

SIKORA^{EXTRA}

Wire and Cable Magazine



**SIKORA devices in their
white design**

SIKORA^{EXTRA}
Issue #3/2016
www.sikora.net

Special topic:
Structural Return Loss (SRL)
and FFT Frequency Analysis

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SIKORA Website Features
Variants of the X-RAY 6000
SIKORA introduces new CRM system

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SCORE WITH PRECISION.

Impressum/Publisher

Herausgeber/Publisher
SIKORA AG, BREMEN

Anschrift der Redaktion/Editor's Office
SIKORA AG, Bruchweide 2, 28307 Bremen,
Deutschland/Germany
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Next Events

■ wire China
Sep 26 – 29, 2016
Shanghai, China
Hall W1, Booth F62

■ Internationale
Maschinenbaumesse
Oct 03 – 07, 2016
Brno, Czech Republic

■ Wire & Cable India
Oct 05 – 07, 2016
Mumbai, India



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Dear customers, colleagues and business partners,

This summer was again devoted to football. Similar to the German national team, SIKORA bets on preparation, experience and training as well as the highest precision "Made in Germany". In a football game you might win titles with this strategy – our clients definitely win a reliable partner and the certainty to always achieve optimal production targets.

Score with precision and optimize your production process with our diverse measuring, control, inspection, analysis and sorting possibilities. Two successful devices are for example the SPARK 6030 HF and the PREHEATER 6000 TC. Both devices have been installed in many production lines all over the world and are continuously developed according to the increasing demands of the wire and cable industry. We have outlined in this EXTRA, which new features are available.

Stay on the ball, with our extensive service portfolio. Whether through the support of our employees at the headquarters in Bremen, Germany, at the SIKORA offices worldwide or directly at your production site – together, we will always reach the goal.

Contact us now for your individual consulting.

Enjoy reading!

Sincerely,

Dr. Christian Frank
CEO SIKORA AG

Harry Prunk
Member of the board SIKORA AG

STRUCTURAL RETURN LOSS (SRL) AND FFT-FREQUENCY ANALYSIS

Application of the SIKORA measuring devices

■ The production of state-of-the-art cable products, e.g. data cables, requires a constant monitoring of the cable diameter, concentricity and/or cable capacity with regard to smallest, periodically occurring cable parameter fluctuations.

These fluctuations may occur from irregularities such as a “pumping” of the extruder, imbalance of rotating parts, periodical fluctuations of the line speed, cyclic fluctuations of the foaming degree and/or periodical fluctuations of the conductor preheating.

Forecast of the return loss

The most commonly used method for

the quality control of data and high-frequency cables is the measurement of the return loss of a certain cable length as a function of the operation frequencies which are supposed to be transmitted on the cable. The Structural Return Loss (SRL) represents the relation – expressed in dB – between a fed signal and the re-reflected signal fraction along the complete cable length towards the entry.

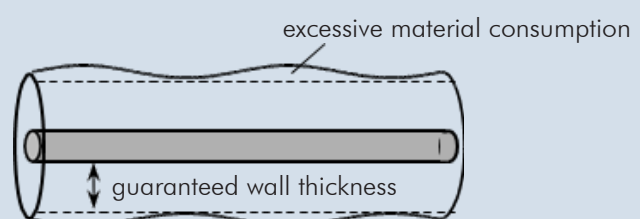
While reflections, caused by smaller randomly occurring fluctuations, may be neglected, reflections caused by periodical re-occurring cable parameter fluctuations should be detected and eliminated.

It becomes clear with the following estimation: Caused by irregularities of the production process, periodical re-occurring “dents” are pushed into the cable insulation with a gap of 10 cm in between. If a reflection of 0.1‰ of the fed signal is taken as a basis at each imperfection, a maximal total reflection of $1,000 \times 0.1‰ = 10\%$ can be estimated (neglecting the cable attenuation at 1,000 impurities at a cable length of 100 m). This complies with a return loss of 20 dB. This value sums up when the signals of all single reflections at the cable entrance are added up in phase.



