

## SPECIFICATIONS OF VOYAGE DATA RECORDER VR-7000

The Voyage Data Recorder (VDR) is a recording system required on certain categories of ships from 1st July 2002 by the revised SOLAS Chapter V. VR-7000 fully complies with the IMO Resolution MSC.333 (90) and IEC 61996-1 testing standard.

### 1 GENERAL

- 1.1 Recording period
  - Fixed DRU/ Float-free DRU 48 hrs
  - Long term device (long-term recording medium) 720 hrs
- 1.2 Battery backup More than two hours after loss of ship's mains

### 2 DATA COLLECTING UNIT (DCU)

- 2.1 CPU Intel Celeron P4505 1.86 GHz
- 2.2 Long term device
  - Memory capacity 512 GB or 1 TB (SSD)
  - Minimum data retention period 2 years after recording

### 3 REMOTE ALARM PANEL

- 3.1 Display 4.3-inch color LCD, 480 x 272 (WQVGA)
- 3.2 Picture color 256 colors
- 3.3 Brilliance 0.2 to 700 cd/m<sup>2</sup>
- 3.4 Visible distance 0.5 m nominal

### 4 DATA RECORDING UNIT (DRU)

- 4.1 Fixed DRU
  - Chassis Protective capsule (metal)
  - Memory capacity 32 GB
  - Minimum data retention period 2 years after recording
  - Shock resistance 50G x 11 ms
  - Penetration resistance 100mm diameter pin with 250 kg weight, dropped from 3 m height
  - Fire resistant 1100°C for 1 hour, 260°C for 10 hours
  - Submersible 6000 m (60MPa)
  - Acoustic beacon Battery life: 3 years from the date of insertion,  
37.5kHz, 10ms pulse transmission,  
Maximum depth: 6000m  
Operating life: 90 days
- 4.2 Float-free DRU
  - Chassis Auto-float capsule
  - Memory capacity 64 GB
  - Minimum data retention period 6 months after recording
  - Battery Lithium, Metal, 7.2 V/ 18 Ah (2S5P),  
5 year's service life (6.5 years from the date of manufacture)
  - Operating life Minimum 168 hrs at -20°C

Release mechanism	Hydrostatic release unit (released at water depth 4 m)
Navigation device	22 channel GPS receiver
COSPAS-SARSAT Transmitter	
Antenna type	Built-in, omnidirectional
Frequency	406.037 MHz $\pm$ 2 ppm
Output power	5 W $\pm$ 2 dB
Protocols	MMSI and Serial Location Protocols
Modulation	Phase modulation 1.1 $\pm$ 1 radian
Data encoding	Bi-phase L
Bit rate	400 bps
Homing Transmitter	
Frequency	121.5 MHz
Output power	50 mW $\pm$ 3 dB
Modulation	A3X, AM sweep tone between 300 Hz and 1600 Hz
Sweep range	700 Hz (sweep rate: 2.5 Hz)
Stability	10 ppm over temperature

**5 MICROPHONE**

5.1 Reference signal level	0 dBm/600 ohm at 91 dBA
5.2 Frequency response	Within 12 dB at 150Hz to 6 kHz
5.3 Audio coverage	Hemisphere area of 3.5 m approx. in radius
5.4 Test beeper	3s in 12 hours period (built in)

**6 HUB (OPTION)**

6.1 Switching HUB (HUB-100)	
Number of ports	8 ports (10Base-T/100Base-TX), Auto-MDI/MDI-X compliant
Switching Method	Store and forward
Buffer memory	SRAM
6.2 Intelligent HUB (HUB-3000)	
Number of ports	8 ports (10/100/1000Base-T) , Auto-MDI/MDI-X compliant
Switching Method	Store and forward, non-blocking L2 switching
Capacitance of switching	16 Gbps
VLAN	Port-base VLAN, IEEE802.1Q Tag VLAN supported
Multiple VLAN	Communication between isolated ports is disabled

**7 INTERFACE**

7.1 Data collecting unit	
Number of port	
LAN	6 ports, Ethernet 100Base-TX, RJ45 connector 5 ports for IEC61162-450: IP address range 172.31.16.1-254, 172.31.17.1-254, default 172.31.16.200 1 port for internal: IP address 10.0.0.100
Bridge audio (input)	8 ch (0 dBm/600 ohm)
VHF audio (input)	2 ch (0 dBm/600 ohm)

