

# PRODUCT CATALOGUE

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2015



We are a recognised global authority in the manufacture of Intrinsically Safe Instrumentation.

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# ABOUT CorDEX

We are the recognised global authority in the manufacture of Intrinsically Safe Instrumentation. We are known for bringing straightforward solutions to complex safety challenges which others haven't dared to tackle. We are copied, envied and respected across the industry.

We understand and embrace the challenges associated with hazardous environments. We look to design and manufacture products which are new and different in the marketplace and which tackle those challenges. Our focus is on unmet needs and simplified process. We will not be deterred. We invest time, money and energy in getting things right. Our products are strong and functional – they can be relied upon.

At CorDEX we are leaders in the innovation and manufacture of instruments used every day in the world's most challenging work environments. All of our instruments are specifically created for safe use in hazardous environments; we are the authority in Intrinsically Safe Instrumentation.

We invest in product development and certification to give you the confidence that you need in order to stay safe. So our products offer more than just safety, performance and accuracy – they give our clients the confidence to do the job.

Our products may be Intrinsically Safe but you won't see a trade off in terms of usability or features. Our products have all of the usual advanced functionality you would expect from an industrial instrument. And like any other high quality instrument it comes with a full warranty and ongoing support from our in-house technical team.



**Winners of the Queen's Award for International Trade 2014 and the North East Business Awards 2014.**



# PROFILE

Douglas Walker is currently director of research for CorDEX.



**Douglas is currently Director of Research for CorDEX. Over the last thirty years after graduating in New Zealand with a BE (electrical engineering) qualification Douglas has developed a range of innovative solutions utilising available technology and resources in a creative way.**

These have been applied in promoting, specifying and implementing products in a wide range of areas within the fields of communications and generic design services.

Within the field of design services these include high frequency (3Gbps) data collection systems, imaging systems with

CMOS sensors, IR camera design for both radiometric and gas applications, multi-processor system design using modular techniques for video on demand applications and ultrasound imaging systems for B-mode, M-mode and Doppler displays.

Within the field of data communications these include architecture of a dual-channel Fibre Channel to SONET (OC48) Bridge, VOIP phone/PBX/gateways including for ISDN BRI and E1/T1 for VOIP PBX with design to safety standards and for BT line interface standards, L3/IP router Switch Module architecture for L3/IP routing module for L2 switch and RMON (network monitoring) probe hardware design.

For CorDEX the design of ultrasound, imaging and lighting products specifically for use in hazardous environments has brought together diverse techniques to produce compact products which meet the IS/ATEX standards in addition to the normal EMC and safety directives. Specifically, these have been applied to power distribution and barrier designs allowing high performance systems in compact form factors to be achieved.

**Douglas has touched many aspects of engineering and design throughout his career, including:**

- Intrinsic product design and design services.
- Expert understanding and experience of all phases of the design process; specification, verification, manufacturing, testing, compliance and marketing requirements.
- Hardware architect and designer with significant experience in managing multidisciplinary teams.
- As a technical team leader and program manager with experience in producing architecture & design specifications through to design implementations.
- Detailed knowledge of VOIP phone/PBX/gateway and datacom-switch/LAN/WAN/SAN architectures and implementation techniques at system, FPGA and board levels. Experienced in high speed multi-processor and memory systems.
- Expert verilog/VHDL FPGA and board level designer.
- Verilog design and test-bench, h/w design and simulation (including board level).
- Cadence concept, Modeltech simulator, Synopsis synthesiser, Altera Maxplus2/Quartus.
- Responsible for all h/w areas including architecture, EMC, design for manufacture, design for test, etc.
- Design for EMC conformance and subsequent EMC performance measurements in approved facility.
- Designs to safety standards.
- Program manager of several multi-site projects:
  - Managed multi-discipline virtual teams to achieve product introduction for several projects, as well as the gateway design. Teams included manufacturing, SQA, test, compliance and marketing.
  - Ensured DFM and DFT requirements for 3Com new product introduction process.
  - Recruitment and career development responsibilities including appraisals, and experienced interviewer for technical positions.

# INTRINSICALLY SAFE DESIGN OVERVIEW

CorDEX are leaders in the innovation and manufacture of instruments specifically created for safe use in hazardous environments.

The applicable standards to which the CorDEX ultrasound, imaging and lighting products are certified against are IEC60079-0 and IEC60079-11.

IEC60079-0 specifies the general requirements for construction, testing and marking of electrical equipment and Ex Components intended for use in explosive atmospheres

IEC60079-11 specifies the construction and testing of intrinsically safe (IS) apparatus intended for use in an explosive atmosphere. In this type of protection the electrical circuits themselves are incapable of causing an explosion in the surrounding explosive atmospheres.

The equipment is approved by a notified body then assigned a certificate number. Typical markings for CorDEX IS equipment are:

Ex ib IIC T4 Gb (Tamb -10C to +40C)  
Ex ib IIC T4 (G)  
Ex II 2G

## Why Intrinsically Safe?

Intrinsic Safety (i) removes the need to obtain hot work permits for Zone 1, 2, 21, 22 and M2 explosive areas. IS designs are light with compact form factors and allow the equipment to be more or less as non-IS equipment.

Other types of protection with disadvantages are:

### IEC 60079-1:

Flameproof enclosures "d" bulky

IEC 60079-7: Increased safety "e" limited

IEC 60079-18: Encapsulation "m" heavy

## What's required?

The spark ignition and thermal ignition are assessed against the standards.

For spark ignition the equipment is assessed for the limitation of the spark energy that may be capable of causing ignition of the explosive atmosphere.

For thermal ignition all surfaces of components, enclosures, wiring and the tracks on printed circuit boards which may come in contact with explosive atmospheres are evaluated for the maximum temperature.

## Design for Spark Ignition Compliance

All aspects of the design are considered for the prevention of a spark.

The separation of every circuit boundary is identified and assessed for creepage and clearance.

Every inductor and capacitor is accounted for and assessed at the operating voltage for stored energy. Resistive short circuit spark capability is also evaluated.

Infallible wiring, connectors, wiring insulation supports and terminals are assessed for operating voltage and current.

The enclosure is evaluated for static charge build up and IP54 rated to ensure IS requirements are not compromised by environmental factors.

## Design for Thermal Ignition Compliance

All aspects of the design are implemented to ensure the maximum temperature is never exceeded.

Limiting the power into an intrinsic circuit is the way this is achieved. For T4 temperature class, the maximum power allowed must not exceed 1.3W. The limitation techniques are based on resistive power limiting within each intrinsic circuit. Separations between these circuits are defined and rigorously implemented.

All components are evaluated for surface temperature based on 1.3W input. The component surface area is defined and increased where needed for small devices.

Multiple IS circuits can be used to increase the power available. For this, an accurate evaluation of transferred energy between circuits is required, including with fault conditions and all defined operating conditions.

## The Design Process

Over and above the normal design activities IS design requires rigorous application of the IS standards with associated documentation.

Infallible components on which intrinsic safety is dependent are specified for operating voltage, current and power rating. Additionally a factor of safety rating is applied. Infallible wiring, assemblies, PCB tracks and connectors are included in this process.

In certain cases, samples of components such as batteries, motors and fuses are tested by the certification body to ensure compliance to the specification.

All these are tracked and audited as part of the design and then the build requirements.

## Intrinsically Safe Manufacturing

Manufacture for IS requires quality assurance beyond the normal ISO 9001.

Additional requirement for manufacture of ATEX products is a QAN/QAR or a suitable ATEX Quality Assurance Notification (QAN) or IECEx Quality Assurance Report (QAR). Random unscheduled audits of the manufacturing process are a key requirement.

# YOUR GLOBAL TEAM

We understand and embrace the challenges associated with hazardous environments. We look to design and manufacture products which are new and different in the marketplace and which tackle those challenges. Our focus is on unmet needs and simplified process. We will not be deterred. We invest time, money and energy in getting things right. Our products are strong and functional – they can be relied upon.



## EUROPE, MIDDLE EAST AND AMERICAS

**Marcus Halliday**  
Distribution Director

Currently Distribution Director at CorDEX Instruments Ltd, where he has been instrumental in the development & implementation of CorDEX's global distribution network.

