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Introduction

CHAPTER 1

System Overview

The new Ultracorr 2 is the next evolution in handheld Ultracorr Corrosion Monitoring Systems. Ultracorr 2 provides a cost effective ultrasonic thickness measurement and temperature measurement of a pipe or vessel wall using fixed transducers mounted at various locations throughout a site.

After initial installation, access to the monitoring point is no longer required. The transducer connector can be located at a convenient location for taking thickness and temperature readings. These readings can then be downloaded to a personal computer running Cosasco Data Corrosion Management Software for storage and trend analysis.

The Ultracorr 2 transducers are equipped with an integral RTD measuring temperature which enables taking of simultaneous metal thickness and metal temperature readings. The instrument uses temperature data to compensate for changes in the metal thickness readings due to temperature variations. The new generation of transducers are embedded with smart sensors that retain user configured ID characteristics.

NOTE: THE CORROSION MONITORING INDUSTRY COMMONLY USES THE TERM “PROBE” TO REFER TO THE CORROSION MEASUREMENT SENSOR, WHICH COULD BE AN ULTRASONIC “PROBE”. IN THE NON-DESTRUCTIVE TESTING INDUSTRY IT IS COMMON TO SEE THE TERM ULTRASONIC TRANSDUCER USED. FOR THE PURPOSES OF THIS MANUAL, THESE TERMS ARE EQUIVALENT AND MAY BE USED INTERCHANGEABLY.

A basic system consists of a smart transducer, the new Ultracorr 2 handheld instrument, data collection device, and Cosasco Data Software package. Since it will often be advantageous to take a reading of the transducer from some remote point, there are numerous cabling options to connect these two items. For example, cables may be run from numerous transducers into a single junction box at ground level, where multiple readings may be taken very quickly.

Although there are many applications for the Ultracorr Corrosion Monitoring System, there are three basic system applications. Refer to chapter 4 and 5 for installation procedures for various placement options.

1. Above ground insulated pipelines or vessels.
2. Above ground uninsulated pipelines or vessels.
3. Below ground, buried pipelines or vessels.
System Diagram

Figure 1.1 illustrates a typical installation of the Ultracorr 2 Corrosion Monitoring System. The major components are described below.

A  UST2 Ultracorr Transducer
B  Signal Cabling
C  Reading Point
D  Ultracorr 2 Instrument
E  Transfer Unit for control and data collection
F  PC Running Cosasco Data Software
Major Components

UST2 Ultracorr Transducer
The transducer (probe) is a small (1.2 inch diameter by 1.8 inch high) sensor which is permanently mounted to the monitoring point. This is accomplished using a special adhesive which also acts as an ultrasonic couplant. The transducer has a magnetic base to aid in holding it in position while the adhesive cures. The temperature sensor on the transducer allows for automatic correction of acoustic velocity as a result of the metal temperature. This provides a significantly more accurate reading of thickness. These newest generation transducers also have the capability of storing and transmitting location and configuration information to the Ultracorr-2 instrument, for ease of operation and to eliminate operator errors.

NOTE: PREVIOUS GENERATION TRANSDUCERS ARE COMPATIBLE, BUT NOT HAZARDOUS RATED FOR USE WITH THE ULTRACORR 2.

Figure 1.2 - UST2 Transducer (Typical)

Signal Cabling
Two types of cables are available to bring the reading point to a convenient location. For example, if a monitoring point is on a vessel 20 feet above the ground, then access to the monitoring point location is only required for the initial installation of the transducer. A cable may then be run from the transducer to a junction box located at ground level. Each installation must be evaluated for the proper type of cable installation. Standard cables have a weather resistant polyurethane jacket.
Reading Point
There are various options available for a remote reading site. For a location with a single monitoring point, the transducer cable is fitted with a weather resistant connector. An optional NEMA 4X junction box with provision for up to seven connectors is available. Larger junction boxes are also available. For underground applications, standard above ground or flush-with-grade monitoring locations are available.

Ultracorr 2 Instrument
The Ultracorr 2 instrument is the heart of the Ultracorr Corrosion Monitoring System. The intrinsically safe Class 1 Zone 1 rated, single Ultracorr 2 instrument may be used to periodically take individual time and date stamped wall thickness, signal and temperature readings of up to 255 sensors. It will store up to 2000 readings for each of these sensors. Refer to Chapter 5 for more information.

Transfer Unit
The Transfer Unit handheld instrument is hazardous approved and is the convenient and hassle-free way to configure the Ultracorr 2 Instrument which in turn will configure the UST2 smart transducer and allows for data from the Ultracorr 2 Instrument to be collected from the Reading Point in the field. The Transfer Unit is an easy to use handheld that interfaces with the Ultracorr 2 instrument via Bluetooth communication. Once data has been saved onto the Transfer Unit, the data can then be easily downloaded onto a PC for analysis with the Cosasco Data Corrosion Management Software.
Cosasco Data Software
The Cosasco Data Corrosion Management Software is a powerful application that can perform various functions. The software can be used to compare and analyze data with graphing tools, while also allowing for data to be converted into an Excel File (*.XLS) format if exporting into a spreadsheet program. The Cosasco Data software can also integrate other data process parameters such as ER and LPR instruments. Refer to Transfer Readings from Transfer Unit to the Cosasco Data section for more information on transferring and analyzing data on a personal computer.

Installation Toolkit
Toolkits containing all the tools for uncoated and coated pipeline installations are available, or tools may be ordered on an individual basis. The toolkits contains such items as a cordless drill with a spare battery and charger, tools for paint removal and surface preparation, and the required epoxy to attach the transducer to the pipeline. Please contact Cosasco for further details.
Specifications

Ultracorr 2 Instrument

Battery Requirements:
2 x 3.6V AA Lithium Cells (Cosasco P/N 095820)

Battery Life:
Over 6000 readings

Operating Temperature:
-40°F to 158°F (-40°C to 70°C)

Storing Temperature:
-40°F to 158°F (-40°C to 70°C)

Dimensions:
6"H x 3.25"W x 1.25"D (152.4 mm x 82.55 mm x 31.75 mm)

Weight:
1 lb. (0.45 kg)

Intrinsic Safety rated for USA, Canada, and Europe:

For USA/Canada: Ex ib IIC T4: Class I, Zone 1
For Europe: II 2G
Ex ib IIC T4 Gb
Ta = -40°C to +70°C

UST2 Ultrasonic Sensor

Thickness Measurement:
Range: 0.2 (0.1 for special orders) to 2.0 inches, up to 25 ft. cable
Resolution: 0.0001 inch
Accuracy: ± 0.0002 inch at constant temperature
± 0.0005 inch from -40°C to +70°C (Instrument)
± 0.0003 inch from -40°C to +150°C (Metal Surface of Transducer)
Specifications

Transducer Temperature:
  Range: Ambient: -40°F to +158°F (-40°C to +70°C)
        Metal Surface: -40°F to +305°F (-40°C to +150°C)

Temperature Compensation:
  -0.0002 inch/inch/°C

Temperature Differential Error:
  -0.0001 inch/inch/°C difference (inside to outside of wall)

Temperature Measurement:
  Range: -40°C to +150°C
  Resolution: 0.1°C
  Accuracy: ±2°C (Transducer)
            ±2°C (Instrument)

Data Storage:
  Memory Type: Nonvolatile
  Probes: 255
  Readings/Probes: 2000
  Time and Date Stamped

Interface:
  Bluetooth®

Transducer Type:
  Contact

Transducer Cable:
  RG-174 up to 25 ft.

