

# Flexibility.

Custom Solutions from Product to Turnkey YOU Choose.



**30 YEARS** of successfully meeting tough customer challenges has taught us at Sierra-CP Engineering that the concept of “one solution fits all” just doesn’t work in the auto test industry. As a result, we have positioned our company to embrace the critical role that flexibility plays at every stage of design and development. And it all starts with creating an open atmosphere for client interaction that breeds innovation.

Whether upgrading existing test cells or planning new installations, Sierra-CP works in partnership with global clients to develop custom products and systems or provide complete turnkey solutions. Our strategic thinking is sharply focused on matching the customer requirements of today with tomorrow’s needs to guarantee a solution that can expand with the test of time.

### **Advanced Hardware and Software Solutions**

To help meet the challenges of a rapidly changing industry, Sierra-CP has developed advanced hardware and software solutions covering the complete scope of test applications. Innovative, open design and a common, easy-to-use interface allow us to integrate seamlessly with existing instrumentation and other manufacturers’ equipment, or build powerful turnkey systems designed to our customers’ specific requirements.

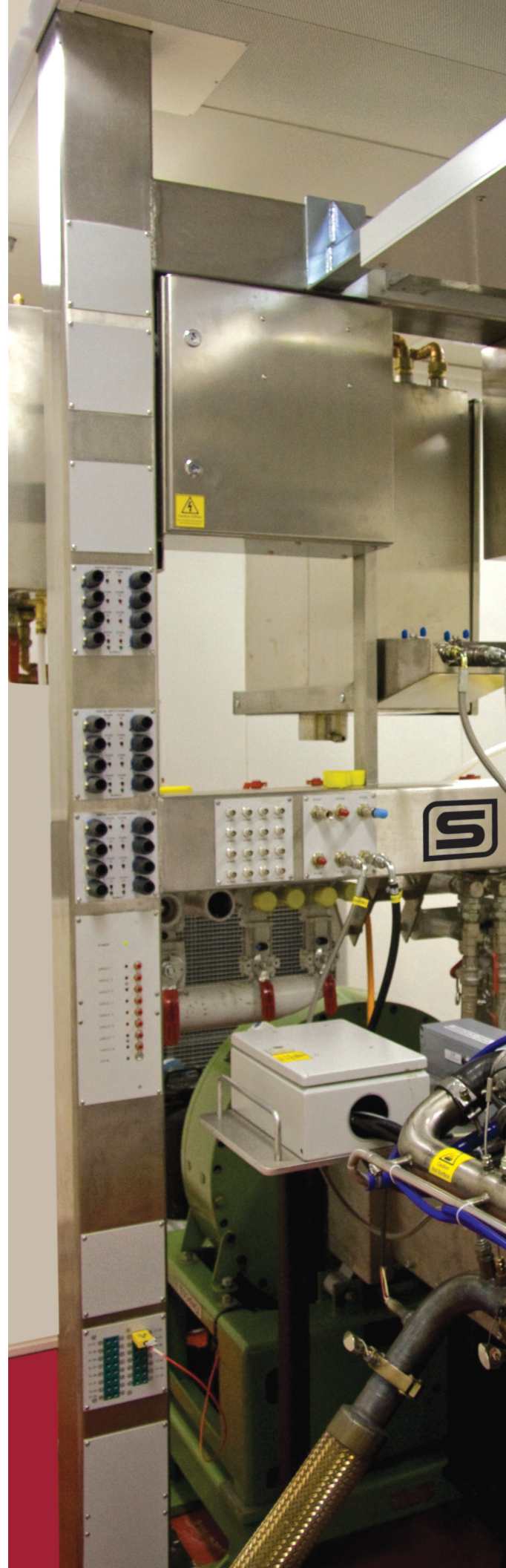
At the heart of many Sierra-CP solutions is our powerful CADET automation technology, which combines accurate multi-channel control and high-speed data acquisition to deliver optimized solutions for engine, powertrain, emissions and component test rig applications.

Headquartered in the UK, Sierra-CP designs and manufactures all of our own solutions and supports them globally with technical support locations in the USA, China, India and Malaysia.

### **Sierra Core Values**

Every one of our customer solutions is built on an Uncompromising Focus on Quality, Delivery, People, Innovation and Customer Service, our core values. We believe that by always staying true to QDPICS during every project, we will build highly creative and productive relationships with customers that endure.

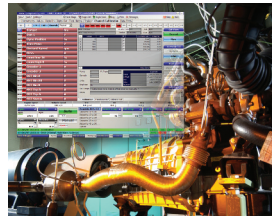
*(right) Sierra-CP’s innovative “H” frame provides maximum test cell flexibility*





## ENGINE TEST

From the upgrade of existing facilities to custom end-to-end solutions, Sierra-CP provides the most advanced tools available



for engine testing. Applications include emissions, endurance, performance development, climatic, calibration, NVH, production and quality audit.

