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Spring 2008



SPECIAL REPORT

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Solutions

Energy efficiency

Market

Testing on pylons





115 years of innovation and discovery!

In March 2008, the Chauvin Arnoux Group will be celebrating its **115th anniversary**. An important date for our company, founded in 1893, which has grown gradually across the centuries by adapting to the market's requirements, while constantly monitoring the newest technologies and drawing on its recognized expertise.

Today, as a major player in its sector of activity, measurement, Chauvin Arnoux offers an extensive range of products thanks to its successive takeovers of Enerdis, Pyro-Contrôle and Metrix: from core multimeter applications, temperature control, via energy management and metering, right through to oscilloscopy. In this way, Chauvin Arnoux covers a broad spectrum of customers, from self-employed electricians to major governmental and industrial accounts.

Does that mean Chauvin Arnoux is a little old lady of more than a hundred? Not quite! Because Chauvin Arnoux is first and foremost a fountain of youth for its founders, as well as a focus for the energy of the men and women in the company.

Chauvin Arnoux means **115 years** of growth with a presence on all the continents and ten subsidiaries in Europe, Asia, North America and the Middle East.

It means **115 years** of inventions, from the universal tester, the ancestor of the multimeter, in 1927 (patent registered), the transformer clamp in 1934, which was the first clamp-on ammeter, and the first single-switch, single-dial universal tester in 1960, to the high-safety cut-out relay in 1969!

115 years of modernity and design, rewarded with the Prix de l'Innovation in 1989 and, successively in 2006 and 2007, the Yves Rocard Prize, the Etoile du Design (design star) prize, the Electron d'Or (golden electron) awarded by the profession, followed by another design prize.

115 years of investment, in the construction of a new head office in Paris in 1993, in new production equipment, in the development and design of major products, in the opening of a new subsidiary, in the construction of a new site, etc.

Recently, on 13th December 2007, in the run-up to its **115th anniversary**, Chauvin Arnoux inaugurated its brand new site at Lyon-Meyzieu as the head office of its French subsidiary Pyro-Contrôle, as well as a local technical centre for Manumasure, our Service division, and sales agencies for the French subsidiaries Enerdis and Test and Measurement. The buildings offer a floor area of 3,400 square metres for an investment of 3 million euros, to meet our customers' requirements and allow us to welcome them in better conditions

Winthrop SMITH

Chief Executive Officer, Chauvin Arnoux

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SPRING 2008
Print run: 6 500 copies

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A few kilometres outside Lyon (Rhône Alpes region), construction of the Chauvin Arnoux Group's new site at Meyzieu has now been completed.

The **3,400-square-metre** building houses the head office and production facilities of the Group's French subsidiary Pyro-Contrôle, which specializes in temperature sensors and thermal control processes. Pyro-Contrôle's teams moved in at the end of August 2007, but the local Manumasure technical centre and the local sales teams of Enerdis and CA-Test and Measurement only arrived in mid-November.

These last two subsidiaries are specialized, respectively, in energy metering and management equipment, and in portable measurement instruments. Their respective head offices remain at Montrouge for Enerdis and in the 18th Arrondissement of Paris for Chauvin-Arnoux-Test and Measurement. With the arrival of the local agency of Manumasure, the Group's service and metrology subsidiary, there are now around eighty people working there. This new site offers the advantage of a prime location three hundred metres from the T3 Tramway terminal and just a few minutes away from the exit from Lyon's eastern ring-road, as well as from Lyon-Saint Exupéry airport. It represents the latest step in the Group's strategy to seek synergy and complementary skills, at a shared address: 6bis-8, Avenue du Docteur Schweitzer, 69330 Meyzieu, France. The telephone details of each local agency remain unchanged.

CHAUVIN ARNOUX invests 3 million euros in the construction of a new site near Lyon



Chinese site



The Group's internet site has been translated into Chinese. After the French, English, Italian, German and Spanish versions, international internet users can now find out about the Chauvin Arnoux Group's products in Chinese.

www.ca-group.com.cn

Trade fairs in 2008

Show	Subsidiary	Dates	Place
Fiera Expo Ferroviaria	CA Amra	20/05 to 22/05/08	Turin
Rebuild Lebanon	Camie	03/06 to 07/06/08	Beirut
BELEKTRO	CA GmbH	15/10 to 17/10/08	Berlin
Matelec	CA Iberica	28/10 to 1/11/08	Madrid
ELECTRONICA	CA GmbH	11/11 to 14/11/08	Munich
Nord Elektro	CA GmbH	20/11 to 22/11/08	Hamburg



A Real Box of Tricks: the new METRIX® Oscilloscopes!



Even more compact than their predecessors and just as complete, the new METRIX **SCOPEin@BOX** oscilloscopes are now available. These digital laboratory oscilloscopes are virtual instruments without a display and are simply connected to a PC.

Ergonomics

The **SCOPEin@BOX** models are genuine "oscilloscopes in a box". This means they are easy to use, transport and set up. Compact and lightweight, these virtual measurement instruments have stackable casings and operate via PC software. They are connected directly to a PC via a USB interface. In this way, users can take advantage of the PC's display and storage capabilities. Accessible to everyone, the Windows environment makes the oscilloscope simple to use.

Display

The **SCOPEin@BOX** models offer multi-windowing and simultaneous display of the traces, zoom, FFT analysis, measurements, etc. This means users can choose a wide range of combinations among:

- "X(t)" traces according to a single or double time base,
- "Advanced Math" functions
- X(t) and XY simultaneously

- X(t) and FFT simultaneously
- X(t) in SPO (Smart Persistence Oscilloscope) mode
- Measurement cursors
- Harmonic analysis
- Simple recording mode or recording with capture of 100 faults using a double time base. The use of the PC screen as the display (minimum resolution 1024x768) makes the curves more accurate and clearer.

Comprehensive functionalities

Developed from the **MTX Compact** range, these oscilloscopes provide the same performance. They are simultaneously oscilloscopes with FFT analysis, Harmonic Analysers and Recorders. The **MTX 1052** has **2** input channels, whereas the **MTX 1054** has **4**. Their bandwidth is **150 MHz** and the sampling rate is **200 MS/s** in one-shot mode and **100 GS/s** in repetitive mode. The two models offer advanced trigger modes and the SPO display mode. The "Advanced Math" functionalities are also included in these oscilloscopes.



Using Ethernet or WiFi, the **SCOPEin@BOX** models operate with a desktop or laptop PC and can communicate through walls...

Simplified use

In a Windows environment, all the **SCOPEin@BOX** functions are directly accessible using the menus and the Windows toolbar. Users control the oscilloscope by means of the "instrument" control panel. This contains a list of the commands, which are identical to those on a normal oscilloscope: instrument, vertical, trigger, measurement, etc. "Unlimited" storage of the measurements can be carried out by simply saving files.