Hardware Supplied:
  - Ultracorr 2 Instrument
  - 2 AA Lithium batteries
  - CD-ROM or Flash Drive

Software Supplied:
  - Ultracorr 2 Corrosion Monitoring System User Manual
  - Window XP/Window7/Windows Drivers
  - Cosasco Data Offline Corrosion Management Software
Figure 2.1 Ultracorr 2 Instrument Specifications
Location of Monitoring Points

The small size of the transducer allows it to be mounted almost anywhere. The only requirement is a two inch diameter area of clean metal. Some of the factors to consider when selecting a monitoring point include:

- Access must be provided to the monitoring point for the initial transducer installation. After installation, access to the monitoring point is not required.
- Insulated vessels must have the insulation removed at the monitoring point. An access port can be installed at that location.
- Generally, the most cost effective installation is the shortest cable run to the most convenient and safe man access to the test station.

Figure 3.1 - Transducer Location
CHAPTER 4

Transducer Connection and Signal Cabling

Cabling

The standard transducer is fitted with a weather resistant connector (see figure 4.1). This connector is suitable for outdoor environments, and therefore can be left at a convenient reading point without any further protection. If required, cable can be run through conduit to its desired location. Conduit must be 1-1/4” or larger, to accommodate the 1.25” diameter connector housing.

Two types of cable are available. The standard has a thick, black polyurethane outer jacket, and is suitable for most environments. For more severe applications, this same cable is available with a braided, stainless steel armor jacket.

Figure 4.1 - Weather Resistant Connector
Local Mount Junction Box

An alternative to leaving the connector exposed is to mount one or more connectors inside a NEMA 4X box. There are several advantages to doing this, including additional protection, security, and the ability to run multiple connections to a single point for rapid measurements.

Two standard box configurations are available. Cosasco part number 744014 is designed to mount on a two inch pipe and has provisions for up to 7 transducer connectors (see figure 4.2). This configuration is particularly suitable for buried pipeline applications, as the cables can be run from the buried pipe, through the 2” supporting pipe and into the box.

![Figure 4.2 - Pole Mount Junction Box](image-url)
Cosasco part number 744017 is the same size box, but is configured for the transducer connectors to mount on the bottom of the box. Mounting ears are provided on the box for wall or pole mounting. This box may be more suitable for above ground transducer applications (see figure 4.3).

Figure 4.3 - Wall Mount Junction Box
Ultracorr® 2 Instrument

CHAPTER 5

The intrinsically safe, Class I, Zone I rated Ultracorr 2 utilizes high sensitivity ultrasonic technology to provide nonintrusive, cost effective monitoring of corrosion and erosion. The instrument can be used to provide periodic time and date stamped measurements of wall thickness and temperature of up-to 255 transducers. The thickness and temperature data can then be downloaded to a personal computer running Cosasco Data Corrosion Management Software for storage and trend analysis.

NOTE: EACH ULTRACORR 2 INSTRUMENT IS CAREFULLY TESTED, INSPECTED AND PACKAGED PRIOR TO SHIPMENT. BEFORE UNPACKING THE INSTRUMENT, PLEASE INSPECT THE PACKAGED MATERIALS FOR SHIPPING DAMAGE AND RETAIN ALL DAMAGED PACKAGED MATERIALS TO SUPPORT ANY CLAIM AGAINST YOUR FREIGHT CARRIER SHOULD THIS BECOME NECESSARY.

Unpacking

Carefully remove the instrument from its package. Included in the package you should find:

- Handheld Ultracorr 2 instrument
- 2 AA Lithium batteries

Battery Installation

The Ultracorr 2 is supplied with a set of two 3.6 Volt lithium batteries (Cosasco PN 095820). To install these batteries, remove the access panel on the back of the unit (see below) and install the batteries with the polarities as indicated on the unit. Replace the back cover when finished.
Figure 5.1 - Battery Cover of Ultracorr 2 Instrument
The Transfer Unit is the essential wireless device that will allow the Ultracorr 2 Instrument to transmit all relevant information from the UST2 probes in the field on to a PC. This portable unit can store readings of up to 255 Ultracorr 2 ID’s. The Transfer Unit is user friendly and is an intrinsically safe handheld that allows the operator to quickly program and collect data from devices installed in hazardous locations via Bluetooth and transfer all the data back to a PC via Bluetooth. If your PC does not have Bluetooth capability, a Bluetooth USB Adapter can be ordered through Cosasco (P/N 723763). For more information on the features of the Transfer Unit refer to the Transfer Unit User Manual.
Ultracorr 2 Configuration

CHAPTER 7

This chapter covers the various steps involved in Ultracorr 2 communications configuration and setup. In order to successfully configure the instrument, the Transfer Unit must have good batteries and the UST2 probe MUST be connected to the Ultracorr 2 Instrument.

Create an ID for the Sensor

On the standby screen select Config. On the screen that appears select Ultracorr 2.

Select device

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<th>CA(T)</th>
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<tbody>
<tr>
<td>Ultracorr 2</td>
<td>Exit</td>
<td></td>
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</table>

The user will then have the option to configure the Ultracorr 2 as a Reader or Logger.

Choosing Reader will create an ID that can be used when connected to the Ultracorr 2 as a reader. Connecting to the Ultracorr 2 as a reader will allow the user to get readings manually, store the readings and get real-time updates of readings.

Choosing Logger will create an ID that can be used when connected to the Ultracorr 2 as a datalogger. Connecting to the Ultracorr 2 as a datalogger will allow the user to configure the Ultracorr 2 to read and store data at certain intervals and get real-time updates of readings.

Ultracorr 2

<table>
<thead>
<tr>
<th>Reader</th>
<th>Logger</th>
</tr>
</thead>
<tbody>
<tr>
<td>Back</td>
<td>Exit</td>
</tr>
</tbody>
</table>

After selecting either Reader or Logger, enter the desired ID number then select OK.

Enter ID: [ _ ]
(1 – 255)

0123456789.< OK Back
Enter a tag name for the device then select Nxt.

Select the correct Alloy.

Click Okay to save the configuration for the chosen ID.

Connecting to the Ultracorr 2

To connect to the Ultracorr 2, on the standby screen select Scan. Select an amount of time, 10s, 20s or 30s, to scan for devices.

Once the Transfer Unit has finished scanning, scroll through the list of found devices to find the Ultracorr 2 you are trying to connect to and select either Dlgr or Rdr to connect to the Ultracorr2 as a datalogger or reader respectively.

NOTE: The user has the option to select Sv to save the device to a list. This will bypass the need to search for the device in the future. For more information refer to the Transfer Unit Manual.
When successfully connected, the Transfer Unit will display the Ultracorr 2 main menu screen shown below. If the ID shown is 0, the sensor has not been configured.

**Configure the Sensor**

To configure the Sensor, first connect to the Ultracorr 2 device then select **Sensor** from the Ultracorr 2 main menu screen. The user can either select **Save Current** to save the current configuration of the sensor to the Transfer Unit or select **Config** to load the sensor with the configuration of a specific ID that was created in the **Create an ID for the Sensor** section.

If the user selects **Save Current** and the same ID number is saved in the Transfer Unit, the following screen will appear. Select **Okay** to clear the ID found and replace it with the current ID.

If the user selects **Config**, the following screen will appear. Enter the **ID** to configure the sensor with.

Select **Okay** to configure the sensor.
Configure the Datalogger

This is only available if the Ultracorr 2 is used as a datalogger when connected to the Transfer Unit.

