

Appendix H RDI DVS Sensor

Profiler firmware release versions 4.11 and above support the Teledyne RDI Doppler Velocity Sensor (DVS), an optional sensor that measures current velocity. DVS data is recorded in the ACM file (one *ANNNNNNN.DAT* file for each profile). This appendix provides assembly information and firmware settings for using the DVS with the Ice Tethered Profiler (ITP). The 4.11 Release Notes also contain information about ITP and DVS integration.



Figure H-1: ITP with DVS Sensor

The DVS sensor is installed on the ITP in a housing and end cap at the bottom of the profiler. The ITP is shipped with the DVS installed. The battery must be installed and connected, which requires removing the DVS and bottom end cap.

Removing the DVS Sensor

To remove the DVS sensor and bottom end cap, complete the following steps:

1. Lay the ITP on a stable surface.
2. Disconnect the COM/UIM cable (Figure H-2).
3. Using a Hex driver (included in the toolkit), remove the 10-32 SS screws from the DVS sensor head (Figure H-3).

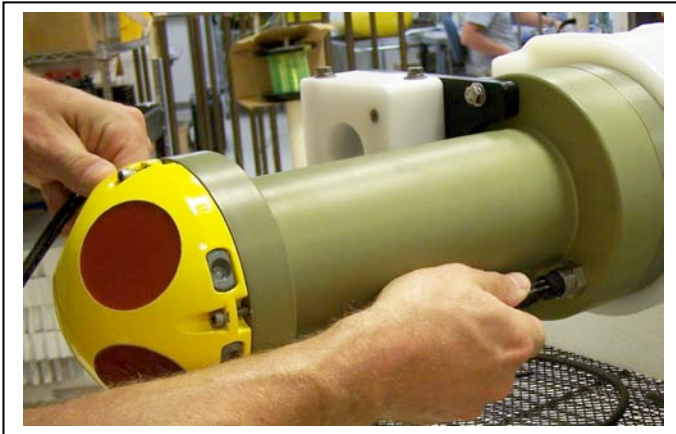


Figure H-2: Disconnecting the COM/ UIM Cable

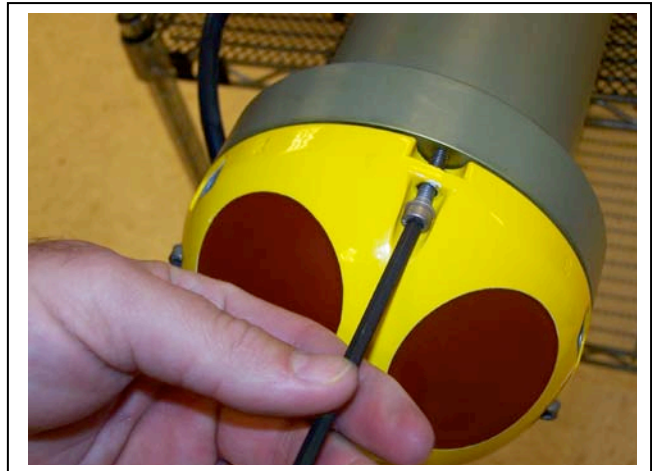


Figure H-3: Removing Screws

4. Using the plastic wedge (included in the toolkit), separate the DVS head from the DVS housing (Figure H-4).
5. Remove the DVS head to expose the DVS electronics and disconnect the sensor (Figure H-5).

