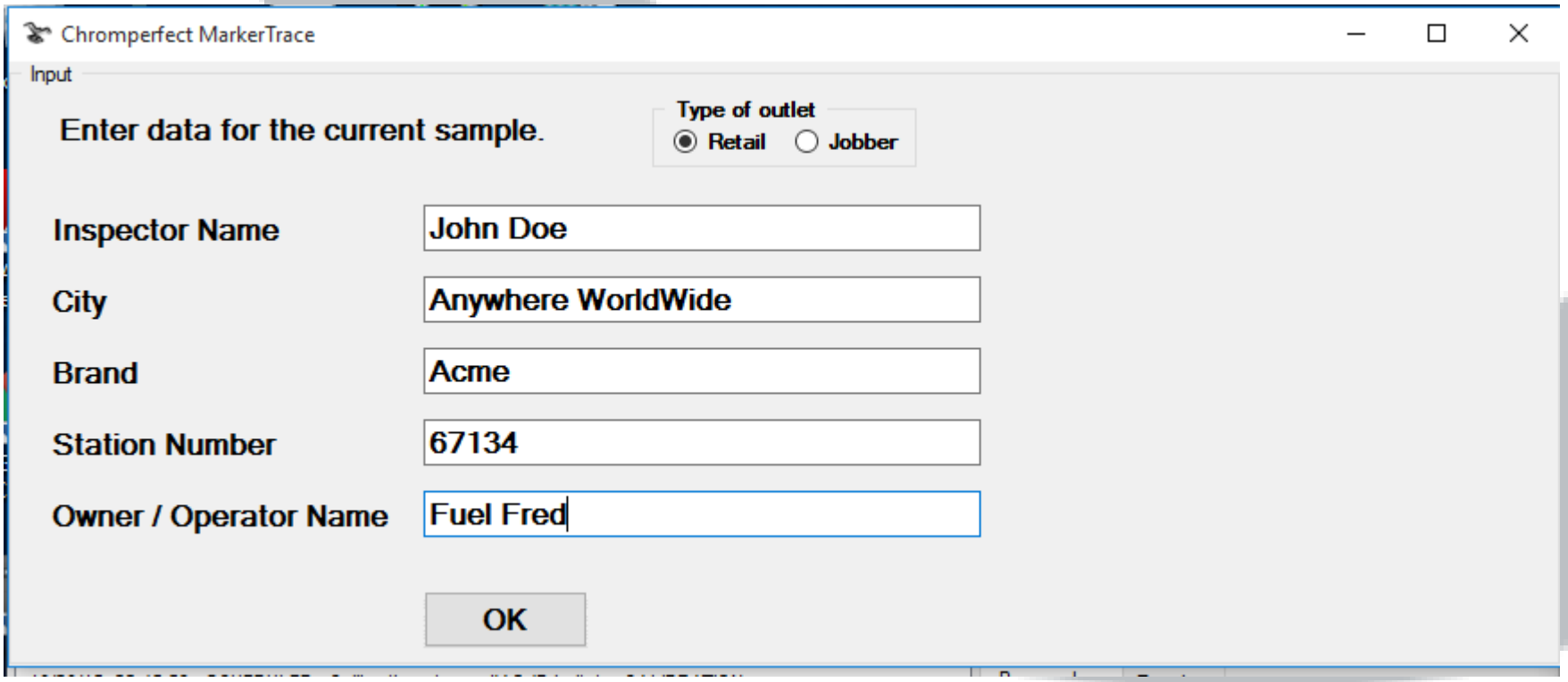
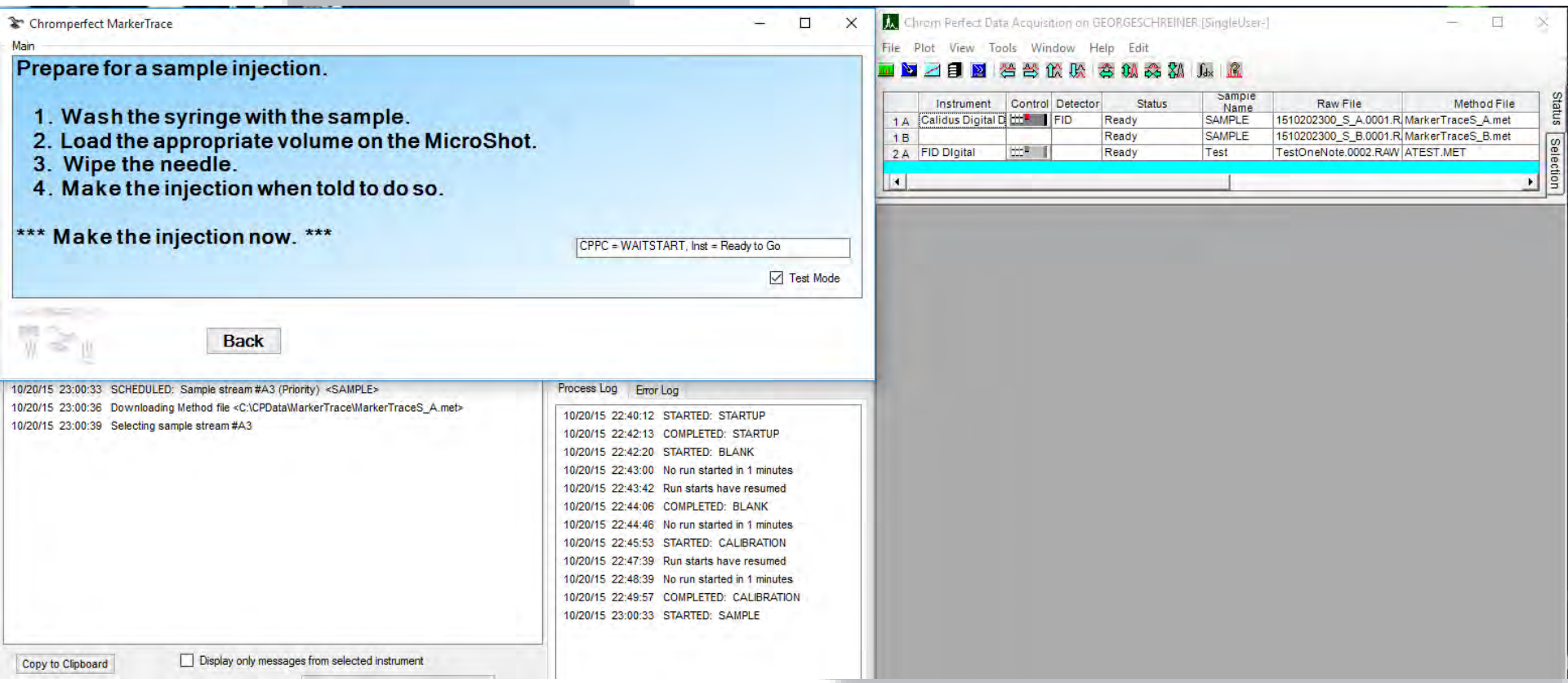
- Once ACU is Ready for Testing the Sample Button is Pressed
- Information is Entered and Becomes Part of the Testing Result Record



