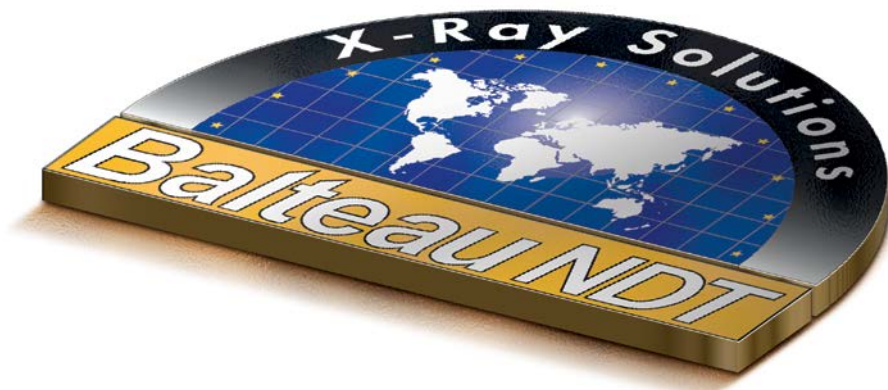


# CATALOGUE OF PRODUCTS



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# CATALOGUE.

# X-RAY

# PRODUCTS

## INTRODUCTION

*To begin this catalogue, we would first like to thank you for the interest you have in Balteau NDT as a company and for its products. With this edition, we have tried to present a non-exhaustive preview of the different ranges and products we can offer.*

*As an NDT manufacturer, Balteau is covering most industries by having portable units, stationary & mobile equipment, real time systems (standard and customized), NDT software, digital imaging, etc. Balteau is one of the most experienced and complete x-ray generators manufacturer and we proud ourselves for delivering high quality and very reliable x-ray equipment for all type of industries since 1932.*

*As the world changes into more digital applications, Balteau has decided to be part of it and developed products to better serve you and your needs. Understanding new requirements is very important to us as we are always looking to answer your needs with the best possible solutions.*

*With a large network of distribution in more than 40 countries, we are able to be responsive and offer a fast delivery for your equipment. Our strategically located Maintenance & Repair Service Centers will allow every users worldwide to have fast maintenance and / or repairs in case the equipment needs it.*

*Highly qualified engineers, a customer orientated staff and an extensive worldwide network is one of the main reason to the success of our brand and to your possibility of always getting, from the selection of your equipment to the follow up in service and maintenance, a qualified and professional support.*

*Balteau NDT team.*

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# BALTO SPOT

## **BALTOSPOT** ■ The portable range

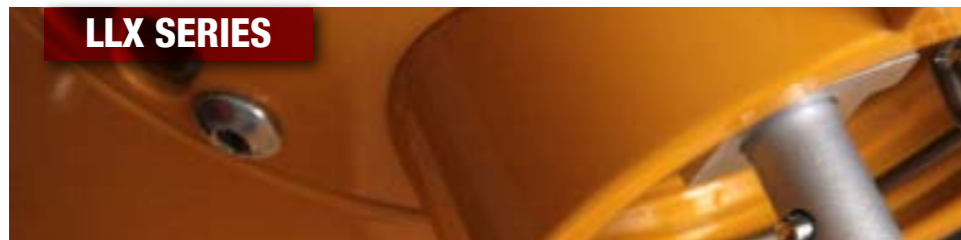
*Pulsed waved and constant potential generators, from 1 to 300kV and up to 12mA*

*The Baltospot range is made of 3 different Series, LLX (Constant potential), CERAM (Ceramic tubehead, pulsed wave) and GF (Glass tubehead, pulsed wave). The three series have different specificities and are corresponding to different applications, field of activities or budgets. Different control units are available including Balteau's wireless remote control, the Hand-X.*

*Balteau is known for its unique, unequalled engineering and manufacturing of portable equipment for about 100 years. Since the introduction of the first gas insulated unit by Balteau in the late 50's, Balteau has continuously been upgrading and improving its series of products.*

*The leadership is nowadays again confirmed with the Baltospot series of products represented by a set of different generators ranging from 1 to 300 kV, panoramic or directional.*

*No matter the application, the location or the environment, our generators are used extensively around the world by service inspection companies or by production plants.*



**LLX SERIES**

**MOST COMMON APPLICATIONS**

- Aeronautics, composites & plastics
- Building sites
- Digital applications (flat panels, CR or linear detectors)
- X-ray cabinets
- Art , museum (LLX110)

The LLX series is an air cooled, high frequency constant potential generator. It is dedicated to high technology applications like aerospace where specific requirements and speed of inspection are needed. These units are CP type and are controlled by a DC1 or Hand-XD and can be used in combination with digital detectors.

**BALTOSPOT LLX110-DA**

High voltage range:	<b>5 to 110 kV</b>
Tube current range:	<b>0,5 to 12 mA</b>
Beam angle:	<b>40° x 40°</b>
Tubehead:	<b>Metal-ceramic</b>
Anode cooling type:	<b>Air</b>
Duty cycle:	<b>100 %</b>
Weight*:	<b>16 kg</b>
Control unit:	<b>DC1 or Hand-XD</b>

\* Without rings

**BALTOSPOT LLX160-DA**

High voltage range:	<b>5 to 160 kV</b>
Tube current range:	<b>0,5 to 12 mA</b>
Beam angle:	<b>40° x 40°</b>
Tubehead:	<b>Metal-ceramic</b>
Anode cooling type:	<b>Air</b>
Duty cycle:	<b>100 %</b>
Weight*:	<b>16 kg</b>
Control unit:	<b>DC1 or Hand-XD</b>

\* Without rings

**BALTOSPOT LLX200-DA**

High voltage range:	<b>5 to 200 kV</b>
Tube current range:	<b>0,5 to 12 mA</b>
Beam angle:	<b>60° x 40°</b>
Tubehead:	<b>Metal-ceramic</b>
Anode cooling type:	<b>Air</b>
Duty cycle:	<b>100 %</b>
Weight*:	<b>18,1 kg</b>
Control unit:	<b>DC1 or Hand-XD</b>

\* Without rings

**BALTOSPOT LLX200-PA**  
PANORAMIC TUBEHEAD

High voltage range:	<b>5 to 200 kV</b>
Tube current range:	<b>0,5 to 12 mA</b>
Beam angle:	<b>360° x 40°</b>
Tubehead:	<b>Metal-ceramic</b>
Anode cooling type:	<b>Air</b>
Duty cycle:	<b>100 %</b>
Weight*:	<b>18,1 kg</b>
Control unit:	<b>DC1 or Hand-XD</b>

\* Without rings



**GF SERIES**

**MOST COMMON APPLICATIONS**

- Oil & gas
- Shipyard building & Building sites
- Petrochemical & Power plants
- tank, reservoirs & pressure vessels
- Inspection companies & training centers
- Conventional films or CR applications

The GF series derives from the Crawler technology and is providing a reliable and cost effective solution for price sensitive markets. These units have to be combined to one of the two available type of control units, CF2000 or Hand-X with very lightweight new generation of cables.

