

## MIRAI MR02-K04 Leg2 Expendable Conductivity-Temperature-Depth Profiler (XCTD)

Last Modified: 2019-08-29

[ReadMe](#) [Observation Data](#) [Data Format](#)

Cruise ID: [MR02-K04 Leg2](#)

Expendable Conductivity-Temperature-Depth Profiler (XCTD): Processed (DMO)-QCed

Data Policy: [JAMSTEC](#)

Observation Items: Depth, Temperature, Salinity

Science Keywords:

OCEANS > OCEAN TEMPERATURE > WATER TEMPERATURE

OCEANS > SALINITY/DENSITY > SALINITY

Cruise Report

[http://www.godac.jamstec.go.jp/catalog/data/doc\\_catalog/media/MR02-K04\\_leg2\\_all.pdf](http://www.godac.jamstec.go.jp/catalog/data/doc_catalog/media/MR02-K04_leg2_all.pdf)

### For Using Data

#### Principal Investigator

Data Management Office

JAMSTEC / BPPT joint cruise in the Indonesian waters.

#### Use Constraints

See [Terms and Conditions](#) about constrain of use.

#### Data Citation

See [Terms and Conditions](#) about data citation.

### Instrument

Instrument:

Expendable conductivity temperature

depth measurements (XCTD) ( -

MR11-E02)



### Overview

Using XCTD (eXpendable Conductivity Temperature Depth profiler) system, the vertical distribution of water temperature and salinity are observed during free fall of its probe part in the seawater. Observed temperature and conductivity are transmitted to the data processor on board by the digital signal. The digital signal is converted to the temperature, conductivity and depth by data processor as binary data. Binary data is transmitted from data processor to PC. The PC calculates salinity from temperature, conductivity and depth, and those properties are recorded in PC as the ASCII files.

### System

#### (1) Launcher

Hand launcher

Manufacturer : Sippican, Inc.

Operation area : Rear upper deck

Automatic launcher

Manufacturer : Tsurumi Seiki Co., LTD.

Location : Port side of rear upper deck (4m from the sea level). The control panel is installed in the investigation room.

#### (2) Converter

Manufacturer : Tsurumi Seiki Co., LTD.

Location : Investigation room

Sampling rate : 40 msec

#### (3) XCTD probe specifications

Probe Type	TSK XCTD-1	TSK XCTD-2	TSK XCTD-3	TSK XCTD-4
Temperature range [deg-C]	-2 to 35			
Temperature accuracy [deg-C]	+/- 0.02			
Temperature resolution [deg-C]	0.01			
Conductivity range [mS/cm]	0 to 60			
Conductivity accuracy [mS/cm]	+/- 0.03			
Conductivity resolution [mS/cm]	0.015			
Measurment depth [m]	1000	1850	1000	1850
Depth accuracy [m]	5 or +/- 2% of depth; whichever is larger			
Maximum elapsed time [sec]	300	600	200	502
Rated ship speed [knot]	12	3.5	20	6

Since XCTD carries no pressure sensor, we need to estimate depth from the elapsed time. The fall-rate equation is as follows.

$$Z = at + 10E^{-3} \cdot bt^2$$

Where Z(m) is the depth and t(sec) is the elapsed time.

In addition, coefficients of the fall-rate equation are different by probe types.

Probe Type	TSK XCTD-1	TSK XCTD-2	TSK XCTD-3	TSK XCTD-4
Coefficient-a	3.42543	3.43898	5.07598	3.68081
Coefficient-b	-0.47	-0.31	-0.72	-0.47

\* Coefficients listed above are supplied by Sippican, Inc., in USA.

The list of an XCTD type used in each cast is as follows.

