

SATURN

The New Generation Transient Recorder

DATA ACQUISITION





For over 10 years AMO has been supplying high speed data acquisition systems to the highest possible quality and specification. Solutions supplied by AMO have been setting the standards in the acquisition and processing fields to a wide range of customers and applications.

By using reconfigurable digital techniques, we offer future-proof products that grow along with your application needs. AMO's internal research and development guarantees access to the latest know how for groundbreaking and innovative solutions in analog and digital design, whilst strict quality control ensures the reliability, efficiency and precision of our measuring instruments.

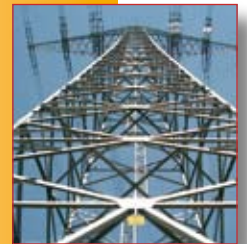
The SATURN measuring platform is part of the newest generation of transient recorders to be available.

High speed data handling with optical transmission via digital fibers combine to build a unique instrument with outstanding quality. Wide-banded analog signal conditioning along with fast sample rates enable acquisition to the highest standards. Our continuously expanding range of products covers all typical applications from mobile data recording with a few channels, to extensive installations of multiple high-speed channels.

AMO is a growing high-technology company in Aachen, Germany, that employs more than 40 experts from different engineering fields. The highly qualified team ensures the latest technology and a natural commitment to best user friendly products, made in Germany.

High and medium voltage analysis

- Circuit breaker tests
- Fuse tests
- Lightning pulse analysis
- Power harmonic analysis
- Power line faults and transients



Military and space flight research

- Ballistic research
- Propulsion systems
- Pyrotechnics
- Electromagnetic launches
- Material tests



Automotive engineering

- Engine analysis
- Airbag ignition systems
- ABS breaking systems
- Injection systems
- Endurance tests





Tailor-made solutions

The modular system concept enables powerful while at the same time economic system customization. This, for example, allows very complex specific real-time data processing based on standard components, customized to meet your demands.

Multi channel high level applications

Broad scalability is only one of SATURN's outstanding features allowing more than 1,000 measurement channels with perfect synchronicity across all channels. SATURN's first class low-noise analog/digital converters ensure optimum performance of the instrument. The user-friendly SATURN Studio II software

offers full control and adapts to changes in your demands at any time.

Highly specialized

The fiber optic coupling of the SATURN measuring satellites Ultimate 160 allows for operation even in the harshest possible electrical environments.

The optical fibers ensure total galvanic isolation of the main system from the measuring satellite.

It is only due to this unique technology that many measurement applications of high and medium voltage become feasible at all whilst still protecting personnel and equipment. Requirements, where great distances are involved, for example, vast security zones or synchronous data acquisition in spacious areas are fulfilled without difficulty.

SATURN The new generation of transient recorders

- Scalable to more than 1,000 channels
- Max. 1 GByte acquisition memory per channel
- Resolution up to 20 bit
- Different trigger inputs, logically combinable
- Function modules for input and output of analog and digital signals
- Cascading of distributed systems via optical fibers of any length
- Up to 100 MS/s acquisition rate per channel
- Galvanic isolation by digital optical fibers
- Robust 19" industry standard
- Enclosures to meet any demands
- Integrated PC with hard drive up to 1 Terabyte (1,000 GB) and more
- Completely controllable via network
- Optional RAID support for maximum storage

SATURN – modular concept, integrated solution

SATURN transient recorders are complete modular solutions to adapt to your applications; optimized to meet the complex demands of test labs, development centers and quality control in the manufacturing process.

The complete system consists of the following components:

- Function modules for input and output of signals; suitable for any application
- Module carrier boards with two bays for function modules and large transient memory
- Ideal housing for your specific application with integrated PC and SATURN Studio II software

Future proof investment

SATURN can be set up for all demands, ranging from mobile use to highly integrated multi channel systems. The systems are modularly expandable at any time, grow with your demands and thus offer optimal protection of investment.

All components are perfectly matched and enable constant high-precision measurement results. Unlike measurement solutions based on standard PC cards, electrical noise and compatibility problems between different components are eliminated. Moreover, standard PC cards are outdated and new technologies replace existing technologies frequently. The fast development progress of commercial PC's sees items becoming

obsolete within a few years only. Industrial style components are available for longer terms and preserve your investment.

High precision measurements

The SATURN system sets new standards in electronic data acquisition and data processing. The analog input covers up to 50 MHz bandwidth. Optional real differential or single-ended inputs with selectable broad voltage ranges allow for highest possible precision. According to your demands, modules of the Basic, Fast or Ultimate series can be used.

The Basic 120 series provides single-ended eight-channel modules up to 3 MS/s - 16 bit resolution per

channel. Slower sample speeds are available at higher resolutions within this Basic 120 series.

The Fast 150 module family is equipped with four differential channels and thus optimized for fast applications up to 100 MS/s per channel at a resolution of 14 bit.

The Ultimate 160 Satellites correspond to the Fast 150 Series and additionally offer isolation via optical fibers to allow ground-less measurements within a high and medium voltage environment. The digital optical fibers bridge distances up to 15 km (~10 miles) with any combination of different lengths. The channel synchronicity perfectly remains throughout any fiber length combination.

SATURN – Compact



Flat SATURN

- Ideal for mobile usage ~7kg (~15 lbs)
- Stackable
- Integrated PC (stand alone or network-operated)
- 3 carrier slots for 48 channels max.