Detailed Instructions Adhere to the Developed SOP



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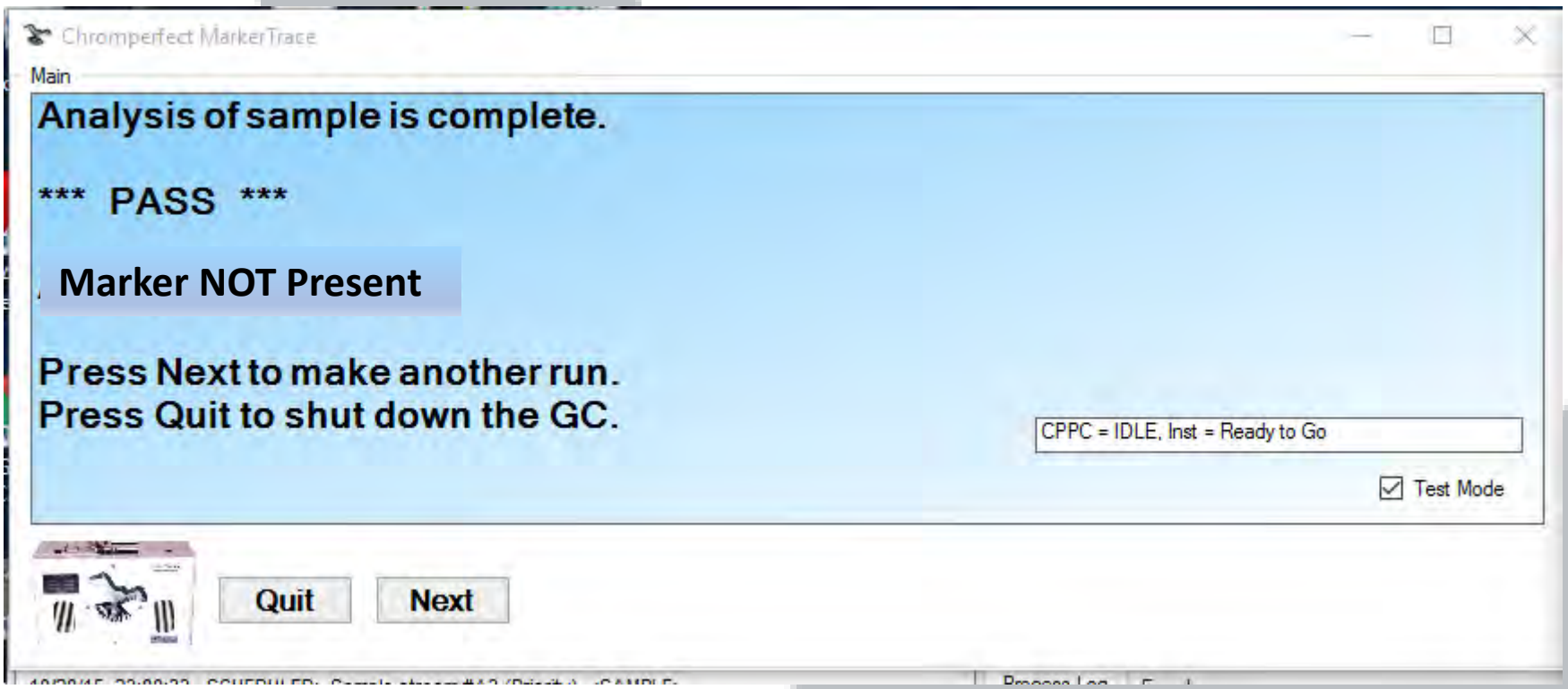
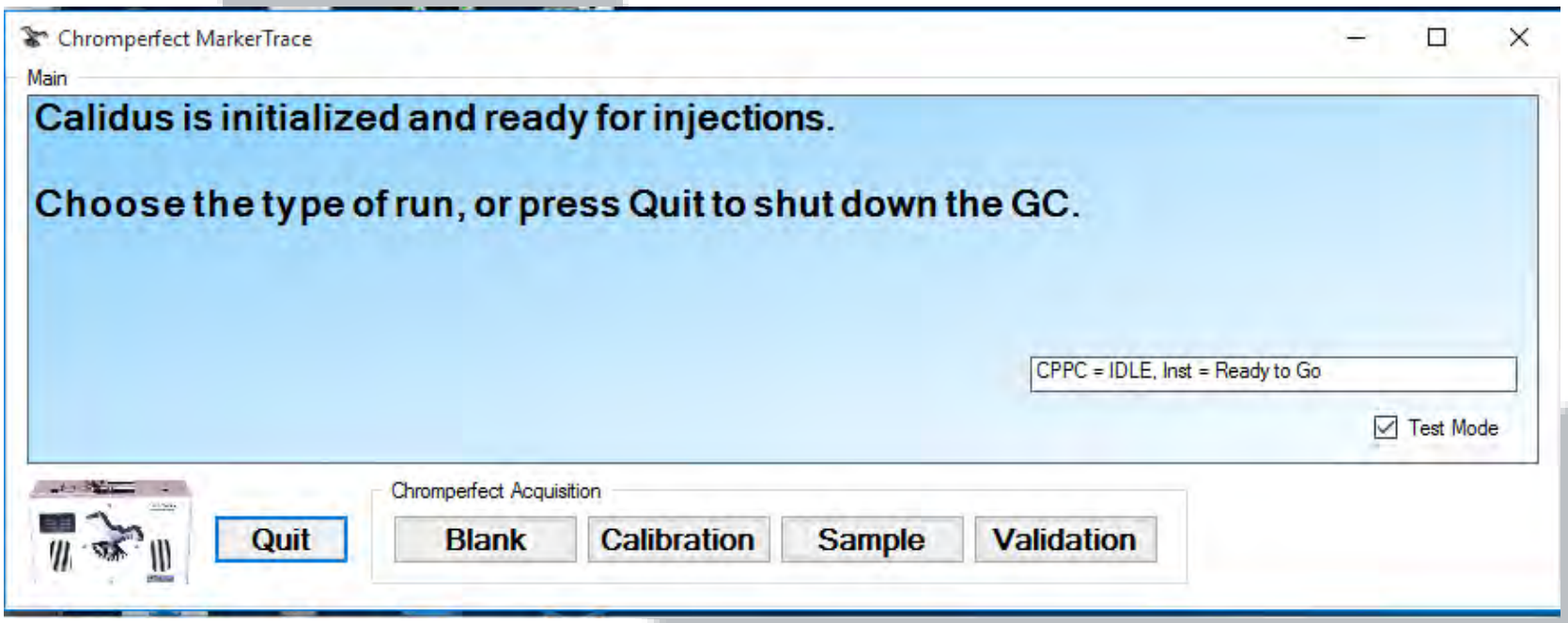
Automatic Results Real Time



Press Next for Additional Samples



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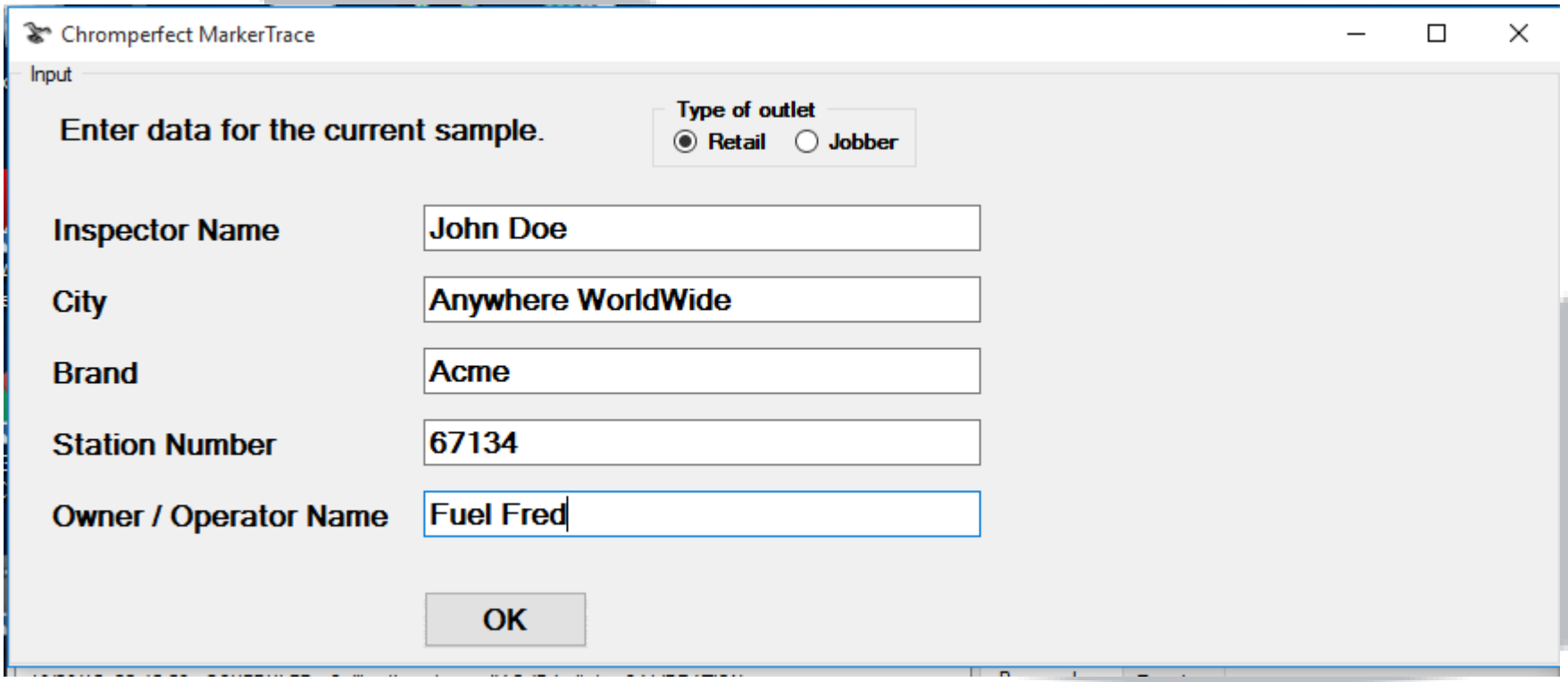
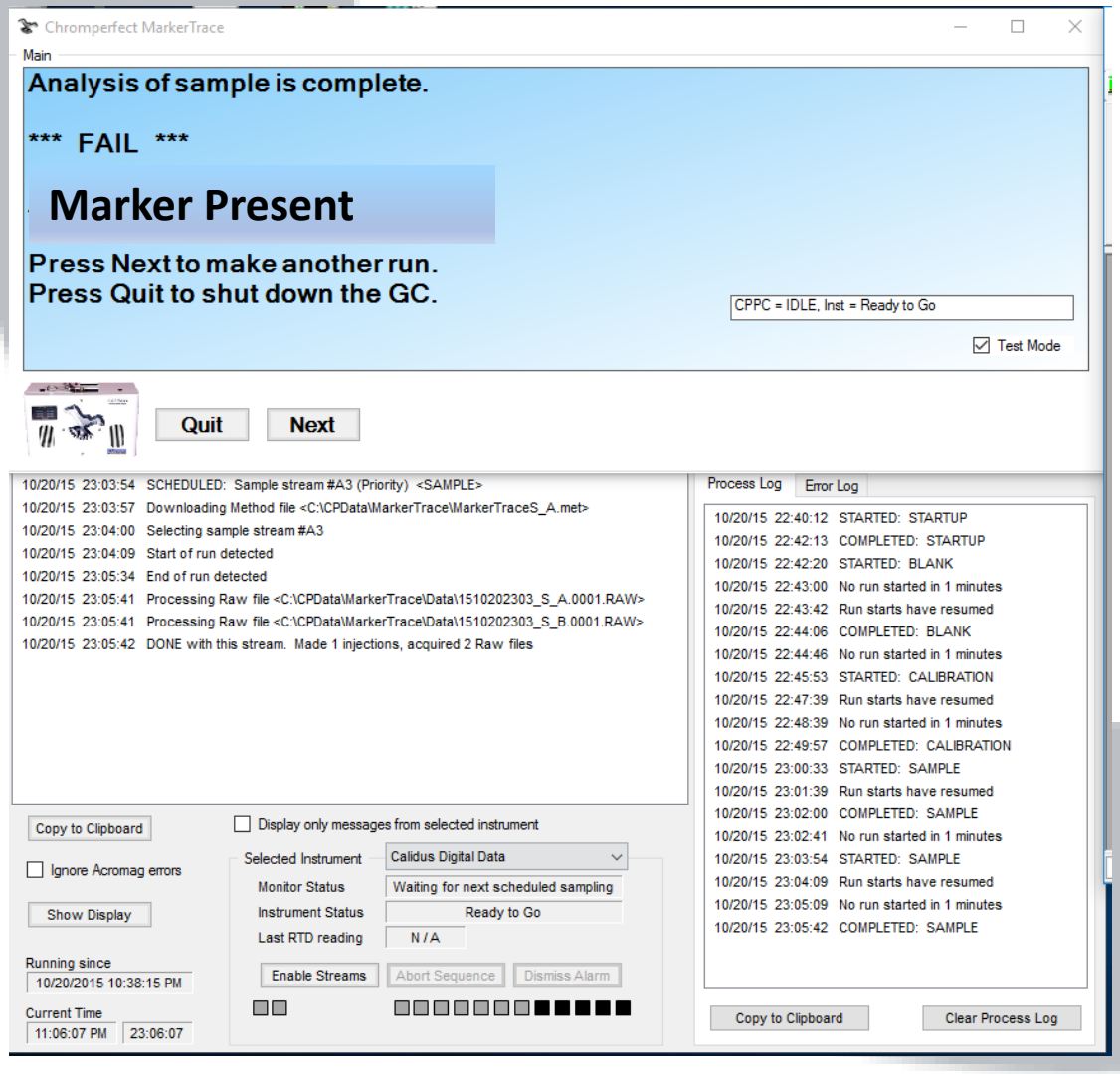
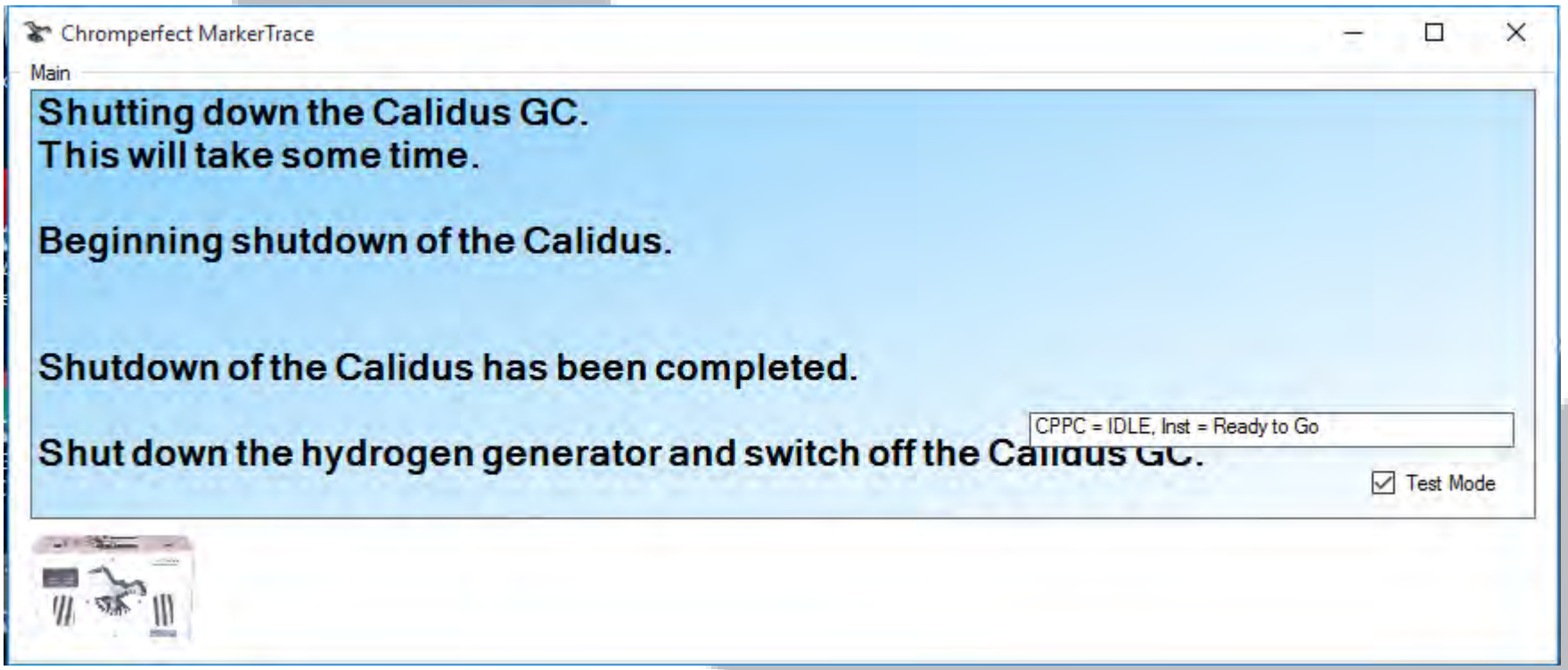
- Once ACU is Ready for Testing the Sample Button is Pressed
- Information is Entered and Becomes Part of the Testing Result Record