Cast name	Probe Serial No.	Probe Type	Launcher	Converter
200207260540	02059187	XCTD-1	Auto	MK-100
200207260816	02059185	XCTD-1	Auto	MK-100
200207261100	02059186	XCTD-1	Auto	MK-100
200207261336	02059191	XCTD-1	Auto	MK-100
200207261620	02059189	XCTD-1	Auto	MK-100
200207261908	02059188	XCTD-1	Auto	MK-100
200207262156	02059190	XCTD-1	Auto	MK-100
200207270038	02059192	XCTD-1	Auto	MK-100
200207270330	02058973	XCTD-1	Auto	MK-100
200207270630	02058971	XCTD-1	Auto	MK-100
200207271136	02059109	XCTD-1	Auto	MK-100
200207271144	02058972	XCTD-1	Auto	MK-100
200207271344	02058974	XCTD-1	Auto	MK-100
200207271941	02059108	XCTD-1	Auto	MK-100
200207280145	02058975	XCTD-1	Auto	MK-100
200207280742	02059106	XCTD-1	Auto	MK-100
200207281337	02059111	XCTD-1	Auto	MK-100
200207290708	02059107	XCTD-1	Auto	MK-100
200207290935	02027710	XCTD-1	Auto	MK-100
200207291146	02059110	XCTD-1	Auto	MK-100
200207310734	02027713	XCTD-1	Auto	MK-100
200207311329	02027709	XCTD-1	Auto	MK-100
200207311944	02027719	XCTD-1	Auto	MK-100
200207312334	02027718	XCTD-1	Auto	MK-100
200208010134	02027715	XCTD-1	Auto	MK-100
200208010746	02027712	XCTD-1	Auto	MK-100
200208011329	02027711	XCTD-1	Auto	MK-100
200208011936	02027708	XCTD-1	Auto	MK-100
200208020132	02027714	XCTD-1	Auto	MK-100
200208021042	02027717	XCTD-1	Auto	MK-100
200208030348	02059129	XCTD-1	Auto	MK-100
200208030406	02059128	XCTD-1	Auto	MK-100
200208030556	02059132	XCTD-1	Auto	MK-100
200208030758	02059137	XCTD-1	Auto	MK-100
200208031006	02059139	XCTD-1	Auto	MK-100
200208031212	02048765	XCTD-1	Auto	MK-100
200208031414	02048764	XCTD-1	Auto	MK-100
200208031621	02059141	XCTD-1	Auto	MK-100
200208031834	02059130	XCTD-1	Auto	MK-100
200208032046	02059140	XCTD-1	Auto	MK-100
200208032254	02059127	XCTD-1	Auto	MK-100
200208040106	02059142	XCTD-1	Auto	MK-100
200208040330	02059135	XCTD-1	Auto	MK-100
200208040557	02048767	XCTD-1	Auto	MK-100
200208040808	02048766	XCTD-1	Auto	MK-100
200208041032	02048768	XCTD-1	Auto	MK-100
200208041255	02048771	XCTD-1	Auto	MK-100
200208041522	02048772	XCTD-1	Auto	MK-100
200208041750	02048770	XCTD-1	Auto	MK-100
200208042003	02048773	XCTD-1	Auto	MK-100
200208042232	02048769	XCTD-1	Auto	MK-100
200208050101	02048800	XCTD-1	Auto	MK-100
200208050318	02048774	XCTD-1	Auto	MK-100
200208050545	02048775	XCTD-1	Auto	MK-100
200208050759	02048802	XCTD-1	Auto	MK-100
200208051015	02048801	XCTD-1	Auto	MK-100
200208051237	02048810	XCTD-1	Auto	MK-100
200208051446	02048811	XCTD-1	Auto	MK-100
200208051655	02048808	XCTD-1	Auto	MK-100
200208051918	02048804	XCTD-1	Auto	MK-100
200208052129	02048807	XCTD-1	Auto	MK-100
200208052349	02048805	XCTD-1	Auto	MK-100
200208130324	02048806	XCTD-1	Auto	MK-100
200208130345	02048803	XCTD-1	Auto	MK-100

#### Data processing

(1) For sensor's stability, values of less than 1 m for temperature and less than 3 m for salinity are replaced by missing values, respectively, based on manufacturer's recommendation.

#### (2) Quality control

QCed data were added flag according to the NODC (National Oceanographic Data Center) quality control procedure.

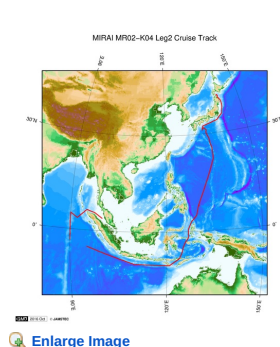
- 1) The gradient check of adjacent depth data
- 2) The density inversion check
- 3) The broad range check set up at given ocean space and depth

Please see the site of NODC of the following link for quality control procedure in detail.

[QUALITY CONTROL AND PROCESSING OF HISTORICAL OCEANOGRAPHIC TEMPERATURE, SALINITY, AND OXYGEN DATA](#)

In addition, an abnormal value is identified by a visual check, and the data after visual QC is released.

#### Related Information



#### MR02-K04 Leg2

Ship Name: MIRAI

Period: 2002-07-25 - 2002-08-22

Chief Scientist: Hideaki Hase (JAMSTEC)

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#### Update History

2019-08-29	An observation data was registerd.
2017-06-14	An observation data was registerd.
2016-10-17	An observation data was registerd.

