User Guide: ComLog2 IS / ISLog (logger devices).

(Part 1 of 2) Installation and Setup (Using HWM IDT).

Warning:	This manual contains important safety and operating information. Please read, understand, and follow the instructions in the manual and also any safety / approvals or ATEX Safety Supplement documents shipped with the device.

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1 INTRODUCTION

1.1 DOCUMENTATION AND SUPPORT OF PRODUCT

Thank you for choosing a HWM device. We trust it will provide you with many years of service.

The "ComLog2" and "ISLog" devices are general-purpose data loggers that are built and configured to suit specific applications of the device; several versions are available within each logger family. Please contact your sales representative for help with selection of the appropriate model for your application.

This user-guide covers the following model families:

Model Number(s)	Description
HIS/*/*/*/C	ComLog2IS logger (Intrinsically safe model) (e.g. models for Automated Meter Reading / AMR).
HIS/*/*/*/W	ISLog logger (Intrinsically safe model) (e.g. models for use in wastewater applications).
HIS/*/*/*/N	ComLog2IS logger (Intrinsically safe model) (e.g. models re-branded for specific customers).

This user-guide should be read in conjunction with relevant parts of the IDT app user-guide. Refer to the IDT app user-guide for additional or latest information.

This user-guide provides details of the logger operation, how to install and setup the product.

Note: The system periodically has new features and changes released, thus you may observe slight changes in layout from those shown in this manual. Additionally, views can vary depending on what user-role you have been given and its permissions.

HWM provides support of the logger devices by means of our customer support webpages:

https://www.hwmglobal.com/help-and-downloads/

Should you have any questions that are not covered by this manual or the system's online help, please contact the HWM Technical Support team on +44 (0) 1633 489479, or email cservice@hwm-water.com

1.2 SAFETY CONSIDERATIONS

Safety Note:

Before continuing, carefully read and follow the information in the "**Safety Warnings and Approvals Information**" document supplied with the product.
This provides general safety information.

The installer or maintainer must also refer to any other **safety supplement** documents, supplied with the intrinsically safe versions of the product. This will provide additional ATEX-related safety information including port parameters. ("ATEX" refers to use of the product within a potentially explosive atmosphere).

Retain all documents for future reference.

Before using this product, make a risk assessment of the installation site and expected work activity. Installations in a hazardous environment (e.g. ATEX) should be carried out by appropriate technicians with suitable training for that environment. Ensure any tools necessary for installation are suitable for use within the hazardous environment. Ensure suitable protective clothing is worn and working practises are followed during installation and any maintenance. Check with the site owner or supervisor for any additional safety requirements before commencing work.

Within an ATEX environment, only use an Intrinsically Safe model of the logger. Confirm from the model number of the unit and also that the device label has suitable ATEX markings.

Ensure any communications device being used to assist in the install or setup of the logger is also suitable for use in any hazardous environment in which you are working.

The logger can also be used in non-ATEX applications.

1.3 OPERATING TEMPERATURE

Refer to the logger Datasheet or your sales representative for guidance on the storage and operating temperature range of the device. Ensure the unit is within the operating temperature range prior to installation.

2 OVERVIEW AND PREPARATION FOR USE

2.1 LOGGER - DEVICE OVERVIEW

The **ISLog** and **Comlog2 IS** products are similar families of logger devices.

- **Comlog2-IS** - Automated Meter Reading applications.
- **ISLog** - Other applications.

2.2 PREPARING A MOBILE PHONE (OR SIMILAR DEVICE) FOR USE WITH LOGGERS

The logger devices require a user-interface in order to setup and test the unit. This is provided by means of an app which is to be installed onto a mobile phone (or similar device). The mobile phone must have Bluetooth-Low-Energy (BLE) compatibility, GPS and Internet capability.

The HWM IDT app is the required app.

Refer to the IDT app User Guide for details of its installation and general use.
Follow the directions including installing any additional apps that are required.

The installer is required to be familiar with the use of IDT and any other required apps.

2.3 LOGGER OPERATION

The logger is powered by a non-rechargeable Lithium battery. The software is designed to minimise battery use and thereby prolong the expected battery life. However, battery life is also affected by user-programable settings. The user is advised to set the logger to keep tasks and sample frequencies to the minimum requirements of the intended use in order to manage battery power effectively.

Refer to the IDT app user-guide for an introduction to basic, general-purpose, logger operation.