After connecting to the Ultracorr 2 as a datalogger, select More from the Ultracorr 2 main menu screen and select Confg on the following screen.

Enter the desired interval in minutes between 10 and 1440 then select m.

Note: The hours (h) option is disabled and will show INVAL if selected.

Stop Data Collection

This is only available if the Ultracorr 2 is used as a datalogger when connected to the Transfer Unit.

After connecting to the Ultracorr 2 as a datalogger, select More from the Ultracorr 2 main menu screen and select Stop on the following screen.
Calibrate the Sensor

**WARNING: CALIBRATION IS DONE BY COSASCO AND CHANGES MAY CAUSE INACCURACIES!**

Transducers are pre-calibrated before being shipped to a customer. **DO NOT** attempt to calibrate a transducer without notifying Cosasco. In most cases your transducer will not require a field calibration.

*If transducer calibration is required, please contact your closest Cosasco regional office location for assistance.*

Connect to the Ultracorr 2 device and select **Sensor** from the Ultracorr 2 main menu screen. On the following screen select **Calibration**.

![Ultracorr 2 Sensor Menu](image)

A warning screen will be displayed stating that Calibration is done by Cosasco and Changes may cause inaccuracies. This screen will disappear after about 3 seconds.

![Warning Screen](image)

Displayed on the next screen are the current values for the **Offset**, **Slope**, and **Delay**. To change these values select **Change**.

![Offset, Slope, and Delay Screen](image)

The user will then go through the following screens to input the desired values for the **Offset**, **Slope** and **Delay**.

![Offset Input Screen](image)

![Slope Input Screen](image)

![Select Delay Screen](image)
This chapter covers the various steps involved in Ultracorr 2 communications and functionality testing. In order to successfully use the instrument, the Transfer Unit must have good batteries and the UST2 probe **MUST** be connected to the Ultracorr 2 Instrument.

### Download Data

Go to the devices list by either scanning for devices or going to the saved device list. On the devices list, select an Ultracorr 2 device and select **Dlgr**.

To download data from the Logger, select **More** then select **Dload**.

After a successful data transfer, a screen will pop up with information about the last data point collected. Select **Next** to see the time when the last data point was collected.
Taking Individual Readings

While connecting to an Ultracorr 2 with the Transfer Unit the user has two options. One option is to get a single reading and be able to save that reading’s data. Another option is to get readings that update continuously.

Individual Data Points

When connected to the Ultracorr 2 as a Reader the sensor is able to take individual readings and save them.

Once connected to the Ultracorr 2, select More from the Ultracorr 2 main menu screen and then select Read.

After a successful reading, a screen displaying Thickness, Temperature, Gain and Battery Voltage values will appear. To get another reading select Read. To save the reading select Save. To Exit this screen, select Back.

Real-Time Data

When connected to the Ultracorr 2 as a Reader or Datalogger, the user is able to take readings that update in real-time.

Once connected to the Ultracorr 2, select More from the Ultracorr 2 main menu screen and then select Test.
Transfer Readings to Cosasco Data

The most recent reading for any probe may be displayed on the Transfer Unit. For maximum functionality and data management, all the data contained in the Transfer Unit may be downloaded to a personal computer running Cosasco Data Corrosion Management Software package. The Cosasco Data package is a flexible corrosion data management system that allows integration of corrosion monitoring parameters depending on which version is purchased. Refer to the Cosasco Data Corrosion Management Software documentation for installation, site setup, capabilities and other details.

Bluetooth Communication Requirements

In order to connect the Transfer Unit to the PC, the user will need a PC with Bluetooth capability or a Bluetooth USB Adapter, which can be ordered through Cosasco (P/N 723763). The recommended Bluetooth version is 2.1 + Enhanced Data Rate (EDR), but is compatible with Bluetooth version 2.0, 1.2 and 1.1.

Run Cosasco Data

After a database has been created, the user can either manually add an Ultracorr probe to the plant layout or have the Transfer Unit Device within Cosasco Data create the probe for the user. Follow the instructions below to manually add the Ultracorr probe to the plant layout. Skip to the Transfer Unit Driver section if the user has the Transfer Unit Device within Cosasco Data create the probe for the user.

1. Click the Item Palette icon to open the window of Containers, Probes and Other.
2. Add a System by dragging the System Icon onto the Play Layout. (Adding offline sub-system is optional.)
3. Click the Probes tab then drag the Ultracorr Icon onto the System.
Transfer Unit Driver

To open the Transfer Unit Driver, click **Devices** and from the drop down menu click **Transfer Unit**. A window will pop up for the Transfer Unit Driver.
Create a New Group

In the top right corner, select **Add New** to create a new group for the Transfer Unit.

The following window will pop up. Select **Transfer Unit** and select **OK**.
After creating a new group, the Transfer Unit Driver window will now appear as below. Name the group by typing the desired name into the **Display Name** box and click **Save** to save the changes made.

![Transfer Unit Driver window](image)

**Open a Group**

In the top right corner, select **Open** to open a previously created group for the Transfer Unit.
A screen will pop up containing a list of all of groups created for the Transfer Unit Driver with the group name next to the group type which is in brackets. Select the group for the Transfer Unit then select OK.

Create Nodes for New Probes

The Transfer Unit Driver gives the user the option to create new nodes in the Plant Layout for Probe Data collected through the Transfer Unit. This removes the step of creating a node manually and choosing a node to save the Probe Data to.

1. Create a new group or open a group then select the checkbox next to Create nodes for new probes.
2. Click the icon under Group Ident. A window will appear with the Plant Layout within, select a System or Subsystem for new probes to be created under and select OK.
3. Click Save on the Transfer Unit Driver to save the changes to where new probes will be created.
Connect Transfer Unit to PC

On the standby screen of the Transfer Unit select **PC**. The Transfer Unit will show the following screen while waiting to connect to the PC.

```
COSASCO TU-500 vX.XX
MM/DD/YY HH:MM:SS
Config | Scan | Device
Disp   | PC   | More
Waiting for PC

| Exit |
```

Follow the instructions below for the Transfer Unit Driver.

1. Click the box containing ‘**Select**’ under **Bluetooth Device**.
2. A window will appear with possible Bluetooth devices the PC can connect to. Select the Transfer Unit then click **OK**. (The Transfer Unit device will contain TU-500 in the device name)
3. The Transfer Unit has been successfully connected to the PC when ‘**connected**’ appears in green under the box that now contains the Transfer Unit name and the Transfer Unit displays the following screen.

![Waiting for command](image_url)
Download Data

To download all of the data on the Transfer Unit, select **Download**.