**BALTOSPOT GFD165**

High voltage range:	<b>50 to 160 kV</b>
Tube current range:	<b>1 to 5 mA</b>
Beam angle:	<b>55°</b>
Tubehead:	<b>Glass</b>
Anode cooling type:	<b>Air</b>
Duty cycle*:	<b>100 %</b>
Weight**:	<b>12 kg</b>
Control unit:	<b>CF2000 or Hand-X</b>

\* At 30°C reduced mA. \*\* Without rings

**BALTOSPOT GFC165**  
PANORAMIC TUBEHEAD

High voltage range:	<b>50 to 160 kV</b>
Tube current range:	<b>1 to 5 mA</b>
Beam angle:	<b>360° x 40°</b>
Tubehead:	<b>Glass</b>
Anode cooling type:	<b>Air</b>
Duty cycle*:	<b>100 %</b>
Weight**:	<b>12,3 kg</b>
Control unit:	<b>CF2000 or Hand-X</b>

\* At 30°C reduced mA. \*\* Without rings

**BALTOSPOT GFC205**  
PANORAMIC TUBEHEAD

High voltage range:	<b>70 to 200 kV</b>
Tube current range:	<b>1,5 to 5 mA</b>
Beam angle:	<b>360° x 40°</b>
Tubehead:	<b>Glass</b>
Anode cooling type:	<b>Air</b>
Duty cycle*:	<b>100 %</b>
Weight**:	<b>25,5 kg</b>
Control unit:	<b>CF2000 or Hand-X</b>

\* At 30°C reduced mA. \*\* Without rings

**BALTOSPOT GFC305**  
PANORAMIC TUBEHEAD

High voltage range:	<b>140 to 300 kV</b>
Tube current range:	<b>1 to 5 mA</b>
Beam angle:	<b>360° x 40°</b>
Tubehead:	<b>Glass</b>
Anode cooling type:	<b>Air</b>
Duty cycle*:	<b>100 %</b>
Weight**:	<b>35 kg</b>
Control unit:	<b>CF2000 or Hand-X</b>

\* At 30°C reduced mA. \*\* Without rings



**CERAM SERIES**

**MOST COMMON APPLICATIONS**

- Oil & Gas
- Shipyard building & Building sites
- Petrochemical & Power plants
- Foundries
- Railway parts
- Boiler or pressure vessels manufacturers

The series is made of 2 different generators based on a ceramic insert with a 100% duty cycle. The generators are specifically designed to be operated in difficult environments with a constant output. Both units have to be combined to one of the two available control units, CF2000 or Hand-X, equipped with very lightweight new generation of cables.

**BALTOSPOT CERAM235**

High voltage range:	<b>70 to 235 kV</b>
Tube current range:	<b>0,1 to 5 mA</b>
Beam angle:	<b>40°</b>
Tubehead:	<b>Ceramic</b>
Anode cooling type:	<b>Air</b>
Duty cycle:	<b>100 %</b>
Weight*:	<b>27 kg</b>
Control unit:	<b>CF2000 or Hand-X</b>

\* Without rings

**BALTOSPOT CERAM35**

High voltage range:	<b>100 to 300 kV</b>
Tube current range:	<b>0,5 to 5 mA</b>
Beam angle:	<b>40°</b>
Tubehead:	<b>Ceramic</b>
Anode cooling type:	<b>Air</b>
Duty cycle:	<b>100 %</b>
Weight*:	<b>29 kg</b>
Control unit:	<b>CF2000 or Hand-X</b>

\* Without rings



**CONTROL UNITS**

Exposure parameters are sometimes very different from one application to another. With our control units, all these values are accessible by well identified keys and can be stored in built in non volatile memories for further retrieval and use. These units are specifically designed for field operations because of their large handles, metallic covers and shock proof design.

**BALTOSPOT CF2000**

Mains supply AC:	<b>170 to 260 V</b>
Frenquency:	<b>45 to 66 Hz</b>
Duty cycle:	<b>100%</b>
kV min step:	<b>1 kV</b>
mA min step:	<b>0,1 mA</b>
Display:	<b>4 line, green back lighting</b>
Weight:	<b>13 kg</b>
Generators:	<b>Ceram &amp; GF series</b>

**BALTOSPOT HAND-X**

Mains supply AC:	<b>170 to 260 V</b>
Frenquency:	<b>45 to 66 Hz</b>
Duty cycle:	<b>100%</b>
kV min step:	<b>1 kV</b>
mA min step:	<b>0,1 mA</b>
Display:	<b>4 line, green back lighting</b>
Battery:	<b>8 hours</b>
Generators:	<b>Ceram &amp; GF series</b>

**BALTOSPOT DC1**

Mains supply AC:	<b>170 to 260 V</b>
Frenquency:	<b>45 to 66 Hz</b>
Duty cycle:	<b>100%</b>
kV min step:	<b>1 kV</b>
mA min step:	<b>0,1 mA</b>
Display:	<b>4 line, green back lighting</b>
Weight:	<b>9,2 kg</b>
Generators:	<b>LLX series</b>

**BALTOSPOT HAND-XD**

Mains supply AC:	<b>170 to 260 V</b>
Frenquency:	<b>45 to 66 Hz</b>
Duty cycle:	<b>100%</b>
kV min step:	<b>1 kV</b>
mA min step:	<b>0,1 mA</b>
Display:	<b>4 line, green back lighting</b>
Battery:	<b>8 hours</b>
Generators:	<b>LLX series</b>

# CRAWLERS ■ From Baltospot

**Pulsed waved & constant potential generators, from 120 to 300 kV and up to 3 mA**

*The Baltospot for Crawlers series is once again the evidence of the long time expertise of Balteau NDT in building reliable, powerful, robust and highly compatible X-ray equipments used for Pipe inspections.*

*When buying an equipment from Balteau, you are sure of receiving the best quality to price value. Thanks to our 100 years of continuous business under the same name as an independent X-ray manufacturer, you stay assured that you'll get a continuous support all through the very long lifetime of the equipment you purchase.*

*Balteau NDT offers a complete assembly including the mechanical carrier, the well-known Balteau NDT X-ray generator, the chopper and a range of accessories in order to make the most out of this equipment.*

ATTENTION,  
RAYONS X:

## A COMPLETE CRAWLER SYSTEM IS COMPOSED OF:

### 1 THE PANORAMIC X-RAY GENERATOR

« Highly compatible, our generators can be adapted to any mechanical carriage of the main manufacturers »

As a major supplier in the crawlers industry, Balteau has designed generators that are specifically designed to be used for pipeline inspection and on mechanical carriers. The Balteau NDT range of generators for crawlers includes the following product: GFC160C, GFC200C, GFC300C, GCP180C & GCP200C. These generators are amongst the most robust and reliable units on the market. With a very light weight and high performances in terms of steel penetration, this equipment is clearly a reference when you are looking for an efficient, cost saving, easy and profitable pipelines inspection.

### 2 THE CHOPPER

« As our generators, Balteau's chopper can be adapted to any mechanical carriage of the main manufacturers »

Entirely renewed in 2014, our new chopper has already become a extremely reliable equipment and contains all features that the previous version was already offering and more. Being the power converter between the batteries and the generator, the CF3 is an intelligent regulator which will offer the most stable and constant output all along exposures. The CF3 and its CFR allow you to set all the parameters for your X-ray exposure and retrieve memory of all generators used before. The CFR also holds memory on the preheating time by retrieving the data stored in the CF3.

### 3 THE MECHANICAL CARRIER

« Particularly robust in order to face harsh environment and intensive use »

Depending on your needs different type of carrier can be chosen. This motorized battery powered vehicle is an essential part of the equipment. This is the reason why, this has to be particularly robust in order to face harsh environment and intensive use. They can also be preprogrammed to react to various orders given from the outside of the pipe by either a Radioactive source or a non Isotope system. More than being active on the crawler market for many years, Balteau NDT has become an essential and reliable player, with carriers to be used for all size of pipes (6"-16" / 10"-60" / 24"-72").

