

# QUALIFIER

Automated Data Acquisition & Analysis

Revolutionize  
Validation Testing &  
Launch With Confidence

**CONTROLTEC**<sup>®</sup>  
UNLOCKING THE POWER OF DATA

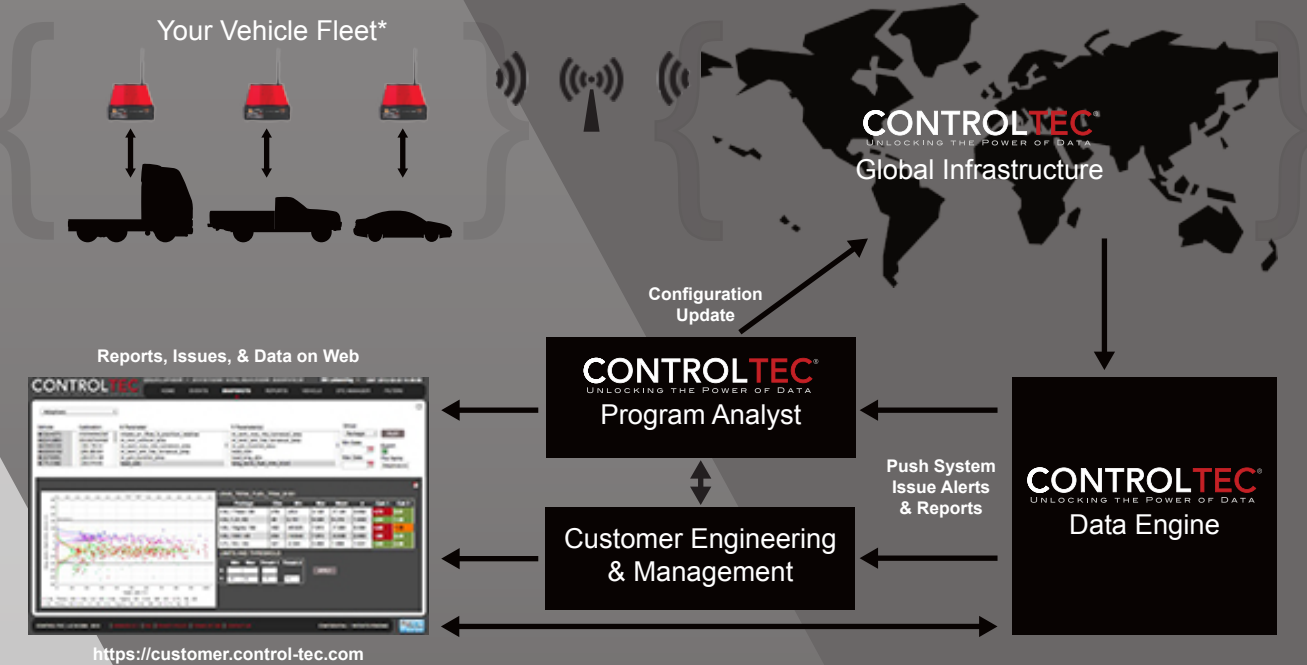
# VALIDATION 2.0

Stop waiting for this... 

