GE
159 Plastics Avenue
Pittsfield, MA 01201
USA

Transmitted via Overnight Courier

November 7, 2006

Susan Svirsky
U.S. Environmental Protection Agency
c/o Weston Solutions, Inc.
10 Lyman Street
Pittsfield, MA 01201

Re: GE-Pittsfield/Housatonic River Site
Unkamet Brook Area (GECD170)
Proposal for Initial Unkamet Brook Flow Monitoring

Dear Ms. Svirsky:

I. INTRODUCTION

This letter describes the General Electric Company's (GE's) proposed data collection activities related to a portion of Unkamet Brook located within the North Area of the Unkamet Brook Area Removal Action Area (RAA). As described in this letter, GE has developed an initial flow monitoring plan to support future evaluation, planning, and design efforts related to the re-routing of an approximate 600-foot section of Unkamet Brook, which is required pursuant to the Consent Decree (CD) for the GE-Pittsfield/Housatonic River Site. Once approved by the US Environmental Protection Agency (EPA), GE will initiate the proposed flow monitoring activities. At present time, it is anticipated that the program will be conducted over a several-month timeframe (extending through to include the spring 2007 season) in order to assess both base flow patterns and seasonal (high-flow) variations within the section of the brook subject to re-routing.

The remainder of this letter provides additional background information (Part II), further describes the primary components of the flow monitoring program, including monitoring objectives and locations (Part III), methodologies, equipment, and field procedures (Part IV), and the anticipated schedule for performing and reporting the monitoring activities (Part V).

II. BACKGROUND

Appendix E to the CD, the *Statement of Work for Removal Actions Outside the River* (SOW), establishes several Performance Standards related to soils, sediment, and groundwater within the Unkamet Brook RAA. Among these are the installation of an asphalt engineered barrier and a vegetated engineered landfill cap for the currently paved and unpaved portions of the former interior landfill, respectively. GE is also required to re-route an approximate 600-foot section of Unkamet Brook that is currently located within the limits of the former landfill. Pursuant to the CD and SOW, this section of the brook is to be re-routed through its approximate former channel, located to the east of the former landfill. Figure 1 identifies the former interior landfill and existing Unkamet Brook.

To date, GE's activities within the Unkamet Brook RAA (as part of the CD and SOW) have focused on the performance of pre-design soil investigations and the separate, ongoing monitoring of groundwater. Reports summarizing the groundwater-related activities (performed as part of the Plant Site 2 Groundwater Management area, also known as GMA 3) are currently submitted to EPA on a semi-annual basis, while the pre-design soil investigations (performed between May 2003 and April 2005) were summarized in a document titled *Pre-Design Investigation Report for Unkamet Brook Area Removal Action* (Pre-Design Report), which was submitted to the EPA in September 2005. Once the Pre-Design Report is approved by the EPA, GE will address remaining soil-related data needs and will then commence Removal Design evaluation activities for the RAA. Toward that end, Section 3 of the PDI Report identified several activities that GE would perform to support future Removal Design/Removal Action (RD/RA) activities, including additional pre-design soil sampling, detailed survey mapping of the RAA, data collection related to the capping of the interior landfill, and several activities related to the re-routing of Unkamet Brook.

As GE has discussed with EPA, there are a number of issues in the conceptual planning and detailed design of the brook re-routing, and several of those issues will need to coordinated with future RD/RA planning related to the adjacent soils, landfill, wetlands area, and remaining portions of the brook. Among these issues are the design and sizing of the channel of the re-routed portion of the brook. To assist in the development of the channel design, GE has determined that it should implement an initial flow monitoring program to further assess current flow conditions within the portion of Unkamet Brook subject to re-routing.

Specifically, GE intends to collect information related to base flow within the brook, as well as the brook's response to seasonal conditions, including rainfall events, snowmelt, and similar factors. Accordingly, GE is proposing to monitor flow within the brook at a location upstream and downstream of the section subject to future re-routing (i.e., that portion of Unkamet Brook located within the former interior landfill). Additional information is presented below.

