

Installation Manual Electronic Chart Display and Information System (ECDIS) FEA-2107/2107-BB/2807

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ECF

(Elemental Chlorine Free)

The paper used in this manual
is elemental chlorine free.

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• FURUNO Authorized Distributor/Dealer

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SAFETY INSTRUCTIONS

WARNING



Do not open the equipment unless totally familiar with electrical circuits and service manual.

ELECTRICAL SHOCK HAZARD

Only qualified personnel should work inside the equipment.

Turn off the power at the mains switch-board before beginning the installation.

Fire, electrical shock or serious injury can result if the power is left on or is applied while the equipment is being installed.

Do not install the monitor unit, processor unit or control unit where they may get wet from rain or water splash.

Water in the units can result in fire, electrical shock, or damage the equipment.

Be sure that the power supply is compatible with the voltage rating of the equipment.

Connection of an incorrect power supply can cause fire or damage the equipment .

Use only the specified power cable.

Fire or damage to the equipment can result if a different cable is used.

WARNING

The PCI-951/PCG820 board is equipped with a lithium battery. The lithium battery should be replaced only in the factory.

There is a danger of explosion if the wrong type of battery is used for replacement.

CAUTION



Attach securely protection earth to the ship's body.

The protection earth (grounding) is required to the AC power supply to prevent electrical shock.

Observe the following compass safe distances to prevent deviation of a magnetic compass:

	Standard compass	Steering compass
Processor Unit (EC-1000C)	1.65 m	1.05 m
LAN Adapter (EC-1010)	1.05 m	0.70 m
B Adapter (EC-1020)	0.80 m	0.50 m
Control Unit (RCU-018)	0.30 m	0.30 m
Control Unit (RCU-015)	0.95 m	0.60 m
Control Unit (RCU-016)	0.65 m	0.45 m
Monitor Unit (MU-201CE-DV15)	2.25 m	1.40 m
Monitor Unit (MU-231CE-DV15)	2.55 m	1.55 m
Monitor Unit (MU-190)	1.65 m	1.05 m
Monitor Unit (MU-231)	0.85 m	0.55 m
Switching HUB (HUB-100)	1.00 m	0.60 m

EQUIPMENT LISTS

Standard Supply

Name	Type	Code No.	Qty	Remarks
Monitor Unit	MU-201CE-DVI5	-	1	For FEA-2107, w/DVI cable (5 m), SP03-14700, CP03-29020, FP03-09810
	MU-231CE-DV15	-		For For-2807, w/DVI cable (5 m), SP03-14700, CP03-29020, FP03-09810
	MU-190	-		For FEA-2107
	MU-231	-		For FEA-2807
Processor Unit	EC-1000C	-	1	Standard type: Processor unit (EC-1000C w/S-DONGLE)
	EC-1000C-R	-		Radar Overlay type: Processor unit (EC1000C w/ S-DONGLE and ROV board)
	EC-1000C-C	-		Conning type: Processor unit (EC-1000C, w/S-DONGLE and VIDEO board)
	EC-1000C-CR	-		Conning/Radar Overlay type: Processor unit (EC-1000C, w/S-DONGLE, ROV board and VIDEO board)
Control Unit	RCU-018-E	-	1	Full keyboard type, w/CP03-25604, FP03-09850
	RCU-015FEA-E	-	1	Trackball type, w/CP03-25604, FP03-09860
LAN Adapter	EC-1010	-	1	
B Adapter	EC-1020	-	1	For EC-1000C-C and EC-1000C-CR
Spare Parts	SP03-14800	000-083-570	1	Fuses
	SP03-14700	008-549-730	1	Fuses, for AC spec.
Accessories	FP03-10700	000-087-221	1	For processor unit
	FP03-09810	008-536-010	1	For Monitor unit
	FP03-09850	008-535-610	1	For Control unit RCU-018-E
	FP03-09860	008-535-690	1	For Control unit RCU-015FEA-E
Installation Materials	CP03-29020	000-082-651	1	For Monitor unit
	CP03-29100	000-087-219	1	For EC-1000C-R Processor unit
	CP03-25604	008-539-850	1	For Control unit RCU-015/018-E
	CP03-29110	000-083-624	1	For EC-1000C-C/CR Processor unit
	CP03-29500	000-083-501	1	For EC-1000C/C-R, D-SUB cable 5 m
	CP03-29510	000-083-502	1	For EC-1000C/C-R, D-SUB cable 10 m
	CP03-29600	000-083-507	1	For EC-1000C-C/CR, D-SUB 5 m
	CP03-29610	000-083-508	1	For EC-1000C-C/CR, D-SUB 10 m

Optional Supply

Name	Type	Code No.	Qty	Remarks
LAN Adapter	EC-1010	-	1	
B Adapter	EC-1020	-	1	
Remote Control Unit	RCU-016	-	1	Remote type, w/CP03-25604, FP03-09860
Monitor Unit	MU-201CE	-	1	
Rectifier	PR-62	000-013-484	1	For 100 VAC
		000-013-487	1	For 230 VAC
Accessory	FP03-09820	008-535-560	1	For MU-201CE, hanger
	FP03-09830	008-536-020	1	For MU-231CE, hanger
Hand Grip	FP03-09840	008-535-570	1	
Dust Cover	03-163-1201	100-307-260	1	For MU-201CE
	03-163-2101	100-307-270	1	For MU-231CE
Clamp Plate	OP03-182	008-535-620	1	For RCU-018
Flush Mount Kit	FP03-09870	008-535-630	1	For RCU-018
Coupling Pedestal	OP03-183	008-535-640	1	For RCU-018
	OP03-184	008-535-650	1	For RCU-018 and MU-231CE
Flush Mount Kit	FP03-09870	008-535-630	1	For RCU-015FEA
Switching HUB	HUB-100	000-083-353	1	w/operator's manual
Installation Materials	CP03-28900	000-082-658	1	LAN cable FR-FTPC-CY 10m, CP03-28901
	CP03-28910	000-082-659	1	LAN cable FR-FTPC-CY 20m, CP03-28901
	CP03-28920	000-082-660	1	LAN cable FR-FTPC-CY 30m, CP03-28901
Cable assy	3COX-2P-6C	000-146-501	1	For external monitor (analog), 10 m
	NH8P-DSUB15BNC2-10M	000-151-857	1	For connecting with a radar
	NH8P-DSUB15BNC2-20M	000-151-858	1	
	NH8P-DSUB15BNC2-30M	000-151-859	1	
	XH8P-NH8P-L10M	000-151-855	1	For connecting Radar switch and radar
	XH8P-NH8P-L20M	000-151-933	1	
	XH8P-NH8P-L30M	000-151-934	1	
	DSUB9P-DSUB9P-L10.0M	000-150-676	1	Between Monitor/Processor unit
	MOD-Z072-100+	000-167-177-10	1	LAN cable (cross)
	MOD-Z072-020+	000-167-175-10	1	
	XH10P-DS-5P L=2.3M	000-150-001	1	For Control unit
	XH10P-DS-5P L=20M	000-149-745	1	
XH10P-DS-5P L=30M	000-149-746	1		
VIDEO PCB	G45FMDVP32DBF	000-165-667-10	1	Conning Board
ROV PCB	301074	000-150-680	1	Radar Overlay Board
Radar Switch	CP03-29501	008-544-940	1	For 12 VDC, for EC-1000C-R/CR
	CP03-29502	008-544-950		For 24 VDC, for EC-1000C-R/CR

SYSTEM CONFIGURATIONS

The ECDIS EC1000 Workstation displays electronic seachart and operates as user interface for the system. The ECDIS processor is connected to various sensors, and performs navigation calculations and route monitoring. Connections to interfaces are typically made with a LAN (Local Area Network) Adapter. The ECDIS processor can be used for both route planning and route monitoring. If required, there can be additional identical ECDIS EC1000C Workstation(s) connected to the same LAN to share the tasks of the ECDIS. If the system incorporates more than one ECDIS EC1000C Workstation, one or more workstation(s) can be used as a user interface (with “full” usage rights) and one or more workstation(s) may be used as planning stations (usage rights as “planning”). If the system has two or more Workstations connected together as multi-workstations, the system keeps data on the workstations harmonised and also tracks selections and settings made on any workstation.

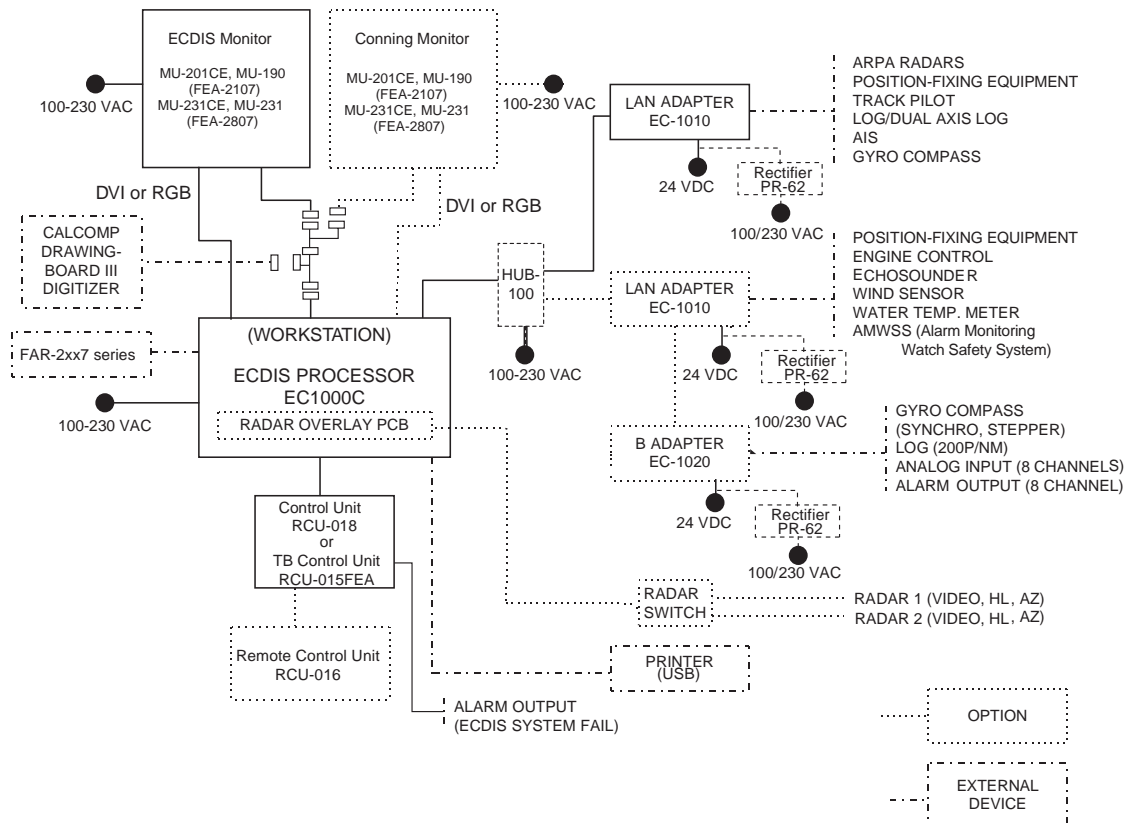
Typically there can be the following kinds of workstation configuration:

Mode as **Single**, only one workstation is used in the system.

Mode as **Multi**, two or more workstations are used in the system where usage rights and sensor source of workstations can be changed by the user.

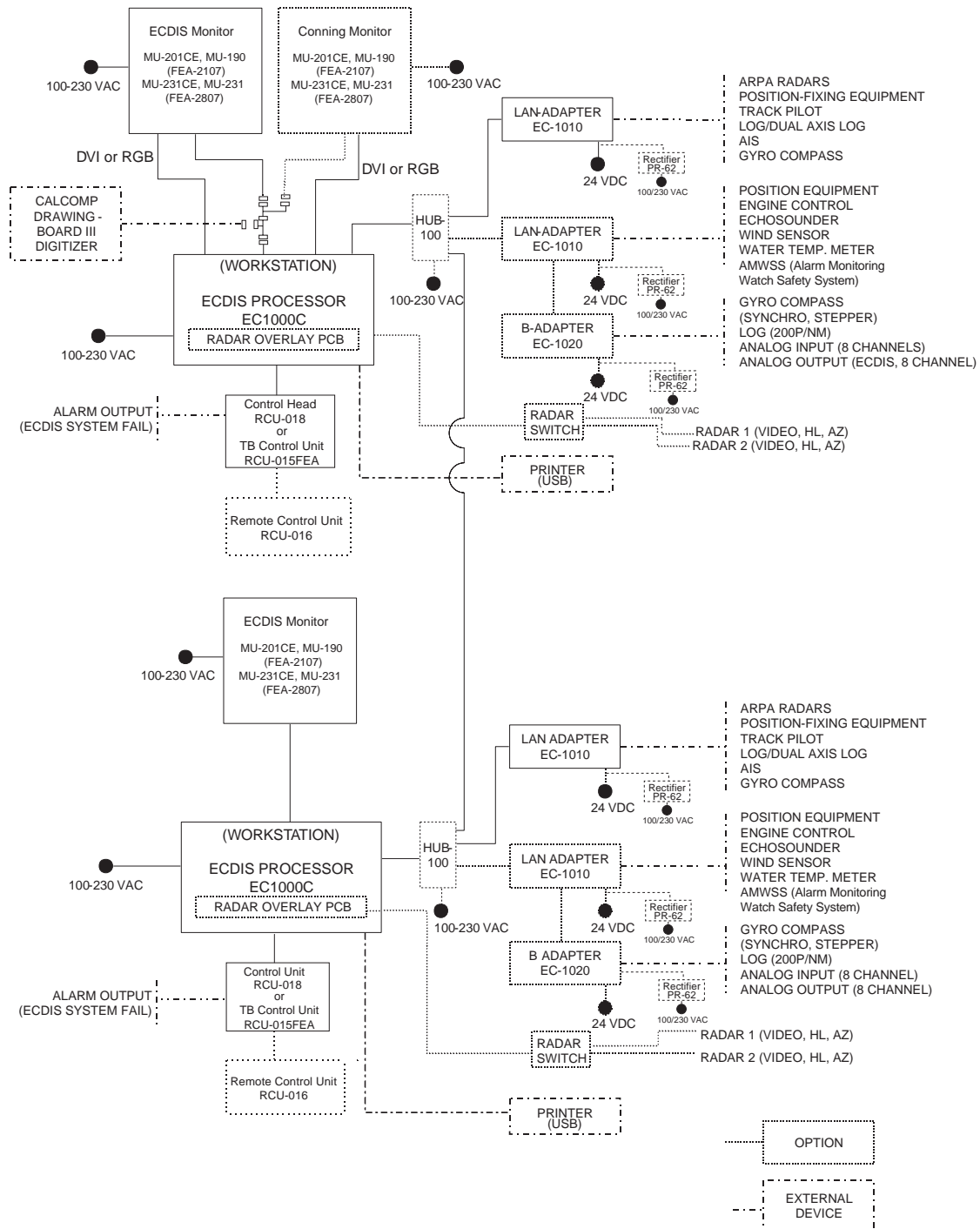
For more information, see the operator’s manual.

One workstation



Multi-workstation configuration

In the multiple workstation configuration, there can be two workstations connected together by a Local Area Network (LAN). In this configuration, one workstation is used as the “sensor source” for navigation sensors and the other workstation(s) are using the sensor source workstation to communicate with sensors, receiving and transmitting data from/to workstation via the LAN. In the multi-workstation configuration (two fully redundant navigation workstations), where navigation sensors are connected to two workstations, the sensor source may be changed and still receive and transmit information from/to the system and to/from navigation sensors. User-defined workstation is responsible for sensors.



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1. MOUNTING

1.1 Monitor Unit

The monitor unit can be flush mounted in a console panel, or mounted on a desktop using the optional accessories. For MU-190/231, see the applicable Operator's Manual(s).

Mounting considerations

When selecting a mounting location, keep in mind the following points:

- Select a location where the display unit can be viewed conveniently and where the screen can be viewed while facing towards the bow.
- Locate the unit out of direct sunlight and away from heat sources because of heat that can build up inside the cabinet.
- Locate the equipment away from places subject to water splash and rain.
- Leave sufficient space on the sides and rear of the unit to facilitate maintenance.
- A magnetic compass will be affected if the monitor unit is placed too close to the magnetic compass. Observe the compass safe distances on page ii to prevent deviation of a magnetic compass.

Installation for TCS

- **TCS with separate Conning Display:** To fulfill this requirement, certain installations may require 21" monitor and separate Conning display.
- **TCS without separate Conning Display (Single screen ECDIS):** Require that certain TCS related data is available in main Conning position of the vessel. To fulfill this requirement, certain installations may require large 23" monitor alternative for single screen installation. The viewing distance from main Conning position to installation place of single screen ECDIS are 120 cm (MU-231CE) and 108 cm (MU-201CE). In this mode, TCS related data fields should always be displayed. To prevent this fields obscured by other popular operational dialogs, set dialog box to open next to left of sidebar. See "3.3.3 Activating dialog boxes on the display" in Operator's Manual.

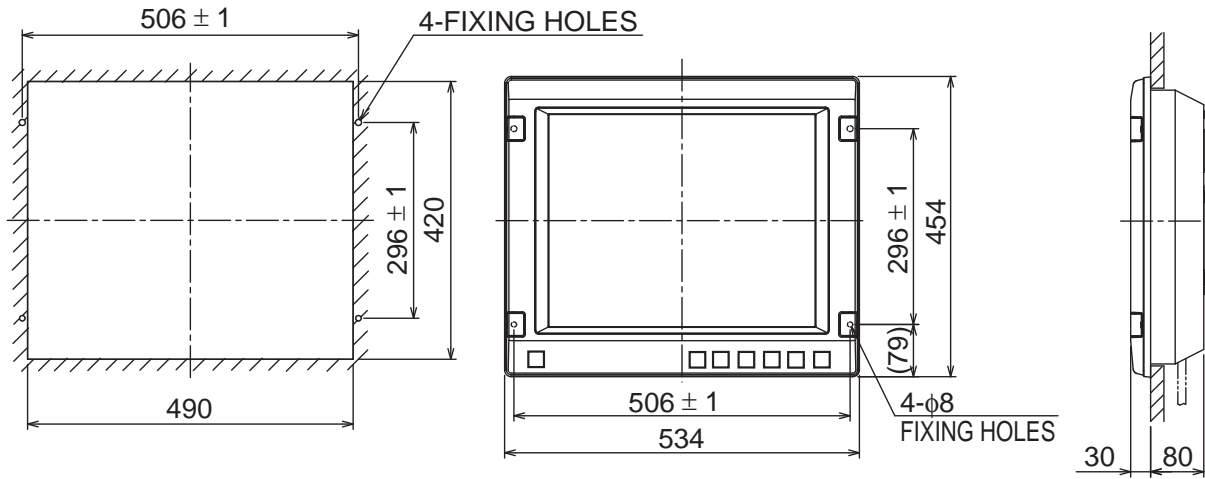
Mounting procedure

Flush mounting

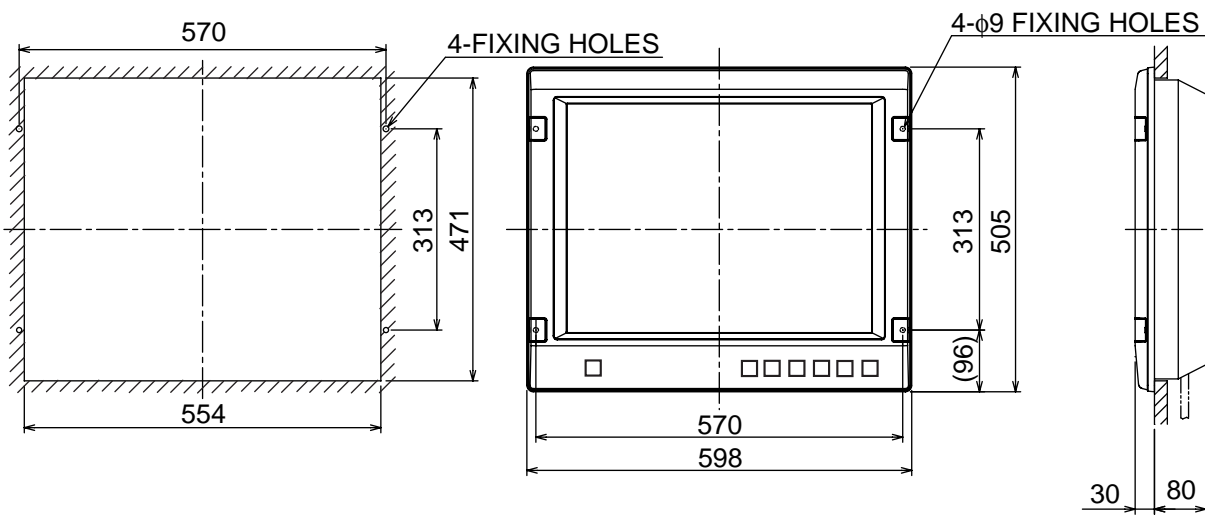
Follow the procedure below to mount the monitor unit in a console panel.

1. Make cutout in mounting location referring to the outline drawing shown on the next page.
2. Insert the monitor unit to the hole and fix it by four self-tapping screws (6x30).
3. Attach panel hooks near the fixing holes. These are used to pull out the monitor unit from a console panel for servicing.
4. Attach four panel covers to the fixing holes.

1. MOUNTING

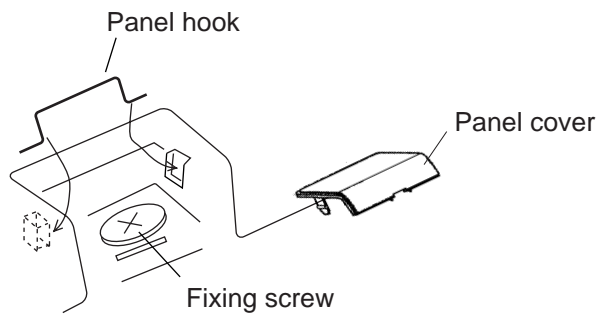


Monitor unit MU-201CE



Monitor unit MU-231CE

Flush mounting of monitor unit



Attaching panel hook and panel cover

Note: If you need to remove the monitor unit from the panel, remove the four panel covers with your fingernail and use two panel hooks supplied as accessories to lift the monitor unit.

Desktop mounting

Use the optional accessories to mount the monitor unit on a desktop.

- Necessary parts

For MU-201CE: FP03-09820 (Code No.: 008-535-560)

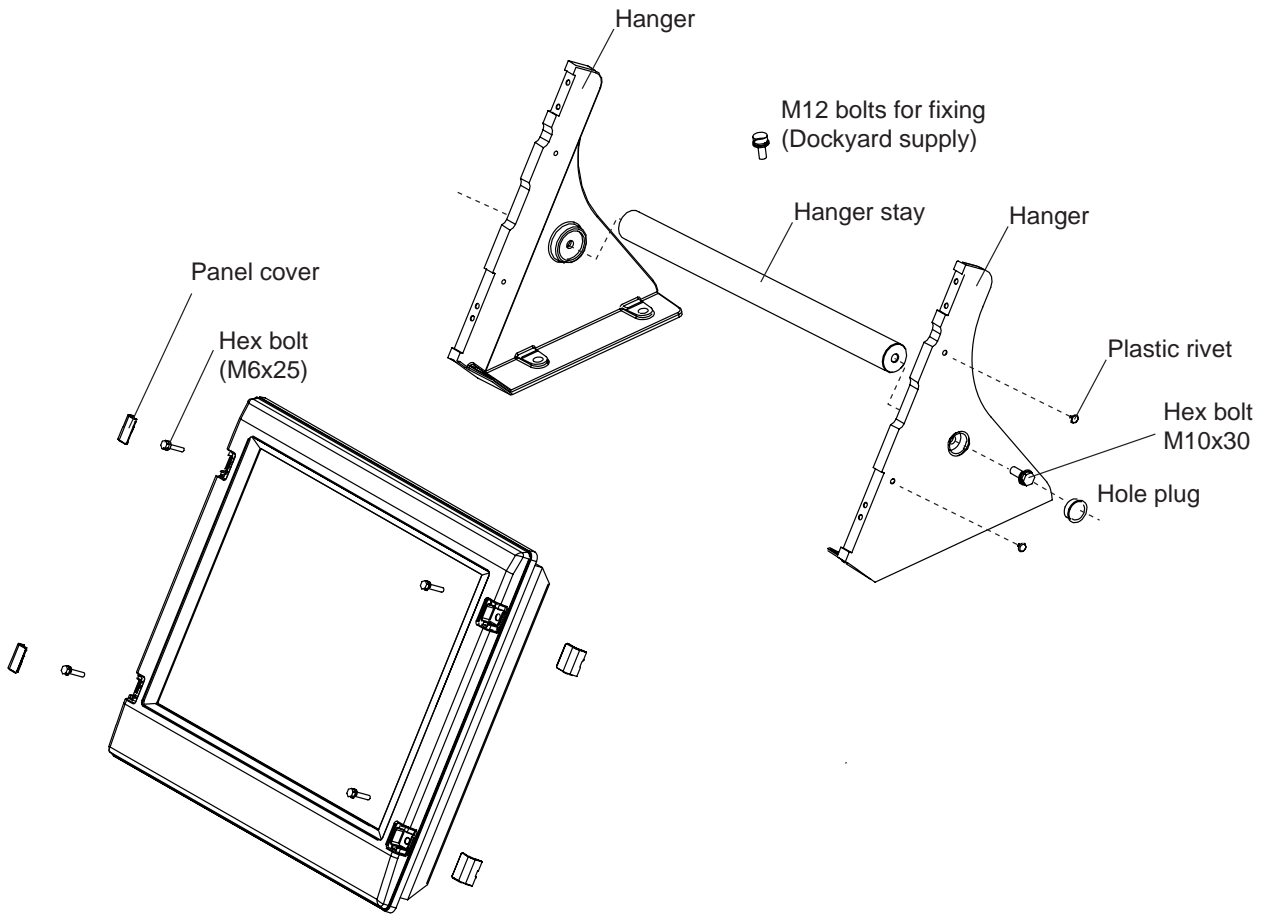
For MU-231CE: FP03-09830 (Code No.: 008-536-020)

Contents of FP03-09820/09830

Name	Type	Code No.	Qty	Remarks
Hanger L	03-163-1111-0	100-305-140	1	
Hanger R	03-163-1112-0	100-305-180	1	
Hanger stay	03-163-1113	100-305-370	1	For MU-201CE
	03-163-2071	100-305-370	1	For MU-231CE
Hole plug	CP-30-HP-13	000-147-143	2	
Plastic rivet	KB-13 Rivet Black	000-570-276	4	
Hex. bolt	M6x25	000-802-771	4	
Hex. bolt	M10x30	000-802-182	2	
Spring washer	M10	000-864-261	2	
Flat washer	M10	000-864-131	2	

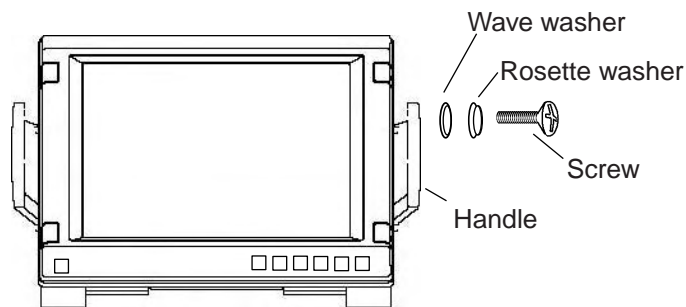
1. Assemble two hangers and hanger stay with two hex bolts (M10x30), flat washers and spring washers and cover each hex bolt with hole plug.
2. Fix the above assembly to the mounting location with four hex bolts (M12, dockyard supply).
3. Fasten the monitor unit to the mounting hanger assembly with four hex bolts (M6x25, supplied).
4. Cover each hex bolt with a panel cover.
5. Cover each hole for hand grip with a plastic rivet (4 pcs).

1. MOUNTING



Monitor Unit

The hand grip is optionally available for the desktop mounting.



Monitor unit, attaching hand grip

1.2 Control Unit

The control unit may be mounted on a desktop, with or without the KB fixing metal (supplied), which mounts the control unit at an angle.

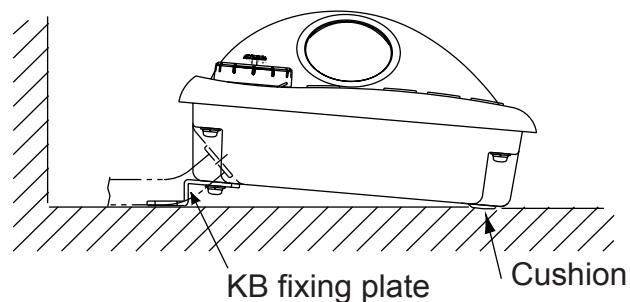
Mounting considerations

When selecting a mounting location, keep in mind the following points:

- Select a location where the control unit can be operated conveniently.
- Locate the unit away from heat sources because of heat that can build up inside the cabinet.
- Locate the equipment away from places subject to water splash and rain.
- Determine the mounting location considering the length of the signal cable between the control unit and the processor unit. (The length of the signal cable is 10/20/30 m).
- A magnetic compass will be affected if the control unit is placed too close to the magnetic compass. Observe the compass safe distances on page ii to prevent deviation of a magnetic compass.

Fixing without KB fixing plate

1. Fix the KB fixing plate to the rear panel of the control unit.
2. Attach cushions (three for RCU-018, two for RCU-015FEA) to the bottom of the control unit as shown below.
3. Fix it to a desired location with self-tapping screws.

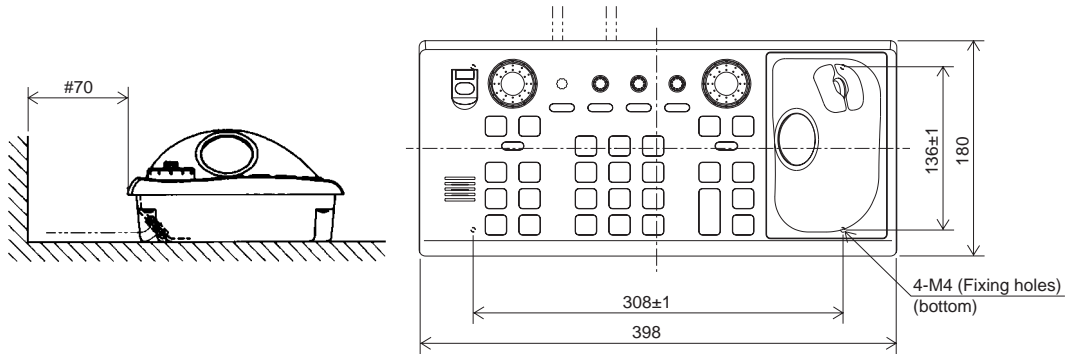


RCU-018/0RCU-15FEA, side view

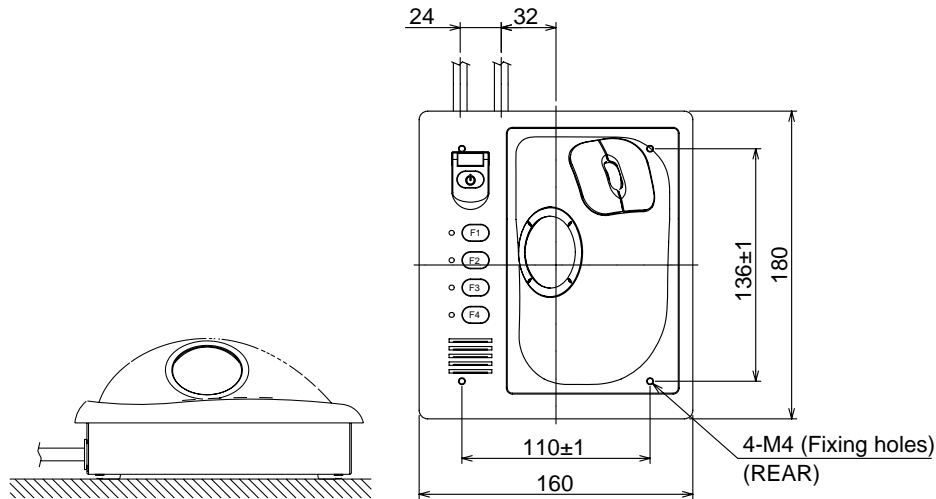
1. MOUNTING

Fixing without KB fixing metal

1. Drill four mounting holes of 5 mm diameter referring to the outline drawing at the back of this manual.
2. Fix the control unit with four screws (M4) from under side of the desktop. (The M4 screws with a sufficient length for the thickness of the desktop should be provided locally.)



RCU-018



RCU-015FEA/16

Flush mounting

Use the optional flush mount kit FP03-09870 to mount the control unit RCU-018/015FEA and/or RCU-016 to a console panel.

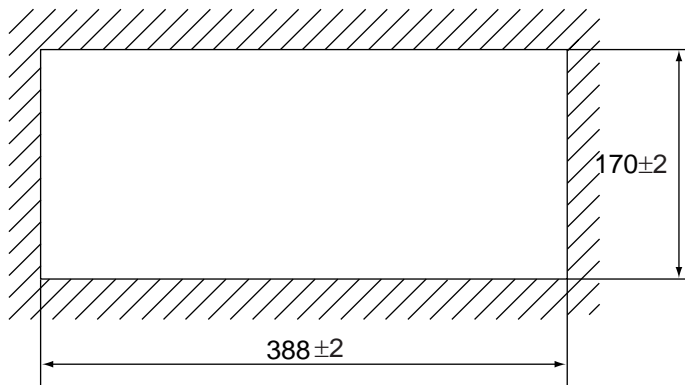
Name: Flush mount kit

Type: FP03-09870

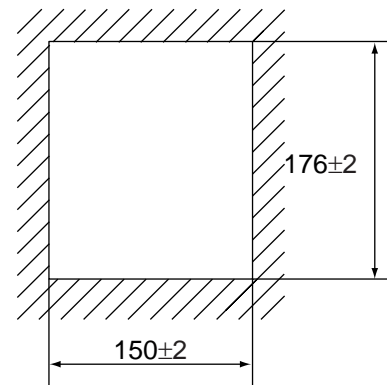
Code No.: 008-535-630

No.	Name	Type	Code No.	Qty
1	Mount plate	03-163-7531	100-306-260	4
2	Hex. nut	M5	000-863-206	4
3	Wing screw	M5x40	008-047-990	4

1. Prepare a cutout in the mounting location as shown in the figure below.

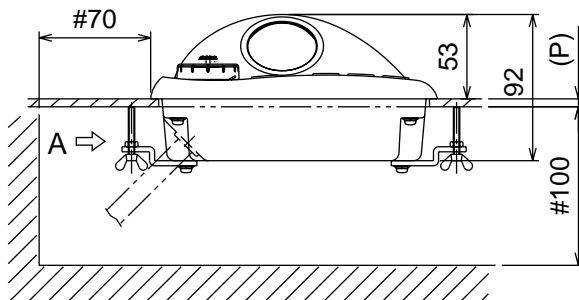


For RCU-018

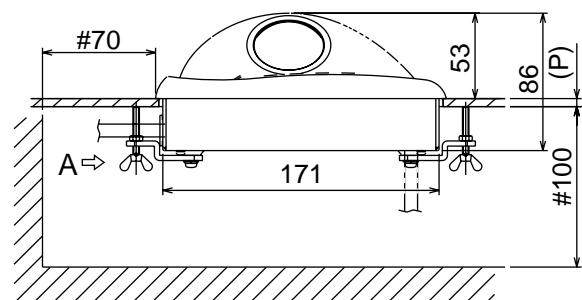


For RCU-015FEA/16

2. Set the control unit to the cutout.
3. Screw four wing bolts into hex. nuts.
4. Screw the above wing bolts into mounting plates.
5. Attach the mounting plate to the control unit with four screws (M4x12, supplied with the control unit) from the bottom side.
6. Fasten four wing screws, and then fasten hex. nuts to fix four wing screws.



