| | |
|---|---|
| **WinFrog Device Group:** | **ROV** |
| **Device Name/Model:** | **INNOSPIDER** |
| **Device Manufacturer:** | **Innovatum International Ltd.**<br>Units 11/12, Woodside Business Park<br>Thetford Road, Ingham<br>Bury St Edmunds<br>Suffolk IP31 1NR, United Kingdom<br>Phone: +44 (0)1284 729123<br>Fax: +44 (0)1284 729133<br>email: info@innovatum.co.uk<br>Web site: www.innovatum.co.uk<br><br>**Innovatum, Inc.**<br>2020 Southwest Freeway, Suite 203<br>Houston, Texas 77098<br>Tel: +1 (713) 526-6333; Fax: +1(713) 526-2555<br>email: innovatum@argolink.net<br>Web site: www.innovatum.net |
| **Device Data String(s) Output to WinFrog:** | Day, Month, Year, Hour, Minutes, Seconds, Relative Heading, Mode, Solution, Signal Strength, Horiz. Video Overlay, Depth Video Overlay, **Source Type** (not shown in I/O Devices/Decoded Data), Horiz. Displacement, Horiz. Displacement Error, Vertical Displacement, Vertical Displacement Error, Burial Depth, Magnetic/Current, Altitude, Rear Solution, Rear X, Rear Z.<br>See Configuration Details for complete information. |
| **WinFrog Data String(s) Output to Device:** | Nil |
| **WinFrog .raw Data Record Type(s):** | Type 491 |

**DEVICE DESCRIPTION:**

Innovatum, Inc. manufactures various pipeline and cable detection systems. These systems can be fitted to ROV's, manned submersibles, towed sleds, ploughs and even surface vessels (for shallow water work).

Of particular note to WinFrog users are Innovatum's Ultra and Multi systems. These are magnetic cable and pipeline tracking systems capable of Passive Magnetic, Active AC (tone), Active DC and Pulse Induction tracking modes, with simultaneous calculation in the first mode and signal monitoring in the others.

There are numerous variations of the Ultra system. The systems can have AC sensors, DC sensors, gradiometers or pulse induction coils installed on the front, or on the front and rear of the vehicle. The simplest system is the Ultra/Multi #02, which has two

forward sensors and can only be used for AC tone cable tracking. One of the more complex systems is the Ultra II, which has 4-axis pulse induction coils installed at both the front and rear of a vehicle. This system can track pipelines or cables using all four tracking modes. Use of the more complex system installations provides more accurate 3D-target positions.

WinFrog's INNOSPIDER driver was specifically written to utilize data from a specific Innovatum system installed on the cable ship "Sea Spider", where the ROV has sensors on the front and rear of the vehicle. The data string on this particular Innovatum system is unique to this installation. Compare the output of the Innovatum system you wish to use with the data listed in the Configuration Details section of this document. If the outputs are similar, then the device will communicate with WinFrog using the INNOSPIDER driver. If the data strings differ, compare the data string to that of the INNOVATUM device. See the INNOVATUM device documentation.