Prof. Dr.-Ing. Werner Blohm, Professor for engineering sciences at the Jade University, Wilhelmshaven and free consultant of SIKORA AG:

“The usage of the FFT frequency analysis offers not only advantages for the production of communications cables. The manufacturer of other cables also benefits from this modern control tool if it is used to detect periodical occurring diameter fluctuations and if these fluctuations are eliminated in order to optimize the production process regarding material savings. As shown in the drawing, the consumption of the insulation material can be decreased to a minimum while a constant wall thickness is guaranteed.”



In order to optimize the cable quality as well as to reduce the scrap rate it is essential to search for the root cause of periodical fluctuations on the return loss of the finished cable at an



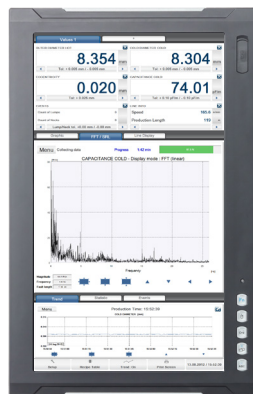
SIKORA CAPACITANCE 2000 Series – Capacity measurement at its finest with multi zones technology

early stage and to eliminate those by adjusting the production parameter. The online prediction of the return loss from short-term cable capacity data offers necessary information.

SIKORA concept: FFT analysis and prediction of the return loss in the gauge head

SIKORA offers a variety of measuring systems for the quality control of telephone wires, data lines and coax cables (e.g. CENTERVIEW 8000, CAPACITANCE 2000). Regarding the measurement accuracy, the measurement resolution and the measuring rate, all of these devices meet the requirements for providing FFT analysis and SRL predictions. Powerful digital signal processors are by default integrated in the gauge heads. On the basis of the computing power of the gauges, SIKORA is able to realize a

digital spectrum analyzer as well as a prediction of the return loss directly in the gauge head. This means, that the online calculation of the spectrum of cable parameter fluctuations as well as the online prediction of the return loss are executed at the same place where the input data (that is diameter, eccentricity or cable capacitance measuring values) is available with high chronological and amplitude resolution as well as high precision with minimal measuring value noise. A problematic (normally analog) transmission of high-rate single measuring values is not necessary.



At the vertical, 22" wide-screen monitor of the ECOCONTROL 6000, FFT analysis and production data are clearly displayed

For the cable manufacturer the complex installation, configuration and cabling of several single devices is not required. Furthermore, the risk of a distortion of the analysis results caused by the coupling of electromagnetic disturbances is reduced to a minimum as no broadband data transfer is necessary.



SIKORA CENTERVIEW 8000 – Non-contact concentricity measurement

Conclusion

The advantages of using a frequency analysis can be summarized as follows:

- (1) detection of periodical occurring defects early on in the production process,
- (2) feedback for the user in virtually real-time,
- (3) provision of helpful information regarding the sources of the periodical occurring defects and
- (4) impacts of the irregularities on the finished (data or HF) cable are directly displayed thanks to the return loss prediction.

In the next SIKORA EXTRA, you will learn how SIKORA measuring devices can help you to draw conclusions on potential error sources in the production line and therefore, guarantee the "condition monitoring" respectively "preventive maintenance".

SPARK 6030 HF SELF-TEST MODULE

Faster and easier exchange of calibrated circuit boards

■ According to European standards, openly operated measuring and testing equipment has to be checked regularly. Therefore, spark testers are tested with regard to the accuracy of the supplied high-voltage, the short circuit current and function (sensitivity). As already introduced in earlier editions of the SIKORA EXTRA, the SPARK 6030 HF offers (optionally) a 3-step self-test and calibration system including the SIKORA App for the mobile monitoring and analysis of the measuring results. As each test probe has to be calibrated, the testing module has to be controlled regularly as well. To support this process, SIKORA developed the module of the SPARK 6030 HF even further.

Development of the module

New is the easy to change module that combines all testing functions and which can easily be exchanged from an additional opening in the housing of the SPARK 6030 HF.