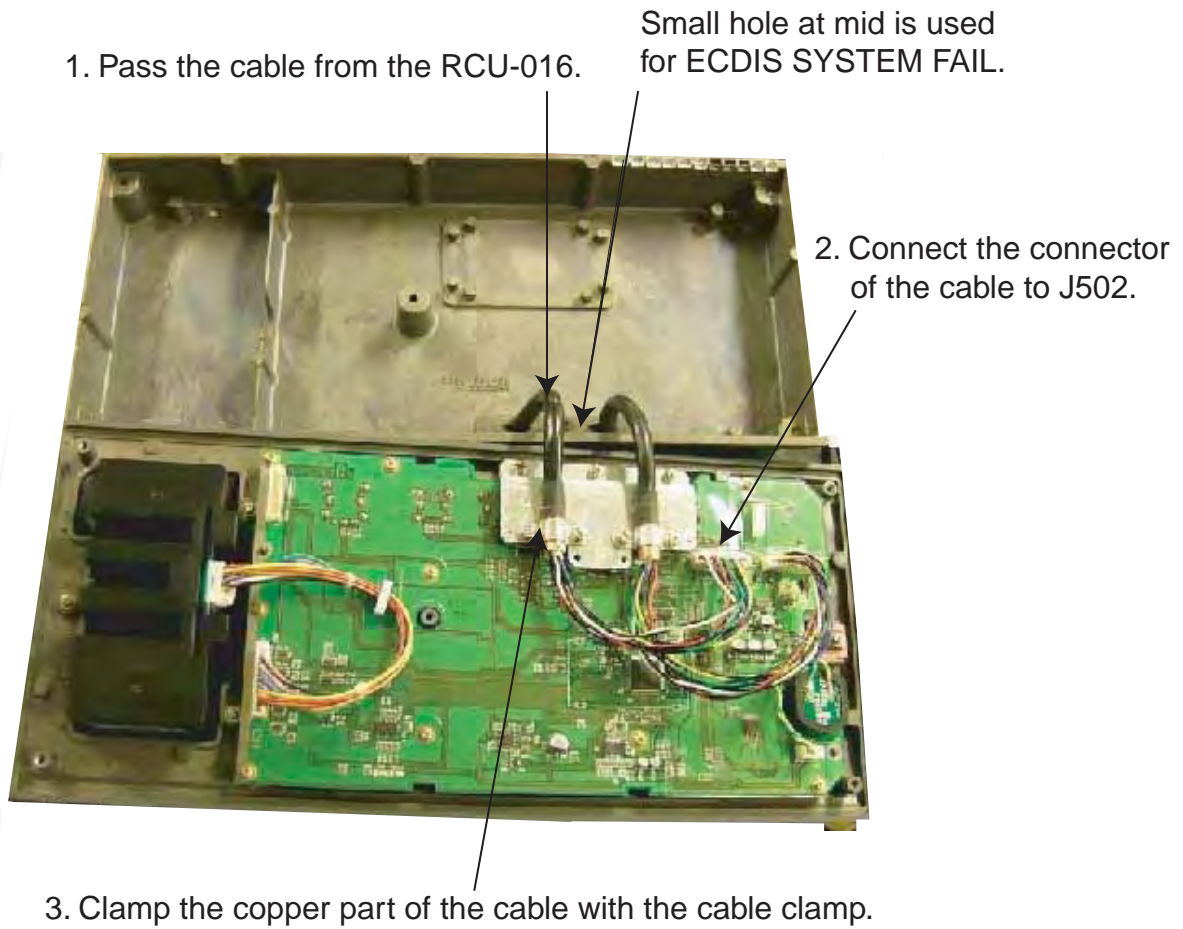
RCU-018



RCU-015FEA/RCU-16

1. MOUNTING

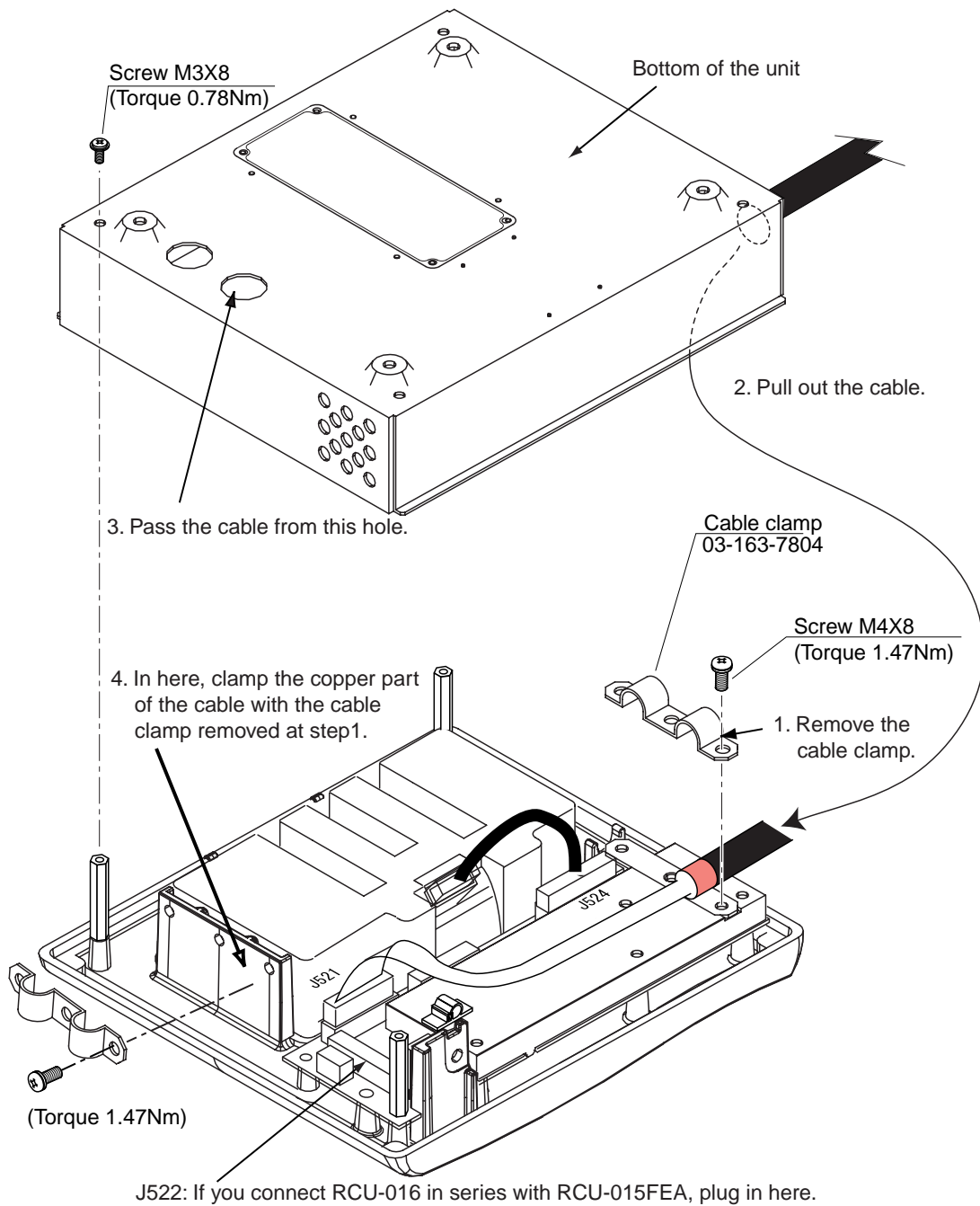
To connect RCU-016 in series with RCU-018



Inside of RCU-018

To change the cable entry

To change the cable entry from the side (default) to the bottom, modify the unit as shown below.



RCU-015FEA/RCU-016, Changing cable entry

1.3 Processor Unit

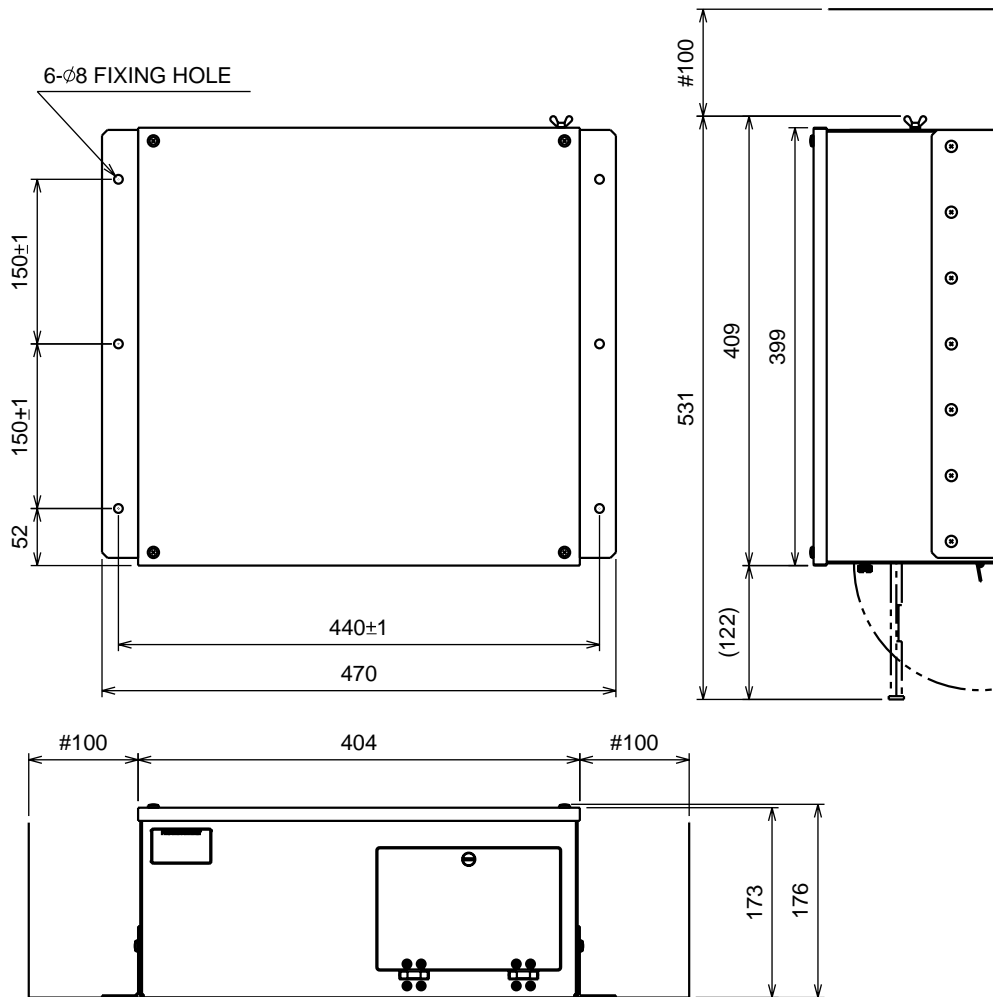
Mounting considerations

When selecting a mounting location, keep in mind the following points:

- Locate the processor unit away from heat sources because of heat that can build up inside the cabinet.
- The vibration at the mounting location should be minimum.
- Locate the equipment away from places subject to water splash and rain.
- Leave sufficient space at the sides and rear of the unit to facilitate maintenance.
- A magnetic compass will be affected if the processor unit is placed too close to the magnetic compass. Observe the compass safe distances on page ii to prevent deviation of a magnetic compass.

Mounting procedure

1. Attach two mounting plates to the processor unit with 14 screws (M4X8, supplied).
2. Fix the unit with four M6 bolts, or self-tapping screws (local supply).



Processor unit

1.4 LAN Adapter/B Adapter

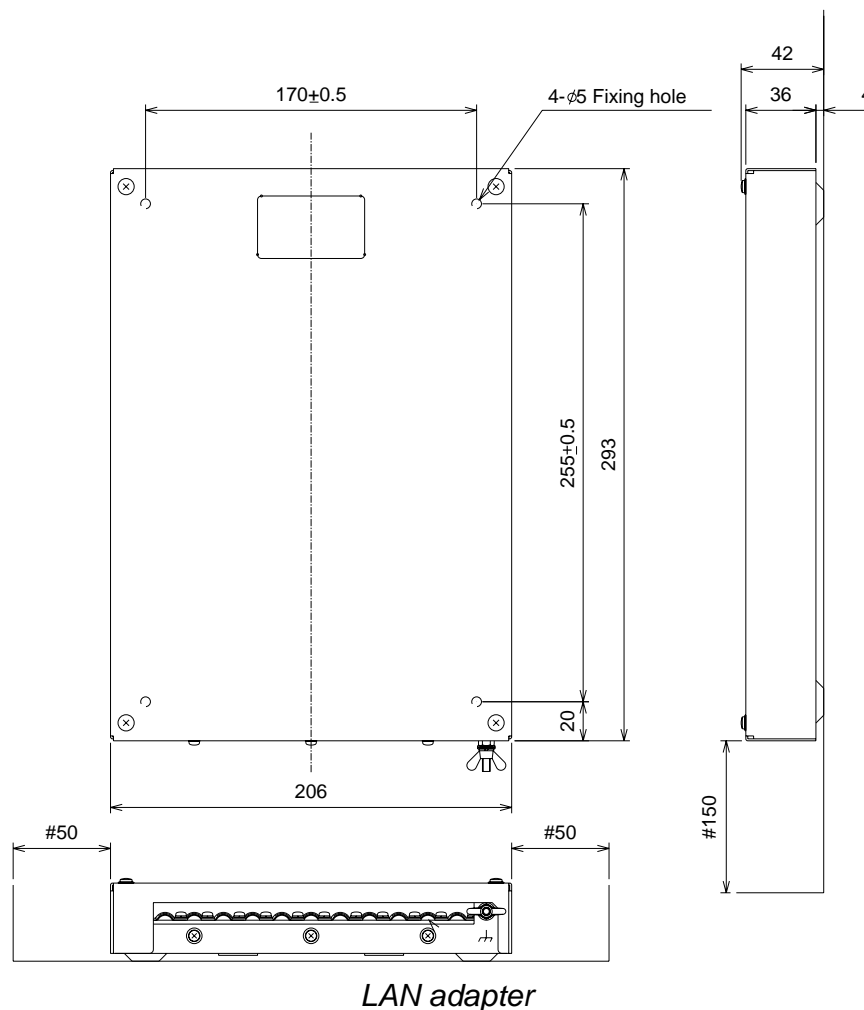
Mounting considerations

When selecting a mounting location, keep in mind the following points:

- Locate the adapter away from heat sources because of heat that can build up inside the cabinet.
- The vibration should be minimal.
- Locate the equipment away from places subject to water splash and rain.
- Leave sufficient space at the sides and rear of the unit to facilitate maintenance.
- A magnetic compass will be affected if the adapter is placed too close to the magnetic compass. Observe the compass safe distances on page ii to prevent deviation of a magnetic compass.

LAN adapter

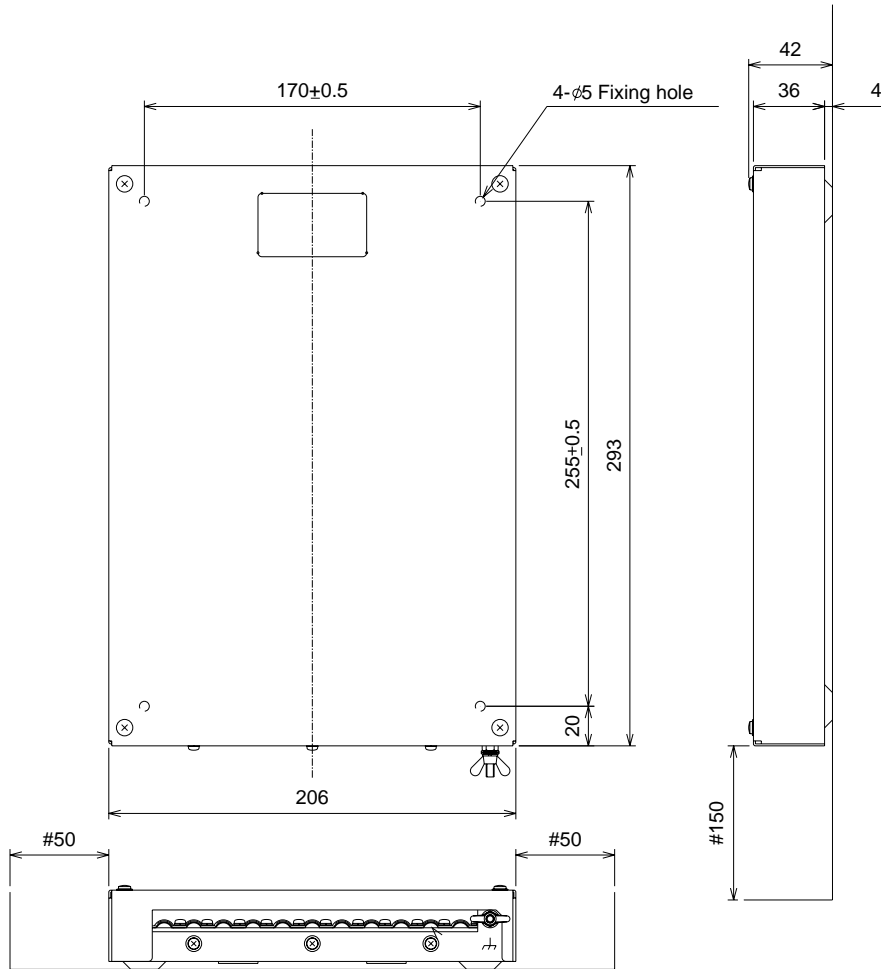
1. Unfasten a pan head screw to remove the cover from the LAN adapter.
2. Fasten four self-tapping screws (M3) to fix the LAN adapter to the mounting location.
3. Reattach the cover.



1. MOUNTING

B adapter

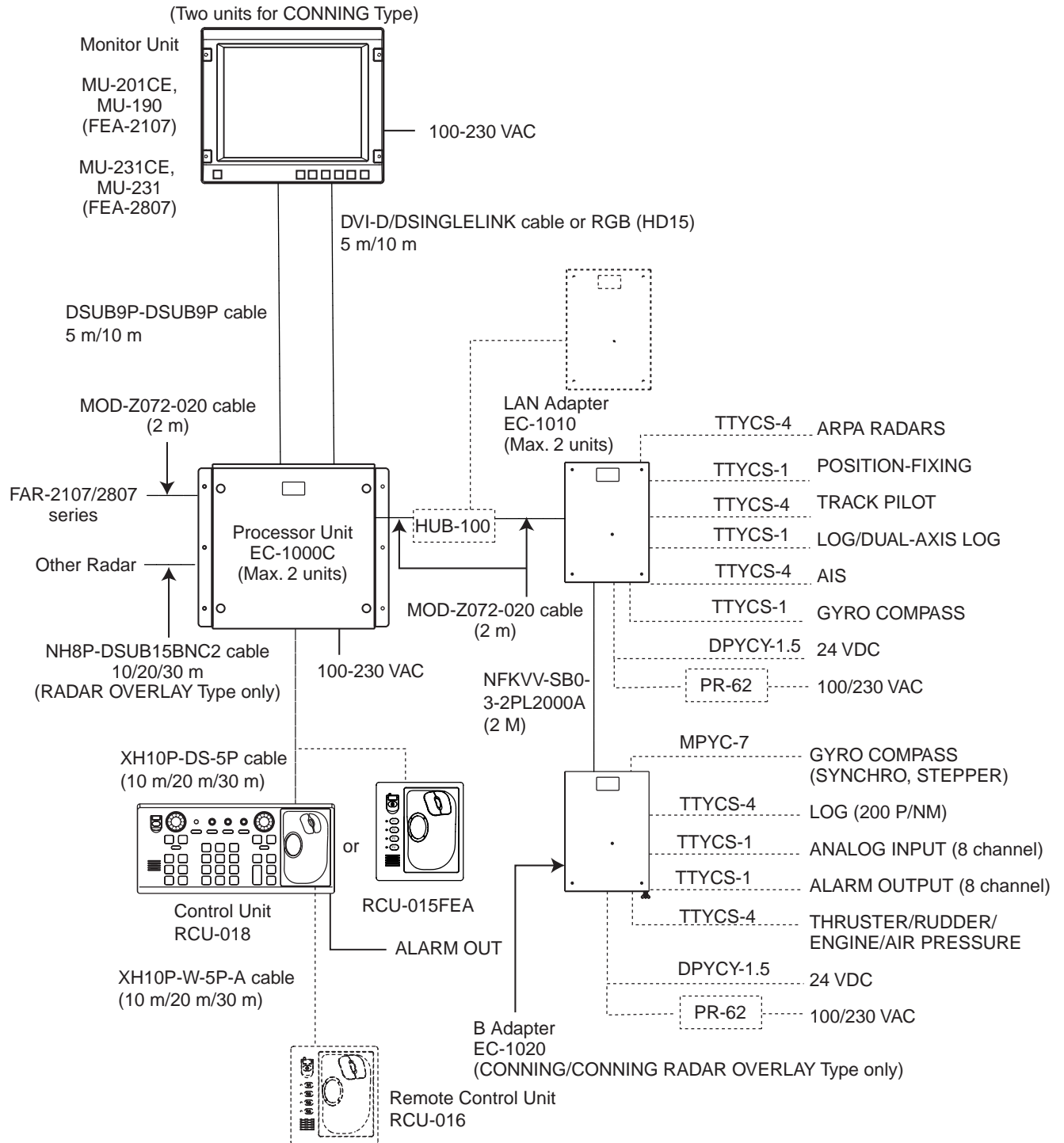
1. Unfasten a pan head screw to remove the cover from the B adapter.
2. Remove six pan head screws to remove the ADAPTER B Board (220615)
3. Fasten three self-tapping screws (M3) to fix the LAN adapter to the mounting location.
4. Reattach the cover.

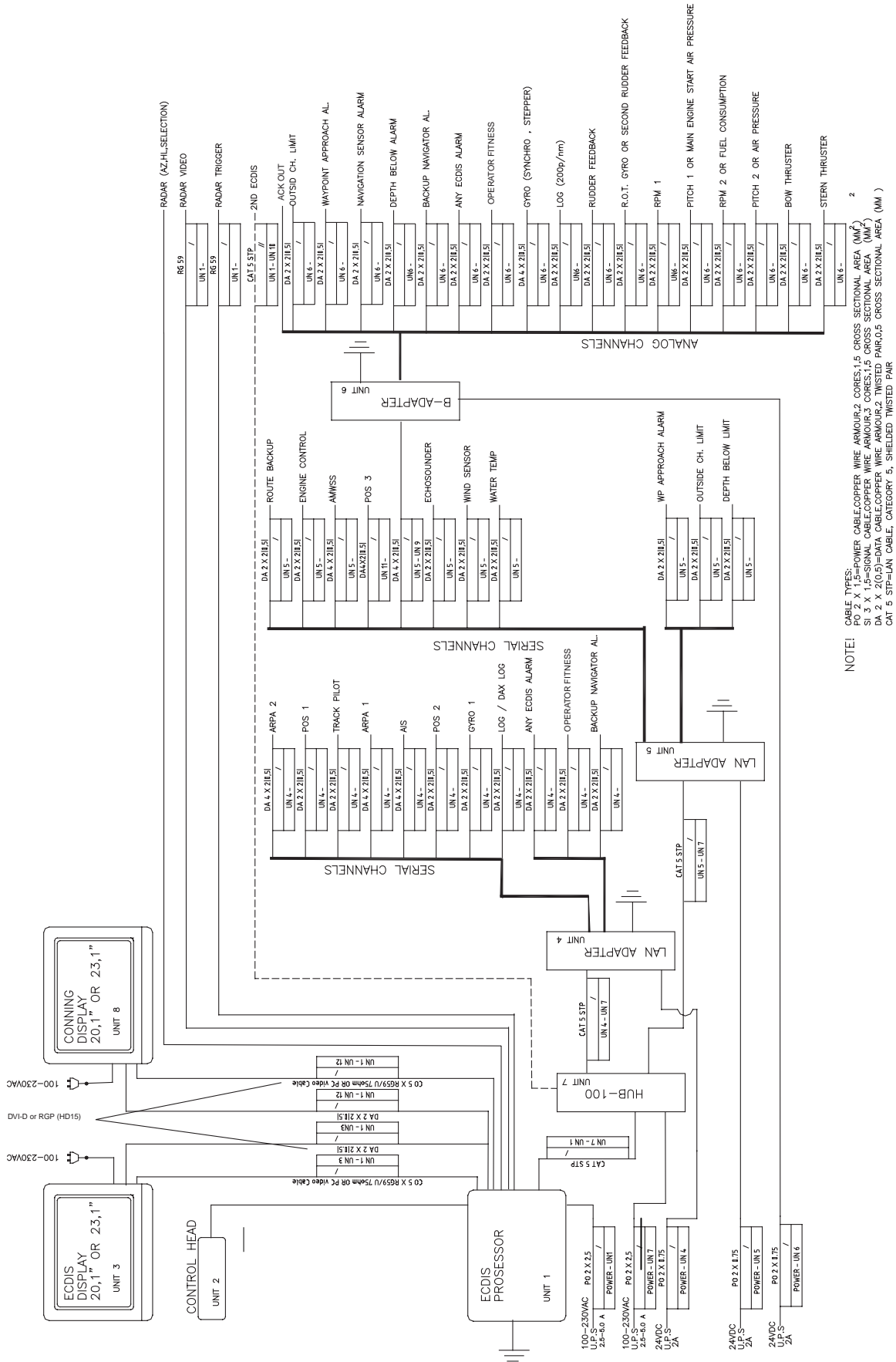


B adapter

2. WIRING

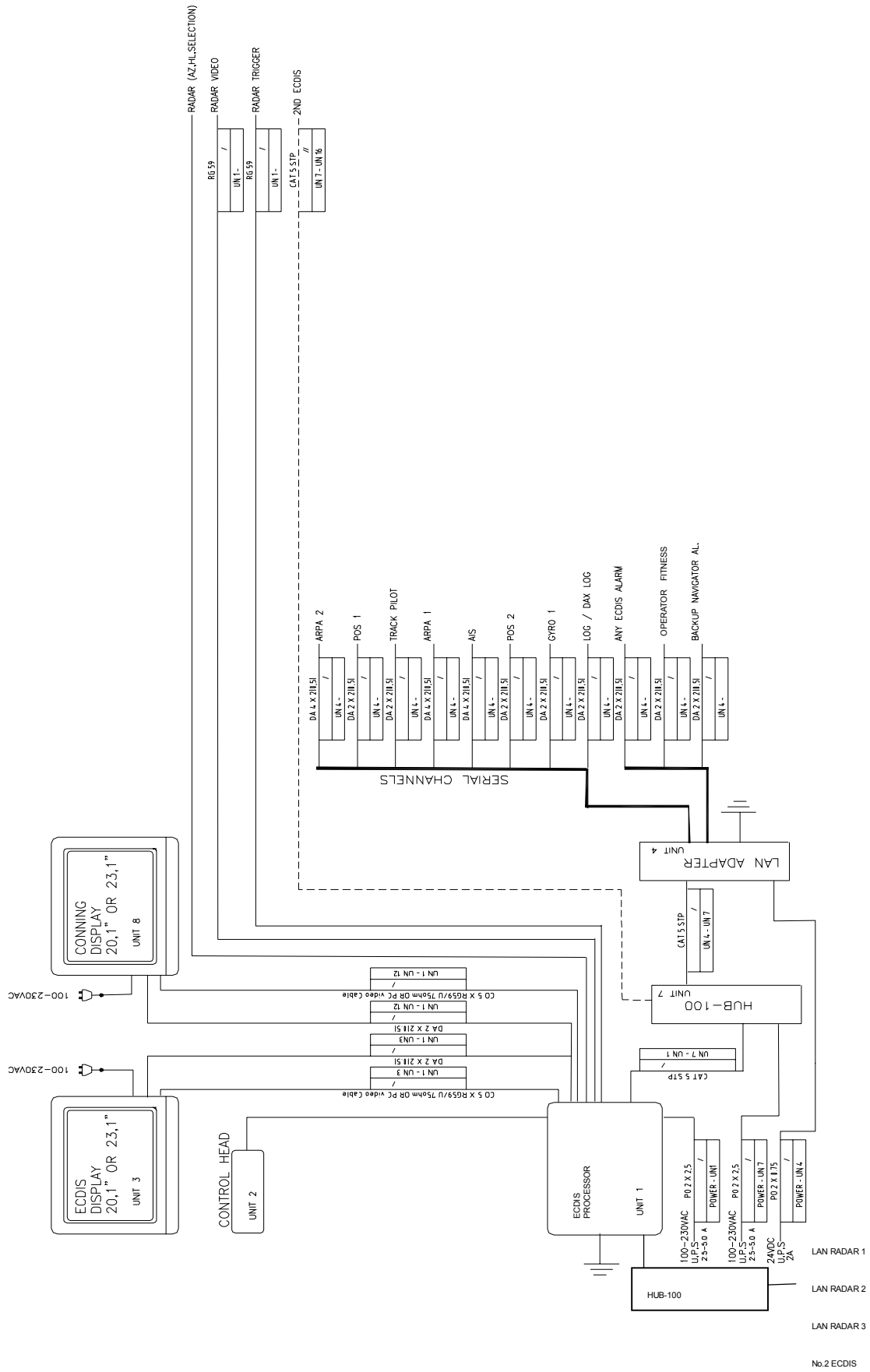
2.1 Wiring





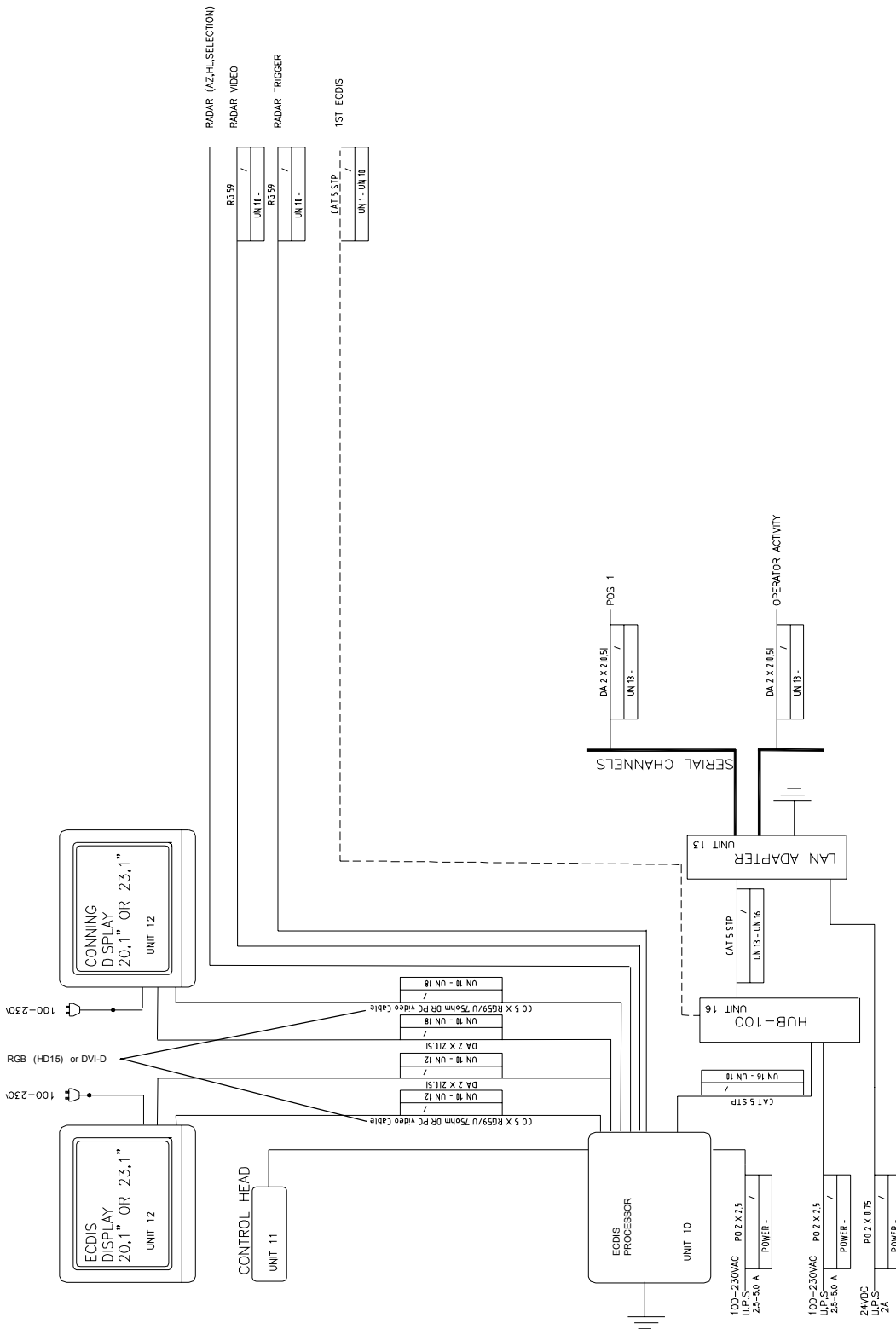
Typical wiring of ECDIS

2. WIRING



Wiring of 1st ECDIS (One LAN adapter)