### 4 THE BATTERIES

« At least one full shift can be covered by only one battery »

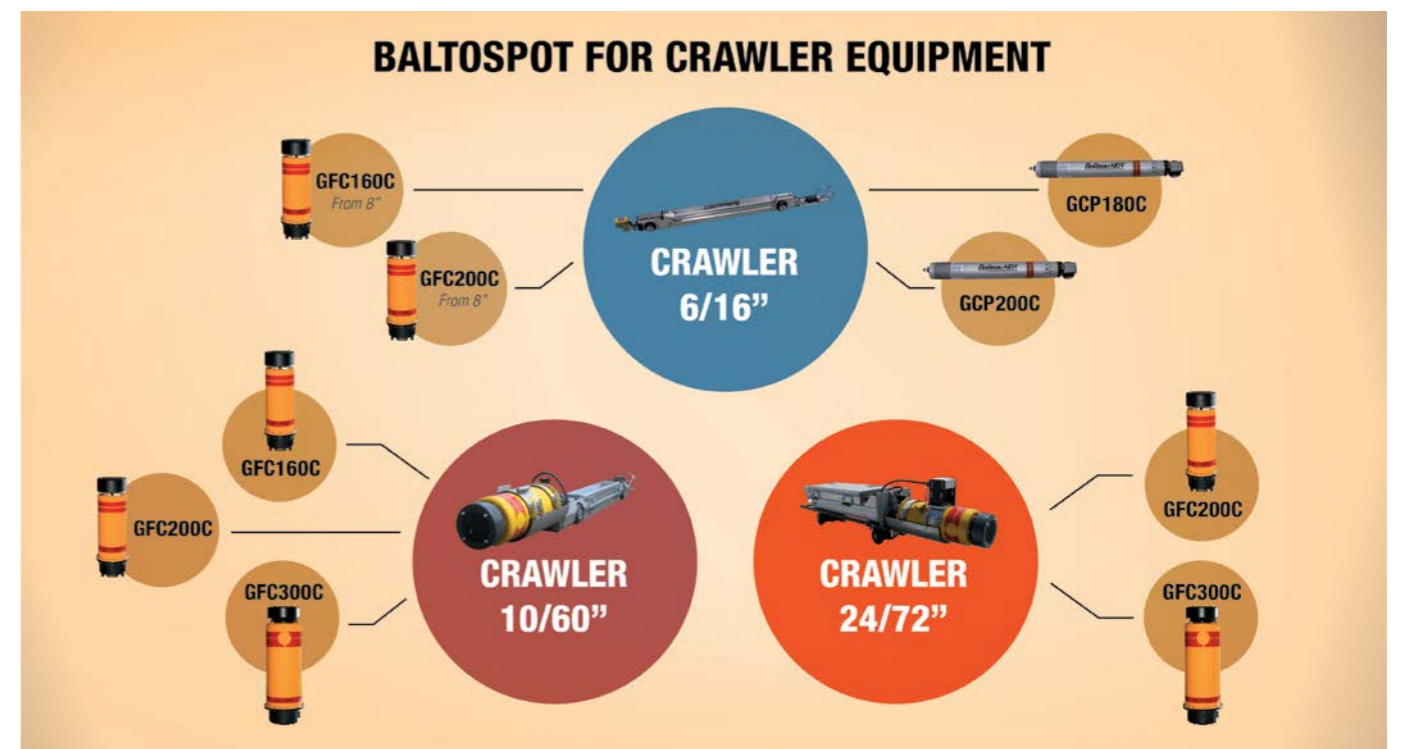
A specific process has been developed on the CF3 to improve the operating possibilities of the battery pack, so much more exposure can be taken before the battery is discharged. This also improves the battery lifetime by a better management of discharge cycles. A 220 V optional power box allows you to use your x-ray generator on mains or with a power generator without the batteries of its mechanical carrier or for the preheating of the generator (tube).

## GFC SERIES

The GFC series has been designed by Balteau's engineers to provide robust and reliable generators to be used with any mechanical carriage available on the market. These units have to be combined with a mechanical carriage, a chopper (control unit) and a set of batteries.

BALTOSPOT GCP180C & 200C		BALTOSPOT GFC160C	BALTOSPOT GFC200C	BALTOSPOT GFC300C
GCP180C	GCP200C			
High voltage range:	120 to 180 kV	120 to 160 kV	140 to 200 kV	150 to 300 kV
Approx. tube current:	2,3 mA	3 mA	3 mA	3 mA
Beam angle:	360° x 45°	360° x 45°	360° x 45°	360° x 45°
Focal spot size (IEC336):	5 X 0,6	4 X 0,9	4 X 1,2	4 X 1,3
Control unit:	Built-in chopper	BNDT chopper or others	BNDT chopper or others	BNDT chopper or others
Anode cooling:	Forced air	Air	Air	Air
Duty cycle:	50%	50%	50%	50%
Steel penetration at max (*):	26 mm	12,5 mm	24 mm	44 mm
Operating temperature:	Max. 70°C	-10 to 40°C	-10 to 40°C	-10 to 40°C
Weight (without rings):	16,7 kg	11 kg	20 kg	23,5 kg
*FFD= 200mm/Film Carestream Industrex AA400/D=2.0/t=1min.		*FFD= 700mm/Film Carestream Industrex AA400/D=2.0/t=10min.		*FFD= 700mm/Film Carestream Industrex AA400/D=2.0/t=10min.

## AN EASY WAY TO FIND WHICH GENERATOR SUITS WHICH CRAWLER VEHICLE...





# BALTOGRAPH

The mobile & stationary range

*Monopolar and bipolar, mobile and stationary, from 1 to 450kV and up to 50mA*

*The new Baltograph series is once again the evidence of the long time expertise of Balteau NDT in building reliable, powerful and safe X-ray stationary equipments used in various NDT applications and inspections.*

*When you buy an equipment from Balteau, you are certain of getting the best quality to price value and thanks to our 100 years of continuous business under the same name as an independent X-ray manufacturer, you rest assured that you'll get a continuous support all through the very long lifetime of the equipment you bought.*

*The difference between the Baltograph series and the Baltospot series is that different combinations of tubes are available with the same generator and that no compromise has been made with the power and weight.*

**XSD SERIES**

**MOST COMMON APPLICATIONS**

- Oil & Gas
- Energy
- Aeronautical/ aerospace
- Transport
- Military
- Bio-medical & agriculture

A full X-ray equipment is made up of a generator (XSD), a control unit (LS1), a tubehead (TSD or TSC) and a cooling unit (WCU or OACU). Balteau XSD generators are 19" racks, built around a sealed, oil and gas free, solid stage voltage multiplier. SMD (surface mount devices) electronic is used to reduce maintenance time, size and weight. XSD are either monopolar or bipolar: generators are 100, 160, 225, 320, 420 and 450 kV. Powers available are 4 to 4,5 kW.

**BALTOGRAPH XSD160/4KW**



High voltage range:	5 to 160 kV
Tube current range:	0,1 to 50 mA
Max. output power:	4000 W
Tubehead:	Metal-ceramic
Anode cooling type:	Water
Duty cycle:	100 %
Weight:	68 kg
Control unit:	LS1 or LS1C2

**BALTOGRAPH XSD225/4KW**



High voltage range:	5 to 225 kV
Tube current range:	0,1 to 30 mA
Max. output power:	4000 W
Tubehead:	Metal-ceramic
Anode cooling type:	Water
Duty cycle:	100 %
Weight:	109 kg
Control unit:	LS1 or LS1C2

**BALTOGRAPH XSD320/4,5KW**



High voltage range:	5 to 320 kV
Tube current range:	0,1 to 30 mA
Max. output power:	4500 W
Tubehead:	Metal-ceramic
Anode cooling type:	Oil
Duty cycle:	100 %
Weight:	136 kg
Control unit:	LS1 or LS1C2

**BALTOGRAPH XSD450/4,5KW**



High voltage range:	5 to 450 kV
Tube current range:	0,1 to 30 mA
Beam Max. output:	4500 W
Tubehead:	Metal-ceramic
Anode cooling type:	Oil
Duty cycle:	100 %
Weight:	218 kg
Control unit:	LS1 or LS1C2

**COOLING UNITS**



To ensure the best colling possible and the most reliable equipment with always 100% duty cycle (24h/day). Water cooling units are used for our monopolar tubeheads up to 3000W or 4000W and oil cooling unit for bipolar tubeheads up to 4500W.