Calibration of the module

In order to meet the requirements of the ISO 9000:2000 standards, SIKORA recommends a yearly calibration of the spark tester by simply exchanging the test module. Due to the fact that all functions are directly mounted at the module, the complete module is exchanged for calibration – a submission of the complete device to SIKORA as well as the assignment of a service engineer is not necessary.

Safe operation

As for the previous version of the module, the sensitivity and short circuit current tests are generated. For the sensitivity test, 20 discharges are simulated in 20 seconds. All of these discharges have to be completely detected by the spark tester. For the short circuit current test, an error caused by the contact of a user and the bead chain electrode during the operation is simulated. Here, a defined value must not be exceeded in order to guarantee the safety of the user. The calibration module measures continuously the accuracy of the testing voltage. The standard for spark testers requests an accuracy of $\pm 5\%$. The test is successful if this criterion is met.



SIKORA SAYS THANK YOU

wire 2016 and Wire Expo – two successful exhibitions

■ 2016 is a special year for SIKORA. With the introduction of a new Corporate Design at the beginning of the year, the traditional company has a new appearance. Numerous visitors at the wire in Düsseldorf, Germany (from April 4th to 8th) and the Wire Expo in Uncasville, USA (from June 8th to 9th), were able to discover the new SIKORA design as well as the corresponding booth concept.

At the wire, an increase in the number of visitors of 17% was registered and also at the Wire Expo numerous visitors stopped for information at the booth – a fact, which is tracing back to an increasing interest in the innovative SIKORA solutions.

Exhibitions such as the wire 2016 and Wire Expo offer opportunities to exchange views with customers and interested visitors, allowing us a better impression of visions and requirements of the market.

We would like thank you for the confidence you place in us and the long-standing loyalty. At SIKORA we put the focus on our customers and your satisfaction is our highest priority.

Your SIKORA exhibition team



SIKORA DEVICES NOW IN WHITE COLOR

■ Since the beginning of this year, SIKORA has been displaying a new design that has been developed in the context of a uniform corporate design relaunch. White and blue precision is the integrated communication concept. With redesigning all of the communication media such as the website, brochures, product advertisements and exhibition booths the claim to innovation for SIKORA products and services shall also be expressed in communication. Many customers could already receive a first impres-

sion of the new appearance during the wire show 2016 in Düsseldorf.

With the launch of the new design also the color of the SIKORA systems was changed. As the devices of the FIBER Series 6000 and LASER Series 6000 have already presented themselves in white color for some years, all the other devices will also be delivered in white, as standard, from now on. In this way, the product design represents a seamless fit into the new SIKORA corporate appearance.

Another advantage: Soiling from lime residue of the cooling water is the least visible on white paint.



SIKORA WEBSITE

Four features you should know about

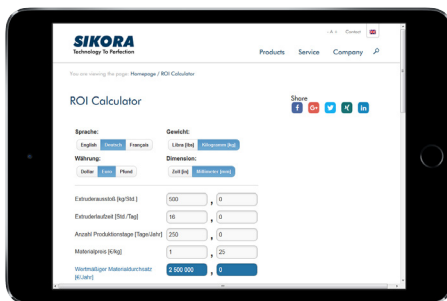
■ With the new SIKORA Corporate Identity (CI) and the belonging communication media, SIKORA offers customers even more service and support. Here are four features, to be found on the company website, that make the cooperation as well as the usage of the measuring devices even more effective.



Support and Spare Part Request

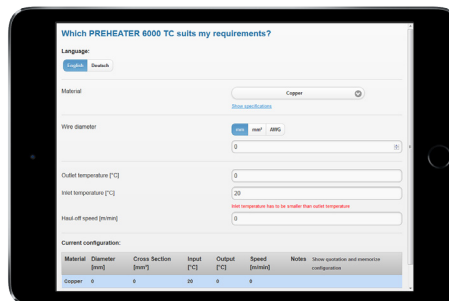
At www.sikora.net/services customers can find an overview of the most important services by SIKORA. Discover how SIKORA supports you at the installation and commissioning, with maintenance and calibration and even trainings. A special highlight is the support and spare part request. Send your support or spare part request directly and easily to the SIKORA service department – at any time.

