

# TIENet™ 306 Sampler Interface

## Installation and Operation Guide



Manual Body #69-4303-072  
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Revision D, April 2015



## Foreword

This instruction manual is designed to help you gain a thorough understanding of the operation of the equipment. Teledyne Isco recommends that you read this manual completely before placing the equipment in service.

Although Teledyne Isco designs reliability into all equipment, there is always the possibility of a malfunction. This manual may help in diagnosing and repairing the malfunction.

If a problem persists, call or e-mail Teledyne Isco technical support for assistance. Simple difficulties can often be diagnosed over the phone. For faster service, please have your serial number ready.

If it is necessary to return the equipment to the factory for service, please follow the shipping instructions provided by technical support, including the use of the **Return Merchandise Authorization (RMA)** specified. **Be sure to include a note describing the malfunction.** This will aid in the prompt repair and return of the equipment.

Teledyne Isco welcomes suggestions that would improve the information presented in this manual or enhance the operation of the equipment itself.

**Teledyne Isco is continually improving its products and reserves the right to change product specifications, replacement parts, schematics, and instructions without notice.**

## Contact Information

### *Customer Service*

Phone: (800) 228-4373 (USA, Canada, Mexico)  
(402) 464-0231 (Outside North America)  
Fax: (402) 465-3022  
Email: IscoCSR@teledyne.com

### *Technical Support*

Phone: Toll Free (866) 298-6174 (Samplers, Flow Meters and Multi-parameter Probes)  
Toll Free (800) 775-2965 (Syringe Pumps and Liquid Chromatography)

Email: IscoService@teledyne.com  
Return equipment to: 4700 Superior Street, Lincoln, NE 68504-1398

### *Other Correspondence*

Mail to: P.O. Box 82531, Lincoln, NE 68501-2531  
Email: IscoInfo@teledyne.com



*General Warnings*

Before installing, operating, or maintaining this equipment, it is imperative that all hazards and preventive measures are fully understood. While specific hazards may vary according to location and application, take heed of the following general warnings:

 **WARNING**

**Avoid hazardous practices! If you use this instrument in any way not specified in this manual, the protection provided by the instrument may be impaired.**

 **AVERTISSEMENT**

**Éviter les usages périlleux! Si vous utilisez cet instrument d'une manière autre que celles qui sont spécifiées dans ce manuel, la protection fournie de l'instrument peut être affaiblie; cela augmentera votre risque de blessure.**

*Hazard Severity Levels*

This manual applies *Hazard Severity Levels* to the safety alerts. These three levels are described in the sample alerts below.

 **CAUTION**

Cautions identify a potential hazard, which if not avoided, may result in minor or moderate injury. This category can also warn you of unsafe practices, or conditions that may cause property damage.

 **WARNING**









**Warnings identify a potentially hazardous condition, which if not avoided, could result in death or serious injury.**

 **DANGER**

**DANGER – limited to the most extreme situations to identify an imminent hazard, which if not avoided, will result in death or serious injury.**

*Hazard Symbols*

The equipment and this manual use symbols used to warn of hazards. The symbols are explained below.

<b>Hazard Symbols</b>	
<b>Warnings and Cautions</b>	
	The exclamation point within the triangle is a warning sign alerting you of important instructions in the instrument's technical reference manual.
	The lightning flash and arrowhead within the triangle is a warning sign alerting you of "dangerous voltage" inside the product.
<b>Symboles de sécurité</b>	
	Ce symbole signale l'existence d'instructions importantes relatives au produit dans ce manuel.
	Ce symbole signale la présence d'un danger d'électocution.
<b>Warnungen und Vorsichtshinweise</b>	
	Das Ausrufezeichen in Dreieck ist ein Warnzeichen, das Sie darauf aufmerksam macht, daß wichtige Anleitungen zu diesem Handbuch gehören.
	Der gepfeilte Blitz im Dreieck ist ein Warnzeichen, das Sie vor "gefährlichen Spannungen" im Inneren des Produkts warnt.
<b>Advertencias y Precauciones</b>	
	Esta señal le advierte sobre la importancia de las instrucciones del manual que acompañan a este producto.
	Esta señal alerta sobre la presencia de alto voltaje en el interior del producto.

# TIENet™ 306 Sampler Interface

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# TIENet™ 306 Sampler Interface

## *Section 1 Introduction*

The TIENet Model 306 Sampler Interface connects the Signature® Flow Meter to a Teledyne Isco wastewater sampler. Through this connection, the Signature can enable the sampler based on user-specified conditions, pace the sampling routine based on flow, and receive sample and bottle information from the sampler.

The 306 is available with a 10m, or 23m cable. For greater distances, external connection via conduit, and connection of additional TIENet devices, the TIENet Expansion Box is available. Bulk TIENet cable may also be used for greater distances.



*Figure 1-1 TIENet 306 with TIENet connector (t) and TIENet with wire connector (b)*

## 1.1 Operation

The Signature flow meter uses a 5-Volt pulse output to signal a connected Teledyne Isco automatic sampler to collect flow paced samples. Based on user-defined conditions, the flow meter can signal the sampler to start (enable) or stop (disable). It also receives signals from the sampler indicating when a sample is collected (event mark), and into which bottle the sample is distributed (bottle number).



Figure 1-2 Basic 306 Configuration

## 1.2 Connector Description

The 306 connects to the flow meter port of a Teledyne Isco sampler with a 6-pin female, sealed plug.

**Note**

The Isco 4700 and 5800 Refrigerated sampler also requires the adaptor cable that duplicates the Isco sampler flow meter port.