Once the data has finished downloading from the Transfer Unit to the PC the Transfer Unit Drive will display the number of readings and the time of the last reading from all of the probes on the Transfer Unit. Click **Save** to save the downloaded data.
Manufacturer’s Declaration of Conformity

APPENDIX A

Product Name: ULTRACORR 2 Ultrasonic Transmitter
Model: ULTRACORR 2

Approved Manufacturing Location
Rohrback Cosasco Systems, Inc. — Santa Fe Springs, California USA

European Union (EU) Directives

ATEX Certification
Sira 12ATEX2083X
II 2G
Ex ib IIC T4 Gb
Ta = -40°C to +70°C
For use only with AA Lithium cells: P/N 095818

ATEX Directive 94/9/EC
The ULTRACORR 2 complies with the European ATEX Directive and the following standards:
IEC 60079-0:2011 Ed. 6, Electrical Apparatus for Explosive Gas Atmospheres - Part 0: General Requirements
EC 60079-11:2011-06 Ed. 6, Electrical Apparatus for Explosive Gas Atmospheres - Part 11: Intrinsic Safety “i”

The ULTRACORR 2 complies with the European EMC Directive and the following standards:
EN 61326:2006, Electrical Equipment for Measurement and Control
EN 61000-4-2:2008, EMC: Electrostatic Discharge Immunity
EN 61000-4-4:2004, Electrical Fast Transient Immunity
EN 61000-4-6:2004, Conducted RF Immunity
IEC Ex Certification

Sira IECEx SIR 12.0028X
Ex ib IIC T4 Gb
Ta = -40°C to +70°C
For use only with AA Lithium cells: P/N 095818

The ULTRACORR 2 complies with the following IEC standards:

IEC 60079-0:2011 Ed. 6, Electrical Apparatus for Explosive Atmospheres - Part 0: General Requirements

EC 60079-11:2011-06 Ed. 6, Electrical Apparatus for Explosive Atmospheres - Part 11: Equipment protection by Intrinsic Safety “i”

CSA International (CSA) Certification

The ULTRACORR 2 has been examined and tested to determine that the design meets basic electrical, mechanical and fire protection requirements by CSA, a Nationally Recognized Testing Laboratory (NRTL) as accredited by the Federal Occupational Safety and Health Administration (OSHA).

North American Certifications

Ex ib IIC T4: Class I, Zone 1 AEx ib IIC T4
For use only with AA Lithium cells: P/N 095818

The ULTRACORR 2 complies with the following North American standards:

CSA C22.2 No. 0-10, General Requirements – Canadian Electrical Code, Part II

CAN/CSA-C22.2 No. 60079-0:11, Explosive atmospheres — Part 0: Equipment — General requirements

CAN/CSA-C22.2 No. 60079-11:11, Explosive atmospheres — Part 11: Equipment protection by intrinsic safety “i”

ANSI/ISA-60079-0 (12.00.01)-2009, Electrical Apparatus for Explosive Gas Atmospheres - Part 0: General Requirements


Federal Communications Commission (FCC) and Industry Canada (IC)

This device complies with Part 15 of the FCC Rules. Operation is subject to the following conditions: This device may not cause harmful interference. This device must accept any interference received, including interference that may cause undesired operation. This device must be installed to ensure a minimum antenna separation of 20 cm from all persons.
Telecommunication Compliance

All wireless devices require certification to ensure that they adhere to regulations regarding the use of the radio frequency (RF) spectrum. Nearly every country requires this type of product certification. RCS is working with governmental agencies around the world to supply fully compliant products and to remove the risk of violating country directives or laws governing wireless device usage.

Place and Date of Issue:

October 17, 2012
Rohrback Cosasco Systems, Inc.
Santa Fe Springs, CA 90670

Authorized Signature:  
Steven L. Stricklin  Quality Assurance Manager
Manufacturer's Declaration of Conformity

CSA International (CSA) Certification

Certificate: 2524043  
Project: 70010363  
Date Issued: July 17, 2013

Model ULTRACORR-2 portable battery supply/transmitter: intrinsically safe only when powered by two non-rechargeable AAA-size cells having part number 995818 or 095820 as specified in drawing number 725126. Output entity parameters: Uo = 126 Vac, Io = 60 mA, Po = 173 mW, Co = 2.79 mF, Lo = 9876 µH; -40°C ≤ Tamb ≤ +70°C.

Notes:
1) The cells in the ULTRACORR-2 battery pack are intrinsically safe and may be replaced by the user, however, only Rohrback Cosasco Systems (RCS) P/N 095818 or 095820 cells supplied by RCS may be used; in addition, provided care is taken to prevent the cells being damaged, they may be changed whilst in the hazardous area. Cells with P/N 095820 are also compatible with units certified under previous issues of the certificate.
2) The ULTRACORR-2 contains a voltage-enhancing step-up transformer circuit clamped to 126 Vac by Zener diodes and used to activate the piezoelectric crystal.

APPLICABLE REQUIREMENTS

<table>
<thead>
<tr>
<th>CSA C22.2 No. 0-10</th>
<th>General Requirements – Canadian Electrical Code, Part II</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAN/CSC-C22.2 No. 60079-0:11</td>
<td>Explosive atmospheres — Part 0: Equipment — General requirements</td>
</tr>
<tr>
<td>CAN/CSC-C22.2 No. 60079-11:11</td>
<td>Explosive atmospheres — Part 11: Equipment protection by intrinsic safety “i”</td>
</tr>
<tr>
<td>ANSI/ISA-60079-0 (12.00.01)-2009</td>
<td>Electrical Apparatus for Explosive Gas Atmospheres - Part 0: General Requirements</td>
</tr>
</tbody>
</table>

MARKINGS

Product markings shall be in accordance with the related standards. In addition, it shall be the responsibility of the manufacturer to provide additional markings on the product to comply with the requirements of the local regulatory authorities. Example, for products intended for use in Canada, any caution and warning markings must be provided in French and English per CSA C22.2 No. 0-10, clause 6.3.1.

The following markings for each unit shall appear on a c-CSA-us Accepted OR c-UL-us Recognized adhesive label, which is suitable for indoor or outdoor use on plastic, at a maximum service temperature of 80°C or higher. The label stock shall be printed with one of the approved printer and ink combinations as specified in the manufacturer listing (Refer to drawing 646129-2 and 725125-2):

- Manufacturer’s name “Rohrback Cosasco Systems, Inc”, “Rohrback Cosasco Systems” or CSA Master Contract Number “252069”, adjacent to the CSA Mark in lieu of Manufacturer’s name.
Model number: as specified in the PRODUCTS section, above.
Electrical ratings/Entity Parameters: As specified in the PRODUCTS section, above.
Ambient temperature rating: as specified in the PRODUCTS section, above (may be abbreviated).
Manufacturing date in MMYY format, or serial number, traceable to month of manufacture.
The CSA Mark, as shown on page 1 of the Certificate of Conformity.
Hazardous Location designation: as specified in the PRODUCTS section, above.
Temperature Code: as specified in the PRODUCTS section, above.
“Exib” (shall appear on the product)
“INTRINSICALLY SAFE”
“WARNING - NO LIVE MAINTENANCE”
“12.2524043” (Certificate number) adjacent to the CSA Monogram
Supplement to Certificate of Compliance

Certificate: 2524043  
Master Contract: 252069

The products listed, including the latest revision described below, are eligible to be marked in accordance with the referenced Certificate.

<table>
<thead>
<tr>
<th>Project</th>
<th>Date</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>70001363</td>
<td>July 17, 2013</td>
<td>Update to report 2524043 to include new battery pack 095820 for ULTRACORR-2 and for UST2; Mechanical changes; modification of Ci; deletion of routine dielectric strength test.</td>
</tr>
<tr>
<td>2569040</td>
<td>December 11, 2012</td>
<td>Update to report 2524043 to include drawing revisions for the addition of a Warning equipment service note on two labels.</td>
</tr>
<tr>
<td>2524043</td>
<td>August 3, 2012</td>
<td>Original Certification of the Model UST2 Ultrasonic Transducer and the Model ULTRACORR-2 portable battery supply/transmitter.</td>
</tr>
</tbody>
</table>
IEC Ex Certification - Ultracorr 2 Ultrasonic Transmitter

IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION
IEC Certification Scheme for Explosive Atmospheres
for rules and details of the IECEx Scheme visit www.iecex.com

Certificate No.: IECEx SIR 12.0028X  issue No.:1
Certificate history: Issue No. 1 (2013-4-23)
Issue No. 0 (2012-4-20)

Status: Current
Date of Issue: 2013-04-23  Page 1 of 5

Applicant: Rohrbach Cosasco Systems
11841 East Smith Ave
Santa Fe Springs
California 90670
United States of America

Electrical Apparatus: ULTRACORR-2 Ultrasonic Transmitter
Optional accessory: 

Type of Protection: Intrinsic Safety
Marking: Ex ib IIC T4 Gb
Ta = -40°C to +70°C

Approved for issue on behalf of the IECEx Certification Body: A C Smith
Position: Certification Manager

Signature: (for printed version) 

Date: 2013-04-23

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
3. The Status and authenticity of this certificate may be verified by visiting the Official IECEx Website.