Since joining CorDEX at its birth, Marcus has developed a wealth of knowledge about the regulations governing hand held equipment use in hazardous working environments, specifically within the Global Oil, Gas & Petrochemical & Marine industries.

**Email:** marcus.halliday@cord-ex.com  
**Tel:** +44 (0)1642 454373  
**Mob:** +44 (0)7815 578107



## ASIA PACIFIC

**Lewis McCormick**  
Distribution Manager

Lewis is a Level III Infrapsection Institute Certified Thermographer with experience in both practical applications and delivering IR training. Lewis also has extensive experience in the use, application & installation of infrared windows throughout Asia Pacific where he was responsible for increasing brand awareness, appointing distributors, installation training on IR windows, running distributor conferences & trade shows.

**Email:** lewis.mccormick@cord-ex.com  
**Tel:** +61 (0)390 396 593  
**Mob:** +61 (0)439 194 966

# CorDEX CONNECT™ SOFTWARE

## **CONNECT**

Oversee your complex world with a system of software and wireless tools that helps you prevent equipment failure.

Multiple tools, one software package. With CorDEX CONNECT™ the onerous task of organising inspection data is fully automated. With CorDEX CONNECT™ enabled tools, you can seamlessly compare, trend and analyse information, all in one cross platform software package.

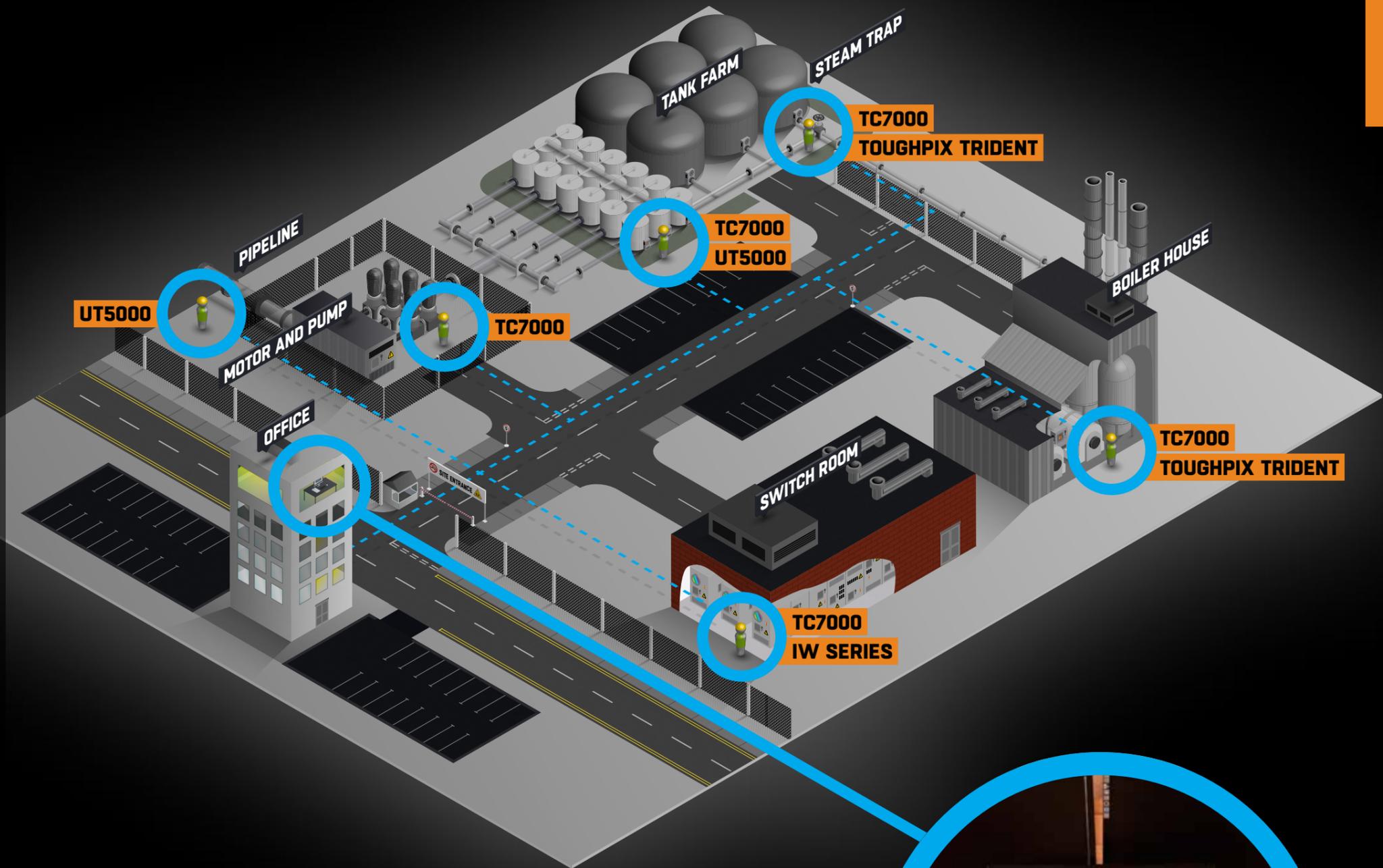
# CONNECT

CorDEX CONNECT enables engineers, technician and maintenance managers to build and sustain successful maintenance programs, combining multiple measurement tools in one simple to use, yet powerful database reporting package.

Using 13.5Mhz RFID tags, CorDEX CONNECT automatically organises your measurement data, saving you valuable time and money. Using this revolutionary, cross platform package, the status of your assets can be assessed and reported almost instantaneously.

Whether you are looking to establish preventive or condition-based practices or simply maximise uptime, you can now do it with minimal investment and setup.

- Combine images, measurements and data into a single picture of your assets' health using RFID technology.
- Quick return on investment. Designed for easy installation and setup without involving your IT team.



## TC7000/TC7150



Tough, safe and accurate, **TC7000** is the **thermal imaging camera** of choice for oil, gas mining, marine and dust environments.

## IW SERIES



The latest generation of **SMART Infrared Windows** for **low, medium and high** voltage applications.

## UT5000



Non-Invasive, next generation thickness gauge, **UT5000** is the **thickness gauge** of choice for rugged environments.

## TOUGHPIX TRIDENT



The **TOUGHPIX II TRIDENT EDITION Explosion Proof Digital Camera** is designed and certified with the professional inspector in mind.



Introducing EXIS intrinsically safe battery pack, intelligent and interchangeable, even in the hazardous area.



**ZONE 1 HOT SWAPPABLE**

[FIND OUT MORE ABOUT EXIS](#)



Ever had the battery die on an intrinsically safe tool? Of course, we all have. What few people realise is that if the battery is removable, it can rarely be removed without returning to a non-hazardous location which can mean a significant amount of time lost transiting to and from the hazardous location simply to change a battery. For tools with integral batteries, this problem is further compounded in that the tool must be returned to the non-hazardous area and then recharged, rendering it useless for that time period. The only solution if you want to continue working is to buy a second tool!

Thankfully, there is finally a solution that saves you time, money and keeps you functioning. After over two years in development, CorDEX Instruments, in association with EXIS Energy Ltd, have created a series of tools that have ultra longlife lithium ion batteries which can be **safely removed and replaced within the hazardous area**, known as Hot Swapping. These Intrinsically Safe certified tools can even **interchange the EXIS smart battery packs** between one another, similar to non-I.S. power tools of today.

No longer is your working day restricted to the life of a single battery. Look out for the Zone 1 Hotswap logo and ensure the tools you select work for you, rather than defining your working day.

# INFRARED CAMERAS

Intrinsic safety isn't overkill, it's the very definition of rugged. At CorDEX it is our goal to design, test and manufacture the safest, most rugged radiometric infrared cameras available. Not only are all of our cameras designed and tested to withstand multiple sub zero (-20C) 1m drops onto concrete, our infrared cameras hold as a minimum, an IP54 Ingress Protection rating.

This severe industrial certification test is performed after the drop test to ensure that the CorDEX line of infrared cameras are not only accurate with crystal clear image quality, but that they are worthy of the term, rugged.