Automatic Results Real Time



ACU Completion Control



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The Future Will Need More ACU Units

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

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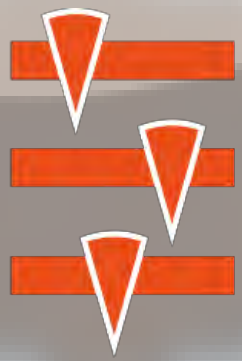
chromperfect process control

chromperfect modbus



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ANALYZER CONTROL UNITS

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

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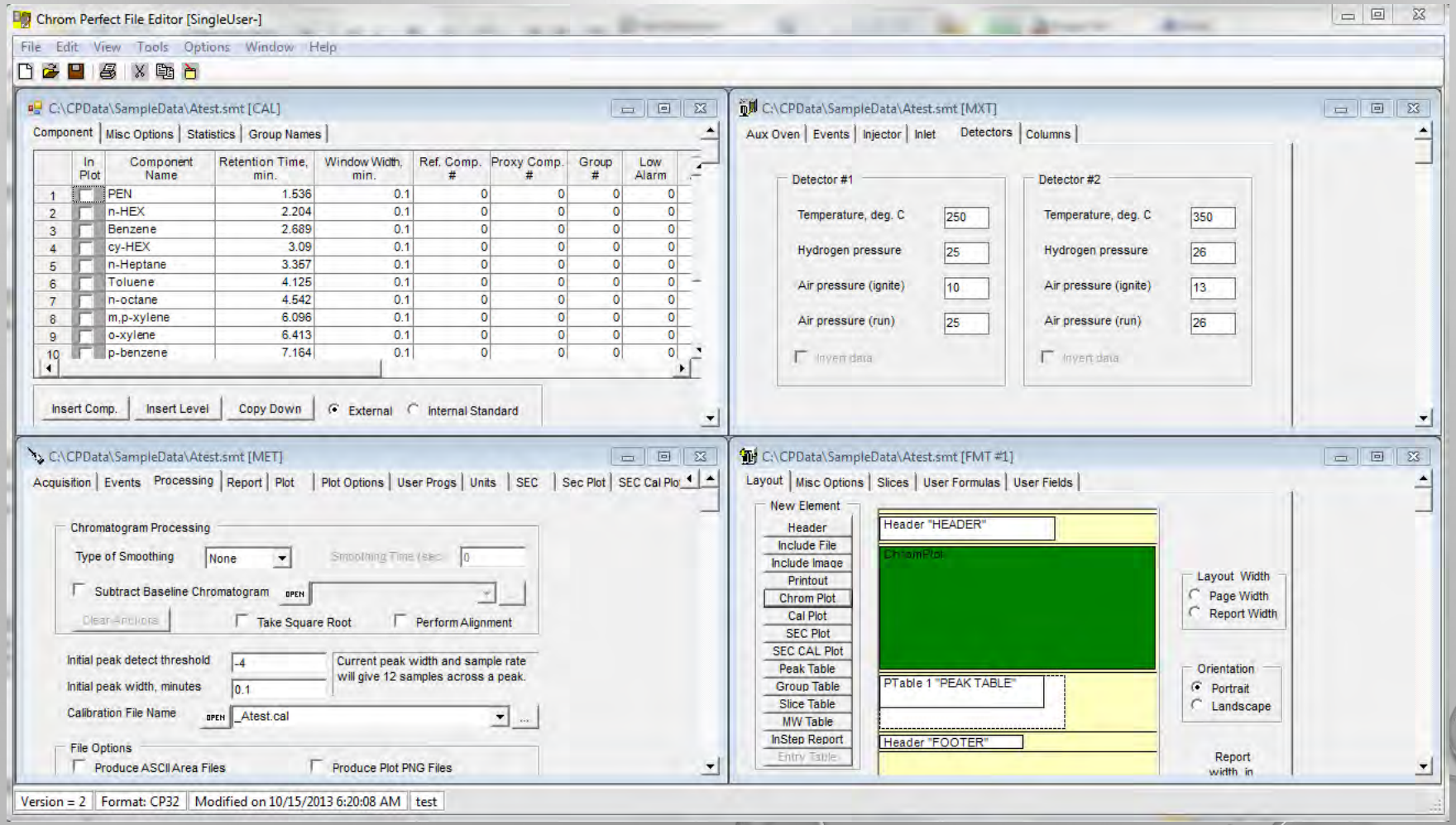
COMBINE ELEMENTS OF ACQUISITION AND ANALYSIS



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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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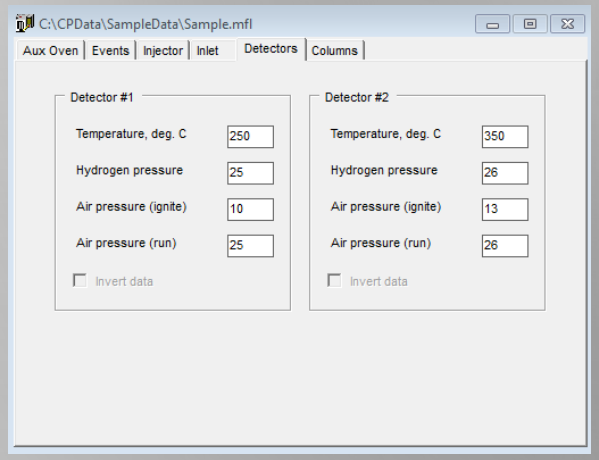
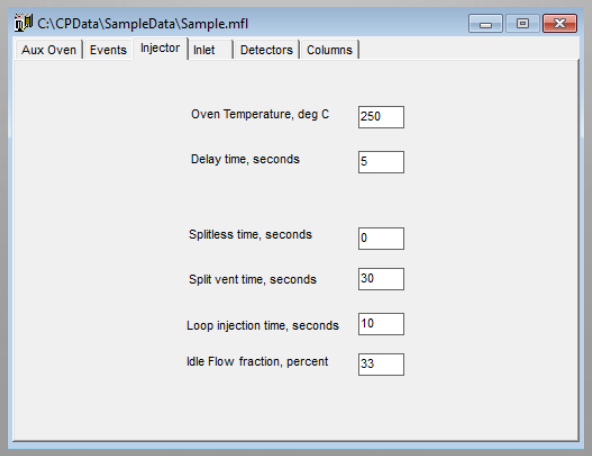
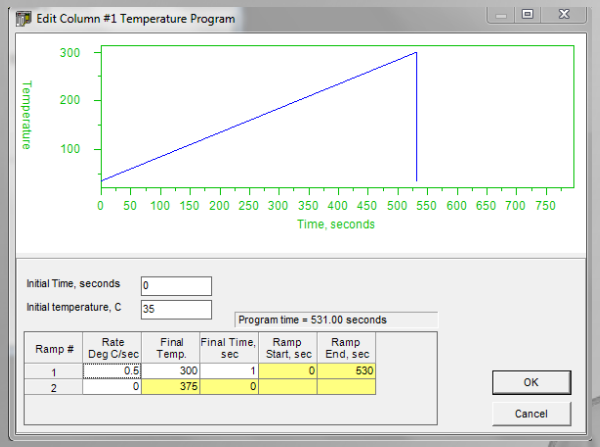
SYMMETRIC INSTRUMENT CONTROL