Communication

The **SCOPEin@BOX** models benefit from a universal 10 Mb Ethernet local or remote communication mode. The firmware updates will be automatic. With just one or two clicks, it is possible to export the results into Excel and print them in Word. Thanks to the "Web server", users can control the oscilloscope remotely without special software or exchange files via FTP very simply.

Reader service n°1



METRIX® Oscilloscopes,

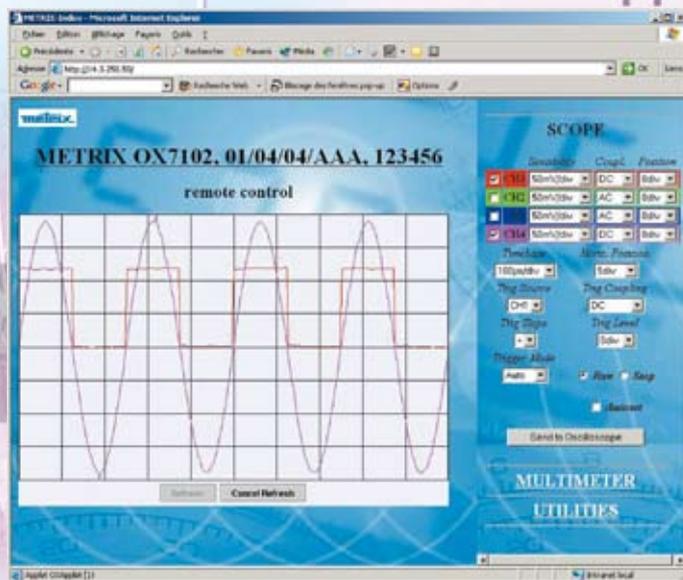
at the cutting
edge of
technology

Metrix® is developing new expert functionalities for its oscilloscopes in the **Scopix, OX 6000, MTX Compact & SCOPEin@BOX** ranges. Responding to its customers' needs, Metrix® is boosting the performance and communication capabilities of its oscilloscopes.

Established as standard by Metrix, real-time multi-channel FFT analysis of the signal is available on all the models in the MTX Compact and Scopix ranges. These oscilloscopes also offer harmonic analysis, as well as

multimeter and recorder functions, allowing a large number of automatic measurements in real time.

Control screen for Scopix oscilloscopes on web server, accessible via Ethernet or Wi-Fi



A new technology serving innovation

SPO "Smart Persistence Oscilloscope" acquisition and display

This is a revolutionary principle combining the advantages of analogue and digital oscilloscopes. Signal parameter acquisition is optimized. By means of an FPGA circuit, parallel, independent management of the display and acquisitions allows the number of acquisitions/second to be increased up to several tens of thousands per second! In this way, dead time in the observation of the signal is reduced. Equipped with a **high-performance algorithm**, the SPO display mode shows the 44,000 points of the bitmap. Smart display at last!

Thanks to SPO, users can detect brief events, instabilities and one-off anomalies, notably by adjusting the persistence time for the points acquired on the screen (100 ms to 5 s). A considerable improvement on analogue persistence, it simplifies the interpretation of recurrent events and allows display of rare phenomena (e.g. timing infraction on digital bus, transients, glitches).

Advanced trigger modes

As well as classic edge triggering, the MTX Compact and SCOPEin@BOX offer users a wide range of advanced modes:

- Pulse, trigger on pulse width
- TV, trigger on a TV signal
- Delay, trigger on edge with delay
- Counting, trigger on edge with event counting

New! The Scopix models now include triggering on thresholds, automatic measurements and recording of anomalies.

All these new functionalities make it possible to study the signals more closely and refine the capture of events, however brief, so that the accuracy of the result can be optimized.

Other innovative functions are now within everyone's reach: scaling on all four channels with direct reading and the physical unit of the signal; a mathematical complex-functions editor; up to four curves on screen simultaneously and "Winzoom", the most effective vertical and horizontal trace zoom function on the market.

In terms of performance, these oscilloscopes offer sampling rates of 200 GS/s in one-shot mode and 100 GS/s in ETS mode for 50,000 points in

memory. They can also detect transients up to 10 ns and are equipped with bandwidth-limiting filters from 1.5 MHz to 5 kHz.

Communication

The **Ethernet** network interface with HTML server solves the problems linked to distance in industry, as well as in the education sector; when the machine rooms and classrooms are separate. This local or remote communication mode allows the development of new working methods which are quick, efficient and comfortable. To use this method, all the equipment (printer, PC, etc.) must possess an IP address. Once this has been done, data transfers and exchanges are handled very simply by the WEB server alone, without any need for additional software.

With the Ethernet interface, it is simpler to transfer the measurements onto a PC. It is also possible to display the curves in real time with an overhead projector, which is very important for educational applications in particular.

The **MTX Compact, Scopix** and **SCOPEin@BOX** models are equipped as standard with the Ethernet 10Mb communication interface with integrated HTML server.



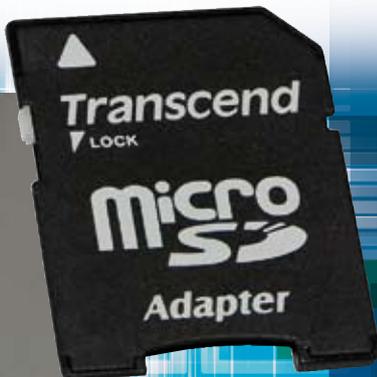
Thanks to the Ethernet network interface, these Metrix oscilloscopes can be controlled remotely without additional software. This opens up a wide range of possibilities, including saving an unlimited number of files onto your PC's hard disk via ftp (file types: trace, text, config, function, printing, etc.)

With the advances in communication technology, the idea of distance is becoming "virtual". Instruments which currently communicate via Ethernet will have no trouble adapting to communication via **Wi-Fi** in a future wireless environment.

Reader service n°2

NEW!

A memory boost for the OX oscilloscope!



Extension of storage capacity

Equipped with a removable SD card, the **OX 6000 SD** models enable users to store all the data (reference curves, instrument settings, screenshots) up to **2 GB**. The adapter simplifies data transfer onto a PC.

At the same time, the memory depth of the **Scopix** models is being increased to 50 k.

Warranty!

The OX 6000 SD versions benefit from a **Life-time Warranty** (as defined by the conditions of application).



Thermographic camera for accurate analysis of your measurements

Ergonomic, compact, rugged and leakproof, the new **RayCAM thermographic camera** from Chauvin Arnoux® offers unrivalled simplicity of use. The **C.A 1884** proposes top-of-the range performance at a highly attractive price.