III. SUMMARY OF MONITORING PROGRAM

The portion of Unkamet Brook subject to re-routing (Figure 1) is largely an open earthen channel which flows in a general north to south direction. The brook enters the Unkamet Brook RAA from the north (flowing beneath Dalton Avenue), flows through the footprint of the former interior landfill, adjacent to the GE Plastics facility, and then through the remainder of the RAA until it discharges into the Housatonic River. In total, approximately 3,600 linear feet of the brook is located within the RAA.

In addition to the flow from the upstream portions of the brook, there are a number of potential point-source and non-point-source flow contributions into or in close proximity to the 600-foot section of the brook subject to re-routing. These include three existing culverts, which intermittently discharge stormwater from areas within the GE Plastics facility to locations in the brook upstream and downstream of the former interior landfill; stormwater surface runoff from areas adjacent to the brook; and possibly flow from the marshy area located to the east of the brook.

The scope of the flow monitoring program therefore includes activities designed to:

- Quantify base flow and seasonal/storm flow conditions into and through the section of the brook subject to re-routing;
- Assess the potential contribution of point and non-point flows to this section of the brook; and
- Determine (based on the initial results) if the scope of the monitoring should be modified to better address the items identified above.

Two locations have been identified for initial flow monitoring activities, as shown on Figure 1. The first is at the concrete box culvert located under Dalton Avenue to the north (the upstream end), while the second location is at a corrugated metal pipe present beneath a railroad spur to the south (the downstream end). These two locations were selected because of their location relative to the required brook re-routing, the presence of physical flow structures (i.e, culvert and piping), and their location within GE-owned property. At each location, GE will install automated monitoring and data collection equipment to measure and record flow measurements on a nearly continuous basis. In total, as further described below, it is expected that the duration of the monitoring program will extend for several months. The program also may be subject to modifications once initiated.

IV. MONITORING PROCEDURES

The flow monitoring equipment selected for this installation is the ISCO 2150 flow module (literature regarding this equipment is provided in Attachment A). This flow module measures both cross sectional flow area and flow velocity passing through a pipe or other physical structure. This equipment also has sufficient battery power and data storage capacity to measure and record readings for an extended (several months) monitoring period. On approximately a two-week basis, the monitoring locations will be visually inspected, electronic data will be downloaded from the data loggers, and the need for maintenance will be assessed.

During installation of the monitoring equipment, and during subsequent data downloads, manual measurements of the water depth and flow velocity will be collected. This information, coupled with a cross sectional survey prepared for each location, will be used to estimate flow and provide a check on the information collected by the automated flow monitoring equipment. If significant differences in flow are observed between the manual flow readings and the instrument readings, additional measurements will be taken and the installed equipment will be checked for proper operation and adjusted if necessary.

V. ANTICIPATED SCHEDULE

Following EPA approval of this proposal, GE will implement the initial flow monitoring program. It is anticipated that this program will be conducted for a period of time sufficient to collect data representative of base flow conditions and conditions within the brook in response to seasonal high-flow events. Accordingly, GE expects that the monitoring program will include several months of monitoring.

Data compiled from the first few months of monitoring will be used to determine if the monitoring program needs to be modified. Potential modifications could include additional monitoring within the brook or at the location of a point-source flow contribution (e.g., pipe outfall), or possibly the elimination/relocation of an existing monitoring location if monitoring at a different location is sufficient to acquire the necessary flow data. In general, GE will evaluate the need for additional flow monitoring locations if flow at the downstream location is more than approximately 50% greater than the flow entering the RAA at Dalton Avenue (i.e., the upstream flow monitoring location).