Certificate issued by:
SIRA Certification Service
Rake Lane
Eccleston
Chester
CH4 9JN
United Kingdom
IECEx Certificate of Conformity

Certificate No.: IECEx SIR 12.0028X
Date of Issue: 2013-04-23
Issue No.: 1

Manufacturer: Rohrback Cosasco Systems
11841 East Smith Ave
Santa Fe Springs
California
90670
United States of America

Additional Manufacturing location (s):

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality System requirements. This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended.

STANDARDS:
The electrical apparatus and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards:

IEC 60079-0 : 2011 Explosive atmospheres - Part 0: General requirements
Edition: 6.0
IEC 60079-11 : 2011 Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"
Edition: 6.0

This Certificate does not indicate compliance with electrical safety and performance requirements other than those expressly included in the Standards listed above.

TEST & ASSESSMENT REPORTS:
A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in

Test Report:
GB/SIR/ExT12.0084/00
GB/SIR/ExT13.0077/00

Quality Assessment Report:
US/UL/QAR08.0005/02
US/UL/QAR08.0005/03
IECEx Certificate of Conformity

Certificate No.: IECEx SIR 12.0028X
Date of Issue: 2013-04-23
Issue No.: 1
Page 3 of 5

Schedule

EQUIPMENT:
Equipment and systems covered by this certificate are as follows:

The ULTRACORR-2 is battery-powered, portable instrument that measures pipe and vessel wall thickness for non-intrusive corrosion and erosion monitoring. The instrument is intended for connection to a piezoelectric ultrasonic transducer manufactured by Rohrback Cosasco Systems, typically a model UST2, which provides periodic time- and date-stamped measurements of wall thickness. The ULTRACORR-2 sends the results via a low power wireless channel to a remote device. The ULTRACORR-2 is powered from two, non-rechargeable, AA cells, which are intrinsically safe and may be replaced in the hazardous area. Only cells with part number 095818 or 095820 from Rohrback Cosasco Systems may be fitted. Apart from the cells, the circuitry is completely encapsulated within a plastic enclosure. A flying lead terminates in a plug-and-socket connector, which is used to connect the ULTRACORR-2 to the ultrasonic transducer. See Equipment Continued for additional description.

CONDITIONS OF CERTIFICATION: YES as shown below:

1. The cells in the battery pack are intrinsically safe and may be replaced by the user, however, only RCS P/N 095818 or 095820 cells supplied by Rohrback Cosasco Systems may be used, in addition, provided care is taken to prevent the cells being damaged, they may be changed whilst in the hazardous area. Cells with P/N 095820 are also compatible with units certified under previous issues of the certificate.
IECEx Certificate of Conformity

Certificate No.: IECEx SIR 12.0028X
Date of issue: 2013-04-23

EQUIPMENT (continued):

For the purposes of the assessment of external equipment, the following worst case parameters may be used. Note: Uo cannot occur at the same time as the Io and Po.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uo</td>
<td>126 V ac</td>
</tr>
<tr>
<td>Io</td>
<td>60 mA</td>
</tr>
<tr>
<td>Po</td>
<td>173 mW</td>
</tr>
<tr>
<td>Ci</td>
<td>2.42 nF</td>
</tr>
<tr>
<td>Li</td>
<td>0</td>
</tr>
<tr>
<td>Co</td>
<td>2.79 nF</td>
</tr>
<tr>
<td>Lo</td>
<td>9876 μH</td>
</tr>
</tbody>
</table>
IECEx Certificate of Conformity

Certificate No.: IECEx SIR 12.0028X
Date of Issue: 2013-04-23

DETAILS OF CERTIFICATE CHANGES (for issues 1 and above):

<table>
<thead>
<tr>
<th>Issue 1 — this issue introduced the following change:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The 095820 battery pack was introduced and recognised in the Product Description and Conditions of Certification. Whilst this is a direct replacement for the original, 095818 battery pack for the purpose of back compatibility, reference to the 095818 battery pack will be retained in the certificate.</td>
</tr>
</tbody>
</table>
IEC Ex Certification - UST2 Ultrasonic Transducer

IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION
IEC Certification Scheme for Explosive Atmospheres
for rules and details of the IECEx Scheme visit www.iecex.com

Certificate No.: IECEx SIR 12.0029X
Current
2013-04-23
Rohrback Cosasco Systems
11841 East Smith Ave
Santa Fe Springs
California
90670
United States of America

UST2 Ultrasonic Transducer
Intrinsic Safety
Ex ia IIC T4 Gb
Ta = - 40°C to + 70°C

Approved for issue on behalf of the IECEx Certification Body: A C Smith
Position: Certification Manager
Signature: (for printed version)
Date: 2013-04-23

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
3. The Status and authenticity of this certificate may be verified by visiting the Official IECEx Website.

Certificate issued by:
SIRA Certification Service
Rake Lane
Eccleston
Chester
CH4 9JN
United Kingdom
IECEx Certificate of Conformity

Certificate No.: IECEx SIR 12.0029X

Date of Issue: 2013-04-23

Issue No.: 2

Page 2 of 4

Manufacturer:
Rohrback Cosasco Systems
11841 East Smith Ave
Santa Fe Springs
California
90670
United States of America

Additional Manufacturing location(s):

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements. This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended.

STANDARDS:
The electrical apparatus and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards:

IEC 60079-0 : 2011
Edition: 6.0
Explosive atmospheres - Part 0: General requirements

IEC 60079-11 : 2011
Edition: 6.0
Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"

This Certificate does not indicate compliance with electrical safety and performance requirements other than those expressly included in the Standards listed above.

TEST & ASSESSMENT REPORTS:
A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in

Test Report:
GB/SIR/ExTR12.0085/00  GB/SIR/ExTR12.0085/01  GB/SIR/ExTR13.0044/00

Quality Assessment Report:
US/UL/QAR08.0005/02  US/UL/QAR08.0005/03
Manufacturer’s Declaration of Conformity

IECEx Certificate of Conformity

Certificate No.: IECEx SIR 12.0029X
Date of Issue: 2013-04-23
Issue No.: 2

Schedule

EQUIPMENT:
Equipment and systems covered by this certificate are as follows:

The UST2 is a piezo-electric ultrasonic transducer that is designed to be attached by adhesive to a metal pipe, for measuring metal thickness. It is equipped with an integral RTD for temperature monitoring and contains an embedded memory chip inside its connector to retain user-configured ID characteristics. It is intended to be periodically interrogated by a monitoring device; this may be an ULTRACORR-2, IECEx SIR 12.0028X, manufactured by Rohrback Cosasco Systems, alternatively, another appropriately certified device may be used provided it is suitable for the application and has matching entity parameters.