SATURN Desktop – ½ 19"

- Compact tabletop unit
- Integrated PC (stand alone or network-operated)
- 6 carrier slots for 96 channels max.
- SMB or BNC connectors



SATURN eco

- Set-top-box
- Gigabit LAN / USB 2.0
- Network operated
- 16 BNC channels max.
- Best price solution!



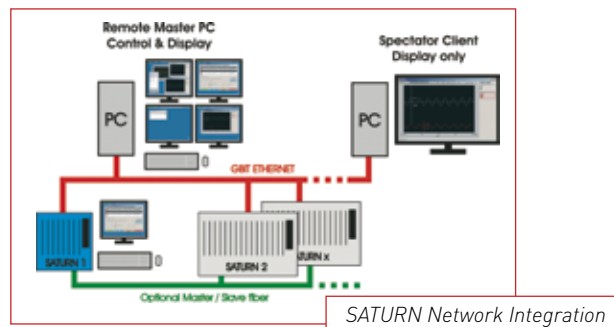


SATURN Studio II software – A powerful tool

SATURN Studio II software takes care of the configuration, data acquisition and storage of your measurements. It offers competent assistance in analyzing the recorded data.

The modern and efficient software architecture allows for easy handling of systems of any size. The management of data volumes of several hundred GByte without major delays, as well as displaying large amounts of data without any delay is possible. Due to integration of powerful data analysis tools, the measured signals can be directly analyzed using online calculations or report generation.

The integrated interface allows for a complete remote control of the SATURN system via Gigabit



LAN. Thus, your internally grown automation-structures and special software solutions remain usable with only specific adaptations to the SATURN API command set.

SATURN – Multi channel



SATURN UPS – 19"

- Ideal to mount into 19" racks or to be used as tabletop unit
- Integrated PC (stand alone or network-operated)
- 10 carrier slots for 160 channels max.
- SMB or BNC connectors
- Integrated uninterruptible power supply (UPS)
 - Up to 40 min. of operation during power failures
 - Successfully finish any current task
 - Store any data locally



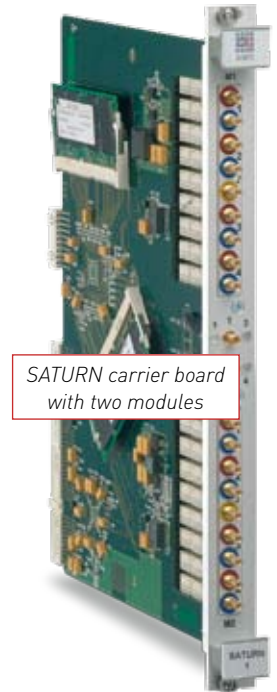
SATURN Rack – 19"

- Ideal to mount into 19" racks or to be used as tabletop unit
- Integrated PC (stand alone or network-operated)
- 15 carrier slots for 240 channels max.
- SMB or BNC connectors
- Cascading of multiple systems for vast multi-channel usage without compromise

The module carrier board

The flexible architecture of the SATURN platform is based on the established Compact PCI industry standard. The modular and robust set-up allows for modernization of the integrated PC at any future time and for scalability of the measuring channels as your demands grow.

The SATURN module carrier board can be equipped with any two function modules (input or output). The carrier board provides local acquisition memory of 2 GByte maximum and powerful data processors to enable the demanding data transfer and to instantly display vast amounts of data. Any available input, output and data transfer module can be combined on the module carrier board.



SATURN carrier board with two modules

	Standard	Medium	Large
Memory options	512 MByte	1 GByte	2 GByte
Basic 120 Series up to 3 MS/s	116 MSample	233 MSample	466 MSample
Sample time at 1 MS/s (1 channel)	58 sec.	1 min. 56 sec.	3 min. 53 sec.
Fast 150 Series & Satellites	233 MSample	466 MSample	932 MSample
Sample time at 100 MS/s (1 channel)	1.2 sec.	2.3 sec.	4.7 sec.

Each carrier board is equipped with a configurable edge trigger input. System wide synchronous data acquisition for all channels is granted using special backplane connections. Either external clock sources or internal highly precise clock generation provides multiple time base options. All of the module carrier boards can be run either independently or synchronously.

The intelligent clock and trigger management enables synchronicity beyond comparison. This includes all fiber-coupled Ultimate 160 Satellites even with different fiber-lengths up to 15 km (~10 miles).

The function modules

The function modules are available for analog, digital, and optical input and output of signals of any speed. They are installed into the two carrier board's module bays and can be combined in any order.

- Analog input up to 100 MS/s per channel, up to 20 bit
- Optically coupled, analog inputs up to 100 MS/s per channel Satellites, single and multi channel
- Analog output up to 100 MHz – 14 bit
- Digital electrical inputs up to 100V
- Digital optical input (POF)

Analog and digital BNC inputs





Modules for data acquisition

- **Fast 150 series**
4 channel differential input
up to 100 MS/s per channel
up to 16 bit resolution
- **Basic 120 series**
8 channel single-ended input
up to 3 MS/s per channel
up to 20 bit
- **Switchable input options**
(1 M – 50 Ohm, AC / DC)
- **Up to 50 MHz analog bandwidth**
- **Dynamic noise reduction**
- **Automatic calibration check**
- **Complex trigger options**
- **Synchronicity over all channels**
- **Stand alone or network-operated software API driver interface (SCI/SDI)**
- **Multiple time bases and trigger domains**
- **Galvanic isolation via optical fibers**

Single-ended and real differential inputs using full Nyquist bandwidth, with a vast spectrum of input voltages open up unrestricted application areas.