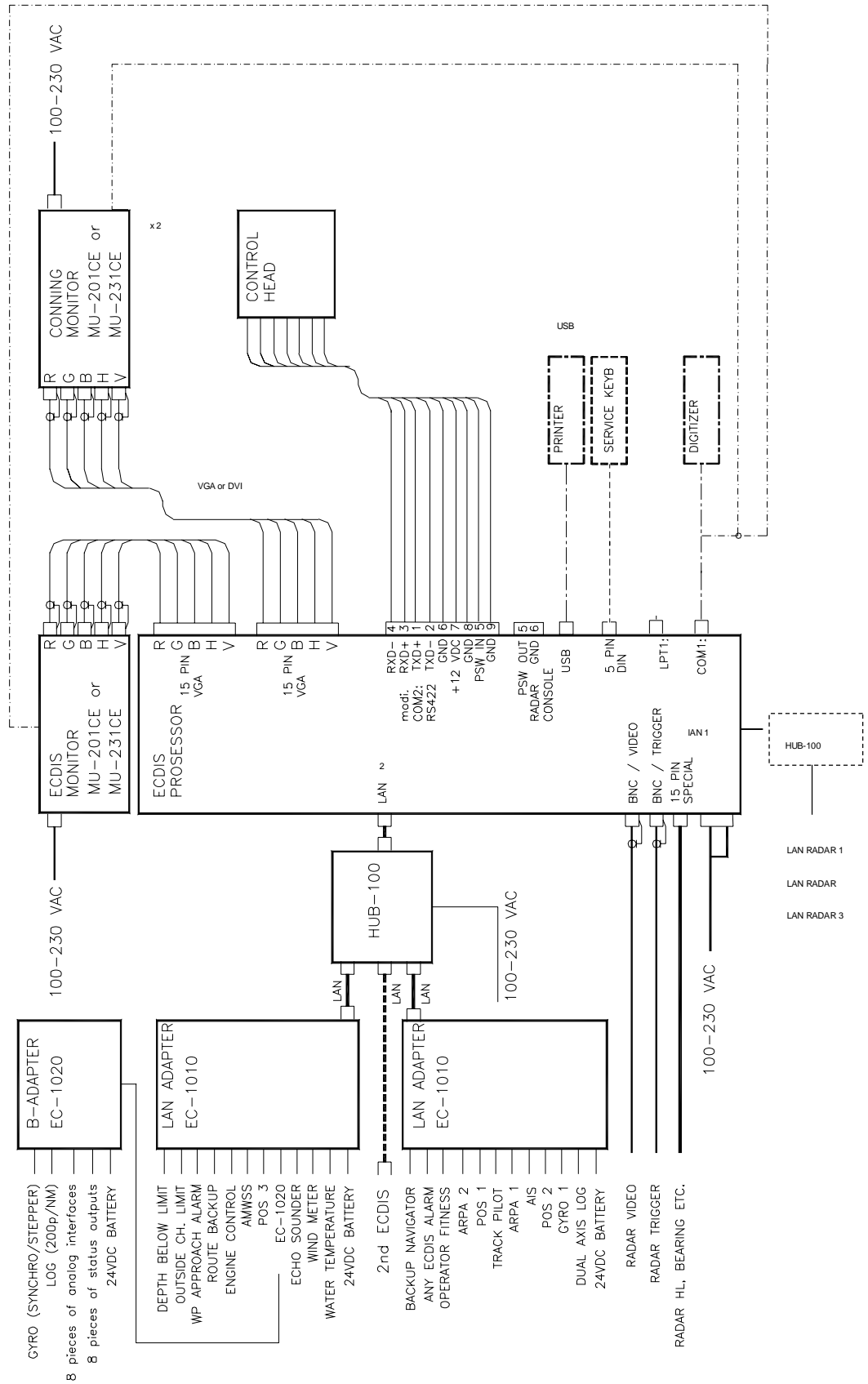
NOTE: CABLE TYPES:
 PO 2 X 1.5=POWER CABLE,COPPER WIRE ARMOUR,2 CORES,1.5 CROSS SECTIONAL AREA (MM²)
 SI 3 X 1.5=SIGNAL CABLE,COPPER WIRE ARMOUR,3 CORES,1.5 CROSS SECTIONAL AREA (MM²)
 DA 2 X 2(0.5)=DATA CABLE,COPPER WIRE ARMOUR,2 TWISTED PAIR,0.5 CROSS SECTIONAL AREA (MM²)
 CAT 5 STP=LAN CABLE, CATEGORY 5, SHIELDED TWISTED PAIR



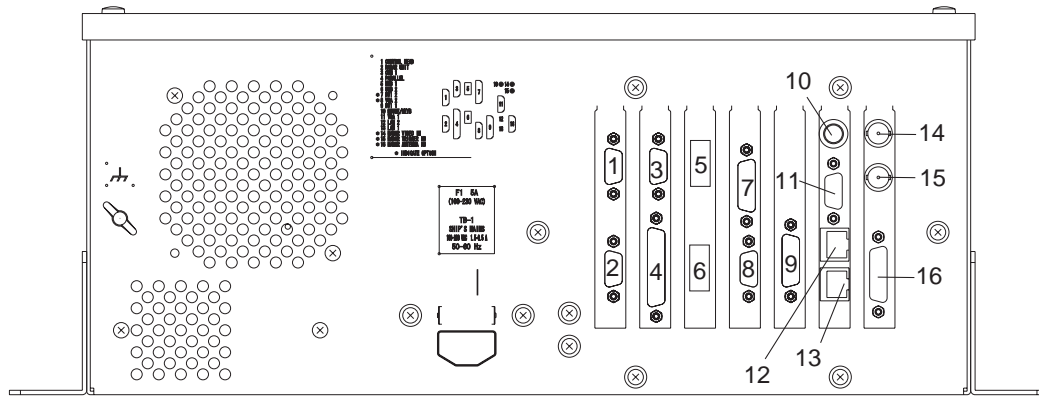
NOTE! CABLE TYPES:
 PO 2 X 1,5=POWER WIRE ARMOUR,2 CORES,1,5 CROSS SECTIONAL AREA (MM²)
 SI 3 X 1,5=SIGNAL CABLE,COPPER WIRE ARMOUR,3 CORES,1,5 CROSS SECTIONAL AREA (MM²)
 DA 2 X 2(O,5)=DATA CABLE,COPPER WIRE ARMOUR,2 TWISTED PAIR,0,5 CROSS SECTIONAL AREA (MM)
 CAT 5 STP=LAN CABLE, CATEGORY 5, SHIELDED TWISTED PAIR

Wiring of 2nd ECDIS (backup ECDIS)

2.2 Processor Unit



Processor unit



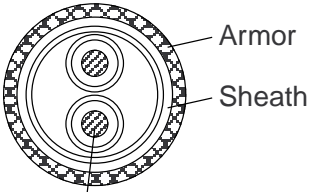
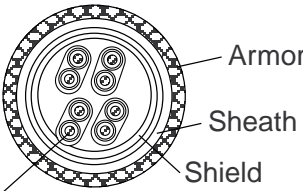
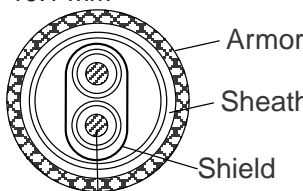
- | | | | |
|---|---------------------|-----------------|-------------------------------|
| 1: CONTROL HEAD | 5: USB 1 | 9: DV1 | 13: LAN 1 |
| 2: RADAR UNIT
(for chart radar only) | 6: USB 2 or nothing | 10: MOUSE/KEYB. | 14: RADAR VIDEO IN (option) |
| 3: COM 1 | 7: DVI 2 (option) | 11: VGA 1 | 15: RADAR TRIGGER IN (option) |
| 4: PARALLEL | 8: VGA 2 (option) | 12: LAN 2 | 16: RADAR ANTENNA IN (option) |

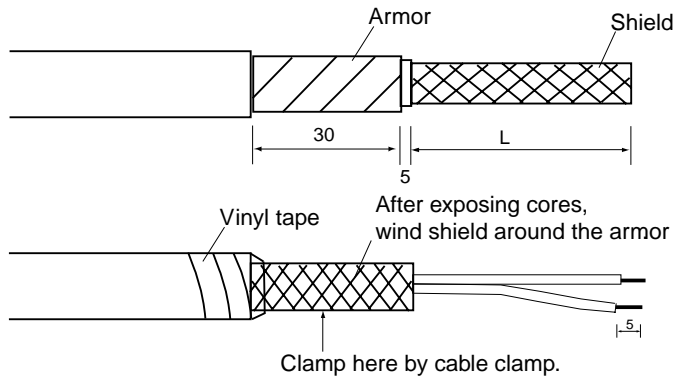
Processor unit, rear view

2.3 LAN Adapter

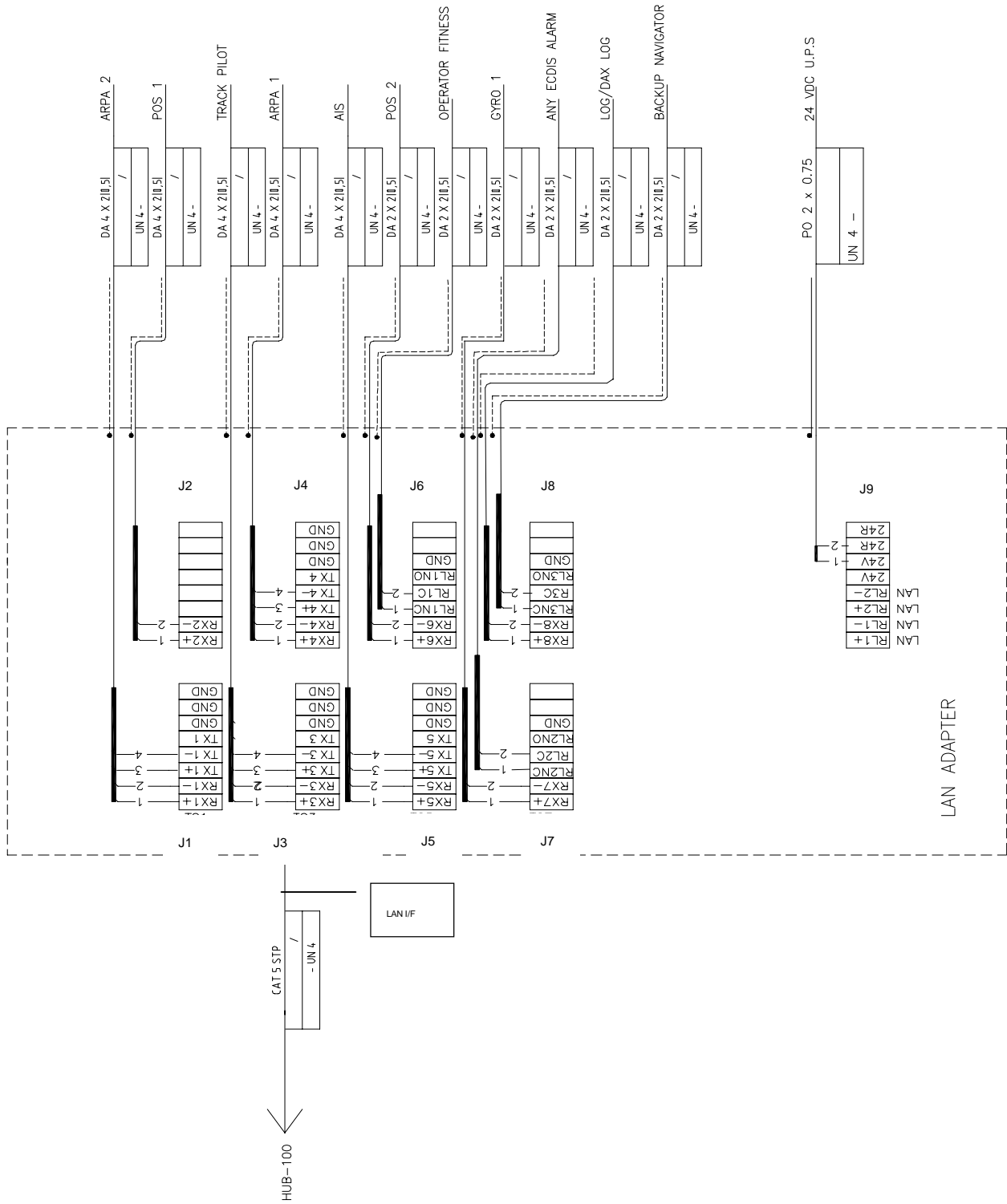
2.3.1 Cables fabrication for the cables connected to the LAN adapter

Use the following JIS (Japanese Industrial Standards) cables or equivalent. When using the TTYCS-4 cable, connect the appropriate cable to it to pass the cable entrance of the adapter.

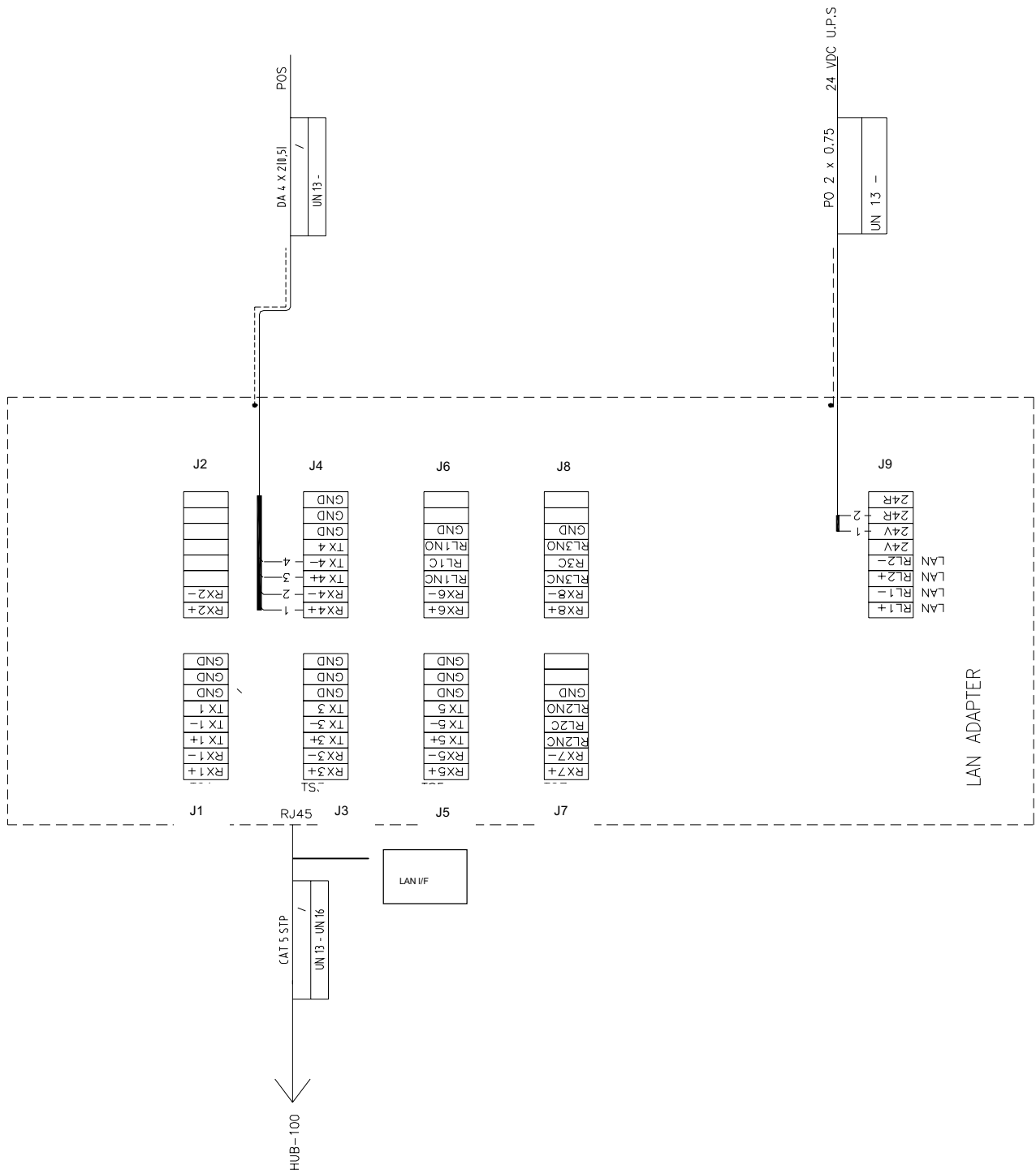
$\phi = 11.7 \text{ mm}$  Armor Sheath Conductor $S = 1.5 \text{ mm}^2$ $\phi = 1.56 \text{ mm}$	$\phi = 16.3 \text{ mm}$  Armor Sheath Shield Conductor $S = 0.75 \text{ mm}^2$ $\phi = 1.11 \text{ mm}$	$\phi = 10.1 \text{ mm}$  Armor Sheath Shield Conductor $S = 0.75 \text{ mm}^2$ $\phi = 1.11 \text{ mm}$
DPYC-1.5	TTYCS-4 (Four twisted pairs)	TTYCS-1 (Twisted pair cable)



L= Depends on equipment connected. Measure at the processor unit.

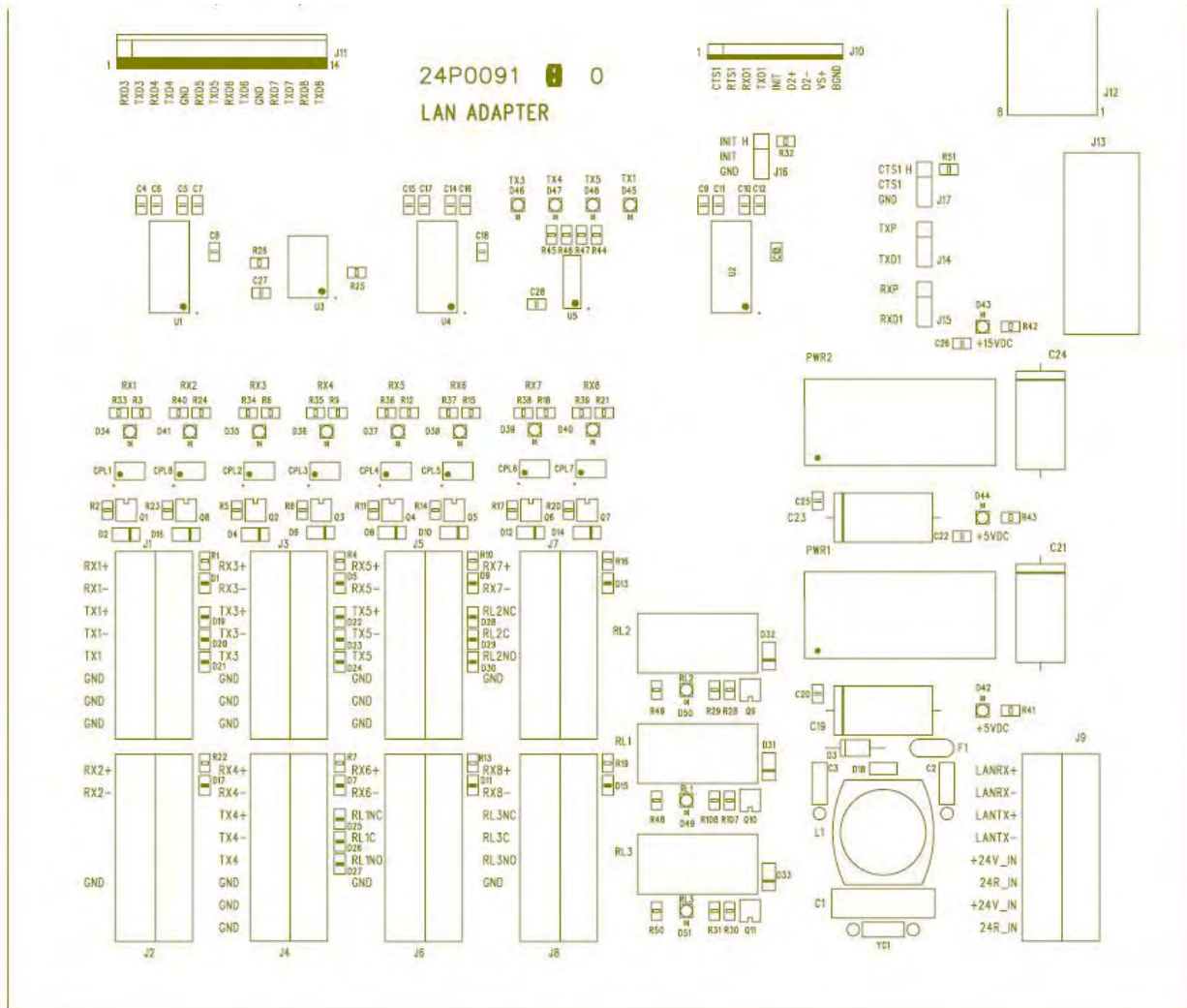


LAN Adapter (1st)



LAN-Adapter as Planning / Backup Station (only one position receiver connected)

2. WIRING



Connectors on LAN-Adapter

2.3.2 Serial data channels in general

An example of serial channel (here channel 1)

RX1+	Input terminals for electrical standards IEC 61162-1, RS-232 and RS-422.
RX1-	“RX+” and “RX-“ may be defined as “RX-A” and “RX-B” in IEC 61162-1.
TX1+	Output terminals for electrical standards IEC 61162-1 and RS-422.
TX1-	“TX+” and “TX-“ may be defined as “TX-A” and “TX-B” in IEC 61162-1.
TX1	Output terminals for electrical standard RS-232C
GND	Ground terminal for RS-232C

2.3.3 Standard serial data channel assignment

First LAN adapter

Channel	Type	bit/s	Default use
1	rx/tx	4800	ARPA2
2	rx	4800	Pos1
3	rx/tx	4800	Track pilot
4	rx/tx	4800	ARPA1
5	rx/tx	38400	AIS
6	rx	4800	Pos2
7	rx	38400*	Gyro1
8	rx	4800	Log/Dual-axis log
Relay1	Relay NO		Operator fitness
Relay2	Relay NC		Any ECDIS alarm
Relay3	Relay NC		Backup navigator

*Program version 05.xx: 4800

Second LAN adapter

Channel	Type	bit/s	Default use
9	rx/tx	4800	Route Backup
10	rx	4800	Engine Control
11	rx/tx	4800	AMWSS
12	rx/tx	4800	Navtex (Not available for program version 05.xx)
13	rx/tx	38400	B-Adapter
14	rx	4800	Echo Sounder
15	rx	38400*	Wind Sensor
16	rx	4800	Water temp
Relay4	Relay NC		Waypoint approach
Relay5	Relay NC		Outside channel limit
Relay6	Relay NC		Depth below limit

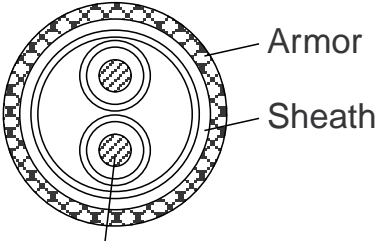
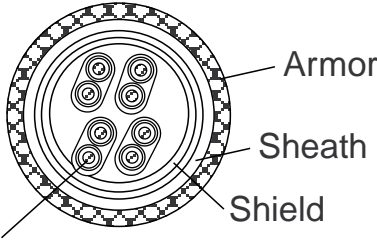
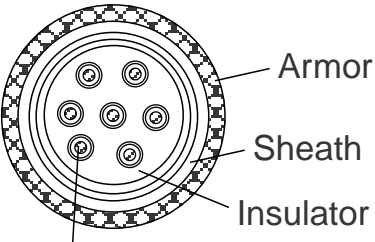
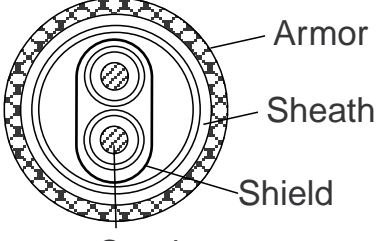
*Program version 05.xx: 4800

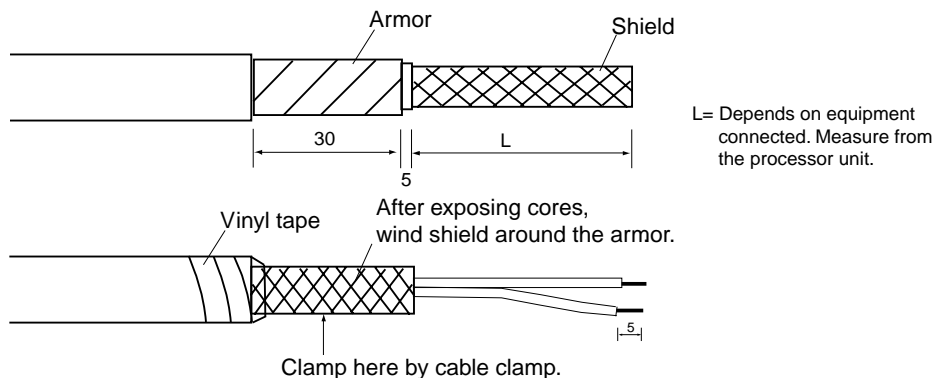
Note: For Relay 2 to 6: Polarities are depending on Relay outputs settings (Normal open or Normal Close) of “Alarm Inputs+Outputs/AMWSS”. (Not available for program version 05.xx)

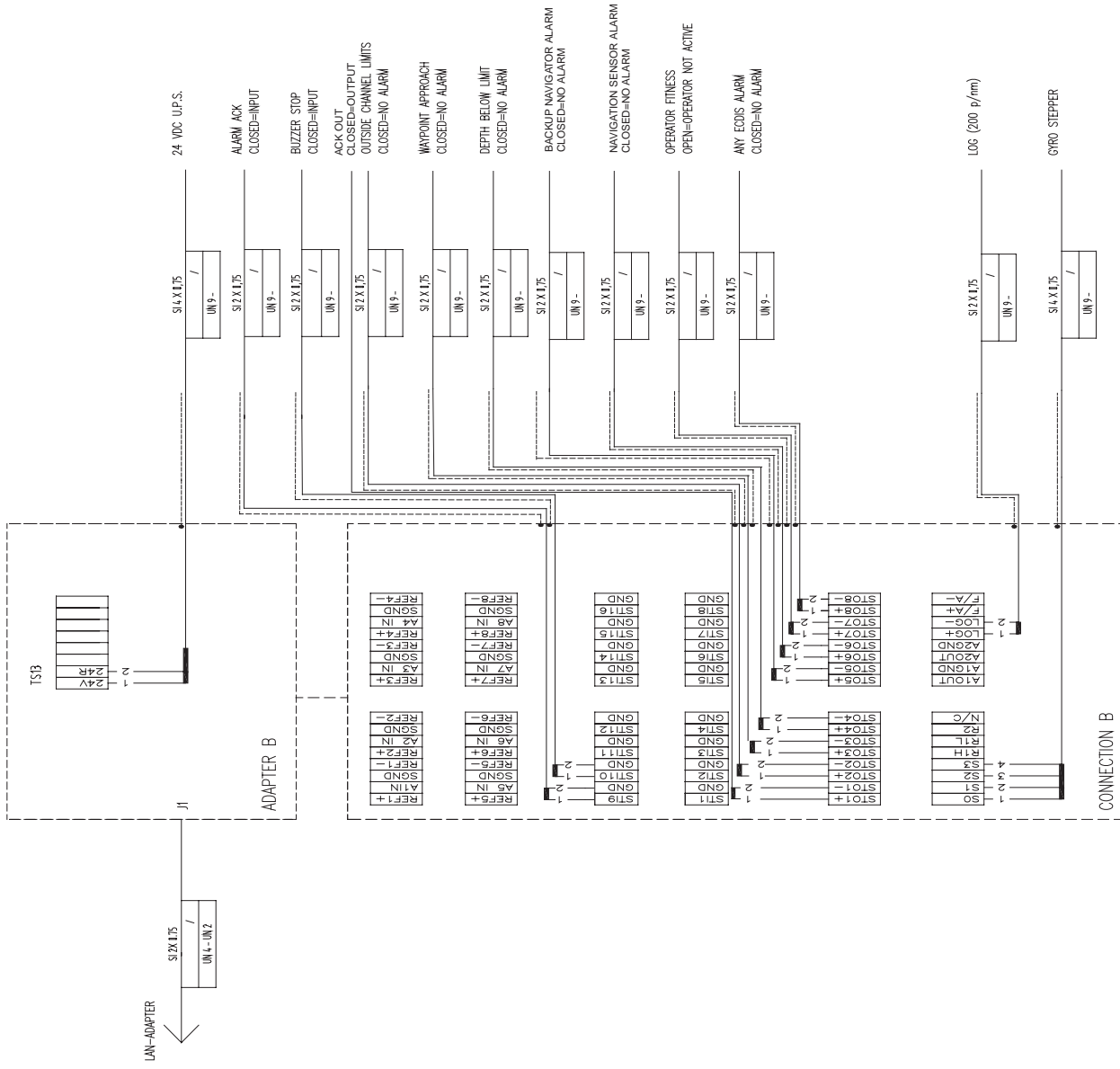
2.4 B Adapter (EC-1000C/EC-1000C-R only)

2.4.1 Cables fabrication for the cables connected to the B adapter

Use the following JIS (Japanese Industrial Standards) cables or equivalent. When using the TTYCS-4 cable, connect the appropriate cable to it to pass the cable entrance of the adapter.

<p>$\phi = 11.7 \text{ mm}$</p>  <p>Armor Sheath Conductor $S = 1.5 \text{ mm}^2$ $\phi = 1.56 \text{ mm}$</p>	<p>$\phi = 16.3 \text{ mm}$</p>  <p>Armor Sheath Shield Conductor $S = 0.75 \text{ mm}^2$ $\phi = 1.11 \text{ mm}$</p>
<p>DPYC-1.5</p>	<p>TTYCS-4 (Four twisted pairs)</p>
<p>$\phi = 13.2 \text{ mm}$</p>  <p>Armor Sheath Insulator Conductor $S = 1 \text{ mm}^2$ $\phi = 1.29 \text{ mm}$</p>	<p>$\phi = 10.1 \text{ mm}$</p>  <p>Armor Sheath Shield Conductor $S = 0.75 \text{ mm}^2$ $\phi = 1.11 \text{ mm}$</p>
<p>MPYC-7</p>	<p>TTYCS-1 (Twisted pair cable)</p>

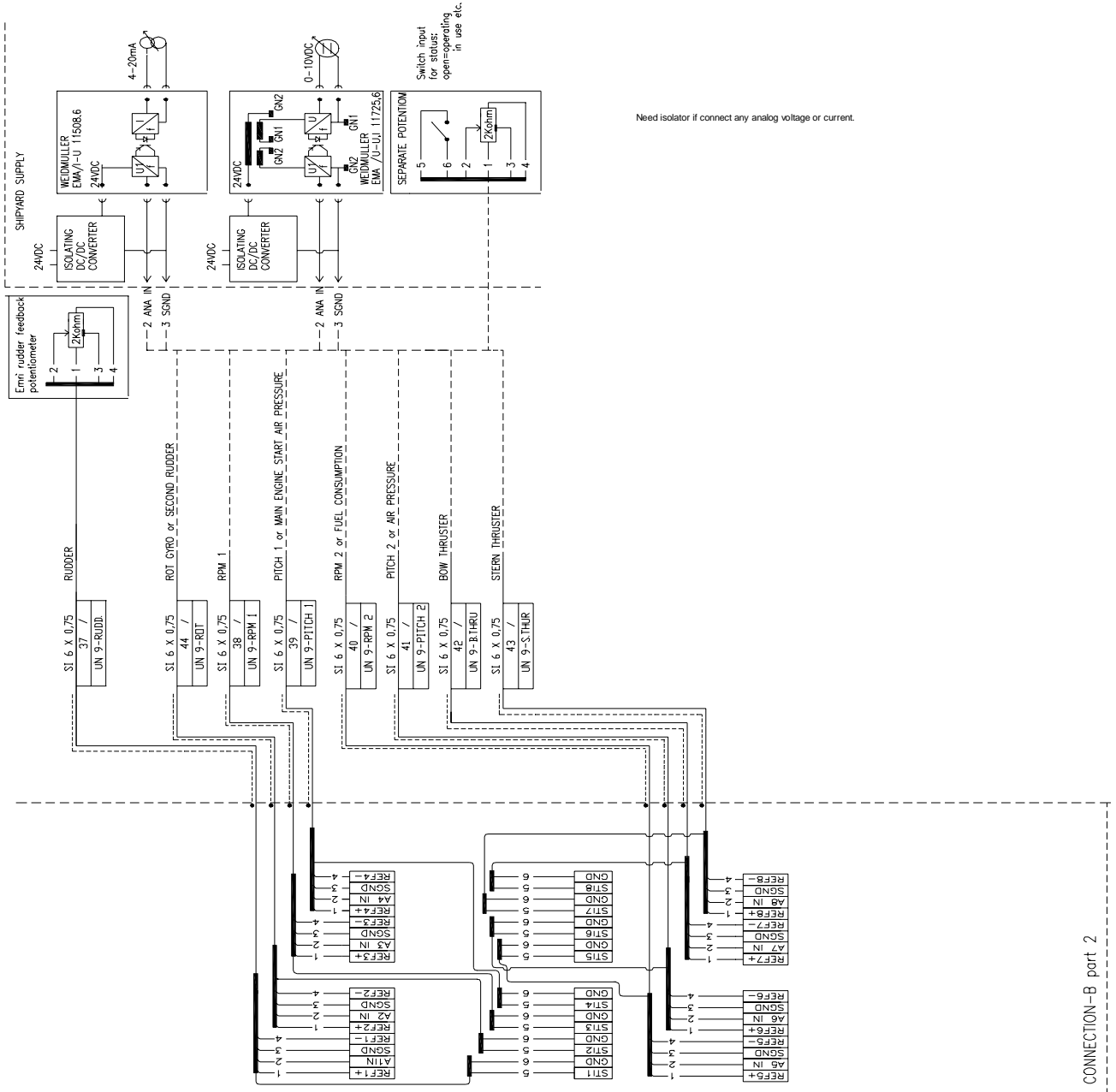


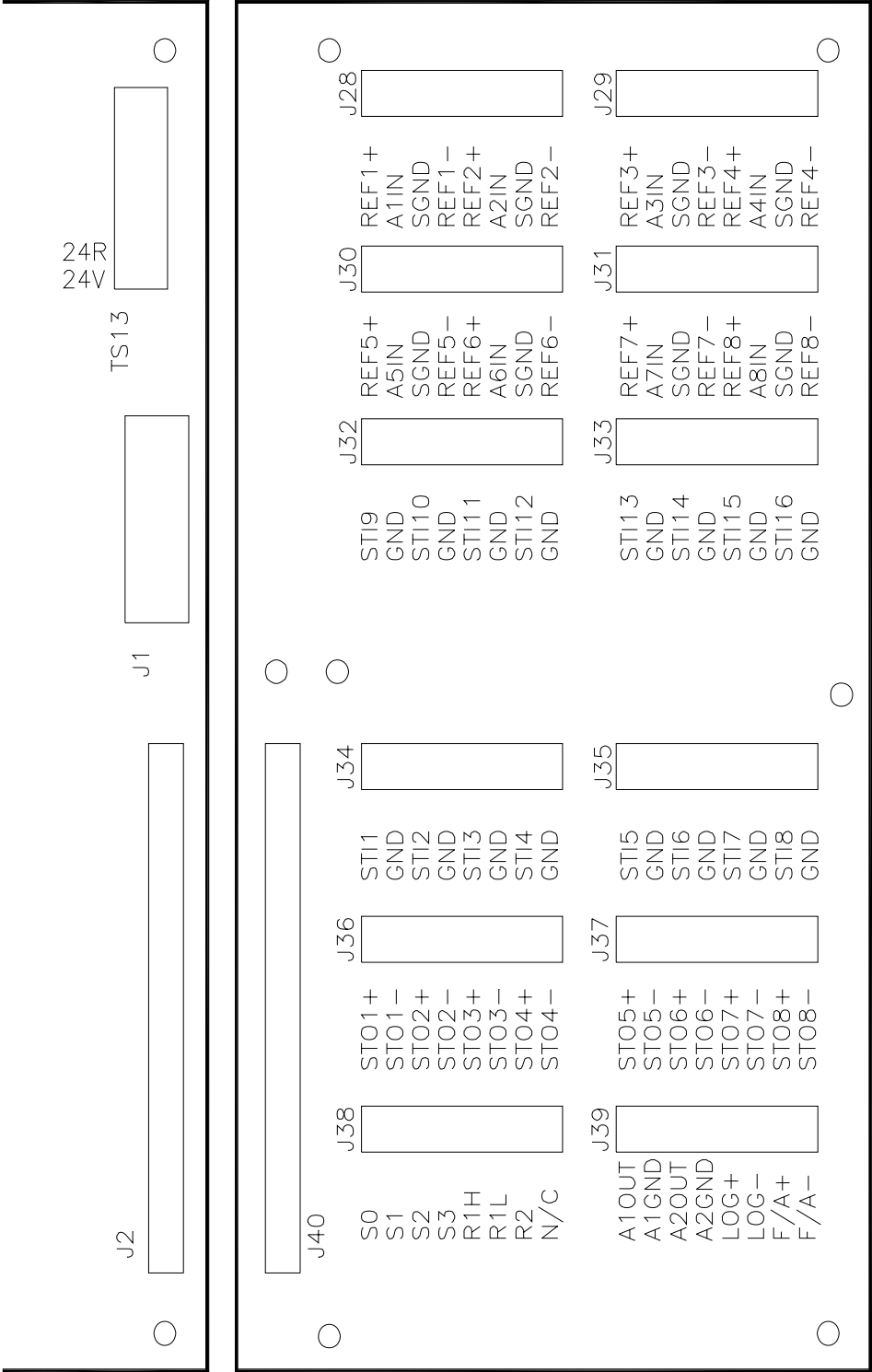


B Adapter (1)

No.1 LAN adapter CH4 or
No.2 LAN adapter CH11, CH12 or CH13

2. WIRING





ALL CONNECTIONS ARE SCREW TERMINALS
 0,14 - 1,0mm² AWG 28-16

Connectors on B-Adapter

2. WIRING

2.4.2 Interface

Status output channels in general

Channel	State
1 (STO1)	ACK OUT
2 (STO2)	ROUTE MONITOR: OUTSIDE CHANNEL LIMIT
3 (STO3)	ROUTE MONITOR: WAYPOINT APPROACH
4 (STO4)	ECHO: DEPTH BELOW LIMIT
5 (STO5)	BACKUP NAVIGATOR ALARM
6 (STO6)	NAVIGATION SENSOR ALARM
7 (STO7)	OPERATOR FITNESS
8 (STO8)	ANY ECDIS ALARM

Pitot log

Pitot log input is for 200 pulses/NM log signal with forward/astern flag.

