

PROTECTION & CONTROL PRODUCTS

IFTA SYSTEMS KEEP YOUR ENGINE RUNNING



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ARGUS



...WITH SOLUTIONS FOR DYNAMICS AND VIBRATIONS

Our innovative monitoring and control systems are used with small turbines as well as with the largest gas turbine power plants in the world. We are your reliable and experienced partner for the monitoring, diagnosis, optimization and the active control of your components:



Combustors



Rotors



Compressors



Structures



Gearboxes and Bearings

IFTA ARGUS OMDS

The flexible and user-friendly combustion dynamics and vibration monitoring system.



IfTA ARGUS OMDS has been developed especially for the monitoring and vibration analysis of the following components:



Combustors



Structures



Rotors



Gearboxes and Bearings



Compressors

IfTA ARGUS OMDS is perfect for all kinds of stationary gas turbines, steam turbine generator sets and other components used in industry and in power plants. Thanks to the optimal coordination of hardware and software, the IfTA ARGUS OMDS is easy to operate. IfTA ARGUS OMDS is based on a modular hardware and software architecture. This flexibility assures that measurement, analysis and monitoring functions are perfectly matched to various types of machines and customer specific applications.

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[illegible]



We have developed the IfTA AIC for the active suppression of instabilities in:



Combustors



Compressors

IfTA AIC sets the standard for instability avoidance in combustion chambers of stationary gas turbines. Harmful dynamics are actively suppressed through high-speed control and high-speed actuators. Even complex combustion phenomena with multiple and variable frequencies can be avoided through an innovative and robust control strategy. The corresponding reduction of the combustion chamber's mechanical load and the improved combustion process lead to prolonged combustor service intervals and reduced NOx emissions.

AIC can also be applied to actively shift the compressor surge line of turbo compressors.

AIC for combustion chambers and compressors increases machine efficiency. In addition, a more dynamic operation of gas turbines becomes possible - in cases of frequency stabilization, for example. The system can be adapted to a gas turbine with a minimum of reconstruction.

AIC saves time and money.

02

Key Features



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- 01 Usable in single- and multi-burner arrangements
- 02 Up to 32 control inputs and 32 control outputs
- 03 Fast, powerful and robust control algorithm
- 04 The control algorithm automatically adapts to current system behavior and changes
- 05 Improved control authority due to low delay time
- 06 Easy adaption of various actuators
- 07 Recording of all system parameters
- 08 Post-processing of stored data with IfTA Trend
- 09 Effortless integration into the engine control system via diverse interface modules from the IfTA Platform
- 10 Simple upgrade from OMDS to AIC



IFTA PLATFORM

The platform solution for dynamic phenomena.

Our OMDS and AIC are based on the IfTA Platform. Both systems profit from a broad variety of sophisticated features. The fact that IfTA develops and produces its own hardware and software components means that these are perfectly tuned to each other and guarantees their smooth interoperability.

The platform concept is in the foreground of all of our developments. General and comprehensive solutions are thereby created - flexible solutions that can be used in many ways. This is our basis for the optimal implementation of customer requests - fast and efficient.

The IfTA Platform provides a wide array of components offering different types of functionality:

- 01** Processing units
- 02** Fast and slow analog inputs/outputs
- 03** Digital inputs/outputs
- 04** Communication interfaces
- 05** Data storage and distribution units
- 06** Post-processing of stored data with IfTA Trend
- 07** Charge amplifiers

We select the components to optimally configure the systems for our customers' monitoring, diagnosis, optimization or active control tasks.

