
# EDM Remote Condition Monitoring

CRYSTAL INSTRUMENTS

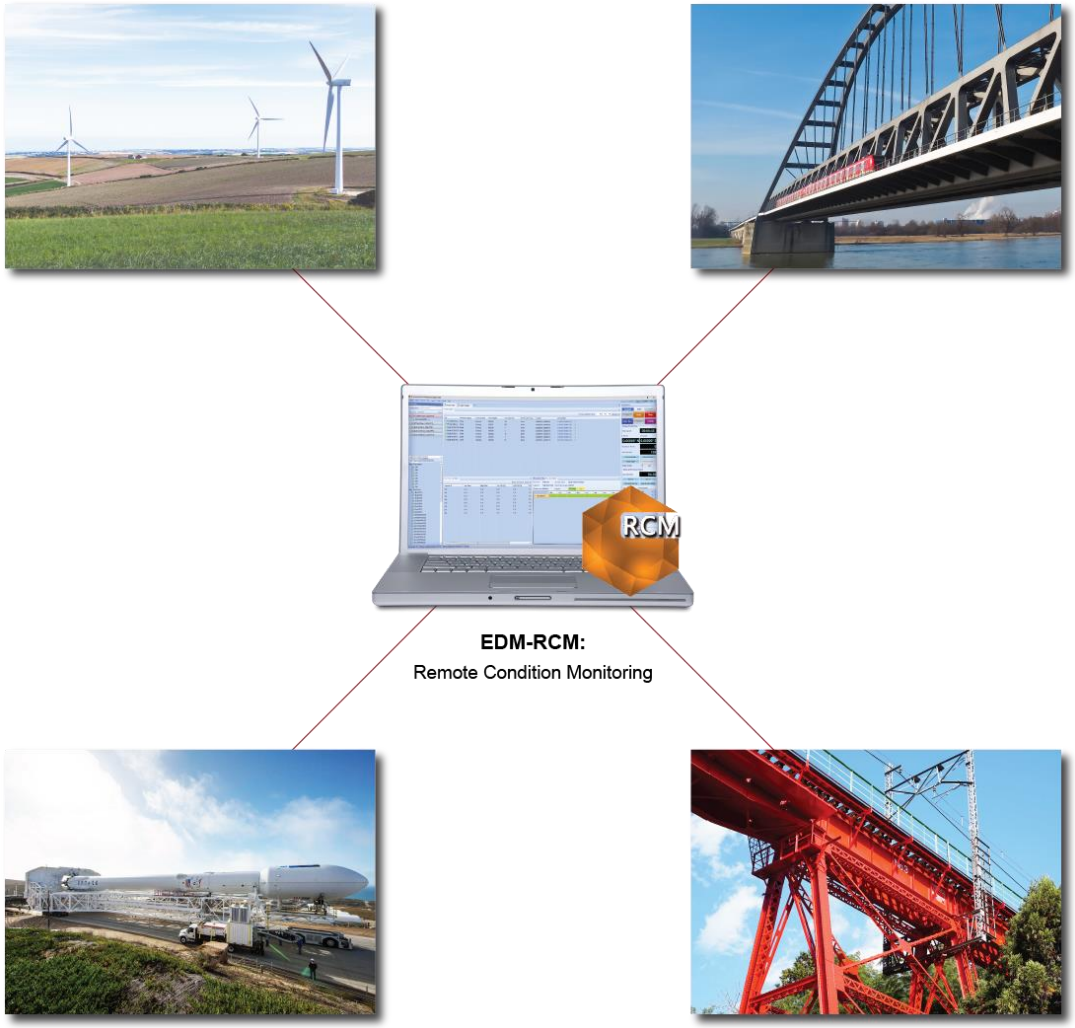
# Topics Covered | Remote Condition Monitoring


- What is RCM?
- How does RCM work?
- Software Requirements
- Hardware Requirements
- Deployed example
- Competitor Analysis

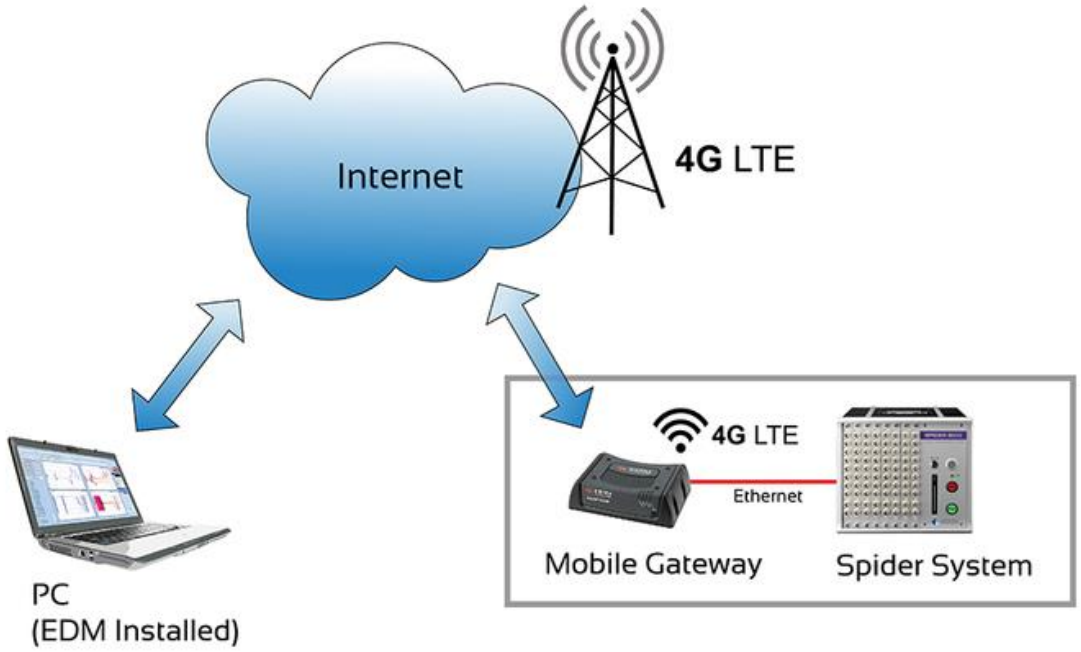
# Remote Condition Monitoring | Overview