Data collected from the flow monitors will be summarized in the monthly CD status reports. In addition, modifications to the monitoring program (if any) will be communicated to the EPA and implemented with EPA concurrence. Such modifications would then be documented in the monthly CD status reports. The results of the information obtained from the monitoring program will be incorporated into the design for the Unkamet Brook RAA.

Please contact me at 413-448-5909 with any questions or comments.

Sincerely,

Richard W. Gates/ACC

Richard W. Gates
Remediation Project Manager

Enclosures
V:\GE_Pittsfield_CD_Unkamet_Brook_Area\Reports and Presentations\Flow Monitoring Plan\57662196Ltr.doc

cc: Dean Tagliaferro, EPA
Tim Conway, EPA
John Kilborn, EPA
Holly Inglis, EPA
Rose Howell, EPA*
Linda Palmieri, Weston
K.C. Mitkevicius, USACE
Susan Steenstrup, MDEP (2 copies)
Anna Symington, MDEP*
Jane Rothchild, MDEP*
Thomas Angus, MDEP*
Dale Young, MA EOEA*
Mayor James Ruberto, City of Pittsfield*
Michael Carroll, GE*
Andrew Silfer, GE
Rod McLaren, GE*
James Nuss, BBL
James Bieke, Goodwin Procter LLP
Public Information Repositories
GE Internal Repository

**cover letter only*

Figure

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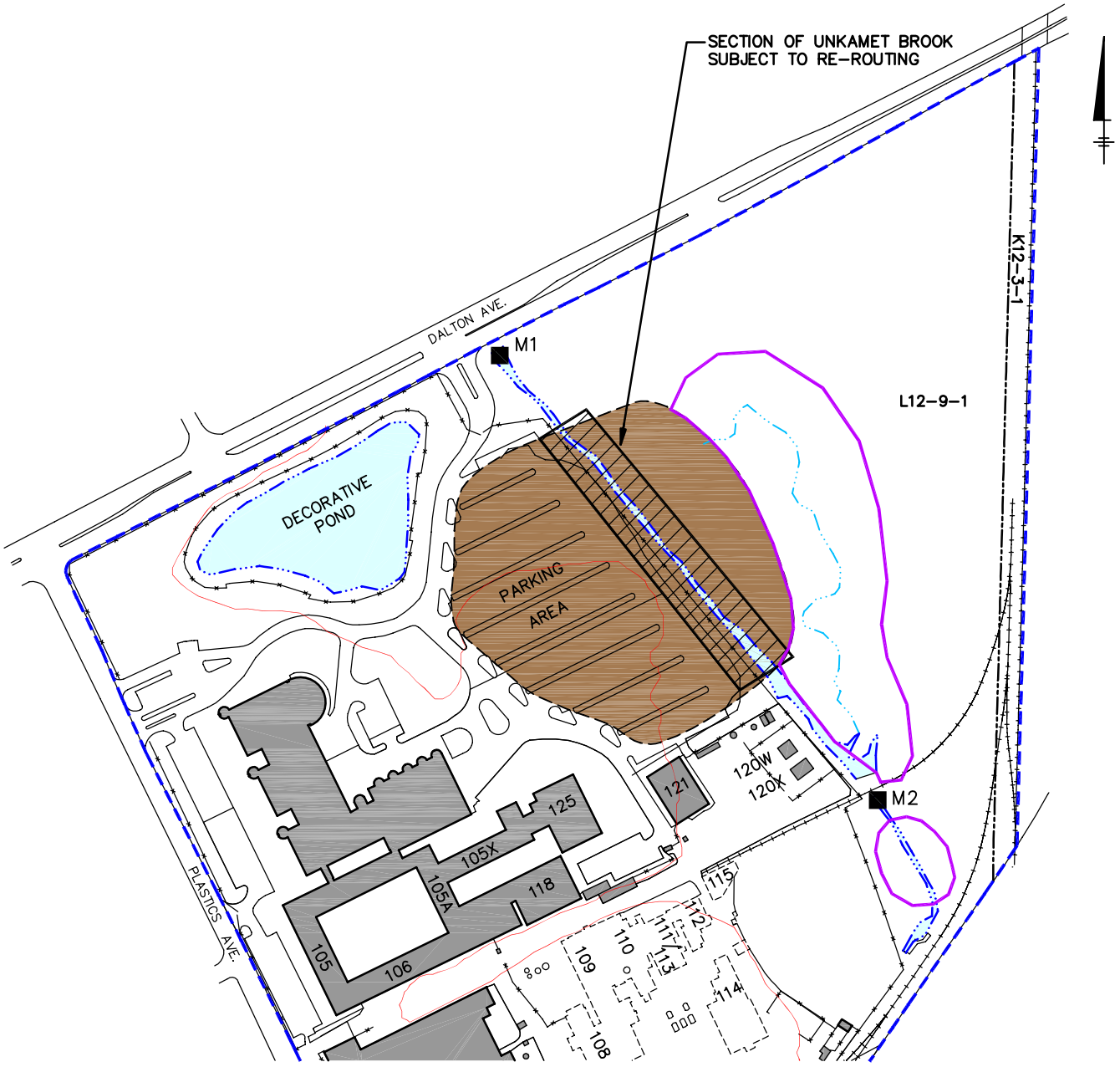
an ARCADIS company