THE ANALYZER INSTRUMENT IN THE PLANT OR AT THE SAMPLE SITE

THE ANALYTICAL INSTRUMENT IN THE LABORATORY







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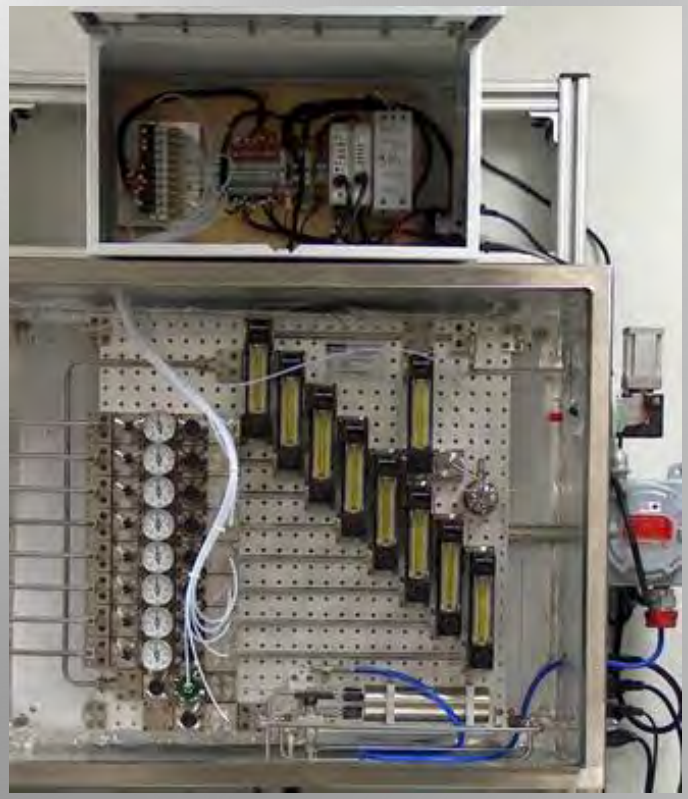
SAMPLING CONTROL

AUTOMATED

SAMPLE STREAMS



- OFF THE SHELF DEVICES
- CUSTOM CONFIGURED

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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

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DATA CONTROL

ANALOG OUTPUT

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

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DATA CONTROL

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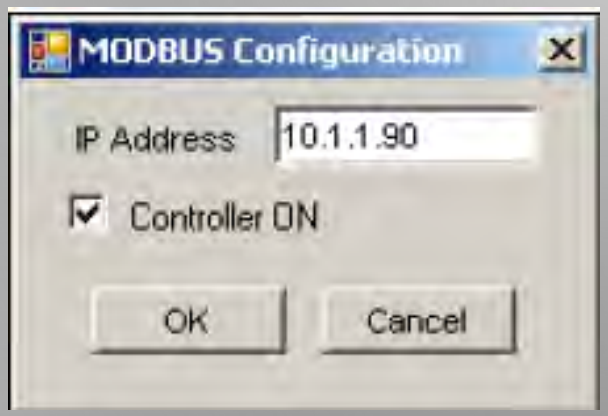

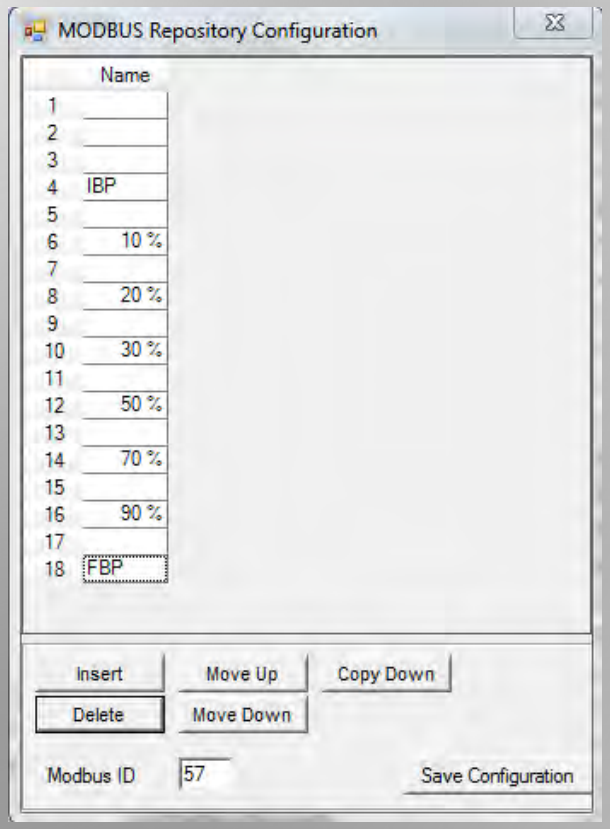

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DATA CONTROL

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

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AUTOMATED ANALYSIS

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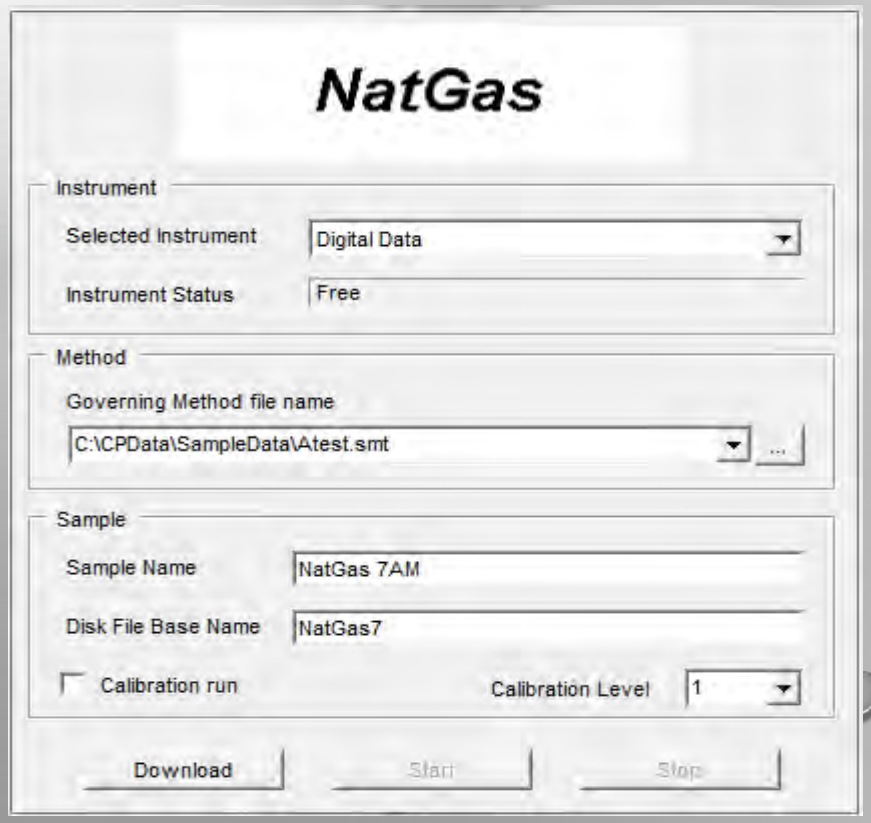

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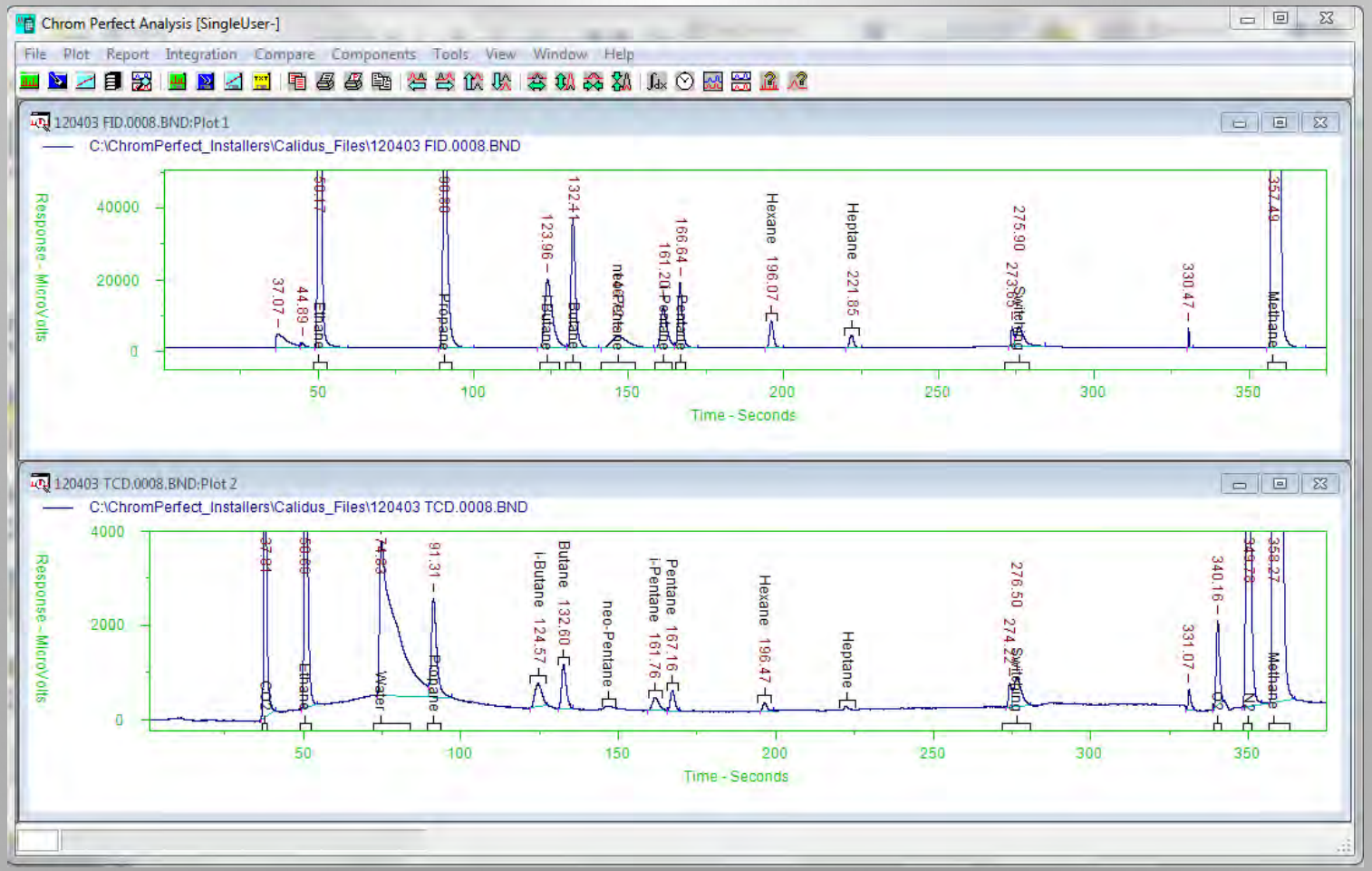
PLANT TO LABORATORY