# Remote Condition Monitoring | Overview

- Simultaneously monitor vibrations on multiple remote structures located across the world
- Includes all the powerful DSA functions
  - Dynamic data acquisition, real time signal analysis and time waveform recording
  - Scalability up to 512 channels with time synchronization
  - Alarm, Limit and trigger functionality with user customizable event actions
- Testing locations can be fixed (Railway bridges or Windmills) or Mobile (Sensitive equipment being transposed on the road)
- Works without a dedicated PC (Spider Black Box mode)



# RCM | How does it work?

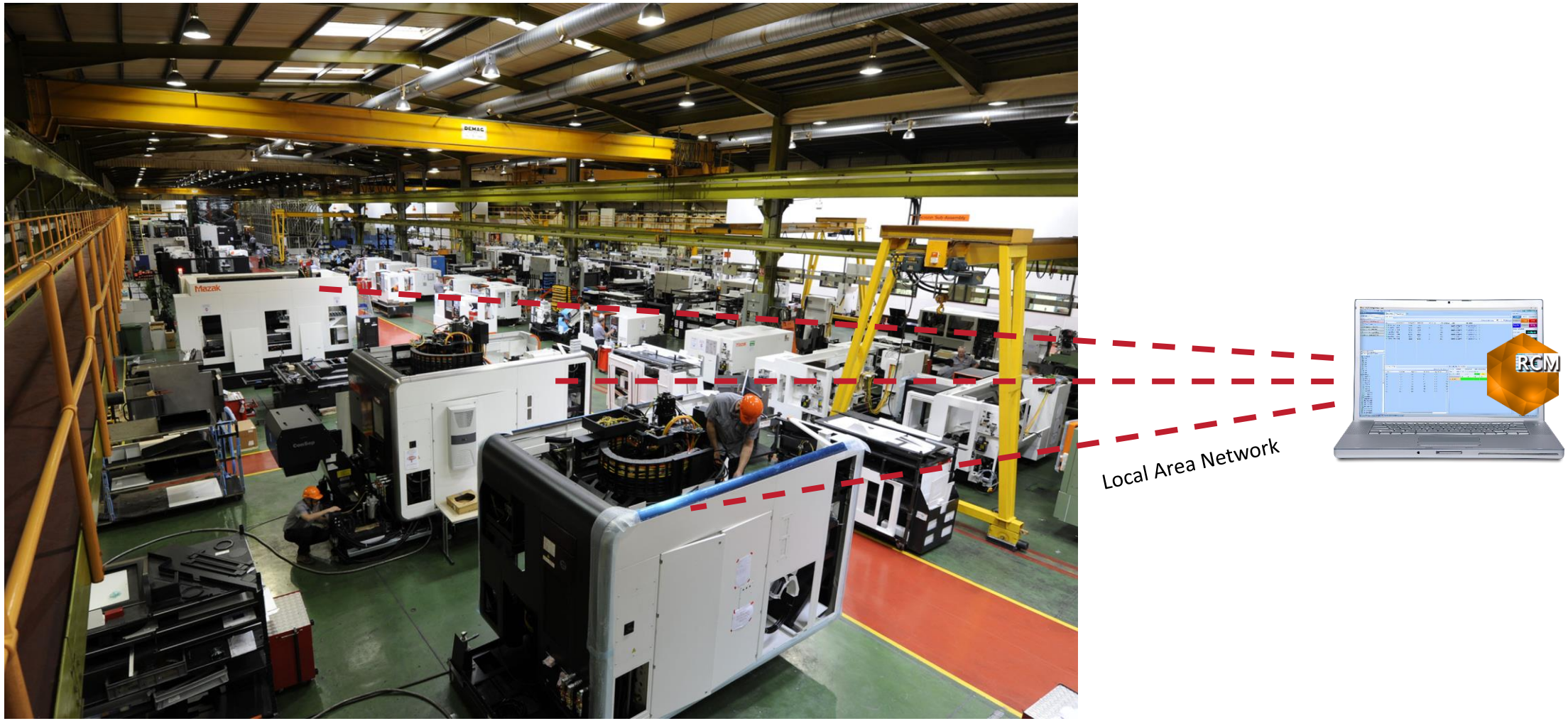



PC w/EDM RCM ⟷ Internet ⟷ Cell Network ⟷ Router ⟷ Spider System

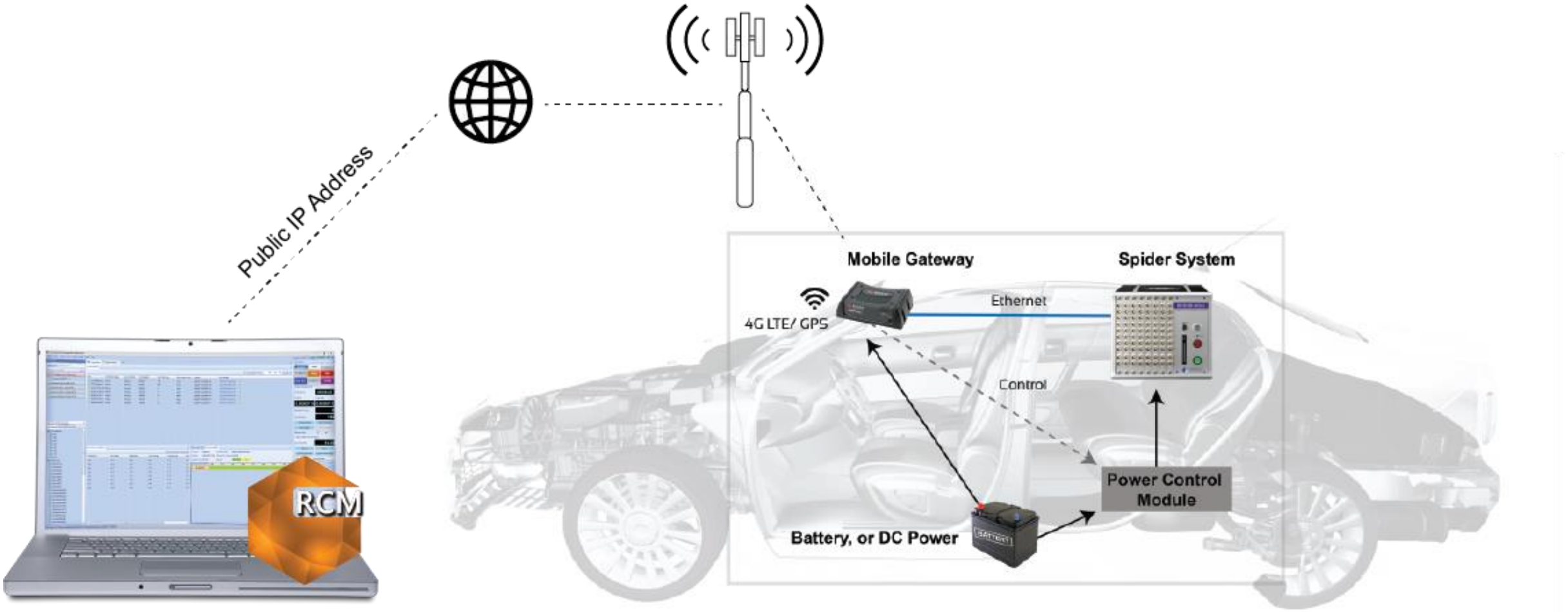
# RCM | Network Connection Types

- Local Area Network
  - Monitor machines within a Local Area Network
- Public Static IP through Mobile Data Network
  - Monitor vibrations on sensitive equipment transported on the road
  - Monitor structures / machines remotely located with no access to internet
- IP address / VPN through Internet
  - Monitor structures or machines within a plant with internet access

# RCM | Local Area Network



# RCM | Mobile Gateway



# RCM | Internet


# Remote Condition Monitoring | Hardware

# RCM | Hardware


- WIFI gateway using cellular data
  - Sierra Wireless RV50
  - SIM card with cell plan
- Spider Analyzer
  - S20, S80X, S80Xi, S81, S81B, S80SG
- Power Source for module and router
- PC with internet connection