*Start measuring performance.*

Pass Fail

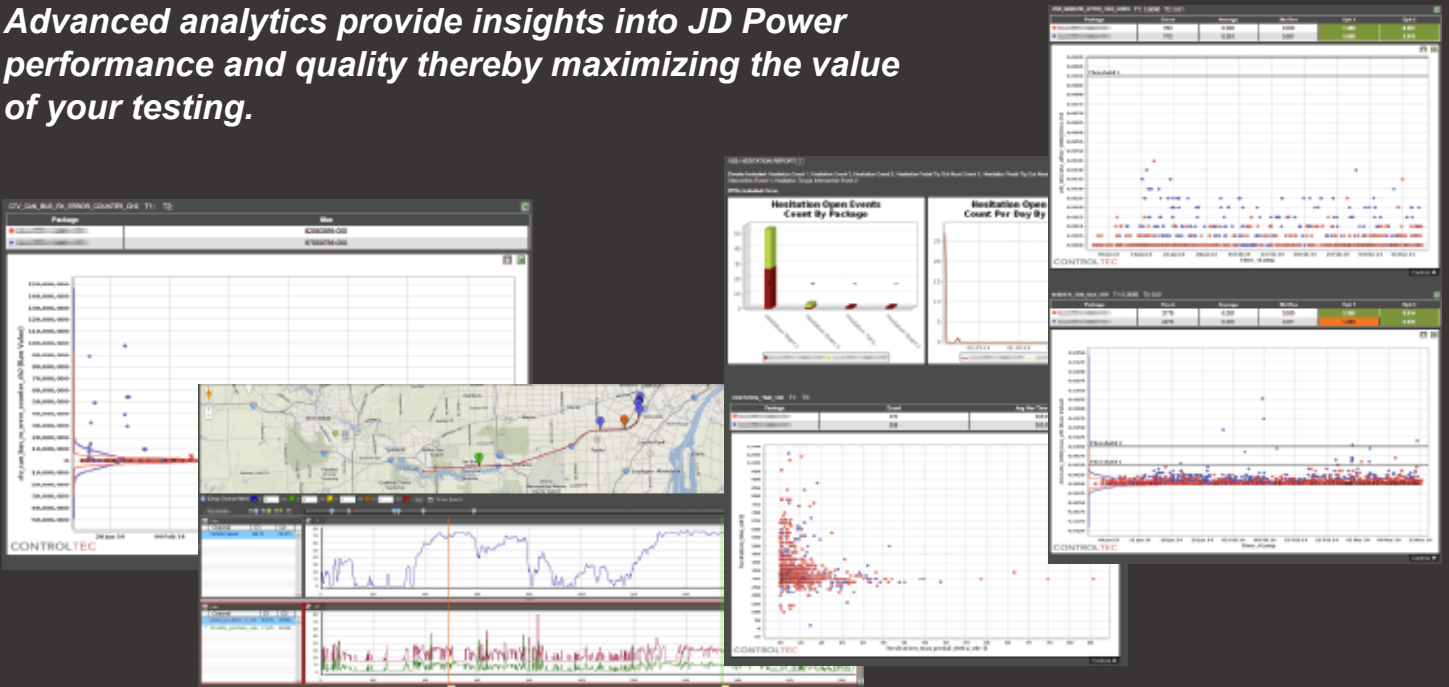
CONTROLTEC® is leveraging 21st century technologies to enable customers to launch quality systems by improving reactive processes and providing proactive measures to identify poorly performing subsystems prior to launch. Qualifier® features automated data download via Cell / WiFi, automated data processing, remote data logger configuration update, issue notifications via SMS & Email, automated reports, embedded analysis tools on the web to enable enterprise collaboration and much more.



\* Full Qualifier® experience available with CT® Hardware. Non-CT® data loggers are supported to varying degrees of functionality.

# UNLOCKING THE POWER OF DATA

*Advanced analytics provide insights into JD Power performance and quality thereby maximizing the value of your testing.*



CONTROLTEC®'s Qualifier® platform provides a comprehensive data management and analytics solution for your testing.

- Fleet management with geolocation features.
- Issue management with real time notifications and report subscriptions.
- Automated analytics to assess the performance of a given subsystem, metrics include: min, max, average, standard deviation, variance, count of values in/out of a specified range, Cpk, C/1000 vehicles, C/12,000 miles, and all data can be filtered on multiple parameters.
- Time based analysis of captured data with CT-Graph® featuring links to all data captured during event/trip with maps, statistics, histograms, calculated signals, graph templates, and more.
- Hardware/software part number tracking of all modules ensure quality test miles.
- Data accessible worldwide, 24/7.
- Fully relational database for in-depth analysis.
- Test thresholds by comparing vehicles, calibrations, and much more.



# ISSUE MANAGEMENT

**CONTROLTEC** QUALIFIER - SYSTEM VALIDATION SERVICE Bill Leisenring GMT 2012-02-20 15:37:14

HOME EVENTS SNAPSHOTS REPORTS VEHICLE DTC MANAGER FILTERS

Package: 2.4L / Theta / A6 3.5L / LX / A5 3.6L / Sigma / A6 3.6L / WK / A5 3.7L / WJ / A5  
 Vehicle #: 82116217 8C224271 8Z328366 A0141083 A6289200  
 Fleet: ctec  
 Status: Open Fix Pending Verify Closed False  
 Event Type: DTC Engine OBD  
 Assignee: Bill Leisenring Brandon Brigham Greg Pannone

Switch View Min Date: Max Date: Keyword Search Apply Filters CLEAR FILTER

**Event Management**

Event	Event Name	Status	Events	Vehicles	Package	State	First	Last	Comment	Assignee
5	P0113	Open	5	3	3.6L / Sigma / A6		02-28-2011	05-06-2011	Assignee updated to Bill Leisenring	Bill Leisenring

**P0113 - Intake Air Temperature Sensor 1 Circuit High (Bank 1)**

Status:  Open  Fix Pending  Verify  Closed  False FILTER

ID	Status	Date	Odo	Config	Location	Type	Comment	Data	GPS
[Status] VIN: 1G6DGSEG3A0141083 (ctec), Veh #: A0141083, Pkg: 3.6L / Sigma / A6									
1	Open	02-28-2011 18:22:48		1.1.0	Allen Park, MI	DTC Malfunction	Occurrence		
2	Open	02-28-2011 20:09:39		1.1.0	Allen Park, MI	DTC Malfunction	Occurrence		
3	Open	02-28-2011 20:07:23	20003	1.1.0	Allen Park, MI	DTC Malfunction	Occurrence		
[Status] VIN: 1GKET63M782116217 (ctec), Veh #: 82116217, Pkg: 5.3L / GMT360 / A6									
4	Open	02-28-2011 20:42:31		1.1.0	Ann Arbor, MI	DTC Malfunction			

