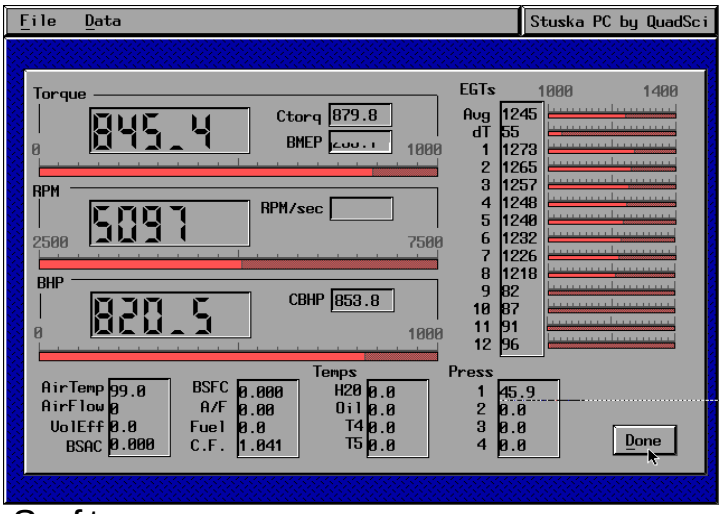
Quadrant Scientific

Engine/Chassis Dyno Data Acquisition System

QS-1000

Features

- **Data acquisition system sends dyno data to your PC**
- **For use with waterbrake, eddy current, and inertia dynos**
- **Works on all engine/chassis dynos from crankshaft to transmission, to wheel speeds**
- **Take steady state or sweep runs up to 3000 rpm/sec**
- **Compensates for engine drivetrain inertia**
- **Over 25 chnls of protected inputs; 12 Egts, 5 LoTemps, 4 Pressures, 3 Fuel flows (add or subtract), AirMass Flow, Torque, RPM**
- **Calculates ambient corrections, BSFC, BSAC, BMEP, rpm/sec, Avg Egt, delta Egt, A/F, Volumetric Eff.,..**
- **Communications to your PC thru RS232 or more noise immune RS422/485**
- **All data files easily imported to Word, Excel, etc.**
- **AutoGraph, graphing program; zooms, data cursors, comparisons, multiple curves, axes, and graphs**



Software

The software included provides a **realtime** display of all sampled and calculated channels using adjustable bargraphs and large digits on all critical data.

Calculated channels include: Corrected Torque and HP, BMEP, BSFC, BSAC, A/F, Volumetric Efficiency, Average EGT, Delta EGT. Averages are also reported for all channels in even 1000 rpm increments or from start to stop of the dyno run.

Description

The QS-1000 is a **fast** multichannel engine dyno data acquisition system. It provides a cost effective way of upgrading your current dyno or **component picking** your new one. The QS-1000's flexibility lets it be used in multiple applications such as:

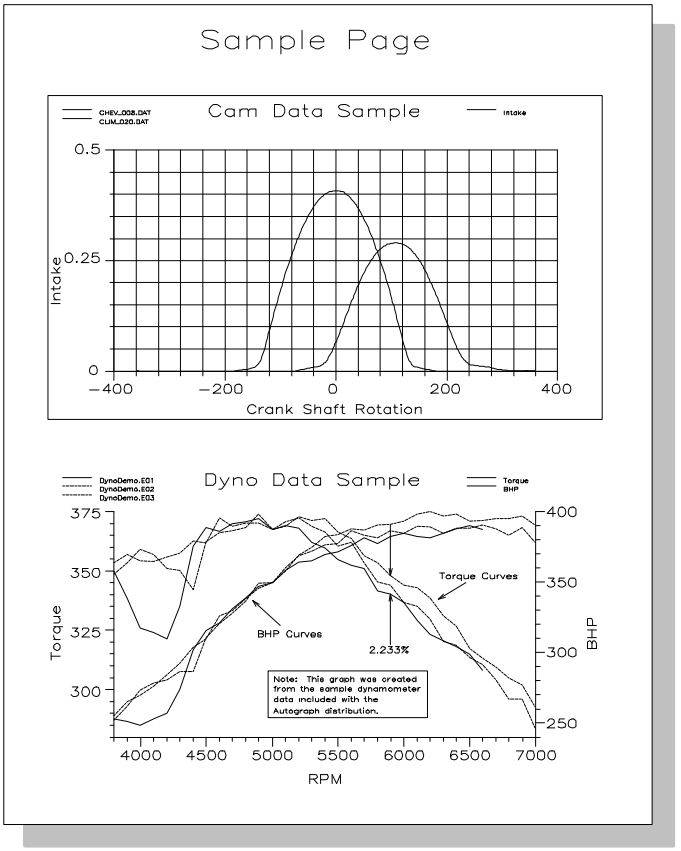
- A **do-it-yourself** 5000 hp **inertia** engine dyno
- A combination inertia/waterbrake chassis dyno (bike or auto)
- Waterbrake dyno upgrade; Stuska, GoPower, Froude…

The unit's portability lets you move it between test cells or dyno and chassis rolls.

High-speed/high-resolution data acquisition with inertia correction ensures **repeatability**, the cornerstone of good dyno work. All analog channels are sampled at 12bit res., frequencies at 16 bit.