Available Modules

03



DSP Realtime processing module

- 01** Digital signal processor
- 02** Realtime data analysis and control
- 03** Ethernet interface
- 04** User defined calculations
- 05** Watchdog
- 06** Stand-alone operation



AD4 Fast analog input module

- | | |
|--|---|
| <ul style="list-style-type: none"> 01 4 dynamic input channels 02 Independent galvanically isolated inputs 03 AC/DC coupling 04 51.2 kHz max. sampling rate 05 24-bit resolution 06 Anti-aliasing filter | <ul style="list-style-type: none"> 07 Synchronous sampling of all channels 08 Voltage and current inputs 09 Key phasor input 10 Front or rear input |
|--|---|

AD4IEPE upgrade

- 11 IEPE power supply

AD4Pro Flexense upgrade

- 11 IEPE power supply
- 12 Integrated charge amplifier
- 13 Strain gauge support (1/4, 1/2, full-bridge)
- 14 Piezo-resistive sensors (i.e. Kulite)



DigIn16 Digital input module

- 01 16 input channels
- 02 Galvanically isolated inputs
- 03 Voltage inputs
- 04 Voltage source for external closer
- 05 Front or rear input



AD32 Slow analog input module

- 01 32 input channels
- 02 640 Hz max. sampling rate
- 03 16-bit resolution
- 04 Voltage / current inputs
- 05 Single-ended inputs
- 06 Front or rear input



DA8 Fast analog output module

- 01 8 output channels
- 02 51.2 kHz max. rate
- 03 16-bit resolution
- 04 Synchronous output of all channels
- 05 Voltage and current output
- 06 Front or rear output



RelOut16 Digital output module

- 01 16 output channels
- 02 Galvanically isolated channels via relays
- 03 Adjustable hold time for each channel
- 04 Front or rear output



Profibus Profibus interface module

- 01 DP-V0
- 02 Two redundant profibuses
- 03 Front connector

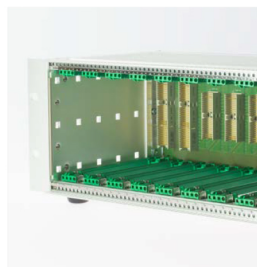
IFTA PLATFORM

The platform solution for dynamic phenomena.



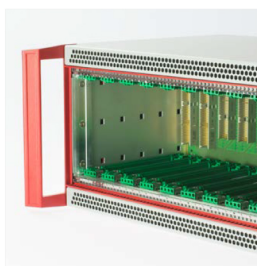
IfTA ChargeAmp *Charge amplifier*

- 01 Sensitivity available from 0.1 mV/pC to 250 mV/pC
- 02 DIN rail(TS35)/industrial housing options
- 03 Band pass filter included
- 04 Powered by IEPE
- 05 single-ended and differential versions
- 06 Ex nA (ATEX) available



IfTA 19" rack-mount chassis

- 01 14 Slots
- 02 Signal connection via terminal strips on the rear side or front connectors
- 03 Supply voltage 23-27 VDC
- 04 19" rack, 3U



IfTA mobile chassis

- 01 7/14 Slots
- 02 Handles and pedestals
- 03 Ext. power supply (50-60Hz, 100-240 VAC)
- 04 Optional travel case



IfTA Keyboard

- 01 Keyboard drawer
- 02 Integrated touch pad
- 03 US keyboard layout
- 04 USB connector
- 05 19" rack, 1U

03



IfTA PanelIPC Data server

- | | |
|--|---------------------------------|
| 01 PanelIPC with 15" TFT touch display | 05 2 Ethernet interfaces |
| 02 Embedded Windows | 06 4 USB interfaces |
| 03 Compact flash card for OS | 07 2 RS232 interfaces |
| 04 Up to 2 HDDs or 2 SSDs for data storage | 08 Fanless cooling |
| | 09 19" rack, 8U |
| | 10 Supply voltage 18 ... 36 VDC |



IfTA SlotPC integrated Data server

- | | |
|--|--------------------------|
| 01 Width: 3 slots | 06 2 Ethernet interfaces |
| 02 Embedded Windows | 07 4 USB Interfaces |
| 03 SSD for OS | 08 1 RS232 interface |
| 04 Additional SSD/HDD for data storage | 09 Fanless cooling |
| 05 1 VGA interface | |