# WHY CHOOSE OUR INTRINSICALLY SAFE THERMAL IMAGING CAMERA?

You may not need an Intrinsicly Safe tool for your work, but the peace of mind associated with its rugged, tested and feature rich certified design means that you can be sure our **TC-Series Thermal Imaging Camera** range will last the test of time.



Infrared Cameras

Infrared Cameras



### Tested for toughness

Passed our ToughTEST including water, dust and repeated drops.



### Articulating head

See over, under and around obstacles without moving the display!



### High speed, manual focus lens

Resolve minute detail with highly sensitive manual focus lens.



### Built in 13.5MHz RFID reader

Assign RFID data to images for automatic collation and reporting with CorDEX CONNECT software.



### Long life Lithium ion battery

Up to six hours continuous runtime with rechargeable Lithium Ion battery pack.



### Large, glove friendly controls

Designed to operate in virtually any environment, with or without gloves.

# TC7000 / 7150

Tough, safe and accurate, **TC7000** is the **thermal imaging camera** of choice for oil, gas mining, marine and dust environments.



## FEATURES

**Intrinsically safe certified. Safe, Reliable and above all, Rugged.**

**High speed, articulating lens. Shoot high quality images over, under and around obstacles.**

**Onboard RFID tag reader. Assign images to RFID tags and automatically create reports, manage data and create trends.**

**CorDEX CONNECT™ enabled.**

### CorDEX TC-Series Intrinsically Safe Thermal Imaging Cameras.

You need troubleshooting tools that are rugged, reliable, efficient and accurate. Tools that can help you detect problems fast and communicate them easily to your team. That's what the CorDEX TC-SERIES Intrinsically safe cameras do. They give you the ability to see heat and detect problems before they happen. All from a tool that is virtually indestructible in everyday use.

### Rugged - Intrinsically Safe Rugged.

With its Intrinsically Safe certification when it comes to Rugged, TC-Series sets the bar. IP54 Ingress Protection rated, you can be sure these cameras will continue to operate in any weather, day or night. Concerned about your valuable tool

being dropped and damaged? Don't be, TC-Series has been tested and certified as having passed a 3'/1m drop onto concrete at a temperature of -20C. Three times!

### Optimised for your world.

- Large keys and simple interface, perfectly suited for gloved hands.
- 135° degree articulating lens, see over, under and around obstacles with ease.
- RFID, voice and text annotations stores in radiometric image.
- CorDEX CONNECT enabled, automatically organise data and create reports saving valuable and unproductive office time.
- Long life, rechargeable lithium ion battery pack - get a full shift from a single charge.

## PRODUCT OVERVIEW

TC7000 Certificate Information		TC7150 Certificate Information	
ATEX / IECEx Certificate No	TRAC12ATEX0037X / IECEx TRC 12.0019X	MET Listing No	E113607
ATEX / IECEx Certificate Types	<ul style="list-style-type: none"> <li>• Ex ib IIC T4 Gb Tamb -10°C to +40°C (Vapor)</li> <li>• Ex ib IIIC T200°C Db Tamb -10°C to +40°C (Dust)</li> <li>• Ex ib I Mb (Mining)</li> </ul>	MET (North American) Certificate Type	Class I, Division 2 Class II, Division 2 Class III

Temperature Information	
Measurement Range	-4°F to 1112°F (-20°C to +600°C )
Accuracy	± 2°C or 2% of reading

Imaging	
Image Frequency	9Hz
Detector	320 x 240 uncooled microbolometer
Thermal Sensitivity/ NETD	50mK
Spectral Range	8µm to 14µm
Field of View (FOV)	25° x 20.5°
Spatial resolution (IFOV)	1.38 mrad
Minimum focus distance	≈ 4" (10cm)
Lens	F 1.2

Image Capture	
File Storage	8GB
File Formats	CDX (Radiometric) JPEG (Non-radiometric)
Voice Annotation	YES
RFID Tag Reader	<ul style="list-style-type: none"> <li>• Operates with 13.54MHz passive tags</li> <li>• Detection range up to 5cm (1.9in)</li> <li>• Supports ISO/IEC15693-2, ISO/IEC18000-3 tag formats</li> </ul>

General	
Operating Temperature	-4°F to 104°F (-20°C to +40°C)
Storage Temperature	-40°F to +158°F (-40°C to +70°C)
Display	3.2" Backlit LCD
Software	CorDEX CONNECT (Included)
Batteries	Rechargeable Lithium-ion



Swivel the lens to minimise screen reflections and comfortably access high and low areas of interest.



See hot spots easily with the clear and bright 3.2" Backlit Display.



Download images and data through the USB connection to CorDEX CONNECT™ reporting and predictive maintenance software.

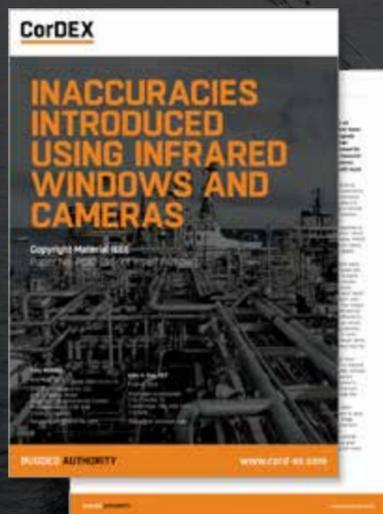
CorDEX reserve the right to make changes to the instrument at anytime and without notice.

# TESTED FOR TOUGHNESS

Some thermal imagers claim to be tough, but can your thermal imager pass the CorDEX **ToughTEST**?



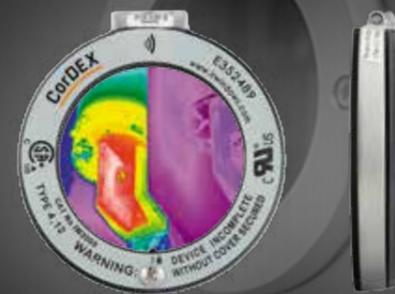
# INACCURACIES INTRODUCED USING INFRARED WINDOWS AND CAMERAS



With increased focus on electrical safety and the widespread adoption by industry of NFPA-70E, infrared systems are increasingly becoming more popular. **Download our FREE white paper** now exploring inaccuracies in predicative maintenance.

# RFID ENABLED, SMART IR WINDOWS

The latest generation of **SMART Infrared Windows** operate with any thermal imager, helping take electrical inspection and predictive maintenance to a new level of safety, efficiency and accuracy.



**HYDROGARD** **CONNECT**



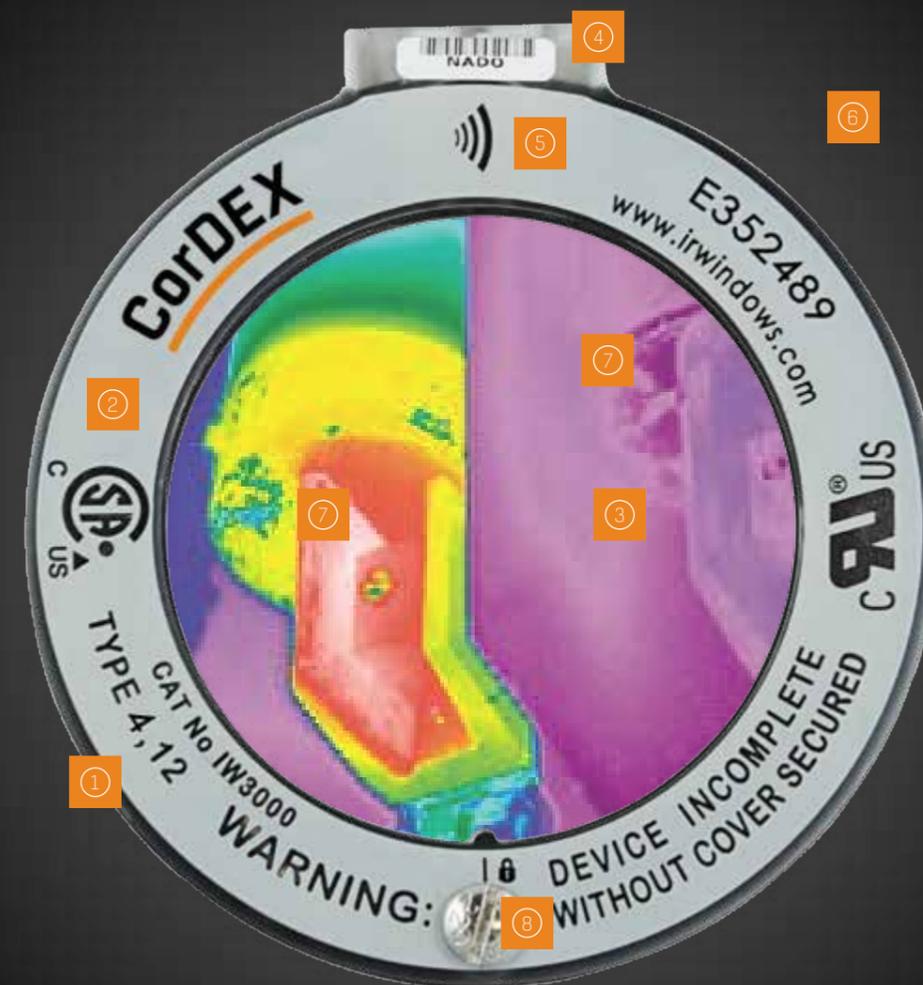
With significantly **rugged engineering**, EXIS™ not only delivers **maximum power and energy**, but is also **incredibly long lasting**.

