

# PRODUCT CONFORMITY CERTIFICATE

This is to certify that the

## **Signature® Flow Meter with TIENet™ 360 LaserFlow™ Velocity Sensor**

manufactured by:

### **Teledyne ISCO**

4700 Superior Street,  
Lincoln,  
Nebraska,  
68504-1398  
USA

has been assessed by Sira Certification Service  
and for the conditions stated on this certificate complies with:

### **MCERTS Performance Standards for Water Monitoring Equipment Part 3, Version 2.4 dated February 2013**

Certification Ranges :

Velocity	±0.25 to ±1.7 m/s
Depth	0.01 to 0.75m

Project No. : 70004430  
Certificate No : Sira MC140265/00  
Initial Certification : 04 November 2014  
This Certificate issued : 04 November 2014  
Renewal Date : 03 November 2019

E Alexander BSc (Hons)  
Deputy Certification Manager

MCERTS is operated on behalf of the Environment Agency by

## **Sira Certification Service**

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*The MCERTS certificate consists of this document in its entirety.  
For conditions of use, please consider all the information within.*

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**Registered Office:** Rake Lane, Eccleston, Chester, UK CH4 9JN

*To authenticate the validity of this certificate please visit [www.siracertification.com/mcerts](http://www.siracertification.com/mcerts)*

## Certificate Contents

Approved Site Application .....	2
Basis of Certification .....	2
Product Certified .....	2
Certified Performance .....	3
Description.....	5
General Notes.....	7

## Approved Site Application

*Any potential user should ensure, in consultation with the manufacturer, that the monitoring system is suitable for the intended application. For general guidance on monitoring techniques refer to the Environment Agency Monitoring Technical Guidance Notes available at [www.mcerts.net](http://www.mcerts.net)*

The product is suitable for use, where it is appropriate, for regulated applications such as abstraction, effluent discharge, ultraviolet disinfection and industrial processing.

Suitable for use over channel widths 0.1m to 1m.

The field trial took place for three months on the final effluent weir of a food processing plant.

## Basis of Certification

This certification is based on the following Test Report(s) and on Sira's assessment and ongoing surveillance of the product and the manufacturing process:

- R1 WRC Report Number UC10409.1 dated October 2014
- R2 WRC Report Number UC9578 v03 dated July 2013
- R3 Signature LaserFlow Field Test Report dated 12.09.14

## Product Certified

The Signature® Flowmeter with TIENet™ 360 LaserFlow Velocity Sensor system consists of the following parts:

- Signature® flowmeter (100 to 230 V AC). Hardware version A0.
- TIENet™ model 360 LaserFlow Velocity Sensor. Hardware version C2 (firmware v2.1.13).
- Optional external power loss alarm (required for MCERTS conformity).

This certificate applies to all instruments fitted with software version 1.21.037onwards (Signature® flowmeter serial number 214B01774 & TIENet™ model 360 LaserFlow Velocity Sensor serial number 214B01652 onwards).

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## Certified Performance

The instrument was evaluated for use under the following conditions:

Ambient Temperature Range: 0°C to +60°C  
Instrument IP rating: IP68

The instrument meets **MCERTS Class 2** requirements for the combined performance characteristic as specified in Table 7 of the MCERTS performance standard. Details of individual performance characteristics are summarised below:

The lab testing was conducted using 3 laser velocity measurement points. The field test was conducted using 13 points.

Results are expressed as error % reading, unless otherwise stated.

Test	Results expressed as error % reading				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Protection against unauthorised access					Password required	Clause 3.1.2
Indicating device					The flowmeter displays totalised volume and/or flow-rate	Clause 3.1.3
Units of measurement					The flowmeter records in metric units	Clause 3.1.6
Combined performance characteristic					Note 1 4.97	Table 6 ≤5% Class 2
Mean error				3.6		Clause 6.3.2 ±4% Class 2
Repeatability			1.3			Clause 6.3.2 ±2% Class 2
Supply voltage 100 to 240 V AC	0.04					Clause 6.3.3 0.5% Class 1
Output impedance	<0.01				Note 2	Clause 6.3.4 0.5% Class 1
Ambient temperature		0.54				Clause 6.3.6 1.0% Class 2
Relative humidity			1.2			Clause 6.3.6 2% Class 2
Incident light	0.09					Clause 6.3.7 0.5% Class 1
Sensor location			1.1			Clause 6.3.8 2.0% Class 3
Direct solar radiation	0.48					Clause 6.3.10 1.0% Class 3