The QS-1000's input channels are signal conditioned for electrical spikes, noise and ground loops. It communicates to **your** Laptop or desktop PC's com port. The DOS software works under Windows 95 displaying realtime data, storing runs to disk, and graphing.

A typical waterbrake test involves setting a **starting** and **ending rpm**, hitting START run button then sweeping the engine thru the rpm zone with the manual water valve. An inertia dyno run involves merely hitting START (below start rpm) and going full throttle.



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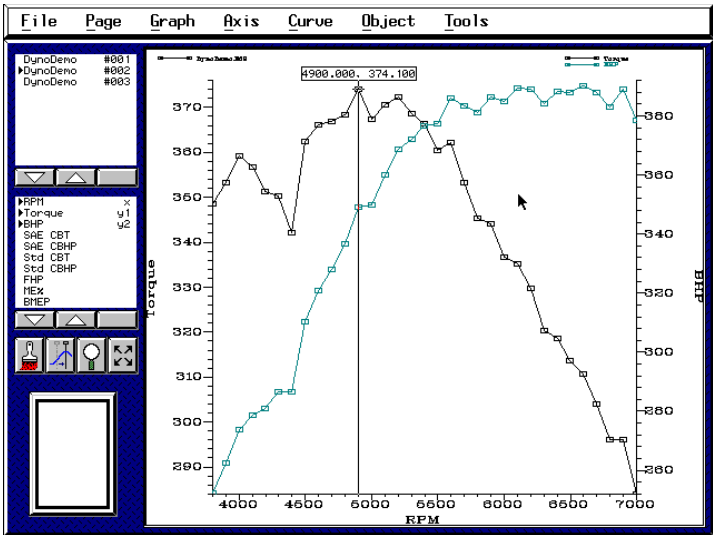

Saved data runs are composed of three files. One holds test conditions, the second holds notes and test documentation, and the third holds the dyno run arranged in a spreadsheet (row and column) format. These can then be immediately imported into Autograph for graphing, or any word processing, database, or spreadsheet programs.

Autograph is an extremely flexible, interactive 2D graphing program with publishable quality output. You can customize just about anything you want using its WYSIWYG (what you see is what you get) page layout mode—from the number of graphs per page, axes per graph, and curves per axis, to control of colors, line thicknesses, line types, text blocks, ect.

A zoom tool lets you “rubber band” an interesting area to enlarge. A data cursor can be added to intersect your curves and report Information such as areas, averages, comparison values, etc. A “heads up” file tool provides one-click curve overlays, curve editing, and note and spreadsheet viewing.

Hardware

All input channels have signal conditioning built for the high noise/spike environment of engine testing. You won't find hassle-to-cal (and temperature drifting) potentiometers to mess with, channels are calibrated by the user thru software.

- 12 - Ktype thermocouple inputs; true differential inputs so any type of junction can be used; open/closed grounded/ ungrounded, 1875'F max, used for exhaust temps, sparkplug temps etc.
- 5 - Low temp probes, Analog Devices current style 320'F max; typically EngineAir, WaterIn, WaterOut, OilTemp…
- 4 - Generic 0-5V inputs, typically used for pressure sensors
- 3 - Frequency inputs, typically used for pulse/gallon fuelmeters, can be added/subtracted (A, A+B, A+B+C, A-B, A+B-C)
- AirMass meter input, 0-5V, for use with QS-AMF air mass meter, available from 0-250 to 0-3200 scfm
- Torque input, StrainGauge load cell or 0-5V pressure sensor can be used.
- RPM input, magpickup, tachpulse generator, or optical pickup

Torque and RPM are sampled at over a 1000 samples/sec. All other channels are sampled at 250 times/ sec. All analog channels are sampled at 12bit res., frequencies at 16 bit.

Communications to the PC are over RS232 or RS422 / RS485 (optional) . RS422 is preferred in high noise environments.

Most of the sensors are **not** included and are available thru various venders, e.g. Quadrant Scientific, or Omega Engineering. This lets the user buy only what's needed and tailor the sensor to the system accuracy desired. For example a fuel meter might go from low cost (2% accuracy), to a high of $3200 (0.5%). Included sensors are AirTemp, and Eng. RPM.

Technical Specifications

- ***Computer Requirements***
  Windows 95,98
  486 66mhz, 12meg Ram (minimum)
  RS232 Serial Port, COM 1-4 supported

- ***Measurements***
  Analog channels 12 bit
  Frequency channels 16bit,
  12 Ktype thermocouple inputs, 1875' F max± 2' F
  5 Low temperature IC inputs, 325' F± .3' F
  4 0-5V transducer inputs, sensor dependent
  3 Frequency inputs, 15v p-p max ac or TTL, sensor dependent
  Air Massflowmeter input,0-5V± .5%
  Torque input, full bridge strain gauge or 0-5V,sensor depend.
  RPM input,magpickup, TTL, 16,000 max , 16 bit

- ***Sensors Included***
  1 Low temp used for engine air temp, 12.5'
  1 RPM pickup, 30'

- ***Size/wt***
  12.5"W, 11"D, 5.5"H; 8lb

- ***Part number***
  QS-1000-xxx xxx = 232 for RS232 communications
  xxx = 422 for RS422 communications