- Optional casing for environmental protection

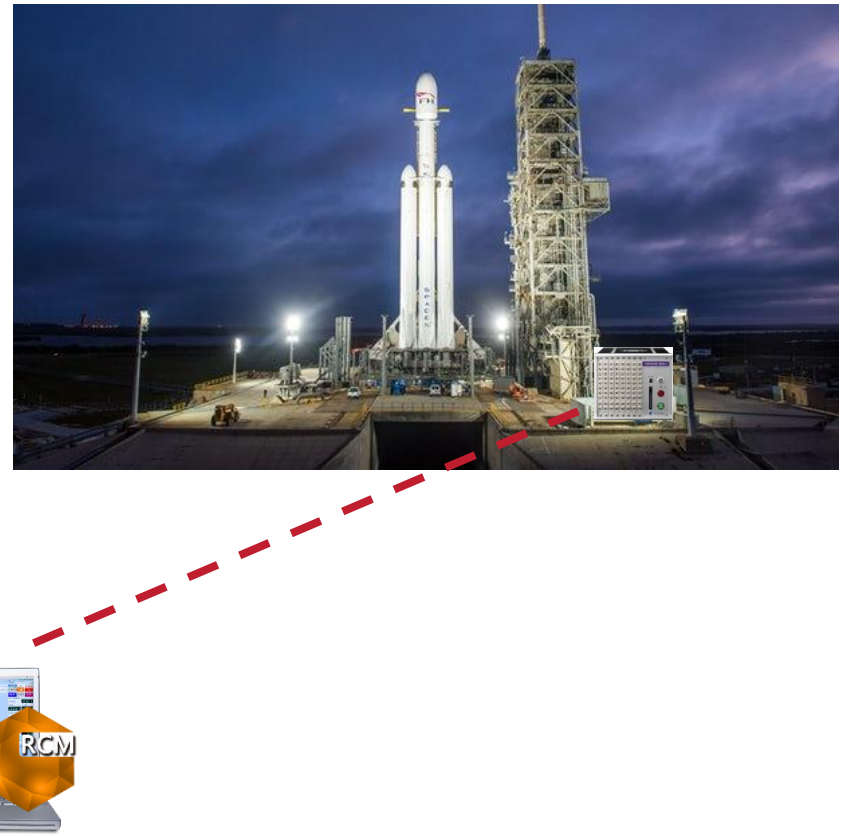
# RCM | Required Components

- Single front-end Spider 80X/80Xi/81/20 or high channel configuration of Spider 80X/Xi – All Spiders are capable of running in Black Box mode
- Network Connection
  - **LAN** – Existing LAN can be used to connect multiple Spiders that need to be simultaneously monitored
  - **Mobile Gateway** – Enables connectivity to the Spider system using Mobile Data Network with a Public Static IP address.
  - **Internet** – Existing Internet connectivity within a structure can also be used to configure multiple Spiders for simultaneous monitoring
- PC running EDM – RCM mode – Part of powerful EDM – DSA software capable of simultaneously connecting to updating the status from multiple Spiders

# RCM | Configurations

RCM handles two typical types of configurations:

- Monitoring multiple independently running Spider front-ends
  - Supports up to 64 Independently running Spider front-ends
- Monitoring High Channel Count System
  - Supports one Spider system up to 512 channels



# RCM | Storage Expansion

- Attach a Spider-NAS directly to the Spider-80X without the necessity for a Spider-HUB (Saves hardware and power)
- Extends the storage of Spider-80X from 4GB to 256GB
- Extended time-waveform recording while Spiders are deployed remotely
- Conveniently swap solid-state drives on the Spider-NAS when post-processing of data is needed or when storage is full