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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

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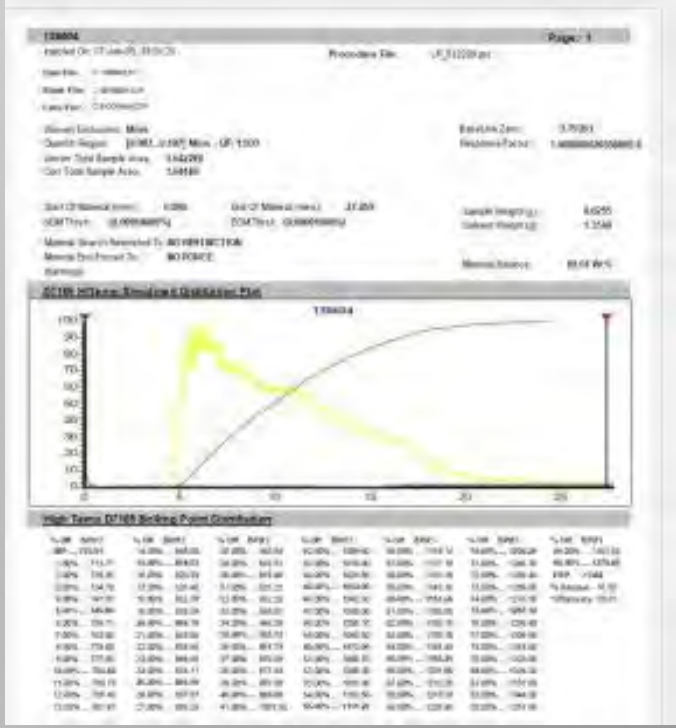
LABORATORY TO PLANT

SIMULATED DISTILLATION



D-7798

Instrument

Selected Instrument: Digital Data

Instrument Status: Free

Method

Governing Method file name

C:\CPData\SampleData\Atest.smt ...

Sample

Sample Name: Total Sulfur

Disk File Base Name: Sulfur100

Calibration run

Calibration Level: 1

Download | Start | Stop

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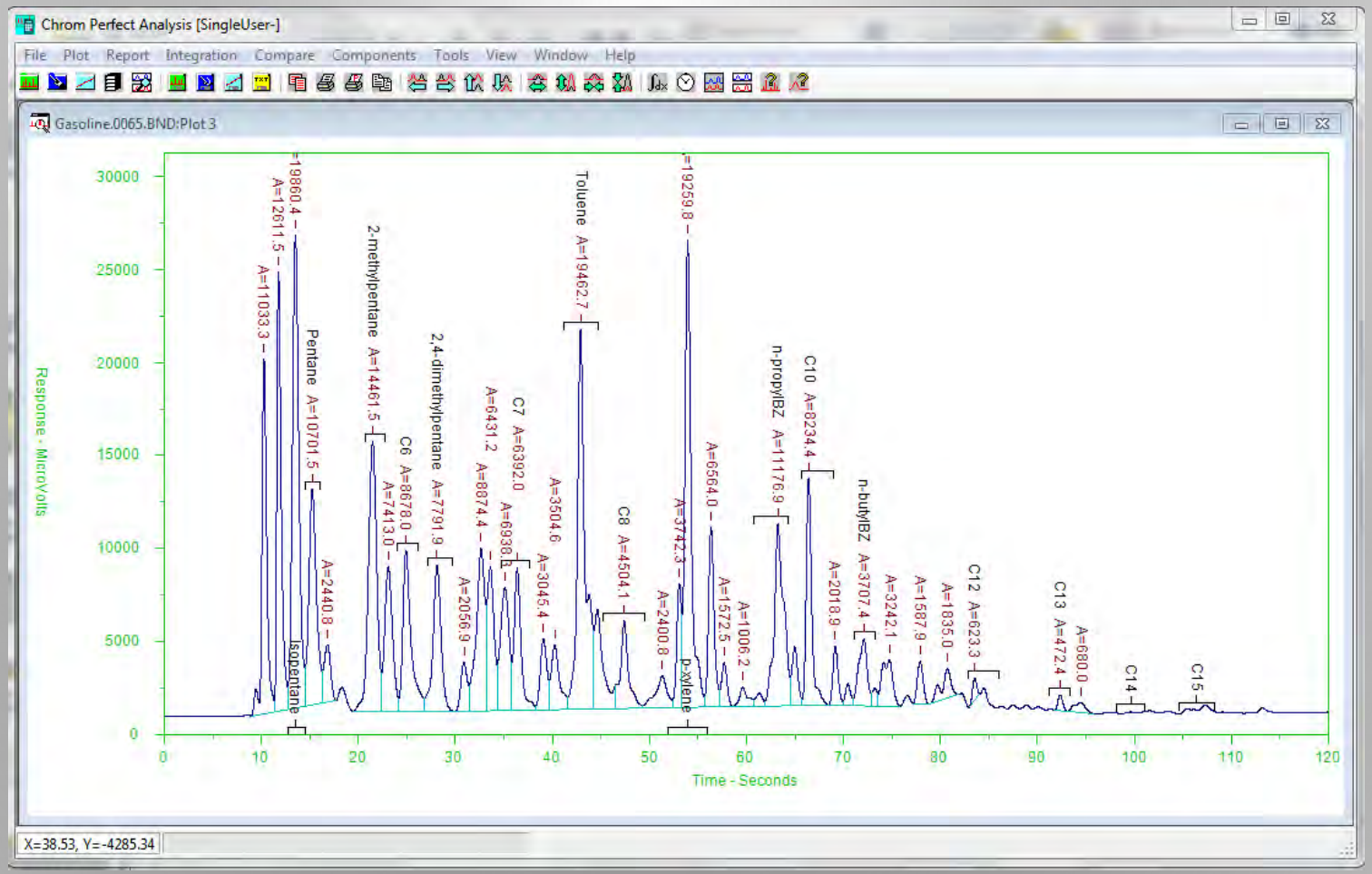
PLANT TO LABORATORY



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LABORATORY TO PLANT

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

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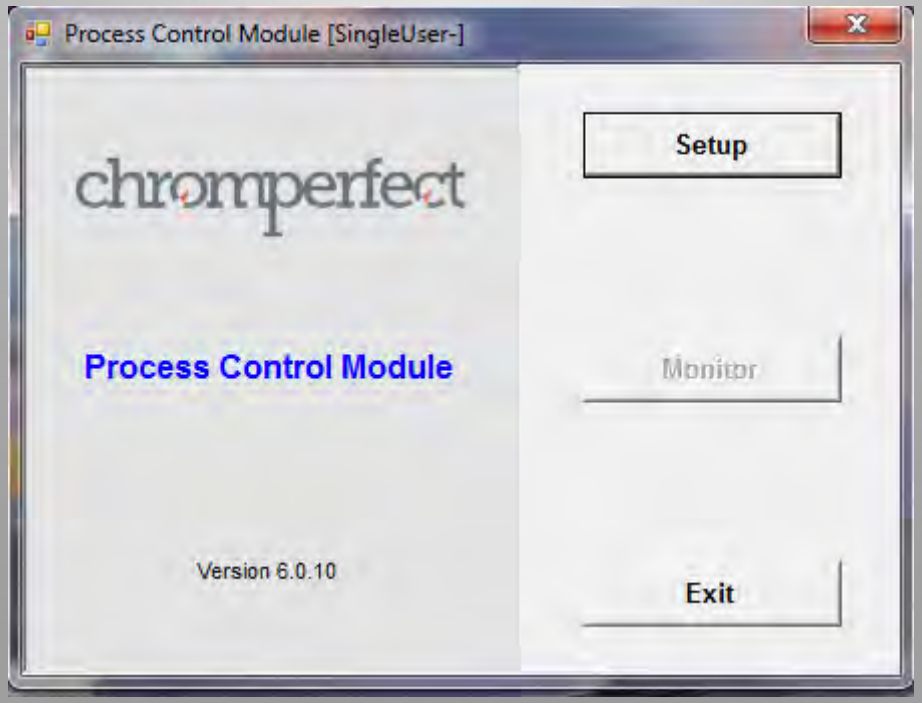