LEGEND:

- APPROXIMATE REMOVAL ACTION AREA BOUNDARY
- FENCE
- PROPERTY LINE
- L12-9-1 PROPERTY IDENTIFICATION
- APPROXIMATE EDGE OF WATER
- INTERMITTENT STREAM
- RAILROAD TRACK
- 100-YEAR FLOODPLAIN BOUNDARY
- APPROXIMATE PALUSTRINE/EMERGENT WETLANDS BOUNDARY
- WATER
- BUILDING
- GE-OWNED FORMER INTERIOR LANDFILL
- M1 PROPOSED MONITORING LOCATION

0 300' 600'

SCALE: 1"=300'

NOTES:

1. THE BASE MAP FEATURES PRESENTED ON THIS FIGURE WERE PHOTOGRAMMETICALLY MAPPED FROM APRIL 1990 AERIAL PHOTOGRAPHS. ADDITIONALLY, CONSTRUCTION PLANS PROVIDED BY GENERAL ELECTRIC COMPANY WERE USED.
2. SITE BOUNDARIES ARE APPROXIMATE.
3. NOT ALL PHYSICAL FEATURES SHOWN.
4. EXTENT OF PAVED/UNPAVED AREAS IS APPROXIMATE.
5. 100-YEAR FLOODPLAIN BOUNDARY IS BASED ON FLOOD ELEVATION PUBLISHED BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY: "FLOOD INSURANCE STUDY – CITY OF PITTSFIELD, MASSACHUSETTS" JANUARY 19, 1987; AND "FLOOD INSURANCE RATE MAP – CITY OF PITTSFIELD, MASSACHUSETTS" (PANELS 250037 0010C AND 25037 0020C), FEBRUARY 19, 1982, AND TWO-FOOT CONTOUR TOPOGRAPHIC MAPPING GENERATED PHOTOGRAMMETRICALLY IN 1990 AT A BASE SCALE OF 1:2,400.
6. TAX ASSESSOR'S PARCEL IDENTIFICATION NUMBERS AND BOUNDARY INFORMATION OBTAINED FROM CITY OF PITTSFIELD'S TAX ASSESSOR'S OFFICE AND IS CURRENT THROUGH JUNE 19, 2002.