The high voltage supply to the piezo-electric transducer and the low voltage supply to the RTD are treated as a single intrinsically safe circuit with the following combined entity parameters:

<table>
<thead>
<tr>
<th>Combined parameters</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>U1</td>
<td>126 V ac</td>
</tr>
<tr>
<td>I1</td>
<td>80 mA</td>
</tr>
<tr>
<td>P1</td>
<td>173 mW</td>
</tr>
<tr>
<td>C1</td>
<td>0.85 nF</td>
</tr>
<tr>
<td>L1</td>
<td>0</td>
</tr>
</tbody>
</table>

CONDITIONS OF CERTIFICATION: YES as shown below:

1. The UST2 has been assessed as compliant for a T4 temperature class at an upper ambient temperature of 70°C. It has also been assessed with the front face attached to a process pipe up to 150°C provided that the cable end of the UST2 is at no more than 70°C. However, it should be noted that in this condition, with a pipe surface temperature at 150°C, the pipe surface itself limits the temperature class to T3.

2. The metallic ring on the top of the enclosure may store a level of electrostatic charge that could become inductive. Therefore, the user/installer shall implement precautions to prevent the build-up of electrostatic charge e.g. locate the equipment where a charge-generating mechanism (such as wind-blow dust) is unlikely to be present. Refer to user instructions for further information.

3. Only portable, battery-powered equipment, with no connection to earth, can be connected to the UST2. The Rohrback-Cosasco Systems Ultracorr (IECEx SIR 12.0028) is suitable equipment.
# IECEx Certificate of Conformity

**Certificate No.:** IECEx SIR 12.0029X  
**Date of issue:** 2013-04-23  
**Issue No.:** 2  
**Page:** 4 of 4

## DETAILS OF CERTIFICATE CHANGES (for issues 1 and above):

<table>
<thead>
<tr>
<th>Issue</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Issue 1</strong></td>
<td>this Issue introduced the following change:</td>
</tr>
<tr>
<td>1</td>
<td>ExTR Free Ref. no. R27101B/01 replaced R27101B/00</td>
</tr>
<tr>
<td><strong>Issue 2</strong></td>
<td>this Issue introduced the following changes:</td>
</tr>
<tr>
<td>1</td>
<td>Mechanical changes, including a thinner diaphragm were approved.</td>
</tr>
<tr>
<td>2</td>
<td>A change to C\text{r} in the entity parameters from 1 nF to 0.85 nF, the table above is amended accordingly.</td>
</tr>
<tr>
<td>3</td>
<td>Minor changes to the artwork were acknowledged.</td>
</tr>
<tr>
<td>4</td>
<td>The addition of a new Condition of Certification and the removal of the Condition of Manufacture.</td>
</tr>
</tbody>
</table>
# IEC Ex Certification – Transfer Unit

## IECEx Certificate of Conformity

**Manufacturer's Declaration of Conformity**

### Certificate No.:

IECEx SIR 14.0098X

### Status:

Current

### Date of Issue:

2015-07-06

### Applicant:

Rohrbach Cosasco Systems
1841 Smith Ave.
Santa Fe Springs
California 90670
United States of America

### Electrical Apparatus:

Moto

### Type of Protection:

Intrinsically Safe

### Marking:

Ex ia IIC T4 Ga
Ta = -40°C TO +70°C

### Approved for issue on behalf of the IECEx Certification Body:

C. Ellaby

### Position:

Deputy Certification Manager

### Signature:

C. Ellaby

### Date:

2015-07-06

---

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
3. The Status and authenticity of this certificate may be verified by visiting the Official IECEx Website.

---

Certificate issued by:

SIRA Certification Service
CSA Group
Unit 6, Hawarden Industrial Park
Hawarden
Deeside
CH5 3US
United Kingdom

---

CSA Certification
IECEx Certificate of Conformity

Certificate No.: IECEx SIR 14.0096X
Date of Issue: 2015-07-06
Issue No.: 0

Manufacturer: Rohrback Cosasco Systems
11841 Smith Ave.
Santa Fe Springs
California 90670
United States of America

Additional Manufacturing location (s):

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements. This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended.

STANDARDS:
The electrical apparatus and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards:

- IEC 60079-0 : 2011 Explosive atmospheres - Part 0: General requirements
  Edition: 6.0
- IEC 60079-11 : 2011 Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"
  Edition: 6.0
  Edition: 3.0

This Certificate does not indicate compliance with electrical safety and performance requirements other than those expressly included in the Standards listed above.

TEST & ASSESSMENT REPORTS:
A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in

Test Report:
GB/SIR/ExTR15.0182/00

Quality Assessment Report:
US/UL/QAR08.0005/04
IECEx Certificate of Conformity

Certificate No.: IECEx SIR 14.0090X
Date of Issue: 2015-07-06

Issue No.: 0
Page 3 of 3

Schedule

EQUIPMENT:
Equipment and systems covered by this certificate are as follows:

The Mate is hand-held equipment that is powered by two, AA size, replaceable, primary cells located in a battery compartment. It consists of a plastic enclosure containing a p.c.b. assembly and a window through which an L.C.D. can be viewed. The front of the enclosure is also fitted with a membrane keypad. The enclosure provides at least IP20 ingress protection.

The intended use of the equipment is for the operator to connect either a Reader-CAT (separately certified as IECEx SIR 14.0090X) or a Reader-COT (separately certified as IECEx 14.0094X: to probes that are installed on plant. A reading is then taken using the Mate, which communicates with the Readers using a wireless Bluetooth link. The Mate is also intended to be used to communicate with other certified equipment.

Conditions of manufacture:
The Manufacturer shall comply with the following:

1. The Mate incorporates an IS Fusion Limited Type IS8217/80 fuse that has previously been Ex Component certified under IECEx SIR 07.0050U. It is therefore the responsibility of the manufacturer to continually monitor the status of the certification associated with this device. The manufacturer shall inform CSA-Sira of any modifications to the device that may impinge upon the explosion safety design of the Mate.

CONDITIONS OF CERTIFICATION: YES as shown below:

1. No precautions against electrostatic discharge are necessary for hand-held equipment that has an enclosure made of plastic, metal, or a combination of the two, except where a significant static-generating mechanism has been identified. Activities such as placing the item in a pocket or on a belt, operating a keypad or cleaning with a damp cloth, do not present a significant electrostatic risk. However, where a static-generating mechanism is identified, such as repeated brushing against clothing, then suitable precautions shall be taken, e.g. the use of anti-static footwear.
### ATEX Certification - Ultracorr 2 Ultrasonic Transmitter

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>EC TYPE-EXAMINATION CERTIFICATE</td>
</tr>
<tr>
<td>3</td>
<td>Certificate Number: Sira 12ATEX2083X  Issue: 1</td>
</tr>
<tr>
<td>4</td>
<td>Equipment: ULTRACORR-2 Ultrasonic Transmitter</td>
</tr>
<tr>
<td>5</td>
<td>Applicant: Rohrback Cosasco Systems</td>
</tr>
</tbody>
</table>
| 6 | Address: 11841 East Smith Ave  
Santa Fe Springs  
California  
90670  
USA |

7 This equipment and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.  
8 Sira Certification Service, notified body number 0518 in accordance with Article 9 of Directive 94/9/EC of 23 March 1994, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment intended for use in potentially explosive atmospheres given in Annex II to the Directive.  
The examination and test results are recorded in the confidential reports listed in Section 14.2.  
9 Compliance with the Essential Health and Safety Requirements, with the exception of those listed in the schedule to this certificate, has been assured by compliance with the following documents:  
IEC 60079-0:2011 Ed. 6  
IEC 60079-11:2011 Ed. 6  
10 If the sign 'X' is placed after the certificate number, it indicates that the equipment is subject to special conditions for safe use specified in the schedule to this certificate.  
11 This EC type-examination certificate relates only to the design and construction of the specified equipment. If applicable, further requirements of this Directive apply to the manufacture and supply of this equipment.  
12 The marking of the equipment shall include the following:  

```
Ex e IIC T4 Gb  
Ta = -40°C to +70°C
```  

### Project Number  
29789

This certificate and its schedules may only be reproduced in its entirety and without change.