Serial IEC61162-1/2: 2 ports, IEC61162-1: 6 ports  
 Serial I/O for AMS IEC61162-1: 1 ch  
 USB 1 port, USB2.0 for data extraction, User disk recording  
 Alarm (output) 3 ch, contact signal, load current 30 mA  
 System fail, Power fail, Local ACK  
 Remote ACK (input) 1 ch  
 Buzzer stop (input) 1 ch  
 IEC61162-450 transmission group  
 Input MISC, SATD, NAVD, VDRD, RCOM, TIME, PROP, USR1 to USR8  
 Output MISC  
 Other Network Function (except IEC61162-450)  
 HTTP; \*.\*.\*:80  
 VR-7000 replies on PC's ARP command and ping command  
 Live player, Maintenance viewer  
 - UDP multicast: 239.255.0.1  
 Port: 20001-20004, 21001-21004, 22001-22007, 23001-23007  
 27001-27010, 28001-28010  
 - TCP: \*.\*.\*, Port: 20, 21, 10106, 24001, 24004

I/O Sentences

Input All incoming  
 Output ALC, ALF, HBT

7.2 Sensor adapter

MC-3000S (serial) 8 ports: I/O, IEC61162-1/2: 4 ports, IEC61162-1: 4 ports  
 MC-3010A (analog, option) 3 ports: Input, -10 to +10V, 0 to 10V or 4 to 20 mA  
 MC-3020D (digital-in, option) 8 ports: relay contact, logics set from program

7.3 Junction box (IF-8530, option)

Serial IEC61162-1/2: 2 ch, IEC61162-1: 6 ch  
 Analog 16 ch (±10V, 4-20 mA)  
 Digital (a/b) 64 ch

7.4 Video signal input

Video LAN converter 2 ch (DVI/RGB selectable for each)  
 SER.NO. 100000 to 199999: RGB is not available  
 RGB VESA: VGA, SVGA, XGA, SXGA, UXGA (FAR-28x7/28x5 ser.)  
 DVI VESA: VGA to SXGA, WXGA+\*, WSXGA+, UXGA, WUXGA,  
 CEA: Full HD (FAR-28x7 ser.)  
 \*: FPGA program ver.01.03 or later and  
 SER. NO. 200991 or later for IF-7100

IEC 61162-450 For PNG (24 bit) or JPEG (baseline: SOF0, progressive: SOF2)

Number of channels for picture recording

Device	Video LAN converter IEC61162-450 PNG	IEC61162-450 JPEG	
		Quality ≥ 50	Quality < 50
Fixed/ float-free DRU or long term device (single)	UXGA: 2ch + full-HD: 1ch, Total 3ch	3ch	5ch
Long term device (dual)	UXGA: 2ch + full-HD: 1ch + WUXGA: 1ch, Total 4ch	4ch	6ch

Picture recording pattern Selectable for each channel (Only one/Patrol/Backup)

**8 POWER SUPPLY**

- 8.1 Data collecting unit 100-230 VAC: 1.6-0.7 A, 1 phase, 50/60 Hz
- 8.2 Sensor adapters 24 VDC: 1.4 A max.(11 units), fed from DCU
- 8.3 Junction box (IF-8530) 24 VDC: 0.9 A, fed from DCU
- 8.4 Video LAN converter (IF-7100, option) 24 VDC: 0.3 A (SER.NO. 100000 to 199999: 0.7 A)
- 8.5 HUB (option)
  - HUB-3000 100-230 VAC: 0.1 A, 1 phase, 50-60 Hz
  - HUB-100 100-230 VAC: 0.1 A, 1 phase, 50-60 Hz

**9 ENVIRONMENTAL CONDITIONS**

- 9.1 Ambient temperature
  - Data collecting unit -15°C to +55°C
  - Fixed DRU -25°C to +55°C
  - Float-free DRU -20°C to +55°C
  - Waterproof microphone -25°C to +55°C
  - Others -15°C to +55°C
- 9.2 Relative humidity 93% or less at +40°C
- 9.3 Degree of protection
  - Data collecting unit IP20
  - Fixed DRU IP56 equivalent
  - Float-free DRU IP67 equivalent
  - Remote alarm panel IP22 (front panel), IP20 (chassis)
  - Sensor adapter IP20 (IP22: option)
  - Junction box IP20 (IF-8530/8540), IP56 (VR-7022F)
  - Video LAN converter IP22
  - Microphone IP22 (panel), IP20 (chassis)
  - Waterproof microphone IP56
  - HUB-3000 IP20 (IP22: option)
  - HUB-100 IPX0
- 9.4 Vibration IEC 60945 Ed.4

**10 UNIT COLOR**

- 10.1 Data collecting unit N2.5 (standard)
- 10.2 Fixed DRU Fluorescent orange (fixed)
- 10.3 Float-free DRU Fluorescent orange (chassis), White (bracket)
- 10.4 Remote alarm panel/ Video LAN converter/ Sensor adapter N2.5
- 10.5 Junction box N3.0 (IF-8530, standard), N2.5 (IF-8540), 7.5BG7/2 (VR-7022F)
- 10.6 Microphone/ Waterproof microphone N2.5 (fixed)
- 10.7 HUB N2.5 (HUB-3000), N3.0 (HUB-100)