LOG+ input terminals for log signal

LOG-

F/A+ input terminals for forward/astern signal (closed = astern)

F/A-

Gyro

Gyro input is for stepper (6 steps per degree) or synchro (1:360).

S1 input terminals for gyro phase signals (stepper & synchro)

S2

S3

S0 input terminal for stepper common signal

R1H input terminals for synchro reference signal

R1L R1H & R2 for high synchro voltage reference (135-90 VAC)

R2 R1L & R2 for low synchro voltage reference

Analog interface**Analog channels in general**

An example for analog channel (here, channel 1)



A1IN input terminals for analog signal
 SGND

REF1+ reference output terminals
 REF1-

STI1 input terminals for status (open = operating, in use, etc.)
 GND

Analog channel assignment

channel usage	alternative usage
1 rudder feedback	
2 R.O.T. gyro	second rudder feedback
3 RPM 1	
4 PITCH 1	engine start air pressure
5 RPM 2	fuel consumption
6 PITCH 2	air pressure
7 BOW THRUSTER	
8 STERN THRUSTER	

Status input channels assignment

Channel	State
9	ALARM ACK.
10	BUZZER STOP
11 to 16	Not used.

2.5 Radar Overlay (EC-1000C-R/EC-1000C-CR only)

Radar Overlay has input for one set of radar signals. Radar Overlay can be used to read the picture from three different radar transceivers, because it has two status inputs which change the following characteristics of the Radar Overlay:

- Video gain operating area (low and high voltage)
- FTC adjust operating area (low and high voltage)
- STC adjust operating area (low and high voltage)
- STC curve length and shape
- Number of azimuth pulses per 360°
- Radar antenna headline detector offset
- Radar trigger range offset
- Offset of the radar antenna from the conning position

Following characteristics of the Radar Overlay are common for all radar transceivers:

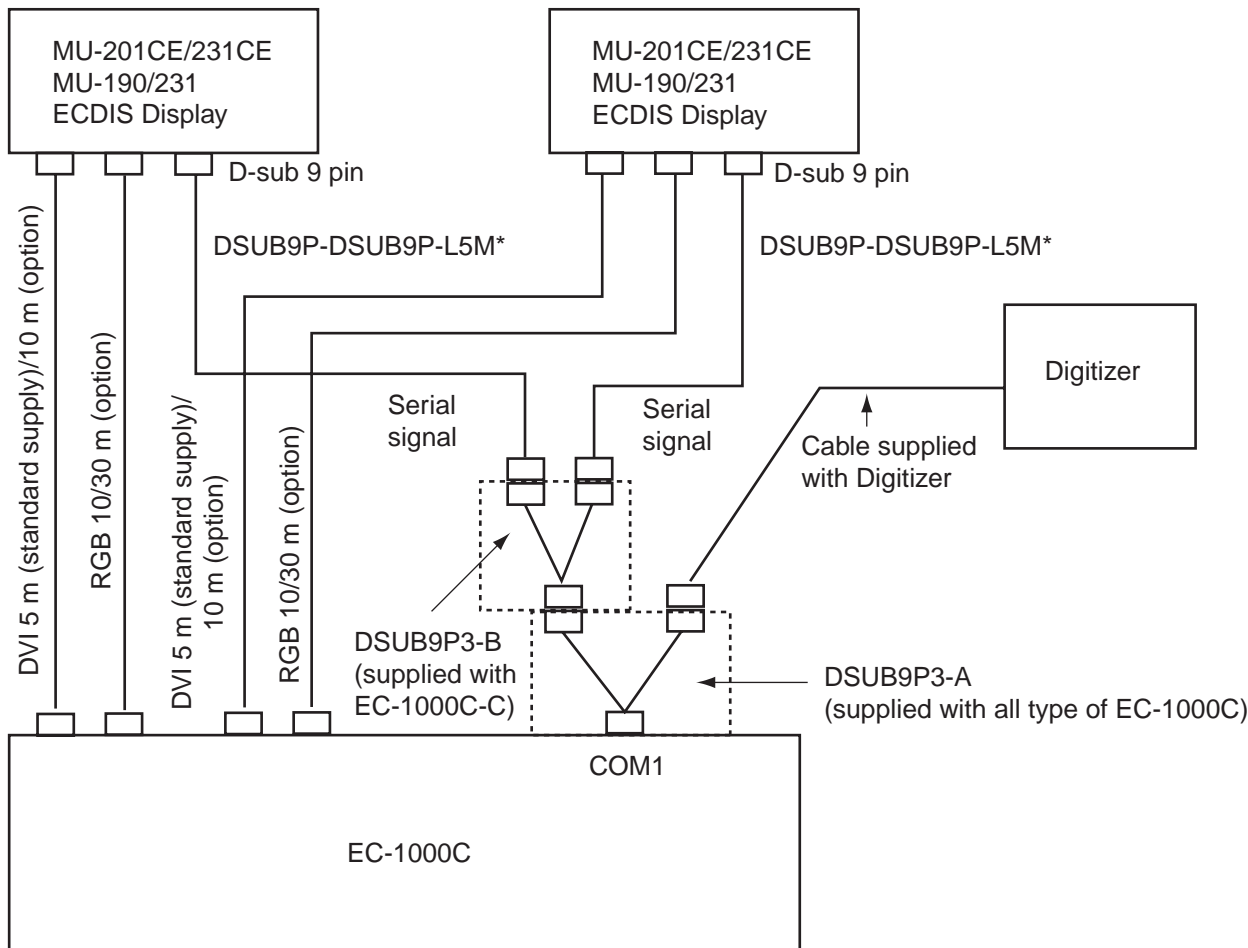
- Video polarity (positive or negative) and impedance (hi-Z or 75Ω)
- Trigger active edge (positive or negative) and impedance (hi-Z or 75Ω)
- Headline polarity (positive or negative)
- HI and LO video detection level difference

If you want to utilize multiple radar transceivers, then you must have a radar interswitch outside the ECDIS. The inter switch reports to the radar transceiver currently in use to the status inputs of Radar Overlay.

To connect the Radar Overlay (in the processor unit) to the radar, use the cable NH8P—DSUB15BNC cable (option). Note that XH8P-NH8P cable is necessary when the optional radar switch is used.

2.6 Connection of Digitizer and LCD Displays to Processor Unit

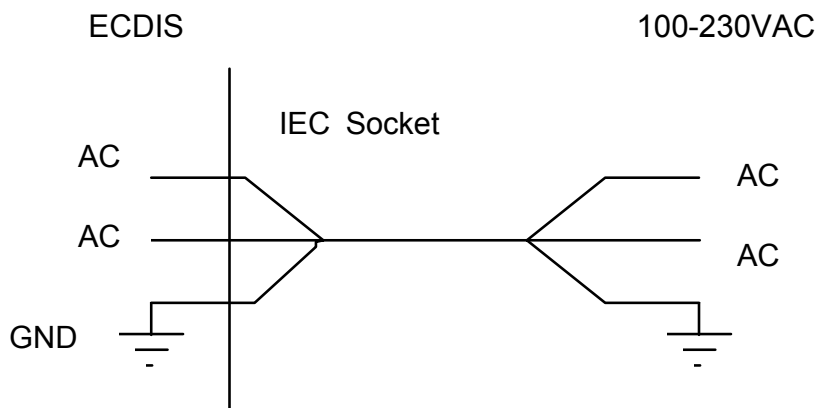
The brilliance of ECDIS and Conning Displays (MU-201CE/MU-231CE/MU-190/MU-231) can be adjusted at EC-1000C by connecting to COM1 port as below. Also, COM1 port is used for connection of Digitizer (CALCOMP Drawing Board III).



*10 m/30 m: option

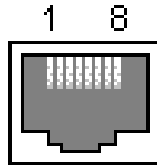
2.7 Power Cabling to ECDIS

ECDIS is powered by 100-230 VAC power. See figure below for cabling.

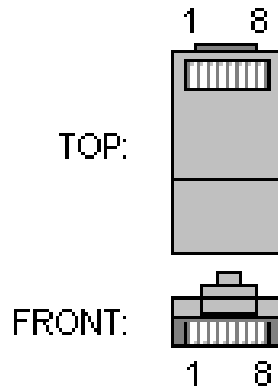


2.8 Ethernet Cable Connection

One ECDIS can be connected to another ECDIS with optional cable MOD-Z072-020+, which is 2 m long. If you need a longer cable, connect LAN (Local Area Network), using RJ45 connectors. Cable used between two ECDIS devices should be UTP (Unshielded Twisted Pair). See figures and tables below.



RJ45 Female connector (at the ECDIS)



RJ45 Male connector (at the cable)

Pin out of female connector at ECDIS

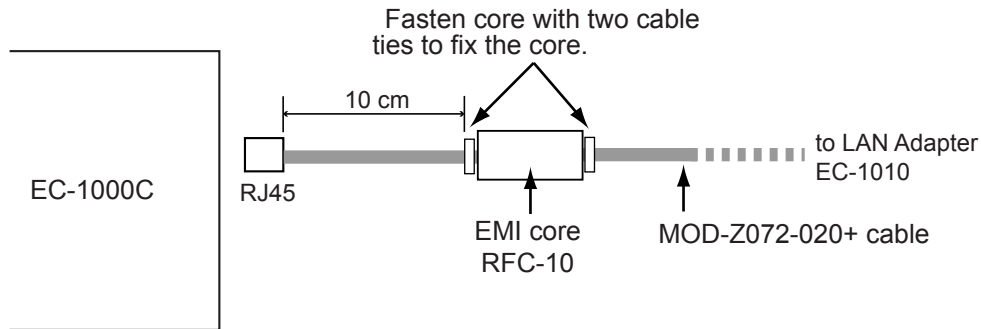
Pin	Name	Description
1	TX+	Transmit Data +
2	TX-	Transmit Data -
3	RX+	Receiving Data +
4	N/C	Not connected
5	N/C	Not connected
6	RX-	Receive Data -
7	N/C	Not connected
8	N/C	Not connected

Wiring of the twisted cable

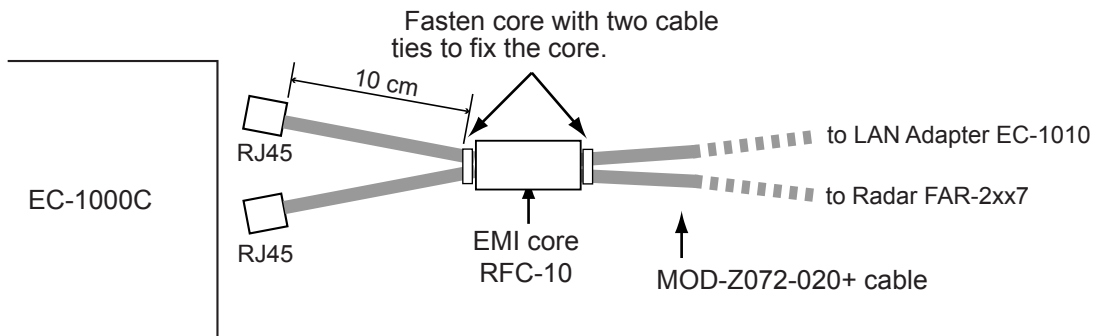
First end Pin	Second end Pin
1	3
2	6
3	1
6	2

2.9 EMI Core for Processor Unit

When connecting the LAN cable MOD-Z072-020+ (supplied) to the processor unit EC-1000C, attach the EMI core (type: RFC-10, supplied as installation materials) to that cable as shown below.



When no radar is connected



When a radar is connected

3. ADJUSTMENTS

3.1 How to Set IP Address for ECDIS

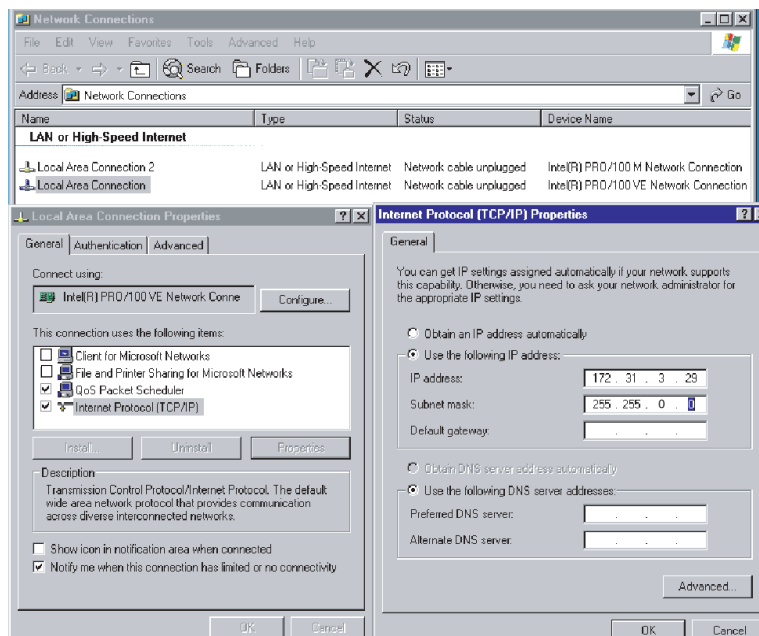
ECDIS has two local area network interfaces, and Interface IP address for the No.2 ECDIS has to be changed. To set the IP addresses, run WindowsXP as follows.

1. Open the cover on the front panel of the processor and connect the service keyboard there.
2. Turn the power on.
3. While pressing down the Alt key, press the Tab key on the service keyboard several times to show ECAWATCH window.
4. Release the keys and press the “Shutdown the ECDIS” button on the screen immediately.
5. Click x mark to close Control Head window.
6. Press the Alt and F4 keys simultaneously to show the WindowsXP screen.

3.1.1 Local Area Connection for LAN 1 (ARPA Radar Network)

To configure IP Address for Local Area Connection interface, proceed as follows:

1. Open the control panel of the Window.
2. Double click the Network Connection icon.
3. Highlight “Local Area Connection”, and then select **Properties** in File menu.



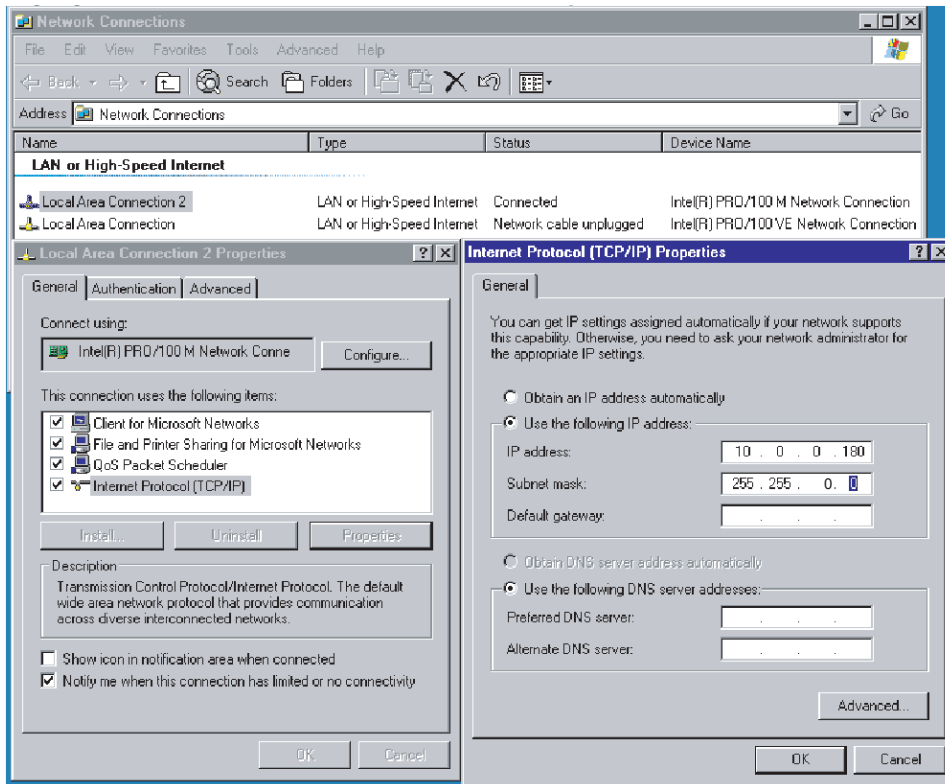
4. In “Local Area Connection Properties”, highlight **Internet Protocol (TCP/IP)** in general tab, and then press the Properties button.
5. Set IP Address as 172.31.3.29 (for the first ECDIS) or 172.31.3.30 (for the second ECDIS).
6. Set Subnet mask as 255.255.0.0.
7. Press the OK button to close the window.

3. ADJUSTMENTS

3.1.2 Local Area Connection for LAN2 (ECDIS LAN Network)

LAN2 interface is used to connect a LAN Adapter or HUB-100 to ECDIS EC1000C. To configure IP Address for this, proceed as follows:

1. Open Control Panel.
2. Double click Network icon.
3. Highlight **Local Area Connection 2** and then select Properties in File menu.



4. In Local Area Connection 2 Properties, highlight Internet Protocol (TCP/IP), and then press Properties button.
5. Set IP Address as 10.0.0.180 (for the first ECDIS) or 10.0.0.181 (for the second ECDIS).
6. Set Subnet mask as 255.255.0.0.
7. Click the OK button to close the window.

To use the EC-1000C as No.2, see page 3-99.

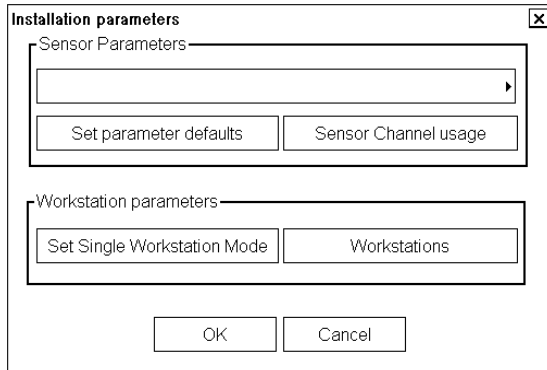
3.2 Parameters

NOTE: Special attention to following topics is required to maintain "Consistent Common Reference System."

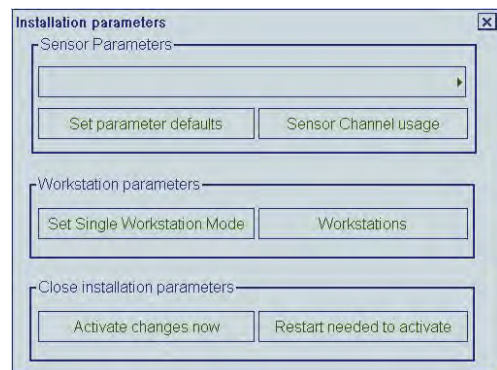
- The values of center and conning positions depend on size and geometry of the ship.
- Offsets from Antenna Position to Conning Position of Position Sensors depend on the location of position sensor antennas.
- Offsets from Antenna Position to Conning Position of Radars depend on the location of radar antennas.

Installation parameters have limited access, and are controlled by an Authorizing key disk (supplied). The Authorizing key disk is a floppy which contains the necessary key to allow access into editing of the installation parameters. Do the following to access the installation parameters. If your unit has USB memory, not the floppy system, see page 3-100.

1. Insert the "Authorization key disk" to the processor unit.
Note that the installation parameters have limited access, which is controlled by the Authorization key disk supplied.
2. Press the MENU key on the control unit to open the menu.
3. Roll the wheel to choose Initial Settings, and then push the wheel.
4. Locate the cursor on the ► next to INITIAL SETTINGS to show Initial settings menu.
5. Roll the wheel to choose Installation parameters and push the wheel.



(Program version 05.xx)



(Program version 06.xx)

There are several buttons in this dialog box, and they are described below:

Set parameters defaults: This restores Installation parameters which are saved as a backup copy by service personnel. Use this function if you are not sure about Installation parameters values.

Sensor channel usage: The CH and sensors are shown.

Set Single Workstation Mode: This button is used to set Workstation to operate as a single workstation.

Workstations

This button is used to define names, source of sensors and location of Access Server of Workstations if two workstations are installed.

Activate changes now: The changed settings are activated immediately. When canceling

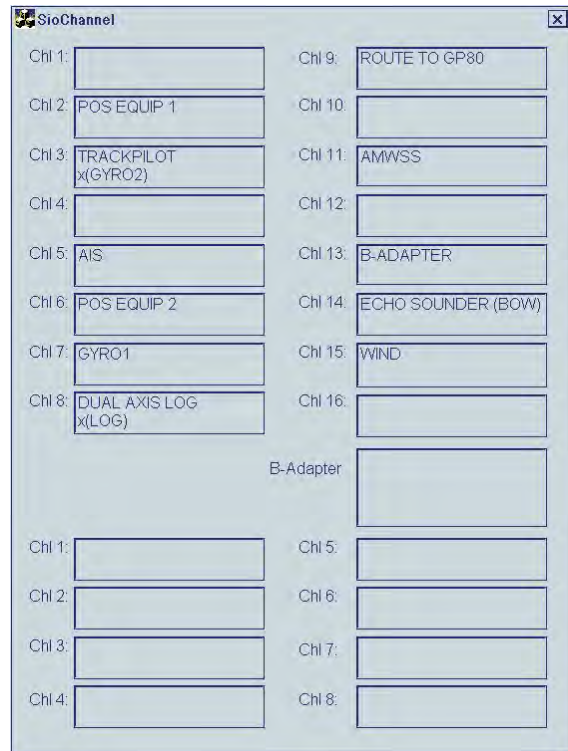
3. ADJUSTMENTS

Activate changes now: The changed settings are activated immediately. When canceling the activation, click the “X” at the top of the screen.

Restart needed to activate: The changed settings are activated when the power is turned off and on again.

Sensor Channel Usage

This shows how the serial channels of A adapters are configured and which analog sensors are connected to the system through the B adapter. Notation x (nnnn) (right is an example of x (GYRO2)) is used to show that some sensor data is collected from the data flow of the main sensor.



What happens after pressing Activate changes now

After pressing Activate changes now, you may get one of the following alarms.

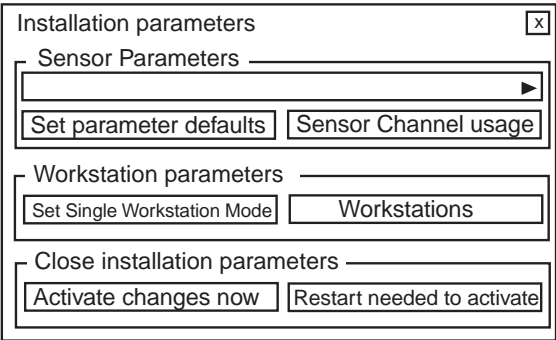
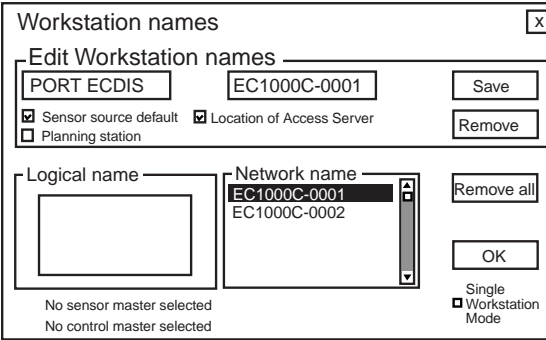
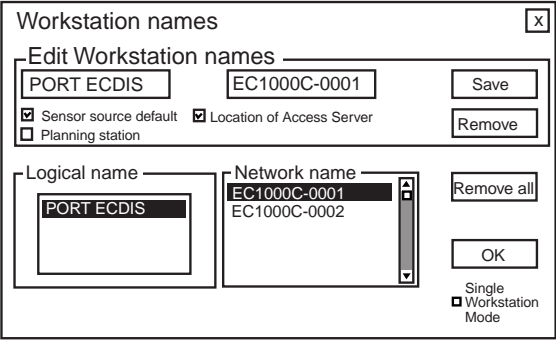
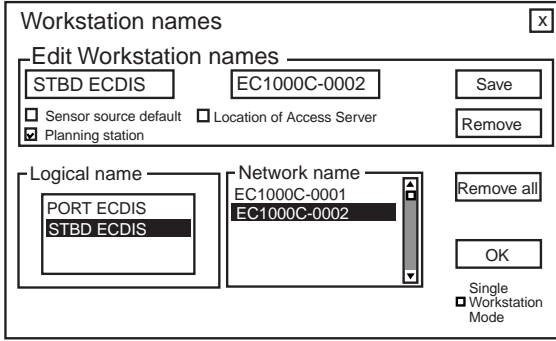
"700 (V.05.xx: 4000) No Sensor parameters": The Sensor Parameters are corrupted. Use backup of Parameters.

"600 (V.05.xx: 3000) Param change disabled": The ECDIS cannot accept change of parameters if Kalman Filter is ON or ECDIS is currently used for steering. Use manual or autopilot steering and turn Kalman Filter OFF when you change parameters.

"459 (V.05.xx: 2459) Steering parameter error": There are incorrect values in the Track pilot installation parameters. Check values of the Track pilot parameters.

Definition of Workstation

Below is a generic description of how to operate the Workstation parameter page.

- 
- 
- 
- 

- In the Installation parameters window, click the **Workstations** button.
- The workstation names window appears and it shows a list of computer names for workstations connected via LAN, in the list box **Network name**. Click a desired computer name of workstation to set workstation function at Edit Workstation names in the **Network name** field.
- You can enter an alias for Workstation (PORT ECDIS as EC1000-0001) to better describe a Workstation (for example PORT ECDIS for workstation located port side). You can also set if the Workstation is used as master of sensor data and if it is used as Workstation that run an Access Server.

Note: Check **Sensor source default** for the Workstation where you have sensors connected. One Workstation can be selected to run **Access Server**.

- When you have defined a Workstation, click the **Save** button.
The EC-1000C-0001 Workstation is set as below:
Alias: PORT ECDIS, Sensor source: default setting, Access Server: ON
- Click EC1000C-0002 at Network name, and set "STBD ECDIS". Then check "Planning station".

3. ADJUSTMENTS

Examples:

Settings when workstation EC1000C-0001 is used as a stand-alone system.

The screenshot shows the 'Workstation names' dialog box. The title bar reads 'Workstation names' with a close button (X). Below the title bar is the 'Edit Workstation names' section. It contains two text input fields: 'PORT ECDIS' and 'EC1000C-0001'. To the right of these fields are 'Save' and 'Remove' buttons. Below the input fields are two checked checkboxes: 'Sensor source default' and 'Location of Access Server', and one unchecked checkbox: 'Planning station'. The next section is 'Logical name', which contains a list box with 'PORT ECDIS' selected. To its right is the 'Network name' section, which has a list box containing 'EC1000C-0001' (selected) and 'EC1000C-0002'. To the right of the 'Network name' list box are 'Remove all' and 'OK' buttons. At the bottom right, there are two radio buttons: 'Single' (unchecked) and 'Workstation Mode' (checked).

Settings when workstation EC1000C-0001 is used as navigation station in a two ECDIS system consisting of one navigation and one planning workstation.

The screenshot shows the 'Workstation names' dialog box. The title bar reads 'Workstation names' with a close button (X). Below the title bar is the 'Edit Workstation names' section. It contains two text input fields: 'NAVIGATION' and 'EC1000C-0001'. To the right of these fields are 'Save' and 'Remove' buttons. Below the input fields are two checked checkboxes: 'Sensor source default' and 'Location of Access Server', and one unchecked checkbox: 'Planning station'. The next section is 'Logical name', which contains a list box with 'NAVIGATION' and 'PLANNING', where 'NAVIGATION' is selected. To its right is the 'Network name' section, which has a list box containing 'EC1000C-0001' (selected) and 'EC1000C-0002'. To the right of the 'Network name' list box are 'Remove all' and 'OK' buttons. At the bottom right, there are two radio buttons: 'Single' (checked) and 'Workstation Mode' (unchecked).

Settings when workstation EC1000C-0002 is used as planning station in a two ECDIS system consisting of one navigation and one planning workstation.

The screenshot shows the 'Workstation names' dialog box. The title bar reads 'Workstation names' with a close button (X). Below the title bar is the 'Edit Workstation names' section. It contains two text input fields: 'PLANNING' and 'EC1000C-0002'. To the right of these fields are 'Save' and 'Remove' buttons. Below the input fields are two unchecked checkboxes: 'Sensor source default' and 'Location of Access Server', and one checked checkbox: 'Planning station'. The next section is 'Logical name', which contains a list box with 'NAVIGATION' and 'PLANNING', where 'PLANNING' is selected. To its right is the 'Network name' section, which has a list box containing 'EC1000C-0001' and 'EC1000C-0002' (selected). To the right of the 'Network name' list box are 'Remove all' and 'OK' buttons. At the bottom right, there are two radio buttons: 'Single' (checked) and 'Workstation Mode' (unchecked).

Settings when workstation EC1000C-0001 is used as navigation station in a two ECDIS system consisting of two navigation workstations.

Settings when workstation EC1000C-0002 is used as navigation station in a two ECDIS system consisting of two navigation workstations.

INITIAL SETTINGS for Multi-workstation mode

“Usage rights” options

Master: The workstation with this setting can open user-created data (User chart, Notes, Route), using the monitor mode.

Plan: This option creates planning data. “Plan” cannot be used to open data in the monitor mode.

Multi (Slave): The workstation with this setting can open user-created data, using the monitor mode. Use this option to assign usage rights to multiple workstations. When you set a workstation to Master, other workstation(s) are automatically set as Slave.

“Sensor source” options

Select the workstation to use as the sensor data source (“EC1000C-xxxx”).

“Mode” options

Multi workstation: Select this option for Multi-workstation mode.

Single workstation: Select this option when loading/updating the chart data, and turning the power off. Do not turn the power off when the multi-workstation mode is active.

3. ADJUSTMENTS

Opening each parameter dialog box

1. Locate the cursor on the ► mark on the drop-down list.
2. Choose an item you want to set, by scrolling the list.



General

Enter your ship's name and characteristics referring to next page.

If there is no optional B adapter connected, set parameters as such.

Edit parameters - General ✕

Ship's Name: OK

Sensor Message interval: x 100 ms Cancel

B-Adapter SIO Channel: ▶

B-Adapter connected: ▶

Trim Indicator: ▶

Docking Disp. Spd. Vector Max Value: Kt

From Center Position to

Bow Position: m (+Bow, -Stern) Length: m

Stern Position: m (+Bow, -Stern)

Dual Axis Log Position: m (+Bow, -Stern)

Conning Position: m (+Bow, -Stern)

Side Position: m Breadth: m

Sidewise Conning Position: m (+Stbd, -Port)

Total height from keel to mast: m

If there is an optional B adapter, set the equipment as such.

Edit parameters - General ✕

Ship's Name: OK

Sensor Message interval: x 100 ms Cancel

B-Adapter SIO Channel: ▶

B-Adapter connected: ▶

Trim Indicator: ▶

Docking Disp. Spd. Vector Max Value: Kt

From Center Position to

Bow Position: m (+Bow, -Stern) Length: m

Stern Position: m (+Bow, -Stern)

Dual Axis Log Position: m (+Bow, -Stern)

Conning Position: m (+Bow, -Stern)

Side Position: m Breadth: m

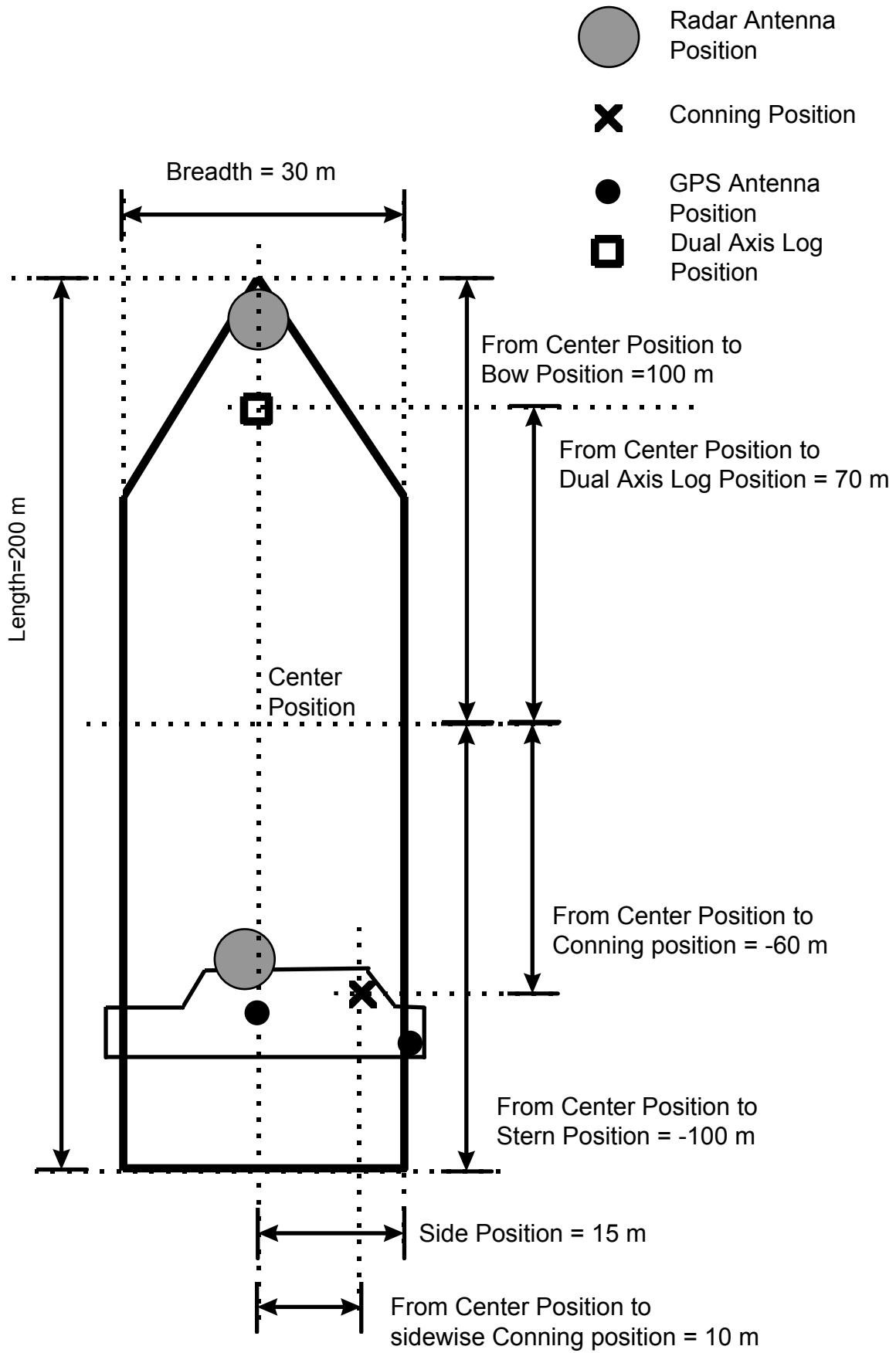
Sidewise Conning Position: m (+Stbd, -Port)

Total height from keel to mast: m

Notes:

- Center position is geometrical center of the ship.
- Conning Position is the point of observation.
- Select Connected = NO, if optional B adapter is not used.
- Select Connected = YES, if optional B adapter is used.