Simply fill in the form on the webpage and a service engineer will contact you as quickly as possible. Your advantage: Thanks to your input, the SIKORA employee gets prepared before the first contact and is familiar with your data to provide a fast and custom-fit consultation.



ROI Calculator

Investments must pay off. SIKORA measuring and control devices help manufacturers of wires and cables to reduce the material consumption to a minimum and to avoid rejects caused by errors during the production by using real-time measurements. Find out at what point the SIKORA X-RAY 6000/PRO pays itself off in your production line by using the Return On Investment (ROI) calculator at www.sikora.net/roi.



Power Calculator

SIKORA offers three different models of the PREHEATER 6000 TC for the non-contact measurement of the conductor temperature. Calculate which model fits your production line with the power calculator. Enter your specific production data at <https://www.sikora.net/ph-calc2/index.html> or on the PREHEATER 6000 TC product detail page to get your suitable device suggestion.



SIKORA App

With the SIKORA App for the gauge heads of the LASER Series 6000 or the SPARK 6030 HF you are always able to retrieve all important production data (measuring values, trend, statistics, video signals and product position within the measuring area as well as test voltage, number of breakdowns and bare patches) in real-time. Download the free iOS or Android version at www.sikora.net/laser6000 or www.sikora.net/spark and connect your smartphone directly to your SIKORA gauge head.

PREHEATER 6000 TC – NEW FEATURE

Electromagnetic break for short circuit pulley

■ A reliable conductor preheating is the basis for an optimal adhesion of the insulation on the wire respectively a controlled foaming during the manufacturing of cables, especially data and automotive cables. With the PREHEATER 6000 TC (Temperature Controlled), SIKORA offers an innovative solution for the precise pre-

heating of the conductor, which is the basis for a high-quality cable production and therefore, a solid control of the processes.

Electromagnetic break

SIKORA is now offering the preheating systems with an electromagnetic break that automatically stops the

short circuit pulley, on which the heated wire is led, if the wire for example breaks. The new feature contributes to safety and process optimization during the cable production.

The PREHEATER 6000 TC – Now with electromagnetic break



SIKORA X-RAY 6000 / 6000 PRO

Wide-ranging applications for the highest precision in all lines

■ The varied diameter possibilities of the SIKORA X-ray measuring systems X-RAY 6000 and X-RAY 6000 PRO for the exact definition and control of the diameter, the wall thickness, the concentricity as well as the ovality, cover the requirements in almost every cable production line.



X-RAY 6070 und 6120

The insulation of wires and the jacketing of cables and optical fibers are subject to the highest quality demands and standards which have to comply in order to ensure the safety and economical production. For diameters from 6 to 110 mm the X-ray measuring devices **X-RAY 6070** as well as the **X-RAY 6120** are suggested.

Diameters from 0.05 mm

For a cable with a diameter from 0.05 to 25 mm, SIKORA offers the non-contact measuring systems of the CENTERVIEW 8000 series. With its 8-point eccentricity, 4-axis diameter and 8-point ovality measurement, the compliance to specifications – especially for the automotive and communication industries – are guaranteed.

Which X-RAY 6000 fits my production?

For always consistent processes respectively applications during the production of single layer cables of the same type where the focus is not on the visualization of the measuring values, SIKORA recommends the X-RAY 6000.

For production lines where different products are produced and, due to more material layers, line sensors with a higher resolution are needed, the X-RAY 6000 PRO is the right choice. With the standard included display and control device ECOCONTROL 6000, the data is clearly displayed and saved for following analysis. The processor system is also used for the automatic control of the line speed, respectively the extruder rpm and guarantees the compliance with the determined specifications.



Quality in its perfect form.

With passion, we develop future-oriented measuring and control devices for quality assurance of wires and cables, such as the **X-RAY 6000 PRO**. An innovative solution with X-ray technology that precisely measures all product parameters, increases product quality and saves costs.