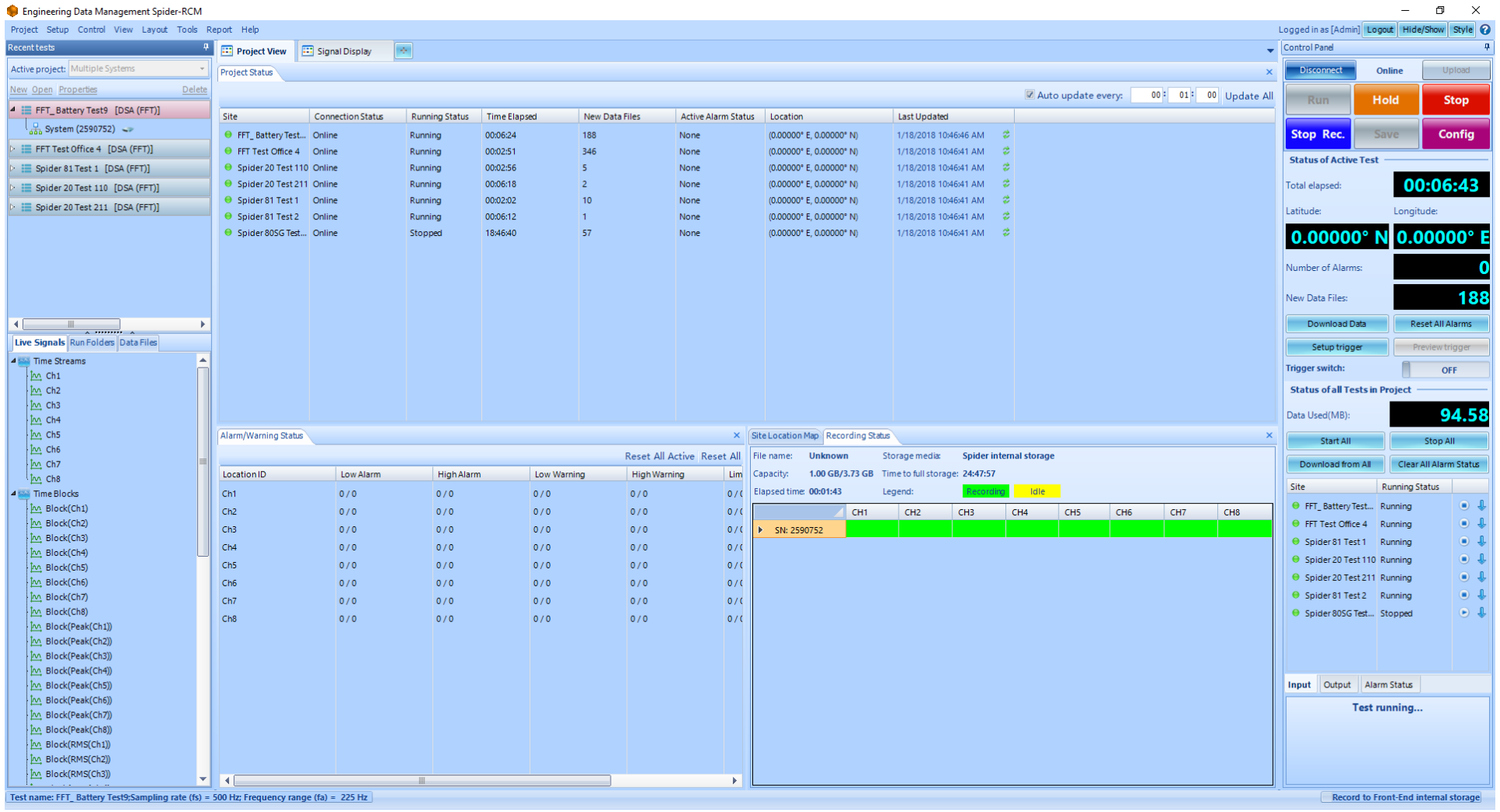

# Remote Condition Monitoring | EDM Software

# RCM | Key Features

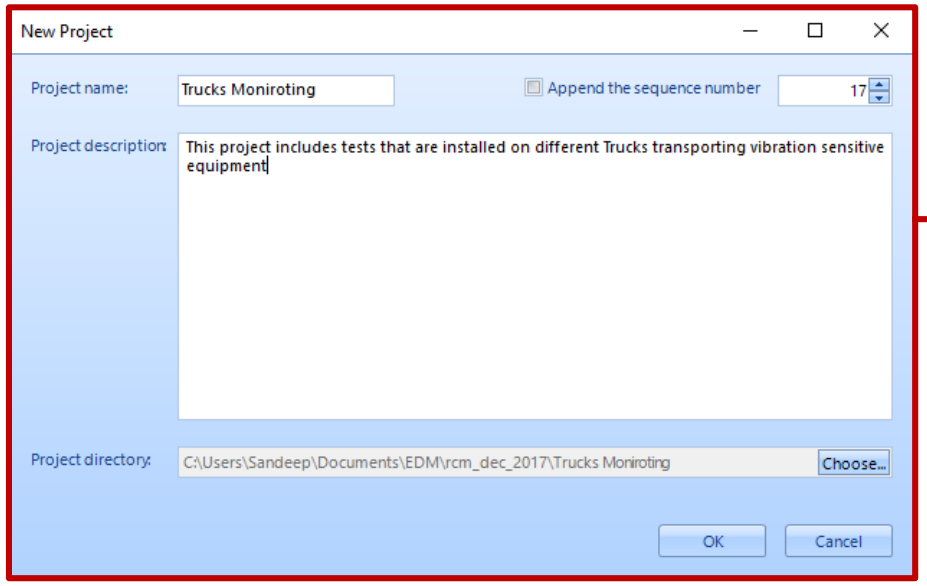
- ❑ View Project Status (consolidated status of all Spiders)
- ❑ Configurable alarms and notification
- ❑ Consolidated “Alarm Status” view
- ❑ Ability to remotely download the data
- ❑ Live View of Data (If required and when connection permits)
- ❑ Long time recording