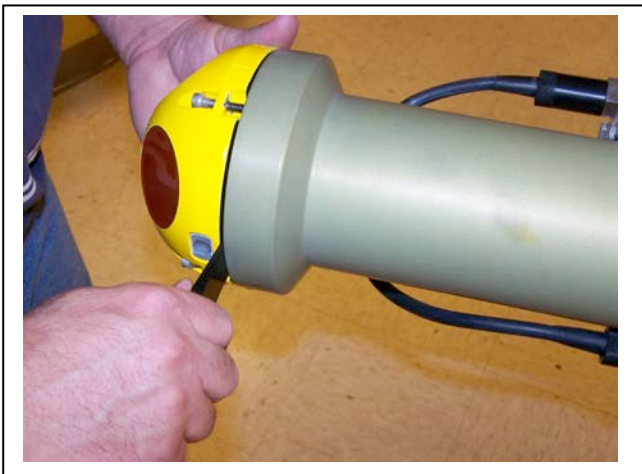


Figure H-4: Removing the DVS Head

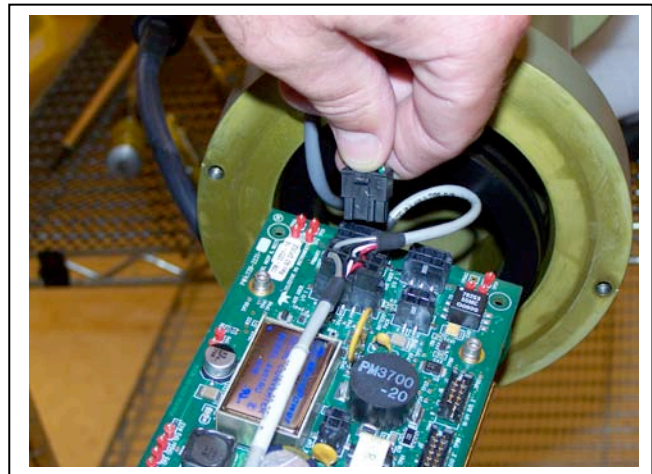


Figure H-5: Disconnecting the DVS Sensor

- Using a T-handle hex driver (included in the toolkit), unscrew and remove the DVS housing connection plate (Figures H-6, H-7 and H8).



Figure H-6: Removing DVS Connection Plate

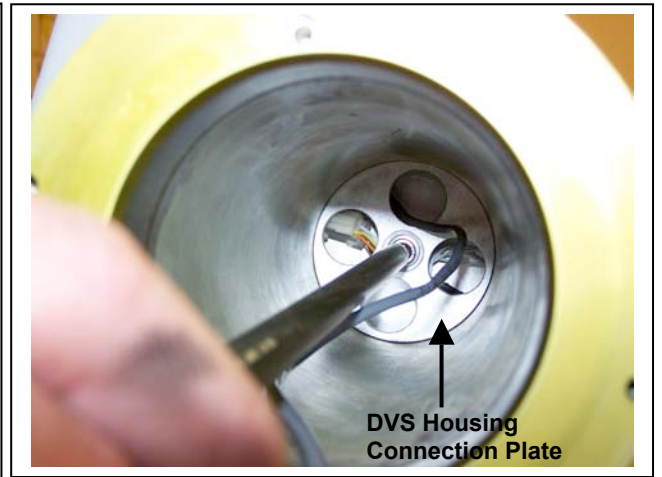


Figure H-7: DVS Connection Plate

When the connection plate is removed, pull off the DVS housing. The battery holder bottom plate, secured with retaining ring will be exposed (Figure H-9).

- Disconnect the COM/UIM connector from the battery holder bottom plate (Figure H-9).

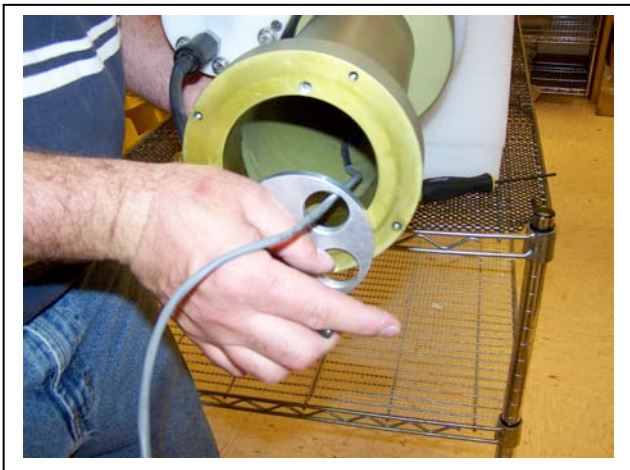


Figure H-8: Removing Connection Plate

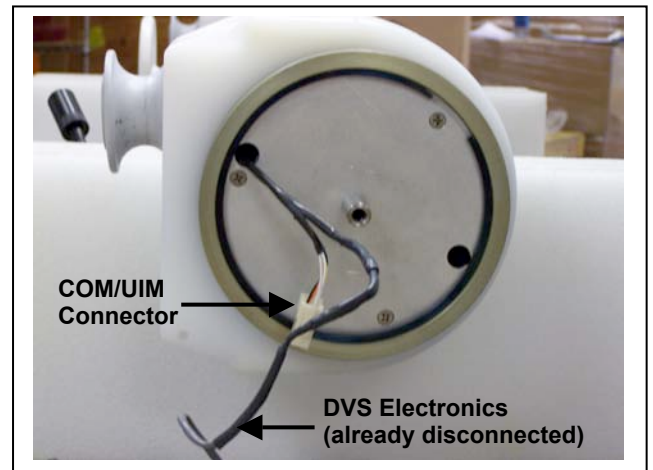


Figure H-9: Battery Holder Bottom Plate

- Follow the steps in Chapter 2 of the ITP User Manual to remove the CTD and top end cap. Once the CTD electronics are disconnected, steps in Chapter 2 illustrate how to remove the battery plate, install and connect the battery.

Connecting and Reinstalling the DVS

To reconnect and reinstall the DVS, complete the following steps:

1. Follow the steps in Chapter 2 of the ITP User Manual to secure the retaining ring on the battery holder bottom plate (Figure H-10).
2. Connect the COM/UIM connector (Figure H-11).

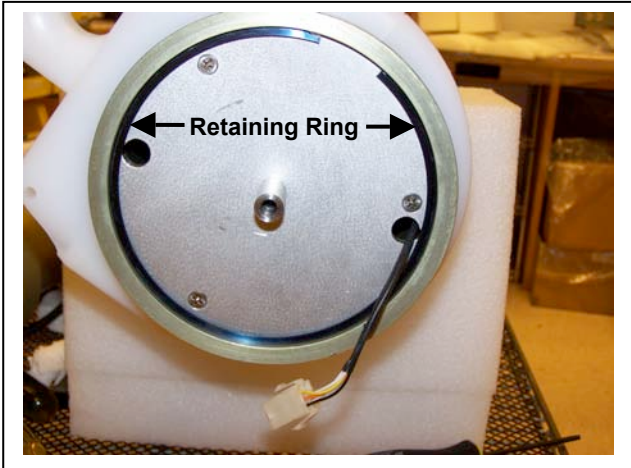


Figure H-10: Securing Retaining Ring



Figure H-11: Reconnecting COM/UIM

3. Feed the DVS connector through the DVS housing (Figure H-12). Before sliding the housing back onto the battery holder bottom plate, inspect the o-ring for cracks or foreign material that could affect the seal. The o-ring must be exceptionally clean to prevent leaks.

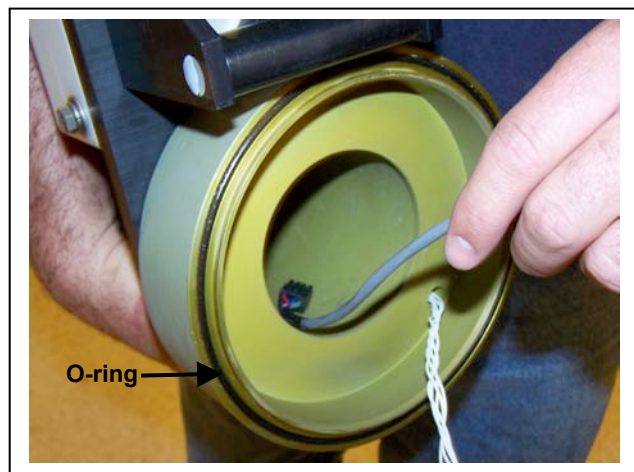


Figure H-12: Re-installing DVS Housing

4. Insert the DVS housing connection plate.

- Using a T-handle hex driver (included in the toolkit), tighten the DVS housing connection plate. Reconnect the DVS Sensor and slide back into the DVS housing (Figures H-13 and H-14).



Figure H-13: Tightening Connection Plate

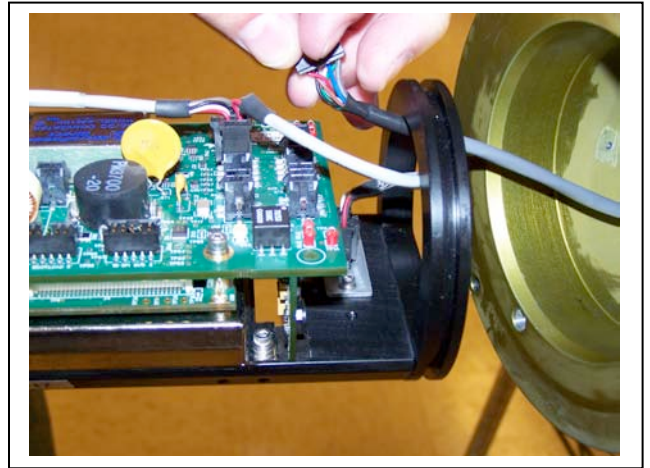


Figure H-14: Reconnecting DVS Sensor

- Reattach the DVS sensor head and tighten the 10-32 SS screws to complete the DVS installation (Figure H-15).
- Reconnect the COM/UIM cable (Figure H-16).



Figure H-15: Reattaching DVS Sensor Head

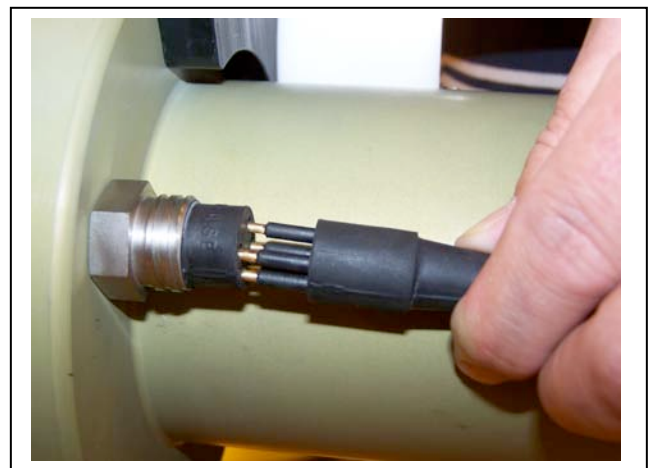


Figure H-16: Reconnecting COM/UIM

Configuring the Firmware to Use the DVS Sensor

The System Configuration menu specifies which sensors are enabled. When the DVS is installed, this option is enabled in the Configuration Menu. To enable a DVS sensor, complete the following steps:

1. From the Main Menu type 'c' and enter the password 'configure'.
2. Select <R> Teledyne RDI DVS and then select 'Y' to enable the sensor.

```
Configuration: MMP_CTD_ACM                      Version 4_11 of Feb  9 2010

-----
                        System Configuration
-----
                        Wed Jan 27 10:23:11 2010

System Parameters:

<E> Nominal Endurance           240 Ah
<I> Inductive Telemetry         Disabled
<T> Acoustic Transponder        Disabled
<C> Inductive Charger Modem     Disabled
<F> File Deletion               Disabled

Sensor Suite:

<1> FSI EM                      CTD           Enabled
<2> SeaBird 41CP                 CTD           Disabled
<3> SeaBird 52MP                 CTD           Disabled
<4> FSI 2D                      ACM           Disabled
<5> Nobska MAVS                 ACM           Disabled
<6> SeaPoint                    Fluorometer   Disabled   (Chlorophyll +)
<7> Wetlabs                     Fluorometer   Disabled
<8> SeaPoint                    Turbidity     Disabled   (IR)
<9> Aanderaa                    Optode        Disabled
<P> BioSpherical                PAR           Disabled
<O> Wetlabs Puck                 Disabled
<V> Satlantic SUNA              Disabled
<R> Teledyne RDI DVS            Enabled

Selection ?
```

Figure H-17: System Configuration Menu with Sensor Selections

3. Select [X] to exit and save the entry.

Communicating with the DVS

Use the Bench Tests menu in the firmware to communicate with the DVS sensor. To display and verify settings, complete the following steps:

1. From the Bench Tests menu, select <5> 'ACM Communication'.

```
Configuration: MMP_CTD_ACM                      Version 4_11 of Feb  9 2010

-----
                          Bench Tests
-----
                          Tue Feb  9 14:40:36 2010

Sensor Utilities:
  <1> CTD Communication          <4> CTD Temperature Record
  <2> CTD Pressure               <5> ACM Communication
  <3> CTD Average Pressure       <6> ACM Tilt and Compass

System Evaluation:
  <7> Motor Operation           <9> Independent Watchdog
  <8> Brake on. Change?

System Options Tests:
  <I> Inductive Telemetry       <F> Chl # Fluorometer
  <P> Acoustic Transponder      <C> CDOM Fluorometer
  <E> Battery Endurance         <T> IR Turbidity
  <S> SIM/UIM Transactions      <U> Power UIM
  <N> Aanderaa Optode           <B> Optode Communication
  <A> Inductive Charger Modem  <Y> Biospherical PAR
  <V> Satlantic SUNA
```

Figure H-18: Bench Tests Menu

The RDI/DVS Bench Test Menu displays as shown in Figure H-19.

```
-----
                          RDI/DVS Bench Test Menu
-----
                          Wed Jan 27 10:31:26 2010

  <1> Direct communications
  <2> Restore McLane parameters
  <3> Restore factory parameters
  <4> Report parameter settings
  <5> Perform a profile test loop
  <M> return to previous Menu

Selection ?
```

Figure H-19: RDI/DVS Bench Test Menu

Selecting <1> from the RDI/DVS Bench Test Menu connects directly with the DVS sensor as shown in Figure H-20.

```
Selection ? 1

Press ^C to terminate session

RDI/DVS communication channels opened..
RDI/DVS powered ON.

DVS

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Firmware Version: 41.16

>cb ?

CB 411 ----- Serial Port Control {baud;parity;stop}
> [^C]
RDI/DVS powered OFF.
RDI/DVS power-down delay .....
RDI/DVS communication channels closed..
```

Figure H-20: Direct Communications with DVS

Option <2> and Option <3> from the RDI/DVS Bench Test menu provide a way to restore the McLane or Teledyne RDI factory settings on the DVS.

Figure H-21 shows an example of resetting the McLane-defined parameters. Using option <2> requires typing the password ‘McLane’.

IMPORTANT
The profiler firmware requires the DVS parameters configured by McLane. Changing these settings, including resetting to the factory settings will prevent the DVS from working correctly with the profiler.

Restoring McLane parameters provides a way to configure a new DVS to work with the profiler firmware.

```
Selection ? 2 Password: mclane

RDI/DVS communication channels opened..
RDI/DVS powered ON.
RDI/DVS waiting for sign-on message . . . . .
RDI/DVS sending [CR1] command . . . . .
RDI/DVS sending [CA 0] command . .
RDI/DVS sending [CF 11100] command . .
RDI/DVS sending [CT 0] command . .
RDI/DVS sending [EA 00000] command . .
RDI/DVS sending [EB 00000] command . .
RDI/DVS sending [EC 1500] command . .
RDI/DVS sending [ED 00100] command . .
RDI/DVS sending [ES 35] command . .
RDI/DVS sending [EX 01111] command . .
RDI/DVS sending [EZ 1022201] command . .
RDI/DVS sending [TE 00:00:04.00] command . . .
RDI/DVS sending [TP 00:00.00] command . . .
RDI/DVS sending [WF 030] command . .
RDI/DVS sending [WN 4] command . .
RDI/DVS sending [WP 001] command . .
RDI/DVS sending [WS 050] command . .
RDI/DVS sending [CK] command . . . . .
RDI/DVS was able to restore McLane parameters.

RDI/DVS powered OFF.
RDI/DVS power-down delay . . . . .
RDI/DVS communication channels closed..
```

Figure H-21: Option <2> Restore McLane Parameters

Option <3> (not shown) restores the factory configuration parameters delivered with the DVS. Option <3> requires using the password ‘factory’.

Option <4> displays the current DVS parameter settings as shown in Figure H-22.

```
Selection ? 4

RDI/DVS communication channels opened..
RDI/DVS powered ON.
RDI/DVS waiting for sign-on message . . . . .

RDI/DVS current parameter settings.

CA      0 ----- Communication Timeout (0=Off,10-65536 sec)
CF 11100 ----- Set Ctrl Flags {e;p;b;s;*}
CT 0 ----- Turnkey (0 = OFF, 1 = ON)
EA +00000 ----- Heading Alignment (0.01 deg)
EB +00000 ----- Heading Bias (0.01 deg)
EC 1500 ----- Speed Of Sound (m/s)
ED 00100 ----- Xdcr Depth (deci-meters)
ES 35 ----- Salinity (ppt)
EX 01111 ----- Coordinate Transformations (cct3m)
EZ 1022201 ----- Sensor Source {c;d;h;p;r;s;t}
TE 00:00:04.00 ----- Time Between Ensembles
TP 00:00.00 ----- Time Between Samples
WF 0030 ----- Blanking Distance (cm)
WN 004 ----- Number of Bins [1-5]
WP 001 ----- Number of Samples [1-999]
WS 0050 ----- Bin Size (cm)
RDI/DVS powered OFF.
RDI/DVS power-down delay .....
RDI/DVS communication channels closed..
```

Figure H-22: Option <4> Report Parameter Settings

Option <5> performs a profile test loop. This test simulates an automated sensor verification and a 5 minute profile, as shown in Figure H-23.

The predefined 5 minute test time allows 2 minutes for sensor warm up, 1 minute for simulated profiling and 2 minutes for sensor warm down.

```
Selection ? 5

Press ^C to exit the loop

RDI/DVS communication channels opened..
RDI/DVS powered ON.
RDI/DVS waiting for sign-on message . . . . .
RDI/DVS powered OFF.
RDI/DVS power-down delay . . . . .
RDI/DVS communication channels closed..

RDI/DVS communication channels opened..
RDI/DVS powered ON.
RDI/DVS waiting for sign-on message . . . . .
RDI/DVS sending [CR0] command . . . . .
RDI/DVS sending [CS] command . .
RDI/DVS successfully started logging.
RDI/DVS communication channels closed..

RDI/DVS Sleeping/Pinging for 1 minute.

01/27/2010 10:37:27 Sleeping until 01/27/2010 10:38:26 . . .

RDI/DVS communication channels opened..
RDI/DVS sending [CStop] command . . .
RDI/DVS successfully stopped logging.
RDI/DVS communication channels closed..
RDI/DVS communication channels opened..
RDI/DVS sending [MM] command . . . . .
RDI/DVS opening file A0000000.DAT for profile 0
RDI/DVS writing 4 byte header for profile 0.
RDI/DVS sending [CA 0] command . .
RDI/DVS sending [CT 0] command . .
RDI/DVS sending [MY] command .
RDI/DVS offloading 12800 bytes.
RDI/DVS Ymodem received header block for profile 0
RDI/DVS Ymodem received block #1. 1024 bytes for profile 0
RDI/DVS Ymodem received block #2. 2048 bytes for profile 0
RDI/DVS Ymodem received block #3. 3072 bytes for profile 0
RDI/DVS Ymodem received block #4. 4096 bytes for profile 0
. . .
RDI/DVS Ymodem received block #16. 12800 bytes for profile 0
RDI/DVS Ymodem end of receive. 12800 bytes for profile 0
RDI/DVS offloaded 12800 of 12800 bytes in 21 seconds (~609 CPS). . . .
RDI/DVS writing 8 byte trailer for profile 0.
RDI/DVS closing file A0000000.DAT for profile 0
RDI/DVS sending [ME ErAsE] command . . ~2 minute delay . . . . .

RDI/DVS powered OFF.
RDI/DVS power-down delay . . . . .
RDI/DVS communication channels closed..

RDI/DVS test profile succeeded

Press ^C to exit the loop
```

Figure H-23: Option <5> Perform a profile test loop

Notes