Page 1 of 1 30

146	Manual Trigger	Open	1	1	3.6L / WK / A5
147	Long Start	Open	2	1	3.5L / LX / A5
146	Stall	Open	5	1	3.5L / LX / A5

**CONTROLTEC** QUALIFIER

Issue: High Current into Battery - BattTrac 1 Act == 30 (Status: Open)  
 Vehicle: 1FAHP3R49CL208137 / [Redacted]  
 Trigger Time: 2011-12-03 14:07:40 GMT  
 PCM Calibration: null  
 Logger SW: 2.21  
 Data Files: [Icons]  
 Assignee: None

Location: Allen Park, MI

**Occurrence History**

Time Period	Count
1-Day	~25
7-Days	~500
30-Days	~8000
All-Time	~8000

**Comment History**  
No Comments

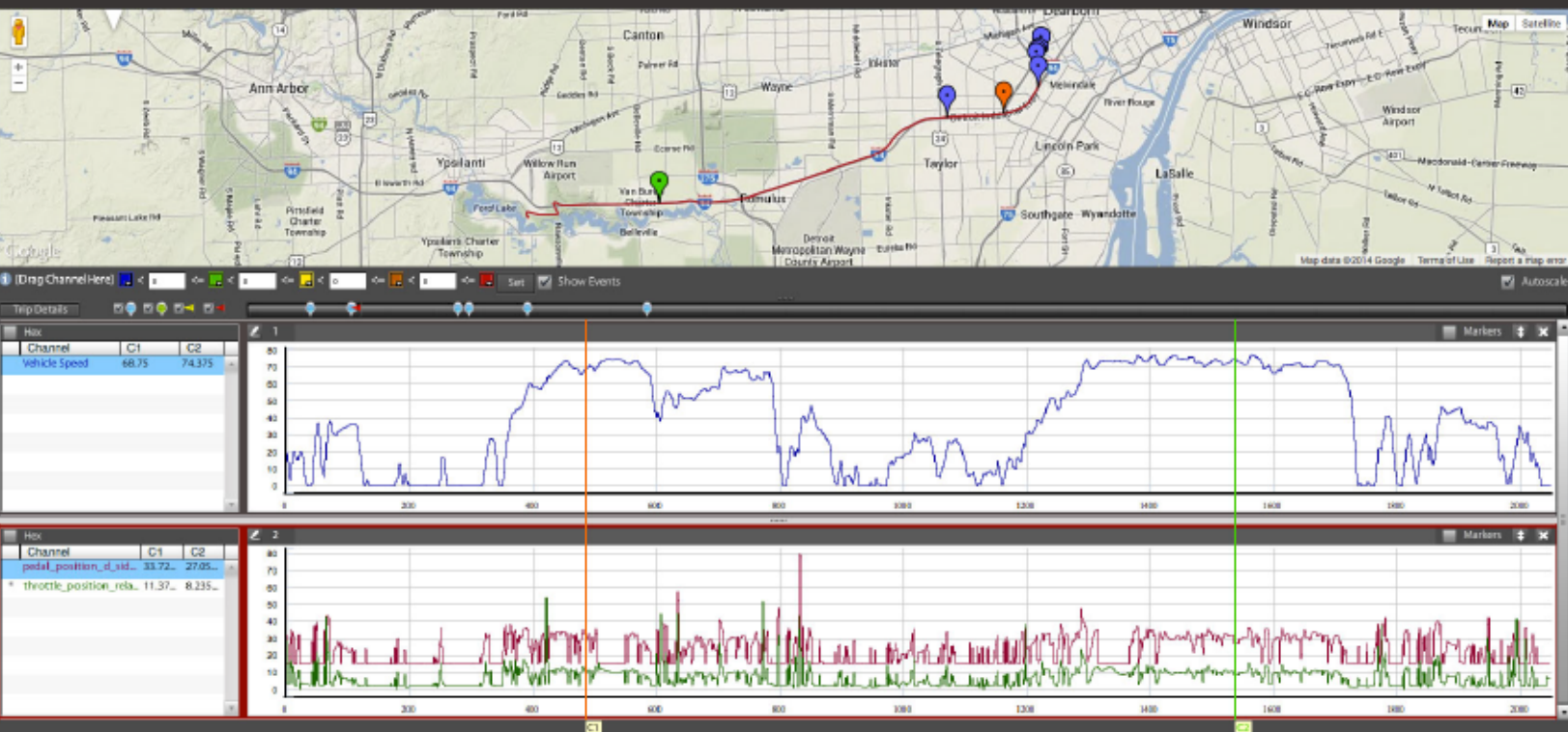
**Notification Info**  
Name: Bill's BEV Notifications (created on 2011-12-03 14:43:07.0) [Manage Notifications]