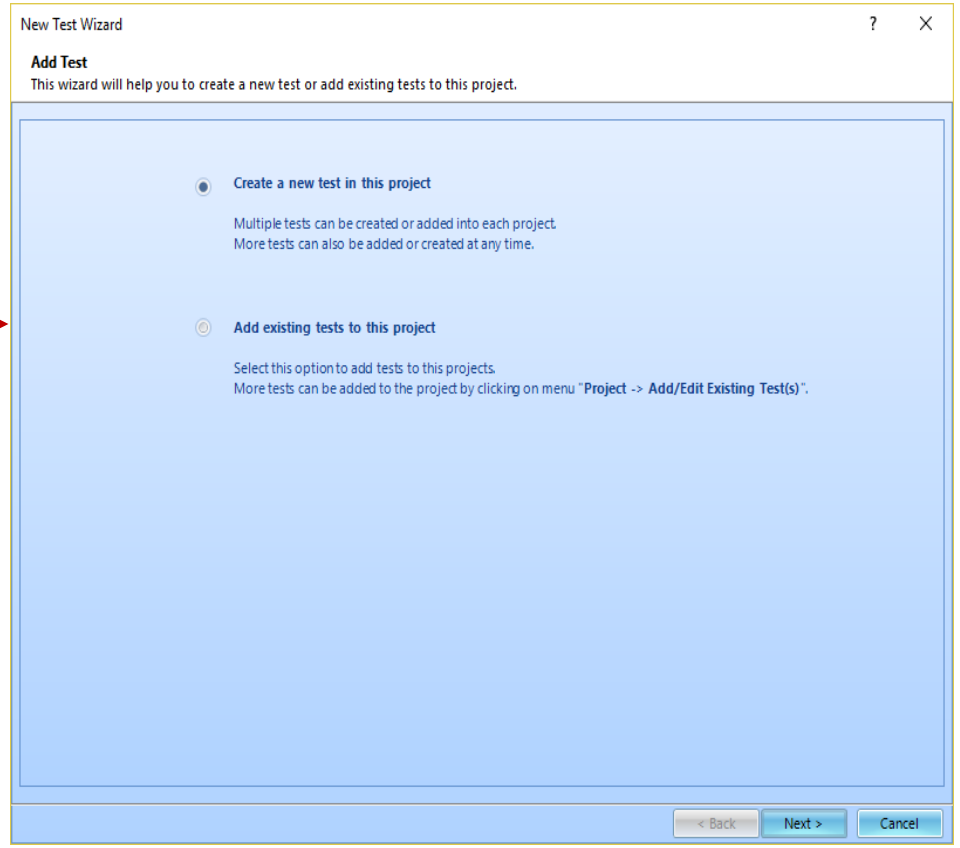
# EDM | RCM

- **Project based** – Consists of a combination of tests, each running on an individual Spider system



# RCM Interface | Project Hierarchy for DSA Tests

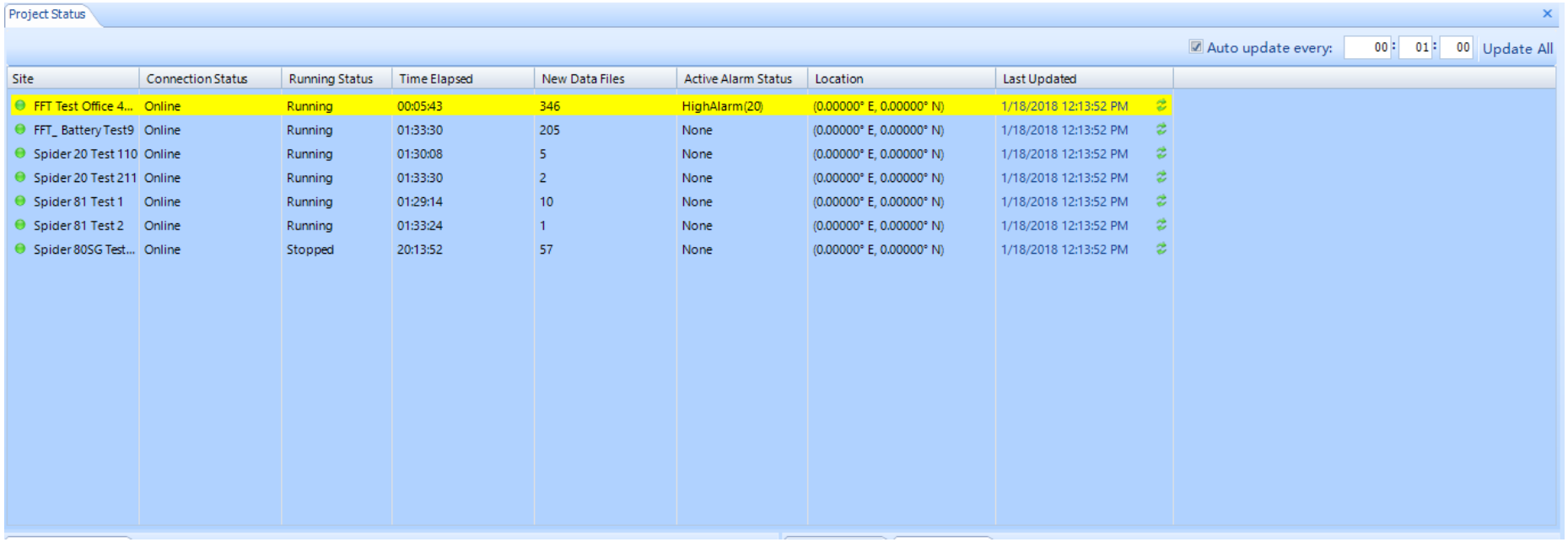



- Projects group many tests together by user categories
- One test in many projects
- Add existing or create a new test
- Each Spider system runs respective test