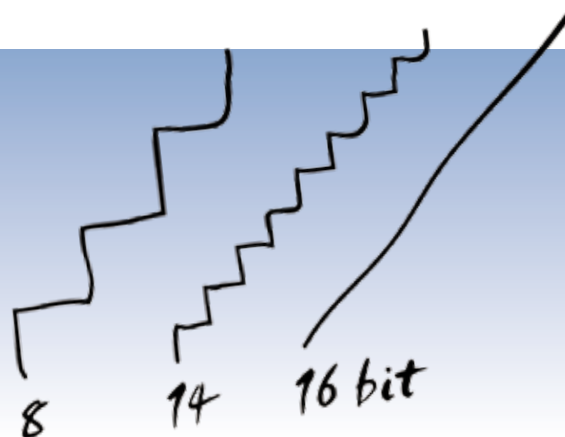
The available A/D modules range from maximum sample rates of 100 MS/s on 4 channel modules down to 200 kS/s on 8 channel modules. Any module can sample as slow as 1 sample per second. Vertical resolutions range from 14 to 20 bit, due to the flexible resolution enhancement (EBR) the effective resolution optionally increases up to 20 bit SNR for lower resolution modules, which goes along with a reduction of the sample rate.

By using the SATURN Studio II software, any module can be configured and operated either independently or collectively. Individually per module, the acquisition can be started using electrical trigger inputs, data triggers or global trigger signals. All trigger signals can be made available synchronously for any module. To make this possible, the system-wide backplane connections interface the four global trigger signals to each module.

Depending on speed requirements, number of channels and input configuration, three different module families can be chosen. Mixed operation is possible, allowing any type of module in the system to be combined freely with any other type enabling a cost-effective solution for your requirements.



A/D converter modules up to 100 MS/s



Basic 120 series - Single-ended

Model	Analog channels	Max. sample rate *	Converter resolution	Analog bandwidth	Input	Dynamic noise reduction	Digital channels	EBR**
200k-20-8	8	200 kS/s	20 bit	100 kHz	Single	Yes	Option	Option
750k-18-8	8	750 kS/s	18 bit	375 kHz	Single	Yes	Option	Option
1.5M-16-8	8	1.5 MS/s	16 bit	750 kHz	Single	Yes	Option	Option
3M-16-8	8	3 MS/s	16 bit	1.5 kHz	Single	Yes	Option	Option

* Max. sample rate per channel
 ** EBR = flexible enhanced bit resolution

The Basic 120 series offers the highest channel density. These modules are equipped with 8 single-ended analog inputs. On the basis of the 120 series up to 96 channels can be operated in the ½ 19" SATURN desktop housing.

Fast 150 series - Differential

Model	Analog channels	Max. sample rate *	Converter resolution	Analog bandwidth	Input	Dynamic noise reduction	Digital channels	EBR**
10M-16-4	4	10 MS/s	16 bit	5 MHz	Diff.	Yes	No	Option
25M-16-4	4	25 MS/s	16 bit	12.5 MHz	Diff.	Yes	No	Option
100M-14-1	1	100 MS/s	14 bit	50 MHz	Diff.	Yes	No	Option
100M-14	1 / 4	100 / 25 MS/s	14 bit	50 / 12.5 MHz	Diff.	Yes	No	Option

* Max. sample rate per channel
 ** EBR = flexible enhanced bit resolution

The Fast 150 family supports optimum flexibility with a maximum sample rate of 25 MS/s per channel in 4 channel mode and 100 MS/s in single channel mode. The differential signal inputs provide up to 50 MHz of analog bandwidth for precise recording of highly dynamic processes. Digital Anti-Aliasing filters dynamically adapt the bandwidth to perfectly adjust the effective noise reduction.

Marker modules - Digital Inputs

Function	Quantity of channels	Max. sample rate*	Resolution	Input	Decision level
HD Marker	56 / 28 / 14	25 / 50 / 100 MS/s	Digital	5V TTL	2V fix
BNC Marker	8 (7)	100 MS/s	Digital	100 V	2V fix
Fiber Marker	8 (7)	10 MS/s	Digital	1 mm POF 650 nm	NA

* Max. sample rate per channel

Digital marker channels allow the recording of events and markers with configurable time resolution, independent of or synchronous to analog channels. Via a SCSI-II plug up to 56 TTL-signals can be connected to one module. Depending on the quantity of enabled channels, the inputs can be scanned up to 100 million times per second. The BNC marker panel allows input voltage of up to 100 V, still granting full sample rate. The fiber marker panel is the optical link version to transmit events and control signals over long distances with perfect galvanic isolation. These plastic optical fiber (POF) inputs are compatible to typical sequencer systems in high and medium voltage laboratories.