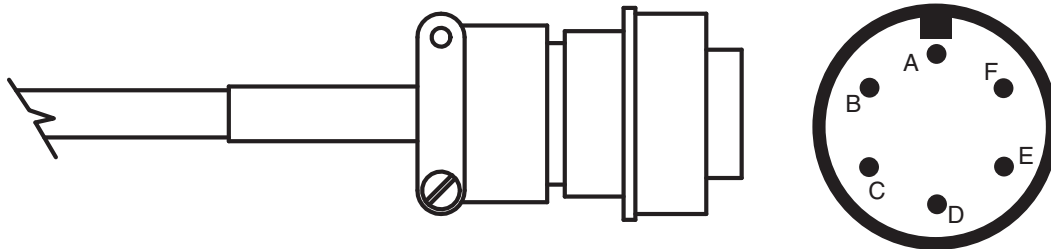


Figure 1-3 306 Sealed connector

The function of each pin in the figure above is listed in Table 1-1:

Table 1-1 306 Connector Pin Functions	
Pin	Function
A	+12VDC (sampler detection)
B	Ground
C	Flow Pulse - Out
D	Bottle Number - In
E	Event Mark - In
F	Enable - Out

## 1.3 Technical Specifications

Table 1-2 Technical Specifications <sup>a</sup>	
Functions	Output: Teledyne Isco Sampler Flow pacing, Enabling on trigger. Input: Event and bottle number
Power	From Signature Flow Meter
Operating Temperature	-4° to 122°F    -20° to 50°C
Storage Temperature	-40° to 140°F    -40° to 60°C
Pulse Width	50 ms
Pulse Output	5 volts
Sampler Connection	Teledyne Isco Models 6712, Avalanche, Glacier, GLS, and 3700 Series: Standard 6-Pin MS connector 4700 & 5800: Flow meter port adaptor cable.

a. All specifications are subject to change without notice.

## 1.4 Accessories

Accessories can be purchased by contacting Teledyne Isco's Customer Service Department:

**Teledyne Isco**  
Customer Service Dept.  
P.O. Box 82531  
Lincoln, NE 68501 USA

Phone: 800 228-4373  
402 464-0231  
FAX: 402 465-3022

E-mail: IscoInfo@teledyne.com

**Note**

For replacement parts, please see Appendix A.1 Replacement Parts.

306 Sampler Interface cables with Signature connection ending in unterminated leads. For use with 6 position plug-in (green) terminal strip; cord grip included:

Cut to length cable .....	60-4304-088
10 m (32.8 ft) cable .....	60-4304-007
23 m (75 ft) cable .....	60-4304-008
Assembly Model 306 5m (5800/4700 OLNy) .....	60-5804-178
Assembly Model 306 10m (5800/4700 OLNy) .....	60-5804-179
Assembly Model 306 23m (5800/4700 OLNy) .....	60-5804-180

306 Sampler Interface cable with signature connection ending in TIENet plug. For use with portable Signature TIENet receptacle:

Cut to length cable .....	60-4304-078
10 m (32.8 ft) cable .....	60-4304-076
23 m (75 ft) cable .....	60-4304-077
CA Assembly TIENet Y w/ connector .....	60-4304-066
TIENet expansion box (includes 10 ft TIENet cable and 2 cord grip) .....	60-4307-023
Cord grip fitting, 3/4" NPT, for TIENet cable .....	209-0073-12
Bulk TIENet Cable (cut-to-length; order by the foot) .....	60-4304-050
4700/5800 Sampler Interface cable .....	60-5314-697

**Note**

Teledyne Isco uses FreeRTOS version 5.4.2 in its TIENet devices. In accordance with the FreeRTOS license, FreeRTOS source code is available on request. For more information, visit [www.FreeRTOS.org](http://www.FreeRTOS.org).

# TIENet™ 306 Sampler Interface

## Section 2 Installation and Operation

### 2.1 Installation

External TIENet devices such as the 306 are all connected to the Signature Flow Meter in the same manner, usually using conduit or cord-grip cable fittings. Multiple external TIENet devices can be connected simultaneously.

#### 2.1.1 Connecting to the Flow Meter

Refer to your Signature Flow Meter manual for instructions on accessing the instrument's interior components.

#### WARNING

Before proceeding, ensure that the flow meter has been disconnected from mains power.

#### Note

The steps that follow include instructions for installing cord-grip fittings. Some applications will use user-supplied  $\frac{3}{4}$ " ID conduit for cable routing.

1. Remove one of the 6-position plug-in terminal strip connectors from the case board.

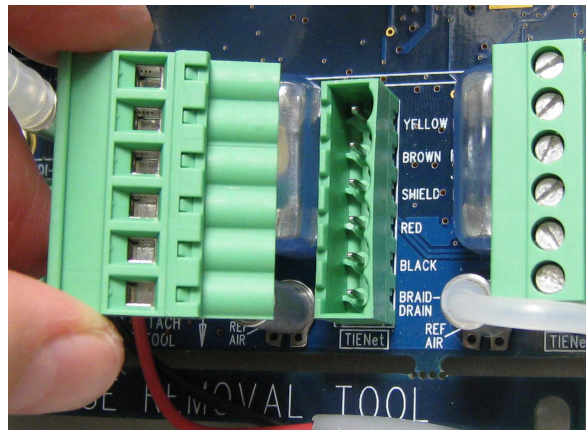


Figure 2-1 TIENet Device terminal strips

2. If using a cord-grip fitting, install the cable nut in the appropriate opening on the bottom of the Signature enclosure, securing it to the wall with the lock nut (concave side facing wall).