Real Time Trigger Notifications

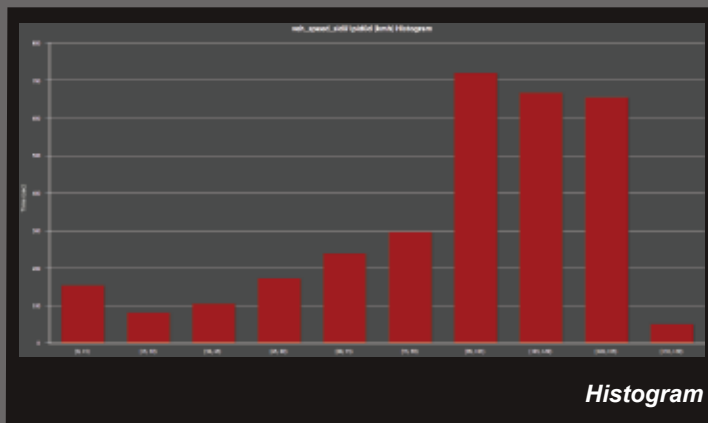
**Issues captured by Qualifier® are automatically managed with the following features:**

- Data consolidation to quickly provide issue scope: who, what, where and when.
- Quick access to the data to determine why and how.
- Issue status control with issue assignment.
- Issue data management including user comments.
- Event frequency analysis.
- Event statistics including freeze frame snapshot data.
- Email & SMS Notifications.
- Triage issues with event freeze frame analysis.
- Root cause issues with data captured at time of issue occurrence, including full CAN bus log.

# ROOT CAUSE ANALYSIS



*Data analysis does not need to be difficult due to time wasted manipulating files to work with your company's analysis tools. CT-Graph® is a time based graphing tool embedded within Qualifier® that enables quick and in depth analysis.*



## Features include:

- Easy plotting with drag and drop charting and intuitive user interface
- All data sources integrated into one file
- Templates for automatic plotting and collaboration
- Export only desired data
- Synthetic variables, histograms and GPS
- Parameter statistics
- Print or share PDF

# ASSET MANAGEMENT

Package: 2.0L / Focus / ATX, 2.0L / Impreza / A6, 2.4L / Buick / A6, 2.4L / Malibu / A6, 2.4L / Optima / ATX

Vehicle #: All Vehicles

Fleet: CTEC, CTEC-APA, DEMO, Unknown

Build: Prod, Test, Unk

Test Status: Running, Idle, Overnight, Completed

Last Data Status: Current, Orange, Red

Min Data Date: [ ] Max Data Date: [ ]

Vehicle Search: [ ] Apply Filters:

CLEAR FILTER

**Vehicles** VDRs Usage Properties Software

VIN	Fleet	Veh No	Package	Location	Last Data	Build	Calibration	VDR #	Config	Status	Comment
JH4CU26689C008236	CTEC	9C008236	2.4L / TSX / A5	Allen Park, M	2014-05-23	Prod	37805-RL5-A510	984	3.26-565	Running	
1G1155S32EU132888	CTEC	EU132888	3.6L / Impala / A6	Allen Park, M	2014-05-23	Prod	12644447	CT1000-1737	3.17-593	Running	
1FADP3F25DL196616	Unknown	DL196616	1.6L / Focus / ATX	Unknown	2014-05-14	Unk	HFCK2F2.H32	CT1000-335	3.36-572	Running	
1G1JH6SB1D4183253	Unknown	D4183253	1.4L / Sonic / MTX	Unknown	2014-05-09	Unk	Unknown	439	3.36-578	Running	
5XXGN4A70DG110148	DEMO	DG110148	2.4L / Optima / ATX	Houghton, M	2014-05-07	Prod	TDC4REAA	1007	3.26-569	Running	
1FMJK2AT9FEF00121	Unknown	FEF00121	3.5L / Fusion / ATX	Unknown	2014-05-01	Unk	KXDJ1L6.H32	CT1000-356	3.36-571	Running	
3FAHP0HA3BR117804	Unknown	BR117804	2.5L / Fusion / ATX	Ann Arbor, M	2014-03-24	Unk	JZBT45Y.H32	CT1000-335	3.17-521	Running	
1VWAP7A31DC052188	DEMO	DC052188	2.5L / VW / A6	Allen Park, M	2014-03-10	Prod	07K906055CR 43	CT1000-1602	3.26-551	Running	
1C3CDFAHXDD299492	CTEC	DD299492	1.4L / Dart / M6	Unknown	2014-03-05	Prod	Unknown	460	3.28-550	Running	

Page 1 of 1 View 1 - 29 of 29

**Trips** Events DTC Modules In Use All Data

Trip Detail: 1G1155S32EU132888 Use Filters Display runtime 0 FILTER RESET

Date	Config	Runtime	Distance	Start ECT	Avg Veh Spd	Avg Eng Spd	Idle Time	Comment
2014-05-23 16:22:41	3.17-593	7		80.0	21.1	999	2	
2014-05-23 16:15:07	3.17-593	4	Download Trip	42.0	27.9	1096	1	
2014-05-23 13:28:34	3.17-593	4	Graph Trip	63.0	31.8	1052	0	