**DEVICE CONFIGURATION INSTRUCTIONS (suggested):**

Baud Rate: 9600
Data Bits: 8
Stop Bits: 1
Parity : None

**WINFROG I/O DEVICES > CONFIG OPTIONS:**

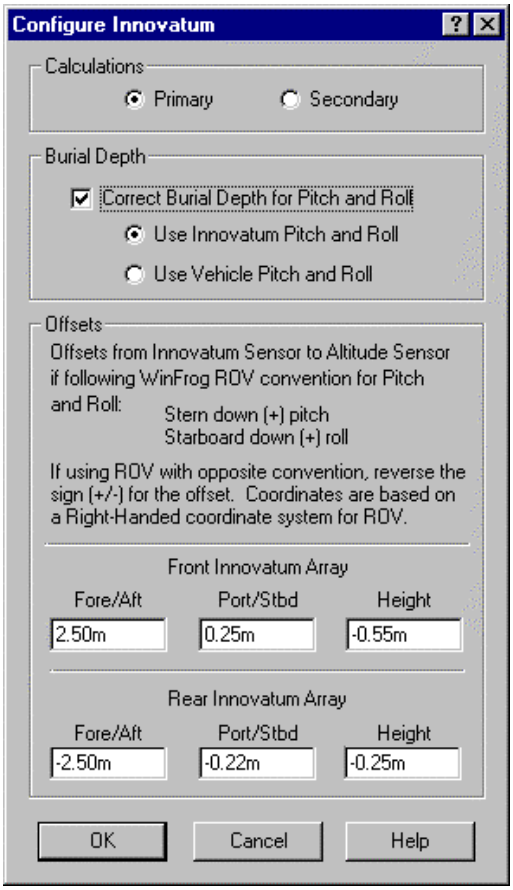
The INNOSPIDER device is added to WinFrog from the ROV device category. Adding an INNOSPIDER device to WinFrog creates an INNODATA data item, as seen in I/O Devices window below.

Refer to the CONFIGURATION DETAILS section for more information on the data string from this device.

No configuration is available or required at the “generic” I/O Device window level.

**WINFROG VEHICLE TEXT WINDOW > CONFIGURE VEHICLE DEVICES > DEVICE > EDIT OPTIONS:**

The INNODATA data item must be added to the vehicle’s device list to enable recording of raw cable and/or pipeline tracking information. Once the INNODATA data item is added to a vehicle’s device list, it must be edited to suit the application. Highlight the **ROV,INNOSPIDER,INNODATA** device in the vehicle’s Devices window and click the Edit button. The **Configure Innovatum** dialog box appears as seen below.




**Calculations:**

Select the **Primary** radio button to enable the display of Burial Depth data in the Vehicle Text window, and to record sensor data in the type 491 raw data record (when raw data recording is enabled). If **Secondary** is selected, the Burial Depth data will only be available in the raw data record or for display in a calculation window.

**Burial Depth:**
The raw Burial Depth data observations can be corrected for sensor pitch and roll. This correction requires an additional Attitude sensor to be installed on the appropriate vehicle. Some Innovatum devices output Pitch and Roll data - the INNOSPIDER device however is **not** one of them. Therefore, the radio button associated with **Use Innovatum Pitch and Roll** should not be selected.
If an attitude device is attached to the vehicle, select the **Correct Burial Depth for Pitch and Roll** checkbox, then select the **Use Vehicle Pitch and Roll** radio button. If there is no attitude device available then you should ensure that this option is not enabled. Both raw and corrected burial depths will be recorded in the type 491 raw data record (if raw data recording is enabled). Refer to the CONFIGURATION DETAILS section for details on the contents of the type 491 raw data record.

**Front /Rear Innovatum Array Offsets:**
These fields allow you to enter Fore/Aft, Port/Stbd and Height offsets to correctly reference the Innovatum sensors to the vehicle's Altitude Sensor. This corrects burial depth data to reference the seabed as opposed to simply the depth below the sensor.

Enter X, Y, Z offsets as measured from the Innovatum Sensor to the Altitude Sensor for both the Front and Rear Arrays. Note the sign conventions used for offset entries, as detailed in the Configure Innovatum dialog box.

**CONFIGURATION DETAILS:**
Refer to system and vessel documentation for information on the installation and interfacing of this device. System performance specifications can be found on the Innovatum web site listed at the beginning of this document.

Listed below is the character string output from this device.