3. Feed the TIENet device cable end through the sealing nut and seal, and through the cable nut. Lightly tighten the sealing nut, just enough to hold the cable in place while installing the connector.

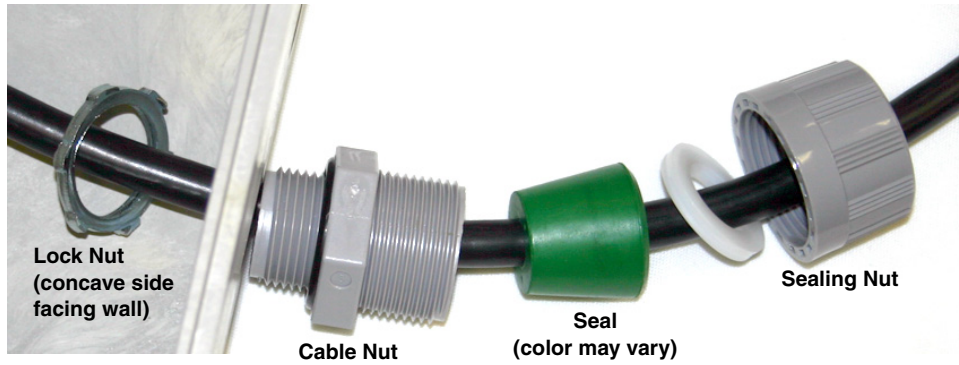


Figure 2-2 Installing cable with a cord-grip fitting

4. Attach the wire ends to the terminal strip as shown in Figure 2-3, then press the terminal strip back down into its socket on the case board, as shown in Figure 2-4, taking care not to strain any wire connections. Gently tug each wire when finished, to verify secure connection to the screw terminals.

**Note**

The SHIELD wire is the bare drain emerging from the foil shield around the YELLOW and BROWN wires. The BRAID-DRAIN wire is the bare drain emerging from the surrounding braided shield inside the cable jacket. It is not necessary to prevent the two braids from coming into contact with each other.



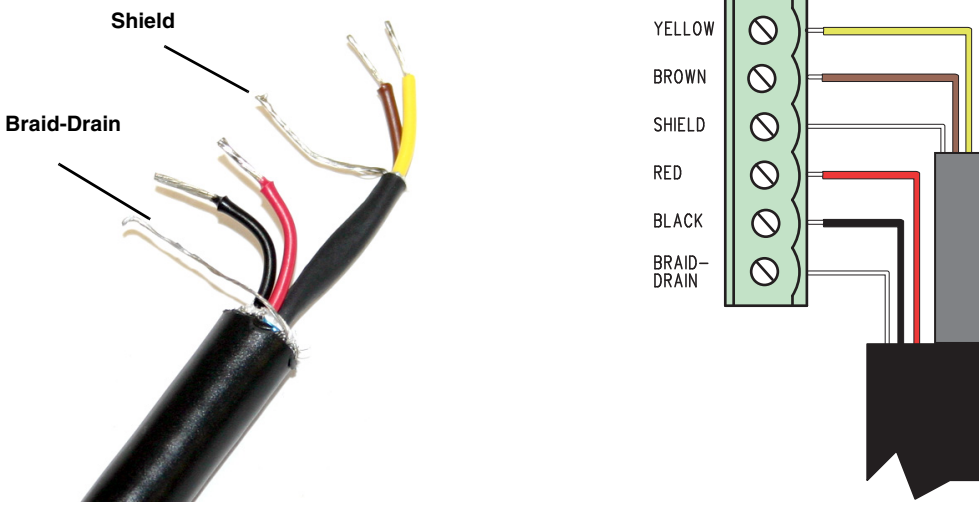


Figure 2-3 TIENet Device terminal connections

5. Press the terminal strip back down into its socket on the case board, as shown in Figure 2-5, taking care not to strain any wire connections.

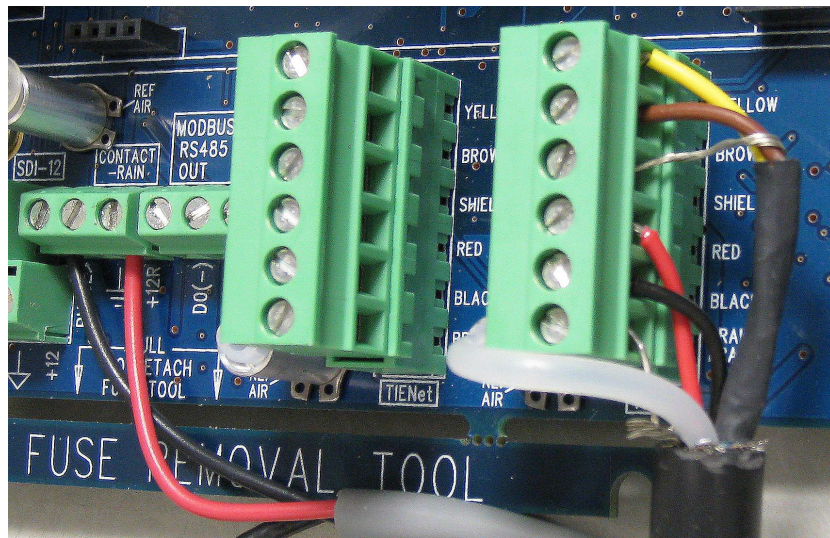


Figure 2-4 Attach wired terminal strip to case board socket

6. Gently tug the cable downward, to remove any slack within the enclosure, taking care not to put any stress on the connection.
7. Tighten the cord grip sealing nut.