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MIRAI

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#### Information of the Submersibles

KAIKO

SHINKAI 2000

SHINKAI 6500

DEEP TOW

HYPER-DOLPHIN

URASHIMA

YOKOSUKA DEEP TOW

6K Camera DEEP TOW

6K Sonar DEEP TOW

KM-ROV

POWER GRAB SAMPLER (SHELL)

POWER GRAB SAMPLER (CLOW)

BMS

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Cruise ID:

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Dive ID:

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## MIRAI MR02-K04 Leg2 Expendable Conductivity-Temperature-Depth Profiler (XCTD)

Last Modified: 2019-08-29

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Cruise ID: [MR02-K04 Leg2](#)

Expendable Conductivity-Temperature-Depth Profiler (XCTD): Processed (DMO)-QCed

Data Policy: [JAMSTEC](#)

### XCTD DMO

#### Format Description for the Corrected Data

Provided in the Exchange Format of CCHDO (CLIVAR and Carbon Hydrographic Data Office). Please see the following link for details of Exchange Format.

[CCHDO | CLIVAR & Carbon Hydrographic Data Office](#)

Data in following cruise is not expressed with Exchange Format. Please see the site of each cruise for format.

MR02-K05 Leg1

MR04-05

#### Format Description for the QCed Data

Each data file contains one line header (meta data) followed by data lines for each cast.

The number of data lines are recorded in the header.

Header part

No.	Column	Content	Format	Remarks
1	1	Header ID	a1	fixed as '#'
2	3 - 6	Data ID	a4	XCTD
3	8 - 22	Cruise ID	a15	
4	33 - 40	Date	i8	YYYYMMDD (UTC)
5	42 - 45	Time	i4	hhmm (UTC)
6	47 - 55	Latitude	i2,a1,f5.2,a1	dd-mm.mmN(S)
7	57 - 66	Longitude	i3,a1,f5.2,a1	ddd-mm.mmE(W)
8	68 - 71	Number of data lines	i4	
9	72 - 73	Terminator	-	CR+LF

Data part

No.	Column	Content	Unit	Format	Remarks
1	1 - 11	Depth	m	f11.1	
2	12 - 22	Temperature	deg-C	f11.2	ITS-90
3	23 - 33	Salinity	PSU	f11.3	PSS-78
4	45 - 55	Flag	-	i11	1 - 7 : space 8 : flag of depth 9 : flag of temperature 10 : flag of salinity 11 : space * reference : <a href="#">Definition of Quality Control Flags</a>
5	56 - 57	Terminator	-	-	CR+LF

Each contents of the data part is stored in 11 bytes.

Missing value is presented by '-5', and error value is presented by '-9'.

#### Definition of Quality Control Flags

##### 1. Depth Flags

- 0 - accepted value
- 1 - error in recorded depth ( same or less than previous depth )
- 2 - density inversion

##### 2. Observed Level Flags

- N - missing value
- 0 - accepted value
- 1 - range outlier ( outside of broad range check )
- 2 - failed inversion check
- 3 - failed gradient check
- 4 - zero anomaly
- 5 - failed combined gradient and inversion checks
- 6 - failed range and inversion checks
- 7 - failed range and gradient checks
- 8 - failed range and zero anomaly checks
- 9 - failed range and combined gradient and inversion checks
- A - failed visual check

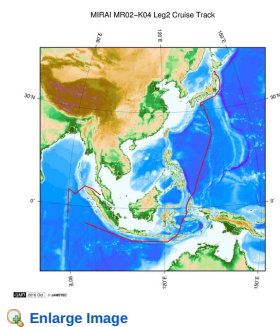
QCed data were added flag according to the NODC (National Oceanographic Data Center) quality control procedure, additionally visually checked. Please see the site of NODC of the following link for quality control procedure.

[QUALITY CONTROL AND PROCESSING OF HISTORICAL OCEANOGRAPHIC TEMPERATURE, SALINITY, AND OXYGEN DATA](#)

#### Sample Program

[ex\\_read2.f](#)

#### Related Information



[Enlarge Image](#)

#### MR02-K04 Leg2

Ship Name: MIRAI

Period: 2002-07-25 - 2002-08-22

Chief Scientist: Hideaki Hase (JAMSTEC)

#### Update History

2019-08-29	An observation data was registerd.
2017-06-14	An observation data was registerd.
2016-10-17	An observation data was registerd.