With our eddy-current and high-performance AC dynamometers, tests can be configured for steady-state, transient and dynamic operation. We also manufacture specialized equipment to precisely control the engine's environmental conditions for water and oil temperature, fuel conditioning, intercooler temperature, test cell air temperature, and the conditioned combustion air supply to the engine for temperature, humidity and pressure.

## VEHICLE TEST

Driven by our CADET V14 CDS test automation software, our chassis dynamometers cover all certification, research and development requirements for cars, trucks, motorcycles, three-wheelers, off-road, and treaded vehicles. We also offer cost-effective upgrades to existing test stands (from other manufacturers) with new control and automation systems, thereby rejuvenating existing installations and prolonging useful operational life.



In addition, our range of chassis dynamometers has been extended to provide a cost-effective solution for testing motorcycles and scooters on a single roll set. We also offer a twin roller version for three-wheelers, quad-bikes and sub-compact city vehicles.

## POWERTRAIN AND TRANSMISSION

By combining Sierra-CP's design expertise with specialty products, we are able to deliver advanced solutions for your powertrain and transmission testing applications suitable for conventional motive power units, e-motor and hybrid variations. Solutions include a wide range of applications from durability and key life testing to NVH and performance development.



Powerful systems support 2wd and 4wd configurations and can be

extended to allow road vehicles to be tested by connecting dynamometers directly to the hubs. In addition, our Gear Shift Force & Feel Analysis, as well as transmission Robot Driver solutions, provide accurate and repeatable performance, with the unique option of measuring and analyzing force and feel.

## TEST RIGS

Traditional "in-house" component test rigs are becoming more difficult to construct due to time and resource constraints. Our test rig solutions are generally custom developed. The flexibility of our CADET V14 test automation software allows us to use our standard control and automation system on a scalable basis to ensure that our solutions are future-proof and can adapt as requirements develop over time.

Our FEAD (Front End Auxiliary Device) test rigs simulate the additional load that "bolt-on" accessories like power assist pumps and air conditioning units will have on the engine. This additional load alters such variables as fuel economy and overall engine power performance. We manufacture a flexible

portable unit that is connected to any engine to simulate the switching in/out of such devices.

## EMISSIONS

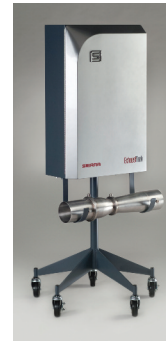
In 2011, Sierra-CP led the way in getting Partial Flow Dilution sampling EPA approved by documenting gravimetric correlation to CVS. In addition to gravimetric particulate matter sampling, we also specialize in real-time engine soot particle mass emissions, particle size, number, and surface area.

The BG3 Elite, our next generation transient partial flow dilution system, is optimized for applications requiring 47mm filter media such as Part 1065, and combines smaller, more precise flow control valves and flow measurement components with an upgraded pressure transducer suite to build on its industry-leading technology base.

We offer seamless integration of devices such as our ExhaustTrak raw exhaust mass meter, light-duty bag samplers, CVS, and gaseous analysis systems. We believe that flexibility to choose from the many different emissions instruments on the market, while benefiting from our user-friendly software interface and test cell control, empowers customers.



## INTAKE AIR & RAW EXHAUST MASS FLOW METERS



We manufacture a comprehensive line of fuel flow meters with both gravimetric and transient capability. Our AirTrak thermal dispersion mass flow meters are widely used for precision measurement engine intake air. Our innovative ExhaustTrak is directed toward satisfying customer requirements for rugged, accurate and fast direct exhaust mass flow measurement, and is specifically designed for transient cycle flow rate measurement. The unit can measure the mass flow rate of intake air flow, diluted exhaust, raw exhaust (pre or post-aftertreatment), or crankcase combustion fumes, since instrumentation pressure line plugging issues no longer exist.

Our complete suite of flow measurement technologies include Thermal Mass, Transit-Time Ultrasonic, Vortex Shedding and Venturi and can cover a diverse set of gas, liquid and steam metering applications.

## SOFTWARE DEVELOPMENT & SYSTEMS INTEGRATION

For customers who require a field-proven test automation software platform at a predictable project cost and do not have the resources to develop and support an in-house solution, we offer many options. Our contract software development and systems integration solutions are enhancements and/or adaptations to our CADET V14 test automation software.



Our Test Lab Management (TLS) software is a good example of a customer driven software effort that integrates seamlessly with CADET V14 to upgrade capability by providing a complete solution for configuring and running tests, performing pre and post test data entry, doing emissions calculations, report generation, and much more.

# GLOBAL LOCATIONS



Monterey, California / USA



Lansing, Michigan / USA



Malvern, Worcestershire / UK



**Manufacturing & Support Centers in USA / UK / CHINA / INDIA / MALAYSIA**



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