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS

PROPOSAL FOR INITIAL UNKAMET BROOK FLOW MONITORING

SITE MAP AND FLOW MONITORING LOCATIONS

BBL an ARCADIS company

FIGURE 1

SYR-85-SDL GMS DMW LAYER: ON=*; OFF=*REF*
G:\GE_ACTIVE\N\40190026\UNKAMET\FLOWPLAN\40190G02.DWG SAVED:11/7/2006 12:11 PM LAYOUT:Layout1 PAGESETUP:---- PENTABLE:PLTFULL.CTB PRINTED:11/7/2006 12:11 PM BY:DWODARCZYK
PROJECTNAME:----
XREFS: IMAGES:
40190X12

Attachment A

Manufacturer's Literature
ISCO 2150 Flow Module

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Isco Product Data

Isco 2150 Area Velocity Flow Module

The 2150 Flow Module uses continuous wave Doppler technology to measure mean velocity. The sensor transmits a continuous ultrasonic wave, then measures the frequency shift of returned echoes reflected by air bubbles or particles in the flow.

The 2150's "smart" area velocity probe is built on digital electronics, so the analog level is digitized in the sensor itself to overcome electromagnetic interference. The probe is also factory-calibrated for 10-foot (3 meter) span at different temperatures. This built-in calibration eliminates drift in the level signal, providing long-term level stability that reduces recalibration frequency and completely eliminates span recalibration.

In field use, the 2150 is typically powered either by two alkaline, or Isco Rechargeable Lead-acid batteries, within a 2191 Battery Module. Highly efficient power management extends battery life up to 15 months at 15-minute data storage intervals. Other power options (including solar) are available.

Applications

- Portable and permanent-site AV flow monitoring for inflow and infiltration, capacity assessment, sewer overflow, and other sewer studies.
- Measuring shallow flows in small pipes. Our low-profile area velocity sensor minimizes flow stream obstruction and senses velocity in flows down to 1 inch (25 mm) in depth.

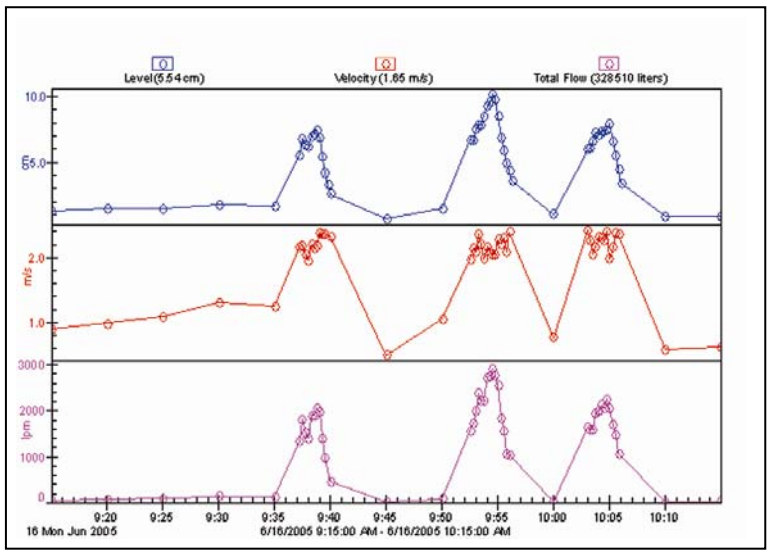
Standard Features

- Rugged, submersible enclosure meets NEMA 4X, 6P (IP68) environmental specs.
- Chemically resistant epoxy-encapsulated sensor withstands abuse, resists oil and grease fouling, and eliminates the need for frequent cleaning.
- Replaceable high-capacity internal desiccant cartridge and hydrophobic filter protect sensor reference from water entry and internal moisture.
- Pressure transducer vent system automatically compensates for atmospheric pressure changes to maintain accuracy.
- The quick-connect sensor can be easily removed and interchanged in the field without requiring recalibration.
- Up to four 2100 Series flow modules can be networked by stacking and/or extension cables.

Above left: Additional modules can be added for redundant or multi-stream measuring (Isco 2110 Ultrasonic Module shown). Right: Optional mounting rings provide quick, secure sensor installation in round pipes from 6 to 80 inches (150 to 2000 mm).