**BALTOGRAPH WCU3000**



Dimensions:	442 x 398 x 446 mm
Coolant capacity:	3,7 l
Cooling capacity:	3000 W
Water flow:	6 l/min
Noise level:	55 dBA
Max. forward pressure:	8 Bar
Weight:	38,5 kg
Operating temp.:	Up to 40°C

**BALTOGRAPH WCU4000**



Dimensions:	400 x 320 x 550 mm
Coolant capacity:	5 l
Cooling capacity:	4000 W
Water flow:	4,4 l/min @ 4.0 bar
Noise level:	72 dBA
Max. forward pressure:	6,7 Bar
Weight:	40 kg
Operating temp.:	Up to 45°C

**BALTOGRAPH OACU4500**



Dimensions:	750 x 350 x 650 mm
Coolant capacity:	23 l
Cooling capacity:	4500 W
Water flow:	> 23 l/min
Noise level:	63 dBA
Max. forward pressure:	9,3 Bar
Weight:	54 kg
Operating temp.:	Up to 40°C

**XMD SERIES**

**MOST COMMON APPLICATIONS**

- Oil & Gas
- Energy
- Aeronautical/ aerospace
- Transport
- Military
- Bio-medical & agriculture

XMD is the mobile version of the XSD. A robust trolley has been specially designed to bring your powerful XSD to the very location of your inspections. Equipped with 2 wheels, well balanced to be easily handled by its hooks if necessary, the trolley is taking all accessories including the 3 or 4 kW closed circuit water cooling unit. No matter if you have narrow doors to pass, the width has been calculated to be kept to the minimum. XMD can be delivered as a 160 or 225 monopolar unit.

**CONTROL UNITS**



The Baltegraph series have 2 available control units, our well known and classic LS1 and its rack version, the LS1C2. Providing all controls and comfort options to help the user and the production in getting the best of the inspection. Both of these units software have been entirely renewed to ensure your daily jobs stay easy. All characteristics from the previous version are still available but also more...

**BALTOGRAPH XMD160/4KW**



High voltage range:	5 to 160 kV
Tube current range:	0,1 to 50 mA
Max. Power output:	4000 W
Tubehead:	Metal-ceramic
Anode cooling type:	Water
Duty cycle:	100 %
Weight:	185 kg
Control unit:	LS1

**BALTOGRAPH XMD225/4KW**



High voltage range:	5 to 225 kV
Tube current range:	0,1 to 30 mA
Max. Power output:	4000 W
Tubehead:	Metal-ceramic
Anode cooling type:	Water
Duty cycle:	100 %
Weight:	250 kg
Control unit:	LS1

**BALTOGRAPH LS1**



Measure of kV & mA:	True measure
kV step:	1 - 2 - 5 kV
mA step:	0,1 - 0,2 - 0,5 mA
Display:	TFT colour screen
memories:	10.000
Duty cycle:	100 %
Weight:	4,8 kg
Modes:	Standard, Supervisor, SAV

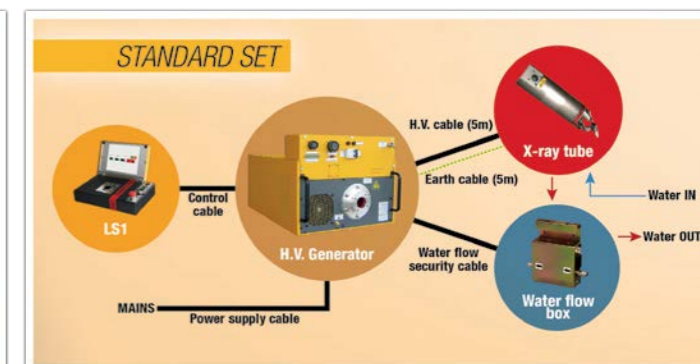
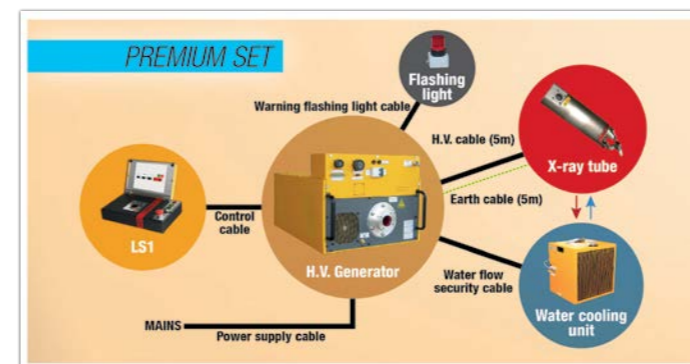
**BALTOGRAPH LS1C2**



Measure of kV & mA:	True measure
kV step:	1 - 2 - 5 kV
mA step:	0,1 - 0,2 - 0,5 mA
I/O:	4 x Sub-D9
memories:	10.000
Duty cycle:	100 %
Weight:	4,8 kg
Modes:	Standard, Supervisor, SAV

**3 DIFFERENT AVAILABLE SETS, SAFETY, PREMIUM AND STANDARD.**

(Feel free to contact us for more details on our sets and / or our products at [sales@balteau-ndt.com](mailto:sales@balteau-ndt.com))





**MONOPOLAR TUBEHEADS**



Monopolar tubes are giving the user the required flexibility for fixed or mobile installations. These tubes are made out of an insert into a shielded housing with a ceramic HV cone to connect the generator.

Inside the housing the cooling circuit is made of a serpentine tube in which the coolant fluid (water and eventual additive for cold countries) which will remove calories at the very heart of the anode.

**PANORAMIC TUBEHEADS**

**TSC200**

- Max. high voltage: **200 kV**
- Max current: **10 mA**
- Nominal power: **600 W**
- Focal spot size\*: **4 x 0,4**
- Anode cooling type: **Water**
- Weight: **13 kg**



**TSC160**

- Max. high voltage: **160 kV**
- Max current: **12 mA**
- Nominal power: **1000 W**
- Focal spot size\*: **4 x 0,4**
- Anode cooling type: **Water**
- Weight: **8 kg**



**DIRECTIONAL TUBEHEADS**

**TSD225-0**

	S. focal	L. focal
• Max. high voltage:	<b>225 kV</b>	<b>225 kV</b>
• Max current:	<b>15 mA</b>	<b>30 mA</b>
• Nominal power:	<b>640 W</b>	<b>3000 W</b>
• Focal spot size*:	<b>1</b>	<b>5,5</b>
• Anode cooling type:	<b>Water</b>	<b>Water</b>
• Weight:	<b>13 kg</b>	<b>13 kg</b>

**TSD225-1**

S. focal	L. focal
<b>225 kV</b>	<b>225 kV</b>
<b>15 mA</b>	<b>30 mA</b>
<b>640 W</b>	<b>1600 W</b>
<b>1</b>	<b>3</b>
<b>Water</b>	<b>Water</b>
<b>11 kg</b>	<b>11 kg</b>