Applications...

Designed for **preventive maintenance**, this instrument provides all the measurements needed to draw up comprehensive maintenance reports, whether electrical, electronic, mechanical or more oriented towards building thermics. The RayCAM is also ideal for R&D and production applications, notably due to its IP 54 casing. While remaining attractive to industry and self-employed electricians, the **C.A 1884** will also interest the technical and technological education sectors because of its excellent **Quality/Price ratio**.

Ergonomics

With its pistol shape for optimized handling and direct access to the functions for one-handed operation, a genuine effort has been made to simplify its use. Thus, if you press the trigger once, the laser sight quickly targets the area to be inspected.

As well as a **multi-directional colour screen**, there is also a second LCD screen which displays the value of the point targeted by the laser sight for an instant result.

↖ For additional reports and analyses, connect the RayCAM to your PC

Accurate measurements and realistic analyses

The **C.A 1884** offers a feature to boost accuracy which is unprecedented in measurement instruments of its category: the possibility of adjusting all the parameters influencing the measurement: the measurement distance, the relative humidity, the ambient temperature and the emissivity. Parameterization of an alarm enables you to save additional time by directly isolating the sensitive zones. With its **storage capacity of 1,000 radiometric images** and **measurements starting as close as 10 cm away**, it can be used to search for the hottest or coldest point automatically.

For even more accurate processing and to produce the inspection report, the **C.A 1884** can be connected directly to a PC using a USB cable.

The **RayCAM Report software** can be used to analyse the measurements and create customized reports in Word. This ergonomic software is so simple that anyone can use it. The user selects the thermogram to be analysed among those recorded, and then places it directly in the required position in the Word page. The toolbar gives direct access to all the software's functionalities:

- cursor positioning,
- thermal profile,
- colour palette, etc.

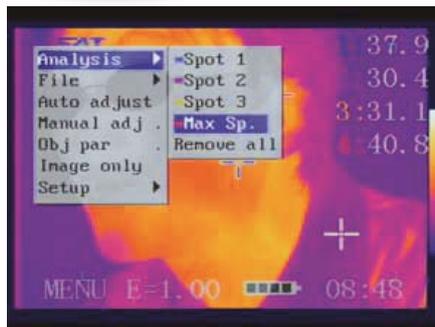
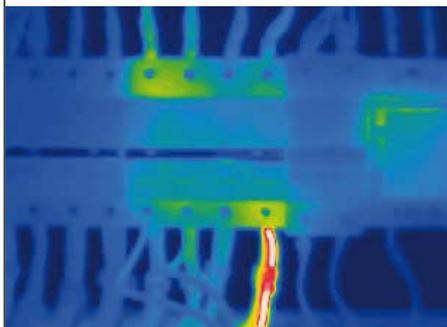
The software also offers the possibility of integrating logos, images, text boxes, tables, etc.

For accurate, realistic analyses, RayCAM Report allows analysis on a specific zone (square or circle), ideal for parameterizing the thermogram according to the different emissivity values which vary depending on the material.

Accessories to make your life easier...

The RayCAM is equipped with rechargeable batteries and a sunshade to ensure good legibility outdoors. A tripod adapter enables the camera to be fitted on a standard tripod: ideal for hands-free use, for continuous recording of engine heating or simply for temperature monitoring in a room. To process the data on a PC, the user has the RayCAM Report software.

Reader service n°3





Bluetooth®: communication "through walls" for industry

Pyro-Contrôle has developed a radio modem using the Bluetooth® wireless communication technology: the "BLUETOP 100".

The primary objective was to set up a local wireless network providing reliable, secure data transmission. The BLUETOP 100 is designed to work in industrial environments, using a point-to-point link; it replaces the RS485 or RS232 cable links to a range of 100 metres or more. This is the solution chosen at STTS and TTM for remote control of temperature mapping in their furnaces

The idea of monitoring the temperature changes in furnaces using a PC with wireless transmission has now become a reality at STTS and TTM. Mr. Richard Rollin, the head of the Methods Department for these two heat-treatment companies, had been thinking of trying it for a long time. Now, with the Bluetop solution, he can monitor the operations to check furnace temperature homogeneity from his desk, saving time and improving supervision.

STTS (Société des Traitements Thermiques Savoyards) and TTM (Traitements Thermiques Marquet) use around fifty furnaces to heat-treat bar-turned parts.

Temperature mapping of these furnaces needs to be carried out periodically in line with the quality procedures. The temperatures involved range from 160 to 930 °C, depending on the furnace; the tests are carried out at two or three temperature setpoints maintained for two hours.

After installing five temperature probes at different points in the furnace, the mapping involves checking, for each setpoint, that the maximum deviation between the measurements does not exceed 10 to 20°C. Another crucial test: the difference between the setpoint temperature and the average of the measurement points in the furnace must not be greater than 5 to 10 °C.

For each of these furnaces, completion of these operations takes a whole day: installation of the sensors, heating to temperature and then recording of the measurements and tests.

Saving time

Before they adopted the Bluetop 100 solution, the measurements were recorded on a data acquisition system located close to the furnace. This meant they had to go regularly to check the equipment to make sure that the mapping was proceeding satisfactorily. With the Bluetop 100, they don't have to go back and forth like that any more.

When developing the Bluetop 100, Pyro-Contrôle adapted the Bluetooth® wireless technologies to meet the requirements of industry, particularly in terms of reliability and easy implementation. Connected to the recorder via its RS-232 port, the first modem communicates by radio with the second modem which is linked to a PC.

Richard Rollin comments on the advantages of this technology: "It allows me to devote my time to other tasks while the measurements are made in the furnace. I simply check the PC screen occasionally to monitor the progress of the measurements and make sure that everything is going satisfactorily. I am alerted immediately if a furnace stops heating,

whereas before, the only way I had of finding out was to go and check on site. This solution also helps me to optimize the temperature setpoint changes and obtain homogeneous temperature plateau times. There are alarms which notify me when the furnace achieves thermal homogeneity so that I can then go and change the setpoint value".

He is even hoping eventually to control set-point changes in certain furnaces remotely via the Bluetop modem.

Reliable communication

For data transmission, the Bluetop 100 uses the FHSS (Frequency Hopping Spread Spectrum) digital radio-communication technology, operating at 2.45 GHz. This technology offers good immunity to electromagnetic disturbances.

Richard Rollin appreciates this feature: "I've been impressed by how reliable communication is, despite the metal furnace shells, the power cables supplying the furnaces and the large number of metal frameworks and stanchions on the site".

Transmission takes place without any problems even though, depending on the furnace, there may be up to six walls separating the recorder from the Method Department Manager's office.