Ultimate 160 series - Satellites

Model	Analog channels	Max. sample rate *	Converter resolution	Analog bandwidth	Input	Dynamic noise reduction	Digital channels	EBR**
100M-14-F	1	100 MS/s	14 bit	50 MHz	Diff.	Yes	No	Option
100M-14-4-F	1 / 4	100 / 25 MS/s	14 bit	50 / 12.5 MHz	Diff.	Yes	No	Option

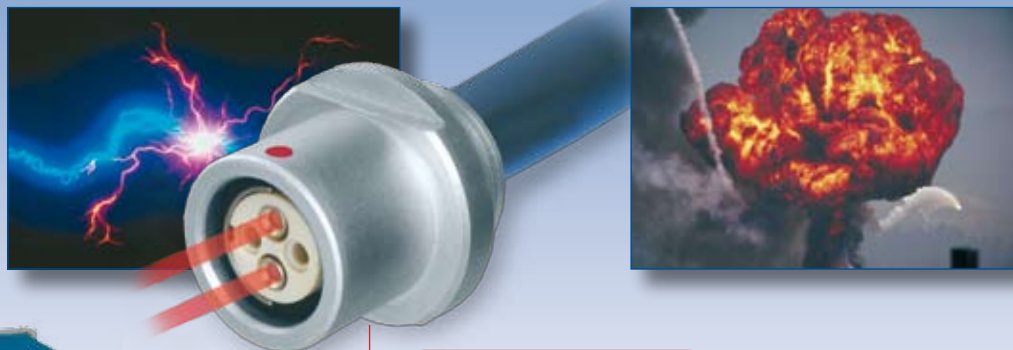
* Max. sample rate per channel
 ** EBR = flexible enhanced bit resolution

**potential-free – highest precision – any distance
 optical link opens up special fields of application**

> 1 Million volts of isolation voltage

The Ultimate 160 series Satellites combine analog to digital conversion of the highest input speed and resolution with perfect galvanic isolation. Optical fiber links offer superior performance for applications in the field of high and medium voltage and bridge long distances between the object to be measured and the transient recorder system. The satellite modules are battery powered and shielded against extreme electric and magnetic fields. They digitally transfer the recorded data in real-time, whilst maintaining perfect synchronicity to all channels in the SATURN main system and on Satellites. The micro controller operated battery management and intelligent data processing allows control and use of satellites at a distance of up to 15 km (~10 miles) apart from the system mainframe without on-site user action. Many hours of continuous duty and even days in automatic control mode can be achieved to cover all typical measuring scenarios.

A new, very robust optical connector made of special alloy is now available for rough measuring environments.



Heavy duty fiber connector



Ultimate 160 Satellite




Fuel station for Satellite PowerPacks

Synchronous triggers


The highly synchronous distribution of triggers in the SATURN system is based on four independent, parallel busses. Any trigger event can be used as a source; any module can start the recording with one or several global triggers that are logically combinable. Module-based pre and post trigger capabilities allow flexible trigger configurations in the SATURN system.

Module	Trigger	Number of channels	Max. sample rate	Max. input	Decision level
Module carrier board	Electrical	1 input	100 MS/s	± 5 V	2 V fix
A/D module	Electrical	1 input	100 MS/s	± 100 V	Adjustable
A/D module	Data channel	1 input	100 MS/s	± 100 V	Complex
Optional trigger board	Electrical	4 inputs 4 outputs	100 MS/s	± 5 V	Adjustable
Optional trigger board	Optical	1 optical in- or output	10 MS/s	1 mm POF 650 nm	NA

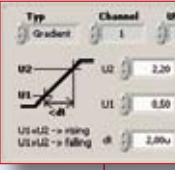
Extensively configurable trigger inputs can be found on each module carrier board and data acquisition module. The data channels enable trigger detection due to multiple complex signal monitoring capabilities. Configurable window, threshold and hysteresis or fixed triggers allow easy setups.



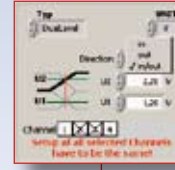
Level trigger



Pulse trigger



Gradient trigger



Window trigger

The optional trigger board offers direct connection to all four global trigger busses as in- and output. Like the module carrier boards it requires one slot in the system. It is ideal for the synchronous coupling of any external component or further SATURN systems. To ensure proper connections, the trigger board is equipped with a strong 5 V (>100 mA) output driver circuit and programmable output pulse duration.

To meet special demands, as an option the trigger board comes with a connector for optical fibers, which allows the coupling of remote devices or the usage within a high voltage field.

Signal source - Arbitrary function generator

The analog output can be used as arbitrary function generator and serves as universal source for signals in the area of development, research, testing and service.

With 14 bit precision output ranges of up to 100 MHz at ± 1, 5 or 10 V output.

The basic functions include sine, triangle, saw tooth, rectangle and impulse signals. More complex signals can be calculated with external programs and then be uploaded to the generators memory. This makes it possible to overlay a custom signal with defined disturbances and noise or to simulate fading.

The output signals are not necessarily synthetic signals. The easiest way is to simply output previously measured signals up to maximum memory length. Optionally the generator can be synchronized with the data acquisition channels.





Special SATURN Features

SNR

The SATURN data acquisition modules are equipped with dynamic noise reduction and as an option flexible enhanced bit resolution (EBR).

The automatic noise reduction uses optimized anti aliasing filters and already provides a considerable improvement of measurement precision and of the signal-to-noise ratio (SNR).

The flexible bit resolution mode (EBR) allows even higher precision at lower sample rates.

Storage and data export

SATURN enables direct storage of recorded data into your preferred data format immediately after the measurement. Time-consuming conversion is no longer necessary. Within a few seconds the recorded data is transferred from the measurement memory to either the local hard drive or via the integrated Gigabit LAN onto your server.

Automatic mode

SATURN enables fully automated measuring operations.

For sequenced measurements just switch the system into permanent automatic mode by choosing "auto re-arm". Once the system has been armed, the data is recorded automatically on a trigger event, stored in the required format or processed with optional calculations for predefined reports. The quickly completed test analysis can be automatically stored as a pdf-file or printed out. Within seconds of the end of your experiment you will have all the analysis data at hand.