**TSD225-3**

S. focal	L. focal
<b>225 kV</b>	<b>225 kV</b>
<b>14,5 mA</b>	<b>30 mA</b>
<b>800 W</b>	<b>1800 W</b>
<b>0,4**</b>	<b>1</b>
<b>Water</b>	<b>Water</b>
<b>11 kg</b>	<b>11 kg</b>

**TSD225-4**

S. focal	L. focal
<b>225 kV</b>	<b>225 kV</b>
<b>18 mA</b>	<b>30 mA</b>
<b>900 W</b>	<b>2500 W</b>
<b>1</b>	<b>3</b>
<b>Water</b>	<b>Water</b>
<b>12 kg</b>	<b>12 kg</b>

**TSD160-0**

	S. focal	L. focal
• Max. high voltage:	<b>160 kV</b>	<b>160 kV</b>
• Max current:	<b>15 mA</b>	<b>40 mA</b>
• Nominal power:	<b>640 W</b>	<b>3000 W</b>
• Focal spot size*:	<b>1</b>	<b>5,5</b>
• Anode cooling type:	<b>Water</b>	<b>Water</b>
• Weight:	<b>8 kg</b>	<b>8 kg</b>

**TSD160-1**

S. focal	L. focal
<b>160 kV</b>	<b>160 kV</b>
<b>15 mA</b>	<b>40 mA</b>
<b>640 W</b>	<b>1600 W</b>
<b>1</b>	<b>3</b>
<b>Water</b>	<b>Water</b>
<b>8 kg</b>	<b>8 kg</b>

**TSD160-3**

Focal
<b>160 kV</b>
<b>15 mA</b>
<b>640 W</b>
<b>1</b>
<b>Water</b>
<b>8 kg</b>

**TSD160-5**

S. focal	L. focal
<b>160 kV</b>	<b>160 kV</b>
<b>20 mA</b>	<b>40 mA</b>
<b>800 W</b>	<b>1800 W</b>
<b>0,4**</b>	<b>1</b>
<b>Water</b>	<b>Water</b>
<b>8 kg</b>	<b>8 kg</b>

**TSD100-1**

	S. focal	L. focal
• Max. high voltage:	<b>100 kV</b>	<b>100 kV</b>
• Max current:	<b>24 mA</b>	<b>24 mA</b>
• Nominal power:	<b>1000 W</b>	<b>1000 W</b>
• Focal spot size*:	<b>3</b>	<b>3</b>
• Anode cooling type:	<b>Water</b>	<b>Water</b>
• Weight:	<b>3,5 kg</b>	<b>3,5 kg</b>

\* Measurement method of focal spot size EN12543

\*\* 30% Threshold

**BIPOLAR TUBEHEADS**



When HV increases, the dielectric strength of even advanced materials is very often not sufficient to provide a good electrical insulation. This is the basic reason for building Bipolar tubes when more than 225kV is expected. These tubes are easily recognizable by the fact that two HV ends are present with a specific Anodic and Cathodic identification. Due to the high difference of potential, the cooling media is always dielectric oil.

**DIRECTIONAL TUBEHEADS**

**TSD450-0C**

	S. focal	L. focal
• Max. high voltage:	<b>450 kV</b>	<b>450 kV</b>
• Max current:	<b>20 mA</b>	<b>30 mA</b>
• Nominal power:	<b>1500 W</b>	<b>4500 W</b>
• Focal spot size*:	<b>2,5</b>	<b>5,5</b>
• Anode cooling type:	<b>Oil</b>	<b>Oil</b>
• Weight:	<b>116 kg</b>	<b>116 kg</b>

**TSD450-0**

S. focal	L. focal
<b>450 kV</b>	<b>450 kV</b>
<b>10 mA</b>	<b>24 mA</b>
<b>900 W</b>	<b>4500 W</b>
<b>2,5</b>	<b>5,5</b>
<b>Oil</b>	<b>Oil</b>
<b>95 kg</b>	<b>95 kg</b>

**TSD450-2**

S. focal	L. focal
<b>450 kV</b>	<b>450 kV</b>
<b>6 mA</b>	<b>14 mA</b>
<b>700 W</b>	<b>1500 W</b>
<b>0,4**</b>	<b>1</b>
<b>Oil</b>	<b>Oil</b>
<b>95 kg</b>	<b>95 kg</b>

**TSD420-0A**

	S. focal	L. focal
• Max. high voltage:	<b>420 kV</b>	<b>420 kV</b>
• Max current:	<b>10 mA</b>	<b>30 mA</b>
• Nominal power:	<b>900 W</b>	<b>4500 W</b>
• Focal spot size*:	<b>2,5</b>	<b>5,5</b>
• Anode cooling type:	<b>Oil</b>	<b>Oil</b>
• Weight:	<b>95 kg</b>	<b>95 kg</b>

\* Measurement method of focal spot size EN12543

\*\* 25% Threshold

**TSD320-0**

	S. focal	L. focal
• Max. high voltage:	<b>320 kV</b>	<b>320 kV</b>
• Max current:	<b>15 mA</b>	<b>30 mA</b>
• Nominal power:	<b>1500 W</b>	<b>4200 W</b>
• Focal spot size*:	<b>3</b>	<b>5,5</b>
• Anode cooling type:	<b>Oil</b>	<b>Oil</b>
• Weight:	<b>41 kg</b>	<b>41 kg</b>

**TSD320-2**

S. focal	L. focal
<b>320 kV</b>	<b>320 kV</b>
<b>9 mA</b>	<b>20 mA</b>
<b>640 W</b>	<b>1600 W</b>
<b>1,9</b>	<b>3,6</b>
<b>Oil</b>	<b>Oil</b>
<b>40 kg</b>	<b>40 kg</b>

**TSD320-3**

S. focal	L. focal
<b>320 kV</b>	<b>320 kV</b>
<b>11 mA</b>	<b>25 mA</b>
<b>800 W</b>	<b>1800 W</b>
<b>0,4**</b>	<b>1</b>
<b>Oil</b>	<b>Oil</b>
<b>40 kg</b>	<b>40 kg</b>

**TSD320-5**

S. focal	L. focal
<b>320 kV</b>	<b>320 kV</b>
<b>15 mA</b>	<b>35 mA</b>
<b>1500 W</b>	<b>4200 W</b>
<b>3</b>	<b>5,5</b>
<b>Oil</b>	<b>Oil</b>
<b>40 kg</b>	<b>40 kg</b>

**YOU DIDN'T FIND WHAT YOU WERE LOOKING FOR ?...**

ONLY A FEW OF OUR AVAILABLE TUBEHEADS ARE PRESENT IN THIS CATALOGUE, WE MAY ALREADY HAVE WHAT YOU REQUIRE. AND IF WE DON'T HAVE IT, WE HAVE THE ABILITY TO DESIGN IT FOR YOU ACCORDING TO YOUR OWN TECHNICAL REQUIREMENT.



# BALTOMATIC ■ Real time Systems

## *Complete Standard & customized real time systems*

*A system is an independent unit that is designed to perform inspections tasks in manual, semi or automatic mode with or without the assistance of an operator. It is generally a combination of several elements interconnected together going from the shielded enclosure to the manipulator and the imaging software for digital solutions.*

*Balteau is known for its long tradition in the manufacture of X-ray units and as a solution provider in systems for about 100 years. Balteau builds standard systems but also unique, customized units as you can have specific requirements. Balteau is indeed specialised in providing the adequate and customized solution to simple or complex products.*

*The Baltomatic series is showing you a basic overview of what has been produced by Balteau in the recent years and all systems presented in this brochure can be adapted or modified to fit exactly into your own requirements.*

## A COMPLETE SYSTEM IS COMPOSED OF:

Due to the various different systems made by Balteau (standard or customized), we can now propose any type of combinations: different generators, digital or analogical detectors, cabinet sizes or different ways of manipulating the object can be proposed and will drive the final result offered to your review. Here are the main components our systems are made with:

### SHIELDED X-RAY CABINET (CBN)



When you don't have the proper irradiation room, Balteau can design it for you. Made of Steel-Lead-steel sandwich plates, our cabins can be equipped with hinged or sliding doors, with or without shielded window. Thanks to their robust and rigid constructions our cabins can also be moved from location with the appropriate lift trucks. Shielding is calculated by Balteau following International standards and all cabins can be delivered with a Shielding Certificate issued by a third party. Cabins are equipped with electrical connexions, switches and lighting. Sometimes, a separate section can also host the generator and cooling device.