# INFRARED WINDOWS

Are you concerned about Arc-Flash but understand the benefit of Infrared Inspections? Then you need IR Windows. Protect your equipment, your plant and your personnel using the next generation of IR Windows from CorDEX. The IW Series SMART IR Windows are not only cost effective, simple to install and extremely rugged, but they are SMART too. Incorporating an embedded RFID tag, each UL and CSA Recognised SMART IR Window can communicate wirelessly with any suitably RFID enabled device providing a unique serial number wirelessly.

# WHY CHOOSE OUR SMART INFRARED WINDOWS?

The IW Series is the latest generation of **SAFIR SMART IR Windows** from CorDEX Instruments. The IW Series infrared window operates with any thermal imager, helping take electrical inspection and predictive maintenance to a new level of safety, efficiency and accuracy.



Infrared Windows

Infrared Windows

## 1 Low profile design

**Why?**  
Smooth, rounded edges, slim profile and typical switchgear colouring match your host equipment perfectly, for a seamless installation.

## 3 Impact resistant clear cover

**Why?**  
Protect your investment and maximize your return. The impact resistant clear cover helps prevent accidental damage whilst at the same time allowing visual inspection and confirmation of equipment status.

## 2 Anodised aluminium housing

**Why?**  
Your switchgear body is made of metal, so your IR Window body should be also. Ensure you are not at risk of electric shock with this fully grounded, corrosion protected design.

## 4 Spring loaded hinge

**Why?**  
Avoid crowded panels restricting your view. Install IW Series in any orientation and its spring loaded hinge will open and hold the cover automatically while you perform your survey.

## 5 13.5Mhz RFID tag

**Why?**  
Wirelessly identify each IR Window with its unique, embedded RFID tag. Build databases of your IR Window inspections with any 13.5Mhz RFID enabled tool, or take advantage of CorDEX CONNECT software and enabled tools to do it for you!

## 7 Broadband, HYDROGARD™ coated crystal

**Why?**  
Operates with any camera; digital, infrared or ultraviolet, the HydroGARD coated optic is designed to be flexible and last the test of time.

## 6 Delivered fully assembled

**Why?**  
No need to waste time and lose parts by removing screws and reassembling. Simply open the package, install and go.

## 8 ¼ turn quick release mechanism

**Why?**  
Captive ¼ turn locking mechanism saves you money every time you use it. Simply twist the key 90 degrees and the IR Window automatically opens.

# IW SERIES

The latest generation of **SMART Infrared Windows** for **low, medium and high voltage** applications.



## FEATURES

The IW Series are fully certified and tested to the following standards: **UL50, UL50V and UL1558**

Manufactured from industrial grade materials proven to withstand electric arcs

Efficient 1/4 turn locking system

Intelligent multiple identification system for each individual window

Arc flash tested against a 50kA short circuit for 1 second at 11kV

### CorDEX IW Series SMART Infrared Windows.

The IW Series is manufactured from industrial grade materials designed to withstand electrical arcs and certified by Underwritten Laboratories (UL) to follow the very latest IR window standards. Install the certified, IW Series SMART IR Windows to help comply with NFPA70E electrical safety guidelines and reduce the need to wear large and bulky PPE.

Take a look before you shoot with the high security, spring loaded impact cover. With IW Series, there is no need for second visual inspection windows in addition to your IR Windows, as you can confirm switch positions for lock-out tag-out compliance with the same Window as you shoot IR. Maximise your investment, don't throw away

your IR Windows when you change your equipment. The fully removable IW Series IR Windows can be used again and again, outliving the life of your equipment.

Through intelligent design and special features, the IW Series reduces the time it takes to perform inspections. With the ¼ turn locking system and spring loaded cover it reduces your time per inspection.

The IW Series crystal lens is also protected with HYDROGARD™ advanced formula to stop environmental moisture damage allowing the windows to be used both indoor and outdoor.

## PRODUCT OVERVIEW

Optic/Crystal Data	IW2000	IW3000	IW4000
Crystal Insert Diameter	50mm (2in)	80mm (3.2in)	100mm (3.9in)
Viewing aperture diameter	45mm (1.8in)	73mm (2.9in)	93mm (3.7in)
Viewing aperture area	1591mm <sup>2</sup> (2.5in <sup>2</sup> )	4186mm <sup>2</sup> (5.6in <sup>2</sup> )	6794mm <sup>2</sup> (9.79in <sup>2</sup> )
Thickness	2mm (0.08in)	2mm (0.08in)	4mm (0.16in)
HYDROGARD™ Coating		Yes	
Shortwave IR capable		Yes	
Midwave IR capable		Yes	
Longwave IR capable		Yes	
Ultraviolet (UV) capable		Yes	
Visual capable		Yes	
Fusion capable		Yes	

### Certification

Underwriters laboratories (UL) recognised	Yes
UL50	Type 4/12
UL746C, UL94, UL50V, UL1558	Yes
Sira IP65	Yes

### General Specification

Maximum Temperature	Gaskets: 250°C (482°F) Body: 659°C (1218°F) Optic: 1400°C (2552°F)
Gaskets	Low smoke and fume (LSF) compliant silicone
NEMA rating	Type 4/12 (UL Third Party Certified)
Vibration rating	IEC60068-2-6
Humidity rating	IEC60068-2-3
Warranty	Lifetime replacement against manufacturing defects

	Window Aperture	Diameter	Depth
IW2000	45mm (1.8in)	77mm (3.0in)	19.5mm (0.8in)
IW3000	73mm (2.9in)	103mm (4.1in)	19.5mm (0.8in)
IW4000	92mm (3.7in)	123mm (4.9in)	21.5mm (0.85in)



Embedded RFID chip enables open-architecture databasing with any compatible RFID enabled device. Use with CorDEX CONNECT enabled imagers for automatic transmission correct and reporting



HYDROGARD™ coated broadband optic, impervious to moisture, mild acids and alkalis – guaranteed



Spring loaded impact cover, automatically raises and holds during your IR scan in any orientation



SMART tools working together, saving you time and money. Go to page 19 for the TC7150 RFID enabled thermal imager.

CorDEX reserve the right to make changes to the instrument at anytime and without notice.

# Case Study

Pacific Drilling Opts for Geo Therm Ltd and CorDEX Infrared Windows



This panoramic view of a Nigerian sunset was shot from Pacific Drilling's drillship Pacific Khamsin with the Pacific Bora drillship in the background. Both vessels opted for the CorDEX IW3000 and IW4000 range of infrared windows that meet with the 11kV transformer rating needs. Geo Therm Ltd (a UK offshore oil and gas inspection and service company) successfully installed more than 240 units per vessel in less than eight days, using a two-man team of offshore service technicians.