Software Features

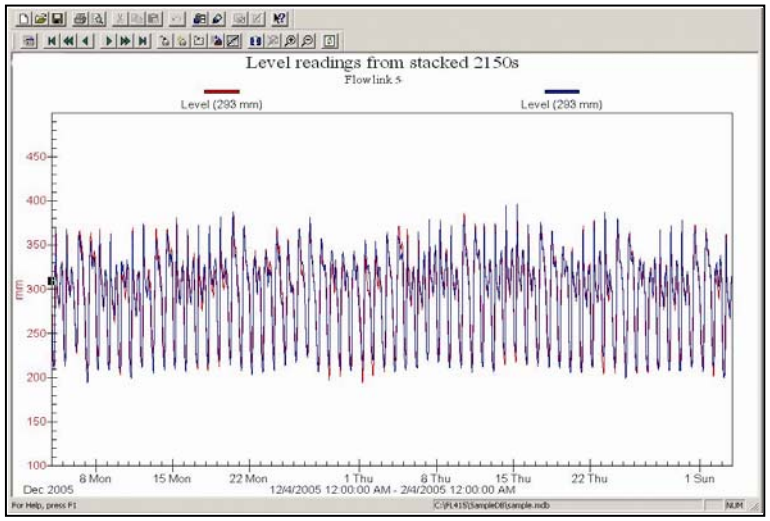
- Secure data storage. All data are continuously stored in flash memory to protect against loss in case of power failure
- Easy to upgrade. New operating software can be downloaded into non-volatile flash memory, without affecting stored program and data.
- Records and stores input voltage and temperature data.
- Variable rate data storage lets you change the data storage interval when programmed conditions occur. This feature assures maximum information about an exceptional event – such as an overflow – while conserving power and data capacity during normal conditions.
- 38,400 bps communication provides speedy setup and data retrieval.



Variable rate data storage

The 2150 flow module has the ability to automatically switch data storage rates based on varying conditions.

In the example at left, the 5-minute data storage rate automatically changed to 30 seconds when the flow rose above a programmed level.



Level stability

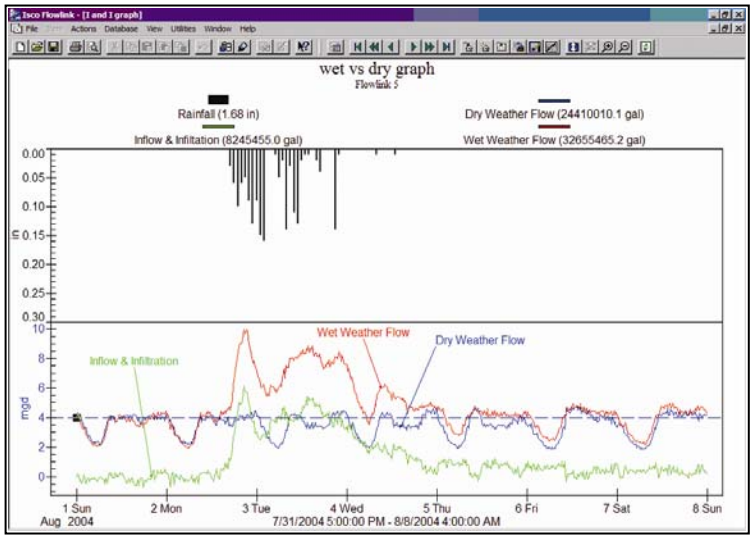
Frequent multipoint level recalibration is a requirement with other area velocity flow meters. Isco's exclusive "smart" sensor design in the area velocity probe yields exceptionally low drift in the level signal.

The 2150's factory-calibrated 3-meter span totally eliminates the need for cumbersome span recalibration in the field.

In the example at left, two area velocity probes were installed at the same site. The level readings from both sensors track closely without any drift, over an 8-week period.