**Character String – 80 characters:**

| Character | Description |
|---|---|
| 1 | Space |
| 2 | Space |
| 3 | } Day of month (1 to 31) |
| 4 | } |
| 5 | } Space |
| 6 | }} Month of year (first three letters) |
| 7 | }} |
| 8 | }} |
| 9 | }} |
| 10 | } Year (all four digits) |
| 11 | } |
| 12 | } |
| 13 | } |
| 14 | }}Hour of day |
| 15 | }} |
| 16 | : |
| 17 | }Minutes of hour (0 to 59) |
| 18 | } |
| 19 | : |
| 20 | }} Seconds of minute (0 to 59) |
| 21 | }} |
| 22 | }Relative heading (+ or -) in degrees |
| 23 | }<equals Vehicle heading minus Target heading> |
| 24 | } |
| 25 | }} Mode 1=Passive, 2=Active DC, 3=Active AC, 4=Active AC (grads) |
| 26 | } Solution 0=No Signal, 1=Direction only, 2=Horizontal Displacement only, 3=Horizontal and vertical displacements |
| 27 | }} Signal Strength (logarithmic) & polarity |
| 28 | }} |
| 29 | }} |
| 30 | }} |
| 31 | } Video overlay (per cent horizontal displacement) |
| 32 | } (-99 to +99 equals full left to full right) |
| 33 | } |
| 34 | }} Video overlay (per cent maximum depth) |

| | |
|---|---|
| 35 | }} (0 to 99 equals minimum to maximum) |
| 36 | } Source type 0-Single 1=Complex |
| 37 | }} Target horizontal displacement (in metres) |
| 38 | }} (+ = target to right, - = target to left) |
| 39 | }} |
| 40 | }} |
| 41 | }} |
| 42 | } Probable error in horizontal displacement (in metres) |
| 43 | } |
| 44 | } |
| 45 | } |
| 46 | }} Target vertical displacement (in metres) from Innovatum reference to target |
| 47 | }} center |
| 48 | }} |
| 49 | }} |
| 50 | } Probable error in vertical displacement (in metres) |
| 51 | } |
| 52 | } |
| 53 | } |
| 54 | }} Vertical displacement from skids to top of target (in metres) |
| 55 | }} (this value is only equivalent to "depth of bury" provided that skids are |
| 56 | }} level with seabed) |
| 57 | }} |
| 58 | }} |
| 59 | } In passive mode - total normalized radial magnetization of target. |
| 60 | } In active mode - estimated magnitude of current flowing in target |
| 61 | } In active DC mode, + indicates DC current flowing in same direction as |
| 62 | } vehicle heading |
| 63 | } |
| 64 | } |
| 65 | } Altitude in metres referenced to skids |
| 66 | } |
| 67 (.) | } |
| 68 | } |
| 69 | } |
| 70 | } Rear Solution |
| 71 | } Rear X |
| 72 | } |
| 73 | } |
| 74 | } |
| 75 | } |
| 76 | } Rear Z |
| 77 | } |
| 78 | } |
| 79 | } |
| 80 | } |

**A typical 64-character Data String would be as follows:**

```
"25 MAY 200015:33:27-4 33 3.6 19320.0.320.061.610.22 0.95 0.48"
```

Where:

| | |
|---|---|
| Date = | 25 May 2000 |
| Time = | 15:33:27 |
| Relative Heading = | -4 |
| Mode = | Active AC |
| Solution = | Horizontal & depth calculation |
| Signal Strength = | 3.6 |
| Overlay Horizontal = | 19 |
| Overlay depth = | 32 |
| Source = | Single |
| Horizontal Displacement = | 0.32 metres |
| Horizontal Error = | +/- 0.06 metres |
| Vertical Displacement = | 1.61 metres |
| Vertical Error = | +/- 0.22 metres |
| Skids to top = | 0.95 metres |
| AC Current = | 0.048 amps |

**A typical 80-character Data String would include the above 64- character Data String as well as:**

Beginning after the `0.48` in the above,

```
"12.341xxxxxyyyyy"
```

Where:

| | |
|---|---|
| Altitude = | 12.34 |
| Rear Solution = | 1 |
| Rear X = | xxxxx |
| Rear Z = | yyyyy |