Auto calibration check

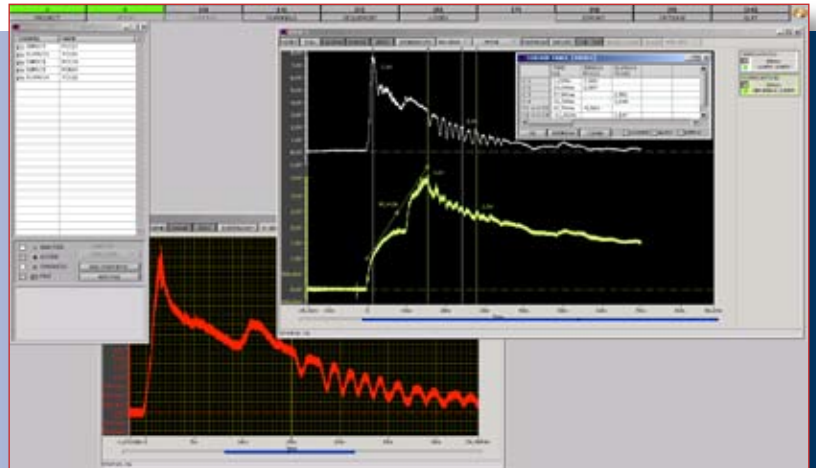
For added confidence it is possible to actually check the validity of the accredited calibration. SATURN offers a unique integrated calibration check.

The optional software is an easy and efficient tool, which guarantees constant monitoring of your calibration status. All data acquisition modules are equipped with integrated and highly precise reference sources, which allow for fast and precise checking of inputs to the system at any time.

There is no limit as to how often you can write calibration reports on site that can be archived, for instance, with your recorded measurements.

Software – SATURN Studio II

The modern software architecture of SATURN Studio II offers a complete operating environment for the SATURN system. It enables easy handling of SATURN systems of any size via drag-and-drop. The administration of data sets of several hundreds of GByte is fast and efficient. The powerful and well documented software interface (API) allows complete remote control of the SATURN transient recorder via Gigabit LAN. Due to the improved network integration, AMO engineers on request can access all worldwide installed systems at high speed for competent online support.



SATURN Studio II

Transient recorder

The SATURN measurement system is perfectly qualified to acquire transient signals. Extensive trigger capabilities in combination with a storage capacity up to 1 GByte per channel allows even most challenging measurement demands to be fulfilled. The storage can be subdivided into freely definable pre and post trigger areas. Acquired signals are displayed directly after the measuring without any time delay. Parameters such as minimum, maximum, etc. are calculated in real-time.

Oscilloscope

The most important difference between oscilloscopes and transient recorders is the order of measuring and configuration. An oscilloscope typically starts measuring without the configuration matching to the awaited signal. The user changes the parameters amplitude and time resolution until the signal perfectly displays. Hence, SATURN Studio II provides an oscilloscope mode to collect data triggered or non-triggered and to continuously adapt the channel configuration.

The fast display update-rate even with multiple channels directly shows the influence of the settings.

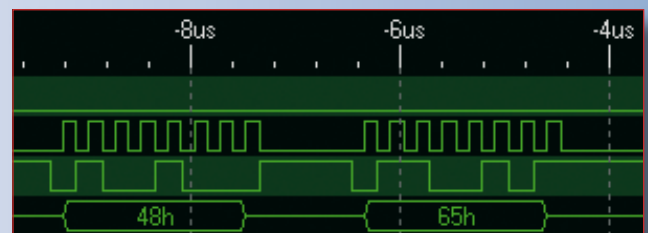
Marker channels - logic analyzer

Digital modules allow the recording of digital marker channels either independently or with a common time base to analog channels. The digital channels are connected via high pin-count data plugs, robust BNC or via plastic optical fiber (POF) connectors.

The optical fibers offer > 1 Million volt of isolation voltage between each digital channel.

Due to complex definable trigger events and bus mode display for several signals, SATURN becomes a professional logic analyzer. It is self-evident that the highly precise synchronicity between digital and analog inputs is guaranteed at all times.

Hidden relations become obvious with the simultaneous display of digital and analog signals.



Logic analyzer



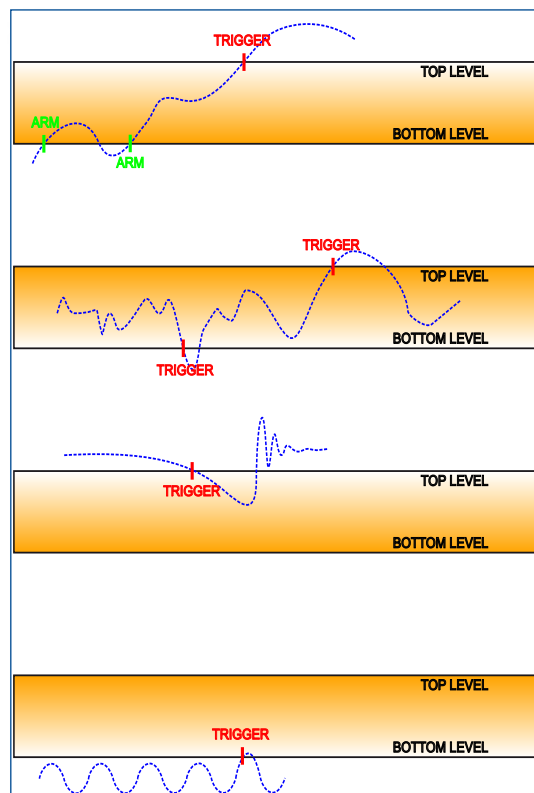


Powerful and flexible triggers

Each module includes separate trigger detection. Additionally, complex trigger analysis can be configured on each data channel.