Asset Tracking with Live Data and Trip Statistics

**Maximize test efficiency by knowing the status of your fleet at all times.**

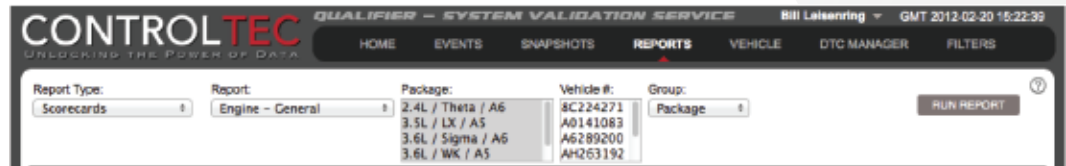
Qualifier® tracks vehicle location and VDR status, provides live data and trip by trip test data to ensure test compliance and understand customer usage.



Fleet Location

Trip by Trip Data

# REPORTING



**CONTROLTEC QUALIFIER**

**OBD - IN USE PERFORMANCE RATIO REPORT**

Packages : 2.4L / Theta / A6, 3.5L / LX / A5, 3.6L / Sigma / A6, 3.6L / WK / A5, 3.7L / WJ / A5, 5.3L / GMT360 / A4, 5.3L / Sierra / A4  
 Group By : Engine

Engine	OBD Cond	Ign Gr	Cat B1	Cat B2	USO2 B1	USO2 B2	DSO2 B1	DSO2 B2	EGR VVT	EVAP
Legal Limit			0.336	0.336	0.336	0.336	0.336	0.336	0.336	0.28
2.4L	877	1928	0.89	0.336	1.27	0.336	1.23	0.336	1.46	0.6
% Compliant:			100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
3.5L	590	2178	0.04	0.04	0.62	0.62	0.8	0.81	0.88	0.89
% Compliant:			100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
3.6L	1921	3385	0.8	0.907	1.013	1.62	0.853	0.86	0.97	0.583
% Compliant:			100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
3.7L	1547	3370	1.22	1.22	1.21	1.21	1.21	1.26	1.42	0.42
% Compliant:			100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
5.3L	3232	9290	1.03	1.035	0.545	0.545			0.655	
% Compliant:			100.0%	100.0%	60.0%	60.0%			100.0%	100.0%

Vehicle	OBD Cond	Ign Gr	Cat B1	Cat B2	USO2 B1	USO2 B2	DSO2 B1	DSO2 B2	EGR VVT	EVAP
Legal Limit			0.336	0.336	0.336	0.336	0.336	0.336	0.336	0.28
2.4L										
2CNALPEWBA0289200	877	1928	0.89	0.336	1.27	0.336	1.23	0.336	1.46	0.6
3.5L										
Legal Limit			0.336	0.336	0.336	0.336	0.336	0.336	0.336	0.28
2C3CA0CVXAH263192	590	2178	0.04	0.04	0.62	0.62	0.8	0.81	0.88	0.89
3.6L										
Legal Limit			0.336	0.336	0.336	0.336	0.336	0.336	0.336	0.28
1G8D05E03A0141083	959	1903	0.93	0.93	1.25	1.25	0.73	0.73	1.54	0.77
1J4RR4G06BC713982	444	1140	1.08	1.00	1.07	1.88	0.41	0.41	0.58	0.81
1J4RR4G06BC670091	118	322	0.09	0.7	0.72	0.73	0.82	0.84	0.79	0.4
3.7L										
Legal Limit			0.336	0.336	0.336	0.336	0.336	0.336	0.336	0.28
1J83M4K38C224271	1547	3370	1.22	1.22	1.21	1.21	1.21	1.26	1.42	0.42
5.3L										
Legal Limit			0.336	0.336	0.336	0.336	0.336	0.336	0.336	0.28
1GKET83M782119217	1005	4122	1.38	1.38	0.8	0.8			0.87	
1GTEK1908Z238368	1627	5174	0.72	0.72	0.29	0.29			0.72	

CONTROLTEC © 2009-2012 | CONFIDENTIAL | Page 1 of 1

	START FLARE	START TIME
	T: 2500.0	T: 1000.0
	12	13
	2.07	0.53
	2.07	0.53
	T: 2500.0	T: 1000.0
	20	14
	1.44	0.17
	1.44	0.17
	T: 2500.0	T: 1000.0
	25	25
	4.84	7.17
	3.75	7.37
	9.76	8.72
	T: 2500.0	T: 1000.0
	22	27
	1.76	2.03
	1.76	2.03

CONFIDENTIAL / PATENTS PENDING | digicert

Scorecard Report

In Use Performance

Quickly and easily determine the performance of your subsystems and status of your fleet by utilizing Qualifier®'s built-in reporting platform.