The logger is normally shipped from the factory in an inactive state to preserve the life of the battery. When activated (see section 3.1) , the logger will go into the state of “Recording” and begin repetitive logging of the various sensors fitted to the unit, according to its configuration and settings.

The loggers make repetitive measurements which are saved as datapoints into an area of memory which is referred to as the “primary recording”.

If the logger has the feature enabled, loggers can also be set to occasionally save additional data into a “secondary recording” memory area, (e.g., data sampled at a higher frequency).

Note: This is not available on all supplied units and must be arranged through your sales representative before placing an order; it has implications concerning expected battery life of the unit).

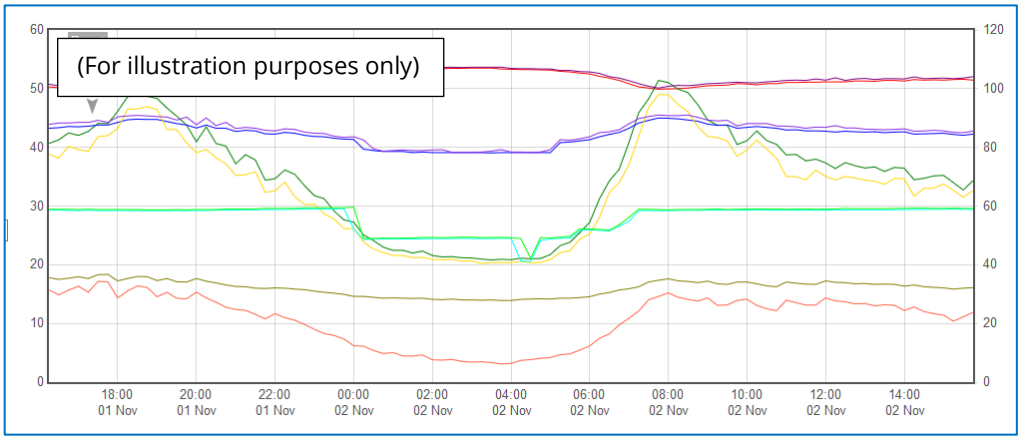
2.4 SERVER INTEGRATION – STORING AND VIEWING DATA

The logger includes an interface (referred to as a modem) that provides access to the internet via the cellular mobile communications network. A SIM card is used to give access of the network.
Measurement data is initially stored within the loggers, until the next call-in time. The data can then be uploaded to the server using an encrypted format. Typically, the server used to receive and store the data will be a HWM DataGate server, although other servers may be used in conjunction with HWM software.

The logger data may be viewed using a viewing portal which has access to the data stored on the server. (Refer to the relevant user guide for details of how it can be used to view the logger data).

2.4.1 DataGate Server / Data viewing portals

When integrated with HWM's DataGate server, the logger's measurement data can be stored centrally and made available to users via a viewing portal (website).



The data can be viewed remotely / graphically by anyone with a suitable user account (and password) using a standard web-browser.

DataGate can also forward any alarms received from the unit to all users that have subscribed to them.

Use of the loggers with the DataGate system can offer security features for certain loggers (see section 2.5).

DataGate can also (by arrangement with your sales representative) be used to export logger data to other servers.

Some administrative setup of the server and the viewing portal is normally required to facilitate storing and presenting logger data correctly. Setup of and use of the DataGate system are not covered by this user guide.

Note: Some loggers have a specific requirement to be used with DataGate in order to meet their security features (if enabled). (see section 2.5).

Depending on the type of sensor used with the logger your data may be alternatively viewed via a dedicated website which is designed to better present data from the sensor. Refer to the sensor user-guide or IDT app user guide to see if this is appropriate or discuss with your HWM representative regarding which viewing portal to use.

2.5 LOGGER SECURITY: SECURE AND UNPROTECTED MODES

The logger has certain security feature options. Refer to the IDT app user-guide for an explanation of each option.

3 Activating the Logger and Communications Link

3.1 Logger activation process (for First-time use)

When shipped from the factory, the unit is deactivated. This mode is designed to preserve its battery life whilst being shipped or in long term storage; this is often called "shipping mode". To use the logger, it must first be *activated*. The process for doing this is the same as required to activate its Bluetooth-compatible communications link. (Refer to section 3.2).

3.2 Communications link for use with IDT

The logger includes a Bluetooth-compatible radio interface, used for short-range communication to a suitable mobile phone. This enables the user to communicate with the logger using the IDT app during installation and on-site test. (No communications cable is required).