Flowlink® Data Analysis

Isco Flowlink® Software is a powerful tool for analyzing flow and water quality data. It provides site setup, data retrieval, and comprehensive data analysis, as well as advanced reporting and graphing. See separate datasheets for details on Flowlink and Flowlink Pro software.



The Flowlink screen shown above gives a comparison of dry and wet weather flows, plus rainfall typical of an inflow & infiltration study

Information Delivery

Isco 2100 Series Flow Modules offer a wide variety of communication and retrieval options, to minimize the need for expensive on-site visits and confined space entry. These include:

Isco 2103 Land-line Modem Module
Reliable two-way dial-up communication between down-hole 2100 Flow Modules and your desktop computer, equipped with Isco Flowlink Software. A dial-out feature enables the system to transmit a text message alarm to your digital cell phone or pager.

Isco 2103c Cellular Modem Module
All the features of the 2103 Modem with the convenience of cell phone access. And the 2103c can automatically send data via the Internet to a designated server running Flowlink Pro software, using economical 1xRTT packet-switched data transmission.

Isco 2108 Analog Output Module
Provides current outputs for use with Isco 2100 Series Area Velocity and Ultrasonic Flow Modules. It allows easy interface with SCADA/DCS or other secondary instrument systems.

Modbus
2100 Series Flow Modules provide digital RS 232 Modbus output that can be used to interface with external communication modules, SCADA systems, or other devices.

On-site Data Retrieval

Isco Flowlink Software
Download and process data on-site. Enjoy unmatched data management capability, advanced data editing and analysis, powerful reporting and presentation choices, and a variety of downloading and data handling options.

Isco 2101 Field Wizard
A durable, weatherproof module for on-site data retrieval. Don't risk damage to your fragile notebook PC. The 2101 Field Wizard provides on-site display of current readings, information about stored data, diagnostics, and more.

Interrogate all 2100 Series Flow Modules in the stack at one time, and store more than 14 days' data from up to 20 modules!

Isco 2102 Communication Module
Connect with your Isco 2100 Series Flow Modules from the safety and convenience of your vehicle.

Digital spread-spectrum radio signals enable "drive-up" data retrieval, system configuration, and level calibration, with minimum power consumption. "Plug and Play" setup – no interfacing needed.

Specifications

2150 Flow Module	
Size (HxWxD):	2.9 x 11.3 x 7.5 in (74 x 287 x 191 mm)
Weight:	2.0 lb (0.9 kg)
Materials of construction:	High-impact polystyrene, stainless steel
Enclosure (self-certified):	NEMA 4X, 6P (IP68)
Temperature Range:	-40° to 140° F (-40° to 60° C) operating and storage
Power Required:	12 VDC nominal (7.0 to 16.6 VDC), 100 mA typical, 1 mA standby
Power Source:	Typically, an Isco 2191 Battery Module, containing 2 alkaline or 2 rechargeable lead-acid batteries. (Other power options are available; ask for details.)
Typical Battery Life:	Using 15-minute data storage interval Energizer® Model 529 alkaline - 15 months Isco rechargeable lead-acid - 2.5 months
Program Memory:	Non-volatile programmable flash; can be updated using PC without opening enclosure; retains user program after updating.
Built-in Conversions	
Flow Rate Conversions:	Up to 2 independent level-to-area conversions and/or level-to-flow rate conversions.
Level-to-Area Conversions:	Channel Shapes - round, U-shaped, rectangular, trapezoidal, elliptical, with silt correction; Data Points - Up to 50 level-area points.
Level-to-Flow Conversions:	Most common weirs and flumes; Manning Formula; Data Points (up to 50 level-flow points); 2-term polynomial equation
Total Flow Calculations:	Up to 2 independent, net, positive or negative, based on either flow rate conversion
Data Handling and Communications	
Data Storage:	Non-volatile flash; retains stored data during program updates. Capacity 395,000 bytes (up to 79,000 readings, equal to over 270 days of level and velocity readings at 15-minute intervals, plus total flow and input voltage readings at 24-hour intervals)
Data Types:	Level, velocity, flow rate 1, flow rate 2, total flow 1, total flow 2, input voltage, temperature
Storage Mode:	Rollover; 5 bytes per reading.
Storage Interval:	15 or 30 seconds; 1, 2, 5, 15, or 30 minutes; or 1, 2, 4, 12, or 24 hours Storage rate variable based on level, velocity, flow rate, total flow, or input voltage
Data Retrieval:	Serial connection to PC or optional 2101 Field Wizard module; optional modules for spread spectrum radio; land-line or cellular modem; 1xRTT. Modbus and 4-20 mA analog available.
Software:	Isco Flowlink for setup, data retrieval, editing, analysis, and reporting
Multi-module networking:	Up to four 2100 Series Flow Modules, stacked and/or remotely connected. Max distance between modules 3300 ft (1000 m).
Serial Communication Speed:	38,400 bps