 **CAUTION**

If you are using conduit instead of the cord-grip fitting, the conduit must be sealed to prevent harmful gases and moisture

from entering the Signature enclosure. Failure to seal conduit could reduce equipment life.

8. Close the front panel and fasten it shut with the two Philips screws.

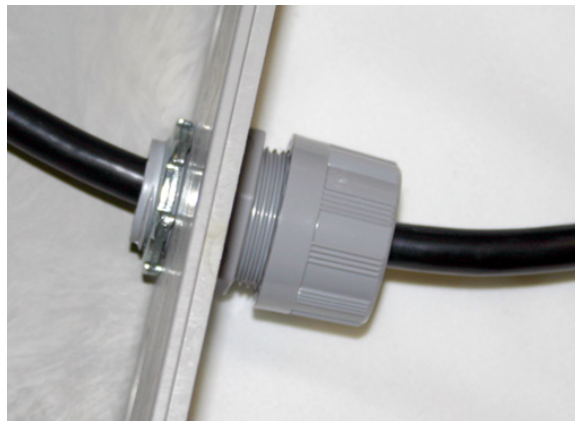
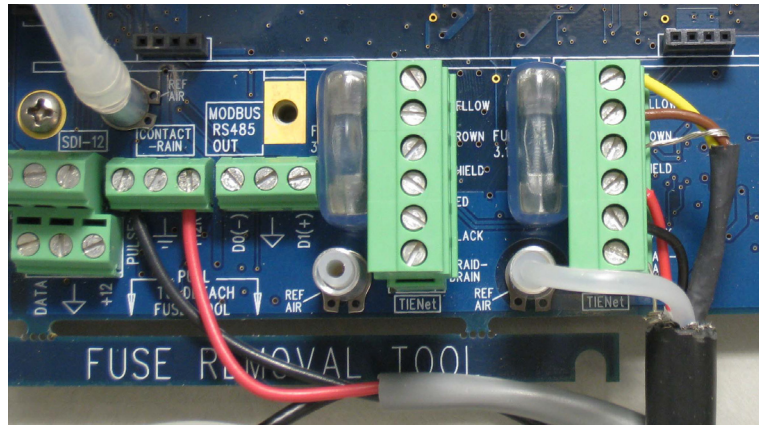


Figure 2-5 Position and secure the cable

### 2.1.2 Connecting to Signature Portable via a TIENet Receptacle

The optional external TIENet devices compatible with the Signature Portable (and Signature) all scan into the hardware in the same manner. A scan is required anytime a new TIENet device is added.

Multiple TIENet devices can be connected simultaneously to the same Signature Portable Flow Meter. The following TIENet devices will attach to the TIENet receptacle:

- Ultrasonic Level Sensor
- Area Velocity Sensor



- 301 pH Interface
- LaserFlow
- 306 Sampler Interface

*Connecting a TIENet plug to the Signature Portable*

To connect the TIENet plug from the sensor to the TIENet Receptacle:

1. Align the connectors and push together (Figure 2-6).
2. The sensor release will “click” when the sensor connector is fully seated.
3. Connect the two caps together.
4. After the physical connection is made, a scan must be performed for the device to be recognized.

For additional TIENet connections, use the TIENet Y-cable or alternately an Expansion Box.

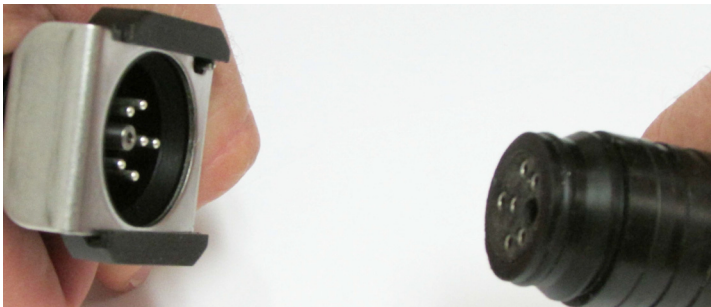
*O-Ring and Lubrication for the TIENet receptacle*

1. Coat the O-ring’s sealing surface with a silicone lubricant.

 **CAUTION**

Do not use petroleum-based lubricants. Petroleum-based lubricants will cause the O-ring to swell and eventually deteriorate. Aerosol silicone lubricant sprays often use petroleum-based propellents. If you are using an aerosol spray, allow a few minutes for the propellant to evaporate before proceeding.

2. The sensor release will “click” when the sensor connector is fully seated.
3. Connect the two caps together.



*Figure 2-6 How to connect a TIENet plug to the Signature Portable*

### 2.1.3 Connecting to the Sampler

Connect the sealed end of the cable to the flow meter port of the sampler.

**Note**

The sampler must have its own power source.