The radio interface is short-range, and infrequently needed (it is only required when someone is attending to the logger on-site). The communications circuit is therefore normally on standby.

To temporarily activate the communications, a magnet is required.

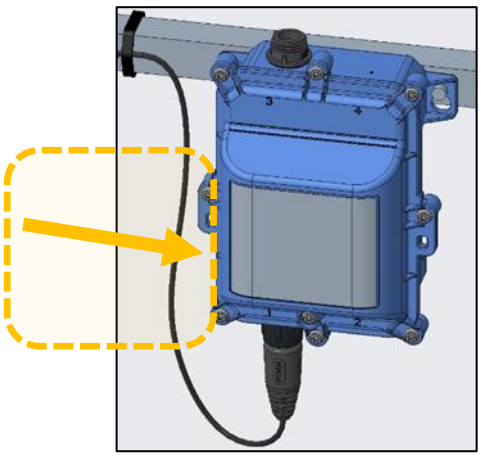
On the side of the logger there is a label showing a magnet symbol. A magnetic field sensor is located under this label.

A strong magnet must be constantly held in front of the label for **12 seconds** to activate the communications link.

Communication remains open for around 120 seconds, but this period is extended if communications is in use; the communication link remains open for 600s after it was last used. The link then goes back into standby.

Note: This action is sometimes referred to as "swiping the logger".

3.3 Access considerations



Whenever choosing a location to mount the logger, ensure there is sufficient space at the side of the unit to access the magnetic sensor.
This will allow the communications link to be activated without the need to remove the logger.

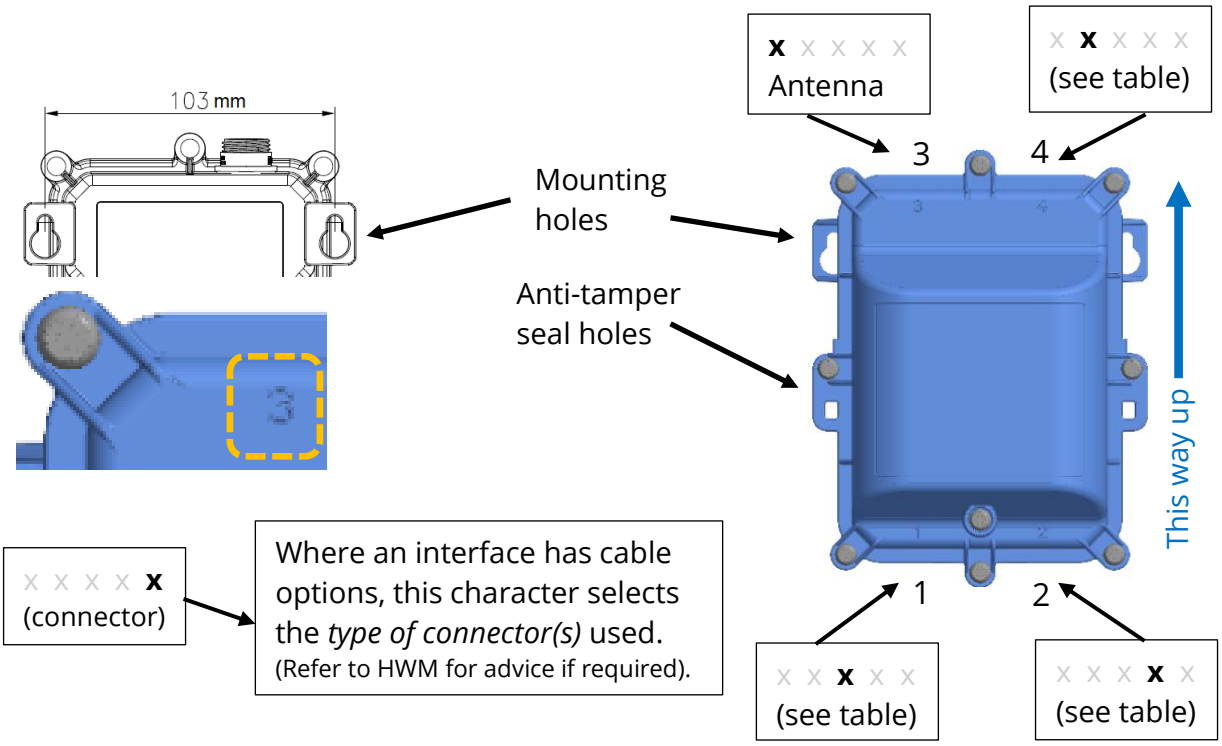
4 INTERFACES AND SENSORS SUPPORTED

The **ISLog** and **Comlog2 IS** families of logger devices share a common plastic case.