The triggers are locally deployed for the measurement start and / or to activate one of the four global trigger busses.

Seven independent trigger sources are available for each acquisition module, granting system-wide synchronous start. Per module individual pre and post trigger configurations can be set. Each trigger from any source can be combined logically. Programmable voltage levels, time and event conditions as well as external trigger inputs – either electrical or optical – make complex trigger scenarios possible. Transient memory of up to 1 GByte per channel allows the recording of huge amounts of data without any loss due to re-arming. During the post-processing even the smallest peaks get detected with the help of arbitrary mask test functions or adaptive algorithms. Important signal characteristics like periodic time, rise- and fall time, jitter, overshoot or noise can be analyzed and, if a crossing above or below a threshold or threshold curve occurs, generate an event.



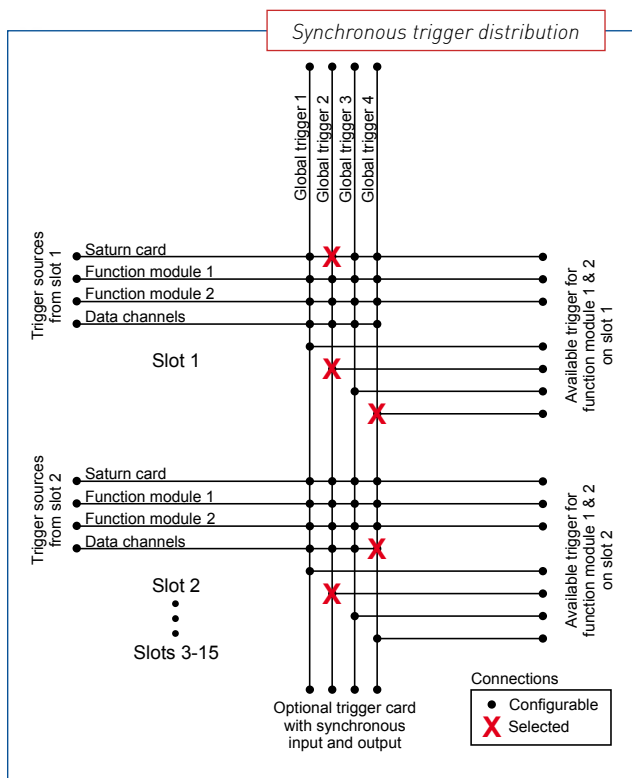
Data trigger - examples

Data trigger

Each data channel provides complex trigger analysis, the configuration per module allows easy set up. If defining a window trigger, upon reaching the upper or lower level boundary the signal either arms the channel or a trigger event is generated directly. This enables the realization of scenarios in which all monitored signals run within defined boundaries. Any irregularity triggers the recording of either all or only selected channels.

Formula editor

Evaluation and analysis of recorded signals often require the use of basic mathematical functions. Depending on the amount of data and on the tool, calculations may be time consuming. In the brand new SATURN formula editor selected functions or blocks automatically compile in the background in a split second to be optimized and to guarantee minimum calculation time.

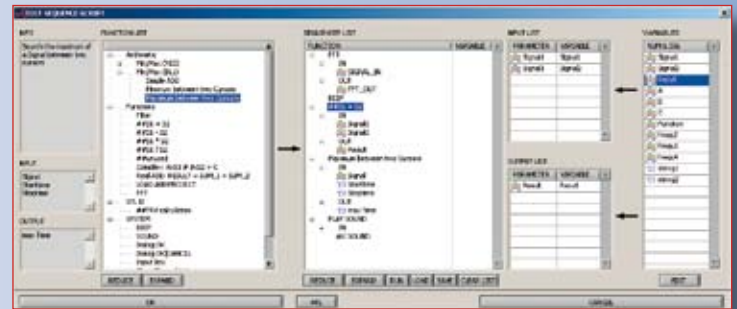


SATURN sequencer for automation

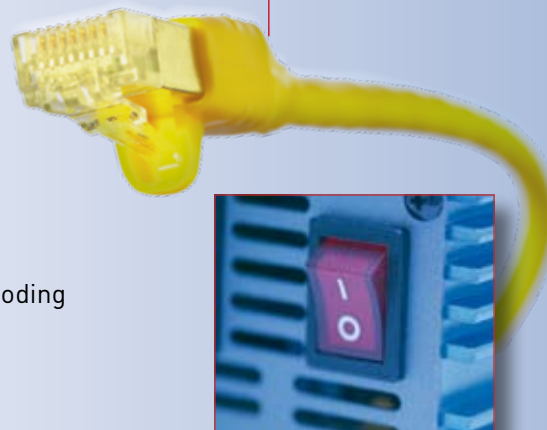
The powerful sequencer option allows the definition of complex operations ranging from arming and analysis to storage of data and reports. With graphical assistance you can configure your own sequence and then access it via customized one-click buttons, that you can include in any place of the GUI you want. This way, repetitive measurements can easily be automated; test analysis and report generation is effectively accelerated. In order to rationalize recurring processes, discrete applications for analysis with integrated user specific dialogues can be generated.