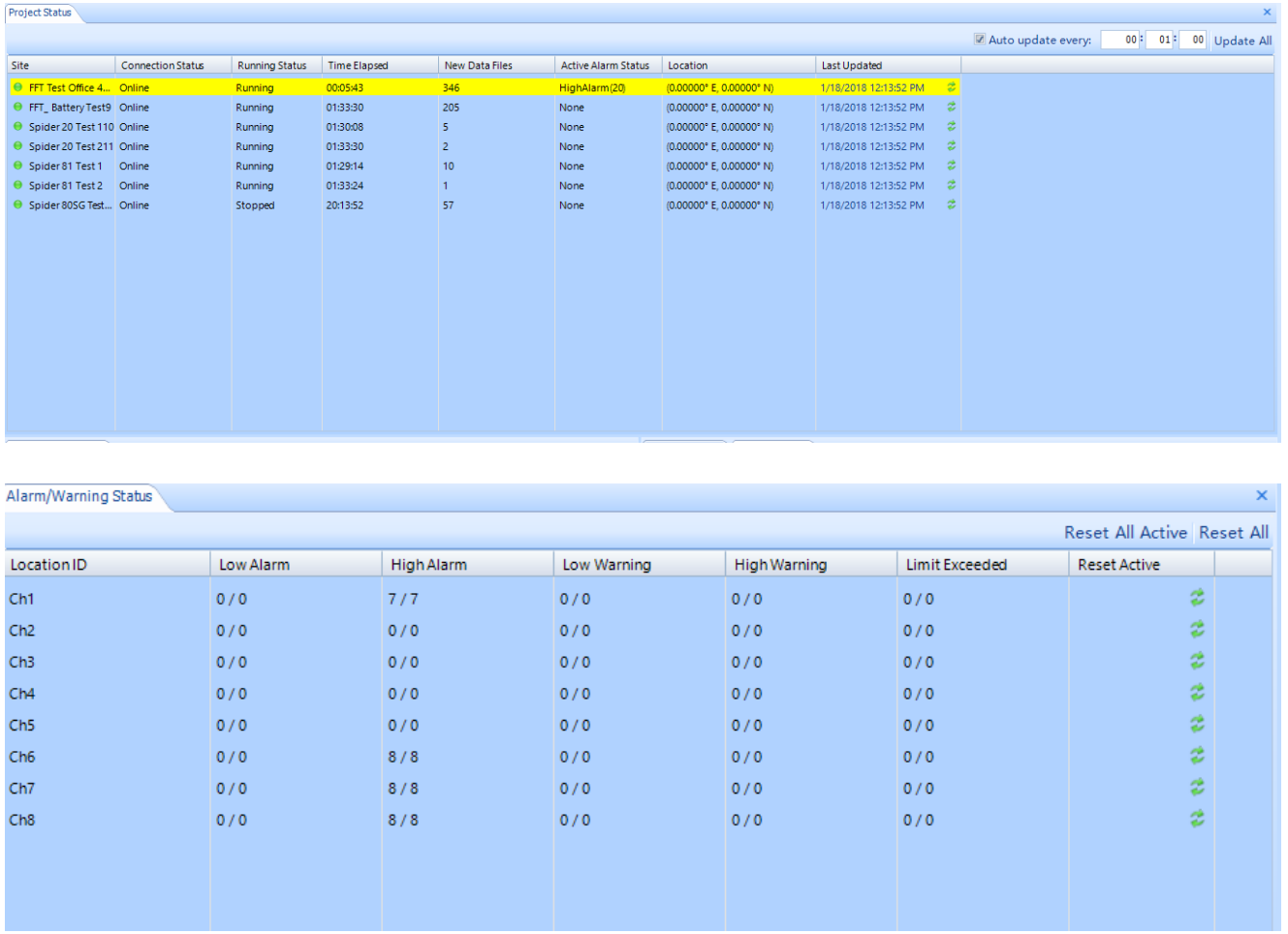
# RCM | Project Status

Shows real-time status of all Spiders associated with the Project



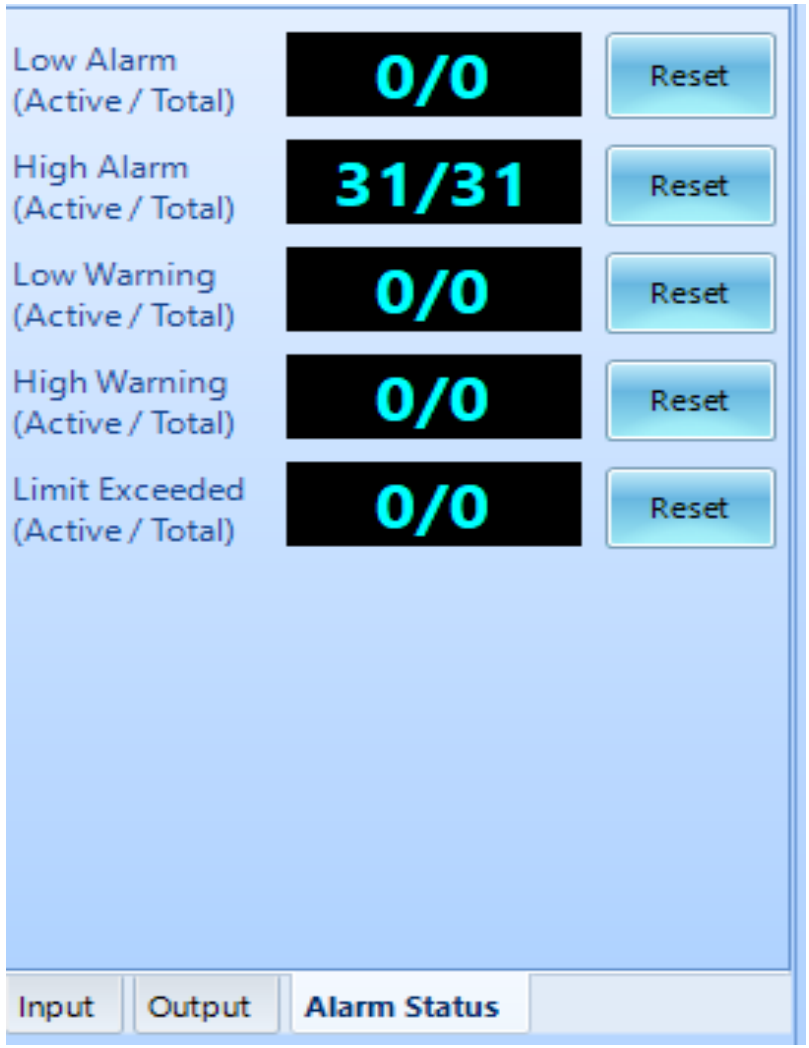
# RCM | Alarm Status

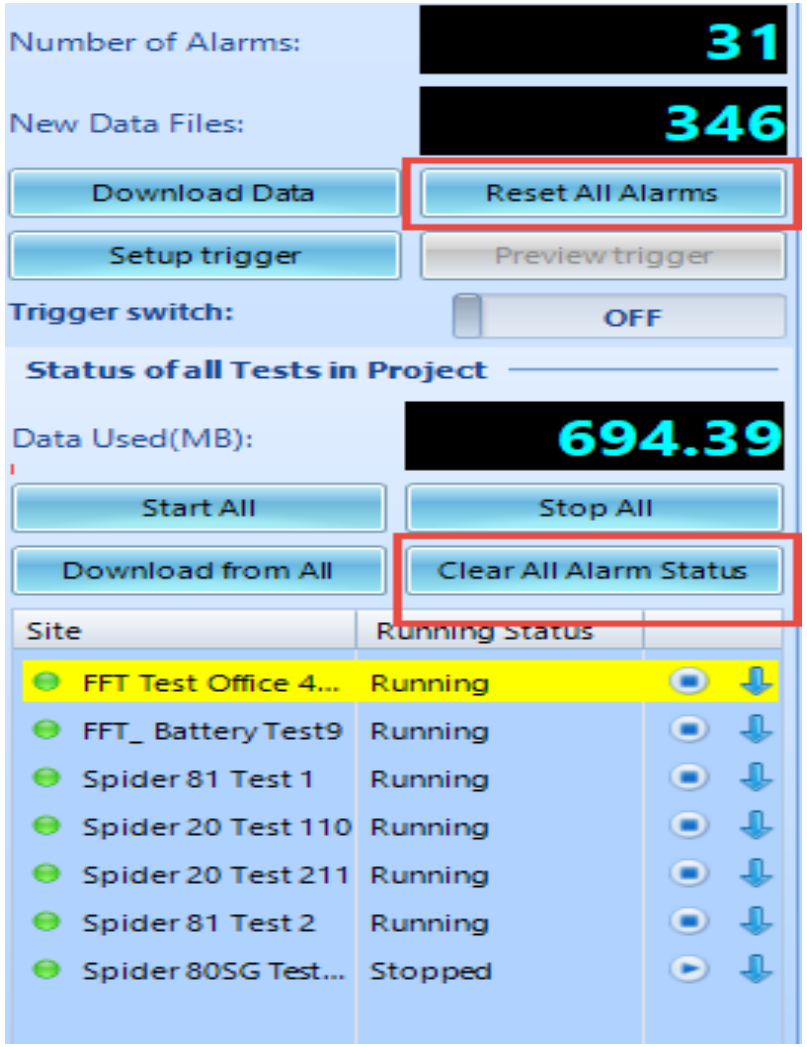
- Define Alarms on Time or Frequency data
- Multiple alarms on each channel
- Custom actions for each alarm including recording raw time data, saving processed time / frequency data, email notifications, and more
- View channel specific, alarm specific status for each of the connected Spider front-end



