SIEMENS
Ingenuity for life

Simcenter SCADAS Satellite

Solution brief

Siemens Digital Industries Software

Field-data acquisition is critical when running test-and-validation campaigns, helping companies avoid recalls and improve product quality.

Field measurements deliver a precise understanding of the lifetime loads that products undergo. Acquiring and processing accurate data, however, can be challenging and time consuming.

When testing large structures, a centralized setup increases instrumentation costs: numerous long cables need to be installed. In case of a sensor or cable problem, repair is a real challenge.

Siemens Digital Industries Software has expanded its Simcenter SCADAS™ Recorder hardware offering by bringing to market Simcenter SCADAS™ Satellite hardware for distributed, digital, local field-data acquisition close to sensors.

With the distributed architecture, digitalization close to the sensors and built-in synchronization of Simcenter SCADAS Recorder, multiple Simcenter SCADAS Satellite units can be used in tough-testing conditions. This saves on cabling cost, improves signal quality and facilitates faster test setup and results delivery.

Reduced test campaign costs

Imagine a truck, train or excavator instrumentation scenario for field-data acquisition, the first component containing 20 measurement points, the second 15 points, and so on for the full vehicle. Sometimes this can lead to more than 200 measurement points. All sensor cables must be taken to the central-data acquisition unit and fixed correctly. This can be time consuming, taking an estimated 10 to 20 percent of the total instrumentation time.

By using a distributed system architecture, this work and time can be reduced. The compact Simcenter SCADAS Satellite is placed near sensors; the cable installation is localized and a single cable runs from Simcenter

Challenges

- Increased instrumentation and cabling costs when testing large structures
- Compromised signal accuracy due to noise pickup
- Test in extreme environmental conditions

Solutions

- Acquire data close to sensors
- Enable high-channel-count mobile data synchronization
- Facilitate time-data acquisition for control of the full test campaign

Results

- Reduce instrumentation costs by 20 percent
- Improve signal quality
- Increase number of test scenarios

Solution focus

SCADAS Satellite to Simcenter SCADAS Recorder. Further, if any of these sensors are broken and require localized repair, no time needs to be spent looking for the related cable/sensor. So they don't need to be fixed and mounted again because only localized repair is required.

Improved signal quality

Strain gages and accelerometers most commonly used during field-data acquisition are sensitive to noise pickup, electromagnetic interference and noise distortion. Therefore, cable length and placement plays a crucial role in improving measurement results; the shorter the cable, the less the influence from these external factors. Strain gauges, in particular, are subject to these problems.

Simcenter SCADAS Satellite can be installed close to the sensor and send digital and synchronized data to Simcenter SCADAS Recorder, improving signal quality. By dividing and distributing the acquisition system over many parts of the vehicle, engineers can place equipment in optimal locations, thus improving measurement quality and even reaching places that could not be reached previously, adding even more possibilities to a successful test campaign.

Figure 1: Centralized data acquisition increases instrumentation and cabling costs when testing large structures.

Validating the extremes

Customer test scenarios have increased over the years with globalized vehicle and product platforms, and with it, companies are obliged to include different inputs in the development cycle. These new test scenarios place extra requirements on the system, as it needs to be placed in an external environment and is subject to different conditions, such as a wide range of temperatures, shock and vibration, with particularly high levels if mounted directly on the vehicle. Not only that, but the system should also be certified for dust and water protection. Can you imagine washing a data-acquisition system after a test campaign? Operational reliability guarantees you can operate under extreme and tough environmental conditions, reducing downtime and increasing test efficiency. With an Ingress Protection (IP) 66 and 67 certified enclosure, an operating temperature range from -40 Celsius (°C) to +85 °C, military standard (MIL-STD) 810F shock and vibration resistance and robust LEMO 2K connectors, Simcenter SCADAS Satellite is designed to enable