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Test	Results expressed as error % reading				Other results	MCERTS specification
	<0.5	<1	<2	<8		
Bi-directional flow				-4.7		Clause 6.3.13 ±6.5% Class 3
Effect of conduit size						Clause 6.3.17 To be reported
Channel width	Ref velocity (m/s)					
TP1	0.99m	0.3	1.4			
TP2	0.99m	0.8		-2.9		
TP3 (max)	0.99m	1.2			Note 3	
Fill level						Clause 6.3.18 To be reported
	Depth (m)	Velocity (m/s)				
TP1	0.19	0.45		-4.2		
TP2	0.11	0.75		1.8		
TP3	0.05	1.6		3.6		
TP4	0.5	0.45		-4.3		
TP5	0.5	0.75		-5.5		
TP6	0.5	1.0		-5.3		
TP7	0.7	0.45		-5.4		
TP8	0.7	0.75		-6.6		
TP9	0.7	1.0		-7.7		
Response time					21 secs	Clause 6.3.19 < 30 secs
Error under field test conditions	Max error 8.60% Min error -5.94% Mean error -2.88%  Proportion of errors ≤5% = 70% Proportion of errors ≤8% = 96%					Clause 7.3 <8% Class 3
Up time					Note 4 96.16%	Clause 7.4 >95%
Maintenance					Note 5 Scheduled	Clause 7.5 To be reported

Note 1: The combined performance characteristic reported is the root-sum-square addition of the maximum errors recorded in the following tests: mean error, repeatability, supply voltage, output impedance, ambient air temperature, incident light, sensor location and direct solar radiation.

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Note 2: A simulated level input using a Teledyne ISCO TIENet™ 310 ultrasonic level sensor was used to evaluate the software / electronics response of the Signature unit.

Note 3: Mean error result 13.7% reading and repeatability 0.7% reading - Velocity conditions unstable and level highly variable.

Note 4: Maintenance of the site consisted of three primary tasks: changing of batteries on Signature and calibrating level for the sensor. Two deep cycle marine batteries were exchanged on the Signature approximately every 3 weeks. Level calibration was undertaken twice, six weeks apart.

Note 5: Battery power to the Signature failed and caused both sensors to go inactive for an extended amount of time. Power was restored by exchanging batteries after ~48 hours.

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## Description

The Signature® Flow Meter is designed for open channel flow monitoring applications using any combination of flow and parameter measurement technologies and sampling, depending on what is required at the measurement site.

The TIENet 360 LaserFlow sensor is an Area Velocity flow measurement device that remotely measures flow in open channels with non-contact Laser Doppler Velocity Sensing and non-contact Ultrasonic Level Sensing technologies. From above the flow stream, the sensor uses advanced technology to measure velocity with a laser beam at single or multiple points below the surface of the wastewater stream. The sensor measures both forward and reverse flows.

The Signature Flow Meter can calculate flow using standard open channel level-to-flow conversions, as well as user-defined equations, level to area data points or level to flow data points, depending upon the measurement device(s) used in the application and the program specified by the user.

The Signature Flow Meter allows multiple simultaneous flow technologies, input for pH and temperature, accepts input from SDI-12 devices and Modbus devices, provides multiple analog output signals, and includes other interface options. The Signature has a graphical display for viewing of parameter measurements and instrument configuration. It is compatible with Teledyne Isco Flowlink software which allows on site or remote data collection or instrument configuration. The Signature has a front panel notification LED to indicate an alarm condition. The Signature is capable of communicating through an Ethernet modem, a cellular modem, or a USB interface.

The Signature flow meter has features to verify data integrity. It logs events such as changes in calibration and power outages to validate data accuracy. Data can be reviewed to detect any type of data alteration. Program reports, summary reports, and time series data are retrievable using a USB flash drive.

With multiple smart interface options and multi-parameter logging (such as pH), the Signature Flow Meter provides a common platform for control action, reporting, and communication.

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## General Notes

1. This certificate is based upon the equipment tested. The Manufacturer is responsible for ensuring that on-going production complies with the standard(s) and performance criteria defined in this Certificate. The Manufacturer is required to maintain an approved quality management system controlling the manufacture of the certified product. Both the product and the quality management system shall be subject to regular surveillance according to 'Regulations Applicable to the Holders of Sira Certificates'. The design of the product certified is defined in the Sira Design Schedule for certificate No. Sira MC140265/00.
2. If certified product is found not to comply, Sira Certification Service should be notified immediately at the address shown on this certificate.
3. The Certification Marks that can be applied to the product or used in publicity material are defined in 'Regulations Applicable to the Holders of Sira Certificates'.
4. This document remains the property of Sira and shall be returned when requested by the company.

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