- high quality products by continuous measurement of wall thickness, concentricity, diameter and ovality of up to 3 different material layers
- automatic control under consideration of minimum values in combination with powerful processor systems
- repeatable processes



www.sikora.net/xray6000



Visit us from September 26-29, 2016
at the wire China in Shanghai.

Hall W1, Booth F62

EXTENSIVE SERVICE OFFER

Jörg Hischer and Maximilian Bövingloh, Director Services and Director Global Customer Service SIKORA AG, about the SIKORA Service

■ Mr. Hischer, you are responsible for the development and organization of the SIKORA maintenance programs. What is the essential advantage for customers who decide for a maintenance program?

Hischer: The most common reason for a customer to opt for a SIKORA maintenance program is the awareness to have a competent partner who supports customers in every situation. SIKORA offers different versions of the programs depending upon device, production line and contract terms – but all of them have one thing in common: SIKORA takes care of the complete planning and performance

of all occurring tasks from the regular maintenance and calibrations to the professional exchange of parts.

Mr. Bövingloh, you have been organizing the international assignments of SIKORA field service engineers for more than seven years now. What are the most requested services by customers?

Bövingloh: Our service for “Maintenance and Calibration” is especially requested as many of our customers have outsourced this tasks. SIKORA devices are used daily for many years and are key elements for the control and optimization of the extrusion pro-

cesses. The task of a preventive maintenance has in this respect the highest importance. At SIKORA, we endeavor to support customers with our competence and solutions. Therefore, even a negative situation can become a positive experience for the customer.

Which other services does SIKORA offer?

Bövingloh: Our service portfolio covers all customer requests perfectly. Already prior to the purchase of a device, we support our customers by consulting them regarding suitable technologies and the best position of installation. After the purchase

Maximilian Bövingloh and Jörg Hischer, Director Global Customer Service and Director Services SIKORA AG, in the interview:

„Our service portfolio covers all customer requests perfectly.“



SIKORA Service portfolio



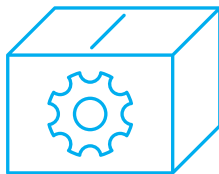
Installation and Commissioning



Maintenance / Calibration



Trainings



Spare Parts



Consulting



Support/Spare Part Request

of the device, naturally, we offer the professional *installation and commissioning* that is often combined with a *user training* in order to guarantee the most effective usage. In addition to *repairs*, we also assist our customers via phone *support* and have always the matching *spare part* for our customers' systems in stock. As SIKORA devices have often been used for more than a decade, they can be updated to the state-of-the-art condition with *upgrades/refurbishments*.

When it comes to service assignments, planning and preparation are probably just as important as the actual performance. How do you ensure that all information is taken into account?

Bövingloh: Our colleagues have long-standing experiences and know how to prepare optimally. Furthermore, our service engineers are able to access extensive documentation from former assignments that are documented and filed after task completion. Product specifications, system parameters and much more information regarding the production site of the customer are saved in our in-house database. This database has continuously grown since the establishment of the company and was recently brought up-to-date by the introduction of the new CRM system.

Hischer: Obviously, detailed error descriptions from the customer are very helpful when preparing for the

job. This is also a reason why we introduced our new support and spare part request form on the SIKORA homepage. With this new platform, the customer is able to reach us at any time and can already summarize important information regarding his requirement. Directly after entering the type of equipment and the serial number, the needed spare part can be chosen. A free field to describe the request as well the possibility to upload a picture for example, enable our service engineers to prepare optimally for the planning discussion and possibly the quotation.

FUTURE-ORIENTED CUSTOMER COMMUNICATION

SIKORA introduces new CRM system – for more transparency worldwide

■ For a company such as SIKORA, good customer communication and loyalty are essential. Hence, the step towards a global uniform communication database was a logical consequence. In 2015, the Customer Relationship Management (CRM) system was introduced. The software was individually tailored to the specific requirements of SIKORA and is today the core of the sales and service customer communication in Bremen, Germany – by 2017, all SIKORA offices worldwide will be connected.