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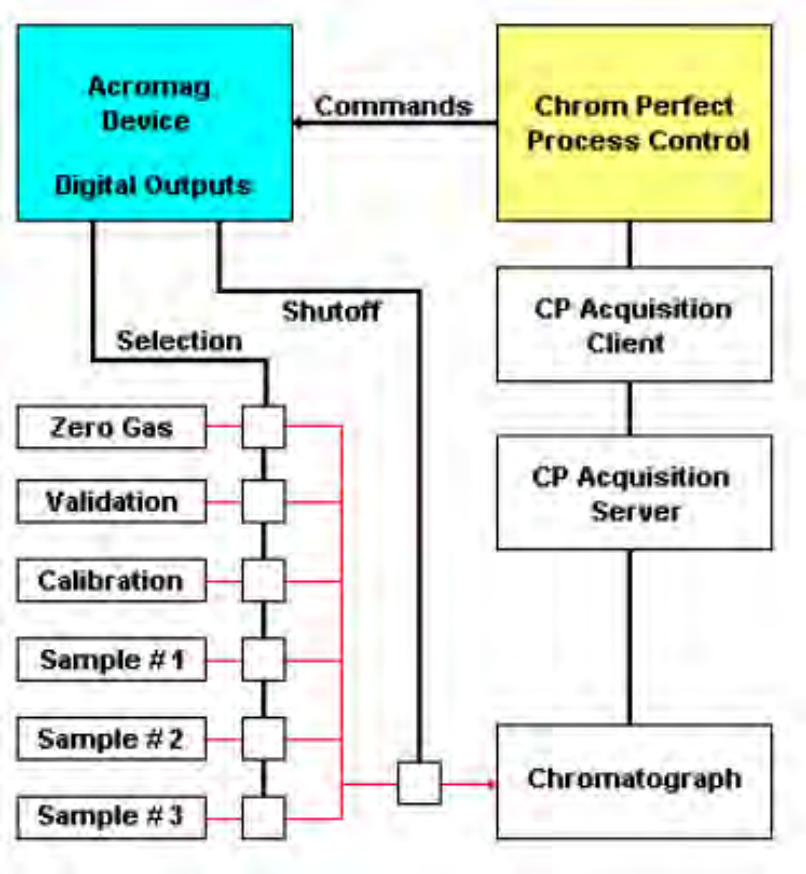

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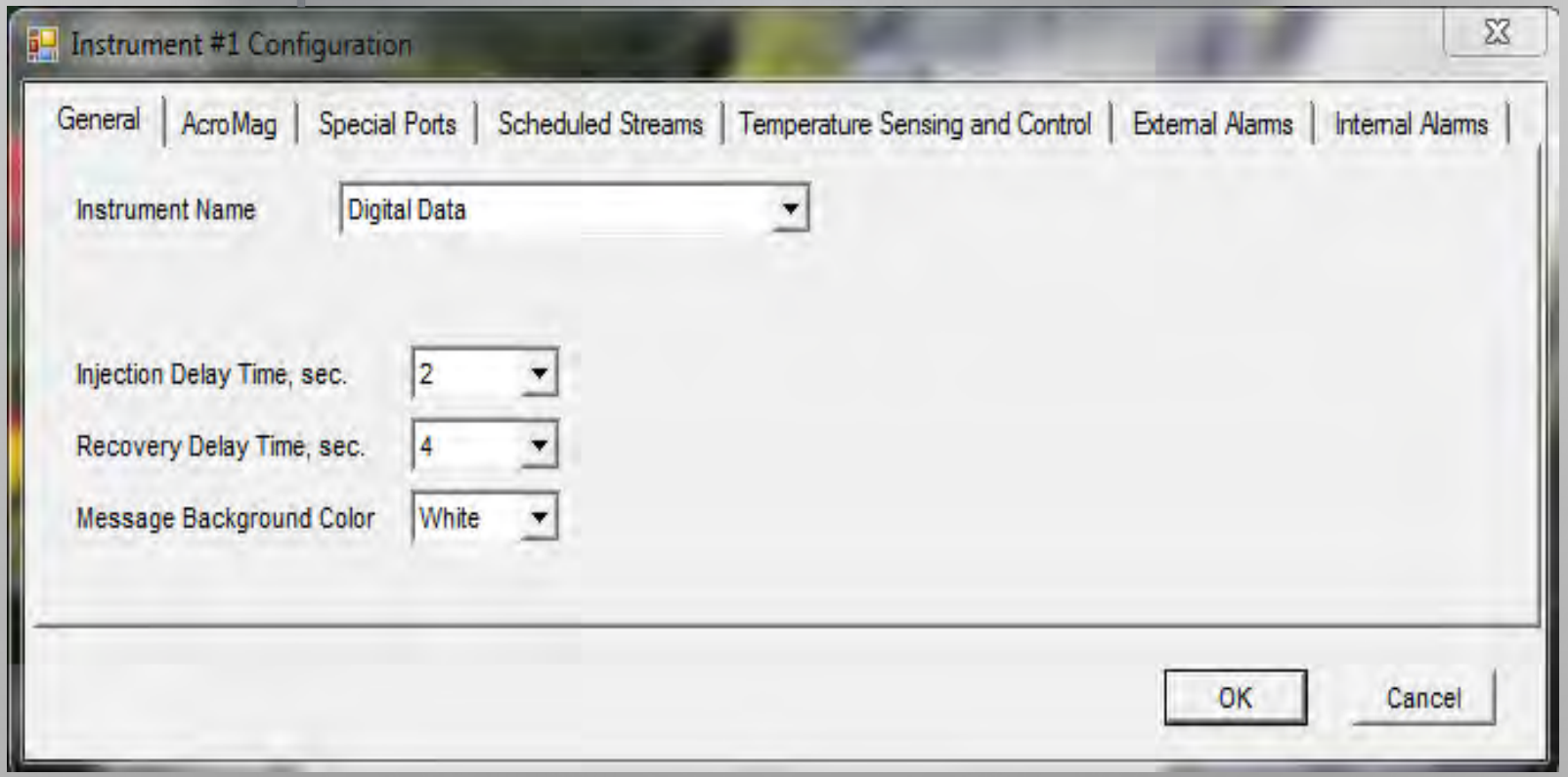
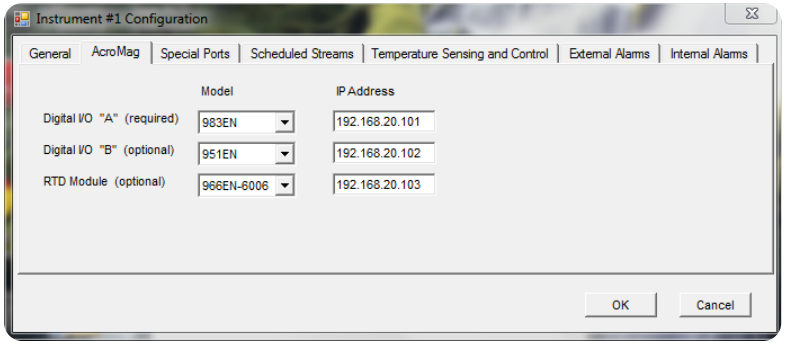


General Instrument Selection



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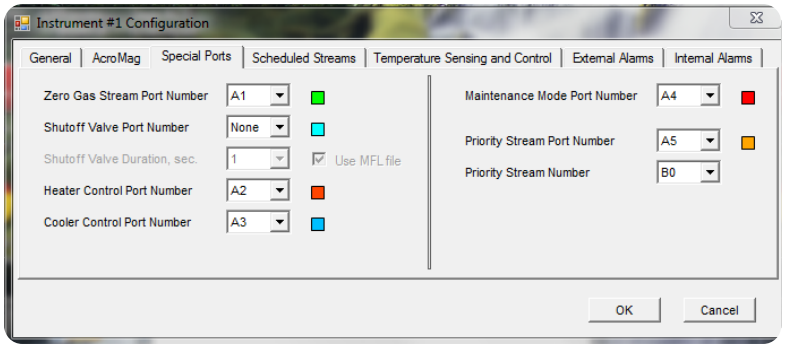
I/O GEAR CONFIGURATION



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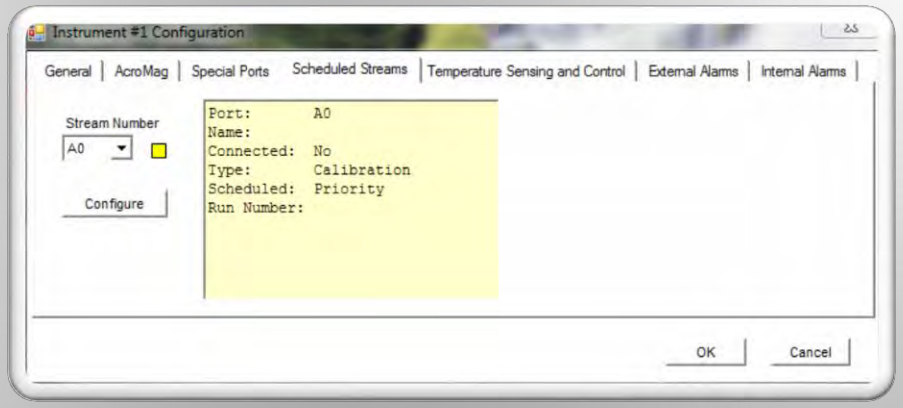
SPECIALIZED PORTS



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SCHEDULED STREAM CONFIGURATION

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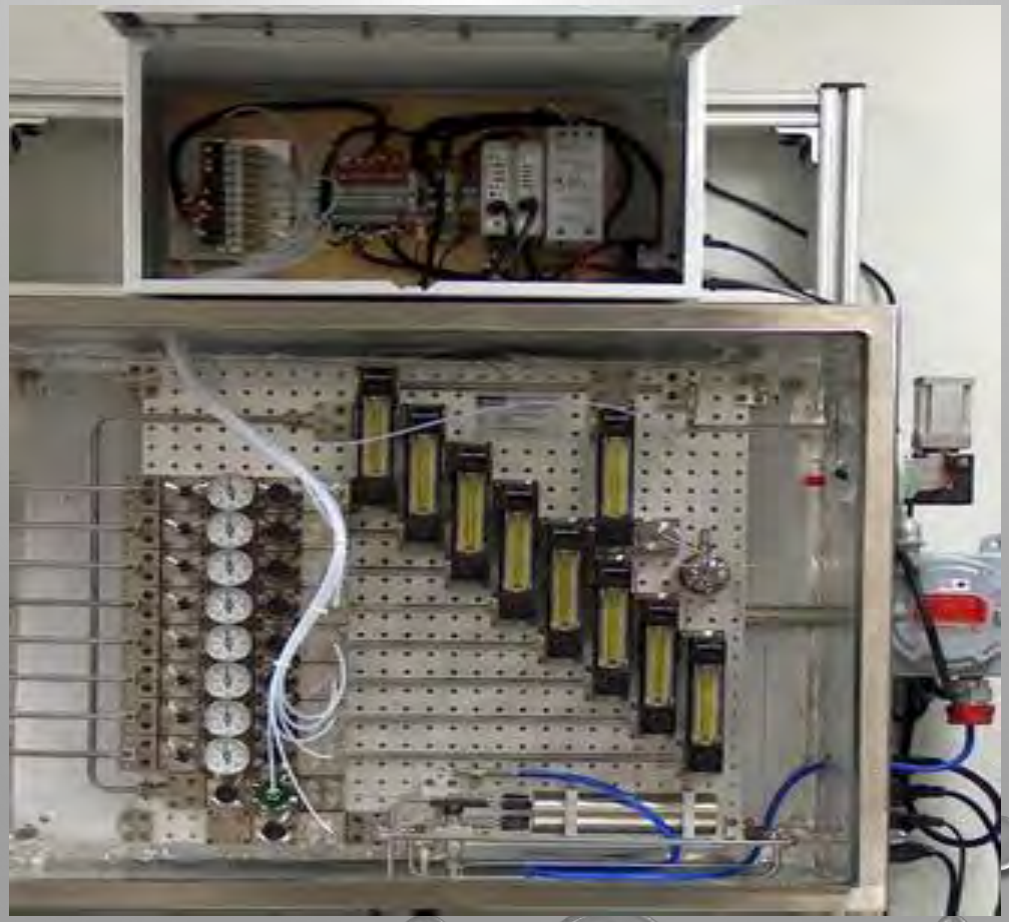