**Features include:**

- Scorecards featuring several metrics such as Cpk, average, standard deviation, counts based on data filters, i.e. number of time misfire count > 20, etc.
- Status reports including pareto charts overall and by subsystem, vehicle status, vehicle hardware and software history, and more
- Subsystem detail reports with subsystem event paretos and performance metrics
- Subscribe to reports to be delivered automatically via email at a specified interval
- Share reports via PDF

# VEHICLE & POWERTRAIN

Comprehensive DAQ solution that provides solutions for electrical and powertrain teams without compromise.

**CONTROLTEC** QUALIFIER - SYSTEM VALIDATION SERVICE  
UNLOCKING THE POWER OF DATA

blaisenring GMT 2014-03-11 20:14:25

HOME EVENTS SNAPSHOTS REPORTS VEHICLE DTC MANAGER FILTERS

Module: Package: Vehicle # X Fleet: All Vehicles

Switch View Min Date: Max Date: Min Odometer: Max Odometer: Group: Vehicle

DTC	DTC Name	Mod	Status	Lamp Off	Lamp On	Stored	Vehicles	Package
30399	U0401 - 00	736	Open	16	0	0	2	
30026	U0415 - 00	736	Open	29	0	0	2	
31073	B1088 - 87	740	Open	8	0	0	2	

All VINs B1088 - LIN Bus "B"

2 DTC Status(s) Selected 2 DTC Type(s) Selected Vehicles: All

ID	Status	Date	Type	Module Info	Odo	Loca
4	Open	2014-02-06 14:07:36.0	Lamp Off	HW: DG9T-14F142-AD SW: DG9T-14C064-AT	974	Cellular
5	Open	2014-02-06 13:59:35.0	Lamp Off	HW: DG9T-14F142-AD SW: DG9T-14C064-AT	974	Cellular
6	Open	2013-11-07 13:20:14.0	Lamp Off	HW: DG9T-14F142-AC SW: DG9T-14C064-AP	7467	Cellular
7	Open	2013-11-06 16:56:07.0	Lamp Off	HW: DG9T-14F142-AC SW: DG9T-14C064-AP	7442	Cellular

Page 1 of 1 15

Graph: Engine Speed, Ignition Status, Battery Voltage vs. Start Time

No longer a powertrain only solution, CONTROLTEC® provides a data acquisition solution for non-powertrain groups with features including:

- Complete CAN traffic history for life of vehicle testing
- Live DTC monitoring of all ECUs on the monitored networks
- CAN log with pre/post trigger data in .asc format with error frames and microsecond precision
- ECU part number tracking for all ECUs on the monitored networks
- CAN bus performance metrics on up to (7) CAN networks

- Record CAN traffic at bus wake
- All this and powertrain too: custom DAQ software for JD Power assessment and analytics for robustness assessment, surgical data acquisition with sophisticated trigger and synthetic variable logic
- CAN logs compatible with Vector CANalyzer and Intrepid Vspy



# DATA ACQUISITION

***Robust data acquisition featuring patent pending Smart Configuration Management ensures you get the right data you need all the time.***

## ***Core DAQ Features:***

- Dynamic Configuration
- Custom Rasters
- Snapshots – Event based
- Snapshots – Time based
- 'Soft Fails'
- Synthetics
- Analogs
- CAN data including error frames
- CAN History
- Statistics
- Histograms
- GPS
- Manual Trigger
- In Use Performance Ratios
- J1979 Legislative
- J1939 Legislative
- Adaptive Surfaces
- Complex Event Triggers
- Enhanced PIDs
- Customer correlation data
- Data logs for trip data, DPF Regen, etc.
- A2L, DBC, MDX, ODX
- Vehicle wide HW/SW
- Vehicle wide DTC Monitoring
- Remote configuration update – one to many
- Power management with wake on CAN

## ***Custom DAQ Features:***

CT provides several custom features and can also add features to meet your needs, contact CT for details. Examples of algorithms deployed by CT are:

- Idle Quality
- Engine Start
- DTC Manager
- DPF Regen
- Engine Stall
- Engine Hesitation
- Transmission Shift Quality
- Vehicle Usage
- Fuel Economy
- Stop Start