The CorDEX range of infrared windows provides a safe, non-invasive means to perform regular visual and periodic thermographic (hotspot) survey inspections and PMs into HV equipment up to 11kV. This is done without fear of electrocution or arc flash. When used in conjunction with the CorDEX Ex-rated range of visual and infrared cameras, all PTW paperwork is further reduced, as is the need to don bulky arc flash PPE suites. Line of sight is now governed by the infrared camera movement and the strategic placement of the infrared window to capture as much as is feasibly practicable of transformer terminations and windings. This is instead of shutting down equipment to open covers or defeat interlocked doors to perform live or residual surveys, both of which have safety and operational limitations.

Designed with safety and quality in mind, the IW range of infrared windows offers clear, unobstructed acuity into energised electrical equipment, while compliant to the NFPA 70E Regulation, as each unit protects personnel by reducing exposure to major electrical hazards. Additionally, their ease of installation, usability and durability have contributed toward CorDEX Instruments Ltd being recognised as one of Europe's leading Ex-rated equipment manufacturers, winning the Queen's Award for International Trade in 2014.



In servicing Pacific Drilling's fleet of high-specification, ultra-deepwater drillships, Geo Therm Ltd's professional installation service teams retrofit the CorDEX IW range of infrared window orders. This helps towards the performance of the annual offshore electrical thermographic survey inspections on the various rig-wide switchboards and HV transformers.

**Name:** Tony Dale  
**Company:** Geo Therm Ltd

Geo Therm Ltd provide Thermal Imaging Surveys and condition based monitoring services.

[www.geothermltd.co.uk](http://www.geothermltd.co.uk)

# THE INTRINSICALLY SAFE THERMAL IMAGING CAMERA

Tough, safe and accurate, **TC7000/TC7150** is the **thermal imaging camera** of choice for oil, gas mining, marine and dust environments.



**CONNECT**



**Hot swappable** in the field and 3000 mAh, this **cutting edge** lithium battery can **power a range of CorDEX products** with **strength and precision.**

# DIGITAL CAMERAS

At CorDEX we believe in the phrase “a picture says a thousand words”. Whether it be a thermal image or a high resolution digital image, our cameras are designed to save you time and money, whilst keeping you safe.

You need a digital camera that’s tough, because that’s the world you work in. You need a digital camera that will shake off the trials of working in a hazardous location and still keep functioning. You need a digital camera that is certified to be safe to use. You need a digital camera that is Tough, Reliable and Certified, you need TOUGHPIX II TRIDENT EDITION explosion proof compact digital SLR.

# WHY CHOOSE OUR Ex DIGITAL CAMERA?

With its full colour armoured display, and its IP54 industrial protection rating, **TOUGHPIX II TRIDENT EDITION** allows you to record and play back pictures and video in the field, in the most demanding industrial environments. Weighing in at 900g **TOUGHPIX II TRIDENT EDITION** is the lightest in class making it easier than ever to carry and transport.



Digital Cameras

Digital Cameras



### Full colour, outdoor armoured display

Take and review images in any weather, day or night in complete confidence.



### Tough, like you

Forget delicate touch screens and small buttons. Your job requires gloves to perform and your camera needs to perform with gloves.



### Fully featured compact digital SLR

5x optical, 4x digital zoom, macro lens and strobe flash. Get the image you need, first time, every time.



### Your job doesn't end when a battery dies

Rechargeable, replaceable batteries means TOUGHPIX II TRIDENT EDITION can keep going when other cameras using built in batteries have to stop.



### Smart charging/diagnostic station

Check battery status and health without multimeters or return to manufacturer. Ensure you manage your batteries for maximum camera runtime.



### You got a great image, but now what...

CorDEX CONNECT is there to support you. A fully integrated database and reporting package, CorDEX CONNECT allows you to annotate and manipulate your TOUGHPIX II TRIDENT EDITION images and create reports quickly and easily.

# TOUGHPIX II

The **TOUGHPIX II TRIDENT EDITION Explosion Proof Digital Camera** is designed and certified with the professional inspector in mind.



## FEATURES

**ATEX and IECEx Certified for Zone 1 IIB+H2 T6 explosive (vapour) atmospheres**

**16 megapixel SLR style with armoured 2.7" LCD screen**

**16GB memory and High Definition video**

**Macro, Auto-focus, Anti-shake, 5x Optical and 4x digital zoom**

**Reporting capability through CorDEX CONNECT™**

### CorDEX TOUGHPIX II TRIDENT EDITION Explosion Proof Digital Camera.

You need a digital camera that's tough, because that's the world you work in. You need a digital camera that will shake off the trials of working in a hazardous location and still keep functioning. You need a digital camera that is certified to be safe to use. You need a digital camera that is Tough, Reliable and Certified, you need TOUGHPIX II TRIDENT EDITION explosion proof compact digital SLR.

The TOUGHPIX II TRIDENT EDITION Explosion Proof Digital Camera is designed and certified with the professional inspector in mind. TOUGHPIX II TRIDENT EDITION is ATEX certified Ex d IIB+H2 T6 Gb / II2G Gb T6, for use in hazardous areas ensures it can go safely where most cameras and phones cannot.

With its high intensity on board strobe flash, TOUGHPIX II TRIDENT EDITION lights up the darkest areas making high quality digital imagery easier and clearer than ever. Coupled with 5x optical zoom, 4x digital zoom, anti-shake technology and additional close-up macro lenses, TOUGHPIX II TRIDENT EDITION gives you the flexibility you need to do your job, any job and get the results you need.

**Ever had a cracked mobile phone screen? Expensive isn't it? Now, imagine that was an I.S. phone, even if it could be repaired, the cost would likely be astronomical. No such problem with TOUGHPIX II TRIDENT EDITION, its full colour, outdoor display is armoured, no need to worry about cracked screens and horrendous repair bills, TOUGHPIX II is tough.**

## PRODUCT OVERVIEW

### Certificate Information

ATEX / IECEx Certificate No.	TRAC13ATEX0046X / IECEx TRC 13.0016x
ATEX / IECEx Certificate Type	Ex d IIB+H2 T6 Gb / II2G Gb T6
Ambient temperature	Tamb -20C to +50C

### General Information

Image download	High Speed USB (safe area only)
Image storage	16GB
Standard image capture resolution	16 Megapixel
Zoom	5x optical, 4x digital zoom
Screen size	2.7 inches
Additional features	Anti shake, auto focus, macro, face recognition
Tripod mount	¼ inch 20 TPI

### Detailed information

Body material	Anodised aluminium with anti-static over mould
Lens & LCD material	Armoured Glass
Weight	900g
IP	54

### Electrical information

Battery type	Removable & Rechargeable
Capacity	1100mAh
Cell type	NiMH



Powerful LED flash for low light imaging



Sleek & rugged SLR design



Soft touch buttons for ease of use



Energy Optimisation Pack



Featuring Toshiba FlashAir™ (For use in non-hazardous locations only).



CorDEX reserve the right to make changes to the instrument at anytime and without notice.

**NEW**

# TOUGHPIX II

**TRIDENT EDITION**

## HIGH SPEED WIRELESS DOWNLOAD CAPABILITY

Using the Toshiba Flashair wireless card, users can download images and movies quickly and easily to either PC, smartphone or tablet without opening the camera.



**FlashAir** The ToughPIX II Trident now incorporates Toshiba Flashair wireless communication technology. Download images directly from the camera to your tablet or smartphone quickly and easily using either Toshiba Flashair apps or CorDEX CONNECT database software. No need to remove plugs or insert cables, simply enable the card, connect to the camera and you're done.

**Wireless LAN**

### Features

- ▶ High speed wireless image transfer **compatible with PC, Android and iOS**
- ▶ Optimised, **High Runtime Electronics**

## SMART CHARGER AND BATTERY DIAGNOSTIC BAY

Check battery status and health without multimeters or returning to manufacturer. Ensure you manage your batteries for maximum camera runtime.

### SMART BATTERY BAY

The ToughPIX II Trident, smart charging/diagnostic bay not only ensures your battery packs obtain the best care and optimum charging. But, for the first time, key information relating to battery charge status and health is also available, helping users manage their battery solutions.