3. ADJUSTMENTS



Gyro 1

Settings when Gyro is outputting data in IEC-61162-1 format.

The dialog box 'Edit parameters - Gyro 1' contains the following settings:

- Connected: YES
- Adapter Chl: 7
- Gear Box: 1:360
- Talker Identifier: HE (with note: HE=typical; XX=don't care)
- Device Interface: IEC-61162-1 (\$xxHDT)

Settings when Gyro is Stepper or Synchro with 1:360 gearbox and optional B adapter is used.

The dialog box 'Edit parameters - Gyro 1' contains the following settings:

- Connected: YES
- Adapter Chl: 7
- Gear Box: 1:360
- Talker Identifier: XX (with note: HE=typical; XX=don't care)
- Device Interface: Stepper/Synchro (uses B-Adapter)

Settings when Gyro is Synchro with 1:180 gearbox and B adapter is used.

The dialog box 'Edit parameters - Gyro 1' contains the following settings:

- Connected: YES
- Adapter Chl: 7
- Gear Box: 1:180
- Talker Identifier: XX (with note: HE=typical; XX=don't care)
- Device Interface: Stepper/Synchro (uses B-Adapter)

Notes:

- Talker identifier can be defined for IEC 61162-1 (typical talker for gyro is HE). If talker identifier is defined as XX, then it is ignored.
- Analog is either synchro or stepper from optional B adapter.
- IEC-61162-1 uses HDT/THS. IEC-61162-2 uses HDT (CH5, CH7, CH13, CH15, program version 06.xx only)
- For DNV NAUT-AW installations, see the paragraph "Gyro interface only for DNV NAUT-AW rule" on page 3-14 for details.

3. ADJUSTMENTS

Gyro 2

Settings when Gyro 2 is receiving from Trackpilot.
If connected TCS.
(BSH type approved)

The dialog box 'Edit parameters - Gyro 2' contains the following settings: 'Connected' is set to 'YES'; 'Adapter Chl' is '3'; 'Gear Box' is '1:360'; 'Talker Identifier' is 'XX' with a note 'HE=typical; XX=don't care'; and 'Device Interface' is 'Trackpilot'. 'OK' and 'Cancel' buttons are on the right.

Settings when Gyro 2 is receiving through Trackpilot.
If connected EMRI TCS.
(DNV NAUT-AW).

The dialog box 'Edit parameters - Gyro 2' contains the following settings: 'Connected' is 'YES'; 'Adapter Chl' is '3'; 'Gear Box' is '1:360'; 'Talker Identifier' is 'XX' with a note 'HE=typical; XX=don't care'; and 'Device Interface' is 'Trackpilot (double gyro / Gyro1 & 2)'. 'OK' and 'Cancel' buttons are on the right.

Settings when Gyro 2 is not connected.

The dialog box 'Edit parameters - Gyro 2' contains the following settings: 'Connected' is 'NO'; 'Adapter Chl' is '3'; 'Gear Box' is '1:360'; 'Talker Identifier' is 'XX' with a note 'HE=typical; XX=don't care'; and 'Device Interface' is 'Trackpilot'. 'OK' and 'Cancel' buttons are on the right.

Gyro interface for Track Control System approved by BSH

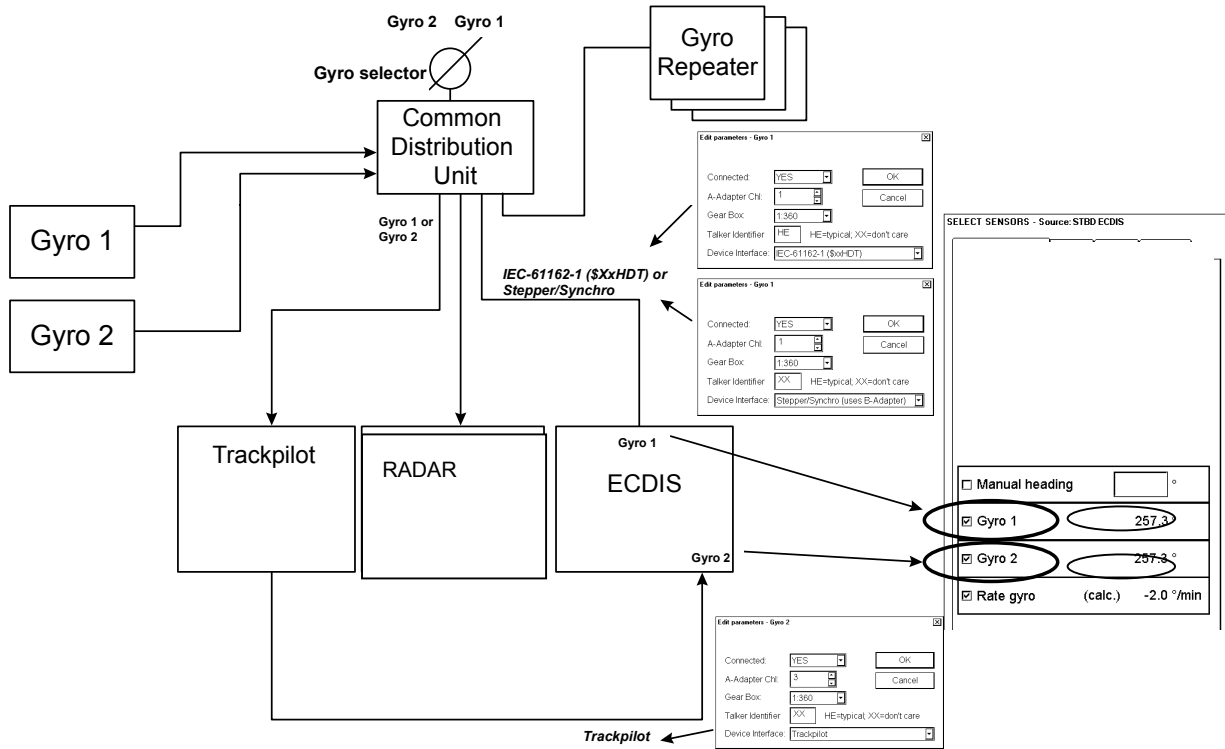


Figure above shows an example where ECDIS Gyro 1 is received from Common Distribution Unit and ECDIS Gyro 2 is received from trackpilot.

3. ADJUSTMENTS

Gyro interface only for DNV NAUT-AW rule

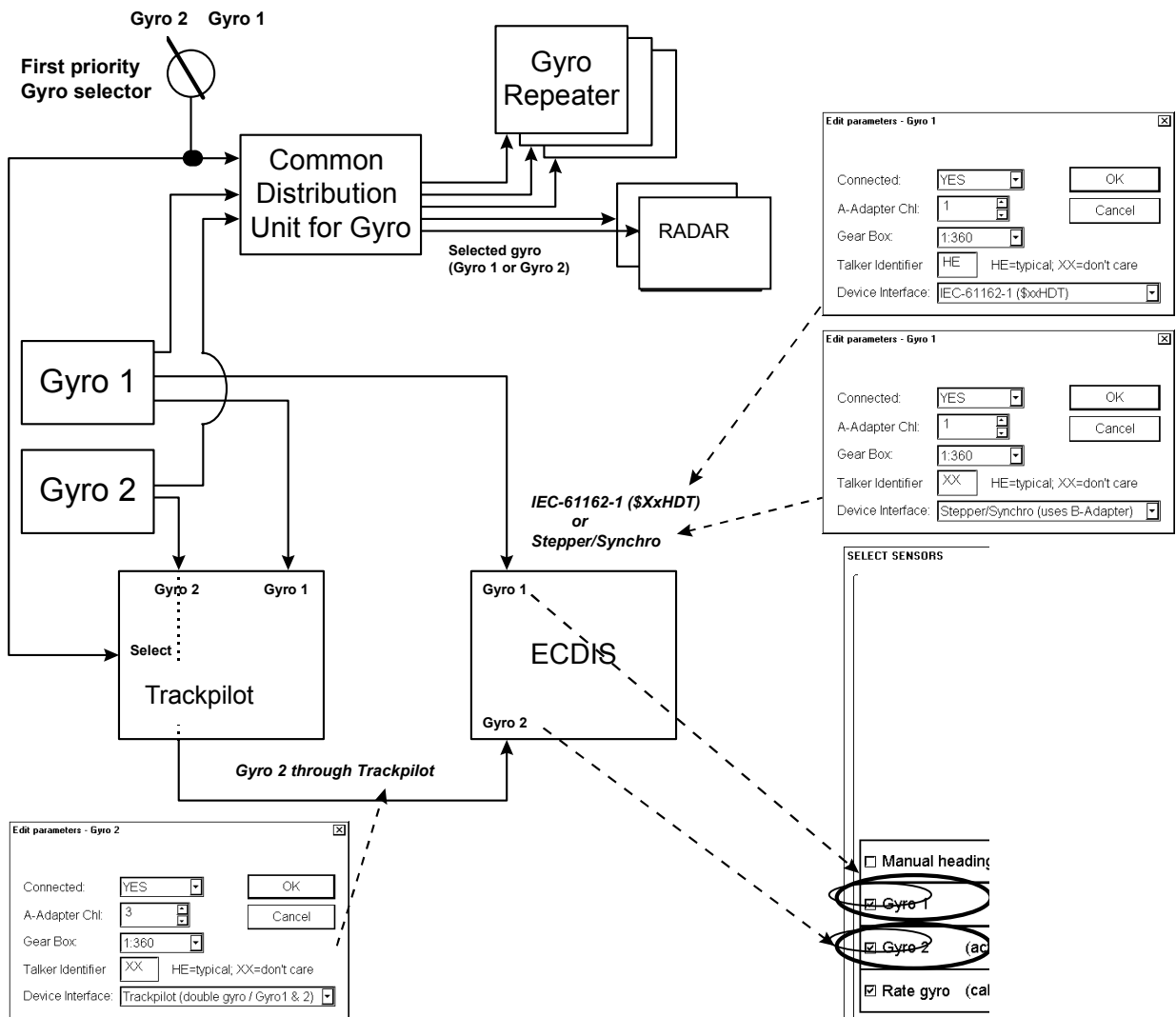


Figure above shows an example where ECDIS Gyro 1 is received directly from Gyro 1 and ECDIS Gyro 2 is received through Track Pilot.

Notes: For receiving Gyro 2 through Trackpilot:

- Software of AEU511 for the Trackpilot must be "SEM200 Version Aeu2_3 Compiled 13-04-2004 11:39".
- MPI31 must be "MIP2 Version Mip2 Compiled 12-03-2004 16:38".
- ExtendedPessa should be checked.

Log

Settings when log is using Analog Pulses 200 p/nm. Note that log is used for water speed component if the dual-axis log is available.

Settings when log is single axis pilot log transmitting IEC-61162-1. Message used is VBW.

Settings when log is used to find out water speed component from a dual-axis log using IEC-61162-1. Sensor log uses water tracking values of VBW message.

Notes:

- Talker identifier can be defined for IEC 61162-1 (typical talker for log is VD). If talker identifier is defined as XX, then it is ignored.
- Analog pulses are from optional B-Adapter.

3. ADJUSTMENTS

Dual-axis log

Settings when using IEC-61162-1.

The screenshot shows a dialog box titled "Edit parameters - Dual Axis Log (DAX)". It contains the following fields and options:

- Connected: YES (dropdown menu)
- Adapter Channel: 8 (text input)
- Device Interface: IEC 61162-1 (\$x:VBW) (dropdown menu)
- Sign Positive: for Ahead (dropdown menu) (longitudinal speed)
- Sign Positive: for Port (dropdown menu) (transversal speed)
- Use Sign Positive parameters to change polarity of speed components (text label)
- Status Flag Check: Check - only "A", "B" or "W" accepted (dropdown menu)
- Talker Identifier: VD (text input) VD=typical; XX=don't care

Buttons for OK and Cancel are located in the top right corner.

Settings when no dual-axis log is available.

The screenshot shows a dialog box titled "Edit parameters - Dual Axis Log (DAX)". It contains the following fields and options:

- Connected: NO (dropdown menu)
- Adapter Channel: 8 (text input)
- Device Interface: IEC 61162-1 (\$x:VBW) (dropdown menu)
- Sign Positive: for Ahead (dropdown menu) (longitudinal speed)
- Sign Positive: for Port (dropdown menu) (transversal speed)
- Use Sign Positive parameters to change polarity of speed components (text label)
- Status Flag Check: Check - only "A", "B" or "W" accepted (dropdown menu)
- Talker Identifier: VD (text input) VD=typical; XX=don't care

Buttons for OK and Cancel are located in the top right corner.

Notes:

- Talker identifier can be defined for IEC 61162-1 (typical talker for dual axis log is VD). If talker identifier is defined as XX, then it is ignored.
- IEC 61162-1 uses VBW or VTG.
- If you selected VBW message, then bottom track is available from dual-axis log and water track could be available from log.

Radar Echo Overlay

Radar Echo Overlay can be received by ECDIS in two ways:

- through Radar Overlay card fitted in ECDIS
- through LAN from FAR-2x07

Radar Echo Overlay (analog) through Radar Overlay card fitted in ECDIS

This menu does not appear if Analog Echo Overlay is set for "No use" during installation.

Configuration for Radar Echo Overlay (analog), when Radar overlay card fitted in ECDIS, is done using "Radar Echo Overlay (Analog)" parameter settings.

Here is an example, when Radar Transceiver is not connected (**Connected as NO**) through Radar overlay card fitted in ECDIS.
NOTE: You have to define all three Radar transceivers whether they are connected through the Radar overlay or not.

The screenshot shows the 'Edit parameters - Radar Echo Overlay (Analog)' dialog box. The 'Connected' dropdown is set to 'NO'. The 'Radar transceiver' is set to '1'. The 'Label' is 'MAST S'. The 'Bearing pulses' is '132 pulses / antenna rev'. The 'From Radar antenna to Conning position' is '12 m (+Stbd, -Port)' and '-5 m (+Bow, -Stern)'. The 'Bearing offset' is '0 °' and the 'Range offset' is '-100 m'. The 'Rain clutter filter' has 'Min: 5 V' and 'Max: 1.7 V'. The 'Gain' has 'Min: 0 V' and 'Max: -2.5 V'. The 'Sea clutter filter' has 'Min: 0 V' and 'Max: -2.5 V'.

Here is an example of a mast-mounted S-band radar, when mast is in about same position as the conning position.

The screenshot shows the 'Edit parameters - Radar Echo Overlay (Analog)' dialog box. The 'Connected' dropdown is set to 'YES'. The 'Radar transceiver' is set to '1'. The 'Label' is 'MAST S'. The 'Bearing pulses' is '132 pulses / antenna rev'. The 'From Radar antenna to Conning position' is '0 m (+Stbd, -Port)' and '0 m (+Bow, -Stern)'. The 'Bearing offset' is '0 °' and the 'Range offset' is '-100 m'. The 'Rain clutter filter' has 'Min: 5 V' and 'Max: 1.7 V'. The 'Gain' has 'Min: 0 V' and 'Max: -2.5 V'. The 'Sea clutter filter' has 'Min: 0 V' and 'Max: -2.5 V'.

3. ADJUSTMENTS

Here is an example of a bow mounted radar with large distance from the conning position. Bearing and Range offsets are used to align radar and chart displays.

The dialog box 'Edit parameters - Radar Echo Overlay (Analog)' shows the following settings:

- Connected: YES
- Radar transceiver: 2
- Label: BOW X
- Bearing pulses: 360 pulses / antenna rev
- From Radar antenna to Conning position: 5 m (+Stbd, -Port)
- 150 m (+Bow, -Stern)
- Bearing offset: 0 °
- Range offset: -100 m
- Rain clutter filter: Min: 5 V, Max: 1.7 V
- Gain: Min: 0 V, Max: -2.5 V
- Sea clutter filter: Min: 0 V, Max: -2.5 V

Here is an example of a mast-mounted X-band radar, when mast is in about same position as the conning position. Bearing and Range offsets are used to align radar and chart displays.

The dialog box 'Edit parameters - Radar Echo Overlay (Analog)' shows the following settings:

- Connected: YES
- Radar transceiver: 3
- Label: MAST X
- Bearing pulses: 132 pulses / antenna rev
- From Radar antenna to Conning position: 0 m (+Stbd, -Port)
- 0 m (+Bow, -Stern)
- Bearing offset: 0 °
- Range offset: -100 m
- Rain clutter filter: Min: 5 V, Max: 0 V
- Gain: Min: 0 V, Max: -5 V
- Sea clutter filter: Min: 0 V, Max: -5 V

Radar Overlay has status inputs which are used to select between 3 different setups for parameters. This arrangement allows installation of three different radar transceivers and antennas. For example a normal set of one S-band and one X-band radar on a mast and then a third radar at the bow. See examples above.

Each radar can have an antenna with different amount of pulses per revolution. Also operational area of FTC (Rain clutter), STC (Sea clutter) and gain is separately defined for each radar. Offsets defined here are also used indirectly by the radar display.

Radar Echo Overlay (LAN) from FAR-2xx7 and FCR 2xx7 series radar through LAN

The following settings are for Radar Echo Overlay (LAN) received from FAR-2xx7 and FCR-2xx7 series radar through LAN.

Set the radar connected through the network. The radar echo set “Connected: Yes” here can be overlay displayed on the chart. When multiple radar are set to “Yes”, select one at RADAR OVERLAY (Main Menu>Radar).

Radar transceiver:

Select the radar to set.

Device Interface:

IMO Radar: For FAR-2xx7, route information loading; OK

Chart Radar: For FCR-2xx7, route information loading; -

Chart Radar with INS:

For FCR-2xx7, route information loading; OK

Chart Radar with CCRS:

For FCR-2xx7, route information loading; OK (all route)

Label:

Set the name for each radar (max. 6 characters) to use on RADAR OVERLAY.

From Radar antenna to Conning position:

Enter the distance between antenna and conning positions (Range: -500 to +500). Upper: port-starboard direction, lower: bow-stern direction

IP address, Port numbers, Radar display number:

Not used.

3. ADJUSTMENTS

If Radar overlay is not received through LAN, set **Connected** as **NO** for each transceiver (1-4).

Radar transceiver 1 is Connected as Yes.
Device Interface defines source of RADAR target (IMO RADAR or Chart Radar).
Label defines name for source of video.
From Antenna to Conning position defines offset position of radar antenna.

Note that Radar display number is defined in Radar Display settings in the field at right "LAN Radar". See figure below.

Edit parameters - Radar Echo Overlay/Communication (LAN)

Radar transceiver	<input type="text" value="1"/>	<input type="button" value="OK"/>
Connected	<input type="text" value="NO"/>	<input type="button" value="Cancel"/>
Device interface	<input type="text" value="IMO Radar"/>	
Label	<input type="text" value="MASTS"/>	
From Radar antenna to Conning position	<input type="text" value="2"/> m {+Stbd, -Port}	
	<input type="text" value="20"/> m {+Bow, -Stern}	
IP address	172.31.3.6	
Port numbers	10024 for Radar echo output 10028 for Radar communication	
Radar display number	1	

Edit parameters - Radar Echo Overlay/Communication (LAN)

Radar transceiver	<input type="text" value="1"/>	<input type="button" value="OK"/>
Connected	<input type="text" value="YES"/>	<input type="button" value="Cancel"/>
Device interface	<input type="text" value="IMO Radar"/>	
Label	<input type="text" value="MASTS"/>	
From Radar antenna to Conning position	<input type="text" value="2"/> m {+Stbd, -Port}	
	<input type="text" value="20"/> m {+Bow, -Stern}	
IP address	172.31.3.6	
Port numbers	10024 for Radar echo output 10028 for Radar communication	
Radar display number	1	

Edit parameters - Radar Display

Radar Displays	<input type="text" value="Display 1"/>
Connected	<input type="text" value="YES"/>
Adapter Channel	<input type="text" value="4"/>
Device Interface	<input type="text" value="FURUNO FAR-2x07 (LAN)"/>
Rx Talker Identifier	<input type="text" value="RA"/>
LAN Radar	<input type="text" value="1"/>
IP address	172.31.3.6

Radar transceiver 2 is Connected as Yes. Device Interface defines source of RADAR target (IMO Radar or Chart Radar). Label defines name for source of video. From Antenna to Conning position defines offset position of radar antenna.

Note that Radar display number is defined in Radar Display settings in the field "LAN Radar". See figure at right.

Radar Echo Overlay received both through Radar overlay card and through LAN

It is possible that Radar Overlay video from one transceiver is received either through Radar Overlay card (analog) or through LAN. You have to make configuration as introduced in previous sections. Pay attention that you set **Connected** as **NO** for transceivers not connected either through Radar overlay card or through LAN.

Connection of ECDIS and Chart Radar

Settings for INS

The ECDIS sends the route information to the Chart Radar in real time. However, the route information cannot be sent to Chart Radar when it stoops during the route monitor.

- Radar transceiver: Enter the radar No. '1 to 4)
- Device Interface: Choose "Chart Radar with INS".
- IP Address: Enter the IP address of FCR-2xx7 which receives the information (33 to 36).

3. ADJUSTMENTS

Settings for Chat Radar

Dialog box: Edit parameters - Radar Echo Overlay / Communication (LAN)

Radar transceiver: 1

Connected: YES

Device Interface: Own for Chart Radar with INS

Label: N1

From Radar antenna to Conning position: 0 m (+Stbd, -Port)
0 m (+Bow, -Stern)

IP address: 172.31.3.6

Port numbers: 10024 for Radar echo output
10028 for Radar communication

Radar display number: 1

INS IP Address: 172.31.3.29

Port numbers: 15003 for INS communication

Settings for CCRS

Note: These settings is available for the chart radar with version 06.01 and after.
The following data are sent from ECDIS to Chart Radar when starting the route monitor.

- Route data
- User chart
- Notes
- Sensor data other than Gyro
(These data are shown on Chart Radar display even if ECDIS is stopped.)

- Radar transceiver: Enter the radar No. (1 to 4)
- Device interface: Choose "Chart Radar with CCRS".
- IP Address: Enter the IP address of FCR-2xx7 which receives the information (33 to 36).

Settings for Chart Radar

Dialog box: Edit parameters - Radar Echo Overlay / Communication (LAN)

Radar transceiver: 1

Connected: YES

Device Interface: Own for Chart Radar with CCRS

Label: N1

From Radar antenna to Conning position: 0 m (+Stbd, -Port)
0 m (+Bow, -Stern)

IP address: 172.31.3.6

Port numbers: 10024 for Radar echo output
10028 for Radar communication

Radar display number: 1

IP Address, CCRS1: 172.31.3.29 CCRS2: 172.31.3.0

Port numbers: 15002, 15003 for CCRS communication

Primary CCRS: CCRS1

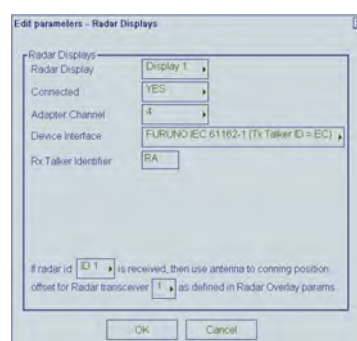
Change between CCRS and Standalone: Automatic

Radar Displays

There are 6 basic device interface alternatives:

- 1) Device interface **FURUNO: IEC 61162-1** (TX Talker ID = II) includes all standard messages for an ARPA radar target data receive interface. Further it also contains a lot proprietary messages supporting integrated navigation features such as user charts, routes, curved EBL, etc.
- 2) Device interface **FURUNO: IEC 61162-1** (TX Talker ID = EI) includes all standard messages for an ARPA radar target data receive interface. Further it also contains a lot proprietary messages supporting integrated navigation features such as user charts, routes, curved EBL, etc.
- 3) Device interface **FURUNO: IEC 61162-1** (TX Talker ID = EC) includes all standard messages for an ARPA radar target data receive interface. Further it also contains a lot proprietary messages supporting integrated navigation features such as user charts, routes, curved EBL, etc.
- 4) Device interface **IMO IEC 61162-1** (\$xxOSD, \$xxTTM) uses TTM message for ARPA radar target data receive interface and OSD message for ARPA radar speed and course receive. It sends standard ECGLL, ECDPT and ECMVW messages to the ARPA radar.
- 5) Device interface **FURUNO: FAR-2x07 (serial)** includes all standard messages for an ARPA radar target data receive interface. Further it also contains a lot proprietary messages supporting integrated navigation features such as user charts, routes, curved EBL, etc
- 6) Device interface **FURUNO: FAR-2x07 (LAN)** includes all standard messages for an ARPA radar target data receive interface. Further it also contains a lot proprietary messages supporting integrated navigation features such as user charts, routes, curved EBL, etc

In the **Radar Display** field you can select radar displays one by one and define if they are in use, etc.



3. ADJUSTMENTS

Radar id and **Radar transceiver** -fields are used to select indirectly radar antenna offsets from Conning position, which is defined as **Conning position** in the **General** parameters page.

In the example above there are settings for ARPA radar **display 1**:

- If ARPA Radar display sends **radar id 1**, it is connected to **Radar transceiver 1** and offset is defined in **Radar Echo Overlay (Analog)** parameters page for Transceiver 1.
- If ARPA radar **display 1** sends **radar id 2**, it is connected to **Radar Transceiver 2** defined in **Radar Echo Overlay (Analog)** parameters page.

Example1:

FURUNO IEC 61162-1 device interface with various TX Talker IDs.

Dialog box: Edit parameters - Radar Displays

Radar Displays

Radar Display: Display 1

Connected: YES

Adapter Channel: 4

Device Interface: IMO IEC 61162-1 (\$xOSD, \$xTTM)

Rx Talker Identifier: RA

If radar id ID 1 is received, then use antenna to conning position offset for Radar transceiver 1 as defined in Radar Overlay params

Buttons: OK, Cancel

Dialog box: Edit parameters - Radar Displays

Radar Displays

Radar Display: Display 1

Connected: YES

Adapter Channel: 4

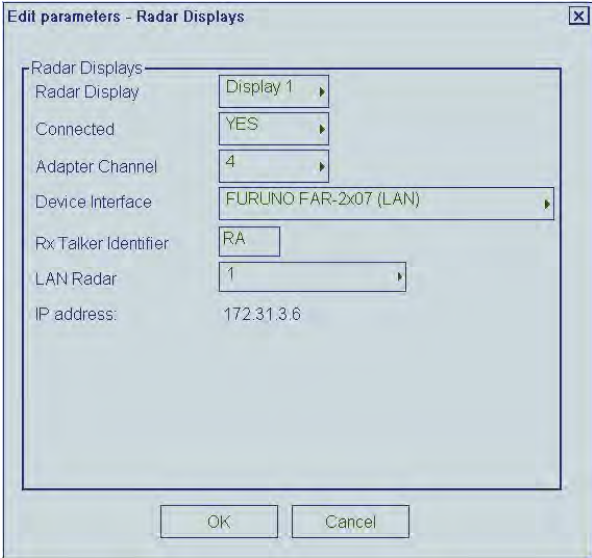
Device Interface: FURUNO FAR-2x07 (serial)

Rx Talker Identifier: RA

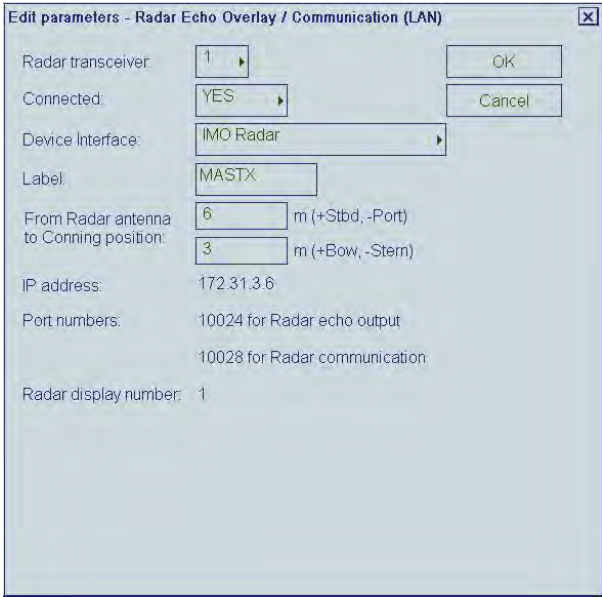
If radar id ID 1 is received, then use antenna to conning position offset for Radar transceiver 1 as defined in Radar Overlay params

Buttons: OK, Cancel

Example 2:
Generic ARPA radar using only IMO standard message.



Example 3
FAR-28x7 ARPA radar connected with serial line.

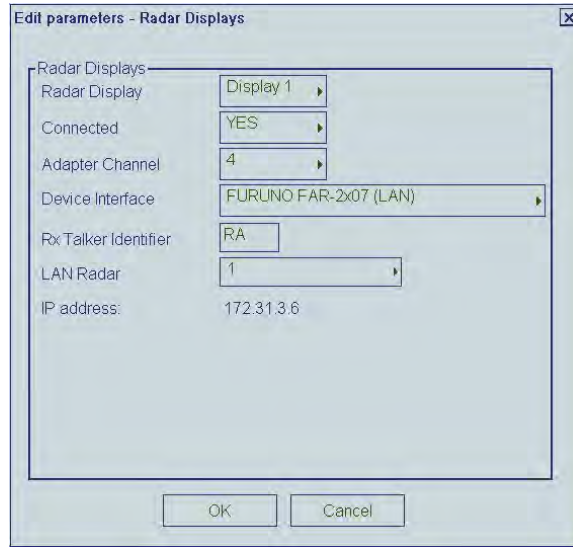


3. ADJUSTMENTS

Example 4

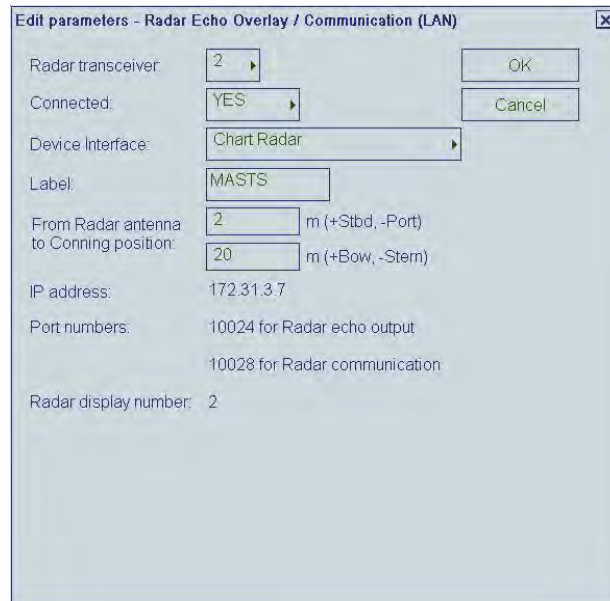
Parameters for one FAR-2xx7 radar and one FCR-28x7 Chart Radar connected with LAN Cable.

First Radar display (FAR-2xx7):



You can define to which LAN radar it is connected, at the "LAN Radar" field.

Note that the settings above together with the settings below must be done for LAN Radar settings:



Note 1: "Radar display number" defines IP address for connected ARPA Radar Display.

Note 2: Following values can be tailored: **Radar transceiver, Connected, Device Interface, Label and From Radar Antenna to Conning Position.** Leave other values as is.

Second Radar display (FCR-28x7):

Edit parameters - Radar Display	
Radar Displays	Display 2
Connected	YES
Adapter Channel	1
Device Interface	FURUNO FAR-2x07 (LAN)
Rx Talker Identifier	RA
LAN Radar	2
IP address	172.31.3.7
<input type="button" value="OK"/> <input type="button" value="Cancel"/>	

You can define to which LAN radar it is connected at the "LAN Radar" field.

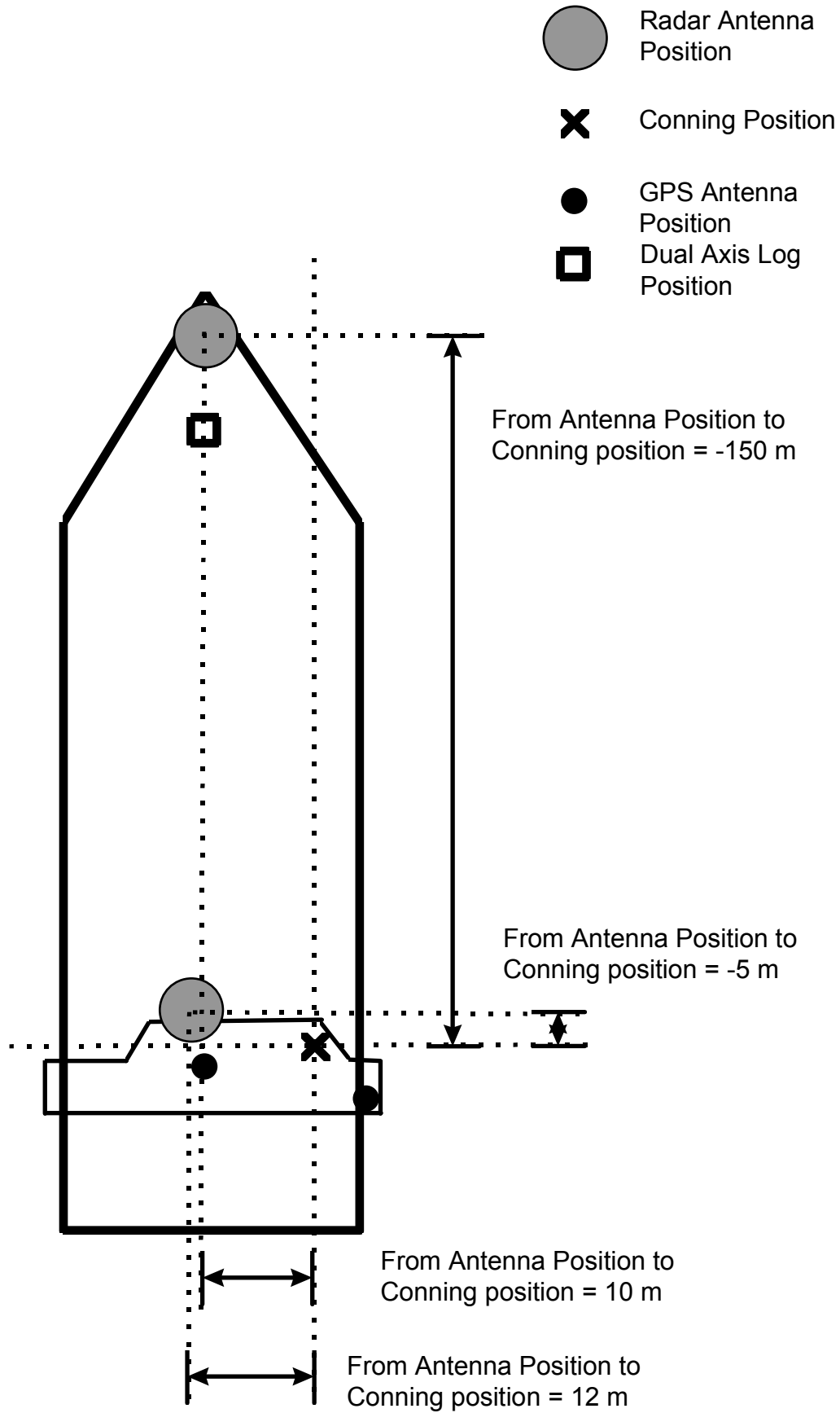
Note that the following settings above together with the settings below must be done for LAN Radar settings:

Edit parameters - Radar Echo Overlay/Communication (LAN)		
Radar Display	2	<input type="button" value="OK"/>
Connected	YES	<input type="button" value="Cancel"/>
Device Interface	Chart Radar	
Label	MASTS	
From Radar antenna to Conning position	2 m (+Stbd, -Port)	
	30 m (+Bow, -Stern)	
IP address	172.31.3.7	
Port numbers	10024 for Radar echo output 10028 for ARPA communication	
Radar display number	2	

Note 1: "Radar display number" defines IP address for connected Radar Display.

