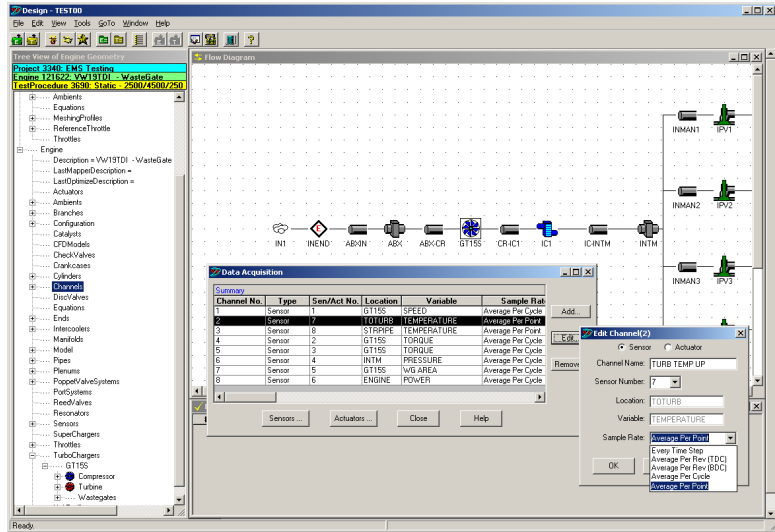


Application Note: VIRTUAL DATA-ACQUISITION

Engine performance cycle simulation and design tools such as OPTIMUM Power Technology's VIRTUAL ENGINES can provide tremendous insight into operating characteristics of any engine. Recognizing the value of such data, VIRTUAL ENGINES v5.0 now includes a generalized data-acquisition module called 'VDAQ'.

VDAQ allows the engine modeler to define sensors and actuators throughout the engine model and record the values of each via a user-configurable data acquisition component. The user has the ability to:

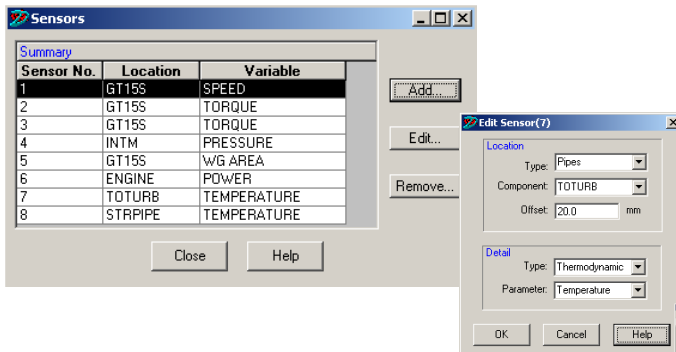
- ❑ Locate a sensor in any existing engine component
- ❑ Select the parameter to monitor (both input and calculated parameters are available)
- ❑ Assign a VDAQ channel to monitor and record the data value at a suitable frequency



VDAQ specification in VIRTUAL ENGINES

VDAQ data is stored in a similar manner to other VIRTUAL ENGINES data, allowing quick and easy plotting through advanced post-processing applications such as ANALYZE and ANIMATE.

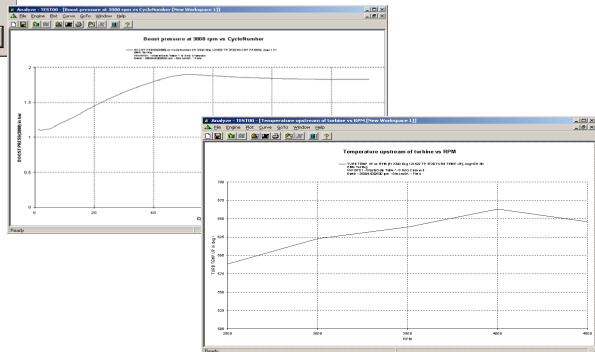
The plots below show data recorded using the VDAQ for a turbocharged engine simulation. One plot shows boost pressure against simulation cycle number, allowing assessment of the waste gate control algorithm. The second plot shows average temperature upstream of the turbine against engine RPM, replicating a typical test cell measurement.



Sensor definition

Sensor and actuator types are dependent on component and location, allowing virtually any parameter in the VIRTUAL ENGINES engine model to be recorded.

Examples of this include cylinder inputs such as ignition advance and piston position as well as calculated data such as pressure, temperature and gas composition.



VDAQ data plots (MS Excel compatible)