Overview of the Bluetop 100

The BLUETOP 100 is a "plug and play" product: it can be installed quickly and is particularly simple to implement. It can be mounted on a DIN rail and is powered by the 230 V mains supply. Its consumption is less than 2 VA.

The transmission distance depends on the antenna chosen: range of 10 m with the internal antenna, 100 m with the omnidirectional antenna and up to 1 km with the directional antenna.

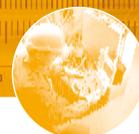
The BLUETOP 100 is delivered with its PC configuration software (in French and English) so that it can be adapted to its environment: pairing of two products, data encryption, etc.



➤ The Bluetop 100 modem is connected to the Pyrotracer Video recorder via its RS 232 port and communicates by radio with a second modem connected to a PC.



Reader service n°4



Reduce your energy spending with an upgradable system which is reliable, accurate and long-lasting

Energy spending reductions, an important economic issue for businesses whatever their sector of activity, are increasingly in the news. The automotive industry, a major energy consumer, is used as an example for the case study presented here, with the aim of reducing the energy costs directly related to production by at least 10 %, while guaranteeing a return on investment in less than 18 months and achieving implementation of a solution within 3 months. A challenge which posed no problems for Enerdis.

Mapping consumption

After the installation of 25 power monitors on the MV/HV transformers and the retrieval of the information on more than 75 water, gas and electricity meters via 20 communicating pulse concentrators, it was essential to set up a system for remote metering and analysis of multi-energy consumption in order to:

- identify energy-hungry areas,
- detect losses and consumption peaks,
- diagnose the potential sources of savings,
- determine the action to be taken.

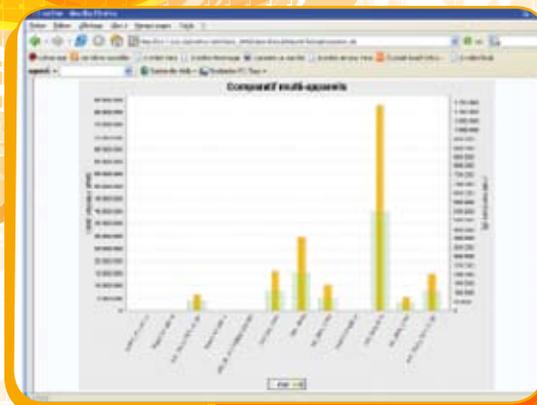
Consuming better

Benefit from sufficient energy in terms of quantity and quality while controlling your bills. With a system for gathering and supervising data on energy distribution and consumption, you can assess the effectiveness of the action taken to achieve savings by managing and allocating the costs by cost centre (daily balance sheets in monetary and energy units).

The system installed can thus be adapted to all the functions in the company, including maintenance, production and financial management.



Analysis of consumption to identify potential sources of savings



Monitoring of the site's electrical consumption

Results

➤ An **11 %** reduction in energy consumption

➤ **4,825,000 kWh** less

➤ Gains worth **€ 270,000**

The equivalent of 35 days' consumption for production

Reader service n°5

For your difficult environments, our on-site multimeters tailored for your requirements



Drawing on its know-how, METRIX® has designed a new range of toughened multimeters for all professionals working in difficult environments

The **MX 20HD, MX 44HD, MX 58HD and MX 59HD** are **toughened** multimeters specially designed for use in environments where water, **humidity** or **dust** make it necessary to use **leakproof, resistant measurement instruments**.

From **electricity to electronics** and from **Education to Industry**, the new multimeters in the Heavy Duty (HD) range meet the requirements of professionals in the agri-food sector, cement works, paper mills, mechanical industry, transport, etc.

Equipped with a proven **IP 67** casing which is rugged and **leakproof**, these new **METRIX®** digital multimeters are made using **self-extinguishing materials** and, for greater safety, their **battery/fuse compartment is separate**.

- Particularly appreciated by self-employed electricians and the Education sector, the **MX 20HD** is a **2,000-count, 600 V CAT II** multimeter.

Ideal for the most basic troubleshooting, this multimeter has a voltage range from **200 mV to 1,000 V** and a bandwidth of 500 Hz. It offers resistance measurements, audible continuity testing, diode testing and a Data Hold mode.

- With its **5,000-count display resolution**, 34-segment analogue bargraph and backlit LCD, the **MX 44HD** will appeal to installers and maintenance technicians (Industry, Electronics, Telecoms, Networks, etc.)

Offering **CAT II 600 V** safety with a voltage range from 200 mV to 1,000 V, the MX 44HD can be used to measure capacitance and resistance, as well as to test the continuity (with buzzer) and diodes. Alongside this, the REL mode, HOLD mode and automatic power-off function

make the MX44HD an essential measurement instrument!

- The **MX 58HD** is a **5,000-count TRMS** multimeter whose technical performance will certainly appeal to automotive maintenance technicians and low-current installers, particularly as it offers high electrical protection (**600 V CAT IV, 1,000 V CAT III** according to IEC1010).

As well as providing the usual functions, such as resistance, audible continuity and capacitance testing, it can also be used for **measuring rapid peaks (1 ms)** and the **Duty Cycle**. Thanks to its **optical/RS232 interface** and the **SX-DMM2 acquisition software**, this multimeter has the advantage of being able to transfer all its data onto a PC for subsequent analysis.

- The **MX 59HD** provides the highest performance in the **METRIX®** HD multimeter range. With CAT IV 600 V, CAT III 1,000 V safety, it offers all the necessary functionalities and accuracy for troubleshooting on electrical distribution, industrial automation and process control systems, as well as electronic equipment. The advantages of this TRMS multimeter also include a 50,000-

count display resolution, a bandwidth of 500 KHz and a basic Vdc resolution of 0.05%.

As well as the **MIN/MAX/AVG monitoring function**, it offers **temperature measurement** over a range from **-200 °C to +800 °C** (Pt100 or Pt1000 probe). As with the MX 58HD, the optical/RS232 interface and the SX-DMM2 acquisition and calibration software enable the data to be transferred onto the PC while allowing "closed casing" metrology.

Delivery:

These four multimeters can be delivered in a blister pack or hard case containing the multimeter, a protective sheath, a set of test-probe leads, a set of hook-type wire grips, a set of crocodile clips and a CMS clamp for the MX 59HD.

Accessories:

The protective sheath and the associated handle (option) make it easier to use the multimeter due to the stand for setting it up on a flat surface or hooking it on another element. The optical serial/RS232 link kit and the acquisition and calibration software are options.