---

**Sira Certification Service**  
Rake Lane, Eccleston, Chester, CH14 9JN, England  
Tel: +44 (0) 1244 670800  
Fax: +44 (0) 1244 681330  
Email: info@siracertification.com
SCHEDULE

EC TYPE-EXAMINATION CERTIFICATE

Sira 12ATEX2083X
Issue 1

13 DESCRIPTION OF EQUIPMENT

The ULTRACORR-2 is battery-powered, portable instrument that measures pipe and vessel wall thickness for non-intrusive corrosion and erosion monitoring. The instrument is intended for connection to a piezo-electric ultrasonic transducer manufactured by Rohrbach Cosasco Systems, typically a model UST2, which provides periodic time- and date-stamped measurements of wall thickness. The ULTRACORR-2 sends the results via a low power wireless channel to a remote device.

The ULTRACORR-2 is powered from two, non-rechargeable, AA cells, which are intrinsically safe and may be replaced in the hazardous area. Only cells with part number 095818 or 095820 from Rohrbach Cosasco Systems may be fitted. Apart from the cells, the circuitry is completely encapsulated within a plastic enclosure. A flying lead terminates in a plug-and-socket connector, which is used to connect the ULTRACORR-2 to the ultrasonic transducer.

For the purposes of the assessment of external equipment, the following worst case parameters may be used. Note: Uo, cannot occur at the same time as the Io and Po.

<table>
<thead>
<tr>
<th>Combined parameters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uo</td>
</tr>
<tr>
<td>Io</td>
</tr>
<tr>
<td>Po</td>
</tr>
<tr>
<td>Cl</td>
</tr>
<tr>
<td>Li</td>
</tr>
<tr>
<td>Co</td>
</tr>
<tr>
<td>Lo</td>
</tr>
</tbody>
</table>

Uo 126 V ac
Io 60 mA
Po 173 mW
Cl 2.42 nF
Li 0
Co 2.79 nF
Lo 9876 μH

Variation 1 - This variation introduced the following changes:

i. The 095820 battery pack was introduced and recognised in the Product Description and the Special Condition for Safe Use. Whilst this is a direct replacement for the original 095818 battery pack, for the purpose of back compatibility, reference to the 095818 battery pack will be retained in the certificate.

14 DESCRIPTIVE DOCUMENTS

14.1 Drawings

Refer to Certificate Annexe.

14.2 Associated Sira Reports and Certificate History

<table>
<thead>
<tr>
<th>Issue</th>
<th>Date</th>
<th>Report no.</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>20 April 2012</td>
<td>R27101A/00</td>
<td>The release of the prime certificate.</td>
</tr>
<tr>
<td>1</td>
<td>04 April 2013</td>
<td>R25789A/00</td>
<td>The introduction of Variation 1.</td>
</tr>
</tbody>
</table>

This certificate and its schedules may only be reproduced in its entirety and without change.

Sira Certification Service
Rake Lane, Eccleston, Chester, CH4 9JN, England
Tel: +44 (0) 1244 670900
Fax: +44 (0) 1244 681330
SCHEDULE

EC TYPE-EXAMINATION CERTIFICATE

Sira 12ATEX2083X
Issue 1

15 SPECIAL CONDITIONS FOR SAFE USE (denoted by X after the certificate number)

15.1 The cells in the battery pack are intrinsically safe and may be replaced by the user, however, only RCS P/N 095818 or 095820 cells supplied by Rohrback Cosasco Systems may be used; in addition, provided care is taken to prevent the cells being damaged, they may be changed whilst in the hazardous area. Cells with P/N 095820 are also compatible with units certified under previous issues of the certificate.

16 ESSENTIAL HEALTH AND SAFETY REQUIREMENTS OF ANNEX II (EHSRs)

The relevant EHSRs that are not addressed by the standards listed in this certificate have been identified and individually assessed in the reports listed in Section 14.2.

17 CONDITIONS OF CERTIFICATION

17.1 The use of this certificate is subject to the Regulations Applicable to Holders of Sira Certificates.

17.2 Holders of EC type-examination certificates are required to comply with the production control requirements defined in Article 8 of directive 94/9/EC.
## Certificate Annexe

**Certificate Number:** Sira 12ATEX2083X  
**Equipment:** ULTRACORR-2 Ultrasonic Transmitter  
**Applicant:** Rohrback Cosasco Systems

### Issue 0

<table>
<thead>
<tr>
<th>Drawing no.</th>
<th>Sheets</th>
<th>Rev.</th>
<th>Date (Sira stamp)</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>725121</td>
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### Issue 1

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<td>General assembly</td>
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ATEX Certification - UST2 Ultrasonic Transducer

EC TYPE-EXAMINATION CERTIFICATE


Certificate Number: Sira 12ATEX2084X Issue: 2

Equipment: UST2 Ultrasonic Transducer

Applicant: Rohrbach Cosasco Systems

Address: 11841 East Smith Ave Santa Fe Springs California 90670 USA

This equipment and any acceptable variation thereof is specified in the schedule to this certificate and the documents therein referred to.

Sira Certification Service, notified body number 0518 in accordance with Article 9 of Directive 94/9/EC of 23 March 1994, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in the confidential reports listed in Section 14.2.

Compliance with the Essential Health and Safety Requirements, with the exception of those listed in the schedule to this certificate, has been assured by compliance with the following documents:


If the sign 'X' is placed after the certificate number, it indicates that the equipment is subject to special conditions for safe use specified in the schedule to this certificate.

This EC type-examination certificate relates only to the design and construction of the specified equipment. If applicable, further requirements of this Directive apply to the manufacture and supply of this equipment.

The marking of the equipment shall include the following:

\[\text{Ex II 2G}\
\text{Ex ia IIC T4 Gb}\
\text{Ta = -40°C to +70°C}\]

Project Number 29833

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Form 9400 Issue 2

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SCHEDULE

EC TYPE-EXAMINATION CERTIFICATE

Sira 12ATEX2084X
Issue 2

13 DESCRIPTION OF EQUIPMENT

The UST2 is a piezo-electric ultrasonic transducer that is designed to be attached by adhesive to a metal pipe, for measuring metal thickness. It is equipped with an integral RTD for temperature monitoring and contains an embedded memory chip inside its connector to retain user-configured ID characteristics. It is intended to be periodically interrogated by a monitoring device; this may be an ULTRACORR-2, Sira 12ATEX2083X, manufactured by Rohrback Cosasco Systems, alternatively, another appropriately certified device may be used provided it is suitable for the application and has matching entity parameters.

The high voltage supply to the piezo-electric transducer and the low voltage supply to the RTD are treated as a single, intrinsically safe circuit with the following combined entity parameters:

<table>
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<th>Combined parameters</th>
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<tbody>
<tr>
<td>Ui</td>
</tr>
<tr>
<td>126 V ac</td>
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<tr>
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<td>60 mA</td>
</tr>
<tr>
<td>Pi</td>
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<td>173 mW</td>
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<tr>
<td>Cl</td>
</tr>
<tr>
<td>0.85 nF</td>
</tr>
<tr>
<td>Li</td>
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14 DESCRIPTIVE DOCUMENTS

14.1 Drawings

Refer to Certificate Annexe.

