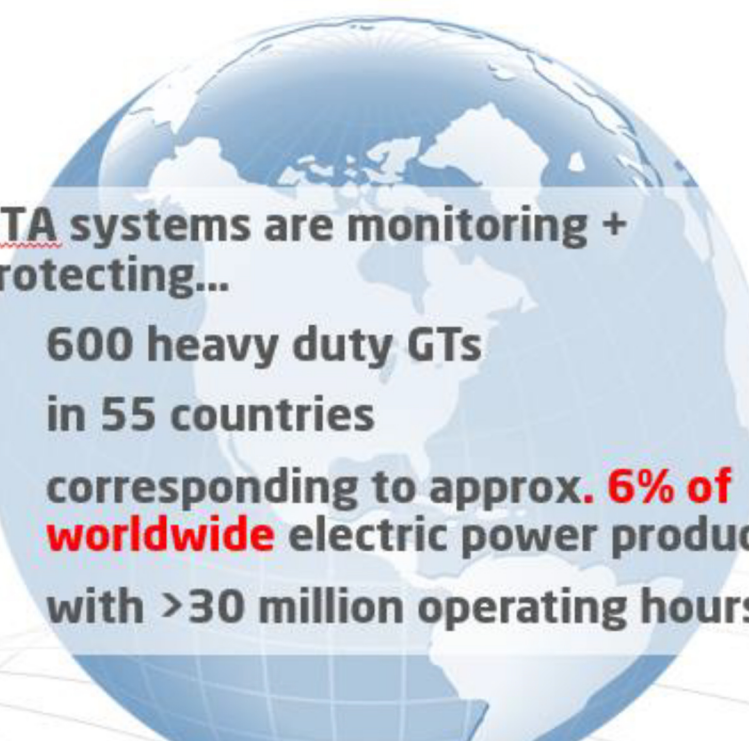


We keep your engine running

IfTA Rotordynamics: Unique Selling Points

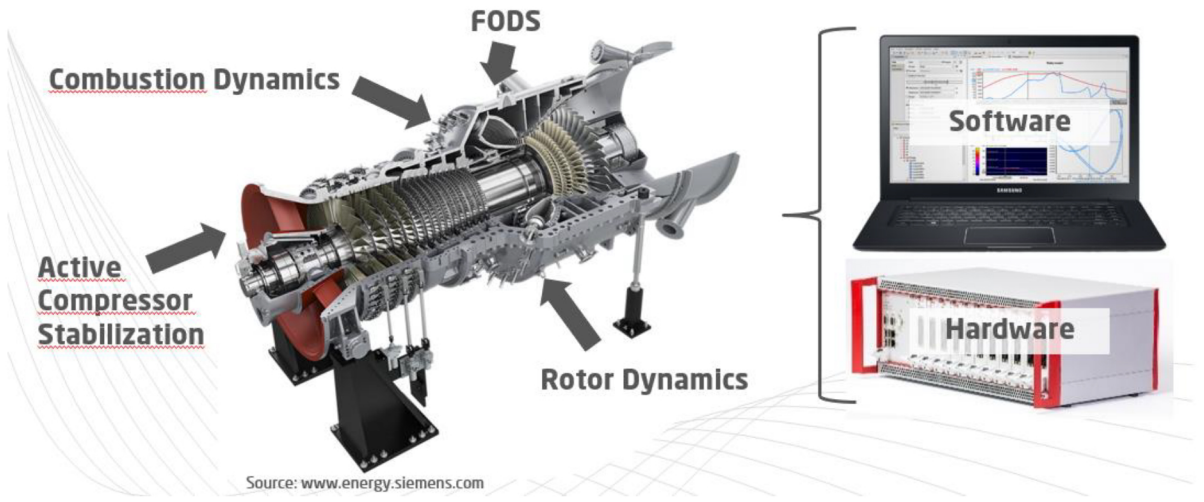
1. High Reliability of IfTA Systems

A large, semi-transparent blue globe with a white grid pattern, showing the continents of North and South America, serves as a background for the text.