The sequence of actions is controlled via SATURN messages. These are released for example with arming the SATURN system, any occurring trigger, analysis results or just by simply pushing a button in the software. This way either single or complex freely configurable system action can be automated.

- Measurement start
- Save to file or database
- Synchronization and automation of external devices via GPIB, Ethernet, RS-232 etc.
- Controlling a widely visible "signal light"
- Global synchronicity via GPS and IRIG time coding
- Switching the system ON and OFF via LAN
- Play video and audio files
- Send emails
- Printout or automatic analysis
- ... Many more



Sequencer



Remote ON / OFF



Signal light

Multi Monitor Support



Up to 4 screens

SATURN status bar - perfect overview

1	2	3	4	[5]	[6]	[7]
PROJECT	SETUP	CONTROL		CHANNELS	OPTIONS	

In order to handle larger SATURN systems, it is recommended to use several monitors. To allow this, the SATURN Studio II software is, just like the hardware, of a modular concept. A system status bar, comparable to the well known Windows task bar, enables you to keep track of up to four displays with up to 20 windows each. This way, setup and control, measured data and also analysis, all get sufficient space to be displayed.





Dynamic Software

During the development of the SATURN Studio II Software the simple usability of even complex systems always had the highest priority. Pre installed standard configurations can be expanded and stored with special configurations using defaults or specific buttons. Manual configuration allows any adaptation for experienced users; configurations can be stored on user and project basis. The Windows-like handling structure enables ease of use for both, smaller and larger systems, even for users that don't use the program on a regular basis. The look and feel of the SATURN Studio II is customizable to meet your demands. The advanced user can decide

on the operational structure and the functional range of the system. Collected data is stored either manually or automatically to the large integrated hard drive or any network storage. SATURN Studio II supports various data formats and provides direct link capabilities to powerful data-analysis software.



Compact SATURN control

Configuration

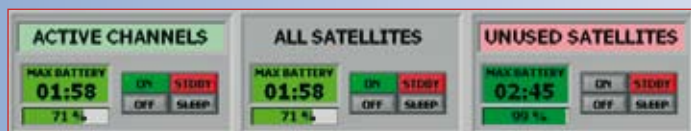


Configuration screen

Selection of channels, sample rates, memory length, input voltage range, external signal conditioning units and many more parameters can easily be configured with the SATURN Studio II Software. The more advanced user can "hide" functions when the system is used by less experienced operators to ensure maximum ease of use. Upon booting, the SATURN System automatically configures the latest settings or any user defined configuration, if required.

SATURN Studio II executes measurements and analysis automatically. You can completely focus on your experiments instead of the data acquisition system.

Satellites with optical fibers



Satellite battery management

The SATURN Studio II handles the Ultimate 160 Satellites seamlessly, the only difference from other modules being the additional display of remaining running time for the battery-operated satellites.

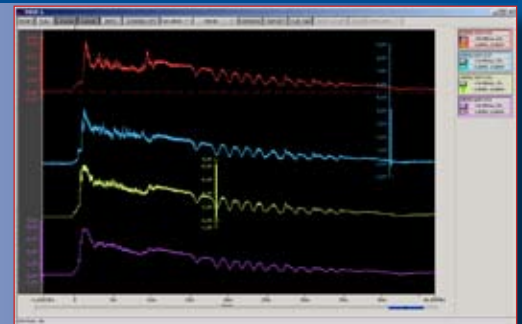
The fully-automatic battery management system reliably informs you of the satellite battery operating state. In case of low batteries, visual and acoustic warning messages inform the user and the SATURN measuring system cannot be activated.

Fast data display - Instant view in less than a second

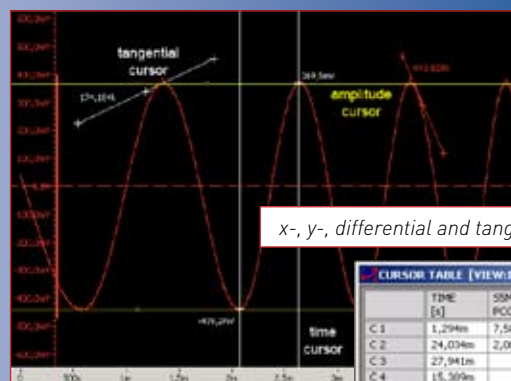
The completely revised viewer part of SATURN Studio II offers an unprecedented range of possibilities. The powerful data management even allows the display of hours and days of recordings within a split second, without any loss of information.

Each signal is displayed with individual scales and base lines. An information block for specific channel data is available for detailed overview. Popular Windows like zoom and pan operations are completed with sensitive auto-arrange functions.

For the data display, selecting a channel via drag-and-drop allows simple access to stored data, acquired signals or to math channels. Analog and digital signals collectively can be displayed synchronously. Along with this clear and high-speed display of large data sets, powerful cursor functions have been integrated for instant analysis. The tabular display of specific signal values and difference cursors allows for quick and easy reading and reporting of data. All values and results can be saved or transferred in a mouse click.