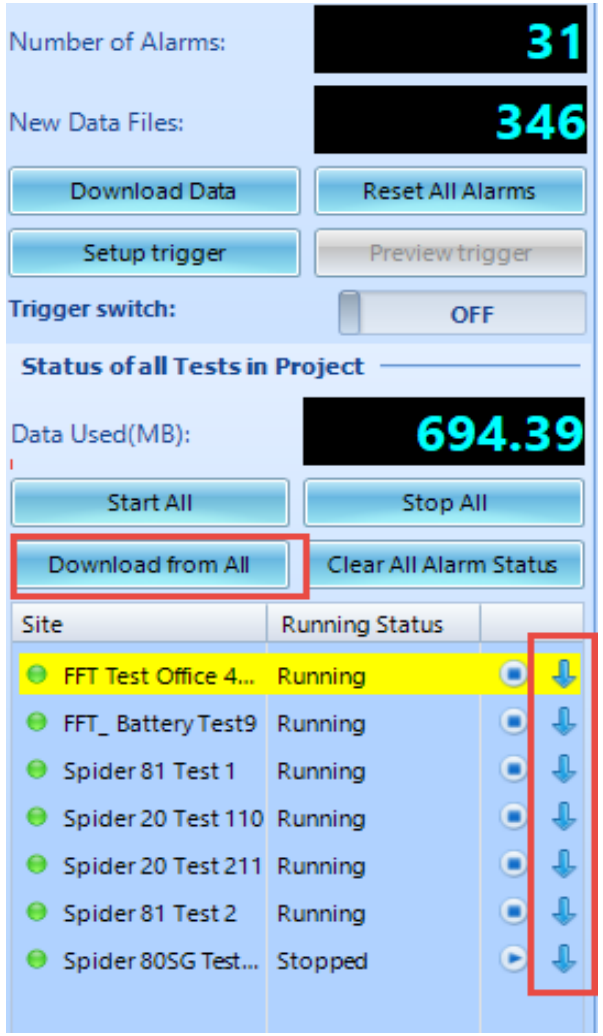

CRYSTAL INSTRUMENTS

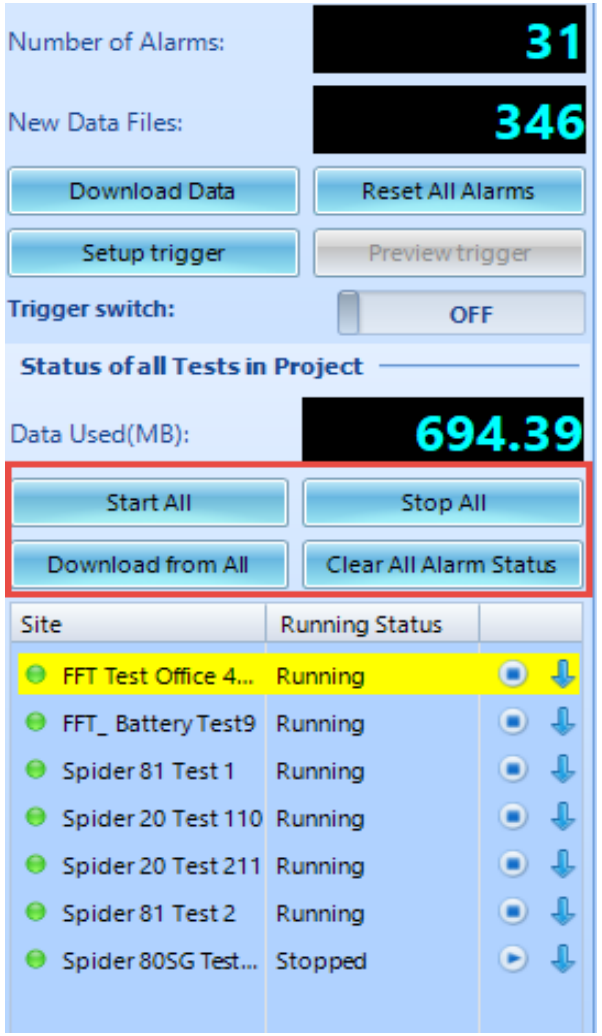
# RCM | Control Panel



# RCM | Batch Operations



# Remote Condition Monitoring | Deployed

# RCM | Deployed Application

Monitoring ground vibrations caused by each rotating Windmill in a Windmill farm

Spider, Gateway and a Battery housed in Weatherproof Cases

Solar Panel to power the System and charge the battery

# Deployed Application | Spider

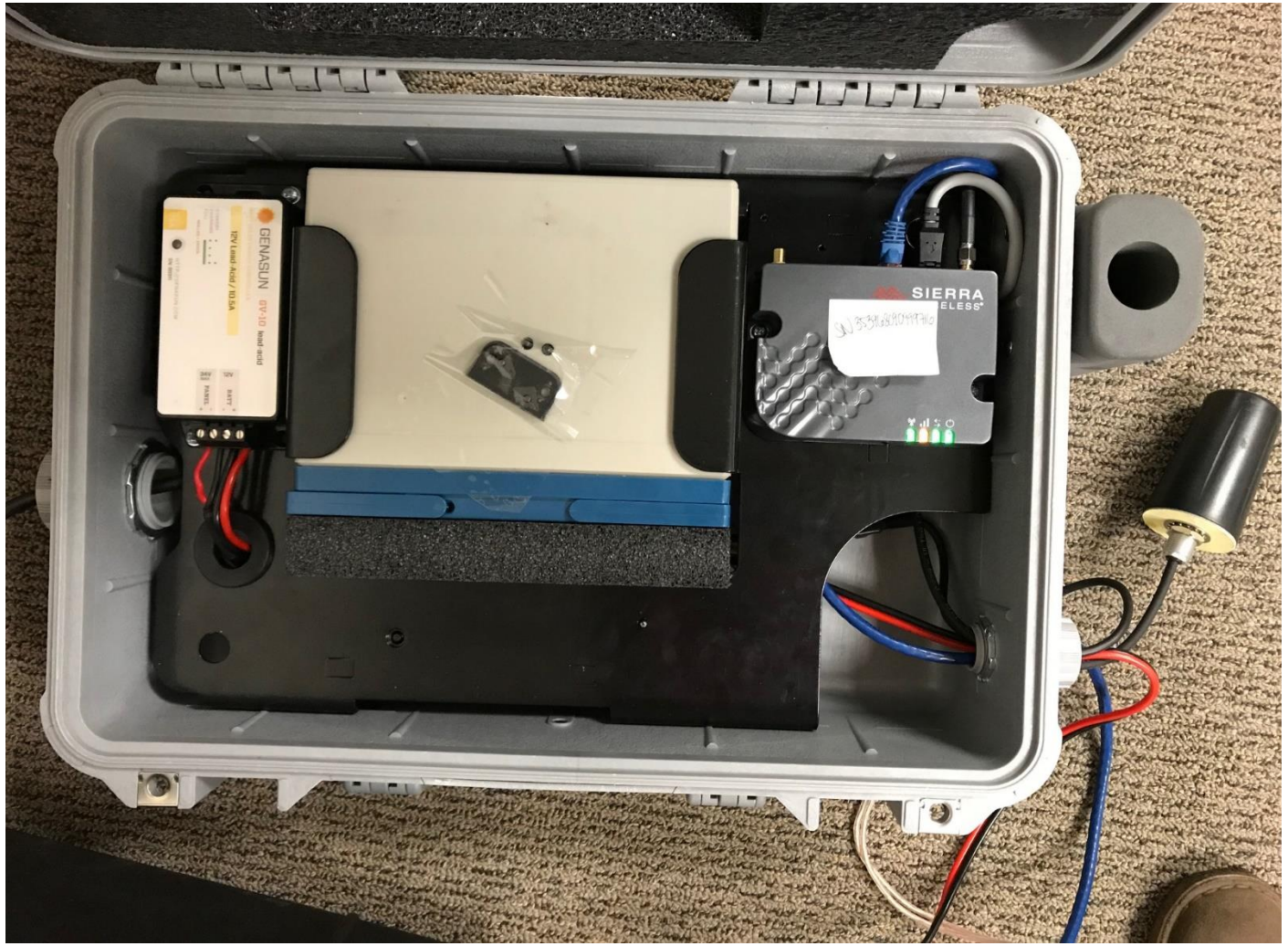
- Spider-80X-P08
- Time waveform recording

# Deployed Application | Battery

- 35 Ah battery
- Genasun regulator

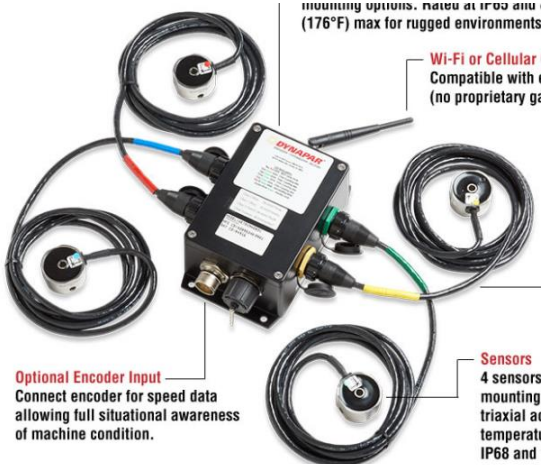
# Deployed Application | Modem

- Sierra Wireless RV50