#### JAMSTEC

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[6K Camera DEEP TOW](#)  
[6K Sonar DEEP TOW](#)  
[KM-ROV](#)  
[POWER GRAB SAMPLER \(SHELL\)](#)  
[POWER GRAB SAMPLER \(CLOW\)](#)  
[BMS](#)

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Cruise ID:

#### Go to a Dive Information

Dive ID:

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## MIRAI MR02-K04 Leg2 Expendable Conductivity-Temperature-Depth Profiler (XCTD)

Last Modified: 2019-08-29

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Cruise ID: [MR02-K04 Leg2](#)

Expendable Conductivity-Temperature-Depth Profiler (XCTD): Processed (DMO)-QCed

Data Policy: [JAMSTEC](#)

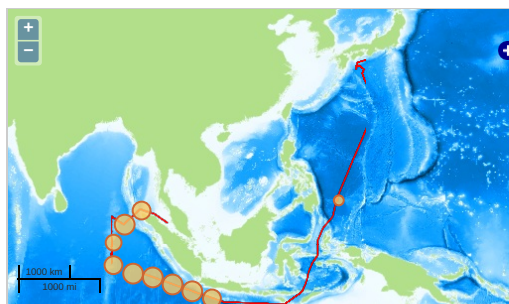
Observation Items: Depth, Temperature, Salinity

Science Keywords:

OCEANS > OCEAN > WATER  
TEMPERATURE  
OCEANS > SALINITY/DENSITY > SALINITY

### Observation Map

1. Clicking the icon displays a balloon with observation information.
2. Then click the observation name, figures will be displayed.

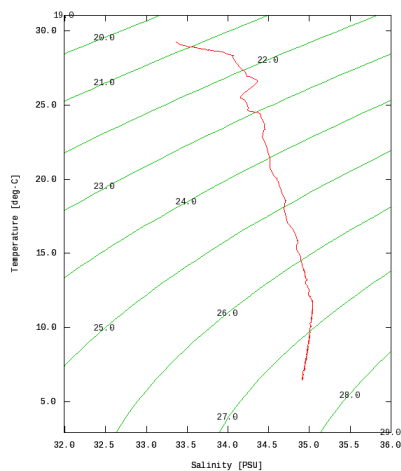


### Figures

200207260540



MR02-K04 Leg2: 200207260540  
Expendable Conductivity-Temperature-Depth Profiler (XCTD): Salinity






















































Only values evaluated as "good": all flags are 0" are plotted in profiles.  
Please see Format Page for the definition of quality flags.

### Data List

[Add to Basket](#)

☐ File names

<input type="checkbox"/>	200207260540.dat
<input type="checkbox"/>	200207260816.dat
<input type="checkbox"/>	200207261100.dat
<input type="checkbox"/>	200207261336.dat
<input type="checkbox"/>	200207261620.dat
<input type="checkbox"/>	200207261908.dat
<input type="checkbox"/>	200207262156.dat
<input type="checkbox"/>	200207270038.dat
<input type="checkbox"/>	200207270330.dat
<input type="checkbox"/>	200207270630.dat
<input type="checkbox"/>	200207271136.dat
<input type="checkbox"/>	200207271144.dat
<input type="checkbox"/>	200207271344.dat
<input type="checkbox"/>	200207271941.dat

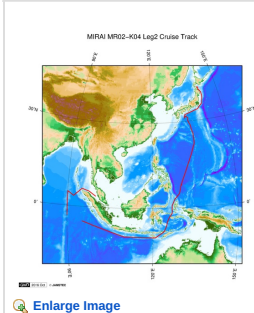
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 200207280742.dat
 200207281337.dat
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 200207311329.dat
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 200207312334.dat
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 200208011329.dat
 200208011936.dat
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 200208021042.dat
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 200208051655.dat
 200208051918.dat
 200208052129.dat
 200208052349.dat
 200208130324.dat
 200208130345.dat
 ex_read2.f (Sample Program)

● Observation List  
The list of observation is shown as follows.