2150 Area Velocity Sensor	
Size (HxWxD):	0.75 x 1.3 x 6.0 in (19 x 33 x 152 mm)
Cable (Length x Diameter):	25 ft x 0.37 in (7.6 m x 9 mm) standard. Custom lengths available on request.
Weight (including cable):	2.2 lbs (1 kg)
Materials of construction:	Sensor - Epoxy, chlorinated polyvinyl chloride (CPVC), stainless steel Cable - Polyvinyl chloride (PVC), chlorinated polyvinyl chloride (CPVC)
Operating Temperature:	32° to 140° F (0° to 60° C)
Level Measurement:	Method - Submerged pressure transducer mounted in the flow stream Transducer Type - Differential linear integrated circuit pressure transducer Range (standard) 0.033 to 10 ft (0.010 to 3.05 m); (optional) up to 30 ft (9.15 m). Maximum Allowable Level 34 ft (10.5 m) Accuracy ±0.01 ft from 0.033 to 10 ft, (±0.003 m from 0.01 to 3.05 m,) Long-Term Stability ±0.023 ft/yr (±0.007 m/yr) Compensated Range 32° to 122°F (0° to 50°C)
Velocity Measurement:	Method - Doppler ultrasonic, frequency 500 kHz Typical Minimum Depth 0.08 ft (25 mm) Range -5 to +20 ft/s (-1.5 to +6.1 m/s) Accuracy (in water with uniform velocity profile, speed of sound = 4850 ft/s, for indicated velocity range) ±0.1 ft/s from -5 to 5 ft/s (±0.03 m/s from -1.5 to +1.5 m/s) ±2% of reading from 5 to 20 ft/s (1.5 to 6.1 m/s)
Temperature Measurement:	Accuracy ±3.6° F (±2° C)

2191 Battery Module	
Size (HxWxD):	6.0 x 9.6 x 7.6 in (152 x 244 x 193 mm)
Weight (without batteries):	3.2 lb (1.4 kg)
Materials of construction:	High-impact polystyrene, stainless steel
Enclosure (self certified):	NEMA 4X, 6P, (IP68)
Batteries:	Two 6-volt Energizer Model 529* alkaline (25 Ahrs capacity) or Isco Rechargeable Lead-acid (5 Ahrs capacity) recommended. *Note – Energizer 529 ER does not give specified life.

2150 Ordering Information

Contact your Teledyne Isco representative for complete ordering details and information on other 2100 Series Modules.

Description	Part No.
2150 with AV sensor, 2191 Battery Module, and Handle	68-2050-002
2150 Module with AV sensor (only)	68-2050-001
Isco Flowlink® 5 Software	68-2540-200
Energizer® Model 529 Alkaline Lantern Battery (2 required)	340-2006-02
Isco Rechargeable Lead-acid Battery (2 required)	60-2004-041
Charger for Lead-acid Batteries (holds 2 batteries)	60-2004-040

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