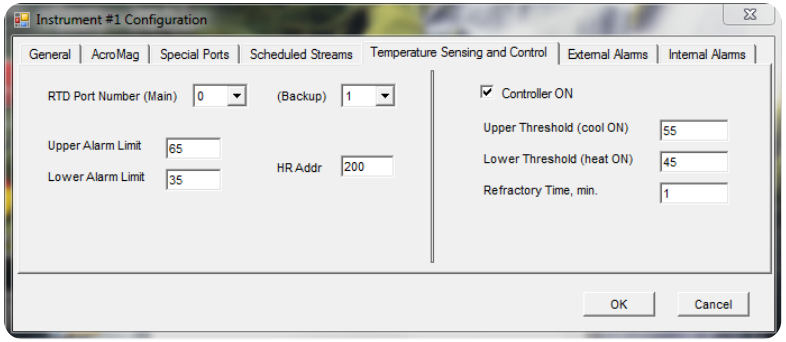

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ANALYZER ENCLOSURE CONDITIONS

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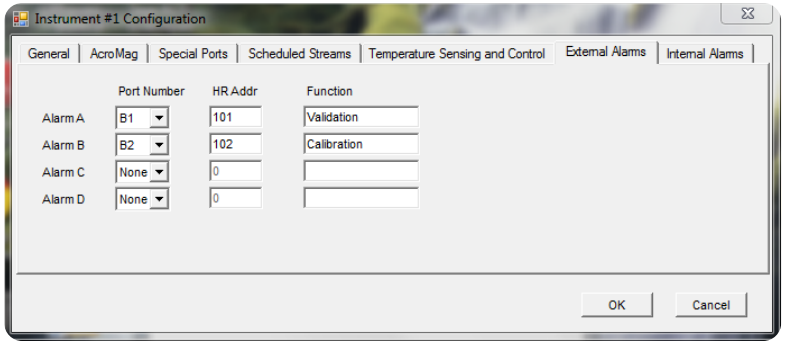
1/23/2018



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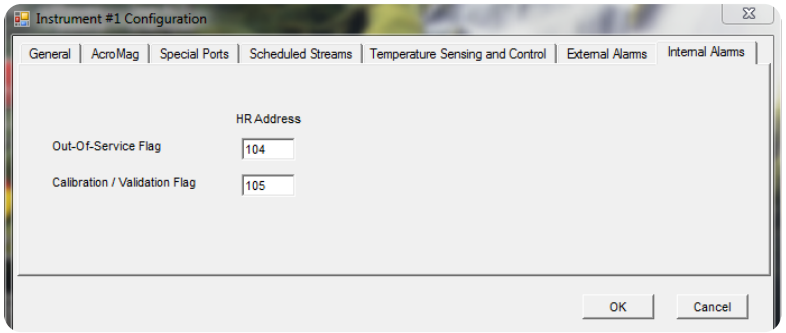
EXTERNAL ALARMS FROM SCADA



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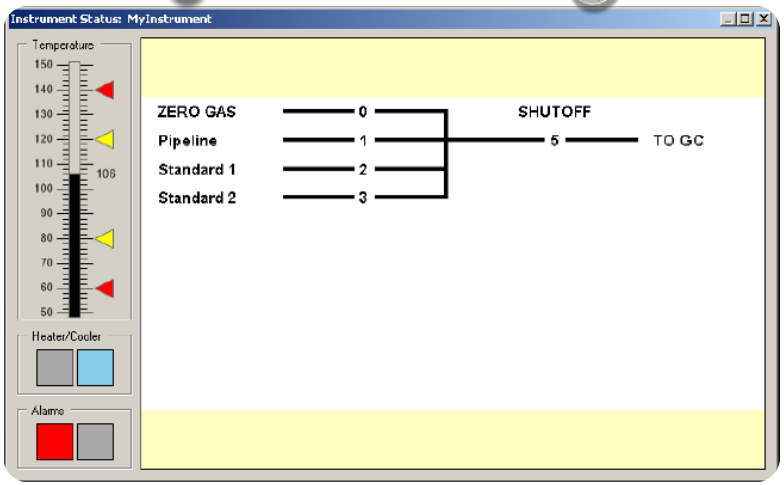
INTERNAL ALARMS VISIBLE TO SCADA



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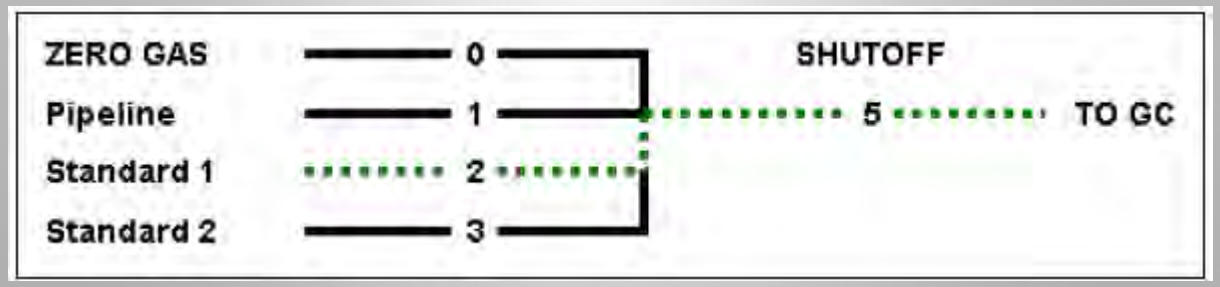
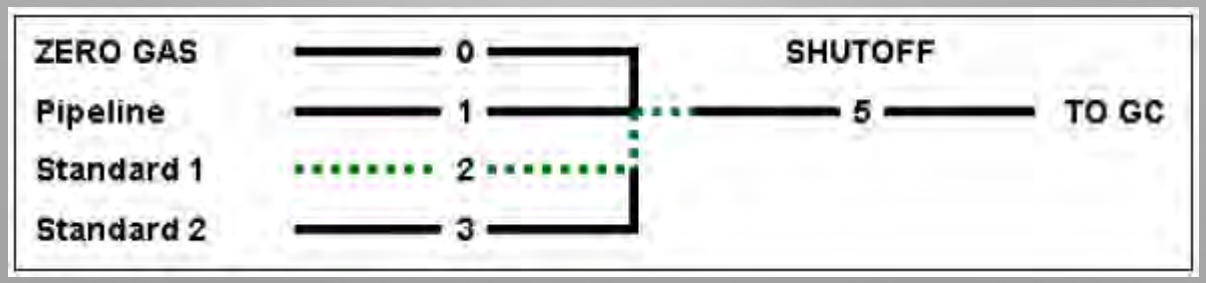
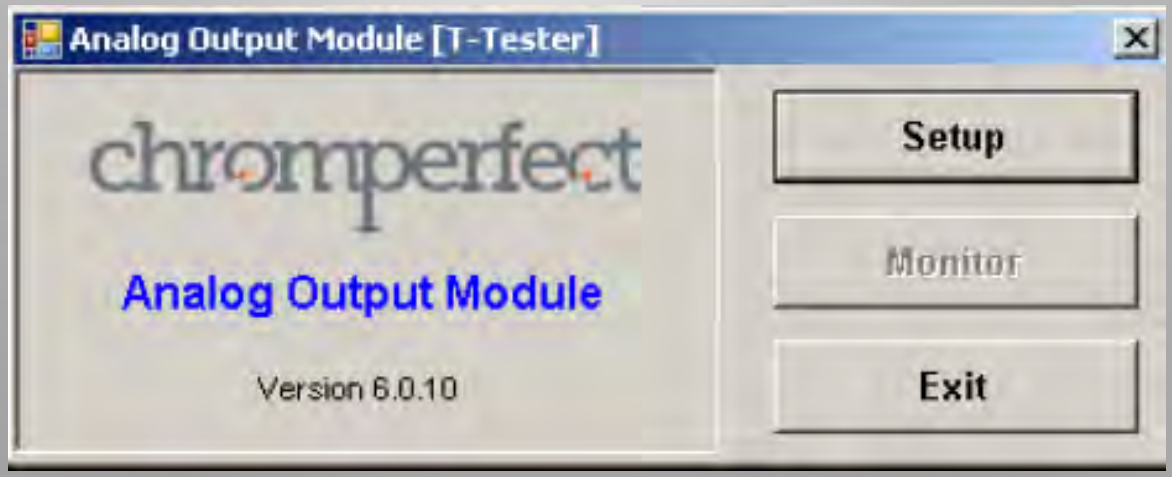
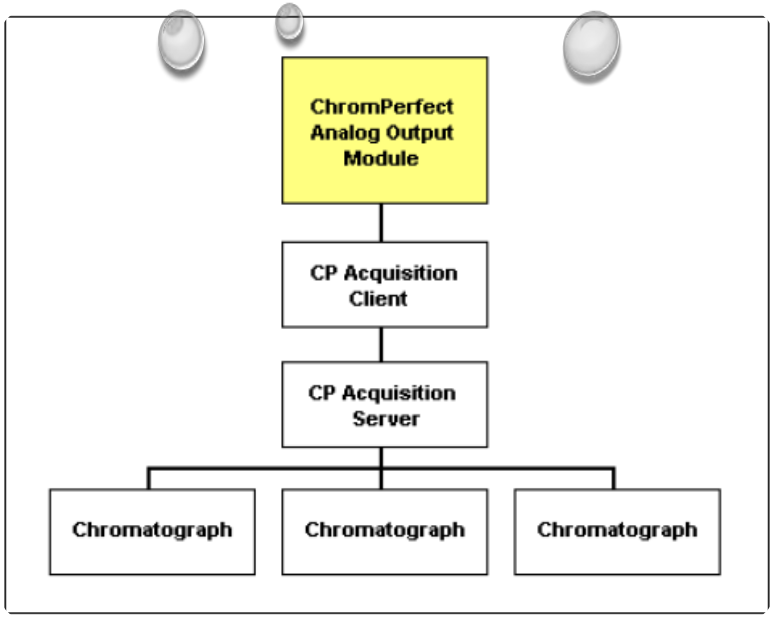