IfTA systems are monitoring + protecting...

- **600 heavy duty GTs**
- **in 55 countries**
- **corresponding to approx. 6% of worldwide electric power production**
- **with >30 million operating hours**

2. Flexibility of IfTA Systems: One System for all Analyses



- Optimize costs and functionality at the same time: Profit from synergies by combining rotor dynamics with combustion dynamics systems

3. Deep In-House Knowledge

IfTA constantly provides engineering services for rotordynamics and vibration issues.

IfTA has its own research department, which actively publishes its latest results in journals and conferences on combustion dynamics and rotor dynamics

This experience shows up in the highly optimized and usable products. Furthermore, IfTA has the experience to help customers to interpret their own data – if desired also on a regular basis

Close cooperation to leading research institutions and experts in the field of rotordynamics

4. State-of-the-Art Rotordynamic Diagnostic

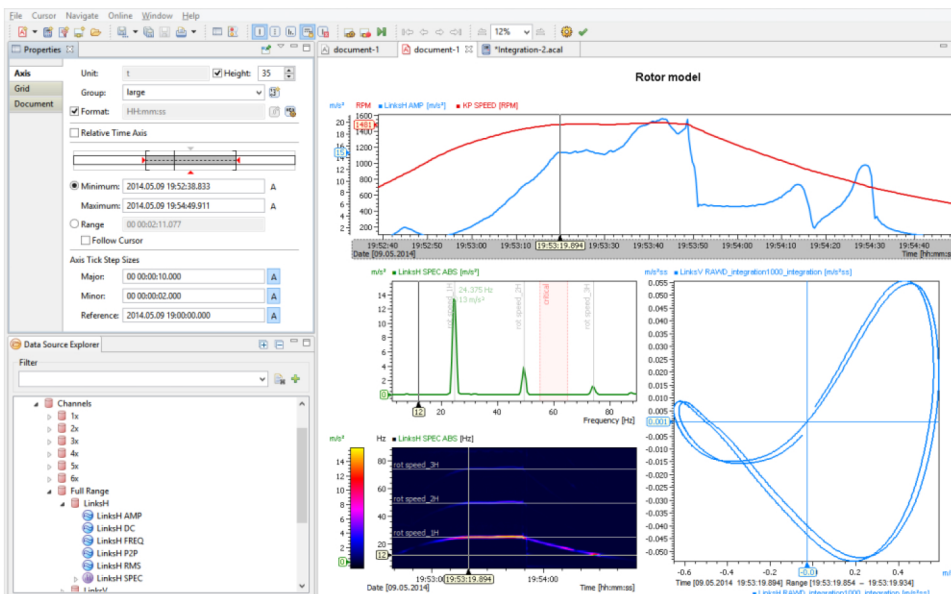
- Time and frequency domain analysis supported
- Configurable number of tracked harmonics
- User defined conditions and thresholds in both time and frequency domain allow for efficient analysis
- User defined configuration of data storage, such as the conditional storage of startup and shutdown procedures.

- Continuous and, thus, complete data storage of dynamic and static data with summaries in lower resolution (seconds/minutes/...)
- Software is constantly improved and new features are added to fit all of the customer's needs. For example, there is an ongoing research project on automated diagnoses by means of machine learning technology.
- Detection of rotor unbalances, hydrodynamic instabilities (whirl/whip) or other bearing issues, lose parts, cracks, ...
- Slow-roll compensation
- Additional support of torsional vibration analysis