Use the key-hole shaped mounting holes to mount the logger. Holes are also provided for applications requiring anti-tamper seals to be applied.

The loggers are of a waterproof construction and waterproof connectors exist for use with certain sensors and the antenna.

The logger is labelled with numbers at each possible location of an electrical interface; The number is etched into the plastic. This is a location identifier, for manufacturing use.



Before connecting the logger to any other equipment, check the correct unit is supplied. When working within an ATEX environment, verify the port-parameters are suitable for interconnection.

Supported sensors and interfaces is model-dependent. The interface type at each location can be determined by inspecting part of the model number.
HIS / **xxxxx** / xx / xxxxxx / x. Refer to the drawing (above) and the key below:

Key to Electrical Interfaces:

0	(not used).	K	Combined: Digital Input and Output.
1, 8, 9	Digital Input x 2. e.g. Flow (Meter pulse collection), or Status Input.		e.g. Pulse collection and replication on the same connector.
		S	SonicSens 3 (ultrasonic distance sensor).
3	HWM EEI Interface. e.g. SpillSens (digital float sensor).	X	HWM GPIO interface. (reserved for future use).
4	Digital outputs x2. e.g. Pulse replication.		

4.1 TAMPER ALARM SUPPORT FOR FLOW SENSOR (METER PULSE DETECTOR)

Tamper alarm is an available setting option for a digital Flow sensor.
IDT provides programming support independent of any cable that is used for the tamper detection circuit. However, not all cable options give adequate protection for tamper-detection. A fundamental requirement is that the meter pulse detection and tamper detection circuits share the same cable; detaching the connector from the meter can then be programmed to cause an alarm.

Feature	Compatible Interface types	Suitable Connector options required to support.
Digital Flow sensor (Single cable with Tamper Alarm option)	1, 8, 9	R (RJ11 plug), B (Binder connector), F (Fischer connector).

- Tamper alarm for the digital Flow sensor must be enabled in IDT. (Refer to IDT user guide).
- The meter must internally interconnect (loop) the two signals used for tamper.

4.2 PULSE REPLICATION SUPPORT FOR FLOW SENSOR (METER PULSE DETECTOR)

Pulse Replication is an available option for use in conjunction with a digital Flow sensor. Pulse replication is used to daisy-chain (connect) equipment together that use the meter-pulses from the meter.

Requirements are that:

- A digital Flow sensor and channel should exist on the logger which is connected to the meter-pulse output of the meter and
- Pulse replication must be output onto a second connector, which must be fitted; meter-pulses are never fed back into the originating equipment.
- Pulse replication setup option must be enabled in IDT. (Refer to IDT user guide).

4.3 LOGGER CHANNEL TYPES AND DATA INTERPRETATION

Refer to the IDT app user guide for an introduction to this topic.
The loggers comply with the description and examples of setup provided therein.

Where required, IDT can be used to check or make any changes to the logger settings.

Note: The logger will usually have settings pre-programmed by the factory prior to shipping. However, the installer has responsibility for confirming the settings are appropriate for use at the installed site.
If you have specific requirements this can be discussed with your HWM sales representative at the time of ordering the loggers.

The Configure Device pages will have considerable variation in content depending on the logger model number and the sensors being installed.
Follow the general guidance within the IDT-app user-guide for most sensors. However, some HWM sensors require specialised setup screens or have their own user-guide which provides further guidance.

5 INSTALLATION

Consider any particular safety requirements of the installation (e.g., ATEX).