Note 2: Following values can be tailored: **Radar transceiver, Connected, Device Interface, Label, From Radar Antenna to Conning Position and Radar display number.** Leave other values as is.

3. ADJUSTMENTS



Position equipment

An example of DGPS receiver with talker identifier GP defined for both GGA and VTG messages.

Enter values for Weight Factor and Cmg Delay as follows.

- Weight Factor: 0.1
- Cmg Delay: 0

Weight Factor	dRMS[m]	4dRMS[m]
0.01	1000	4000
0.05	200	800
0.07	143	571
0.1	100	400
0.2	50	200
0.4	25	100
0.6	17	67
0.8	12	50

An example of DGPS receiver which is able to send IEC 61162-1 Ed. 2 messages (includes information about Datum of output position).

Enter values for Weight Factor and Cmg Delay as follows.

- Weight Factor: 0.1
- Cmg Delay: 0

Weight Factor	dRMS[m]	4dRMS[m]
0.01	1000	4000
0.05	200	800
0.07	143	571
0.1	100	400
0.2	50	200
0.4	25	100
0.6	17	67
0.8	12	50

An example of GPS receiver with ignored talker identifiers for both GLL and VTG messages.

- Weight Factor: 0.1
- Cmg Delay: 0

Weight Factor	dRMS[m]	4dRMS[m]
0.01	1000	4000
0.05	200	800
0.07	143	571
0.1	100	400
0.2	50	200
0.4	25	100
0.6	17	67
0.8	12	50

3. ADJUSTMENTS

An example of setting for DGPS receiver which is able to send IEC 61162-1 Ed. 2 messages.

Enter values for Weight Factor and Cmg Delay as follows.

-Weight Factor: 0.1

-Cmg Delay: 0

Edit parameters - Positioning Equipment 1

Connected: YES Device Name: DGPS1
 Adapter Chl: 2 Device Type: DGPS
 Device Interface: IEC 61162-1 ed2 Weight Factor: 0.1
 Identification: GLL+VTG Cmg Delay: 0 s
 Talker Identifier: GP XX=don't care Offsets from: 0.0 m (+Stbd, -Port)
 Speed Talker ID: GP XX=don't care Antenna position to Conning position: 0.0 m (+Bow, -Stern)
 Device Datum: WGS 84

Roll and Pitch Receive:	Weight Factor	dRMS[m]	4dRMS[m]
Disabled	0.01	1000	4000
IEC 61162-1 Transmit checksum	0.05	200	800
\$ char included in transmit checksum	0.07	143	571
	0.1	100	400
	0.2	50	200
	0.4	25	100
	0.6	17	67
	0.8	12	50

OK Cancel

An example of setting for Syledis receiver.

Enter values for Weight Factor and Cmg Delay as follows.

-Weight Factor: 0.1

-Cmg Delay: 0

Edit parameters - Positioning Equipment 3

Connected: YES Device Name: SERCEL
 Adapter Chl: 12 Device Type: Syledis
 Device Interface: Syledis Weight Factor: 0.1
 Identification: GGA+VTG Cmg Delay: 0 s
 Talker Identifier: XX XX=don't care Offsets from: 10.0 m (+Stbd, -Port)
 Speed Talker ID: XX XX=don't care Antenna position to Conning position: 5.0 m (+Bow, -Stern)
 Device Datum: WGS 84

Roll and Pitch Receive:	Weight Factor	dRMS[m]	4dRMS[m]
Disabled	0.01	1000	4000
IEC 61162-1 Transmit checksum	0.05	200	800
\$ char included in transmit checksum	0.07	143	571
	0.1	100	400
	0.2	50	200
	0.4	25	100
	0.6	17	67
	0.8	12	50

OK Cancel

An example of setting for Loran receiver.

Enter values for Weight Factor and Cmg Delay as follows.

-Weight Factor: 0.1

-Cmg Delay: 0

Edit parameters - Positioning Equipment 5

Connected: YES Device Name: LORAN C
 Adapter Chl: 12 Device Type: Loran
 Device Interface: IEC 61162-1 ed1 Weight Factor: 0.1
 Identification: GLL+VTG Cmg Delay: 0 s
 Talker Identifier: LC XX=don't care Offsets from: 5.0 m (+Stbd, -Port)
 Speed Talker ID: LC XX=don't care Antenna position to Conning position: 10.0 m (+Bow, -Stern)
 Device Datum: WGS 84

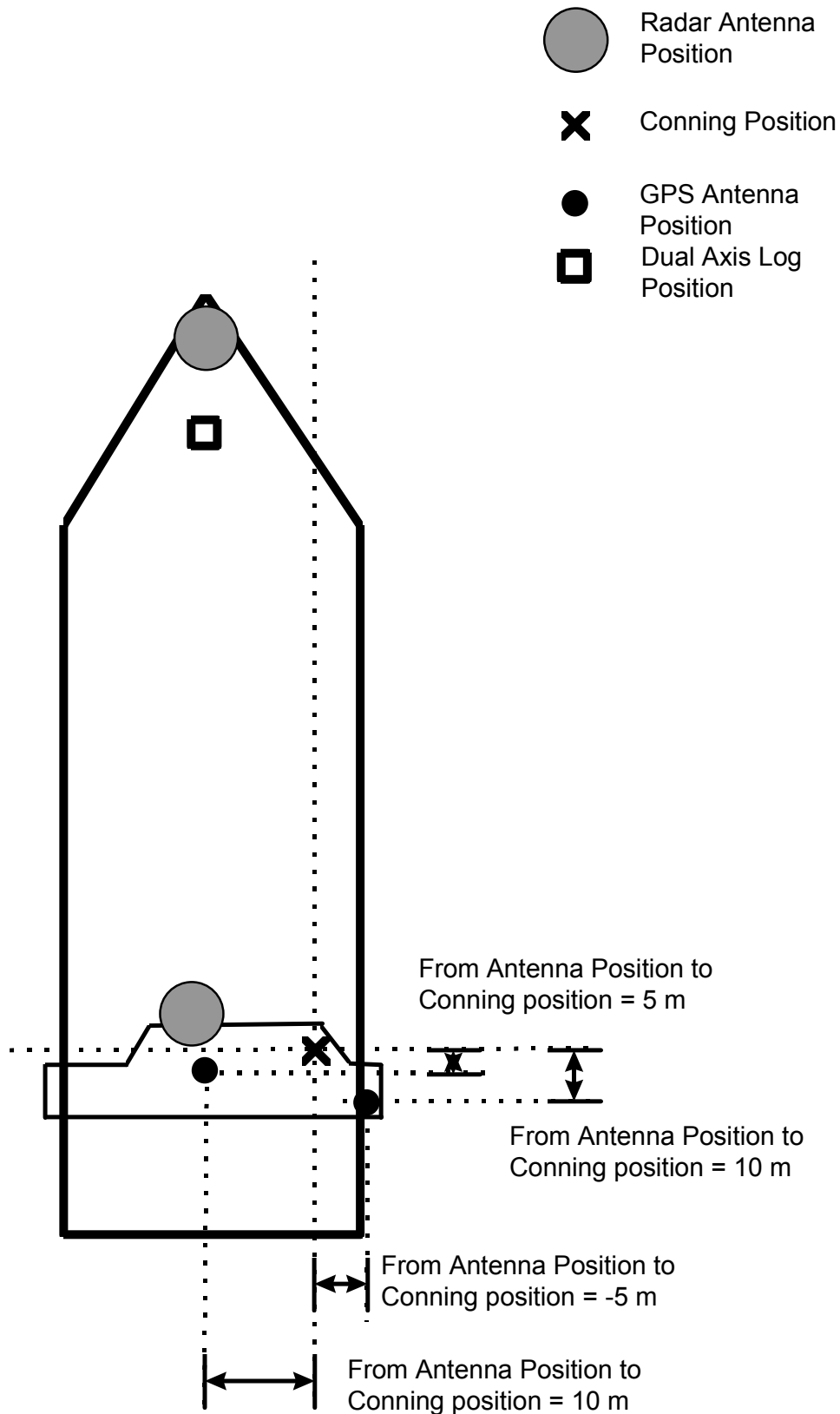
Roll and Pitch Receive:	Weight Factor	dRMS[m]	4dRMS[m]
Disabled	0.01	1000	4000
IEC 61162-1 Transmit checksum	0.05	200	800
\$ char included in transmit checksum	0.07	143	571
	0.1	100	400
	0.2	50	200
	0.4	25	100
	0.6	17	67
	0.8	12	50

OK Cancel

Notes:

- Talker identifier can be separately defined for speed and course (VTG message) and for position (GLL, GGA or PAT message). If talker identifier is defined as XX, then it is ignored.
- IEC 61162-1 ed1 or ed2: GGA uses messages VTG and GGA. Recommended for DGPS. Correct operation of a DGPS sensor requires that the system also receives VTG (COG/SOG) message. If no VTG message is received, the system thinks that there is something wrong in the DGPS and it downgrades the DGPS to an ordinary GPS sensor.
- IEC 61162-1 ed1: GLL uses messages VTG and GLL. Recommended for non-differential position receivers.
- IEC 61162-1 ed2: GLL uses messages VTG and GLL. Recommended for both differential and non-differential position receivers.
- COG delay is the delay between own ship turning and course made good in the VTG message to detect turning. Typically values are from 0 to 15 seconds.
- Because no message has any datum indication, the user is responsible for reference system used in the position receiver. GGA message is supposed to always be in WGS-84, but unfortunately some manufacturers do not follow this standard.
- Only one of connected sensors is allowed to send ZDA message, which will be used to adjust the system clock. If time difference is larger than 5 seconds and if the system is not a part of steering (i.e., mode is not Goto Wp, Goto Track or Program Track Turn) and if the system has Kalman filter in OFF position.
- Offset from antenna position to Conning position is essential for speed, course, drift and predictor related calculation.
- Roll & pitch data may be enabled only with PAT.
- First two channels can also operate as general purpose outputs. Checksum related parameters are for outputs only. Sent messages are GLL, VTG and HDT.
- There are two alternatives for IEC 61162-1 based interface: **ed1** and **ed2**. Ed1 was published in September 1998 and Ed2 was published in July 2000. The differences are new datum message (DTM) and changed content of GLL position message.
- Ed2 requires that position information (in this case GLL or GGA messages) also contain separate indication of datum used (DTM message). IMO rule states that ECDIS can only accept position in WGS84 datum. In practice only EPFS (for example, GPS or DGPS), which has "IEC 61162-1 Ed 2 (2000-7)" indicated in their type approval certificate can detect Datum.
- Ed2 requires that the GLL message includes a quality indicator i.e., the GLL message can indicate if position is based on standard GPS or differential GPS.

3. ADJUSTMENTS



Note for service engineer:

If the vessel has main and backup system, then you must yourself set proper antenna offset for both systems. Keep in mind that they are two independent and separate systems, but they should share common antenna offset in case that they are connected to the same position antenna.

Echo Sounder and Weather

Edit parameters - Echo Sounder and Weather

OK Cancel

	Echosounder (BOW)	Echosounder (AFT)	Water Current
Connected	YES	YES	YES
Device Interface	IEC61162-1 (\$xxDBT)	IEC61162-1 (\$xxDBT)	IEC61162-1 (\$xxCDR)
Adapter Chl	14	16	12
Talker Identifier	SS	SS	SS
Median Filter	NO	NO	
Sensor to keel distance	0 m	0 m	

	Water Temperature	Air Temperature	Air Pressure	Air Humidity
Connected:	YES	NO	NO	NO
Device Interface:	IEC61162-1 (\$xxMTW)	Analog(uses B-Adapter)	Analog(uses B-Adapter)	Analog(uses B-Adapter)
Adapter Chl:	10	8	6	4
Output	0 V (at 0 °C)	0 V (at 0 °C)	0 V (at 800 hPa)	0 V (at 0 %)
Output per Volt:	0 °C / Volt	2 °C / Volt	0 hPa/Volt	0 %/Volt
Prefiltering:	0	0	0	0
B-Adapter Chl:	2	3	7	5

Notes: (air temperature)

- Not used by this system, should have Connected = NO.

Notes: (air pressure)

- Not used by this system, should have Connected = NO.

3. ADJUSTMENTS

Wind sensor

Here is an example of a wind sensor which is connected to LAN Adapter channel 15.

Dialog box titled "Edit parameters - Wind Sensor" with the following fields and values:

- Connected: YES
- Adapter Channel: 15
- Device Interface: IEC 61162-1 (\$xMWW)
- Identification: MWW
- Interpretation of received angle: wind blows from direction of angle
- Source of True Wind: Receive (T)heoretical Wind (HDG) and Calculate True Wind
- Style of Display: Display Rel (=Apparent) or True (=North)
- Style of send to ARPA: Send T (=True/Theoretical) or R (=Apparent)

Wind modes are defined as: The wind as measured by a wind meter is known as apparent wind. If indicated wind includes speed compensation it is known as relative wind. If indicated wind includes both speed and heading compensation it is known as true wind.

Definitions:

- APPARENT Wind as measured by wind meter.
- RELATIVE Wind includes speed compensation.
- TRUE(T)heoretical Wind includes both speed and heading compensations.
- TRUE(=North) Wind includes both speed compensation and North stabilization.

Notes:

- Talker identifier is ignored.
- THIES in the Device Interface is a special case.
- Calculation of true from relative can only be used if wind sensor sends TRUE wind according to definition above.
- **Source of True Wind** to define what kind of wind is transmitted by weather station: Receive (T)heoretical Wind (HDG) and calculate True wind is default.
- **Style of Display** to define what kind of wind is displayed on ECDIS, True wind or Relative wind.
- **Style of output to ARPA** to define what kind of wind is transmitted to ARPA.

Trackpilot, autopilot

Settings when no Trackpilot is connected:

The screenshot shows the 'Edit parameters - Trackpilot' dialog box with the following settings:

- Device Interface: ASPO-EMRI
- Connected: NO
- Adapter Channel: 3
- WPT Approach: IEC 62065
- Steering Sources: Trackpilot
- Steering Style: Program Track
- Trackpilot SW type: Uses Turn/Linear bit
- Radius Values: No device limitations
- Minimum Turning Radius: 0.1 NM
- Lower Off Course Alarm Limit: 15
- Higher Off Course Alarm Limit and Drift Compensation Limit: 45
- Minimum Route Speed: 8.0 kn
- Route Check: IEC 62065 (Not required)
- Off Track Style: Arrowheads (<->)
- From Conning position to XTE calculation position (+Bow, -Stern): 50 m
- Turn Endline in Route Steering: WPT+WOP
- Received Messages: Enable Check and Alarms
- IEC 61162-1 Transmit checksum: Used
- Checksum: \$ char not included (IEC 61162-1 & EMRI)
- Manual Steering Label: HAND
- Forwarding Distance Range: -0.5 , 0.6 - 1.1 , 1.2 -
- Auxiliary Steering Mode Info: Not Used

Settings for FURUNO FAP-2000/EMRI SEM200 Trackpilot

The screenshot shows the 'Edit parameters - Trackpilot' dialog box with the following settings:

- Device Interface: ASPO-EMRI
- Connected: YES
- Adapter Channel: 3
- WPT Approach: IEC 62065
- Steering Sources: Trackpilot
- Steering Style: Traditional
- Trackpilot SW type: Uses Turn/Linear bit
- Radius Values: No device limitations
- Minimum Turning Radius: 0.1 NM
- Lower Off Course Alarm Limit: 15
- Higher Off Course Alarm Limit and Drift Compensation Limit: 45
- Minimum Route Speed: 8.0 kn
- Route Check: IEC 62065 (Not required)
- Off Track Style: Arrowheads (<->)
- From Conning position to XTE calculation position (+Bow, -Stern): 20 m
- Turn Endline in Route Steering: WPT+WOP
- Received Messages: Enable Check and Alarms
- IEC 61162-1 Transmit checksum: Used
- Checksum: \$ char not included (IEC 61162-1 & EMRI)
- Manual Steering Label: HAND
- Forwarding Distance Range: -0.5 , 0.6 - 1.1 , 1.2 -
- Auxiliary Steering Mode Info: Not Used

Notes:

In general all settings above are mandatory for FURUNO FAP-2000/EMRI SEM200 Trackpilot. The following parameters can be used to tailor the system to the vessel:

- Minimum turn radius
- Turn Endline in route steering
- From Conning position to XTE calculation position
- Minimum route speed
- Manual Steering Label
- Forwarding Distance Range
- Route Check (Available when “Connected” is “YES”)
 - IEC-62065 (Not required): Route Monitor is available without Route Check.
 - DNV (Required by class note): Route Check is necessary to use Route Monitor.

3. ADJUSTMENTS

FURUNO FAP-2000/EMRI SEM200 Trackpilot

FURUNO FAP-2000 Trackpilot is a separate unit. It consists of electronic unit AEU511 and control panel(s) MIP. If it is used with ECDIS some parameters must be as below. For further details, see separate manual for FAP-2000/EMRI SEM 200.

The values of the following remote interface parameters must be checked:

- VMS: 0 (Vector interface)
- VMSTimeout: 0 (Vector interface)
- ctsdef: 2 (cts=hsc when leaving remote (continue turn))
- seldef: 1 (display hsc as cts during remote track turns)
- lundef : 1 (default condition)
- SpeedSource: 3 (ECDIS is main source of speed)
- LogNmeaCh: 0 (ECDIS is connected to serial channel 0)
- FreezeRudder: 0 (Maintain manoeuvre after loss of heading)
- HdtTimeoutLimit 5 (For serial data gyro with high message rate more than 5 HDT messages per second. If message rate is less than this, then use HdtTimeoutLimit = 25).

The following parameter can be used to tailor the system to the vessel. Write down values of following parameters:

- fiondly: xx (Track regulator integrator start delay [sec], 64 is recommended)
- firw: xx (Track regulator integrator start limit [NM], 0.02 is recommended)
- ficimax xx (Max attack angle to track for integral part of cross track error [radians]. 0.2 is recommended, which is about 12 °.)
- fpcimax xx (Max attack angle to track for proportional part of cross track error [radians]. 0.2 is recommended, which is about 12 °.)
- Rrudabs: xx (Rudder limit for Radius and Goto WP mode)
- Grudabs: xx (Rudder limit for Heading Control, Program Track and Goto Track mode)
- sleng xxx (Ships length [m])
- u_norm xx (Max speed of vessel [kt])
- BackupSpeedSource x (Backup speed source if ECDIS fails. If no backup is available then set this as 3.)
- BackupLogNmeaCh x (Serial channel for backup speed source. If no backup is available then set this as 0.)

- GyroNmeaCh x (Serial channel for gyro)
- PminRadius xx (Minimum available radius. Must be equal to ECDIS parameter.)

For proper track control, software of AEU511 must be "SEM200 Version Aeu2_3 Compiled 6-5-2003 15:37" and MPI31 must be "MIP2 Version Mip2 Compiled 7-5-2003 14:55".

Notes (Emergency instructions for cases when software of AEU511 or MIP31 is older version.)

- Parameter "ctsdef" requires careful special attention.
- When software of AEU511 is older than "SEM200 Version Aeu2_3 Compiled 13-2-2002"
- ctsdef0 cts=hsc when leaving remote (continue turn)
- When software of AEU511 is newer or equal to "SEM200 Version Aeu2_3 Compiled 13-2-2002"
- ctsdef2 turn/linear bit control behaviour. For turn, cts=hsc when leaving remote (continue turn). For linear, cts=hdg; when leaving remote (steady as she goes).

Note also that if software of AEU511 electronic unit is newer or equal to "SEM200 Version Aeu2_3 Compiled 13-2-2002", then software of MIP panel must be newer or equal to "MIP2 Version Mip2 Compiled 7-3-2002 13:33".

3. ADJUSTMENTS

Yokogawa PT-500A Autopilot

Below are settings for the Yokogawa PT-500A Autopilot.

The screenshot shows a dialog box titled "Edit parameters - Trackpilot" with a close button (X) in the top right corner. The dialog contains several configuration fields:

- Device Interface: IEC 61162-1 (Yokogawa HTC/HTD)
- Connected: YES
- Adapter Channel: 3
- WP Approach Rule: IEC 62065
- Steering Sources: Trackpilot
- Radius Values: No device limitations
- From Conning position to XTE calculation position (+Bow, -Stern): 20 m
- Minimum Turning Radius: 0.1 nm
- Turn Endline in Route Steering: wp+wop
- Lower Off Course Alarm Limit: 15 °
- Received Messages: Enable Check and Alarms
- Higher Off Course Alarm Limit and Drift Compensation Limit: 30 °
- IEC 61162-1 Transmit checksum: Used
- Minimum Route Speed: 5.0 kt
- Checksum: \$ char not included (IEC 61162-1 & EMRI)
- Route Check: IEC-62065 (Not required)
- Forwarding Distance Range: - 0.5 , 0.6 - 1.1 , 1.2 -

Buttons for "OK" and "Cancel" are located in the top right area of the dialog.

GENERAL NOTES:

- In general all settings above are mandatory for Yokogawa PT-500A Autopilot. The following parameters can be used to tailor the system to the vessel:
- Minimum turn radius
- Turn Endline in route steering
- From Conning position to XTE calculation position
- Minimum route speed

NOTES ABOUT PARAMETERS INSIDE YOKOGAWA PT-500A:

Yokogawa PT-500A Autopilot steering control unit is a separate unit, which can operate together with ECDIS. Some parameters must be as below in Autopilot control unit.

For more information see manual of Yokogawa PT-500A Autopilot.

Confirm that the values of following remote interface parameters are as follows:

- INS/GPS Inp: INS-2 (type B)
- INS/GPS Out: \$AGHDT (INS-2)
- Rudder State Control: BY-PASS

For proper steering, control software of Yokogawa PT-500A Autopilot must be:

- For Main: CPU-CR155K05 or newer
- For Calc: CPU-CR325A09 or newer

TOKYO KEIKI PR-6000 Autopilot

Settings for TOKYO KEIKI PR 6000 Autopilot in ECDIS:

Edit parameters - Trackpilot		OK	Cancel
Device Interface:	IEC 61162-1 (Tokimec HTC/HTD)		
Connected:	YES		
Adapter Channel:	3		
WP Approach Rule:	IEC 62065		
Steering Sources:	Trackpilot		
Radius Values:	No device limitations	From Conning position to XTE calculation position (+Bow, -Stern)	63 m
Minimum Turning Radius:	0.1 nm	Turn Endline in Route Steering:	wp+wop
Lower Off Course Alarm Limit:	4.6 °	Received Messages:	Enable Check and Alarms
Higher Off Course Alarm Limit and Drift Compensation Limit:	45 °	IEC 61162-1 Transmit checksum:	Used
Minimum Route Speed:	5.0 kt	Checksum:	\$ char not included (IEC 61162-1 & EMRI)
Route Check	IEC-62065 (Not required)	Forwarding Distance Range:	- 0.5 , 0.6 - 1.1 , 1.2 -

NOTES:

In general all setting above are mandatory for TOKYO KEIKI PR-6000 Autopilot. Following parameter can be used to tailor the system to the vessel

- Minimum turn radius
- Turn End line in route steering
- From Conning position to XTE calculation position
- minimum route speed
- Forwarding Distance Range

Settings for Tokimec PR 6000 Autopilot:

Tokimec PR 6000 Autopilot Autopilot steering control unit is a separate unit, which can operate together with ECDIS. Some parameters must be as below in Autopilot control unit.

1. Data setting

data 5 (speed compensation): 12 or 92
 data 15 (rudder speed): bit6 = 0, bit7 = 0
 data 30 (XTE Gain): 06
 data 40 (drift compensation): 00

3. ADJUSTMENTS

2. Auto Steering Control Adjusting(Ref AP manual)

	Adjustment	Auto Mode		RC-NAV Mode	Remarks
		PID	ADPT		
1	Rate of turn (RATE)	(1-9)	----	----	
2	Rudder Ratio (Rudder)	(1-9)	----	----	
3	Weather adjustment (Weather)	(0-10)	----	----	
4	ADPT(OPN/CNF)	----	OPN/CNF	OPN or CNF	Note 1
5	Pilot watch setting (Pilot Watch)	(5-15°)	(5-15°)	----	Note 3
6	Rudder limit setting (Rudder Limit)	(5-35°)	(5-35°)	----(Note 2)	

---: No function

Note1 Adaptive function becomes OPN on RC-NAV mode (under ECDIS control) when ADPT/Weather knob selected 0-10.

Note2 During RC-NAV mode (under ECDIS control), the Rudder Limit is ignored.

Note3 During RC-NAV mode (under ECDIS control), Pilot watch alarm is not given.

3. Speed selection

	Ship's speed input signal	Example of ordinary display	Example of display when operating CHANGE switch	Remarks
> 1	Log pulses input	20.5	P-Lc	Ship's speed is used from ECDIS when RC-NAV is selected.
2	Manual input	C 15.0(Manual)	P 0c - P40c	

(1) During RC-NAV mode, Low Speed Alarm on Autopilot is not given but ECDIS generate own Low Speed Alarm setting by installation parameter of Track pilot.

(2) During RC-NAV mode speed selection of Autopilot could not change. NAV Ready lamp dose not lit when manual speed is selected on other mode than RC-NAV, then Autopilot could not accept to RC-NAV Mode (Track control).

(3) If speed selection of Autopilot is manual "SPD" indicator will be flicker on "AUTO", "HAND" or "NFU" mode.

Autopilot information area indicate as manual speed on ECDIS screen,

4. Software version

For proper track control, software of PR-6000 must be:

MMA: v3.80 ->

PID: v3.80 ->

ADNCT: v1.40 ->

ROT gyro

No ROT Gyro connected:
The system calculates from
movement of Gyro heading.

Connected: NO, Calculated from Gyro source

Adapter Channel: 1

Device Type: Gyro1: IEC 61162-1 (\$xROT)

B-Adapter Channel: 2

Output at 0 °/min: -5 V

Output per Volt: -40 (°/min) / V

Prefiltering: 0

Max scale: 200

Use sign of Output per Volt to change polarity of Rate of turn

ROT gyro value is received
from Dolog 23 dual-axis log.

Connected: YES

Adapter Channel: 8

Device Type: DAX Dolog23: (\$PKDRU)

B-Adapter Channel: 2

Output at 0 °/min: -5 V

Output per Volt: -40 (°/min) / V

Prefiltering: 0

Max scale: 200

Use sign of Output per Volt to change polarity of Rate of turn

ROT gyro value is received
from gyro connected as
Gyro1.

Connected: YES

Adapter Channel: 7

Device Type: Gyro 1: IEC 61162-1 (\$xxROT)

B-Adapter Channel: 2

Output at 0 °/min: -5 V

Output per Volt: -40 (°/min) / V

Prefiltering: 0

Max scale: 200

Use sign of Output per Volt to change polarity of Rate of turn

3. ADJUSTMENTS

ROT gyro value is received from Trackpilot.

The screenshot shows a dialog box titled "Edit parameters - Rate of Turn Gyro" with a close button in the top right corner. The dialog contains the following fields and controls:

- Connected: YES (dropdown menu)
- Adapter Channel: 3 (text input)
- Device Type: Trackpilot (dropdown menu)
- B-Adapter Channel: 2 (text input)
- Output at 0 °/min: -5 (text input) V
- Output per Volt: -40 (text input) (°/min) / V
- Prefiltering: 0 (text input)
- Max scale: 200 (text input)

On the right side of the dialog, there are two buttons: "OK" and "Cancel". Below the "Output per Volt" field, there is a note: "Use sign of Output per Volt to change polarity of Rate of turn".

ROT gyro value is received using analog interface directly from a ROT gyro sensor.

The screenshot shows a dialog box titled "Edit parameters - Rate of Turn Gyro" with a close button in the top right corner. The dialog contains the following fields and controls:

- Connected: YES (dropdown menu)
- Adapter Channel: 4 (text input)
- Device Type: Analog (uses B-Adapter) (dropdown menu)
- B-Adapter Channel: 2 (text input)
- Output at 0 °/min: -5 (text input) V
- Output per Volt: -40 (text input) (°/min) / V
- Prefiltering: 0 (text input)
- Max scale: 200 (text input)

On the right side of the dialog, there are two buttons: "OK" and "Cancel". Below the "Output per Volt" field, there is a note: "Use sign of Output per Volt to change polarity of Rate of turn".

Conning display

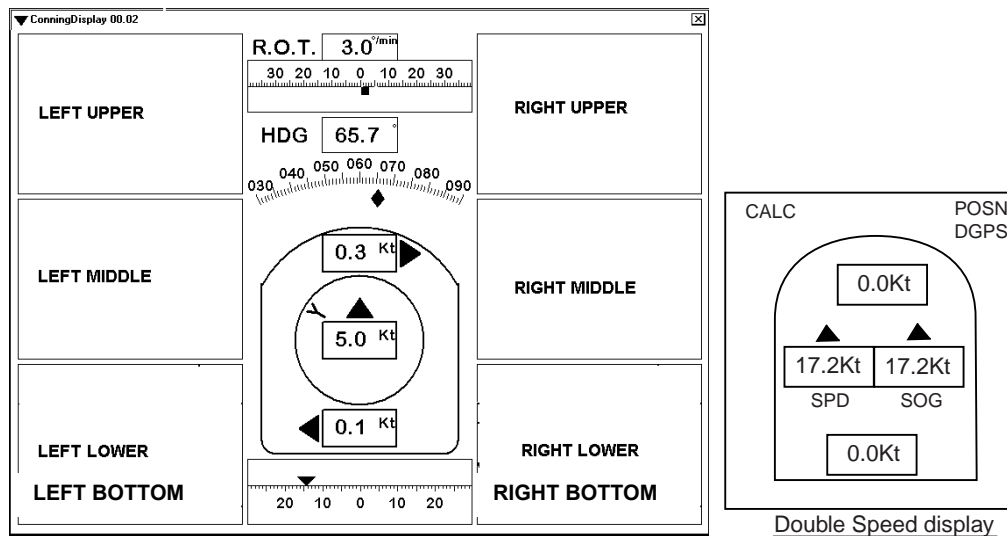
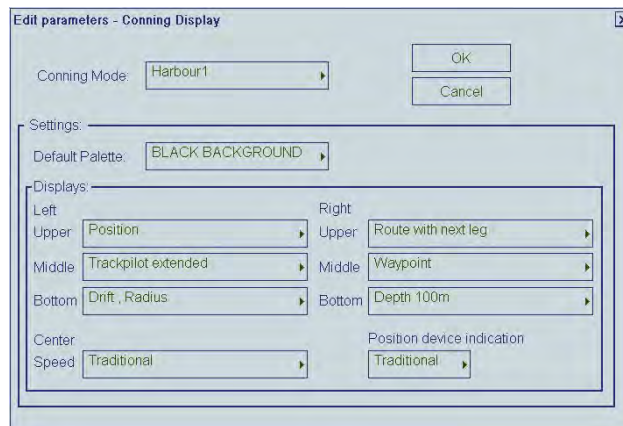


Figure above shows how the windows are located in Conning Display.



1) Select Conning Mode (Harbour1, Harbour2, Navigate1 or Navigate2).

Note, Stand-alone Conning Mode is used only with Conning Processor CP-01 and sidebar Conning Display.

You can make individual settings for each Conning Mode in the Settings field.

2) Use Default Palette setting to define background of Conning Display. This palette is used when you start Conning Mode in question.

3) Define which windows are displayed in each Conning Mode in the Display field. For more information about content of windows, see the Operator's Manual.

- **Alarm messages** windows are used only if Device Interface of Alarm Inputs is "\$CAALA".
 - **Track pilot extended** window is used only if steering mode of Trackpilot is "Program Track".
 - **Service nnnn** windows are intended for use by a service engineer during sea trials.
- 4) Select Traditional, Double speed, Small size or Small with Double speed.
5) Select Traditional or Detailed.

Note: The number of conning display can be changed only when installing the program. For detail, see Service Manual.

3. ADJUSTMENTS

Rudders

Select Connected **NO** if no rudder is connected to the ECDIS.

Edit parameters - Rudders

Connected:

Device Type:

Number of Rudders:

Navigation Display Scale Max:

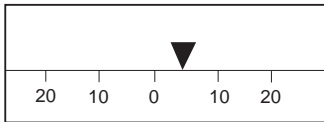
Harbour Display Scale Max:

Rudder type:

Numerical value:

Not Used	Not Used	Not Used	Not Used
Label: <input type="text" value="ACT"/>			
Display method: <input type="text" value="Normal"/>	<input type="text" value="Normal"/>	<input type="text" value="Normal"/>	<input type="text" value="Normal"/>

One rudder is connected and value is received using analog interface.



Edit parameters - Rudders

Connected:

Device Type:

Number of Rudders:

Navigation Display Scale Max:

Harbour Display Scale Max:

Rudder type:

Numerical value:

Use sign of Output per Volt to change polarity of Rudder

Rudder 1	Not Used	Not Used	Not Used
Label: ACT ANALOG			
B-Adapter Channel: <input type="text" value="1"/>	<input type="text" value="4"/>	<input type="text" value="3"/>	<input type="text" value="1"/>
Output at 0°: <input type="text" value="4.00"/> V	<input type="text" value="0.00"/> V	<input type="text" value="0.01"/> V	<input type="text" value="0.01"/> V
Output per Volt: <input type="text" value="-5.00"/> %V	<input type="text" value="0.00"/> %V	<input type="text" value="0.01"/> %V	<input type="text" value="0.70"/> %V
Prefiltering: <input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>
Label: <input type="text" value="ACT"/>			
Display method: <input type="text" value="Normal"/>	<input type="text" value="Normal"/>	<input type="text" value="Normal"/>	<input type="text" value="Normal"/>

Two rudders are connected and one value is received using analog interface and second value is received from Trackpilot.

Edit parameters - Rudders

Connected:

Device Type:

Number of Rudders:

Navigation Display Scale Max:

Harbour Display Scale Max:

Rudder type:

Numerical value:

Use sign of Output per Volt to change polarity of Rudder

Rudder 1	Rudder 2	Not Used	Not Used
Label: ACT ANALOG	Label: ORD TRACKPILOT		
B-Adapter Channel: <input type="text" value="1"/>			
Output at 0°: <input type="text" value="4.00"/> V			
Output per Volt: <input type="text" value="-5.00"/> %V			
Prefiltering: <input type="text" value="0"/>			
Label: <input type="text" value="ACT"/>			
Display method: <input type="text" value="Normal"/>	<input type="text" value="Normal"/>	<input type="text" value="Normal"/>	<input type="text" value="Normal"/>

Two rudders are connected and values are received using analog interfaces.

Edit parameters - Rudders

Connected: YES

Device Type: Analog (uses B-Adapter)

Number of Rudders: 2

Navigation Display Scale Max: 23

Harbour Display Scale Max: 33

Rudder type: Conventional (one scale)

Numerical value: Comered

Use sign of Output per Volt to change polarity of Rudder

	Rudder 1	Rudder 2	Not Used	Not Used
	ACT ANALOG	ORD ANALOG		
B-Adapter Channel	1	4	3	1
Output at 0°	4.00 V	0.00 V	0.01 V	0.01 V
Output per Volt	-5.00 %V	0.00 %V	0.01 %V	0.70 %V
Prefiltering	0	0	0	0
Label	ACT			
Display method	Normal	Normal	Normal	Normal

Two rudders are connected and values are received from Trackpilot.

Edit parameters - Rudders

Connected: YES

Device Type: Trackpilot

Number of Rudders: 2

Navigation Display Scale Max: 23

Harbour Display Scale Max: 33

Rudder type: Conventional (one scale)

Numerical value: Only ORD/Comered

	Rudder 1	Rudder 2	Not Used	Not Used
	ACT TRACKPILOT	ORD TRACKPILOT		
Label	ACT			
Display method	Normal	Normal	Normal	Normal

Note: You can give "name" for rudder in the Label field. This "name" is displayed in the Rudder window of the Conning Display.

One rudder is connected and value is received from Engine Control.

Edit parameters - Rudders

Connected: YES

Device Type: Engine Control

Number of Rudders: 1

Navigation Display Scale Max: 23

Harbour Display Scale Max: 33

Rudder type: Conventional (one scale)

Numerical value: Not used

Use sign of Output per Volt to change polarity of Rudder

	Rudder 1	Not Used	Not Used	Not Used
	ACT ENGINE CTRL			
Output per Volt	-5.00 %V	0.00 %V	0.01 %V	0.70 %V
Label	ACT			
Display method	Normal	Normal	Normal	Normal

3. ADJUSTMENTS

Two rudders are connected and values are received from Engine Control.

Edit parameters - Rudders

Connected: YES

Device Type: Engine Control

Number of Rudders: 2

Navigation Display Scale Max: 23

Harbour Display Scale Max: 33

Rudder type: Conventional (one scale)

Numerical value: Only ORD/Cornered

Use sign of Output per Volt to change polarity of Rudder

	Rudder 1	Rudder 2	Not Used	Not Used
ACT	ACT	ORD		
ENGINE CTRL	ENGINE CTRL	ENGINE CTRL		
Output per Volt	-5.00 %V	0.00 %V	0.01 %V	0.70 %V
Label	ACT			
Display method	Normal	Normal	Normal	Normal

Rudder-type Azimuth Propulsion
Display method = Azimuth 0° up and
Display method = Azimuth 0° down are used to select between alternative scale for Azimuth propulsion window.

Rudder-type-Azimuth Propulsion and values, are received as SIN/COS values using analog interface.

Note: For each rudder required, two analog channels are required to receive both SIN and COS values.

Edit parameters - Rudders

Connected: YES

Device Type: Analog SIN/COS (uses B-Adapter)

Number of Rudders: 2

Navigation Display Scale Max: 23

Harbour Display Scale Max: 33

Rudder type: Azimuth Propulsion (no scale)

Numerical value: Not used

Use sign of Polarity to change turning direction of Azimuth

	Azimuth 1	Azimuth 2	Azimuth 1	Azimuth 2
ANALOG Sin	ANALOG Sin	ANALOG Sin	ANALOG Cos	ANALOG Cos
B-Adapter Channel	1 SIN	4 SIN	3 COS	1 COS
Output at 0 unit	4.00 V	0.00 V	0.01 Offset °	0.01 Offset °
Output per Volt	-5.00 unit/V	0.00 unit/V	0.01 Polarity	0.70 Polarity
Prefiltering	0	0	0	0
Label	ACT			
Display method	Azimuth 0° up	Azimuth 0° up		

Two rudders are connected and values are received as IEC 61162-1 (\$xxRSA) format.

Edit parameters - Rudders [X]

Connected: YES [dropdown] OK [button]

Device Type: IEC 61162-1 (\$xxRSA) [dropdown] Cancel [button]

Number of Rudders: 2 [dropdown]

Navigation Display Scale Max: 37 [input] °

Harbour Display Scale Max: 37 [input] °

Rudder type: Conventional (one scale) [dropdown]

Numerical value: Cornered [dropdown]

Use scaling factor to generate real Rudder angle from the proportional value in message

	Rudder 1	Rudder 2	Not Used	Not Used
	PORT	STBD		
	RSA (single value)	RSA (single value)		
Adapter Channel	0 [input]	16 [input]	16 [input]	16 [input]
Talker Identifier	II [input]	[input]	[input]	SD [input]
Scaling factor	1.00 [input]	1.00 [input]	2.00 [input]	2.00 [input]
Label	ACT [input]	ORD [input]		
Display method	Normal [dropdown]	Normal [dropdown]	Normal [dropdown]	Normal [dropdown]

3. ADJUSTMENTS

Propellers

Select Connected **NO** if propeller is not connected to the ECDIS.

Edit parameters - Propellers 1 (stern)

General
 Connected:
 Device Type:
 Label:

	RPM	Pitch	Power	Torque	M/E Rpm
In use		<input type="text" value="NO"/>	<input type="text" value="NO"/>	<input type="text" value="NO"/>	<input type="text" value="YES"/>
B-Adapter channel	<input type="text" value="3"/>	<input type="text" value="4"/>	<input type="text" value="2"/>	<input type="text" value="2"/>	<input type="text" value="0"/>
Output at 0	<input type="text" value="0"/> V	<input type="text" value="9.7"/> V	<input type="text" value="0"/> V	<input type="text" value="0.01"/> V	<input type="text" value="0.00"/> V
Output per Volt	<input type="text" value="-26.45"/> RPM/V	<input type="text" value="-28.94"/> unit/V	<input type="text" value="0"/> kW/V	<input type="text" value="0.01"/> Nm/V	<input type="text" value="0.00"/> RPM/V
Prefiltering	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>
Minimum	<input type="text" value="0"/> RPM	<input type="text" value="-99.96"/> unit			<input type="text" value="0"/> RPM
Maximum	<input type="text" value="100"/> RPM	<input type="text" value="100"/> unit	<input type="text" value="30000"/> kW	<input type="text" value="70"/> Nm	<input type="text" value="0"/> RPM

Ship has one fixed propeller connected as Propeller 1 (stern).

Edit parameters - Propellers 1 (stern)

General
 Connected:
 Device Type:
 Label:

	RPM	Pitch	Power	Torque	M/E Rpm
In use		<input type="text" value="NO"/>	<input type="text" value="NO"/>	<input type="text" value="NO"/>	<input type="text" value="YES"/>
B-Adapter channel	<input type="text" value="3"/>	<input type="text" value="4"/>	<input type="text" value="2"/>	<input type="text" value="1"/>	<input type="text" value="0"/>
Output at 0	<input type="text" value="0"/> V	<input type="text" value="9.7"/> V	<input type="text" value="0"/> V	<input type="text" value="0.01"/> V	<input type="text" value="0.00"/> V
Output per Volt	<input type="text" value="-26.46"/> RPM/V	<input type="text" value="-28.95"/> unit/V	<input type="text" value="0"/> kW/V	<input type="text" value="0.01"/> Nm/V	<input type="text" value="0.00"/> RPM/V
Prefiltering	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>
Minimum	<input type="text" value="0"/> RPM	<input type="text" value="-99.97"/> unit			<input type="text" value="0"/> RPM
Maximum	<input type="text" value="100"/> RPM	<input type="text" value="100"/> unit	<input type="text" value="30000"/> kW	<input type="text" value="70"/> Nm	<input type="text" value="0"/> RPM

Ship has one pitch propeller connected as Propeller1 (stern).

Edit parameters - Propellers 1 (stern)

General
 Connected:
 Device Type:
 Label:

	RPM	Pitch	Power	Torque	M/E Rpm
In use		<input type="text" value="YES"/>	<input type="text" value="NO"/>	<input type="text" value="NO"/>	<input type="text" value="YES"/>
B-Adapter channel	<input type="text" value="3"/>	<input type="text" value="4"/>	<input type="text" value="2"/>	<input type="text" value="1"/>	<input type="text" value="0"/>
Output at 0	<input type="text" value="0"/> V	<input type="text" value="9.7"/> V	<input type="text" value="0"/> V	<input type="text" value="0.01"/> V	<input type="text" value="0.00"/> V
Output per Volt	<input type="text" value="-26.47"/> RPM/V	<input type="text" value="-28.96"/> unit/V	<input type="text" value="0"/> kW/V	<input type="text" value="0.01"/> Nm/V	<input type="text" value="0.00"/> RPM/V
Prefiltering	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>
Minimum	<input type="text" value="0"/> RPM	<input type="text" value="-99.98"/> unit			<input type="text" value="0"/> RPM
Maximum	<input type="text" value="100"/> RPM	<input type="text" value="100"/> unit	<input type="text" value="30000"/> kW	<input type="text" value="70"/> Nm	<input type="text" value="0"/> RPM

Ship has two pitch propellers and the second propeller is connected as Propeller2 (stern).

Edit parameters - Propellers 2 (stern)

General
 Connected:
 Device Type:
 Label:

	RPM	Pitch	Power	Torque	M/E Rpm
In use		<input type="text" value="YES"/>	<input type="text" value="NO"/>	<input type="text" value="NO"/>	<input type="text" value="YES"/>
B-Adapter channel	<input type="text" value="5"/>	<input type="text" value="6"/>	<input type="text" value="7"/>	<input type="text" value="8"/>	<input type="text" value="0"/>
Output at 0	<input type="text" value="0"/> V	<input type="text" value="0"/> V	<input type="text" value="0"/> V	<input type="text" value="0.01"/> V	<input type="text" value="0.00"/> V
Output per Volt	<input type="text" value="-26.47"/> RPM/V	<input type="text" value="-31.96"/> unit/V	<input type="text" value="0"/> kW/V	<input type="text" value="0.01"/> Nm/V	<input type="text" value="0.00"/> RPM/V
Prefiltering	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>
Minimum	<input type="text" value="0"/> RPM	<input type="text" value="-99.96"/> unit			<input type="text" value="0"/> RPM
Maximum	<input type="text" value="100"/> RPM	<input type="text" value="100"/> unit	<input type="text" value="30000"/> kW	<input type="text" value="70"/> Nm	<input type="text" value="0"/> RPM

Note: You can give "name" for propeller in Label field. This "name" is displayed in the Propeller window of the Conning Display.

Ship has one pitch propeller connected as Propeller 1 (stern) using Engine Control Device Type “IEC 61162-1 (MAN B+W, \$xxXDR, \$xxRPM)”.

Ship has one pitch propeller connected as Propeller1 (stern) using Engine Control “NCDAT”, “PNAV” or proprietary message used by Sindel simulators.

Switch Input	In Use	Open is OFF	Fixed Use For
1	<input type="checkbox"/>	<input type="checkbox"/>	Propeller 1
2	<input type="checkbox"/>	<input type="checkbox"/>	Propeller 1
3	<input type="checkbox"/>	<input type="checkbox"/>	Propeller 2
4	<input type="checkbox"/>	<input type="checkbox"/>	Propeller 2
5	<input type="checkbox"/>	<input type="checkbox"/>	Not Used
6	<input type="checkbox"/>	<input type="checkbox"/>	Not Used
7	<input type="checkbox"/>	<input type="checkbox"/>	Not Used
8	<input type="checkbox"/>	<input type="checkbox"/>	Not Used
9	<input type="checkbox"/>	<input type="checkbox"/>	Not Used
10	<input type="checkbox"/>	<input type="checkbox"/>	Not Used
11	<input type="checkbox"/>	<input type="checkbox"/>	Not Used
12	<input type="checkbox"/>	<input type="checkbox"/>	Not Used
13	<input type="checkbox"/>	<input type="checkbox"/>	Not Used
14	<input type="checkbox"/>	<input type="checkbox"/>	Not Used
15	<input type="checkbox"/>	<input type="checkbox"/>	Not Used
16	<input type="checkbox"/>	<input type="checkbox"/>	Not Used

3. ADJUSTMENTS

Ship has two pitch propellers and the first propeller is connected as Propeller 1 (stern) using Engine Control “NCDAT”, “PNAV” or proprietary message used by Sindel simulators.

Edit parameters - Engine Control

Connected: YES

Adapter Channel: 15

Device Type: \$NCDAT,\$PNAV,Sindel (timeout 30 s)

Switch Input	In Use	Open is OFF	Fixed Use For
1	<input type="checkbox"/>	<input type="checkbox"/>	Propeller 1
2	<input type="checkbox"/>	<input type="checkbox"/>	Propeller 1
3	<input type="checkbox"/>	<input type="checkbox"/>	Propeller 2
4	<input type="checkbox"/>	<input type="checkbox"/>	Propeller 2
5	<input type="checkbox"/>	<input type="checkbox"/>	Not Used
6	<input type="checkbox"/>	<input type="checkbox"/>	Not Used
7	<input type="checkbox"/>	<input type="checkbox"/>	Not Used
8	<input type="checkbox"/>	<input type="checkbox"/>	Not Used
9	<input type="checkbox"/>	<input type="checkbox"/>	Not Used
10	<input type="checkbox"/>	<input type="checkbox"/>	Not Used
11	<input type="checkbox"/>	<input type="checkbox"/>	Not Used
12	<input type="checkbox"/>	<input type="checkbox"/>	Not Used
13	<input type="checkbox"/>	<input type="checkbox"/>	Not Used
14	<input type="checkbox"/>	<input type="checkbox"/>	Not Used
15	<input type="checkbox"/>	<input type="checkbox"/>	Not Used
16	<input type="checkbox"/>	<input type="checkbox"/>	Not Used

Edit parameters - Propeller 1 (stern)

General

Connected: YES

Device Type: Engine Control

Label: PB

In use: RPM, Pitch: YES, Power: NO, Torque: NO, M/E Rpm: NO

B-Adapter channel

Minimum: 0 RPM, -100.0 unit, 30000 kW, 70 Nm, -500 RPM

Maximum: 100 RPM, 100.0 unit, 30000 kW, 70 Nm, 500 RPM

Ship has two pitch propellers and the second propeller is connected as Propeller 2 (stern) using Engine Control “NCDAT”, “PNAV” or proprietary message used by Sindel simulators.

Edit parameters - Propeller 2 (stern)

General

Connected: YES

Device Type: Engine Control

Label: STBD

In use: RPM, Pitch: YES, Power: NO, Torque: NO, M/E Rpm: NO

B-Adapter channel

Minimum: 0 RPM, -100.0 unit, 30000 kW, 70 Nm, -500 RPM

Maximum: 100 RPM, 100.0 unit, 30000 kW, 70 Nm, 500 RPM

Ship has one pitch propeller. You can connect and scale Main Engine RPM to be displayed on Conning Display.

Edit parameters - Propeller 1 (stern)

General

Connected: YES

Device Type: Engine Control

Label: PB

In use: RPM, Pitch: YES, Power: NO, Torque: NO, M/E Rpm: YES

B-Adapter channel

Minimum: 0 RPM, -100.0 unit, 30000 kW, 70 Nm, -500 RPM

Maximum: 100 RPM, 100.0 unit, 30000 kW, 70 Nm, 500 RPM

Ship has two pitch propellers and the second propeller is connected as Propeller2 (stern) using Engine Control.

Edit parameters - Propellers 2 (stern)

General
 Connected: YES
 Device Type: Engine Control
 Label: STBD

OK
Cancel

In use	RPM	Pitch	Power	Tprque	M/E Rpm
B-Adapter channel	5	YES	NO	NO	YES
Output at 0	0 V	6 V	7 V	8 V	0 V
Output per Volt	-26.45 RPM/V	-31.94 unit/V	0 kW/V	0.01 Nm/V	0.00 RPM/V
Prefiltering	0	0	0	0	0
Minimum	0 RPM	-99.94 unit	30000 kW	70 Nm	0 RPM
Maximum	100 RPM	100 unit			0 RPM

Ship has azimuth propulsion: **Maximum RPM = 800** and **Minimum RPM = 0** creates bar scale from 0 to 800.

Label = PORT is used as label for azimuth propulsion.

Edit parameters - Propellers 2 (stern)

General
 Connected: YES
 Device Type: Analog (uses B-Adapter)
 Label: PORT

OK
Cancel

In use	RPM	Pitch	Power	Tprque	M/E Rpm
B-Adapter channel	3	NO	NO	NO	YES
Output at 0	0 V	4 V	2 V	1 V	0 V
Output per Volt	-26.41 RPM/V	9.7 unit/V	0 kW/V	0.01 Nm/V	0.00 RPM/V
Prefiltering	0	0	0	0	0
Minimum	0 RPM	-99.92 unit	30000 kW	70 Nm	0 RPM
Maximum	800 RPM	100 unit			0 RPM

Ship has azimuth propulsion: **Maximum RPM = 800** and **Minimum RPM = 0** creates bar scale from 0 to 800.

Label = STBD is used as label for azimuth propulsion.

Edit parameters - Propellers 2 (stern)

General
 Connected: YES
 Device Type: Engine Control
 Label: STBD

OK
Cancel

In use	RPM	Pitch	Power	Tprque	M/E Rpm
B-Adapter channel	5	NO	NO	NO	YES
Output at 0	0 V	6 V	7 V	8 V	0 V
Output per Volt	-26.45 RPM/V	-31.94 unit/V	0 kW/V	0.01 Nm/V	0.00 RPM/V
Prefiltering	0	0	0	0	0
Minimum	0 RPM	-99.94 unit	30000 kW	70 Nm	0 RPM
Maximum	800 RPM	100 unit			0 RPM

Ship has azimuth propulsion: **Maximum RPM = 350** and **Minimum RPM = -350** creates bar scale: -350 .. 0 .. 350.

Label = SWNG is used as label for azimuth propulsion.

Edit parameters - Propellers 2 (stern)

General
 Connected: YES
 Device Type: Analog (uses B-Adapter)
 Label: SWNG

OK
Cancel

In use	RPM	Pitch	Power	Tprque	M/E Rpm
B-Adapter channel	4	NO	NO	NO	YES
Output at 0	-4.99 V	5 V	1 V	1 V	0 V
Output per Volt	20 RPM/V	0 unit/V	0 kW/V	0.01 Nm/V	0.00 RPM/V
Prefiltering	0	0	0	0	0
Minimum	-350 RPM	-99.99 unit	10000 kW	70 Nm	0 RPM
Maximum	350 RPM	100 unit			0 RPM

3. ADJUSTMENTS

Thrusters

Select Connected **NO** if thruster is not connected to the ECDIS.

Edit parameters - Thrusters 1 (stern)

Connected:

Device Type:

B-Adapter Channel:

Output at 0 rpm: V

Output per Volt: rpm/V

Prefiltering:

Maximum Power:

Maximum rpm:

Use sign of Output per Volt to change polarity of bar presentation

Thruster 1 (stern) is connected to the ECDIS.

Edit parameters - Thrusters 1 (stern)

Connected:

Device Type:

B-Adapter Channel:

Output at 0 rpm: V

Output per Volt: rpm/V

Prefiltering:

Maximum Power:

Maximum rpm:

Use sign of Output per Volt to change polarity of bar presentation

Thruster 3 (bow) is connected to the ECDIS.

Edit parameters - Thrusters 3 (bow)

Connected:

Device Type:

B-Adapter Channel:

Output at 0 rpm: V

Output per Volt: rpm/V

Prefiltering:

Maximum Power:

Maximum rpm:

Use sign of Output per Volt to change polarity of bar presentation

Thruster 1 (stern) is connected to the ECDIS using Engine Control.

Edit parameters - Thrusters 1 (stern) ✖

Connected:	<input type="text" value="YES"/>		<input type="button" value="OK"/>	
Device Type:	<input type="text" value="Engine Control"/>		<input type="button" value="Cancel"/>	
B-Adapter Channel:	<input type="text" value="8"/>			
Output at 0 rpm:	<input type="text" value="100"/>	V		Use sign of Output per Volt to change polarity of bar presentation
Output per Volt:	<input type="text" value="85"/>	rpm/V		
Prefiltering:	<input type="text" value="0"/>			
Maximum Power:	<input type="text" value="10000"/>			
Maximum rpm:	<input type="text" value="10000"/>			

Thruster 3 (bow) is connected to the ECDIS using Engine Control.

Edit parameters - Thrusters 3 (bow) ✖

Connected:	<input type="text" value="YES"/>		<input type="button" value="OK"/>	
Device Type:	<input type="text" value="Engine Control"/>		<input type="button" value="Cancel"/>	
B-Adapter Channel:	<input type="text" value="7"/>			
Output at 0 rpm:	<input type="text" value="100"/>	V		Use sign of Output per Volt to change polarity of bar presentation
Output per Volt:	<input type="text" value="10"/>	rpm/V		
Prefiltering:	<input type="text" value="0"/>			
Maximum Power:	<input type="text" value="10000"/>			
Maximum rpm:	<input type="text" value="10000"/>			

3. ADJUSTMENTS

Main engine start air pressure

Select Connected **NO** if Main Engine Start Air Pressure is not connected to the ECDIS.

Dialog box titled "Edit parameters - Main Engine Start Air Pressure". It contains the following fields and values:

Connected:	NO
Device Type:	Analog (uses B-Adapter)
B-Adapter Channel:	4
Output at 0 kg/cm2:	0 V
Output per Volt:	5 kg/cm2 / V
Prefiltering:	0
Alarm:	20 kg/cm2
Maximum Value:	50 kg/cm2

Buttons: OK, Cancel

Main Engine Start Air Pressure connected to the ECDIS.

Dialog box titled "Edit parameters - Main Engine Start Air Pressure". It contains the following fields and values:

Connected:	YES
Device Type:	Analog (uses B-Adapter)
B-Adapter Channel:	2
Output at 0 kg/cm2:	0 V
Output per Volt:	-5 kg/cm2 / V
Prefiltering:	0
Alarm:	20 kg/cm2
Maximum Value:	50 kg/cm2

Buttons: OK, Cancel

Main Engine Start Air Pressure connected to the ECDIS using Engine Control.

Dialog box titled "Edit parameters - Main Engine Start Air Pressure". It contains the following fields and values:

Connected:	YES
Device Type:	Engine Control
B-Adapter Channel:	1
Output at 0 kg/cm2:	0.07 V
Output per Volt:	0 kg/cm2 / V
Prefiltering:	0
Alarm:	20 kg/cm2
Maximum Value:	50 kg/cm2

Buttons: OK, Cancel

Fuel consumption

Select Connected **NO** if Fuel Consumption is not connected to the ECDIS.

Edit parameters - Fuel Consumption

Connected: Device Type:

	Main Flow	Ret Flow	Temperature
In Use	<input type="text" value="5"/>	<input type="text" value="NO"/>	<input type="text" value="NO"/>
B-Adapter Channel:	<input type="text" value="5"/>	<input type="text" value="8"/>	<input type="text" value="8"/>
Output at 0 Position:	<input type="text" value="0.00"/> v	<input type="text" value="0.00"/> v	<input type="text" value="0.00"/> v
Output per Volt:	<input type="text" value="200.00"/> units / V	<input type="text" value="0.00"/> units / V	<input type="text" value="0.00"/> % / V
Prefiltering:	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>
Minimum			<input type="text" value="0"/> °
Maximum			<input type="text" value="1"/> °

Units: HFO Used:

Fuel consumption connected to the ECDIS.

Edit parameters - Fuel Consumption

Connected: Device Type:

	Main Flow	Ret Flow	Temperature
In Use	<input type="text" value="5"/>	<input type="text" value="NO"/>	<input type="text" value="NO"/>
B-Adapter Channel:	<input type="text" value="5"/>	<input type="text" value="8"/>	<input type="text" value="8"/>
Output at 0 Position:	<input type="text" value="0.00"/> v	<input type="text" value="0.00"/> v	<input type="text" value="0.00"/> v
Output per Volt:	<input type="text" value="200.00"/> units / V	<input type="text" value="0.00"/> units / V	<input type="text" value="0.00"/> % / V
Prefiltering:	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>
Minimum			<input type="text" value="0"/> °
Maximum			<input type="text" value="1"/> °

Units: HFO Used:

Fuel consumption connected to the ECDIS using Engine Control.

Edit parameters - Fuel Consumption

Connected: Device Type:

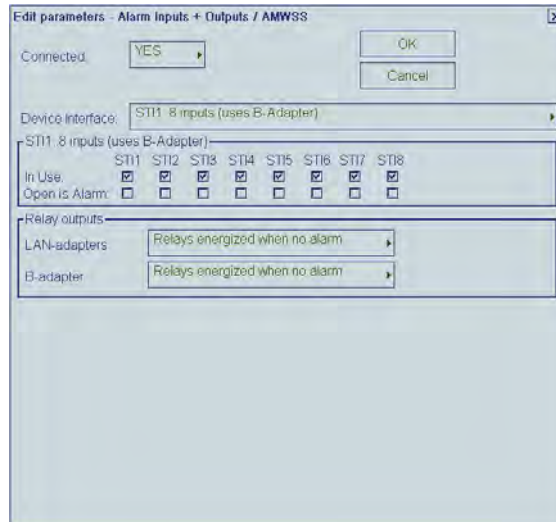
	Main Flow	Ret Flow	Temperature
In Use	<input type="text" value="5"/>	<input type="text" value="NO"/>	<input type="text" value="NO"/>
B-Adapter Channel:	<input type="text" value="5"/>	<input type="text" value="8"/>	<input type="text" value="8"/>
Output at 0 Position:	<input type="text" value="0.00"/> v	<input type="text" value="0.00"/> v	<input type="text" value="0.00"/> v
Output per Volt:	<input type="text" value="200.00"/> units / V	<input type="text" value="0.00"/> units / V	<input type="text" value="0.00"/> % / V
Prefiltering:	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>
Minimum			<input type="text" value="0"/> °
Maximum			<input type="text" value="1"/> °

Units: HFO Used:

3. ADJUSTMENTS

Alarm inputs+Outputs/AMWSS

Settings for closed contact external alarm inputs required in the past to fulfil OMBO class notation of RINA. If this feature is activated it generates alarms 4201...4208 "Ext. navigation eq. Error".

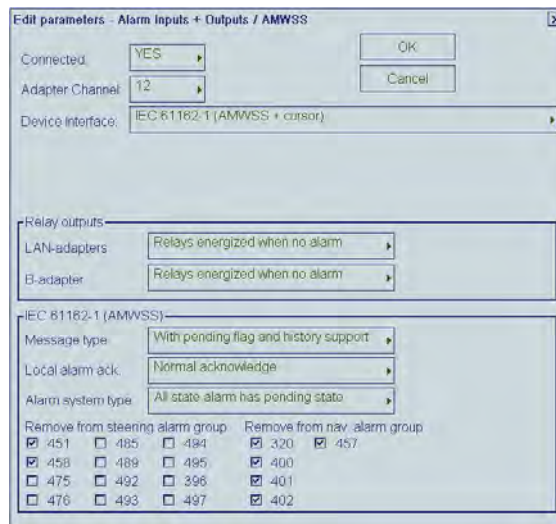


Settings when the ECDIS is connected to Alarm Monitoring and Watch Safety System (AMWSS). ECDIS alarms are transferred to AMWSS.

Local ECDIS alarm acknowledge and EMRI trackplot acknowledge operate only as buzzer stop.

ECDIS and EMRI trackplot alarms can only be acknowledged from AMWSS.

Alarm 9997 transferred to ECDIS is used to acknowledged first alarm (topmost).



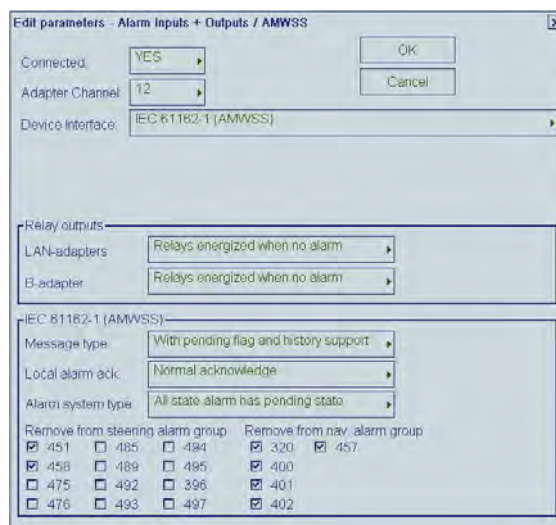
Settings when the ECDIS is connected to Alarm Monitoring and Watch Safety System (AMWSS).

ECDIS alarms are transferred to AMWSS.

ECDIS and EMRI trackplot alarms can be acknowledged locally or from AMWSS.

Local acknowledge of an alarm removes the alarm also from AMWSS.

Cursor position of ECDIS is transmitted.



Note: "Relay outputs" cannot be reverse video for version 05.xx.

Sensor Source of ECDIS is transmitted

Settings when the ECDIS is connected to a Central Alarm System which uses only closed contacts. Input channels 9 and 10 of B-Adapter are used for Alarm Ack. and Buzzer Stop.

*:

(Relays energized when no alarm)
Relay outputs: close (no Alarm),
open (Alarm active)

(Relays energized when alarm)
Relay outputs; close (Alarm active),
open (no Alarm)

3. ADJUSTMENTS

Connected: YES

Device Interface: Relays with Central Alarm including pending (use B-Adapter)

Relay outputs

LAN-adapters: Relays energized when no alarm

B-adapter: Relays energized when no alarm

Relays with Central Alarm

Ignore pending state for

451 485

458

Connected: YES

Device Interface: Relays with Central Alarm + SensorSource (use B-Adapter)

Relay outputs

LAN-adapters: Relays energized when no alarm

B-adapter: Relays energized when no alarm

Relays with Central Alarm

Ignore pending state for

451 485

458

Connected: YES

Device Interface: Engine control

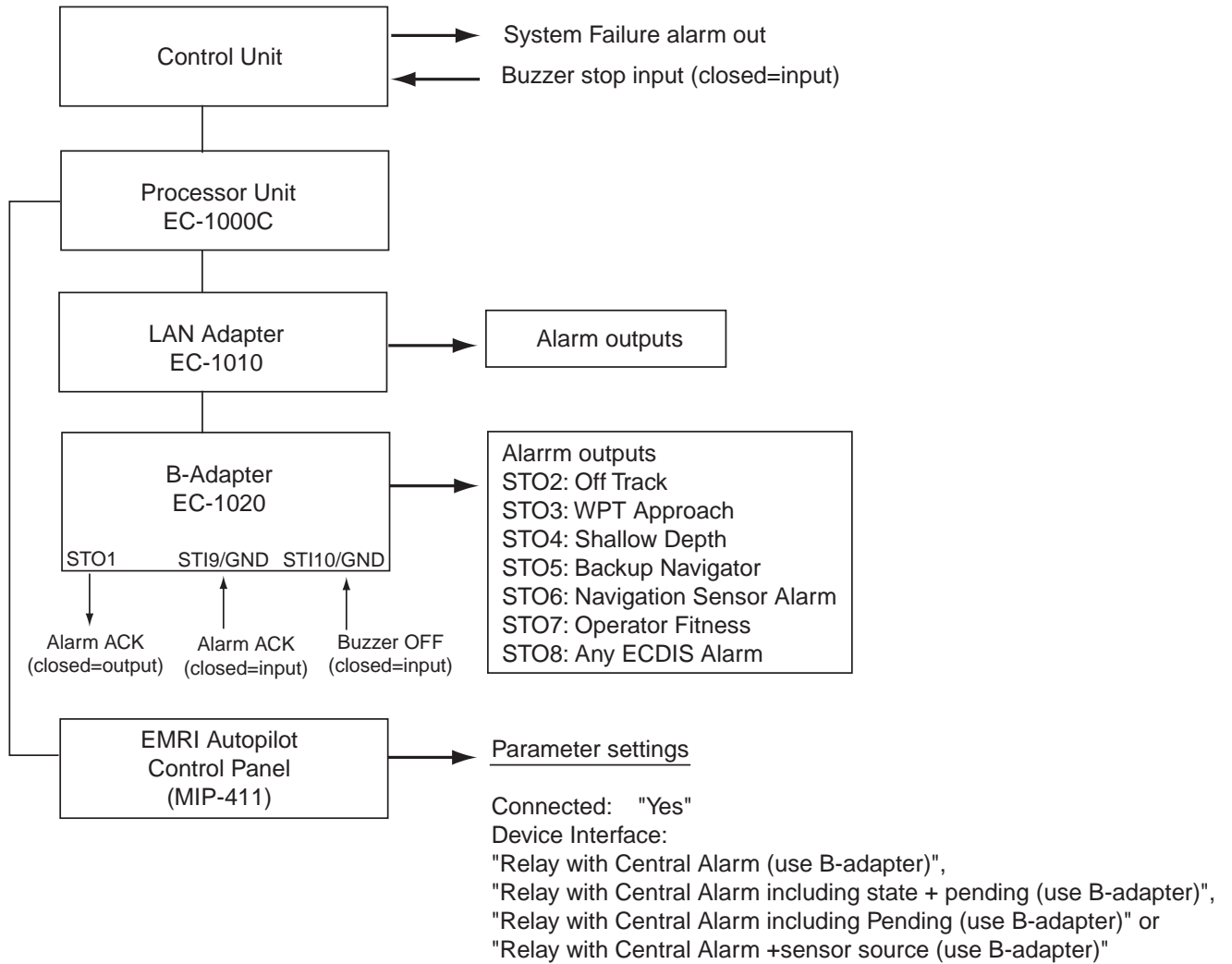
Relay outputs

LAN-adapters: Relays energized when no alarm

B-adapter: Relays energized when no alarm

Settings when the ECDIS is connected to Engine Control System.

Alarm system and Alarm ACK



NAVTEX Receiver (not available for version 05.xx)

Check alphabets to receive corresponding data. For details, see the operator's manual for NAVTEX receiver connected.



3. ADJUSTMENTS

SatCom/External Computer/Sindel repeaters

- Settings for Route backup to Furuno GP-80 GPS navigator.

- Setting for Ropute Restore from Furuno GP-80 GPS navigator.

Connected: YES

Device Interface: Route backup to FURUNO GP-80

Adapter Channel: 9

IEC 61162-1 Transmit checksum: Used

\$ Char Included in Checksum: Included

Buttons: OK, Cancel

-Wiring of ECDIS and GP-80/90

EC-1010 (CH1, 3, 4, 9, 11 to 13)	GP-80/90 (DATA4)
RXD+	TD-B
RXD-	TD-A
TXD+	RD-B
TXD-	RD-A

Settings for route backup to external equipment which can receive IEC 61162-1 message.

Connected: YES

Device Interface: Route backup IEC 61162-1

Adapter Channel: 9

IEC 61162-1 Transmit checksum: Used

\$ Char Included in Checksum: Included

Buttons: OK, Cancel

AIS

Settings for AIS Transponder.

ETA display (not available for version 05.xx):

“Type approved (adjusted for time zone)”; Displays the local time changed from ETA reported at the ship.

”Custom (ignore time zone)”; Display ETA reported at the ship as is.

Connected: YES

Adapter Chl: 5

Device Interface: IEC 61162-2 (38400bit/s)

Device mode: Normal IEC 61993-2

IEC 61162-1 Transmit checksum: Used

Checksum: \$ char not included (IEC 61162-1 & EMRI)

ETA display: Type approved (adjusted for time zone)

Buttons: OK, Cancel

Engine control

Settings for receiving Fuel Consumption, Propeller and Main Engine Air Pressure data from engine control system manufactured by NORCONTROL (used message is \$NCDAT). Note that full use of this feature requires that you also activate Fuel Consumption, Propeller and Main Engine Air Pressure parameters, set as Engine Control.