Observation	Time and Date	Lat. [°]	Lon. [°]
200207260540	2002-07-26 05:35	6.1978	95.0003
200207260816	2002-07-26 08:11	5.7475	94.5005
200207261100	2002-07-26 10:55	5.2634	94.0001
200207261336	2002-07-26 13:31	4.8245	93.5001
200207261620	2002-07-26 16:15	4.3611	92.9996
200207261908	2002-07-26 19:03	3.8961	92.5005
200207262156	2002-07-26 21:51	3.6961	92.0001
200207270038	2002-07-27 00:33	4.0220	91.5000
200207270330	2002-07-27 03:25	4.3521	91.0000
200207270630	2002-07-27 06:25	4.6816	90.5003
200207271136	2002-07-27 11:31	5.0025	89.9941
200207271144	2002-07-27 11:39	4.9870	89.9940
200207271344	2002-07-27 13:39	4.5001	90.0000
200207271941	2002-07-27 19:36	3.4998	90.0001
200207280145	2002-07-28 01:40	2.4998	89.9983
200207280742	2002-07-28 07:37	1.4963	90.0000
200207281337	2002-07-28 13:32	0.5000	90.0303
200207290708	2002-07-29 07:03	-0.0061	90.0585
200207290935	2002-07-29 09:30	-0.5008	89.9880
200207291146	2002-07-29 11:41	-1.0005	90.0200
200207310734	2002-07-31 07:29	-2.5001	90.0035
200207311329	2002-07-31 13:24	-3.5003	90.0048
200207311944	2002-07-31 19:39	-4.5221	90.0025
200207312334	2002-07-31 23:29	-4.9916	90.0071
200208010134	2002-08-01 01:29	-4.9970	90.5000
200208010746	2002-08-01 07:41	-4.9996	91.5000
200208011329	2002-08-01 13:24	-5.0098	92.4998
200208011936	2002-08-01 19:31	-5.0046	93.5000

Observation	Time and Date	Latitude	Longitude
200208021042	2002-08-02 11:27	-5.9871	94.9363
200208021042	2002-08-02 10:37	-5.0465	94.9830
200208030348	2002-08-03 03:43	-5.0061	95.0155
200208030406	2002-08-03 04:01	-5.0298	95.0705
200208030556	2002-08-03 05:51	-5.1906	95.5001
200208030758	2002-08-03 07:53	-5.3203	96.0005
200208031006	2002-08-03 10:01	-5.4973	96.5003
200208031212	2002-08-03 12:07	-5.6745	96.9996
200208031414	2002-08-03 14:09	-5.8453	97.5003
200208031621	2002-08-03 16:16	-6.0176	97.9996
200208031834	2002-08-03 18:29	-6.2176	98.4995
200208032046	2002-08-03 20:41	-6.4300	99.0003
200208032254	2002-08-03 22:48	-6.6025	99.5000
200208040106	2002-08-04 01:01	-6.7300	100.0001
200208040330	2002-08-04 03:25	-6.9286	100.5000
200208040557	2002-08-04 05:52	-7.1266	101.0000
200208040808	2002-08-04 08:03	-7.2785	101.5001
200208041032	2002-08-04 10:27	-7.4568	102.0000
200208041255	2002-08-04 12:50	-7.6315	102.4998
200208041522	2002-08-04 15:17	-7.8155	103.0000
200208041750	2002-08-04 17:45	-7.9983	103.5000
200208042003	2002-08-04 19:58	-8.1423	103.9998
200208042232	2002-08-04 22:27	-8.3293	104.5000
200208050101	2002-08-05 00:56	-8.5288	105.0001
200208050318	2002-08-05 03:13	-8.6971	105.5000
200208050545	2002-08-05 05:40	-8.8785	106.0006
200208050759	2002-08-05 07:54	-9.0228	106.5000
200208051015	2002-08-05 10:10	-9.1991	107.0000
200208051237	2002-08-05 12:32	-9.4051	107.5000
200208051446	2002-08-05 14:41	-9.5676	108.0001
200208051655	2002-08-05 16:50	-9.7350	108.4998
200208051918	2002-08-05 19:13	-9.9248	109.0001
200208052129	2002-08-05 21:24	-10.0796	109.5001
200208052349	2002-08-05 23:44	-10.2550	109.9998
200208130324	2002-08-13 03:19	8.0048	130.0220
200208130345	2002-08-13 03:40	8.0051	130.0218

#### Related Information



#### MR02-K04 Leg2

Ship Name: MIRAI  
Period: 2002-07-25 - 2002-08-22  
Chief Scientist: Hideaki Hase (JAMSTEC)

#### Update History

2019-08-29	An observation data was registered.
2017-06-14	An observation data was registered.
2016-10-17	An observation data was registered.

#### JAMSTEC

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KAIYO  
YOKOSUKA  
MIRAI  
KAIREI  
CHIKYU  
KAIMEI  
SHINSEI MARU  
HAKUHO MARU

#### Information of the Submersibles

KAICO  
SHINKAI 2000  
SHINKAI 6500  
DEEP TOW  
HYPER-DOLPHIN  
URASHIMA  
YOKOSUKA DEEP TOW  
6K Camera DEEP TOW  
6K Sonar DEEP TOW  
KM-ROV  
POWER GRAB SAMPLER (SHELL)  
POWER GRAB SAMPLER (CLOW)  
BMS

#### Go to a Cruise Information

Cruise ID:

#### Go to a Dive Information

Dive ID: