

C-FINS

Fluorometric Integrated Nautical Mapping System



Presenter: Tom Brumett, Sales Engineer Turner Designs



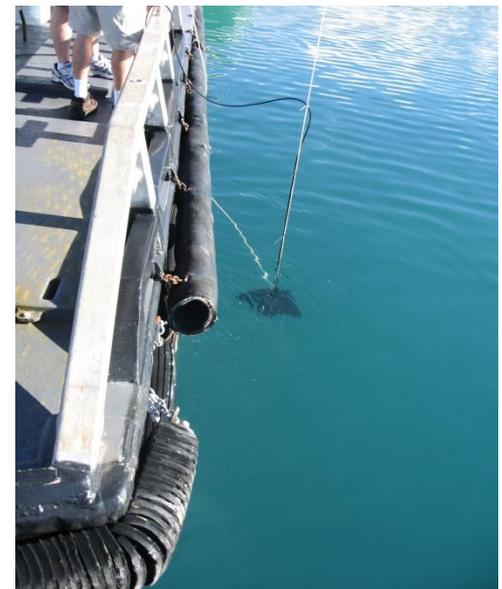
- CTDs collect water quality data.
- Many researchers want more than vertical profiles.
- They also want to collect real-time data and multiplex the fluorescence, depth, temperature and position data.
- Custom software development is costly and complicated.
- Instrument manufacturers offered technical advice but no real solutions.

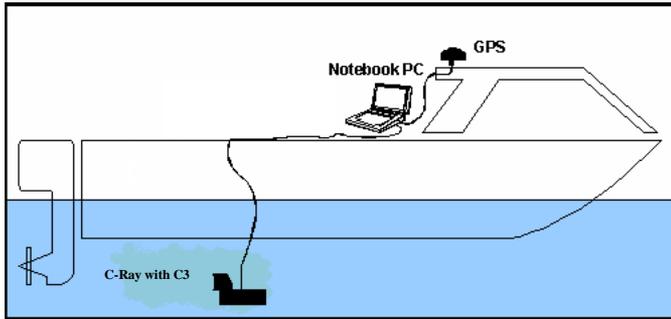


- The C-3 provides 1, 2 or 3 channels of fluorescence or turbidity plus temperature and depth.
- The C-ray towed body facilitates moving the fluorometer horizontally through the water.
- ArcGIS 10.0 provides the platform for integrating water quality and position data.



Packaged product for environmental customers who want to collect continuous fluorescence, depth and temperature data and integrate with GPS information.





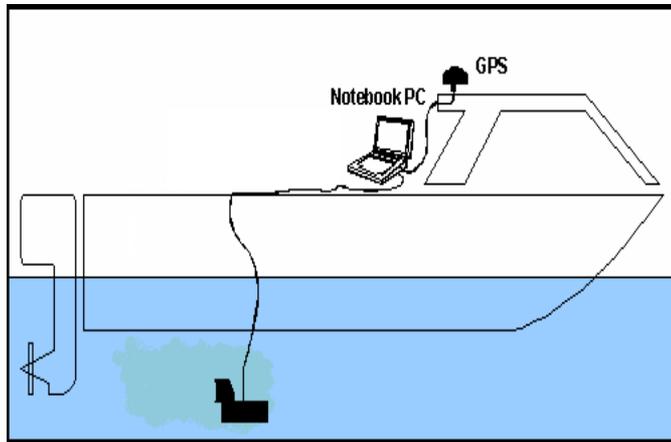
Free software module integrates field data with ArcGIS 10.0 mapping to create graphic representations of field conditions.

A screenshot of the ArcMap software interface. The main window displays a map with various layers. Overlaid on the map are two data windows. The 'Show Live C3 Data' window shows real-time data for three channels. The 'Setup C3' window shows configuration options for the C3 sensor, including channel names, units, and a data table.

Channel 1	Channel 2	Channel 3
Depth (m): 9.66	6.80	
Temp (C): 20.19	11.04	
Time: 14:01:36	5.04	

Date	Time	Depth (m)	Temp (C)
1/21/11	14:01:37	9.72	20.19
1/21/11	14:01:34	7.40	12.04
1/21/11	14:01:35	7.16	11.36
1/21/11	14:01:36	6.80	11.04
1/21/11	14:01:37	7.96	11.00
1/21/11	14:01:38	8.12	11.20

PC combines C3 data stream with GPS position data and displays and records the information on the ArcGIS 10.0 system.



Fluorometry and navigational information is displayed in real-time as well as recorded for later analysis.

Required Components supplied by Turner Designs

- **C3 Submersible Fluorometer**
- **C-ray Tow Body**
- **C-ray Shade Cap**
- **10, 25 or 50 Meter Extender Cable**
- **Boosters**

Other Required Components

- **PC with ArcGIS 10.0 Software and at least 2 Com ports**
- **GPS with RS232 com port output-NEMA format (not USB)**
- **Power Source**

Support Software

C-Soft Firmware Upgrade & Software Download for C3 Submersible Fluorometer or C6 Multi-Sensor Platform

Firmware version 2.1 does not allow data output to continue when the instrument's memory is full. We revised the current firmware and released version 2.2 allowing users to continue capturing data output even though the memory's maximum capacity has been reached. We recommend all C3 and C6 users to upgrade to firmware version 2.2 enabling this feature and keeping up to date with the latest functions available for the C3 Submersible Fluorometer and C6 Multi-Sensor Platform.

Users who received their C3 Submersible Fluorometer or C6 Multi-Sensor Platform on or before 02/16/2011 should upgrade their instruments using the Firmware and Software upgrades below to maximize performance of their instrument. **Note: Upgrade is not required for customers using the C3 Submersible Fluorometer for the SMART protocol.**

Firmware Upgrade

[Easy to download - firmware upload instructions](#)

[TI Downloader Program \(required for uploading firmware; 2.3Mb\)](#)

[C-Soft Hex File Version 2.2 \(0.03MB\)](#)

C-Soft Software Download

[Easy to download - software installation instructions](#)

[C-Soft Software Version 2.1 \(90.8 MB\)](#)

Please contact our [Technical Support](#) department if you have questions.

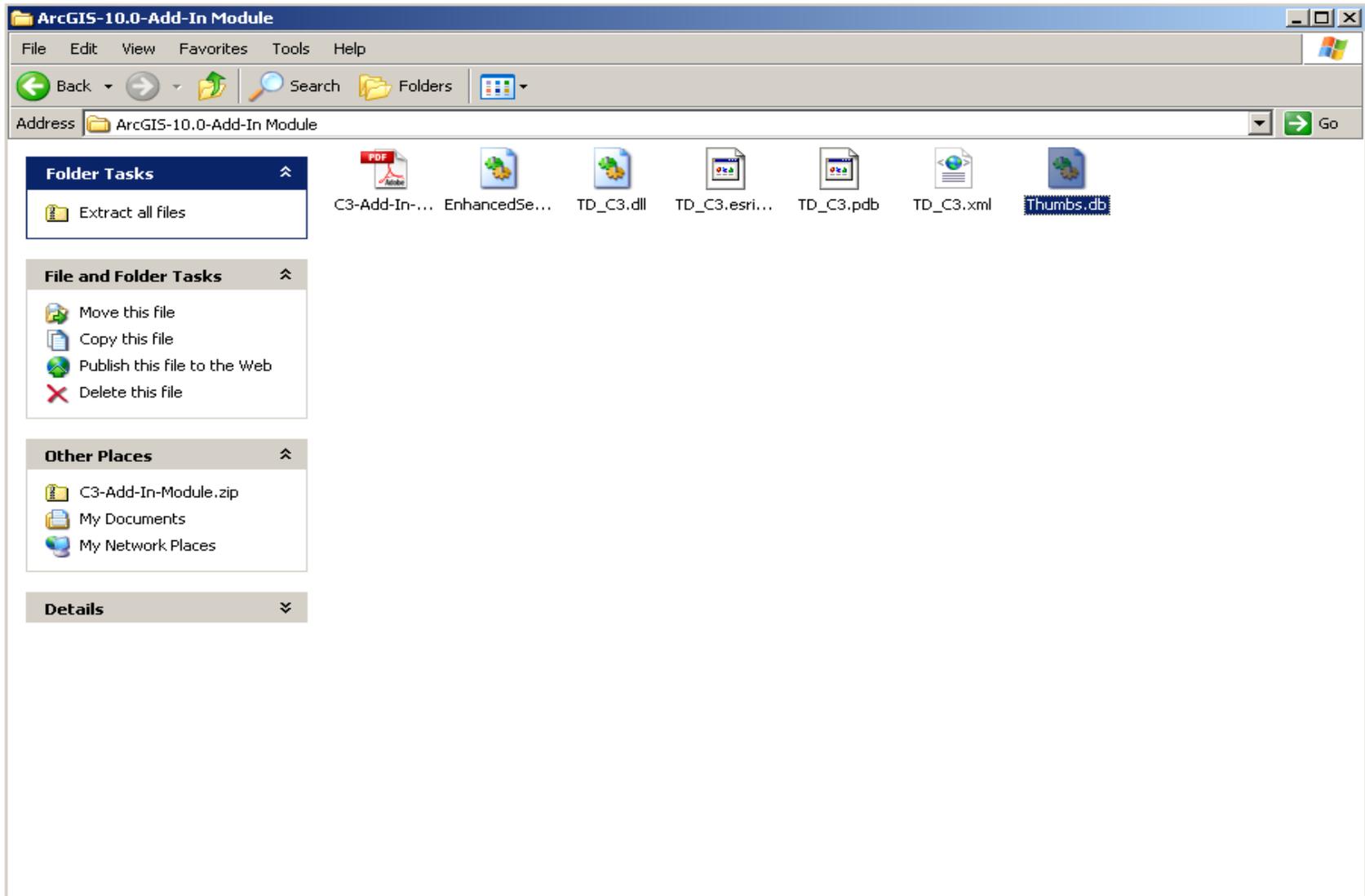
C3 Add-In Module for ArcGIS® 10.0 (for use with C-FINS package)