5.1 SUMMARY

- Check the logger is suitable for use and that you have the required sensor attachments. Check port-parameters are compatible for a logger being used in an ATEX environment.
- Activate the logger communications and select the logger device using IDT.
- Use IDT to:
    - Program a local time-zone into the logger.
    - Check / modify the communications settings of device, as required:
      Call-in settings,
      Data Destination settings,
      SIM settings (network access),
      Modem settings (Network technology).
    - Check / modify the timing parameters for making measurement samples.
    - Check / modify channel settings for producing datapoints.
      Where required, undertake any additional operations required for setup of the channel (e.g. add an initial meter reading, pulse replication setting, sensor calibration; these will be dependent on sensor and use).
    - Set any Trigger-Actions required for each channel.
    - Test the logger sensors are functioning correctly.
      (Some can be done pre-installation; others post installation).
- Install the logger and sensors.
  Refer to the orientation shown in the diagram in section 4. The logger should be installed as shown for optimum battery performance.
  Determine the location and cable / hose routing prior to commencing work.
  Install anti-tamper seals to the device after installation (if required).
- Install the antenna.
  Choose suitable location options for the antenna and test in each location until the optimal position is found.
  Test using signal test and call test with any access door / chamber lid open initially and then closed.
- (If required) transfer details of the logger to the Deployment app.
  (The HWM Deployment app is then used to complete the task of selecting the site of deployment and update of the DataGate system).

5.2 INSTALLING THE LOGGER

The logger must be mounted in a suitable location where the sensors attached to it can reach their intended installation points. The cables should be routed without causing any hazards. Position loggers, sensors, and antenna away from sources of electrical interference such and motors or pumps.

Refer to section 3.3 regarding access considerations for activating on-site communications.

Use the keyhole mounting holes to fix the logger in position. Anti-tamper seals can be used if required to bear witness if anyone has interfered with the installation by disassembling the logger. (See diagram in section 4)

Ensure the antenna can be mounted in a suitable location where the radio signal will be of sufficient strength to call into the cellular network.

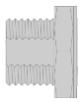
Note: Certain sensors have their own instructions regarding installation requirements and their configuration using IDT.
Follow the additional guidance where available.

5.3 INSTALLING THE ANTENNA AND TESTING CELLULAR COMMUNICATIONS

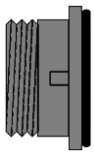
Only use HWM-provided antenna for use with your logger, to ensure the radio interface meets approvals requirements (safety, etc).

The logger family has several antenna connector options:

- Internal Antenna (no antenna connector fitted).
- Antenna (plastic connector shell).
- Antenna (metal “FME” connector).



FME



Plastic

An antenna with the appropriate connector should be selected and attached, tightening finger-tight only. No sharp bends should exist in the cable routing of the antenna.
If possible, avoid locations where the antenna could be adversely affected (e.g., by an occasional flood condition).

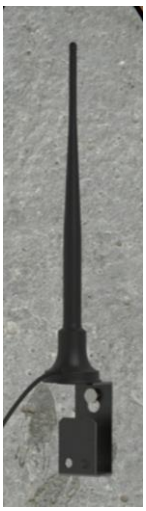
The IDT app should be used to check that the logger can connect to the cellular network and that the antenna is in the optimal position for the site.

- Choose a suitable antenna for the installation and decide on its initial position.
- Perform the “Signal Test” to confirm the logger connects to the mobile network and find the best location of the antenna.
- Perform a “Call Test” to confirm the logger can communicate with the DataGate server.

(Details of use of IDT for making these tests are provided in the IDT app user-guide).

Trouble-shoot a call-test failure if required, following the advice in the IDT app user-guide (MAN-2000-0001). Further information is given in the HWM Antenna Installation Guide (MAN-072-0001), and on the webpage shown below.

Monopole Antenna



For most installations, a monopole antenna will give acceptable performance.
Installation Considerations:

- The antenna has a magnetic base to be used for mounting.
- For optimum performance, the antenna requires a "ground plane" (metal surface). Consider installing a metal bracket made of a ferrous material to attach the magnetic base of the antenna if space allows or signal strength is marginal.
- When installing the antenna in large underground chambers it should be positioned close to the surface.
- Ensure that any chamber lid will not interfere with the antenna or cables when being opened/closed.
- This antenna is vertically polarised, it should always be installed in the vertical orientation.
- Never bend the radiating element of the antenna.
- The antenna can also be attached to an installation bracket mounted to an existing marker post.
- Where an antenna is held in place by magnets, ensure the weight of any cables does not excessively load the magnet so as to detach it from the installed location.
- Do not allow any equipment to rest on the antenna connector as crush damage to the connector or antenna cable can result.

For other antenna options and guidelines, refer to the documents available on the HWM support webpage: https://www.hwmglobal.com/antennas-support/

6 VIEWING YOUR DATA

The data of the connected logger can also be viewed graphically by using the IDT app to make a temporary copy of the data stored within the logger.
Refer to the IDT app user-guide for instructions on how to do this.