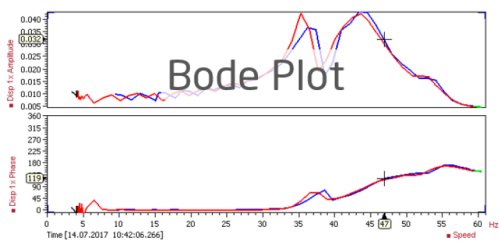
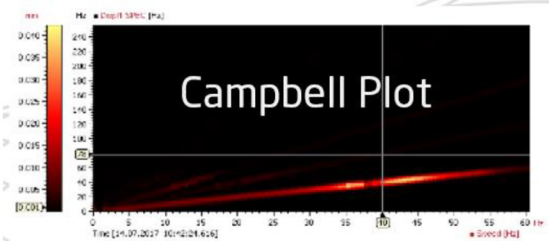
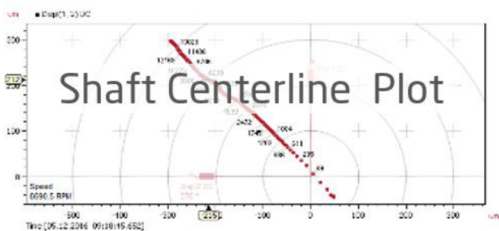
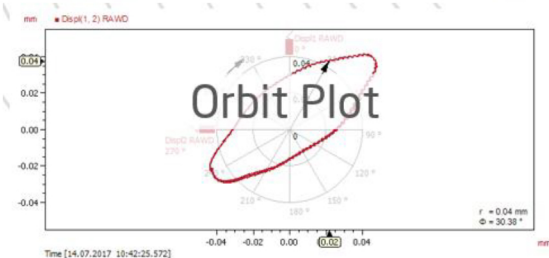
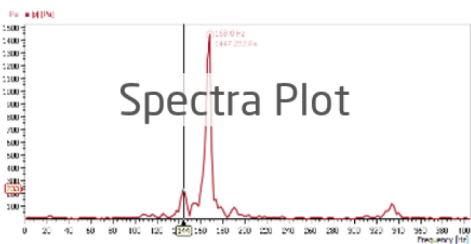
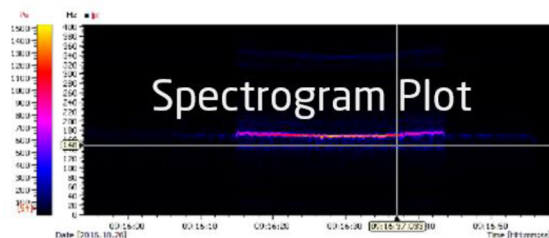
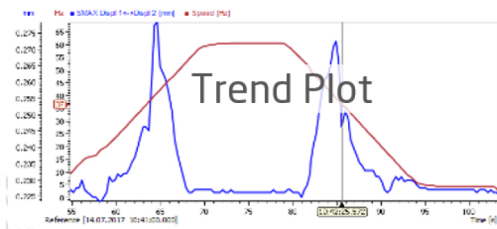
5. Reliable and Tailored Real-Time Protection

- Strictly separated analysis, recording and protection layers. Such a system design provides maximum reliability of real-time protection
- Fully in-house developed lean and highly optimized DSP firmware provides fast and secure operation
- Automatic start-up of the system (important if power supply was interrupted)

6. Awarded User-Friendly and Intuitive Software



- Many predefined plots:



And many more...

- Maximum flexibility due to generic plots
- Designed to efficiently handle large data sets
- Dynamic and static data in one program
- Able to seamlessly switch between on- and offline data
- Includes many features to actively support user to analyze the data, such as intelligent filters, synchronous cursors, synchronous zooming, peak markers

7. Awarded and Unique Data Server Technology



- Collects data from a wide range of sources (OPC, dynamic measurement, Profibus,...) and enables combined analysis of rotor- and/or combustion dynamics
- Can cope with dynamic measurement data of more than 100 GB/day
- 24/7 ring buffers provide continuous and reliable data storage: never lose any data!
- Supports the user by creating small and easy to handle overview files that allow a quick check of the data and make finding of anomalies possible
- Supports triggered storage and aggregation of measurement and operational data with different time resolutions (seconds, hours, days,...)

8. Modular Hardware

- 102.4 kHz sampling rate with 24 bit resolution
- All input channels are independently galvanically isolated up to +-250V
- Large internal storage capacity (>1 TB)
- Modularity of IfTA hard- and software supports simple upgrades and replacements of defect parts