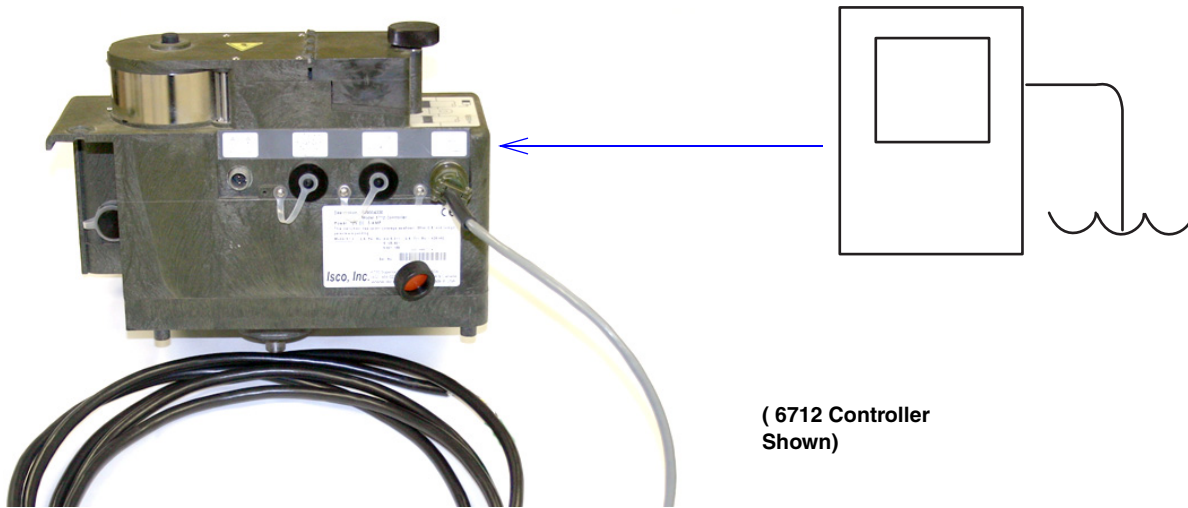


Figure 2-7 Connecting to the sampler

## 2.2 Configuring the Interface

To configure the Signature flow meter for operation with a sampler using the TIENet 306 device, press MENU ( **B** ) to access the top menu, and select Hardware Setup. For all TIENet devices including the 306, select TIENet Setup (Smart Sensor).

### 2.2.1 Updating the Device List

When the 306 is physically added to the system, select Perform Scan so that the flow meter detects it. When the scan is complete, the 306 appears in the list of connected devices, ready to be configured with the steps shown in Figure 2-9 on the following page.

**Note**



From the Hardware Setup menu, “Configure” refers to defining and selecting the parameters for each connected device.

### 2.2.2 Input Data from the Sampler

The two parameters that appear for the 306 device are:

**306 Sample Bottle** – Sample event and Bottle number

**306 Input Voltage** – 12VDC present on pin A from the sampler connector (the sampler is powered separately from the Signature flow meter). NOTE - This measurement is only to indicate whether or not a sampler is connected.

The name of any parameter can be customized by highlighting it and pressing Enter () to display the character grid. Navigate the grid using the arrow keys. Select characters with Enter and clear characters with Delete (.

306 Sample Bottle														
Done				Cancel										
<b>A</b>	B	C	D	E	F	G	H	I	J	K	L	M	N	▲
O	P	Q	R	S	T	U	V	W	X	Y	Z	a	b	
c	d	e	f	g	h	i	j	k	l	m	n	o	p	
q	r	s	t	u	v	w	x	y	z		/	:	!	
@	#	\$	%	^	&	*	(	)	-	_	+	=	<	
>	?	,	.											▼