The logger usually calls into a server, where the data can be stored for the entire deployment period to a site (see also section 2.4). Site data is best viewed with the viewing tool linked to this data-store. For certain applications, the viewing tool can display the status of multiple deployed devices simultaneously (e.g. a representation of the status of each site a map). Refer to the appropriate manual or instructions for your viewing tool for guidance.

IDT is not designed to support such fleet-wide views of data.

7 TROUBLESHOOTING

The IDT app, the logger, the user and sometimes the server interact with each other. Any issues should consider all four parts of the system.

Refer to the IDT app user-guide for advice on various problems which can occur with use of the logger.

8 MAINTENANCE, SERVICE AND REPAIR

Unauthorised servicing will void the warranty and any potential liability for HWM-Water Ltd.

8.1 REPLACEABLE PARTS

Antenna

- Only use antenna recommended and provided by HWM.

For details of antenna options and part-numbers to order, refer to the following link: https://www.hwmglobal.com/antennas-support/

Batteries

- Only use batteries and parts recommended and provided by HWM.
- Batteries are only replaceable by a HWM approved service centre or relevantly trained technician. Contact your HWM representative for more details if required. A battery swap must be accompanied by a reset of power-use counters for the logger to perform normally.

SIM-card

- SIM-cards are replaceable by a HWM approved service centre or relevantly trained technician.
- Only use consumable parts recommended and provided by HWM.

8.2 RETURN OF PRODUCT FOR SERVICE OR REPAIR:

When returning product for investigation or repair, be sure to follow the instructions of your distributor to document why the product is being returned.

If returning to HWM, this can be done by completing the on-line RMA form: https://www.hwmglobal.com/hwm-rma/

Prior to shipping, put the equipment into Shipping mode (refer to the IDT app user-guide for instructions). Refer to the Safety Warnings and Approvals Information for guidelines of the packing requirements.

If soiled, ensure the unit is cleaned with a mild cleaning solution and soft brush, disinfected, and dried prior to shipment.
Any cleaning must be done outside of an ATEX environment.

9 CONNECTOR INFORMATION

The logger is available with many connection options. Discuss your specific needs with your HWM representative to confirm availability. This section provides additional information for connection options that are widely used.

Warning: This equipment must be installed by a person who is competent to make any required electrical connections in a manner suitable for the installation site. Care must be taken where the site has a requirement for ATEX or other Intrinsically Safe standards to be met.

9.1 FLOW INTERFACE (DIGITAL - PULSE COLLECTION).

Note: Where fitted, these 2 signal inputs can be used for flow (pulse collection), flow with tamper detection, or general digital inputs.
(To select, choose the appropriate channel type and settings).

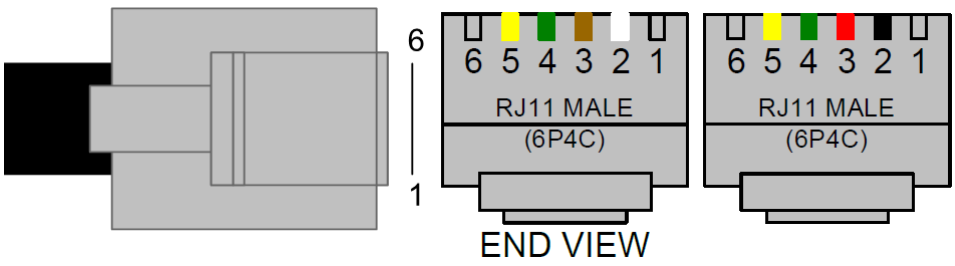
Interface (Cable with bare wire ends)
Code: / description:
1T Flow (Bi-directional). (2 signals combine to give 1 channel).
8T Flow (Uni-directional). (2 channels)

Pinout: (wires)

Blue = Flow1 (Input)
Yellow = Flow2 (Input) / Tamper (+)
Green = GND / Tamper (-)

Interface (Cable with RJ11 plug)
Code: / description:
1R Flow (Bi-directional). (2 signals combine to give 1 channel).
8R Flow (Uni- directional). (2 channels)

(Alternative wire colours used).



Pinout: (RJ11 plug)	Colours			
5 = Flow2 (Input)	/ Tamper (+)	Yellow	Yellow	
4 = Flow1 (Input)		Green	Green	
3 = Flow1 GND		Brown	Red	
2 = Flow2 GND	/ Tamper (-)	White	Black	

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