To use the Add-In Module please do the following:

- » Ensure ArcGIS® 10.0 is installed on your PC.
- » Download the free [C3 Add-In Module \(zip file\)](#) to your desktop.
- » Unzip and open the file and click on the File TD_C3.esriAddIn
- » This is a self-extracting file that will add the C3 Add-In Module to your ArcGis 10.0 system.
- » Open the [C3 Add In Module Quick Start file](#) (pdf) for information on using the Add-In Module

Please contact our [Technical Support](#) department if you have questions.

The software add-In module for the C3 can be downloaded from the Support section of the Turner Designs web site.



After installing the C3 Add-In Module, select the C3 toolbar

GPS Toolbar →

C3 Toolbar →

Turner Designs C3

Setup C3

C3 Com Port: C3 Status = **Port Open**
C3 Data Valid

Enable	Name	Units	Value
<input checked="" type="checkbox"/>	Rhodamine	PPB	8.20
<input checked="" type="checkbox"/>	Turbidity	NTU	11.92
<input checked="" type="checkbox"/>	Chlorophyll a	µg/l	7.16

Date	Time	Depth (m)	Temp (°C)
<input type="text" value="11/22/10"/>	<input type="text" value="10:06:55"/>	<input type="text" value="9.66"/>	<input type="text" value="19.12"/>
11/22/10	10:06:52	8.36	10.84
11/22/10	10:06:53	8.76	11.64
11/22/10	10:06:54	8.28	11.40
11/22/10	10:06:55	8.20	11.92
11/22/10	10:06:56	7.80	11.84

 No file set.....

 Log Interval (Seconds)

Clicking on the “C3 setup” icon will pop up the screen to the right.

Choose the “connect” button to establish communications with the C3.

Setup C3

C3 Com Port: COM4 C3 Status = Port Closed
No C3 Data

Enable	Name	Units	Value
<input checked="" type="checkbox"/>	Rhodamine	PPB	
<input checked="" type="checkbox"/>	Turbidity	NTU	
<input checked="" type="checkbox"/>	Chlorophyll a	µg/l	

Date: Time: Depth (m): Temp (°C):

Set Log File No file set.....

3 Log Interval (Seconds) Connect Disconnect

-13603808.488 4518708.193 Meters

3:24 PM 3/12/2011

The screenshot shows the software interface with two main panels. On the left, the 'GPS Connection Setup' dialog box is open, showing options for connecting to a GPS receiver. On the right, the 'Setup C3' panel displays the current C3 status and a table of data points.

GPS Connection Setup

Specify Your GPS connection

Connect to GPS receiver

Communication Port: COM3 Detect GPS Port

Baud Rate: 4800 Data Bits: 8

Parity: None Stop Bits: 1 Test Connection

Datum Used On GPS Receiver: GCS_WGS_1984

Simulate GPS connection using point or line data

Layer:

Interval: 1.000 Seconds

OK Cancel

Setup C3

C3 Com Port: COM4 C3 Status = **Port Open**
C3 Data Valid

Enable	Name	Units	Value
<input checked="" type="checkbox"/>	Rhodamine	PPB	42.92
<input checked="" type="checkbox"/>	Turbidity	NTU	375.20
<input checked="" type="checkbox"/>	Chlorophyll a	µg/l	32.84

Date	Time	Depth (m)	Temp (°C)
3/12/11	15:32:54	0.00	-2.00
3/12/11	15:32:51	39.24	374.00
3/12/11	15:32:52	40.48	376.00
3/12/11	15:32:53	42.00	376.40
3/12/11	15:32:54	42.92	375.20
3/12/11	15:32:55	41.64	376.00

Set Log File No file set.....

3 Log Interval (Seconds) Connect Disconnect

From the GPS tab, choose "setup" to configure and detect your GPS unit

-13632970.451 4556618.744 Meters

3:28 PM
3/12/2011

The screenshot shows the ArcView interface with a map of a coastal area. A blue arrow points from the text 'Next, from the GPS tab choose "display GPS position"' to the 'GPS' tab in the top toolbar. The 'GPS Position' window is open, displaying the following data:

Latitude:	37° 24' 40" N	Altitude:	18.700	Meters
Longitude:	122° 2' 6" W	Speed:	N/A	Kilometers/Hour
		Heading:	N/A	Degrees (true)
Status:	Connection open. Receiving data. (GPS on COM3) .			
UTC Time:	23:32:08	Dilution of precision		
UTC Date:	03/12/11	HDOP:	0.90	
Mag. Variance:	15.0 E Degrees	VDOP:	3.00	
Quality Indicator:	N/A	PDOP:	3.90	
Satellite Availability	Differential GPS			
Satellite Count:	10 / 10	Station ID:	N/A	
Average SNR:	30.40	Age:	N/A	

The 'Setup C3' dialog box is also open, showing the following configuration:

C3 Com Port: COM4 C3 Status = **Port Open**
C3 Data Valid

Enable	Name	Units	Value
<input checked="" type="checkbox"/>	Rhodamine	PPB	41.36
<input checked="" type="checkbox"/>	Turbidity	NTU	381.20
<input checked="" type="checkbox"/>	Chlorophyll a	µg/l	32.64

Below the table, the Date is 3/12/11 and Time is 15:36:09. A table of recent data points is shown below:

Date	Time	Depth (m)	Temp (°C)
3/12/11	15:36:06	0.00	-2.00
3/12/11	15:36:07	0.00	-2.00
3/12/11	15:36:08	0.00	-2.00
3/12/11	15:36:09	0.00	-2.00
3/12/11	15:36:10	0.00	-2.00

At the bottom of the 'Setup C3' dialog, there is a 'Set Log File' button with the text 'No file set.....', a 'Log Interval (Seconds)' field set to 3, and 'Connect' and 'Disconnect' buttons.

At the bottom of the ArcView window, the coordinates -13601820.173 4511550.257 Meters are displayed.

Next, from the GPS tab choose
"display GPS position"

-13601820.173 4511550.257 Meters

3:32 PM
3/12/2011

File Edit View Bookmarks Insert Selection Geoprocessing Customize Windows Help

1:500,992

Show Live C3 Data GPS

Show Live C3 Data

Depth (m)	Channel 1	C3 Status: Port Open
0.00	39.00	C3 Data Valid
Temp (C)	Channel 2	Log Status: Not Logging
-2.00	382.40	Log File:
Time	Channel 3	Latitude (DD.dddd)
15:38:17	33.28	37.42168
		Longitude (DDD.dddd)
		-122.03488

GPS Position

Latitude: 37° 25' 18" N	Altitude: 18.700 Meters
Longitude: 122° 2' 6" W	Speed: N/A Kilometers/Hour
	Heading: N/A Degrees (true)

Status: Connection open. Receiving data. (GPS on COM3) [Simple <<](#)

UTC Time: 23:34:18	Dilution of precision
UTC Date: 03/12/11	HDOP: 0.90
Mag. Variance: 15.0 E Degrees	VDOP: 3.00
Quality Indicator: N/A	PDOP: 3.90

Satellite Availability	Differential GPS
Satellite Count: 10 / 10	Station ID: N/A
Average SNR: 30.50	Age: N/A

Table Of Contents

Layers

- Basemap
- Boundaries and Place
- Reference
- Physical

-13582467.234 4551581.678 Meters

View Bookmarks Insert Selection Geoprocessing Customize Windows Help

1:500,992

Save As

Desktop

Organize New folder

Search Desktop

Libraries System Folder

Tom Brumett System Folder

Computer System Folder

Network System Folder

64

File name: SF Bay 03-2011

Save as type: Shapefiles (*.shp)

Hide Folders Save Cancel

Setup C3

C3 Com Port: COM4 C3 Status = Port Open C3 Data Valid

Enable	Name	Units	Value
Chan 1 <input checked="" type="checkbox"/>	Rhodamine	PPB	44.52
Chan 2 <input checked="" type="checkbox"/>	Turbidity	NTU	384.40
Chan 3 <input checked="" type="checkbox"/>	Chlorophyll a	µg/l	32.92

Date	Time	Depth (m)	Temp (°C)
3/12/11	15:40:47	0.00	-2.00
3/12/11	15:40:46	45.12	383.20
3/12/11	15:40:47	44.52	384.40
3/12/11	15:40:48	44.40	385.60
		33.44	0.00
			-2.00

Set Log File No file set.....

Log Interval (Seconds) Connect Disconnect

-13595855.226 4529975.315 Meters

Name and choose a location for your data file.

File Edit View Bookmarks Insert Selection Geoprocessing Customize Windows Help

1:125,759

Show Live C3 Data

Depth (m)	Channel 1
0.00	45.24

Temp (C)	Channel 2
-2.00	387.20

Time	Channel 3
15:43:42	29.76

C3 Status: **Port Open**
C3 Data Valid
Logging Data

Log Status: **Logging Data**

Log File: **SF Bay 03-2011**

Latitude (DD.dddd) **37.44776**

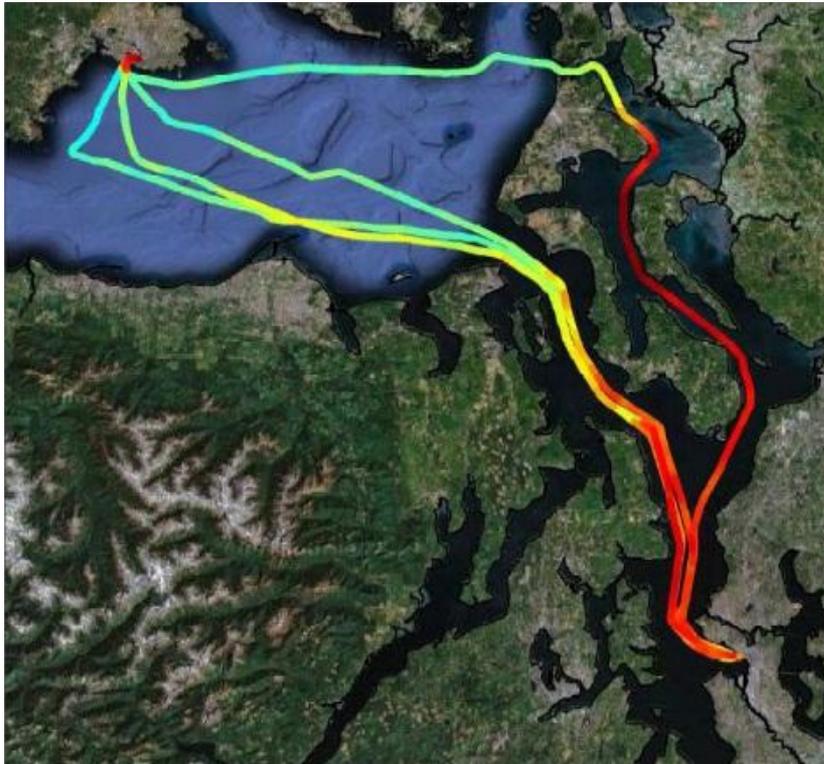
Longitude (DDD.dddd) **-122.03488**

Table Of Contents

- Layers
 - SF Bay 03-2011
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Choose the “record data” button to start logging data.

Choose the “stop” button to halt data logging



C-FINS makes it simple to hit the water and start collecting data.

C-FINS

Fluorometric Integrated Nautical Mapping System

Thank You for attending our C-FINS presentation! You can find more information on C-FINS and our other products on the web www.turnerdesigns.com