Figure 2-8 Character grid

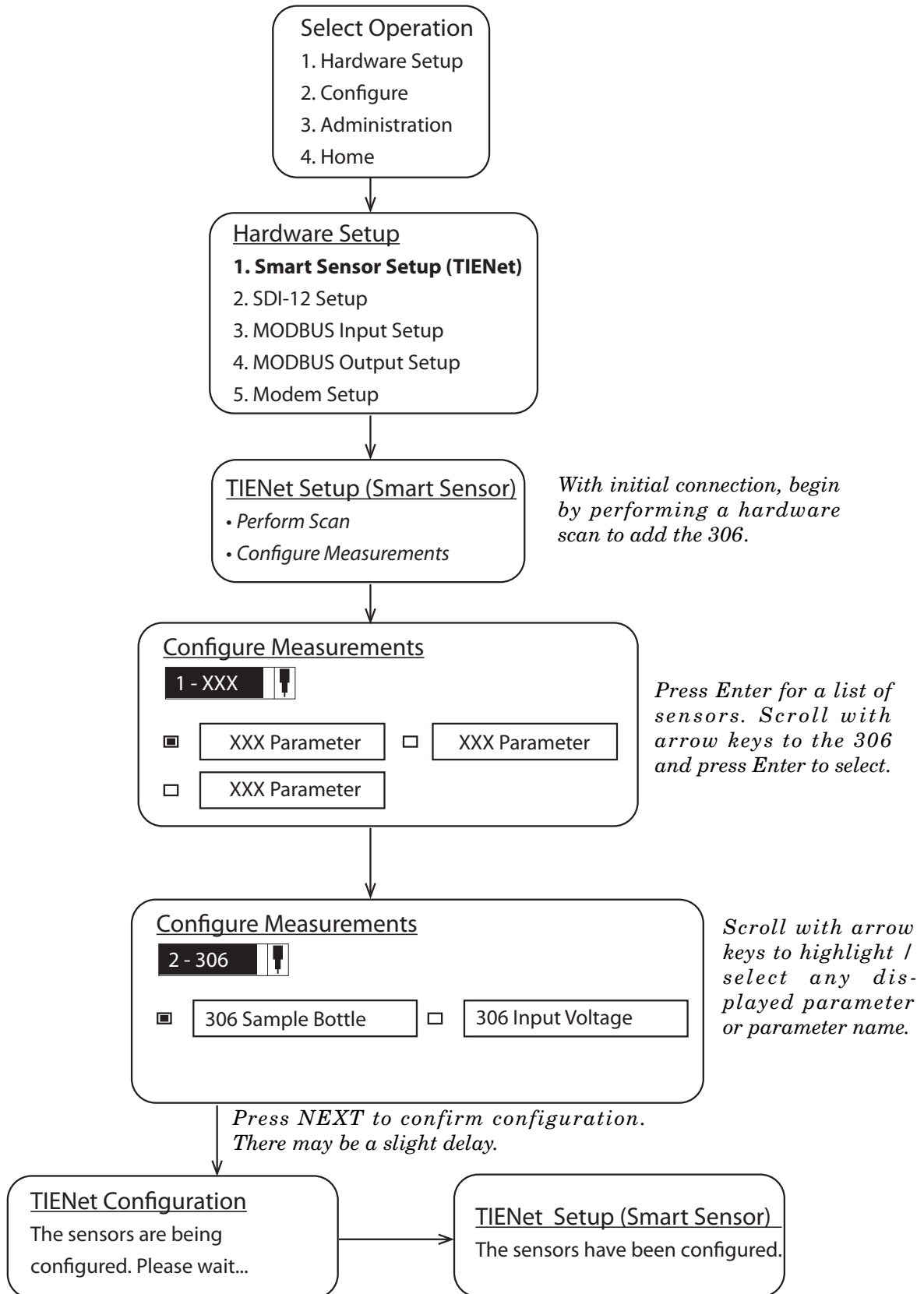


Figure 2-9 Menu Tree: 306 Configuration

## 2.3 Enabling and Pacing the Sampler

The Signature flow meter can enable or disable the connected sampler with a signal based on a defined condition (such as level, flow rate, pH, temperature, etc.) or combination of conditions. This is called a sampler **Trigger**.

**Refer to your *Signature Installation and Operation Guide* for detailed instructions on defining conditions and using them to build equations.**

If the sampler is disabled at its programmed start time, the sampling program is suspended until the sampler is enabled.

Refer to your sampler's user manual for detailed instructions on sampler programming.

To set up the sampler control, select option #6, Sampler, from the Configure menu (refer to Figure 2-10 on the following page).

### 2.3.1 Enable Settings

The sampler setup screen has a choice of four enable settings:

**Enable Never** – The sampler remains disabled and is never activated.

**Enable Always** – The sampler remains enabled and is never deactivated.

**Enable Latched** – Once enabled, the sampler remains enabled until it either reaches the end of its program or the latch is reset by the flow meter.

**Note**

When the sampler setup screen first appears, the "Reset Latch" function is highlighted by default. If you do not want to reset the latch, be sure this field is NOT highlighted before pressing Enter or Next.

**Enable on Trigger** – The sampler becomes enabled when triggered by a defined condition selected from the pull-down list. Once the condition has passed, the sampler is once more disabled.

**Note**

In order to populate the pull-down list, you must first define one or more conditions. **Refer to your *Signature Installation and Operation Guide* for detailed instructions on defining conditions and using them to build equations.**

### 2.3.2 Sampler Pacing

For flow-paced sampling, select Pace by Flow. (If the sampler is programmed for time-paced sampling, select Pace None.)

Highlight the Volume Input field to select the Total Flow measurement used to pace the sampler.

Next to Pace Interval, select volumetric units of measure, and enter the number of units (such as gallons) equal to one flow pulse.