SATURN Studio II viewer



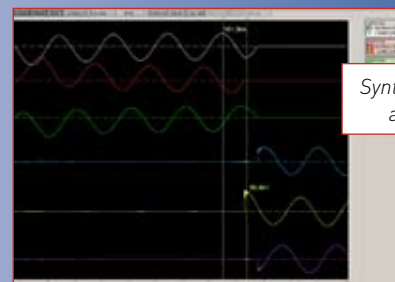
x-, y-, differential and tangential cursor

	TIME [s]	SOPDC#	S11RUC#
		BC21	YCODE
C1	1,294m	7,509	
C2	24,034m	2,007	
C3	27,941m		2,501
C4	15,309m		3,648
C1 <-> C2	22,741m	5,581	
C3 <-> C4	-12,552m		1,147

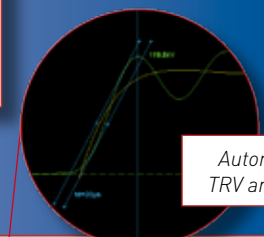
Analysis functions

The close coupling of powerful data analysis tools allows the user to analyze recorded signals online and to link them to individual reports and calculations. Diagrams, tables, and calculated results can be integrated directly into text processing and spread sheets (e.g. MS Word, MS Excel) by using the popular Windows clipboard or automated macros.

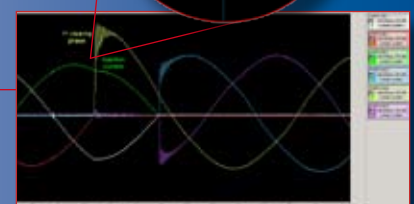
Powerful mathematical functions like FFT, digital filters, smoothing, integration, differentiation or statistical characteristic values etc. are optionally available. Printer optimized screenshots or complete measurement reports can either be printed out directly or saved in HTML or PDF format. Macro and script functions, a fast programming interface and 2D/3D reports further expand the capabilities.



Synthetic circuit breaker test according to EN 60427



Automatic TRV analysis



3-phase measurement





SATURN interface - API

Communication between the SATURN Studio II software and the system hardware is realized on a client/server structure. A server works in the background of the measuring system and transparently exchanges data and commands with SATURN Studio II. The software runs either locally on the SATURN System or connects via network. There is no difference in performance or speed, just perfect integration into established workflows. Simply manage the SATURN system from your desk via Gigabit LAN. Even multiple connections with individually limited functionality are supported. E.g. a SATURN Studio II master sets up the system for acquisition. Multiple SATURN Studio II viewers, running on different PCs on the network, can monitor the display of the acquired data and generate reports if wanted. The well documented application interface (API) SCI/SDI allows secure access to the SATURN System for your individual applications and perfect integration. It is designed to meet any user specification and to be integrated into grown software structures at your site.

Simple calculation

A perfect example of the enormous flexibility of the SATURN platform – technically and economically – is the unique “MultiSaturn” option. Several completely independent transient recorders can be operated simultaneously within a single SATURN mainframe. Not only does this save the space for further system boxes, but also “MultiSaturn” reduces the basic costs of the system up to 53%.



AMO analysis libraries

In order to support specific measuring tasks, AMO has developed customized data analysis and complete application specific solutions.

Do not hesitate to present us your special demands. We are happy to offer an integrated solution - customized to exactly meet your needs.

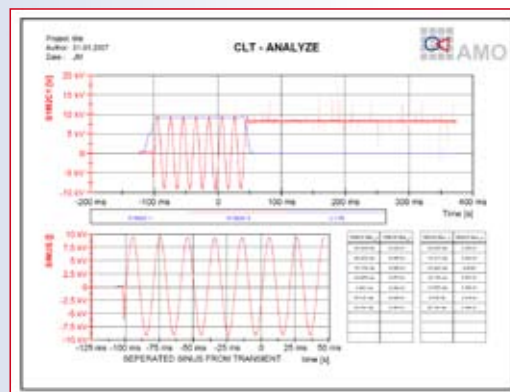
The following modules are currently available:

- **High Power Circuit Breaker Test**

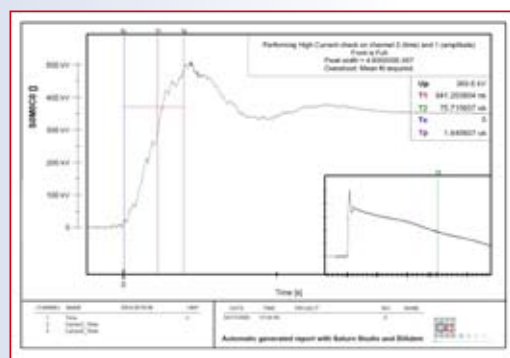
Automated analysis routines according to the STL (Short-Circuit Testing Liaison) Standard. It meets the demands of the IEC 60060-1 for tests of high current and high voltage switches for different test cases. No-Load, Short Circuit, Capacitive Load and Synthetic Test analysis are available.

- **Lightning Pulse Test**

We offer a complete analysis package according to IEC 61083-1; automatically assessing the parameters U_p , T_1 and T_2 within seconds. Printed reports or PDF files are instantly available after the measurement is completed.



STL compatible circuit breaker test analysis



Lightning pulse test analysis

> 1 Mill. Volt
isolation voltage
data display
in a split second



1 GByte memory
per channel

100 MS/s - 14 bit

+/- 100 V input

Best customer support





*Software integration
into existing solutions*

*Get further
information!!!*



Customer specific solutions - Tailor made

The use of the very latest in digital technology and data processing techniques allows the SATURN system the ability to be specifically tailored to your measurement needs. This high-end concept enables the AMO engineers to individually customize basic and advanced functions of the SATURN System.

AMO assists you in the development and integration of specific solutions.

Should you have any special requirements please contact us directly or via our representative network to discuss the possibilities.

SATURN

The New Generation Transient Recorder



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