14.2 Associated Sira Reports and Certificate History

<table>
<thead>
<tr>
<th>Issue</th>
<th>Date</th>
<th>Report no.</th>
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<tr>
<td>0</td>
<td>20 April 2012</td>
<td>R27101B/00</td>
<td>The release of the prime certificate.</td>
</tr>
<tr>
<td>1</td>
<td>6 June 2012</td>
<td>R27101B/01</td>
<td>Report no. R27101B/01 replaced R27101B/00 to allow the specification of the insulation material around the piezo transducer to be more generic.</td>
</tr>
</tbody>
</table>
| 2     | 20 February 2013 | R29833A/00 | It was recognised that the manufacturer has not made any UST2 devices in accordance with the design covered by Issues 0 and 1. It is therefore their intention to replace this model with the one introduced by Issue 2, also known as the UST2, which incorporates the following design modifications:
  i. The approval of mechanical changes, including a thinner diaphragm.
  ii. The entity parameter Cl was changed from 1 nF to 0.85 nF.
  iii. Minor changes to the artwork were acknowledged.
  iv. The Description, Special Conditions for Safe Use and Conditions of Certification were revised so that they apply specifically to the new model design. |

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Form 9400 Issue 2

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SCHEDULE

EC TYPE-EXAMINATION CERTIFICATE

15  SPECIAL CONDITIONS FOR SAFE USE (denoted by X after the certificate number)

15.1 The UST2 has been assessed as compliant for a T4 temperature class at an upper ambient temperature of 70°C. It has also been assessed with the front face attached to a process pipe up to 150°C provided that the cable end of the UST2 is at no more than 70°C. However, it should be noted that in this condition, with a pipe surface temperature at 150°C, the pipe surface itself limits the temperature class to T3.

15.2 The metallic ring on the top of the enclosure may store a level of electrostatic charge that could become incendive. Therefore, the user/installer shall implement precautions to prevent the build-up of electrostatic charge e.g. locate the equipment where a charge-generating mechanism (such as wind-blown dust) is unlikely to be present. Refer to user instructions for further information.

15.2 Only portable, battery-powered equipment, with no connection to earth, can be connected to the UST2. The Rohrbach-Cosasco Systems Ultracorr (Sira 12ATEX2083) is suitable equipment.

16  ESSENTIAL HEALTH AND SAFETY REQUIREMENTS OF ANNEX II (EHSRs)

The relevant EHSRs that are not addressed by the standards listed in this certificate have been identified and individually assessed in the reports listed in Section 14.2.

17  CONDITIONS OF CERTIFICATION

17.1 The use of this certificate is subject to the Regulations Applicable to Holders of Sira Certificates.

17.2 Holders of EC type-examination certificates are required to comply with the production control requirements defined in Article 8 of directive 94/9/EC.
The drawings listed with these Issues were rationalised and have been superseded by those detailed in Issue 2.

### Issue 2

<table>
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<td>UST2 IECEx &amp; ATEX marking</td>
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<td>UST2 PCB artwork</td>
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<td>11 Feb 13</td>
<td>UST2 schematic and parts list</td>
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<td>646133</td>
<td>1 to 2</td>
<td>B</td>
<td>19 Feb 13</td>
<td>UST2 general assembly</td>
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ATEX Certification – Transfer Unit

EC TYPE-EXAMINATION CERTIFICATE


Certificate Number: Sira 14ATEX2263X Issue: 0

Equipment: Mate

Applicant: Rohrback Cosasco Systems

Address: 11841 Smith Ave.
Santa Fe Springs
California 90670
USA

This equipment and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

Sira Certification Service, notified body number 0518 in accordance with Article 9 of Directive 94/9/EC of 23 March 1994, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in the confidential reports listed in Section 14.2.

Compliance with the Essential Health and Safety Requirements, with the exception of those listed in the schedule to this certificate, has been assured by compliance with the following documents:

EN 60079-0:2012/A11:2013
EN 60079-11:2012
EN 60079-26:2015

The above list of documents may detail standards that do not appear on the UKAS Scope of Accreditation, but have been added through Sira’s flexible scope of accreditation, which is available on request.

If the sign ‘X’ is placed after the certificate number, it indicates that the equipment is subject to special conditions for safe use specified in the schedule to this certificate.

This EC type-examination certificate relates only to the design and construction of the specified equipment. If applicable, further requirements of this Directive apply to the manufacture and supply of this equipment.

The marking of the equipment shall include the following:

Ex ii T4 Ga
Ta = -40°C to +70°C

C Eldeby
Deputy Certification Manager

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Web: www.csagroup.org

Project Number: 70005213

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SCHEDULE

EC TYPE-EXAMINATION CERTIFICATE

Sira 14ATEX2263X
Issue 0

13 DESCRIPTION OF EQUIPMENT
The Mate is a hand-held equipment that is powered by two, AA size, replaceable, primary cells located in a battery compartment. It consists of a plastic enclosure containing a p.c.b. assembly and a window through which an LCD can be viewed. The front of the enclosure is also fitted with a membrane keypad. The enclosure provides at least IP20 ingress protection.

The intended use of the equipment is for the operator to connect either a Reader-CAT (separately certified as Sira 14ATEX2262X) or a Reader-COT (separately certified as Sira 14ATEX2262X) to probes that are installed on plant. A reading is then taken using the Mate, which communicates with the Reader using a wireless Bluetooth link. The Mate is also intended to be used to communicate with other certified equipment.

14 DESCRIPTIVE DOCUMENTS
14.1 Drawings
Refer to Certificate Annex.

14.2 Associated Sira Reports and Certificate History

<table>
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<th>Issue</th>
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<td>R70005218A</td>
<td>The release of the prime certificate.</td>
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15 SPECIAL CONDITIONS FOR SAFE USE (denoted by X after the certificate number)

15.1 No precautions against electrostatic discharge are necessary for hand-held equipment that has an enclosure made of plastic, metal or a combination of the two, except where a significant static-generating mechanism has been identified. Activities such as placing the item in a pocket or on a belt, operating a keypad or cleaning with a damp cloth, do not present a significant electrostatic risk. However, where a static-generating mechanism is identified, such as repeated brushing against clothing, then suitable precautions shall be taken, e.g. the use of anti-static footwear.

16 ESSENTIAL HEALTH AND SAFETY REQUIREMENTS OF ANNEX II (EHSRe)
The relevant EHSRs that are not addressed by the standards listed in this certificate have been identified and individually assessed in the reports listed in Section 14.2.

17 CONDITIONS OF CERTIFICATION
17.1 The use of this certificate is subject to the Regulations Applicable to Holders of Sira Certificates.

17.2 Holders of EC type-examination certificates are required to comply with the production control requirements defined in Article 8 of directive 94/9/EC.

17.3 The Mate incorporates an IS Fusion Limited Type ISF021/T/80 fuse that has previously been Ex Component certified under Sira 05ATEX2274U. It is therefore the responsibility of the manufacturer to continually monitor the status of the certification associated with this device. The manufacturer shall inform CSA-Sira of any modifications to the device that may impinge upon the explosion safety design of the Mate.

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Web: www.csagroup.org
Certificate Annexe

Certificate Number: Sira 14ATEX2263X
Equipment: Mate
Applicant: Rohrback Cosasco Systems

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