### Features

- ▶ SMART charging bay with **onboard diagnostics**
  - 1 Charge status
  - 2 Battery
  - 3 Fuse testing
  - 4 Smart charging



### ENERGY OPTIMISATION PACK (EOP)

The ToughPIX II Trident is shipped complete with the revolutionary CorDEX Energy Optimization Pack (EOP). EOP is a proprietary system that dynamically matches the instantaneous power requirements of ToughPIX II Trident to that available at the battery.



# TESTED FOR TOUGHNESS



Some digital cameras claim to be tough, but can your camera pass the **CorDEX ToughTEST?**



# 10 THINGS TO CONSIDER BEFORE BUYING AN EX DIGITAL CAMERA

Buying any Ex digital camera is a big commitment, even the simplest of Ex devices can be many times the cost of their non-Ex equivalent. **Download our FREE eBook which includes the 10 key things to consider when making your purchase.**



There is a variety of applications and requirements to consider when choosing your Ex digital camera. At CorDEX Instruments, we want you to be happy with your purchase and as such, we have compiled this fantastic **FREE e-book: '10 Things to Consider Before Buying an Ex Digital Camera'** to help you work your way through the maze of marketing and get to what we believe are the ten most important points when considering an Ex digital camera.

EXIS™ **lasts a lot longer than most,** features an **onboard, intelligent charge indicator** and offers **extreme power** for **hazardous industries.**

# ULTRASONIC GAUGES

Your working environment is tough, that's why you need our tools. At CorDEX we make accurate measurement simple, no matter what. Our tools are rugged, safe and simple to operate, even in the most demanding environments.

# WHY CHOOSE OUR INTRINSICALLY SAFE THICKNESS GAUGE?



## ATEX and IECEx certified for Gas & Dust (Zone 21)

From storage tanks to dust conveyors, UT5000 can measure thickness and detect safely, problems in virtually any explosive environment.



## Ruggedized transducer

Brass wear ring, prevents undue wear on the transducer surface.



## Data storage for download

Store up to 1000 datapoints for download and trending via CorDEX CONNECT database report package.



## Continuous real-time measurement mode

Hunt for those hard to find defects using continuous measurement mode with configurable high or low alarms for each location.



## Measure through paint

Don't remove the paint and expose your metalwork to corrosive environment. UT5000's Echo/Echo mode can see through the painted surface and only measure the metalwork underneath!



## Store multiple readings at one tag location

Store up to 9 readings per RFID tag location, ideal for thickness testing around the circumference of a pipe or valve.



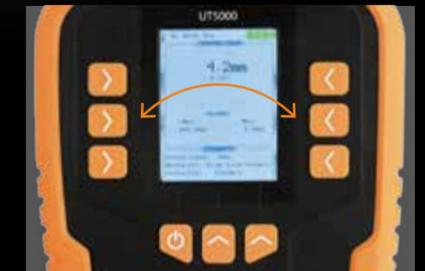
## Built in RFID reader

Embedded 13.5Mhz RFID reader. Link measurements to RFID tag locations for automatic collation and trending within CorDEX CONNECT database report package (included).



## Pre-loaded material velocity table

Don't know the material velocity? Doesn't matter, choose from UT5000s' extensive list of materials or measure and load your own via CorDEX CONNECT™.



## Put your best hand forward

Flip the menus for maximum comfort and usability if your left or right handed.

# UT5000

Non-Invasive, next generation thickness gauge, **UT5000** is the **thickness gauge** of choice for rugged environments.



## PRODUCT OVERVIEW

Specification	
ATEX Certificate No.	Baseefa11ATEX0114
IECEX Certificate No.	IECEX BAS 11.0094
Memory	Stores up to 1000 measurements
Screen	8cm (3.1inch) RGB TFT colour screen with backlight Right/left handed set up
Material Velocity Selection	Preloaded via Drop-Down menu, or user defined.
Transducer	Dual Element
Pulse Rate	Standard transmit pulse rate of 4Hz Adjustable from single shot up to 8Hz
Receiver Bandwidth	1MHz to 15MHz (-3dB points)
Frequency	4MHz, 3mm up to 100mm (0.01in to 3.9in)
Accuracy	+/- 0.05mm (0.01in)
RFID Tag Reader	Operates with 13.54MHz passive tags  Detection range up to 5cm (1.9in)  Supports ISO/IEC 15693-2, ISO/IEC 18000-3 tag formats
Battery Details	Lithium thionyl chloride primary 3.6V cell  100 hours continuous operation with back light restrictions  Low battery warning
Operating Temperature	-10 to +50C (14°F to 122°F)
Weight	1.1Kg (2.4lb)



Multiple calibration and zeroing modes for repeatable accuracy.



On-board data recorder and RFID scanner, store upto a thousand automatically linked to tag location.



Menu "flip" function allows use by both left and right handed technicians.

## FEATURES

**ATEX and IECEX Certified for Zone 1 IIC T4 hazardous areas**

**Features CorDEX CONNECT™**

**Intrinsically safe probe supplied as standard**

**Full Colour, Backlit Screen**

**EchoEcho Technology to measure thickness through painted surfaces**

**Drop-down menus to select the correct material velocity**

**UT5000** Intrinsically Safe thickness gauge with CorDEX CONNECT™ measures metal thickness for Non-Destructive Testing (NDT) and Predictive Maintenance (Pdm) on pipelines and fixed equipment within hazardous locations.

UT5000 is a next generation thickness gauge packed with proven technologies: CorDEX CONNECT™ uses RFID + Software to tag measurements with their location then organises the data, giving the engineer a view of the pipeline at any specific location.

The unique corrosion mode option helps identify spots of thinning; MultiECHO™ technology improves accuracy on uneven surfaces; onboard memory stores up to 1000 readings.

The CorDEX UT5000 is ATEX and IECEX certified for Gas & Dust (Zone 21). From storage tanks to dust conveyors, UT5000 can measure thickness and detect safely problems in virtually any explosive environment. The Ruggedized transducer and Brass wear ring prevent undue wear on the transducer surface and ensure the UT5000 is as tougher than most.

Designed for rugged environments, the shock resistant skin protects a 3.1 inch (8cm) colour screen and has easy-to-feel raised buttons. The intrinsically safe dual-element, 4MHz transducer is adjustable up to 8Hz with accuracy of +/- 0.05mm (0.01inch).



Ultrasonic Gauges

Ultrasonic Gauges

# TESTED FOR TOUGHNESS



Some ultrasonic gauges claim to be tough but can it pass the **ToughTEST**? Watch our video and see what stringent tests we put our **UT5000 Ultrasonic Gauge** through.

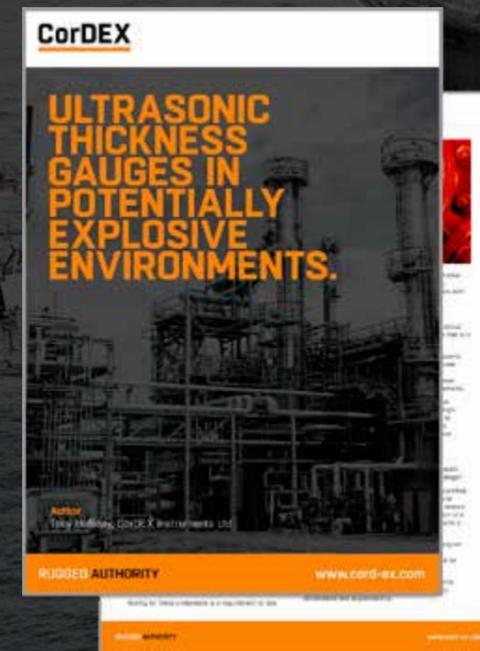


Ultrasonic Gauges



# ULTRASONIC THICKNESS GAUGES IN POTENTIALLY EXPLOSIVE ENVIRONMENTS.

This white paper covers the basics of Ultrasonic measurement, measurement accuracy, corrosion inspection, and intrinsically safe requirements for hazardous areas.



The use of ultrasonic devices for non-destructive testing (NDT) has become more common in recent years as equipment has increased in capability and decreased in price. The use of ultrasonic NDT devices is attractive because of their non-invasive nature. They don't require a plant shutdown to obtain a measurement. However, deploying this kind of device within a hazardous (classified) location has implications for safe use that even NDT inspectors may not be fully aware of.

Download your **FREE** copy of our '**ULTRASONIC THICKNESS GAUGES IN POTENTIALLY EXPLOSIVE ENVIRONMENTS.**' White Paper today.

Both **evolutionary**  
and **revolutionary**,  
EXIS™ is **rugged** and  
**intrinsically safe.**



# LIGHTING

Power, Longevity and Flexibility at your fingertips with the GENESIS, intrinsically safe lighting solutions from CorDEX. Using the interchangeable, smart battery pack, GENESIS can remain in the hazardous location as long as you require, providing 400 lumens of light for a virtually indefinite period. There is no need to return to the safe area to charge a battery or replace for a new one, with GENESIS Zone 1 Hot Swap technology, you can replace the battery right there, in the hazardous area, as soon as you need to. Saving you time and money whilst keeping you safe.

ATEX certified GENESIS lighting products are rigorously tested to ensure maximum reliability. The smart EXIS powerpacks have on-board energy level indication, along with a Bluetooth enabled battery diagnostic station, providing you with data relating to your battery health, charge state and much more all via a dedicated PC application.

# Introducing the new **GENESIS Intrinsicly Safe lighting** range.

Powered by

**EXIS +**



## GENESIS LANTERN

Intrinsically safe, lightweight and rugged handportable LED Lantern.

**EXIS +** **IS** **54** **1M**

INTRINSICALLY SAFE INGRESS PROTECTION THREE TIMES DROP ZONE 1 HOT SWAPPABLE



## GENESIS WORKLIGHT

Intrinsically safe and rugged handportable LED Worklight.

**EXIS +** **IS** **54** **1M**

INTRINSICALLY SAFE INGRESS PROTECTION THREE TIMES DROP ZONE 1 HOT SWAPPABLE

# WHY CHOOSE OUR GENESIS LIGHTING PRODUCTS?

New CorDEX portable, Intrinsically Safe Lighting Solutions transform the market with best in class functionality, Zone 1 interchangeable battery pack and world-renowned ruggedness.

The CorDEX **GENESIS Portable Worklight** and **GENESIS Lantern** are ATEX certified for Zone 1 IIC T4 hazardous locations and are powered by the revolutionary EXIS 740 interchangeable, hot swappable battery pack, meaning a simple change of battery right there in the hazardous area for virtually unlimited runtime.



## GENESIS LANTERN

- Handportable LED Lantern
- Lightweight and rugged, IP54
- Five superbright LEDs
- Powered by interchangeable EXIS™ battery
- Intrinsically Safe

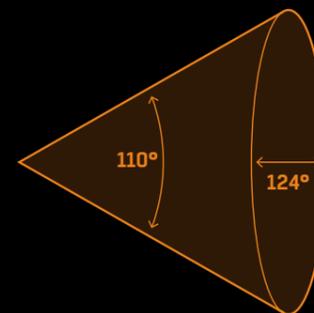


## GENESIS WORKLIGHT

- Handportable LED Lantern
- Lightweight and rugged, IP54
- Five superbright LEDs
- Powered by interchangeable EXIS™ battery
- Intrinsically Safe

## BEAM ANGLE

**Wide coverage;**  
124° horizontal  
x 110° vertical



## LIGHTING RANGE SPECIFICATION

**ATEX Certified Zone 1 IIC T4**

**Zone 1 Hazardous area hot swappable battery pack**

**Lightweight;**  
**1.9kg (worklight)**  
**1.2kg (lantern)**  
**Including battery pack**

**Up to 3 hours runtime**

**Onboard battery charge status and health information available in the field**

**PC based Bluetooth diagnostics provides detailed battery information for maximum usability**

## GENESIS FLASHLIGHTS

- Every product in our flashlight range is manufactured from the highest quality aircraft aluminium.
- FL Series flashlights are impact resistant, shockproof and are so durable, you can even use them underwater.
- Not only are these probably the most rugged industrial flashlights on the market today, they are also Intrinsically Safe.
- Incorporating super bright, white light LEDs powered by off-the-shelf batteries, FL Series Flashlights Pack a big punch in a compact package.



**DESIGNED AND TESTED TO BE RUGGED.**

## PRODUCTS OVERVIEW

Introducing the new intrinsically safe, lightweight and rugged GENESIS lighting range.

Lighting Product	GENESIS LANTERN (FL4700)	GENESIS WORKLIGHT (FL4725)
ATEX Marking	Ex II 2 G Ex ib IIC T4 Gb (Ta = -10°C to +40°C)	Ex II 2 G Ex ib IIC T4 Gb (Ta = -10°C to +40°C)
Certificate (Lamps)	ExVeritas 15 ATEX 0010 X	ExVeritas 15 ATEX 0010 X
Certificate (Battery Pack)	ExVeritas 15 ATEX 0009 U	ExVeritas 15 ATEX 0009 U
Lumens	400	400
Runtime	Up to 3 hrs on one battery	Up to 3 hrs on one battery
IP Rating	54	54
Dimensions	Box dimensions 210mm x 240mm x 104mm	Box dimensions 215mm x 235mm x 300mm
LED	Five LEDs each operating at up to 1W powered by constant current driver	Five LEDs each operating at up to 1W powered by constant current driver
LED Lifespan	25000 hours (not replaceable)	25000 hours (not replaceable)
Protection Type	Intrinsic Safety "ib"	Intrinsic Safety "ib"
Compliant with	EN60079-0:2012+A11:2013 and EN 60079-11:2012	EN60079-0:2012+A11:2013 and EN 60079-11:2012
Area Classification	Gas Zones 1 and 2	Gas Zones 1 and 2
Enclosure	Aluminium with toughened glass lighting window	Aluminium with toughened glass lighting window
Temperature Classification	T4 (T135C)	T4 (T135C)
Operating Temperature	-10°C to 40°C	-10°C to 40°C
Weight	1.2kg (with battery)	1.9kg (with battery)

Flashlight Product	FL2203	FL2210	FL2220
Certification	Ex II 3 G Ex ic IIB T4 Gc	Ex II 3 G Ex ic IIB T4 Gc	Ex II 3 G Ex ic IIB T4 Gc
Dimming options	Low, Mid, High	Low, Mid, High, Strobe	Low, Mid, High, Strobe
Lumens	Low	9LM	20LM
	Mid	35LM	110LM
	High	120LM	200LM
	Strobe	N/A	9Hz
Max Runtime	Low	95Hrs	61Hrs
	Mid	6Hrs	3Hrs
	High	2.5Hrs	1Hrs
	Strobe	N/A	5Hrs
IP Rating	67	67	67
Diameter	14mm/0.55inch	23.5mm/0.93inch	23.5mm/0.93
Length	146mm/5.75inch	106mm/4.17inch	160mm/6.30inch
LED Lifespan	50000 Hours	50000 Hours	50000 Hours
Batteries required	2*AAA (not supplied)	1*AA (not supplied)	2*AA (not supplied)
Lens	Toughened ultra-clear glass lens with anti-scratch coating	Toughened ultra-clear glass lens with anti-scratch coating	Toughened ultra-clear glass lens with anti-scratch coating
Body	Aircraft-grade aluminum	Aircraft-grade aluminum	Aircraft-grade aluminum
Weight	32g/1.13oz	70g/2.47oz(Excluding Battery)	100g/3.53oz

Being able to swiftly make a **transition between products** with no downtime, charging time, or the need for extras, **greatly reduces cost.**



# ACCESSORIES

Supporting your CorDEX products with genuine Accessories ensure your valuable tool is kept fully operational and safe to use. From cases to protect your tools, to replacement batteries and probes, CorDEX genuine accessories has got you covered.

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## EXIS +

Introducing **EXIS™ Lithium 7.4V** intrinsically safe battery pack, intelligent and interchangeable, even in the hazardous area.



## EnergyEVOLVED

**Hot swappable** in the field and 3000 mAh, this **cutting edge** lithium battery can **power a range of CorDEX products** with **strength and precision**.

Being able to swiftly make a **transition between products** with no downtime, charging time, or the need for extras, **greatly reduces cost**.

With significantly **rugged engineering**, EXIS™ not only delivers **maximum power and energy**, but is also **incredibly long lasting**.

Both **evolutionary** and **revolutionary**, EXIS™ is **rugged** and **intrinsically safe**.

Products powered by EXIS™

**FL4725**



**FL4700**



# EXIS +

## WHY CHOOSE OUR EXIS™ LITHIUM 7.4V BATTERY PACK?

### Zone 1 Hot Swappable

Change batteries right there in the hazardous area. No need to wait for an internal battery to charge or return to safe area to change. Just swap the EXIS pack and keep working.

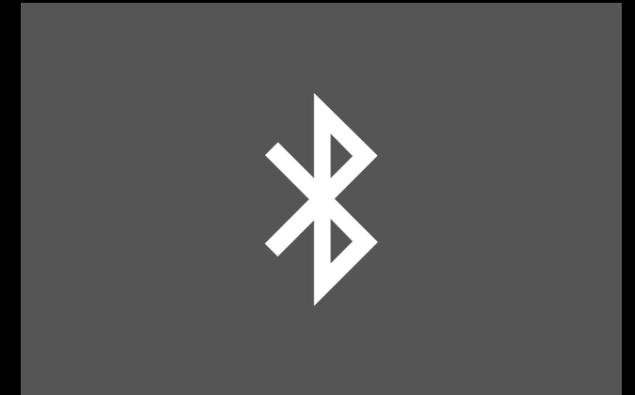


## EnergyEVOLVED



### Lightweight, 330grams (12oz)

Extra batteries are easily transported using the EXIS battery belt clip.



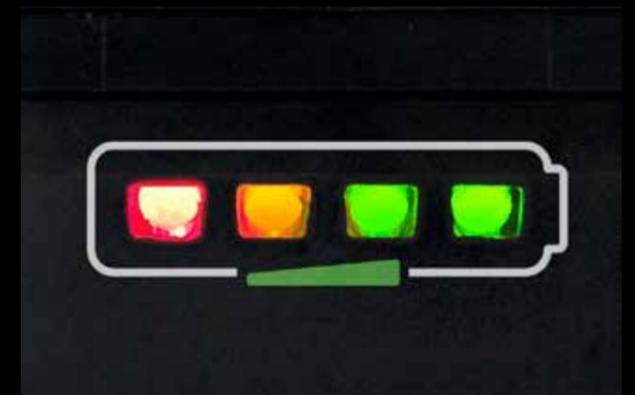
### Bluetooth connectivity

Download detailed battery health information to a PC via the Bluetooth diagnostics bay to maximize the return on investment on your EXIS battery packs.



### 3000mAh Lithium Ion Technology

Ultra-long life Lithium Ion battery technology along with onboard smart battery monitoring means you get maximum runtime with any EXIS powered tool.



### On-board charge and health status

Simply tilt the EXIS pack to display battery charge level and check for errors via the on-board LED bank.

# TC7000/TC7150 ACCESSORIES

## TC CHARGING STATION (INC MAINS ADAPTOR)

Part No. TC-750  
(BATTERY NOT INCLUDED)



## ADDITIONAL BATTERY

Part No. TC-730



# TOUGHPIX II ACCESSORIES

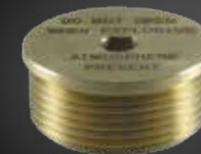
## TOUGHPIX II SMART CHARGING & DIAGNOSTIC STATION

Part No. CDX2410-50



## REPLACEMENT BATTERY PLUG

Part No. CDX2410-15



## ENERGY OPTIMISATION PACK

Part No. CDX2400-011



The ToughPIX II Trident is shipped complete with the revolutionary CorDEX Energy Optimization Pack (EOP). EOP is a proprietary system that dynamically matches the instantaneous power requirements of ToughPIX II Trident to that available at the battery.



# ULTRASONIC GAUGE ACCESSORIES

## ADDITIONAL PROBE

Part No. XP-570



**TC7000**  
INTRINSICALLY SAFE THERMAL IMAGING CAMERA



**IW SERIES**  
SMART INFRARED WINDOWS

## COUPLANT GEL

Part No. XP-560



**TOUGHPIX II TRIDENT**  
EXPLOSION PROOF DIGITAL CAMERA



**UT5000**  
INTRINSICALLY SAFE ULTRASONIC THICKNESS GAUGE

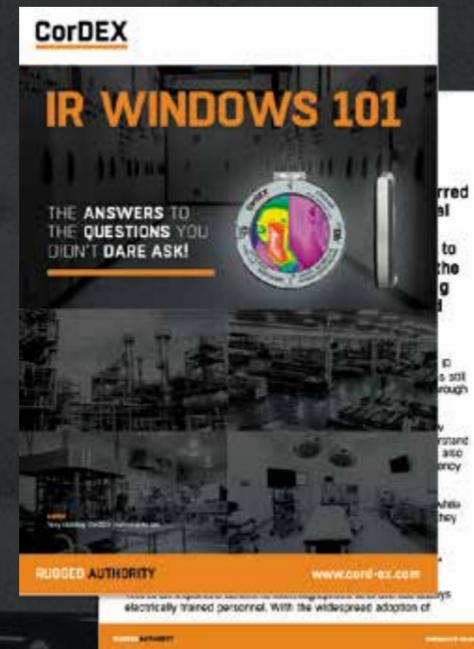
# KnowledgeHUB

We are the recognised global authority in the design and manufacture of Intrinsically Safe Instrumentation.

You can also visit our CorDEX online KnowledgeHUB for further useful industry updates, white papers, blog posts and news, focusing on electrical safety, intrinsic safety and hazardous environments.

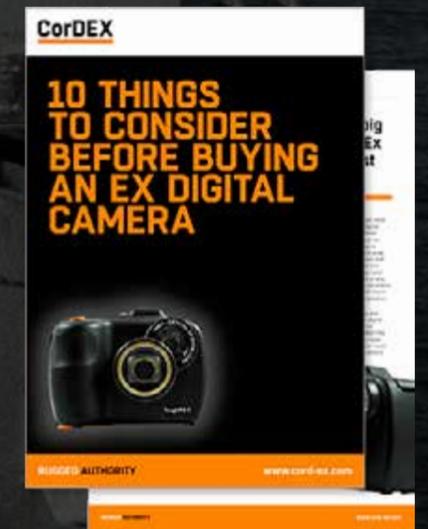
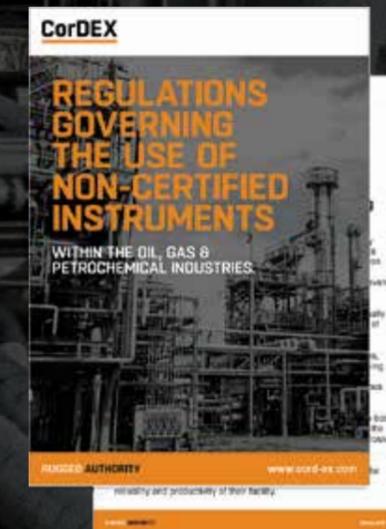
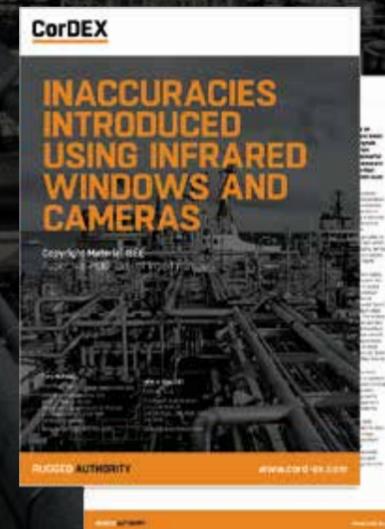
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## IR WINDOWS 101 EBOOK

Are you considering using IR Windows? Then you need to **download your FREE copy** of our white paper 'IR Windows 101: The answers to the questions you were afraid to ask'. A decade ago Infrared IR Windows were very much in their infancy, but today things are very different.





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