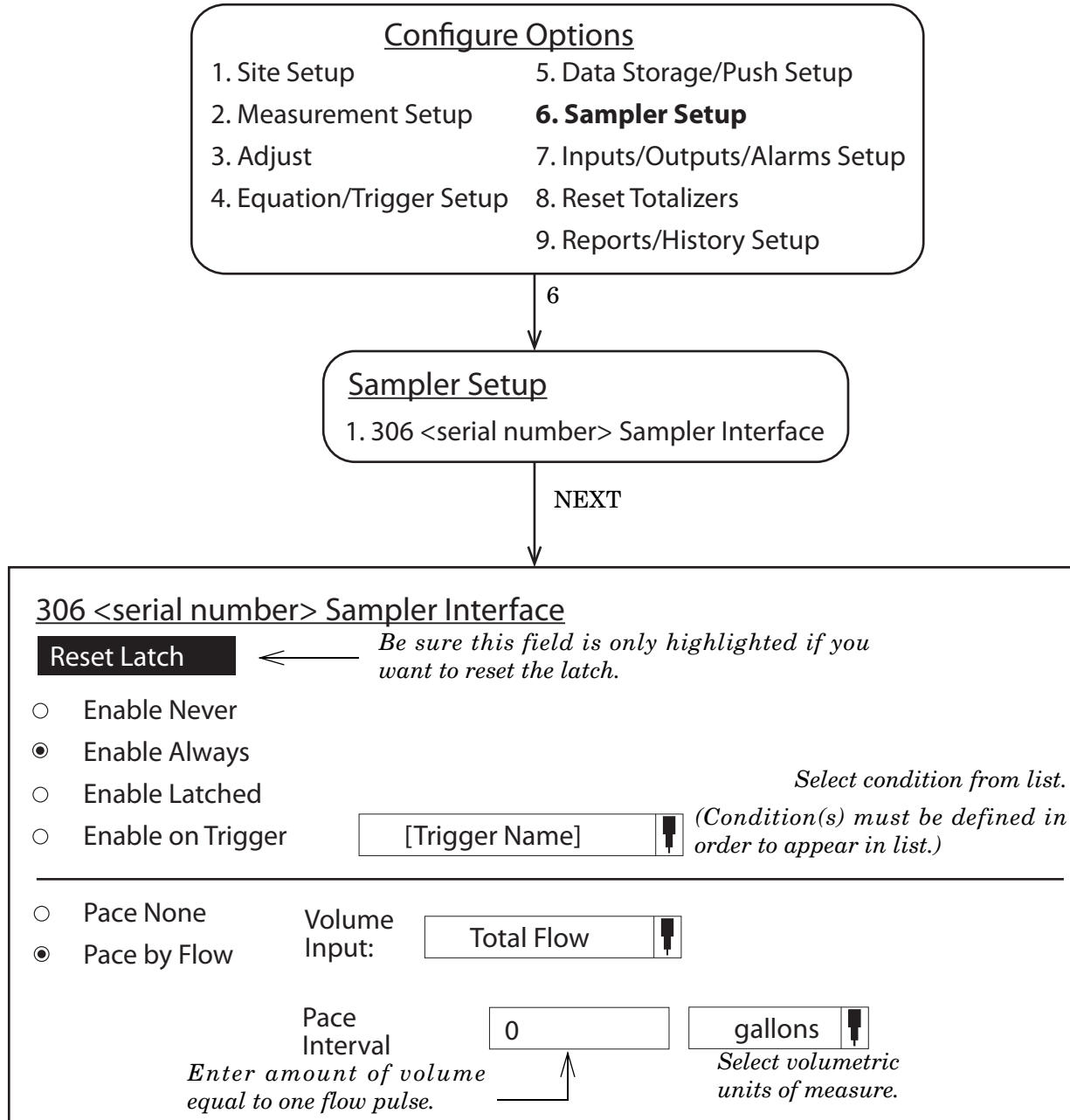


Figure 2-10 Sampler enabling and pacing

## **2.4 Firmware Updates**

The TIENet device's firmware is updated via the USB port on the front panel of the Signature Flow Meter. Step-by-step instructions for updating the firmware can be found in Section 2 of the Signature user manual.

## **2.5 Contact Teledyne Isco**

If you have further questions about the installation, operation, and maintenance of your TIENet device, please contact our service department at:

Teledyne Isco  
4700 Superior St.  
Lincoln, NE 68504

Phone: 866 298-6174 or 402 464-0231

Fax: 402 465-3022

E-mail: [IscoService@teledyne.com](mailto:IscoService@teledyne.com)





# TIENet™ 306 Sampler Interface

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## *Appendix A Replacement Parts*

### **A.1 Replacement Parts**

Replacement parts are called out in the following illustrations. Refer to the call-out in the adjacent table to determine the part number for the item.

Replacement parts can be purchased by contacting Teledyne Isco's Customer Service Department.