## ***Protocols Supported:***

ISO-14229, ISO-15765, ISO-15031, GMLAN, CCP, XCP  
SAE J1979 / J1939 / J1708 / RP1210

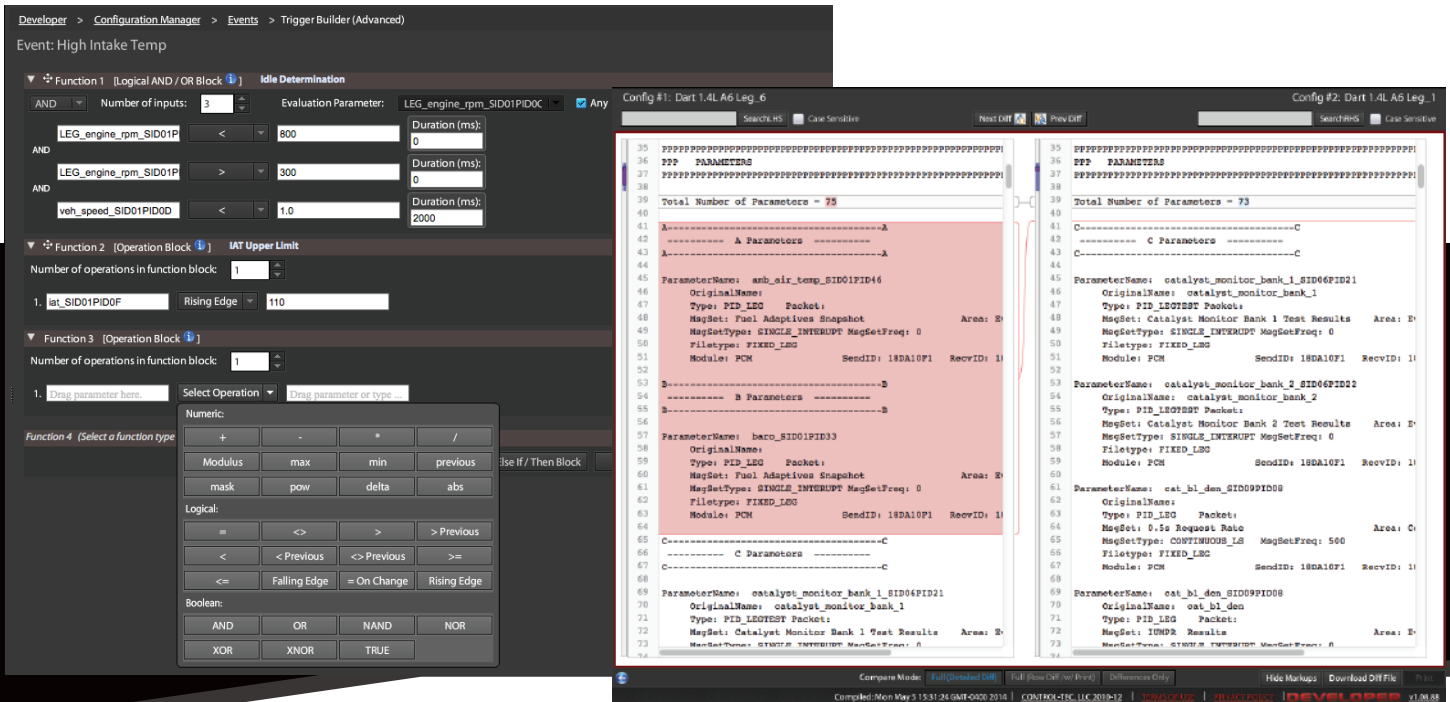
## ***Hardware Options:***

- CT-1000® and CT-200, lease and purchase options available
- Intrepid NeoVI Ion



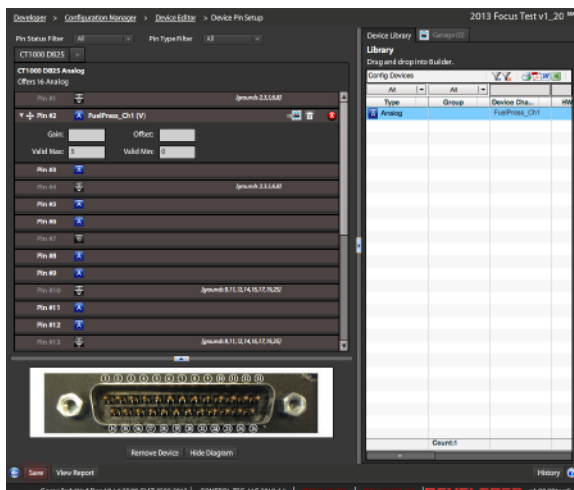
# DEVELOPER

**Advanced DAQ configuration software lets you get the data you need when you want it.**

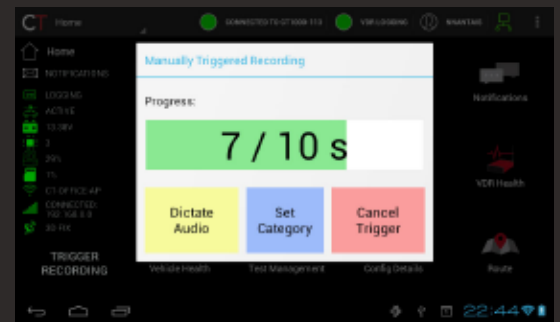
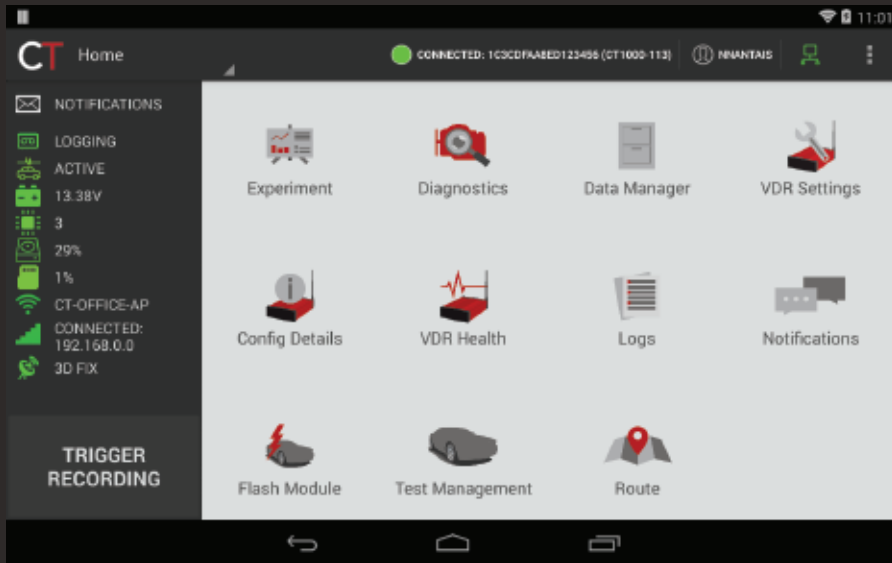


CONTROLTEC®'s surgical data acquisition methods are managed with Developer. In addition, Developer also is setup to enable VDR asset and configuration management for your test fleets. Features include:

- NEW advanced trigger builder makes it easier to build more comprehensive triggers and synthetic variables.
- NEW device setup enables user setup of analog inputs to the VDR.
- Work flow tools such as VDR Manager, Config Groups and Config Compare ensures DAQ quality.
- Supports the following DAQ methods: CAN Broadcast, CCP, XCP, ISO-15765, ISO-14229, J1939, J1979 and J2534
- Supports .a2l, .dbc, .mdx, .odx and SAE J1979 legislative PIDs input files.
- Continuous performance improvements to let you spend less time in setup and more time in data analysis.
- Remotely deploy configurations to VDR(s) anywhere in the world.

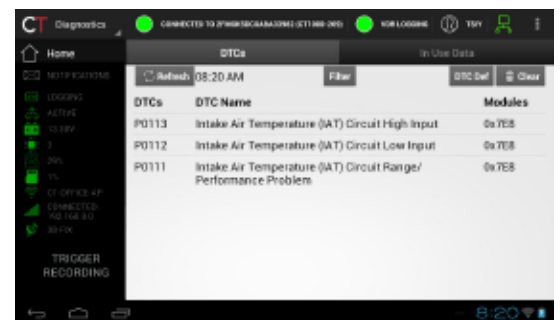


*In-vehicle companion to enhance the CT® experience.*



CT-Dash™ is powered by CONTROLTEC®'s Mercury technology which provides a connection to your test vehicle in the car as well as via Qualifier®. Features include:

- Mercury provides two-way data connection to any online VDR in the world
- In-vehicle display of live data and diagnostic functions including reading/clearing DTCs and ECU flashing
- Driver tool with electronic drive evaluation sheets that feed back-office database
- More efficient in-vehicle package with manual trigger and GPS provided by tablet
- Electronic 'manual trigger' with event classification and audio/visual feedback to Qualifier®
- Messaging system to provide drivers with messages and instructions
- Access VDR data and adjust upload priority to Qualifier®
- Compatible with CT-1000®
- Localization included to support multiple languages



# QUALIFIER FEATURES

	Stand Alone	Lite	Pro	
CONFIGURE	Configuration Development	X	X	X
	Remote Data Download	X	X	X
	Remote Configuration Update		X	X
	Configuration Hosting and Sharing		X	X
	Custom DAQ Features			X
	Smart Config Management			X
PROCESSING & MANAGEMENT	Data Conversion - Manual / Local	X		
	Data Conversion - Automatic / Web		X	X
	Data Hosting		X	X
	File Management System		X	X
	DTC Manager			X
	Relational Architecture			X
ANALYSIS & REPORTING	Google Maps Integration			X
	Graphical Time Based Data Viewer			X
	Relational Analysis Methods			X
	Statistical Assessment Capability			X
	Automated Reporting			X
	Event Notifications			X
	Fleet Management			X
	Issue Management			X
	Vehicle Wide Software Tracking			X

**CONTROLTEC**<sup>®</sup>  
UNLOCKING THE POWER OF DATA

For more information: [info@control-tec.com](mailto:info@control-tec.com)

999 Republic Drive, Suite 100  
Allen Park, MI 48101  
[www.control-tec.com](http://www.control-tec.com)

© 2014