	MX 20HD	MX 44HD	MX 58HD	MX 59HD
Display	2,000 counts	4,000 counts	5,000 counts	50,000 counts
Voltage	AVG AC+DC		TRMS AC & AC+DC	
	200 mV to 1,000 V	400 mV to 1,000 V	500 mV to 600 V	500 mV to 600 V
Bandwidth	500 Hz	1 kHz	50 kHz	100 kHz
Functions	Resistance, audible continuity, DATA HOLD, diode test	Resistance, audible continuity, HOLD mode, REL mode; diode test, capacitance	Rapid peak measurement for V & A, resistance, audible continuity, diode test, frequency, capacitance, duty cycle	Rapid peak measurement for V & A, resistance, audible continuity, diode test, frequency, capacitance, duty cycle, dB function
Electrical safety	CAT II 600 V	CAT III 600 V	CAT IV 600 V	CAT IV 600 V

Reader service n°6



Performance and Safety, the ATEX-certified MX 57Ex multimeter

*A single tool for all
your measurements!
Usable in explosive
and non-explosive
environments!*



Specially designed for all professionals working in **difficult environments**, such as the chemical or pharmaceutical industries, refineries or coal mines, the **MX 57Ex** is the multimeter of reference for total safety.

Ergonomics

This **new version** of the **MX 57Ex** can now also be used outside explosive areas. With its rugged casing, it offers the performance of a 50,000-count TRMS multimeter and benefits from IP67 ingress protection. Its patented "Securix" system prevents accidental disconnection of the leads. It is delivered with a carrying case.

Reader service n°7

Difficult environments

This **ATEX-certified** instrument is designed for use in hazardous or explosive environments involving gas or dust, in compliance with the EN 50014, 50020 and 50281-1-1 standards. It is rated LCIE 02 ATEX 6005 X and EEx ib IIC T6/ EEx ib I according to the "old regulations".

Multiple functionalities

The **MX 57Ex** can be used for all TRMS AC or AC+DC measurements. There are functions for monitoring the MIN, MAX and Average values and for measuring rapid peaks (1 ms). Just as fast, the bargraph offers a (x5) or a central zero. As well as offering resistance and continuity testing, diode tests and frequency measurements, the **MX 57Ex** also measures: capacitance, temperature, reactive power, dB function, duty cycle, pulse width and event counting.

Accessories

For full calibration, verification and adjustment of the **MX 57Ex**, a metrology kit is

available as an option. This kit operates with all the calibrator models, allowing data to be stored and reports to be printed via its RS232 communication interface.

Additional technical specifications:

- Usable outside explosive areas, Cat III 600 V
- 50,000 counts, VDC accuracy 0.025%, TRMS AC/AC+DC 50 kHz
- Measurement ranges: Voltages (DC, AC, AC+DC) from 500 mV to 600 V
Currents (DC, AC, AC+DC) from 500 μ A to 500 mA
Resistance & continuity from 500 Ω to 50 M Ω
Capacitance from 50 nF to 50 mF (non-explosive environments only)
Temperature from -200°C to +800°C
- Suitable for Surface Industries (EEx group II T6)



ENERDIS and energy efficiency



Energy, a major issue

Saving energy or optimizing consumption are key components of the environmental protection framework to which numerous industrial countries, mainly in Europe, have signed up in the context of the Kyoto Agreement. This Agreement has triggered a drive to gradually tighten up the regulations, with the aim of reducing CO₂ emissions by 20 % by 2020! These ethical considerations are accompanied by economic constraints. Thus, whatever the sector of activity, whether industrial, tertiary, infrastructure or local government, **energy efficiency has become a major issue**. In industry, for example, it is widely accepted that there are potentially major savings to be made, possibly representing up to 30 % of current energy consumption (source: Ademe). Reducing energy spending and/or optimizing consumption are now major concerns for everyone.

An increasingly restrictive context

The rise in energy prices (+ 76 % for gas, + 18.3 % for oil and + 1.7 % for regulated-tariff electricity between 2004 and 2006 (source: AFPJ) will inevitably continue over the next few decades, leading to tighter regulatory, economic and environmental constraints: ISO 14001, legislation on energy efficiency in buildings, implementation of energy-saving certificates. **To apply all these directives and regulations, you need a system allowing you to measure, monitor, optimize and qualify the operations necessary for compliance.**

"Good management means anticipating" and the scheduled abolition of regulated electricity tariffs in France by 2010 if forcing everybody to look closely at their energy bills.

Tailored solutions

An energy cost reduction plan must be the focus of a global, company-wide project and cannot be improvised. There are two crucial prerequisites for success: the appointment of an "Energy Officer" to

co-ordinate the project and the implementation of a tool to measure performance. The actual execution of the project will then depend on the company's policy. The company may handle it in-house with its own resources and teams, or it may outsource it to service providers specialized in the implementation and management of energy performance contracts. Nevertheless, whatever the solution chosen, it necessarily involves **the implementation of suitable fixed instrumentation** which will become the contractual reference between the company and its departments or between the company and its external service provider.

When there are more than a few tens of metering points, this instrumentation needs to be supported by a system for gathering, processing, storing and distributing the data. This is an essential tool for:

- 1. carrying out a detailed audit of the multi-energy consumption serving as a reference** for the project;
- 2. simulating the economic effects of the action** to be taken;
- 3. measuring over time the impact of the investments made and the action taken** so that any deviations can be rectified.

The implementation of such a system helps to motivate all the people involved in the project by giving them **regular, pertinent and reliable long-term information** which is therefore **incontestable**. Lastly, this **system** must be **upgradable**.

Controlling energy is ENERDIS's business

After fifteen years as a recognized player in energy metering, ENERDIS has built up a considerable portfolio of references in the industrial, tertiary and major infrastructure sectors who have decided to "stamp out waste" in their energy usage. **ENERDIS is supporting them in this forward-looking policy to implement a management system capable of helping them quantify the potential savings.**

Drawing on its experience, ENERDIS designs and proposes a complete energy management system integrating:

- the electrical measurement equipment (sub-meters, power monitors, etc.);
- the pulse concentrators allowing all the data from all types of meters (electricity, water, gas, steam, etc.) to be read;
- the products and accessories of the field buses handling communication between the various components such as Ethernet gateways, STN modems, GSM, radiofrequency, etc.;
- the multi-energy management software;
- the expertise necessary to install, commission and operate the system.

But before seeking to make savings, it is best to gather objective data first.

Producing a correct breakdown of your energy spending

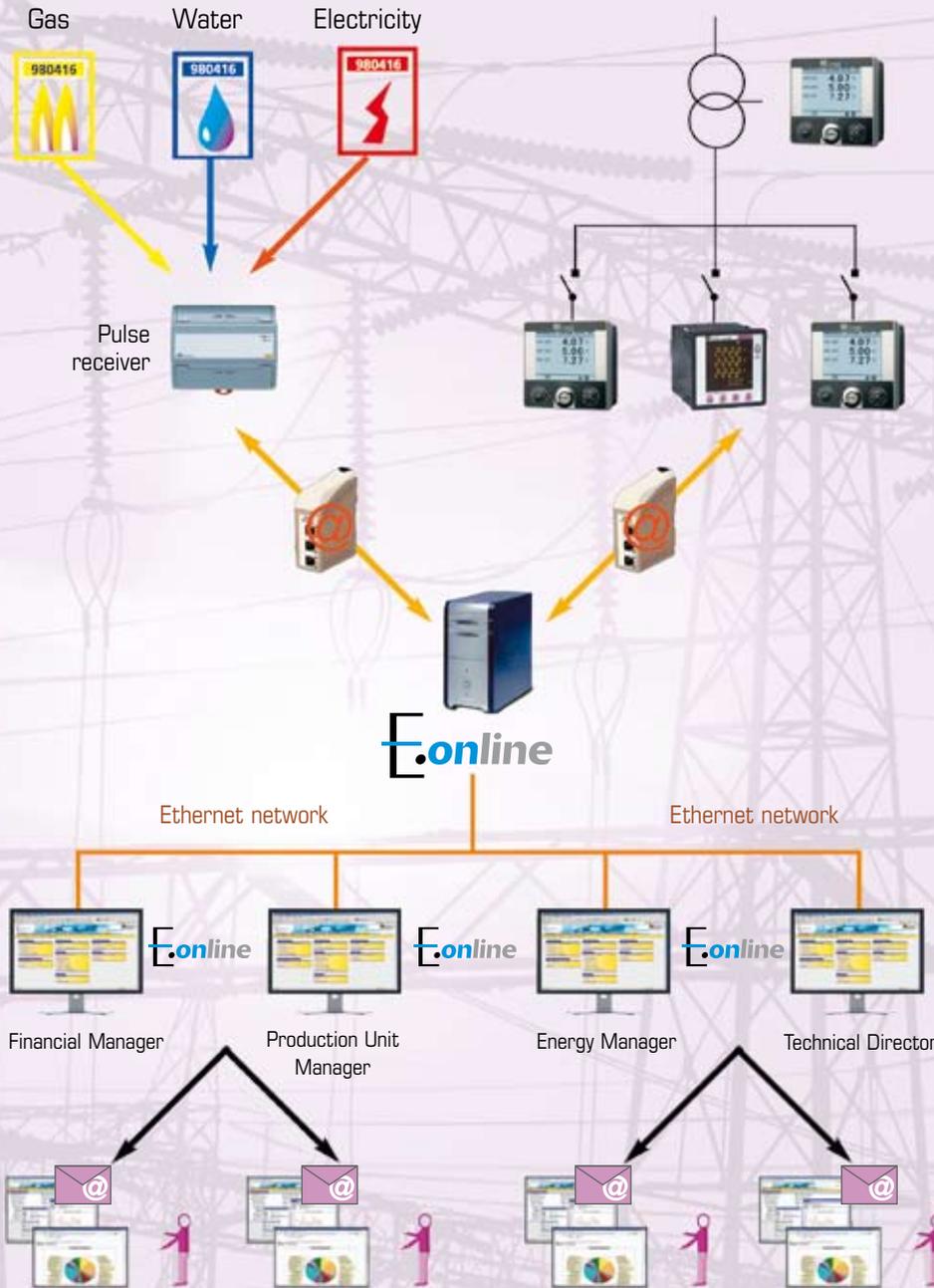
One logical approach to energy cost management and reduction involves **first exhaustively identifying all your types of consumption and calculating their costs**, the obvious thing to do when there are remote sites or sites spread over a large area. Experience shows that this is not always easy.

Once the information has been collected, it should be examined to determine whether it is detailed enough or whether power measurements (one-off or over a longer period representative of a process cycle) and/or extra meters are needed. An initial diagnosis will show whether the energy supply contracts are optimized in relation to the consumption cycles and whether the types of energy used are the most economical.



Pulse output meters

Power monitors



Analysing the data and identifying where savings can be made

After establishing the framework in this way, **the data gathered must be classified and analysed by usage** (process, lighting, HVAC, etc.), as well as by site, building or workshop, as relevant, in order to prioritize the action to be taken.

Detailed analysis of an installation's operating parameters, notably through simple production of multi-year comparative balance sheets and reports, presenting the results in energy units and/or monetary units to serve as a **reference for objective monitoring of the corrective action undertaken and the investments made**. It is also the reference in the context of an energy performance contract.

The analytical capabilities of such a system should also allow you to identify any problems quickly (abnormal water or compressed-air consumption, for example), to ensure that the electrical distribution network is sized correctly or that the consumption ratios are uniform on different sites and there is no drift.

By distributing the information automatically, formatted and adapted for each user profile, it is possible to bring together all the actors in an energy cost reduction project so that they can work **collaboratively**. An energy management system must also be capable of **adapting** easily to any organizational changes, extra equipment or new production modes. In addition, it must provide comprehensive data or, if not, automatically identify whether analytical data is missing (data in a load curve, for example) in order **to deliver conclusive, objective information** whatever the changes.

Return on investment

In practice, it has been shown that **the implementation of a project to improve energy performance can lead to gains of around 10 to 15 % in the overall energy bill in the first year**. When the overall bill exceeds several hundred thousand euros per annum, experience has demonstrated that the implementation of an energy management system pays for itself in less than 24 months, even when the investments linked to the process (high-efficiency motors, variable speed drives, reactive energy compensation systems, etc.) are taken into account. So the installation of an **instrument to measure performance and facilitate project management** is fully justified.



ENERIUM, a range of power monitors for advanced **energy efficiency** measurement

ENERIUM provides a concrete response for companies whose priorities are beginning to include reducing energy bills over the long term and becoming active players in sustainable development.

Managing and securing an electricity supply means monitoring, controlling and protecting the whole network at all times. It also means **optimizing** the price of **energy consumption** without affecting activity, safety or comfort. This also requires **a global, real-time view of the whole installation's electrical parameters**, thus ensuring it is properly sized. Whatever the sector, whether energy, industry tertiary or residential, **ENERDIS** products and services are available at all levels to optimize productivity, flexibility and costs on low and medium-voltage systems.

There are growing requirements in terms of energy availability and consumption monitoring on installations in order to ensure profitability. This is why ENERIUM offers **Class 0.5s** accuracy according to the IEC 62053-22 standard to guarantee precise measurement of the main electrical quantities for our customers.

ENERIUM is also a global solution with its associated software **E.set**, **E.view** and **E.view+** for configuration, installation troubleshooting and display of all the electrical parameters.



ENERDIS, specialists contributing measurement of performance

- Advice / recommendations concerning site instrumentation and the architecture of the data gathering system:
 - Metering equipment and accuracy of the measurement line adapted to the requirements
 - Communication network typology and accessories
 - Computer equipment
- Adaptation of the software to the specific customer context and integration into an existing system (centralized technical management, etc.)
- Assistance with commissioning
- User training
- System maintenance contract

Reader service n°8



The C.A 6240, a compact, simple and economical 10 A micro-ohmmeter

The broad range of its applications makes it useful in sectors as varied as the aerospace industry, aeronautics, telecommunications, the automotive industry, component manufacturers, research laboratories and maintenance departments.

Essential for testing the quality of connections, contacts and surfaces, the **C.A 6240** is also ideal for producing prototypes during the design phase, as well as for preventive maintenance later on. It can be used in particular for checking the resistance of machine windings, transformers, contacts, continuity of earth connections, etc.

Simple and intuitive to use, the **C.A 6240** is suitable for **inductive and non-inductive measurements**. With its very extensive **5 $\mu\Omega$ to 400 Ω** measurement range, this instrument guarantees high accuracy, notably through its use of the 4-wire measurement method. It allows the polarity of the measurement current to be reversed and prevents the measurement of disturbance voltages.

Compact and lightweight (5 kg), the new **C.A 6240** micro-ohmmeter is a rugged, leak-proof, on-site instrument designed for use in the field, the workshop or the laboratory. Its wide LCD screen comprising 2 digital displays is particularly comfortable to read. It includes a large number of indications intended to facilitate implementation and interpretation of the results. The automatic measurement mode that it offers make it even simpler to use, as **there is no need to press a key to trigger measurement**.

Protected against accidental overloads up to 500 V, the **C.A 6240** has 2 measurement modes, manual or automatic. It is equipped with a memory to store the results (1,500 measurements) and allows data to be transferred via an RS232 link with the **Microhm-view[®]** operating software.



The C.A 6240 10 A micro-ohmmeter is a "high-performance" instrument due to its 1 $\mu\Omega$ resolution.

Reader service n°9

Did you know?

Connection of the micro-ohmmeter to the object to be measured may cause thermocouple effects and therefore generate electromotive forces (EMFs) on the terminals of the object. As these EMFs are added to or subtracted from the voltage measured, they may lead to inaccurate measurements. Due to the possibility of automatically reversing the measurement current polarity, measurements on the C.A 6240 are not influenced by these EMFs: the instrument performs the measurement with positive and negative currents and then automatically calculates the average of the two measurements "R+" and "R-".



2-in-1 or 3-in-1 on-site calibrators for simpler calibration

Essential on site, the **Chauvin Arnoux® C.A 1641 & C.A 1643 multi-function process calibrators** are ideal for a wide range of sectors: maintenance departments, industries (chemicals, agri-food, etc.), certification organizations, laboratories, hospitals and education.

Multiple functions

The 2-in-1 **C.A 1641** is both a calibrator and a multimeter. The 3-in-1 **C.A 1643** also has a pulse generator function.

Both instruments include a current generator function and the **C.A 1643** also offers a voltage generator. The **C.A 1641** can be used to check and adjust control equipment, while the **C.A 1643** can be used to calibrate, adjust and test the various elements in a control loop.

Precision multimeters, they offer functions such as AC + DC voltage and current measurement, resistance, diode test and frequency, as well as **temperature measurement** by K thermocouple with compensation.

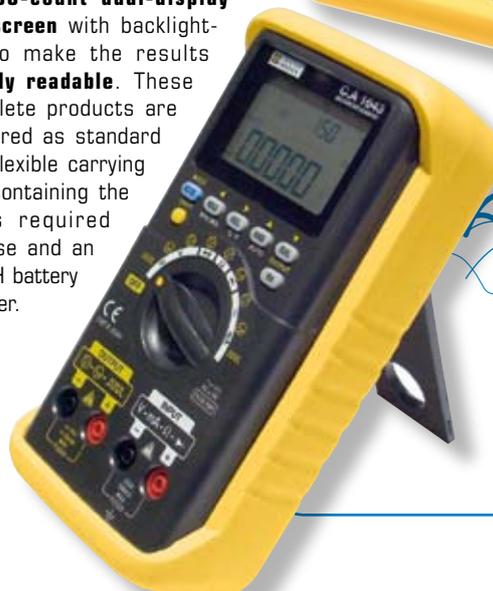
In **pulse generator** mode, the C.A 1643 can be used as a pulse modulation control board or to adjust pulse transmitters.

Ergonomics

Compact and lightweight, these calibrators are equipped with **50,000-count dual-display LCD screen** with backlighting to make the results **clearly readable**. These complete products are delivered as standard in a flexible carrying bag containing the leads required for use and an Ni-MH battery charger.



← C.A 1641: 24 V loop generation and power supply



← C.A 1643: Generates and measures at the same time

Reader service n°10

Simple temperature measurement in all circumstances!



Compact, lightweight and accurate, the **TK 2000** and **TK 2002** thermometers are very easy to use. Simply connect up the probe and press the dedicated button to start measuring. It only takes one hand!

The TK 2000 is equipped with a single thermocouple input, whereas the TK 2002 has 2 inputs, allowing temperature differences to be measured. These rugged IP 65 instruments offer a wide measurement range extending from -50°C to +1,000 °C, depending on the sensor used. Users can choose the sensor best suited to their requirements: needle, elbow, magnetic, etc.

Reader service n°11

Did you know?

For correct air temperature measurement, you should avoid putting your hand on the active part of the sensor or it might be heated or cooled. If the air or gas is moving, there is no problem. If the air is "stationary", the sensor should be moved around for 10 to 20 seconds before taking the measurement.

For measurements with penetrating sensors, the tip of the sensor has to penetrate into the medium by at least 10 times the sensor's diameter.

Simplicity and performance for electrical safety testing

The multifunction Metrix® **MX 435C** installation tester offers all the essential functions for checking the safety of electrical installations. Its full fuseless protection makes it safe to use while freeing time previously spent changing or simply managing fuses.

Its high performance makes it ideal for measuring insulation and continuity, as well as for RCD and voltage testing (up to 600 VAC). When coupled with a clamp-on ammeter, it can be used to measure current and leakage current from 1 mA to 200 A.

The colour-coding of the terminals and the switch mean that connection is immediate and foolproof.

Complete and lightweight, ideal for intensive use; this instrument is delivered as standard with a carrying bag which also allows hands-free use.

Aimed particularly at self-employed electricians, installers, certification organizations and maintenance departments, the **MX 435C** offers an excellent price-performance trade-off.



All the measurement
required
by NFC 15-100

Reader service n°12

Use our new range of accessories to measure in total safety

CHAUVIN ARNOUX®, **METRIX®**
and **MULTIMETRIX®** are
commercializing a new range
of universal test accessories.

Their major advantage is that they **comply** with the IEC 61010 **CAT IV 600 V** standard. For fully-compliant measurements, if the measurement instrument is rated CAT IV 600 V, the accessories have to be CAT IV 600 V as well. Greater safety also means more reliable measurement results.

Designed for electrical and electronic applications, this range includes PVC and silicone leads, test probes, wire grips, insulation-piercing clips, etc.

These accessories are commercialized in blister packs. In order to optimize logistics for distributors and customers, special conditioning has been developed. During transport it serves as packaging, but transforms very simply into a display pack when it arrives.

In addition, they are available at a very attractive price.

Reader service n°13

Electrical Safety
IEC 61010-1
Cat. IV 600 V



Quick, comprehensive testing of all earthing systems

*Designed to characterize existing earthing, determine where a new earth connection should be located or check connections, Chauvin Arnoux®'s new **C.A 6472** tester is a **5-in-1** instrument. Continuity, earth resistance, ground potential and soil resistivity measurements are all directly accessible using a rotary switch.*

*When coupled with the **C.A 6474** adapter, it can be used to check, measure and analyse the earthing of pylons (selective measurement with Ampflex flexible current sensors).*

The C.A 6472 makes earth measurement accessible to everyone ↗

The C.A 6474, the essential add-on for testing pylons ↗

Reliable measurements

This configuration ensures that the measurements are reliable:

- through the use of traditional rod methods
- through self-diagnosis at the start of each measurement so that the presence of any faults liable to affect the accuracy of the measurements (poor connections or disturbance signals)
- by using extensive measurement ranges: **0.001 Ω to 100 kΩ**
- by analysing the frequency behaviour of the earthing systems (41 Hz to 5 kHz)

Performance

The C.A 6472 is equipped with high-level expert calculation capabilities:

- for earth coupling measurement, it can carry out the 3 measurements required and then automatically calculate the coupling coefficient
- for soil resistivity measurement, you simply enter the distances used for the measurement and the tester then calculates ρ using the Wenner or Schlumberger method

Key areas of use

Thanks to their advanced functions, these top-of-the-range products meet the specific requirements of power distribution networks, telecommunications (transmission pylons) and government services. The C.A 6472 and C.A 6474 are also ideal for construction workers, installers, inspectors, etc.

Telecommunications

In a telecommunication network, the pylons are important elements which require regular maintenance, particularly after a storm or cyclone. The following systems need to be checked: lightning arrester, copper earth connection strip, pylon earth wire, terminal block for strip connection. The connections of the earthing kits and the resistivity value of the earthing system must also be checked.

New buildings

When constructing new buildings, it is crucial to set up a good earth connection providing a link with the natural earth via the protective conductors (green-yellow) to the frames of the metal equipment operating on electricity.

Ergonomics

Ergonomic and compact because they are designed for on-site use the C.A 6472 & C.A 6474 are rugged and leakproof. The C.A 6472 includes a large backlit LCD screen and a battery which can be recharged using an external charger connected to the mains or to a vehicle cigarette lighter.

It also has a function for direct, ordered memorization of the measurement results. A USB communication output allows the data to be exported for processing

Reader service n°14



In situ testing of temperature sensor accuracy

These specific temperature sensors guarantee accurate measurements. They are calibrated directly on the production site.

This verification method, proposed by **Pyro-Contrôle**, is simple and quick, so it is no longer necessary to remove the sensor or stop production.

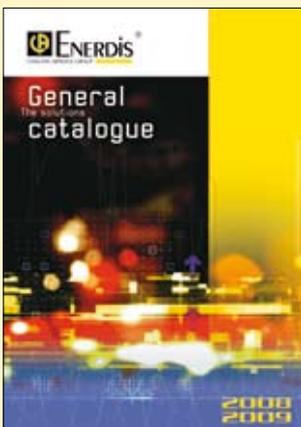
Reader service n°15 (2 pages)



The Scopix range of portable stand-alone oscilloscopes is being upgraded.

This document provides an overview of the whole Scopix range, from 40 MHz to 100 MHz. It gives full details of the performance levels provided by these on-site oscilloscopes.

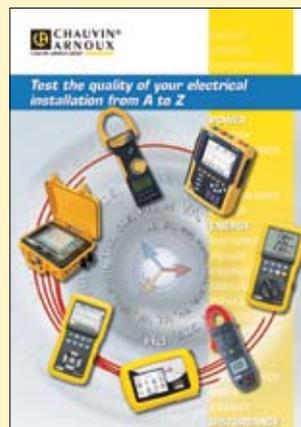
Reader service n°16 (8 pages)



2008/2009 Enerdis Catalogue

A large number of new products: ENERIUM, ENERTRACE, the new energy management software range and the Audit & Troubleshooting service

Reader service n°17 (268 pages)



Everything you need to check the quality of your electrical installation

This 6-page document presents the offer for checking power values, energy values, disturbances, etc. It also includes reminders of useful information, such as the causes of harmonics or imbalances, the risks, etc.

Reader service n°18 (6 pages)

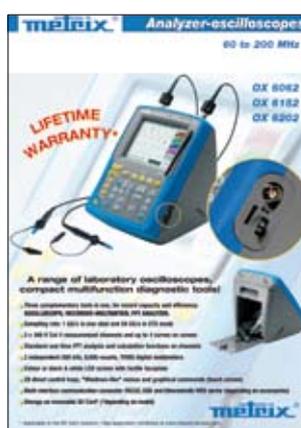


Compact, simple and economical: the 10 A micro-ohmmeter

Chauvin Arnoux® has given further proof of its expertise with the **C.A 6240**, a **10 A micro-ohmmeter** classified as "high-performance" due to its **1 μΩ resolution**. Essential for testing the quality of connections, contacts and surfaces, it is also ideal earlier on, for prototype development, for example, as well as for subsequent preventive maintenance. In particular,

it can be used to check resistance measurements on machine windings, transformers, contacts, earthing continuity, etc.

Reader service n°9 (2 pages)



OX 6000SD oscilloscopes with Lifetime Guarantee!

The OX 6000 multi-function laboratory oscilloscopes can now be fitted with up to 2 GB of extra memory capacity thanks to a removable SD card. At the same time, the SD versions of these oscilloscopes now benefit from a LIFETIME guarantee!

Reader service n°19 (4 pages)

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ENERIUM

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- Installation sizing
- Energy management
- Electrical network quality



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