CHROMPERFECT ANALOG OUTPUT CPAO





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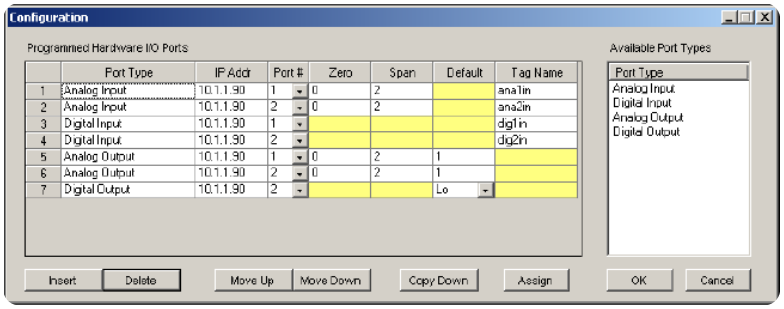

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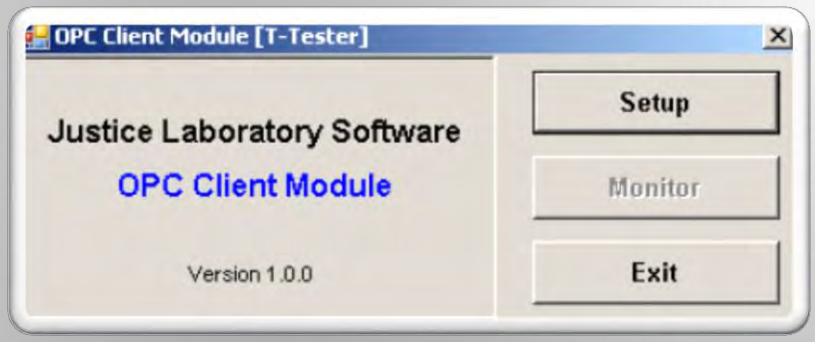

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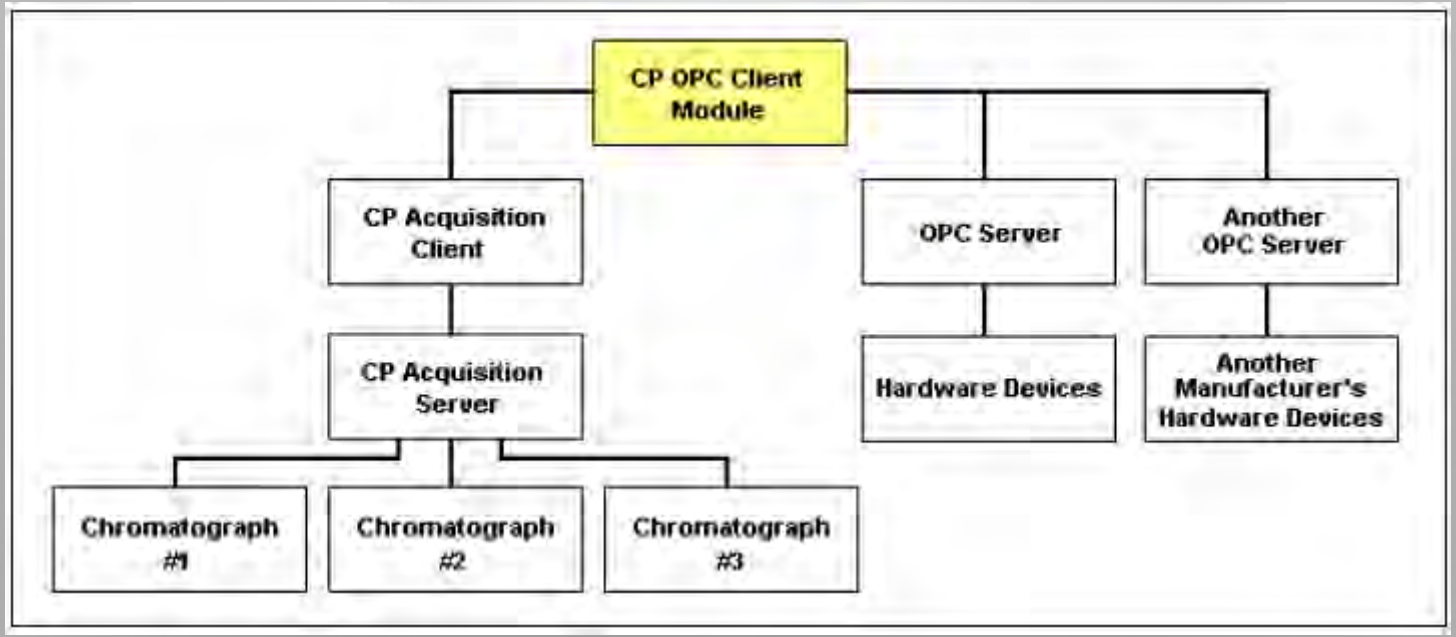

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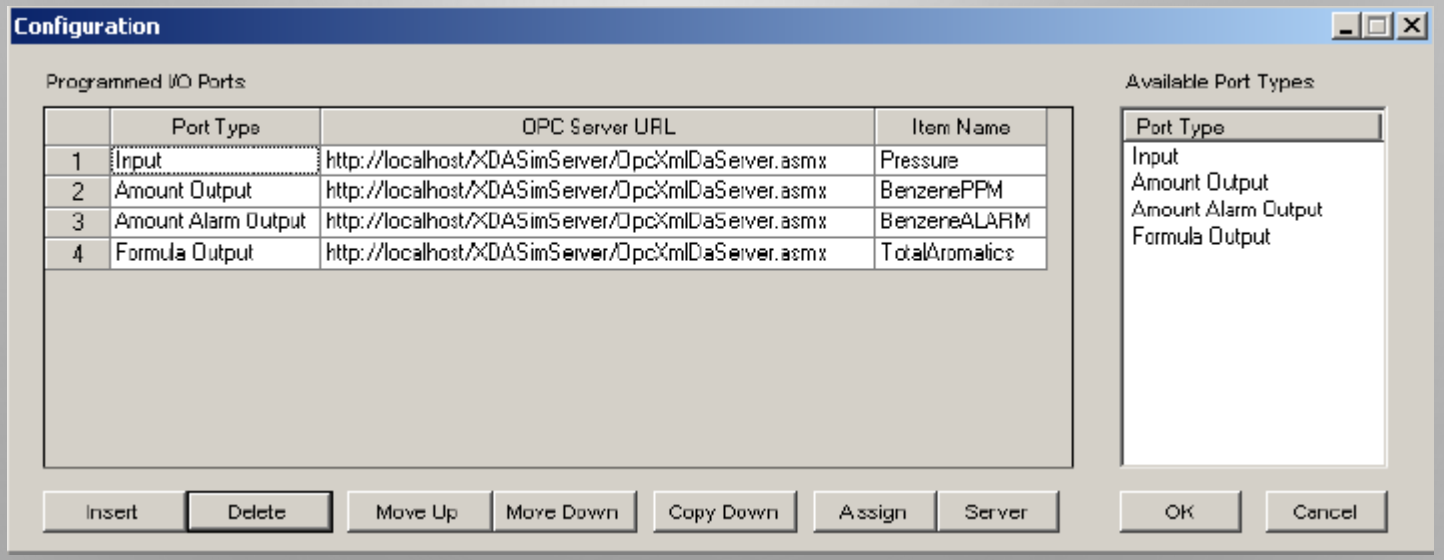

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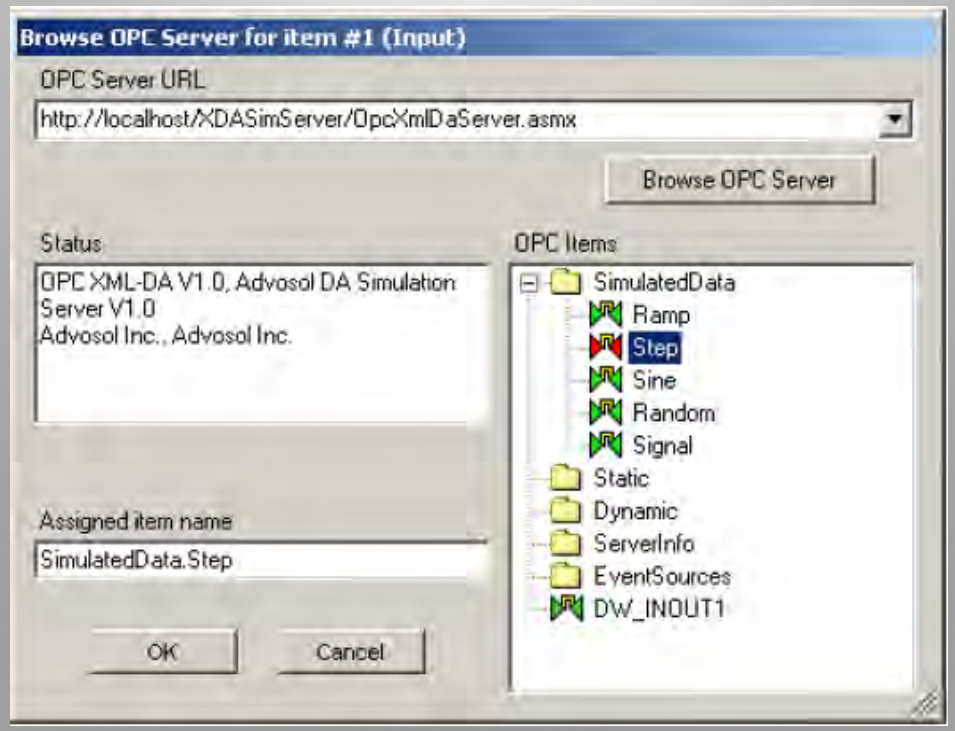

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