### X-RAY SOURCE (SCE)



We provide x-ray sources from 100 to 450 kV with different characteristics. Once Energy and power have been defined according to the application, any corresponding Balteau units can be selected or proposed to be integrated into a system. Mostly common integrations are Baltograph series with a monopolar or bipolar tubehead depending on the selected equipment. When budget are limited and applications are allowing it, we can also propose Baltospot units (portable equipment) to be integrated to the system.

### MANIPULATOR (MNP)



Variety of possible manipulation of an object is such that it is difficult to describe them all. Basically one can move the object, the detector and or source or all of them. The selection of the proper manipulator is one of the most important thing that will condition the versatility of your system in the future. When moving the object, things like weight, size of the object, travelling distances and area coverage will define what need to move, with what accuracy and speed. We have a list of standard manipulators from 2 to 6+ axis on both object and Source/Detector, from 5 kg to 500 kg. Other manipulators, up to 9 axis are available upon request.

### COLLIMATOR (CLM)

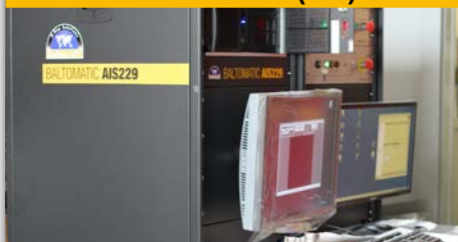


Not only for shielding efficiency and reduction but also for improving image quality with the reduction of scattering, collimators are existing to be used on the detector or the source side.

It can be composed of 2 or 4 independent motorized sliding shutter, from 100 kV to 450 kV.

By closing all shutters, the collimator will also increase the lifetime of the detector.

### CONTROL DESK (CTL)



All elements are gathered in a control desk which can have different form and sizes. The control desk is feeding the system and hosting the necessary switches, fuses or breakers to make the installation as independent as possible. Most of our control desks are 19" compatible.

The control desk presented here encloses a dual 19" PC Rack, A LS1C2 control unit, dual monitors (high brightness B&W, color), and more.

### DETECTOR (DTR)



Any type of detector can be placed into a system when it has been properly designed. Film, LDA (linear detector arrays), Flat Panels or Image intensifier, Balteau can propose the integration of various solutions according to the specification or application. The selection of components integrated can either be the selection of the customer or a documented proposal when the customer wants a specific resolution or result. The main criteria after Performance will be price and therefore our specialists can certainly help you in that field to assist you in the proper selection.

### INSPECTION SUITE

When radiography becomes digital, your system will need an Image Processing Software but not only; this is the reason Balteau's engineers developed a complete suite of software, able to control every parts of your installation named «The Inspection Suite».

Part of the Baltoscope family and a direct successor of our well known IPS011, the Inspection Suite is made of 12 different modules (software), including our brand new IPS012. Discover all the possibilities the Baltoscope Inspection Suite can offer to your everyday jobs.

For further information about the suite, please refer to the Baltoscope range on page 22 and do not hesitate to contact one of our sales manager.

A few example of Balteau's most popular systems with a brief description. If you want more details, do not hesitate and contact us via [sales@balteau-ndt.com](mailto:sales@balteau-ndt.com)

#### AIS 229 - Multipurpose X-Ray Solution

Latest standard & automatic real time system developed by Balteau. It has been designed to do series inspection in a wide variety of industry. Composed of a shielded cabinet, 5 axis manipulator and equipped with the version of the Inspection suite, it will facilitate and accelerate the everyday inspection jobs thanks to its software allowing to record motions to automatized the inspection. The operator will also be able to process the image with the included IPS012 image processing software.

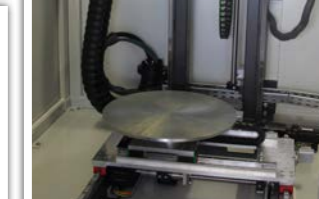
#### MAIN CHARACTERISTICS

- Shielded cabinet
- A 5 axes motorized manipulator
- An x-ray generator type XSD
- An x-ray tube head type TSD or TSC
- A flat panel FP Digit (14 or 16 bits)
- A diaphragm 4 shutters (CLMT 4-4)

- A control desk
- Inspection Suite of software

#### APPLICATIONS

Multipurpose real time inspection system



#### AIS 912 - Honeycomb composite material

The AIS912 has been created with the aim to automate the inspection of composite material with honeycomb structure and as a result to accelerate the inspection process. Thanks to its 9 motorized axes and with the different software developed by our engineers, the AIS912 allows the records of different motions the operator needs in order to radiography the whole sample with only one action. Every picture is then saved on a server database and can be processed by our Image processing system IPS012.

#### MAIN CHARACTERISTICS

- A 9 axes motorized manipulator
- An X-ray generator type XSD
- An X-ray tube head type TSD or TSC
- A flat panel FP Digit
- A control unit type LS1
- A control desk

#### APPLICATIONS

Aerospace, Automotive, Composite and large objects



#### AIS203RD - Metallic & non-metallic components

The AIS203RD has been created to inspect metallic and non-metallic components. It has been built for every single element to be configurable and highly flexible to be used in different applications in digital radiography. The system is built around a robot for the detector/source manipulation in order to provide the user with every possible inspection angle for any components that can be fitted on the main manipulator. All sequences of inspection can be unique or repeated using the 'record and play' functions.

#### MAIN CHARACTERISTICS

- Shielded cabinet (optional)
- An X-ray generator type XSD
- An X-ray tube head type TSD or TSC
- A flat panel FP Digit
- A control desk
- A collimator

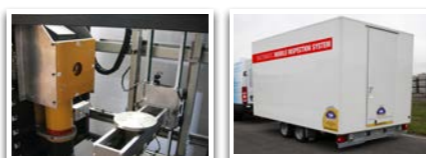
- A manipulator with horizontal rotating motion
- An industrial robot with multiple axes
- Inspection Suite of software

#### APPLICATIONS

Aerospace, Hollow forgings, In line production

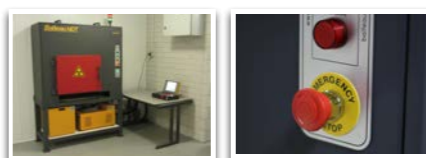


#### AIS958 - Small to middle size components



Very compact complete digital X-ray system allowing the inspection of a wide variety of samples. The 5 axis motorized manipulator can inspect a sample from all angles and thus, achieve a complete inspection. It can also be mobile with its installation in a trailer (optional), allowing to move over a wide area and respond effectively to customer requests.

#### AIS228- Small to middle size components



Very compact equipment that has been designed to inspect a wide variety of samples with different thicknesses. This shielded cabinets includes a directional X-ray generator from Baltospot range. The cabinets is made of a steel structure with lead reinforcement «sandwich» type assembly (steel-lead-steel). Can be equipped with a rotating plate (optional).