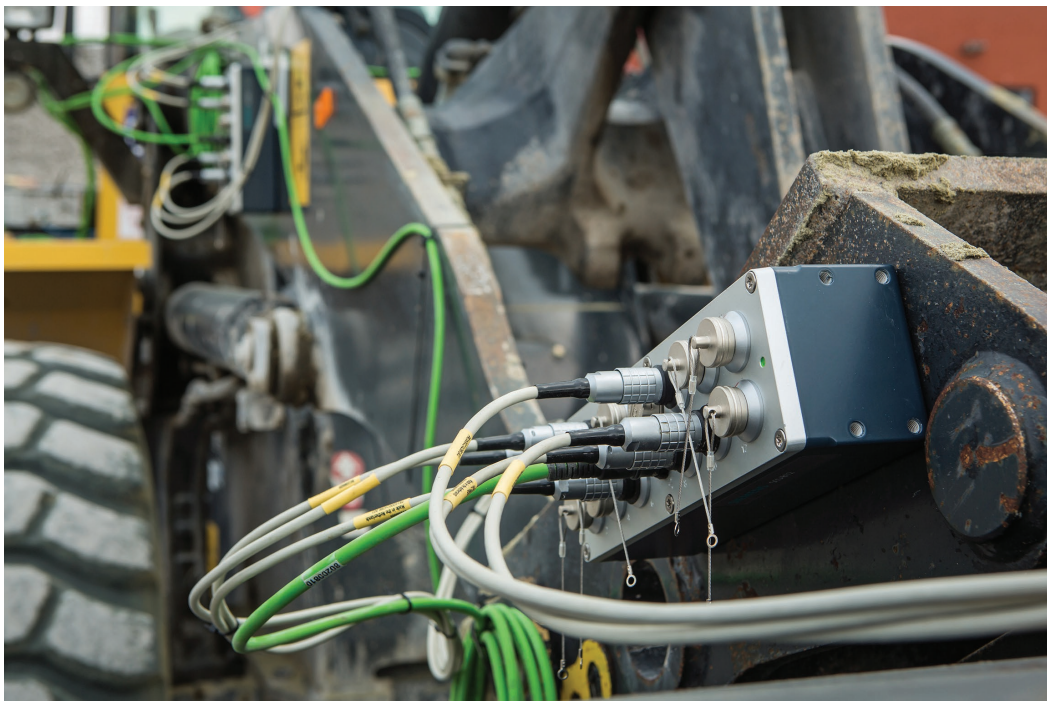


Figure 2: The compact Simcenter SCADAS Satellite is placed near sensors; the cable installation is localized and a single green cable runs from Simcenter SCADAS Satellite to Simcenter SCADAS Recorder.

Figure 3: Simcenter SCADAS Satellite is designed to enable you to confidently execute your test campaign in the toughest environments.

you to confidently execute your test campaigns in the toughest environments.

Secure and synchronized recording

Simcenter SCADAS Satellite is used with Simcenter SCADAS Recorder to develop sample accurate, secure and real-time data synchronization. This enables engineers to perform tests with a high-channel count, and collect data in a single data file without merging or synchronizing everything manually afterwards. Also, Simcenter SCADAS Satellite is powered through the same cable that brings data to Simcenter SCADAS Recorder, reducing power requirements for the test setup and simplifying installation. With Simcenter SCADAS Recorder, it's also possible to increase connectivity by adding extra modules to acquire digital data streams from wheel-force sensors, Global Positioning Systems (GPS), vehicle bus and high-definition video cameras, which means you can conduct a complete test all at once with a single system.

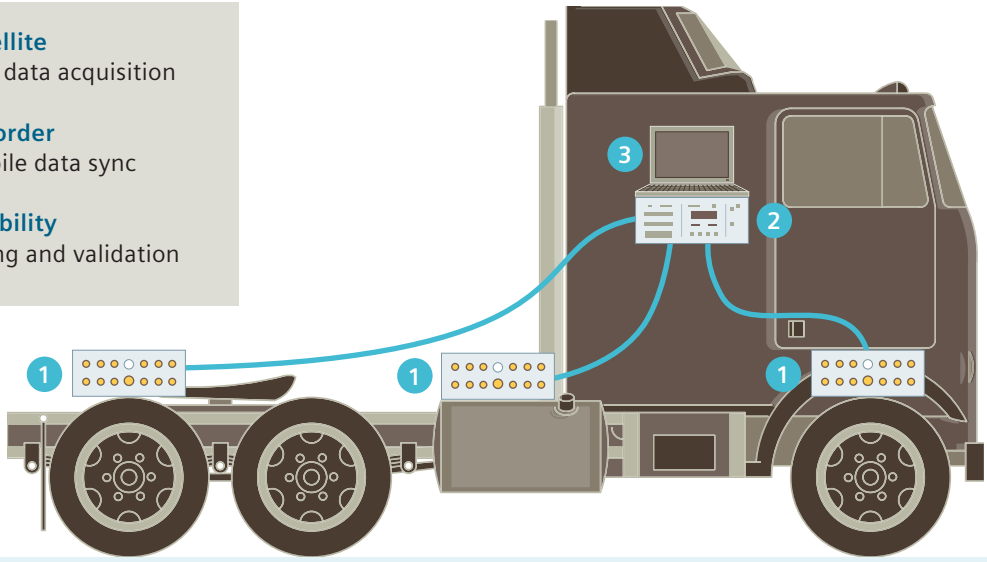
Reduced test campaign time

By using Simcenter Testlab™ Durability Acquisition software, you have control of the full test campaign, including fast and easy Simcenter SCADAS Recorder and Simcenter SCADAS Satellite configuration and setup, instrumentation verification, infield measurement and on-board validation, automated consolidation, active reporting and batch export; all accessible from a single software product. An end-to-end hardware and software solution delivers results much faster, enhancing measurement flexibility and reducing total test campaign time.

1 **Simcenter SCADAS Satellite**
Distributed, digital, local data acquisition

2 **Simcenter SCADAS Recorder**
High-channel-count mobile data sync

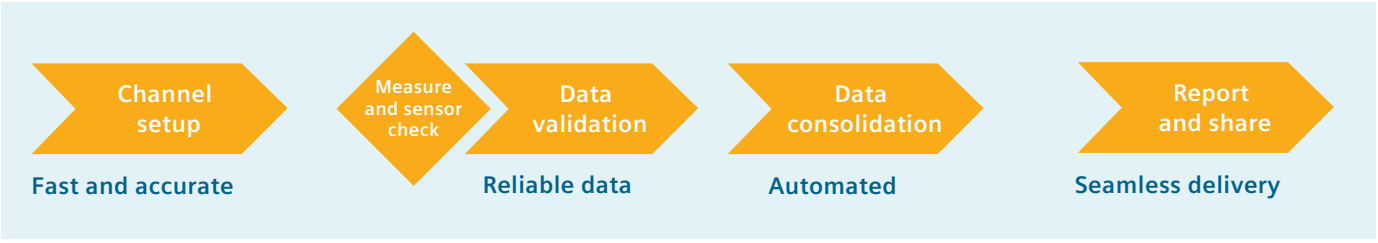
3 **Simcenter Testlab Durability**
Quick, easy data recording and validation



Typical 200+ channel campaign: strain gages, accelerometers, displacements, wheel-force, temperature, CAN and video

Figure 4: Combining Simcenter SCADAS Satellite for distributed, digital, local data acquisition close to sensors with Simcenter SCADAS Recorder for high-channel-count mobile data synchronization and Simcenter Testlab Time Data Acquisition for full test campaign control saves on cabling and instrumentation costs, improves signal quality in the toughest environments and accelerates test setup and results delivery.

Simcenter Testlab Durability



An end-to-end hardware and software solution delivers results much faster, gains measurement flexibility and reduces total test campaign time.

Figure 5: Simcenter testing solutions provide a complete platform for acquiring and managing data.

Operator-friendly measurement control

All measurement operations can be performed with the Simcenter Testlab Control App application that runs on a touchscreen tablet and wirelessly connects to Simcenter SCADAS Recorder. It's compact, smart and ideal for mobile use under challenging conditions. Test drivers can cycle through test setups, start-and-stop measurements, monitor in real time, and instantly validate recorder data quality right on-site during and after each measurement. This way test drivers and technicians can return to the office with all the right data and without fear of having to rerun expensive test campaigns.

Raising the bar on productivity

Combining Simcenter SCADAS Satellite for distributed, digital, local data acquisition close to sensors with Simcenter SCADAS Recorder for high-channel-count mobile data synchronization and Simcenter Testlab Durability Acquisition for full test campaign control saves on cabling and instrumentation costs, improves signal quality in the toughest environments and accelerates test setup and delivery of results.

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