IfTA Host Data storage and distribution software

- | | |
|--|--|
| 01 Running on IfTA PanelIPC/SlotPC | 04 Pre- and post-trigger functionality |
| 02 Up to 8 user definable processing modules for storage and online distribution | 05 OPC Client / Server |
| 03 Reduction of data size through advanced recording strategies | 06 Interface for online calculations |
| | 07 Logging of configuration changes and events |
| | 08 Optional: automatic external data storage |



Key Features



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Time-saving

- 01 Easy-to-use: drag and drop and flat menu hierarchies
- 02 Flexible plot layouts
- 03 Online connection - connect to any IfTA Systems available on a network and visualize data online
- 04 Synchronous cursors in all plots
- 05 Intuitive modification of plot properties, e.g. zoom range
- 06 Smart axis grouping for easy property adjustment

Big Data analytics

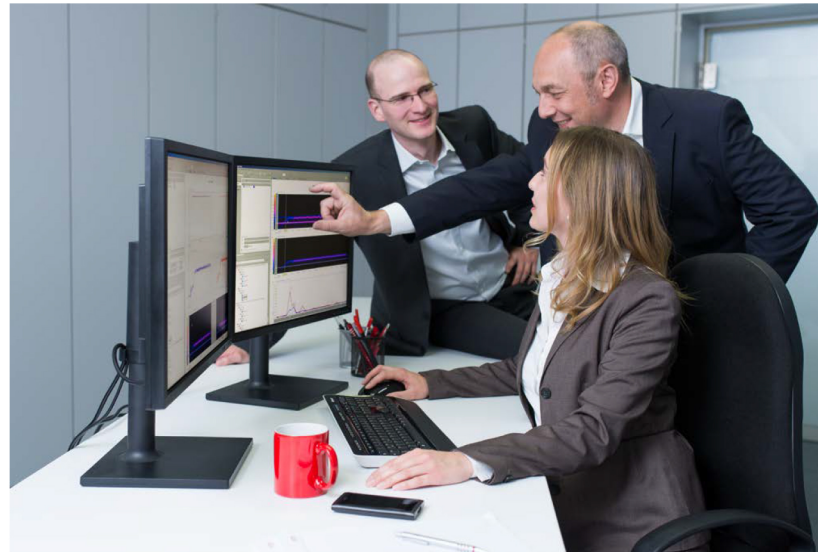
- 01 Automatic filtering: find data hidden in your files fast with conditions that you specify
- 02 Handles files up to 10 GB
- 03 Lets you evaluate tens of millions of data points at once and thus enables an overview of hours/days/years of engine operation
- 04 Merge data from different times to work with just one file
- 05 Relative time axis allows comparison of engine states at different points of time, e.g. multiple run ups

Calculations

- 01 Post-processing of measured data, e.g. calculation of new signals
- 02 Predefined calculations, e.g. moving average etc.
- 03 Data correlation in frequency domain

Additional features

- 01 Data-source explorer with smart signal filter
- 02 Two measurement cursors with delta calculation
- 03 Signal adjustable gridlines, e.g. gridlines in spectra follow speed
- 04 Frequency band monitoring
- 05 Scripting for automated report generation



Plot types

- 01 Trend plot - displays the value of any signal over time
- 02 Intensity plot - shows a spectrum or group of equivalent signals, e.g. a set of thermo couples, over time
- 03 Spectrum plot - shows a spectrum or group of equivalent signals at cursor positions
- 04 XY-plot - correlates signal pairs
- 05 List plot - displays your data as numbers in a list
- 06 Polar plot - shows groups of equivalent signals in polar form
- 07 LED plot - displays boolean signals or states
- 08 Orbit plot - shows the shaft orbit of two proximity sensors
- 09 Shaft centerline plot - shows shaft movement
- 10 Nyquist plot - allows the visualization of complex number signals
- 11 Bode plot - shows amplitude and phase versus frequency
- 12 XY-Intensity plot



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