#### AIS201 - Inspection of welded cylinders



Real Time system especially designed for the control of welded cylinders. This cost effective inspection system will drastically cut down the inspection time and cost, thanks to its motorized (automatic optional) handling 5 axis manipulator. Equipped with the XSD160 specially suited to the RTR inspection, thanks to its high dose stability.



# BALTOSCOPE ■ Digital Imaging

*Digital imaging & radiosopic modular software solution*

*Digital detectors have become unavoidable in Radiography. Benefiting from fast electronics progresses and also from volume production which has driven prices down and quality standards up. Products have now reached all sectors of Industries and have been adapted to fit to the most stringent requirements like harsh environment, high and very high energies, etc...*

*Digital detectors are not only taking care of environmental aspects by removing chemical processes in radiography, but also improves production efficiency and quality by providing faster and better images with larger latitude for increased legibility of indications.*

*But detectors themselves are useless without the right software to use them and process snapshots. This is why Balteau has designed a modular software solution able to control & process every part of a radiosopic installation.*



**FLAT PANELS & LDA**

Flat panels are a combination of electronic and Silicon technologies which gives a direct conversion media for displaying radiographic images instead of using films. Flat panels are basically a two dimension array of detectors which sensitivity is 10 to 100 times greater than conventional films. This helps in reducing exposure time but also gives an extended range of thicknesses with the same use of energy. Balteau provides a wide range of flat panels of different sizes, dimensions and pitches to fit in your applications and requirements with also a « Phantom » allowing calibrations. Please contact us with your requirements.

BALSCOPE FPDIGIT11-200	BALSCOPE FPDIGIT13-127	BALSCOPE FPDIGIT22-200	BALSCOPE PHANTOM
Pixel area: <b>20,5 x 20,5 cm</b>	Pixel area: <b>19,5 x 24,4 cm</b>	Pixel area: <b>41 x 41 cm</b>	Dimensions: <b>326 x 275 mm</b>
Pixel pitch: <b>200 µm²</b>	Pixel pitch: <b>127 µm²</b>	Pixel pitch: <b>200 µm²</b>	Homogeneity measurement
Spacial resolution: <b>25 lp/cm</b>	Spacial resolution: <b>3,94 lp/cm</b>	Spacial resolution: <b>25 lp/cm</b>	Distortion measurement
AD/conversion: <b>14 or 16 bits</b>	AD/conversion: <b>16 bits</b>	AD/conversion: <b>14 or 16 bits</b>	Linearity measurement
Frame rate: <b>Up to 30 (14bits)</b>	Frame rate: <b>Up to 30</b>	Frame rate: <b>1 (14bits)</b>	Sensitivity measurement with:
Standard shielding: <b>160 kV</b>	Standard shielding: <b>225 kV</b>	Standard shielding: <b>160 kV</b>	<b>2 zones of holes IQI</b>
System interface: <b>Gigabit Ethernet</b>	System interface: <b>Gigabit Ethernet</b>	System interface: <b>Gigabit Ethernet</b>	MTF measurement with:
Weight: <b>3,7 kg</b>	Weight: <b>2,51 kg</b>	Weight: <b>8,8 kg</b>	<b>Duplex IQI</b>

Linear Diodes arrays (LDA) are also available, up to 1.2m length with different versions of scintillators. Contact us with your requirements at balteau@balteau-ndt.com An image acquisition module is delivered with Balteau NDT dectector such as flat panel or LDA showing the image in real time like in fluoroscopy.

**INSPECTION SUITE**

« The inspection suite can be delivered with any already owned installation and is always supplied with our standard and customized real time inspection systems »

A complete suite of software made of 12 modules for each part of your inspection system able to communicate between each other but not only. Discover what can offer the Balteau NDT Inspection Suite. From manipulator motions to source settings, every step of your inspection can be previously thought and recorded to the system to be retrieved from the database when it is needed. All modules combined offer one the most powerful solution available on the market of x-ray inspection.

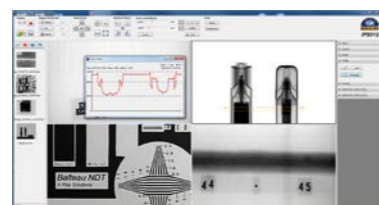
**AUTOMATION**  
Module Integrator

Automation is the software that will lead the system, will make every step of the inspection easier and faster. All modules available are independant and work on their own. Automation will integrate them into one and only window to offer access to all controllers from every module (except IPS and Dicom to AVI) on only one screen, offering a fast and easy control of every part of the inspection system.



**IPS012**  
Image Processing System

IPS is the Image Processing System that will convert the electronic data into an intelligible image that you will be able to store, process, print or transfer to other users. Based on a Windows platform, this software is embedding all common and usual processing algorithms. Combined with the acquisition module, snapshots can be sent directly to the IPS as long as computers are plugged on the same network.

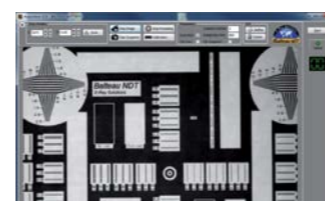


**DICOM TO AVI**  
Image converter

DICOMtoAVI is a standalone software and also an add-on to IPS012. It provides the user with the ability to convert high quality DCM images into a more compact and portable AVI file for sharing with customers or third parties. It uses native Windows Media Player or any other basic video player for sequence playing. What says more compact and more portable obviously stands for a lesser image definition as it is compressed for portability. Typically a 250 MB directory containing 40 DCM images

**ACQUISITION**  
Detectors module

Drives detectors such as flat panel or digital camera. Showing images in real time, the user can take snapshot whenever he's satisfied and it will be automatically stored on the selected disk. This module can support Diconde, Dicom, Tiff, Jpeg, Png, Bmp and raw images.



**Type of detectors:**  
- Image intensifier (Bix)  
- Flat panel (FPDigit)  
- Linear Detector Array

**XRRC**  
X-Ray Remote Control

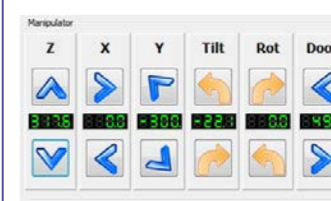
Connects to the X-ray source using a serial link and is able to control all operations remotely, directly on the computer screen. Allowing you to interact with the mA, kV, start and stop the X-ray from running, view of the tube characteristics and state, start and stop preheating.



**Type of sources:**  
- Balteau NDT  
- Others

**ARC**  
Axis Remote Control

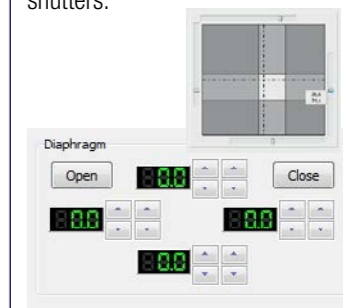
This module will control the motors of the equipment, such as manipulators, doors, etc. It works with the latest technology and allows up to 9 axes. This module can also be driven by remote control when used for teaching inspection process.