- 2 antennas
- Connected via ethernet to Spider

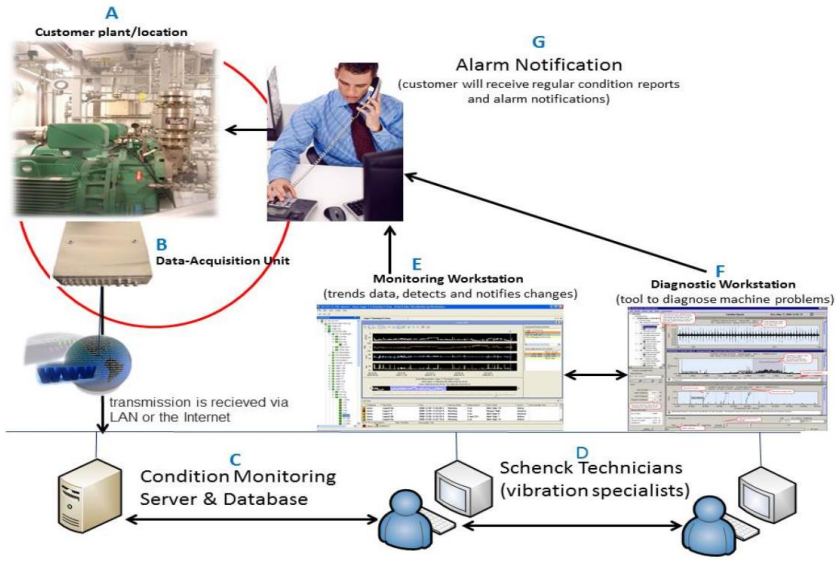


# Remote Condition Monitoring | Sales and Marketing

# Remote Monitoring | Competitive Analysis








- Dynapar
- Schneck
- Emerson
- Prufteknik

# Thank You

Crystal Instruments is dedicated to the innovation of testing equipment and solutions. Founded in 1996, Crystal Instruments is a leading manufacturer of equipment for condition monitoring, dynamic signal analysis, and vibration test control. Crystal Instruments is headquartered in Santa Clara, California, and is an ISO 9001 certified company.

## Contact

Sales@go-ci.com

Support@go-ci.com

408.986.8880

www.crystalinstruments.com

CRYSTAL INSTRUMENTS