**Teledyne Isco**

Customer Service Department

P.O. Box 82531

Lincoln, NE 68501 USA

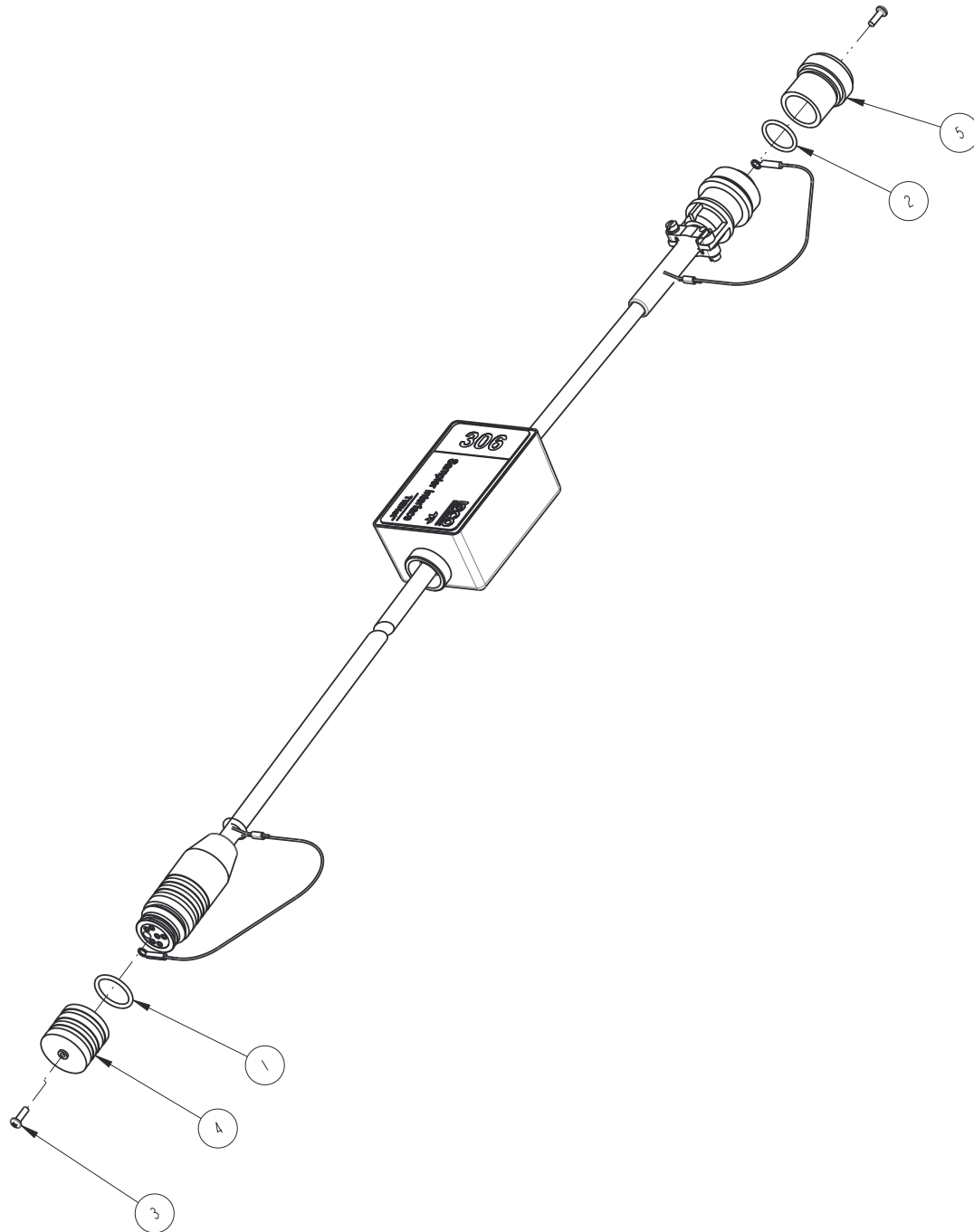
Phone: (800) 228-4373

(402) 464-0231

FAX:(402) 465-3022

E-mail: [IscoInfo@teledyne.com](mailto:IscoInfo@teledyne.com)

**A.1.1 306 Sampler Interface**







产品中有毒有害物质或元素的名称及含量

Name and amount of Hazardous Substances or Elements in the product

部件名称 Component Name	有毒有害物质或元素 Hazardous Substances or Elements					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴二联苯 (PBDE)
线路板 Circuit Boards	X	O	O	O	O	O
显示 Display	X	O	O	O	O	O
接线 Wiring	O	O	O	O	O	X
内部电缆 Internal Cables	O	O	O	O	O	X
直流电机 DC Motor	X	O	O	O	O	X
接头 Connectors	O	O	X	O	O	O
电池 Battery	X	X	X	O	O	O
电磁阀 Solenoid valve	X	O	O	O	O	X

产品中有毒有害物质或元素的名称及含量：Name and amount of Hazardous Substances or Elements in the product

O: 表示该有毒有害物质在该部件所有均质材料中的含量均在ST/ 标准规定的限量要求以下。

O: Represent the concentration of the hazardous substance in this component's any homogeneous pieces is lower than the ST/ standard limitation.

X：表示该有毒有害物质至少在该部件的某一均质材料中的含量超出ST/ 标准规定的限量要求。

(企业可在此处，根据实际情况对上表中打“X”的技术原因进行进一步说明。)

X: Represent the concentration of the hazardous substance in this component's at least one homogeneous piece is higher than the ST/ standard limitation.

(Manufacturer may give technical reasons to the “X”marks)

环保使用期由经验确定。

The Environmentally Friendly Use Period (EFUP) was determined through experience.

生产日期被编码在系列号码中。前三位数字为生产年(207 代表 2007 年)。随后的一个字母代表月份：

A 为一月，B 为二月，等等。

The date of Manufacture is in code within the serial number. The first three numbers are the year of manufacture (207 is year 2007) followed by a letter for the month. "A" is January, "B" is February and so on.



## Teledyne Isco One Year Limited Factory Service Warranty\*

This warranty exclusively covers Teledyne Isco instruments, providing a one-year limited warranty covering parts and labor.

Any instrument that fails during the warranty period due to faulty parts or workmanship will be repaired at the factory at no charge to the customer. Teledyne Isco's exclusive liability is limited to repair or replacement of defective instruments. Teledyne Isco is not liable for consequential damages.

Teledyne Isco will pay surface transportation charges both ways within the 48 contiguous United States if the instrument proves to be defective within 30 days of shipment. Throughout the remainder of the warranty period, the customer will pay to return the instrument to Teledyne Isco, and Teledyne Isco will pay surface transportation to return the repaired instrument to the customer. Teledyne Isco will not pay air freight or customer's packing and crating charges. This warranty does not cover loss, damage, or defects resulting from transportation between the customer's facility and the repair facility.

The warranty for any instrument is the one in effect on date of shipment. The warranty period begins on the shipping date, unless Teledyne Isco agrees in writing to a different date.

Excluded from this warranty are normal wear; expendable items such as pH sensors, charts, ribbon, lamps, tubing, and glassware; fittings and wetted parts of valves; and damage due to corrosion, misuse, accident, or lack of proper maintenance. This warranty does not cover products not sold under the Teledyne Isco trademark or for which any other warranty is specifically stated.

No item may be returned for warranty service without a return authorization number issued by Teledyne Isco.

**This warranty is expressly in lieu of all other warranties and obligations and Teledyne Isco specifically disclaims any warranty of merchantability or fitness for a particular purpose.**

The warrantor is Teledyne Isco, 4700 Superior, Lincoln, NE 68504, U.S.A.

**\* This warranty applies to the USA and countries where Teledyne Isco does not have an authorized dealer. Customers in countries outside the USA, where Teledyne Isco has an authorized dealer, should contact their Teledyne Isco dealer for warranty service.**

Before returning any instrument for repair, please call, fax, or e-mail the Teledyne Isco Service Department for instructions. Many problems can often be diagnosed and corrected over the phone, or by e-mail, without returning the instrument to the factory.

Instruments needing factory repair should be packed carefully, and shipped to the attention of the service department. Small, non-fragile items can be sent by insured parcel post. **PLEASE BE SURE TO ENCLOSE A NOTE EXPLAINING THE PROBLEM.**

**Shipping Address:** Teledyne Isco - Attention Repair Service  
4700 Superior Street  
Lincoln, NE 68504 USA

**Mailing Address:** Teledyne Isco  
PO Box 82531  
Lincoln, NE 68501 USA

**Phone:** Repair service: (800) 775-2965 (lab instruments)  
(866) 298-6174 (samplers & flow meters)  
Sales & General Information: (800) 228-4373 (USA & Canada)

**Fax:** (402) 465-3001

**Email:** IscoService@teledyne.com



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