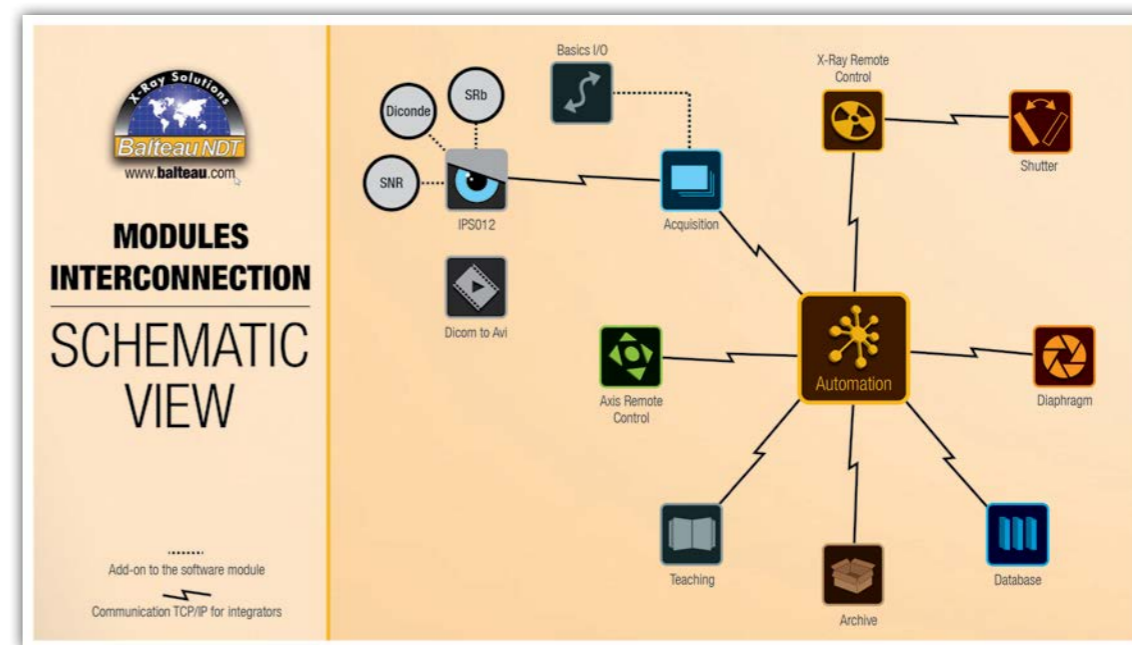
**Type of motion objects:**  
- Motor drive  
- Low torque  
- High torque

**DRC**  
Diaphragm Remote Control

Controls the motors of the different shutters of the collimator. It works with the latest technology regarding motors control and allows up to 4 shutters.



**Type of collimators:**  
- Balteau NDT CLMT  
- Others



**TEACHING**  
Inspections recording module

Teaching is a software able to control manipulators, collimators and sources. Working directly with a database, it allows the record of complete motions with precision that the user can retrieve and use to do an inspection. Because of this software, the everyday work becomes much faster and it highly reduces human mistakes as each movement will be previously recorded. This is the heart of the automation of a complete system.

**BASIC I/O**  
Peripherals module

Peripherals is the link between the computed system and all accessories such as radiation alert & switches. The driver will send impulsion to the system to inform of the accessory statut.

**Type of peripherals:**  
- Safety & emmergency switches  
- Avara  
- Etc.

**SRC**  
Shutter Remote control

Linked to XRRC, SRC will control and collimate the x-ray beam when required by the user.

**ARCHIVE**  
Storage module

Old components will be stored in archive in case an old design need repairs, maintenance or inspections.

**DATABASE**  
Saving / Retrieval module

This is a backend module which has no visible effect on screen. With this module, all images will be stored and indexed in a database which allows easy retrieval by doing a research on the metadata. All recorded motions made with teaching will be retrieved including all parameters of the loaded inspection such as motions, x-ray settings, etc.



# ACCESSORIES.

*For Balteau products, safety, measurement & quality improvement*

READY

**AVARA**

DETECTION

AUDIBLE & VISIBLE AUTOMATIC RADIATION AL...



LOW

CHARGING

FULL

SENSOR  
FAILURE

Balteau NDT

## ACCESSORIES

Balteau offers a lot of different accessories made to serve the existing ranges of products or to ensure a complete inspection from beginning to end with Balteau's products.

## CLIGNOTIX

**Warning flashing light with 20 m cable**

An external warning Flash light (Clignotix) can be connected to the control unit, indicating the emission of X-rays.

## AVARA/P

**Audible visible automatic radiation alert**

AVARA/P is the unavoidable tool for an efficient control of a specific area in order to guarantee a maximum security to the operator and other people standing close to the working zone.

## AVARA/C

**Audible visible automatic radiation alert**

AVARA/C is the cabin version of the portable version of the avara, allowing the operator to monitor closely the working area.

## HYDRAULIC STAND

**Hydraulic stand with yoke and cradle**

The X-ray beam can be oriented at any angle between the vertical and horizontal positions. The crane can be mounted with any of the tubeheads. and is mounted on the hydraulic appropriate clamp.

## TRIPOD

**Tripod stand for tubehead**

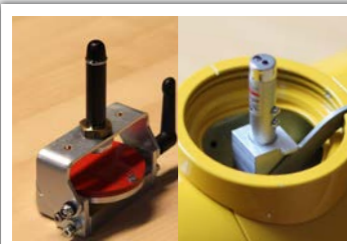
This aluminium robust device is used to ease the work of the operator. The shoulder strap makes the carrying of this tripod very convenient.

## UTS01

**Universal stand, mechanical lifting**

The UTS01 is an assistance for the tube positioning. The tube is held by a strong steel tubing which gives the ability to move the tube in three different axis.

## LASER CENTERING DEVICE

**Laser centering device**

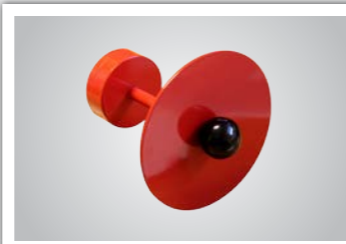
It is a module that has to be attached to the window the tubehead. It consists of a metallic attachment with a smaller laser pen, available for Baltospot & Baltograph.

## DIAPHRAGM

**Diaphragm 10 x 48 mm or 10 x 24 mm**

Using diaphragms will help having a better quality of the image taken and also lower the scattering as the beam of x-ray will be reduced.

## LEAD OBTURATOR

**Led obturator for preheating**

Ensuring better safety of the user while preheating and also lengthen the life of a digital camera such as flat panels or bix with stopping the x-rays aging the unit.

## PEX01

**Personal exposure assistant - PEX01**

It gives you the right exposure time and eliminates the risks of retaken due to calculation errors. It is easy to use thanks to the joystick and the simple menu.

## POWER GENERATOR

**Power generator 4.2 KVA single 50 Hz 230V 3200 Watts - fuel**

Thanks to our equipments ready to work on power generator, Balteau provides a solution to work in every environment, even when there is no power available.

## RING LEAD SCREEN

**Ring lead screen allowing directional shot and centering rods kit**

Most of your work is done with a panoramic tube but sometimes a directional beam would be useful? This ring lead screen is your solution.

## PROTECTIVE CRADLE

**Protective cradle**

The cradle provides good protection for directional generators against shocks and simplifies their handling. It can be easily turned into a four leg stand or adapted to the hydraulic stand.

## FLS02

**Four legs support (FLS02)**

This four legs stand facilitates the accurate positioning of the generator to the support. Units are surrounded and protected by a steel frame which can be securely fastened on the height adjustable legs.

## TRANSPORT CASE

**Transport case**

The best way to transport balteau's generators and it's accessories is this transport case, protecting and securing the equipment at all time.

## WATER SECURITY BOX

**Water security box**

designed to be used on water cooling network or with water cooling unit without security. The box will permanently verify the pressure and the temperature of the water used to cool down the anode of the tubehead..

## PREHEATING BOX

**Preheating box for tubehead**

To ensure a safe environment during preheating, a shielded box has been designed by Balteau where the tubehead can be placed.

## LS1 REMOTE CONTROL

**LS1 Remote control**

When inspection can't be made in a shielded cabinet, the security of the user can be kept, thanks to this remote control with up to 40m cable plugging to the LS1 control unit.