In the era of mass production and mass processing, many companies risk losing customers due to

increasing impersonal contact and insufficient support. Therefore, company processes and concepts were developed early on, to counteract this trend. One example for such a concept is the introduction of the Key Accounting – the “one-contact-person-philosophy”. For SIKORA this concept has been common practice for many years.

Advantages for the customer – Transparency

The usage of a global company database implies enormous time savings, especially for customers. If the personal contact person cannot be reached, every employee is able to attend the customer wishes and needs fast and targeted by using the back-

ground information and history provided in the system. This guarantees a high reaction speed.

Advantages for the customer – Quality Management

Since the connection of the service department to CRM at the beginning of the year, SIKORA service engineers have access to the central database and all product information of a customer, they retrieve former travel and repair reports and foresee and plan eventualities of the task. Furthermore, the automatic device administration provides a detailed overview of all SIKORA products worldwide allowing online conclusions regarding the Mean Time Between Failures (MTBF) and supports new and further developments of the measuring systems.



Sonja Hülscher
Project Manager SIKORA CRM

“CRM integrates and optimizes inter-divisional all customer related processes and therefore, helps us to focus on the relationship with our customers even more.”

Advantages for the customer – Centralization

With its offices and permanent representatives on all continents, SIKORA serves customers worldwide. Furthermore, the measuring and control devices as well as inspection, analysis and sorting systems are used in the wire and cable, hose and tube, optical fiber and plastics industries.

Therefore, the connection of sales, service and marketing data was focused during the establishment of the SIKORA CRM.

Advantages for SIKORA

In addition to more efficient customer support, resulting from the usage of centralized data, SIKORA and its customers benefit especially from leaner

and effective processes that positively affect the time and costs management. Furthermore, the connection of the offices worldwide provides process optimizations due to a uniform internal communication structure.

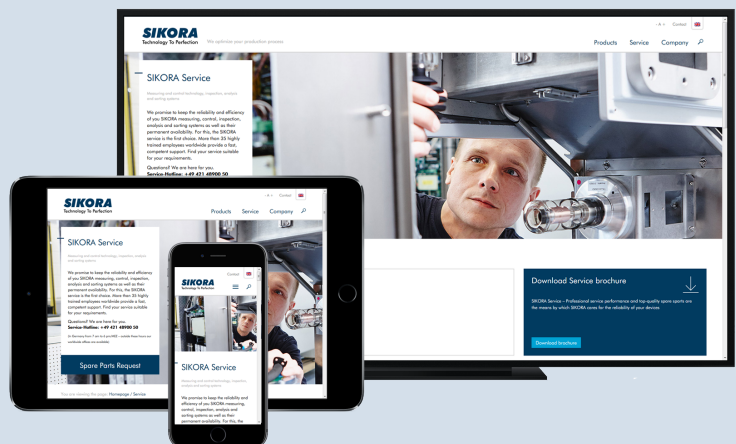
RAFFLE

Your opinion is wanted

On page 8 of this EXTRA edition, we introduced four important features of the new SIKORA web-site.

In order to keep our support always up to date and oriented to your requirements as well as to guarantee the best service and support in every situation, please send us your feedback, suggestions for improvement or critique regarding these features.

Each submission participates automatically in the raffle.



Send an email with your suggestions, praise or critique by September 16th, 2016 to:
communications@sikora.net

Fitting the football summer, we will draw one of three Weber Smokey Joe charcoal grill

(Picture similar)



Each correct answer takes part in the raffle. Employees of SIKORA AG and SIKORA Holding GmbH & Co. KG and their relatives are not allowed to participate. Each player can only participate once. We value the first e-mail, all subsequent e-mails will be considered invalid. The legal process is excluded.

Good luck!

The correct answer of the last raffle was:

LASER 2100

Congratulations to the winners!

- Dennis Belzer
- H. Moghimi
- David Graff

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Technology To Perfection

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