Edit parameters - Engine Control [X]

Connected: YES ▾

Adapter Channel: 10

Device Type: IEC 61162-1 (timeout 30 s) ▾

Switch Input	In Use	Open is OFF	Fixed Use For
1	<input type="checkbox"/>	<input type="checkbox"/>	Propeller 1
2	<input type="checkbox"/>	<input type="checkbox"/>	Propeller 1
3	<input type="checkbox"/>	<input type="checkbox"/>	Propeller 2
4	<input type="checkbox"/>	<input type="checkbox"/>	Propeller 2
5	<input type="checkbox"/>	<input type="checkbox"/>	Not Used
6	<input type="checkbox"/>	<input type="checkbox"/>	Not Used
7	<input type="checkbox"/>	<input type="checkbox"/>	Not Used
8	<input type="checkbox"/>	<input type="checkbox"/>	Not Used
9	<input type="checkbox"/>	<input type="checkbox"/>	Not Used
10	<input type="checkbox"/>	<input type="checkbox"/>	Not Used
11	<input type="checkbox"/>	<input type="checkbox"/>	Not Used
12	<input type="checkbox"/>	<input type="checkbox"/>	Not Used
13	<input type="checkbox"/>	<input type="checkbox"/>	Not Used
14	<input type="checkbox"/>	<input type="checkbox"/>	Not Used
15	<input type="checkbox"/>	<input type="checkbox"/>	Not Used
16	<input type="checkbox"/>	<input type="checkbox"/>	Not Used

OK
Cancel

Settings for receiving Propeller, Thruster and Rudder data from simulated engine control system manufactured by SINDEL (used message are \$PLPRO, \$PLTHR and \$PLRAN). Note that full use of this feature requires that you also activate Propeller, Thruster and Rudder parameters, set as Engine Control.

Edit parameters - Engine Control [X]

Connected: YES ▾

Adapter Channel: 10

Device Type: IEC 61162-1 (timeout 4 min) ▾

Switch Input	In Use	Open is OFF	Fixed Use For
1	<input type="checkbox"/>	<input type="checkbox"/>	Propeller 1
2	<input type="checkbox"/>	<input type="checkbox"/>	Propeller 1
3	<input type="checkbox"/>	<input type="checkbox"/>	Propeller 2
4	<input type="checkbox"/>	<input type="checkbox"/>	Propeller 2
5	<input type="checkbox"/>	<input type="checkbox"/>	Not Used
6	<input type="checkbox"/>	<input type="checkbox"/>	Not Used
7	<input type="checkbox"/>	<input type="checkbox"/>	Not Used
8	<input type="checkbox"/>	<input type="checkbox"/>	Not Used
9	<input type="checkbox"/>	<input type="checkbox"/>	Not Used
10	<input type="checkbox"/>	<input type="checkbox"/>	Not Used
11	<input type="checkbox"/>	<input type="checkbox"/>	Not Used
12	<input type="checkbox"/>	<input type="checkbox"/>	Not Used
13	<input type="checkbox"/>	<input type="checkbox"/>	Not Used
14	<input type="checkbox"/>	<input type="checkbox"/>	Not Used
15	<input type="checkbox"/>	<input type="checkbox"/>	Not Used
16	<input type="checkbox"/>	<input type="checkbox"/>	Not Used

OK
Cancel

3. ADJUSTMENTS

Speed pilot

Settings when speedpilot is **not** connected.

Dialog box titled "Edit parameters - Speedpilot". Fields include: Connected: NO, Adapter Chl: 9, Device Interface: Speedpilot (EMRI), Device mode: Normal, IEC 61162-1 Transmit checksum: Not used, Checksum: \$ char not included (IEC 61162-1 & EMRI). Buttons: OK, Cancel.

Settings when speedpilot is connected.

Dialog box titled "Edit parameters - Speedpilot". Fields include: Connected: YES, Adapter Chl: 9, Device Interface: Speedpilot (EMRI), Device mode: Normal, IEC 61162-1 Transmit checksum: Not used, Checksum: \$ char not included (IEC 61162-1 & EMRI). Buttons: OK, Cancel.

Alarm Inputs External

This function is not available for version 05.xx. You can define which sensors report alarms to ECDIS.

-Check "Conn" for sensor reporting to ECDIS.

-Check "Bi-dir" option, if acknowledge message will be sent to alarm transmitting sensor

-Check "Retry ack" option, if acknowledge message to alarm transmitting sensor fails to respond (retry three times)

Dialog box titled "Edit parameters - Alarm Inputs/External". Table with columns: Ch, Conn, Bi-dir, Retry, ack, Alarm source name. Rows 1-16 show various sensors like EXT1, POS1, RUDR2, etc. Buttons: OK, Cancel.

Ch	Conn	Bi-dir	Retry	ack	Alarm source name
1	<input type="checkbox"/>				EXT1
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		POS1
3	<input type="checkbox"/>				RUDR2
4	<input type="checkbox"/>				EXT4
5	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		AIS
6	<input type="checkbox"/>				POS2
7	<input type="checkbox"/>				GYRO1
8	<input type="checkbox"/>				LOG
9	<input type="checkbox"/>				EXT9
10	<input type="checkbox"/>				EXT10
11	<input type="checkbox"/>				BADAP
12	<input type="checkbox"/>				AMWSS
13	<input type="checkbox"/>				ROUTE
14	<input type="checkbox"/>				ECHO
15	<input type="checkbox"/>				WIND
16	<input type="checkbox"/>				EXT16

In this example Position equipment 1 connected to channel 2 of LAN Adapter can report alarm in Position equipment 1.

AIS in channel 5 of LAN Adapter reports alarm in AIS and they can be also acknowledged in ECDIS or Central Alarm System.

Central Alarm Output

You can define channel for Central Alarm System to where report sensor alarms.

-"Bi-directional" as YES, in case that if alarms can be acknowledged from Central Alarm System.

-"Propagate RX alarms" used to define if alarm from alarms transmitting sensor are sent further to Central Alarm System.

Dialog box titled "Edit parameters - Central Alarm Output". Fields include: Connected: YES, Adapter Chl: 13, Bi-directional: YES, Propagate RX alarms: YES, Device Type: IEC 61162-1 (4800 bit/s). Buttons: OK, Cancel.

Sensors which are not connected

In installation parameters there are several sensors in a list which are not used with ECDIS and their status should be **Connected = NO**.

The list of sensors which are not connected:

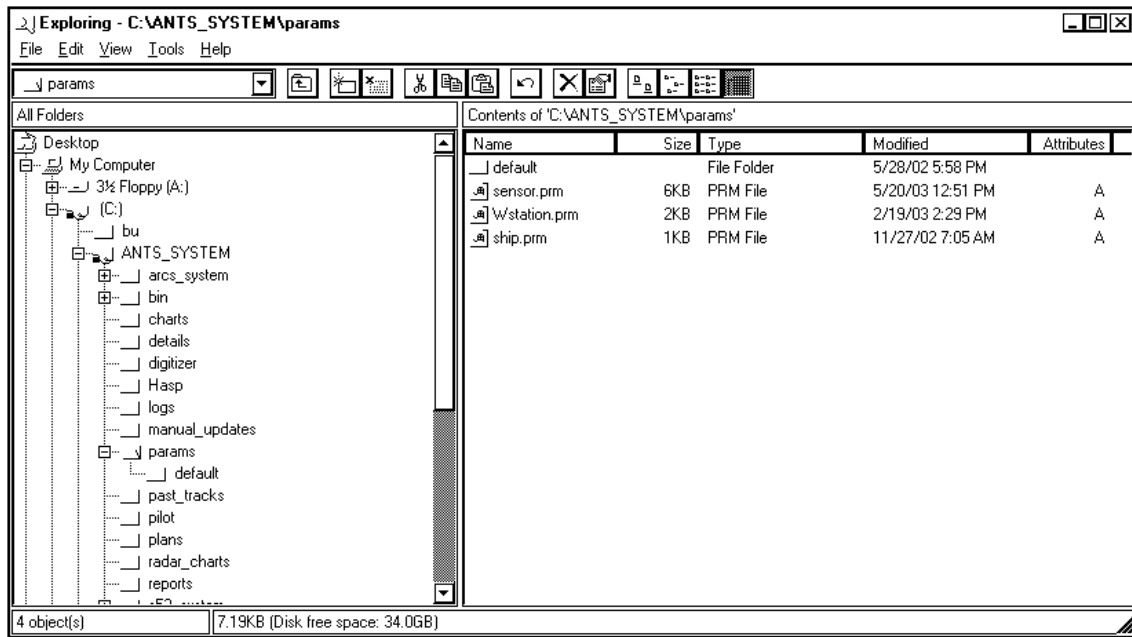
(Electronic Chart, VDR, Position Equipment, Heel and Trim, Steering Info)

3. ADJUSTMENTS

Storing default parameters

After installing the equipment, store the default parameters of the ECDIS as follows:

1. Connect service (for PC) keyboard.
2. Press Windows key.
3. Click **Start, Programs, Accessories** and **Windows Explore** in order.
4. Choose **My Computer, Local Disk [C:], ANTS_SYSTEM** and **params** in order to open the params folder.



5. Click **sensor.prm, ship.prm** and **wstation.prm** while pressing the Shift key.
6. Choose **Copy** from the Edit menu.
7. Open **default** folder, and choose **Paste** from Edit menu. If overwriting them, confirm replacement of existing file by pressing **OK**.
8. Go back to normal ECDIS operation mode.

Note: The above steps allow you to return parameters by clicking "Set parameter defaults" on Installation parameters when changing Sensor parameter settings.

3.3 Adjustments for the LAN Adapter EC-1010

3.3.1 Setup for the LAN adapter EC-1010 program

The following tools are needed for programming LAN adapter:

- Ordinary serial RS-232C line cable to make connection from COM1 port to Connector J13 of LAN Adapter.

You need to set the jumpers of the LAN adapter to enable connector J13 and programming mode.

To change J1 (CH 1) connector to J13 Connector for programming, set as below.

J17	CTS1-GND
J14	TXP
J15	RXP

To enable manual startup and programming, set as below.

J16	INIT-GND
-----	----------

3.3.2 IP address agreement for LAN Adapter EC-1010

The table below shows IP addresses for each device.

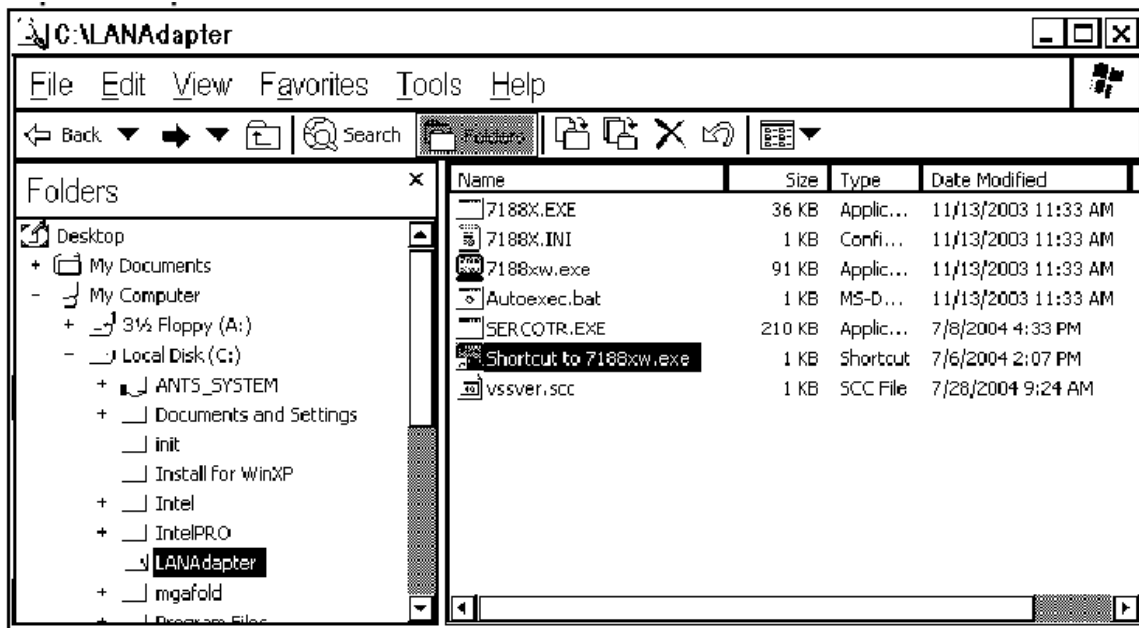
Device	IP Address	Function
First ECDIS	10.0.0.180	MAIN
Second ECDIS	10.0.0.181	BACKUP
First LAN adapter	10.0.0.190	MAIN 1 st LAN adapter
Second LAN adapter	10.0.0.191	MAIN 2 nd LAN adapter
First LAN adapter	10.0.0.192	BACKUP 1 st LAN adapter
Second LAN adapter	10.0.0.193	BACKUP 2 nd LAN adapter

3.3.3 How to load programs for LAN adapter EC-1010

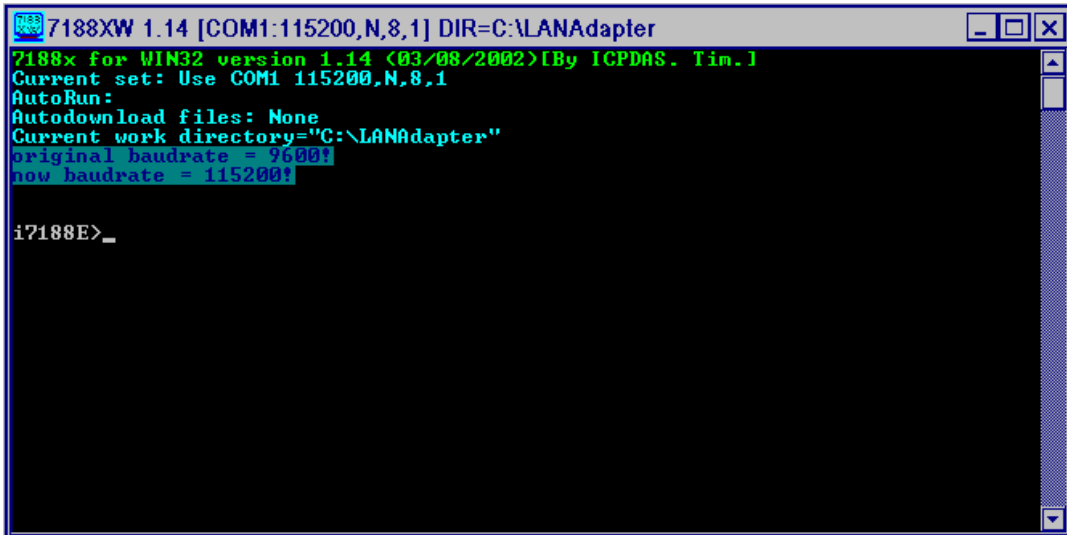
The following is an example of how to program the first LAN adapter for the first ECDIS.

Note: The program version for LAN adapter should be same with ECDIS's.

1. Click **Start, Programs, Accessories** and **Windows Explore** in order.
2. Click **My Computer, Local Disk [C], LAN Adapter** in order to open the LAN Adapter folder.
3. Double click **Shortcut to 7188xw.exe**.



7188XW program will start in MS DOS window.



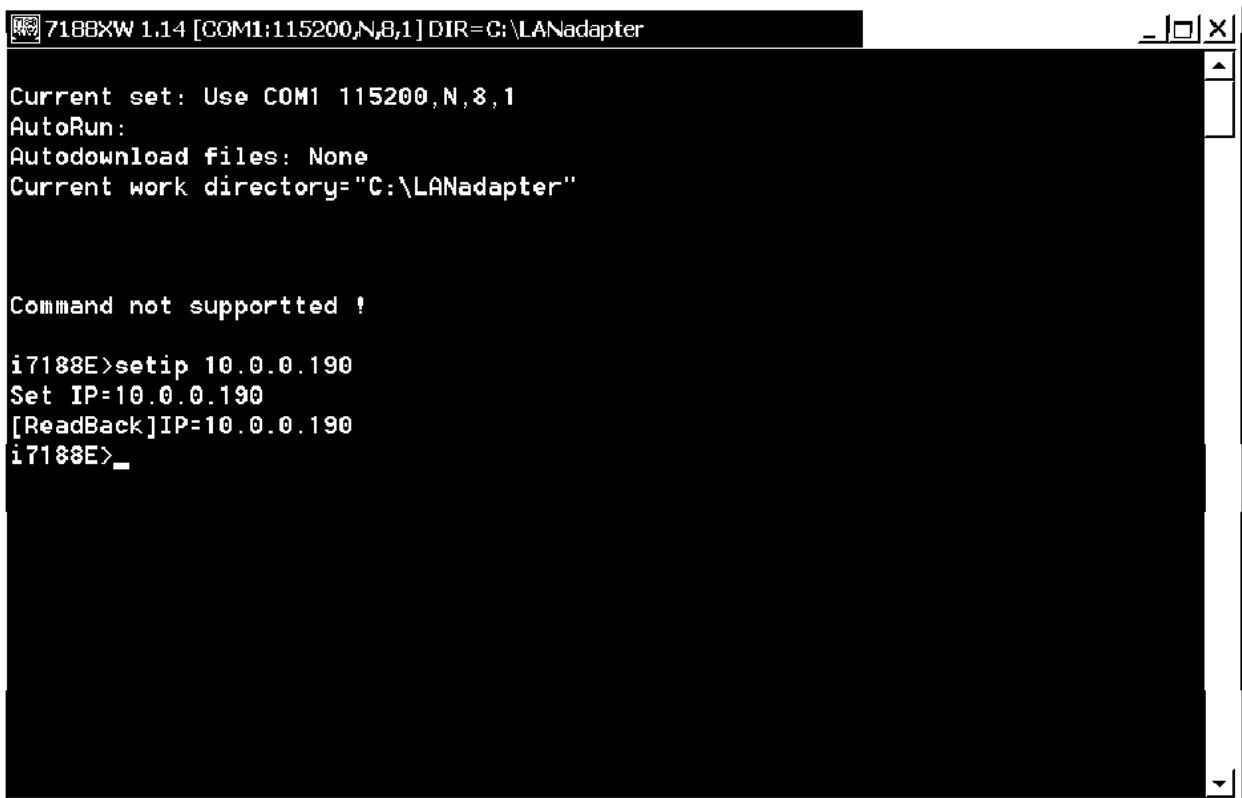
```

7188XW 1.14 [COM1:115200,N,8,1] DIR=C:\LANAdapter
7188x for WIN32 version 1.14 (03/08/2002) [By ICPDAS. Tin.]
Current set: Use COM1 115200,N,8,1
AutoRun:
Autodownload files: None
Current work directory="C:\LANAdapter"
original baudrate = 9600!
now baudrate = 115200!

i7188E>_

```

4. Type IP, and then press the ENTER key to confirm the IP address. For the first LAN adapter of MAIN ECDIS, Type SETIP 10.0.0.190, and press the ENTER key.



```

7188XW 1.14 [COM1:115200,N,8,1] DIR=C:\LANAdapter
Current set: Use COM1 115200,N,8,1
AutoRun:
Autodownload files: None
Current work directory="C:\LANAdapter"

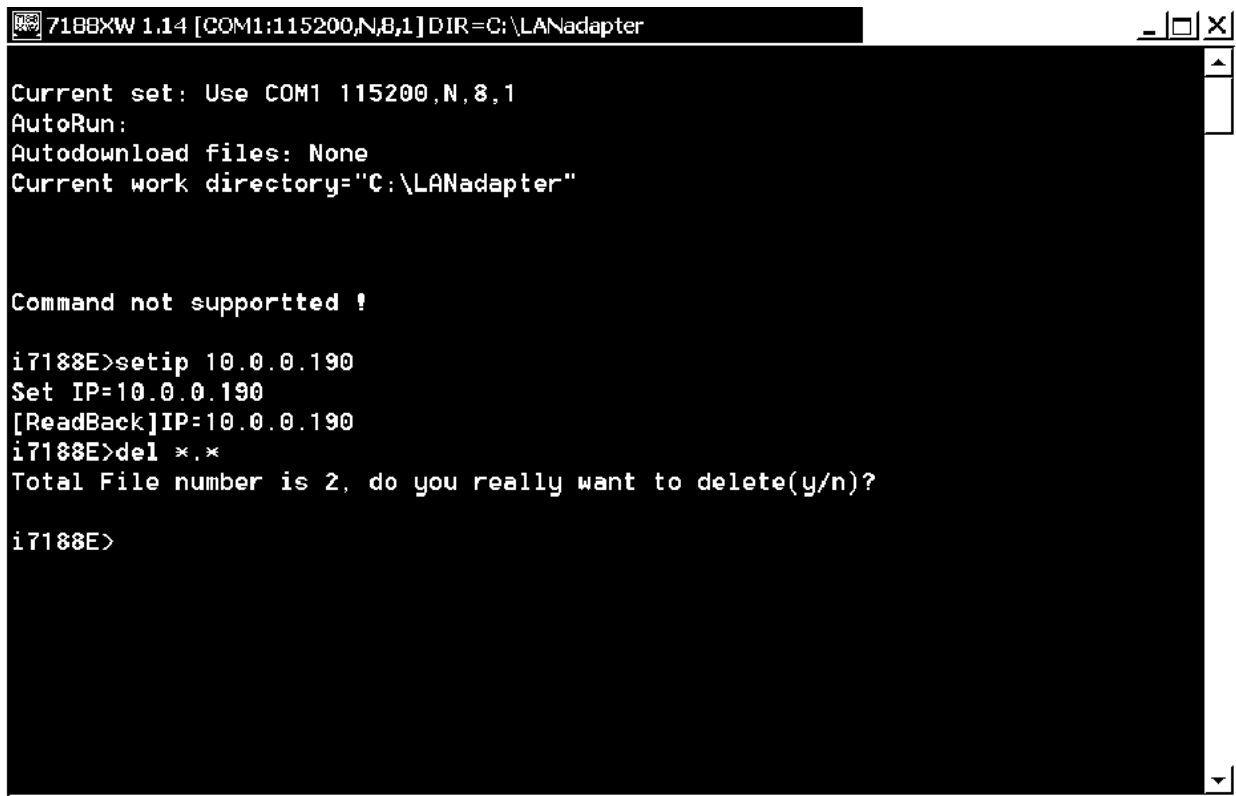
Command not supported !

i7188E>setip 10.0.0.190
Set IP=10.0.0.190
[ReadBack]IP=10.0.0.190
i7188E>_

```

5. Type SETMASK 255.255.0.0 and then press the ENTER key. To confirm the netmask, type MASK, and press the ENTER key.
6. Remove old files from LAN adapter; type del *.* , and then press the ENTER key.

3. ADJUSTMENTS



```
7188XW 1.14 [COM1:115200,N,8,1] DIR=C:\LANadapter

Current set: Use COM1 115200,N,8,1
AutoRun:
Autodownload files: None
Current work directory="C:\LANadapter"

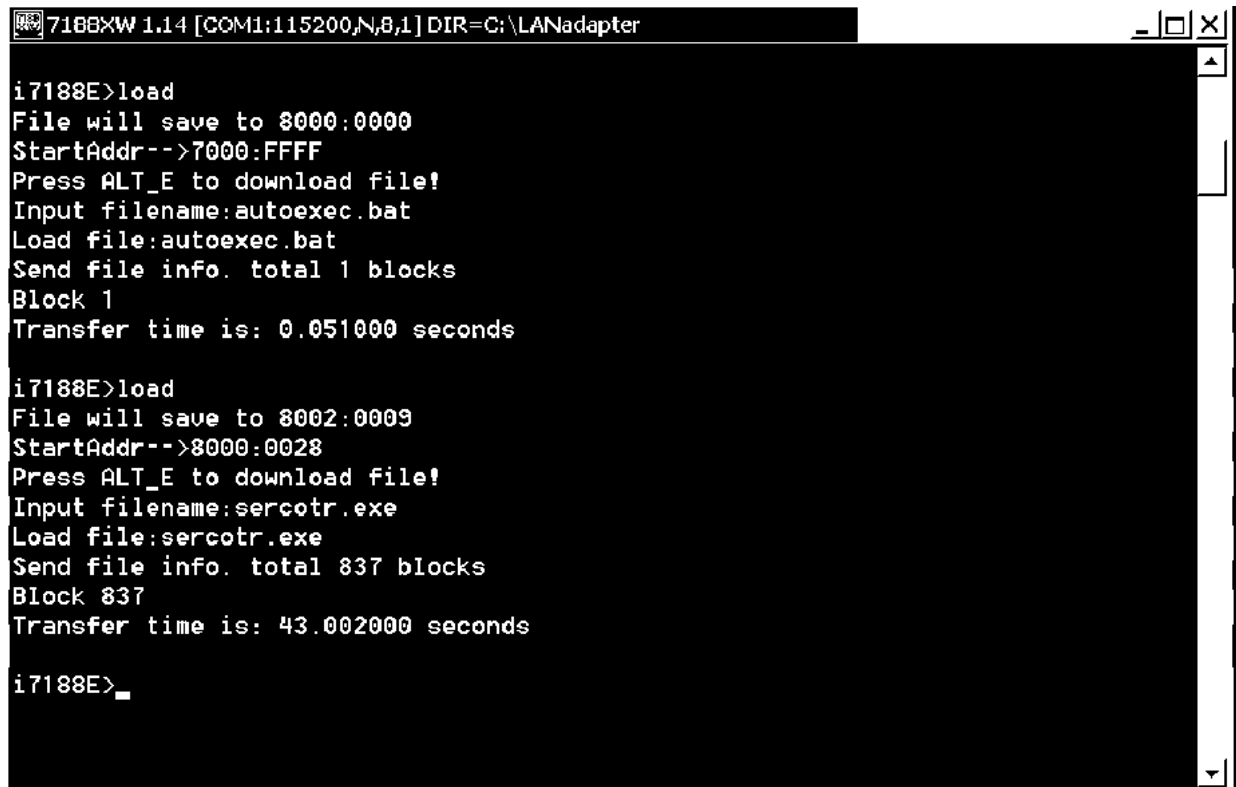
Command not supported !

i7188E>setip 10.0.0.190
Set IP=10.0.0.190
[ReadBack]IP=10.0.0.190
i7188E>del *.*
Total File number is 2, do you really want to delete(y/n)?

i7188E>
```

7. Load autoexec.bat and sercotr.exe as shown below.

- a) Type "Load".
- b) Press the Alt key and E key at the same time.
- c) Type the file name to load.



```
7188XW 1.14 [COM1:115200,N,8,1] DIR=C:\LANadapter

i7188E>load
File will save to 8000:0000
StartAddr-->7000:FFFF
Press ALT_E to download file!
Input filename:autoexec.bat
Load file:autoexec.bat
Send file info. total 1 blocks
Block 1
Transfer time is: 0.051000 seconds

i7188E>load
File will save to 8002:0009
StartAddr-->8000:0028
Press ALT_E to download file!
Input filename:sercotr.exe
Load file:sercotr.exe
Send file info. total 837 blocks
Block 837
Transfer time is: 43.002000 seconds

i7188E>_
```

8. Set parameters for LAN adapter as follows:

a) Type command.

Status	Command
First LAN adapter (MAIN)	sercotr /d=2 /p=15001 /r=15000 /f=1 /n=8 /m=0 /e0=10.0.0.180
Second LAN adapter (MAIN)	sercotr /d=3 /p=15001 /r=15000 /f=9 /n=8 /m=0 /e0=10.0.0.180
First LAN adapter (BACKUP)	sercotr /d=4 /p=15001 /r=15000 /f=1 /n=8 /m=0 /e0=10.0.0.181
Second LAN adapter (BACKUP)	sercotr /d=5 /p=15001 /r=15000 /f=9 /n=8 /m=0 /e0=10.0.0.181

For example, type the command for First LAN adapter (MAIN).

```

i7188E>
i7188E>sercotr /d=2 /p=15001 /r=15000 /f=1 /n=8 /m=0 /e0=10.0.0.180 /e1=0.0.0.0

```

b) Type the command: **sercotr /e2=0.0.0.0 /e3=0.0.0.0 e4=0.0.0.0**

```

Conf d=2 p=15001 r=15000 f=1 n=8 m=0
Hosts e0=10.0.0.180 e1=0.0.0.0 e2=0.0.0.0 e3=0.0.0.0 e4=0.0.0.0
01.01.2000 00:00:01 Waiting watchdog reset

ICP_DAS MiniOS7 for I-7188E Ver. 2.00 build 001,Aug 22 2003 15:29:32
SRAM:512K, FLASH MEMORY:512K
[CPU=RDC 8820-D]
Serial number= 01 8c 9A A0 09 00 00 87

i7188E> sercotr /e2=0.0.0.0 /e3=0.0.0.0 /e4=0.0.0.0

```

9. Type **sercotr**, and press the ENTER key.

```

Channel reset: 7
Blks 50 ffffffffffffffffffffffffffffffffffffffffffffffffffffffffffff
Alive timer reload (CSerMain::Receive)
Set baudrates
Blks 50 ffffffffffffffffffffffffffffffffffffffffffffffffffffffffffff
Alive timer reload (CSerMain::Receive)
Blks 50 ffffffffffffffffffffffffffffffffffffffffffffffffffffffffffff
Alive timer reload (CSerMain::Receive)
Blks 50 ffffffffffffffffffffffffffffffffffffffffffffffffffffffffffff
Alive timer reload (CSerMain::Receive)
Blks 50 ffffffffffffffffffffffffffffffffffffffffffffffffffffffffffff
19.08.2004 15:04:45 laninsCount 3086 (3973 3867 106)
19.08.2004 15:04:45 ** Panic (reason: 37) **
LAN Adapter d5.00
Own IP: 10.0.0.190
Conf d=2 p=15001 r=15000 f=1 n=8 m=0
Hosts e0=10.0.0.180 e1=0.0.0.0 e2=0.0.0.0 e3=0.0.0.0 e4=0.0.0.0
19.08.2004 15:04:45 Waiting watchdog reset

ICP_DAS MiniOS7 for I-7188E Ver. 2.00 build 001,Aug 22 2003 15:29:32
SRAM:512K, FLASH MEMORY:512K
[CPU=RDC 8820-D]
Serial number= 01 0F 97 9F 09 00 00 0A

i7188E>

```

10. Confirm that the setting is correct.

11. Set jumpers to the default position.

12. Turn the power of LAN adapter off, and on again.

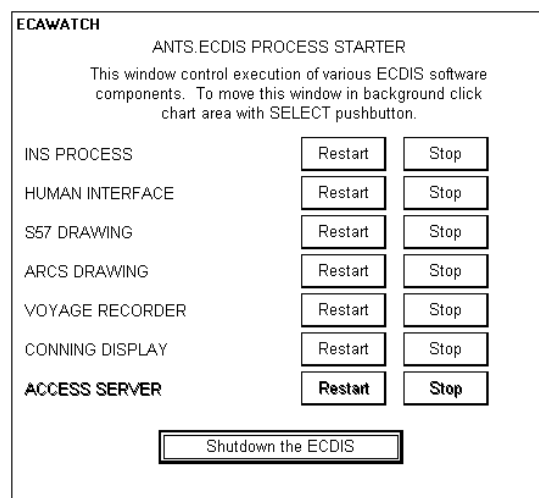
3. ADJUSTMENTS

3.3.6 Installation of Network Connections

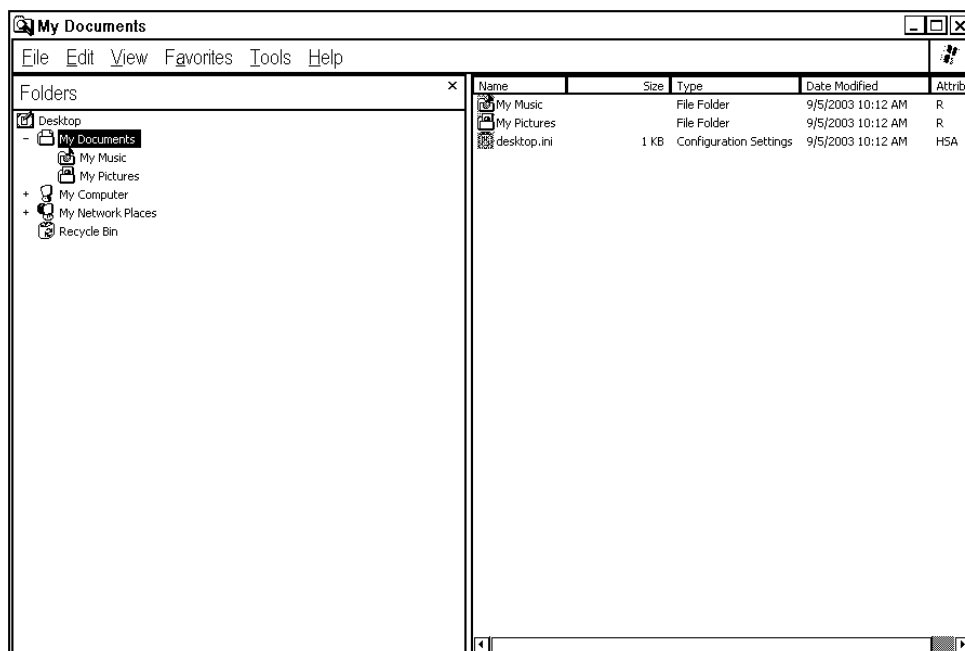
You can install network connections between the Navigation ECDIS and second (for planning/back-up) ECDIS. To install, proceed as follows:

1. Turn the power on.
2. If you already have ECDIS installed, then you have to shut down the ECDIS program before you install network connections.

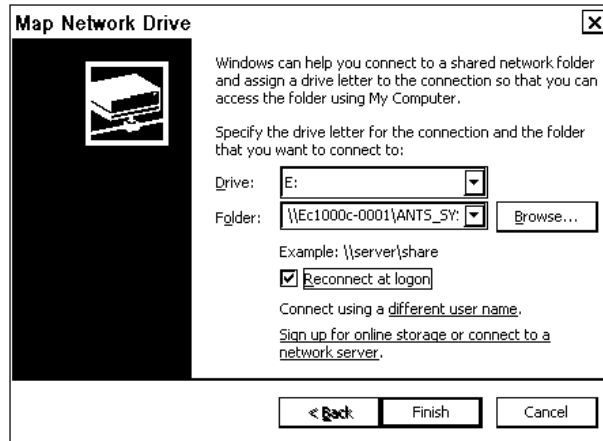
To shut down the ECDIS program, use the ECAWATCH window to do it. This window can be shown by pressing the Tab key on the service keyboard several times while pressing down the Alt key.



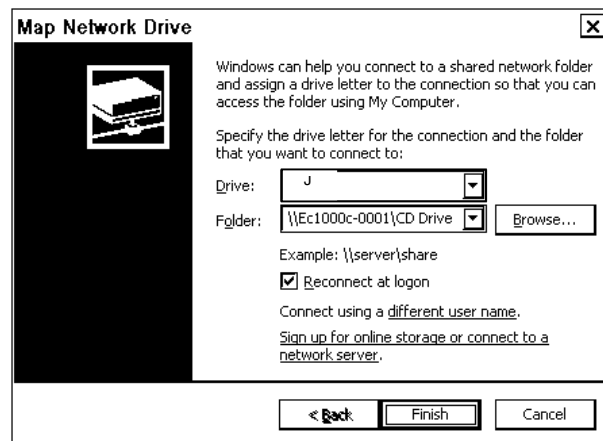
3. Click the **Shutdown the ECDIS** button.
4. Press the Windows key, and choose **Start, Programs, Accessories** and **Windows Explorer** in order.
5. Choose Map Network Drive from the Tools menu.



6. Select drive I: for the hard disk of the other ECDIS computer.
Browse the other ECDIS computer from ECDIS work group.
7. Select **Ec1000C-0001\ANTS_SYSTEM** and press OK.

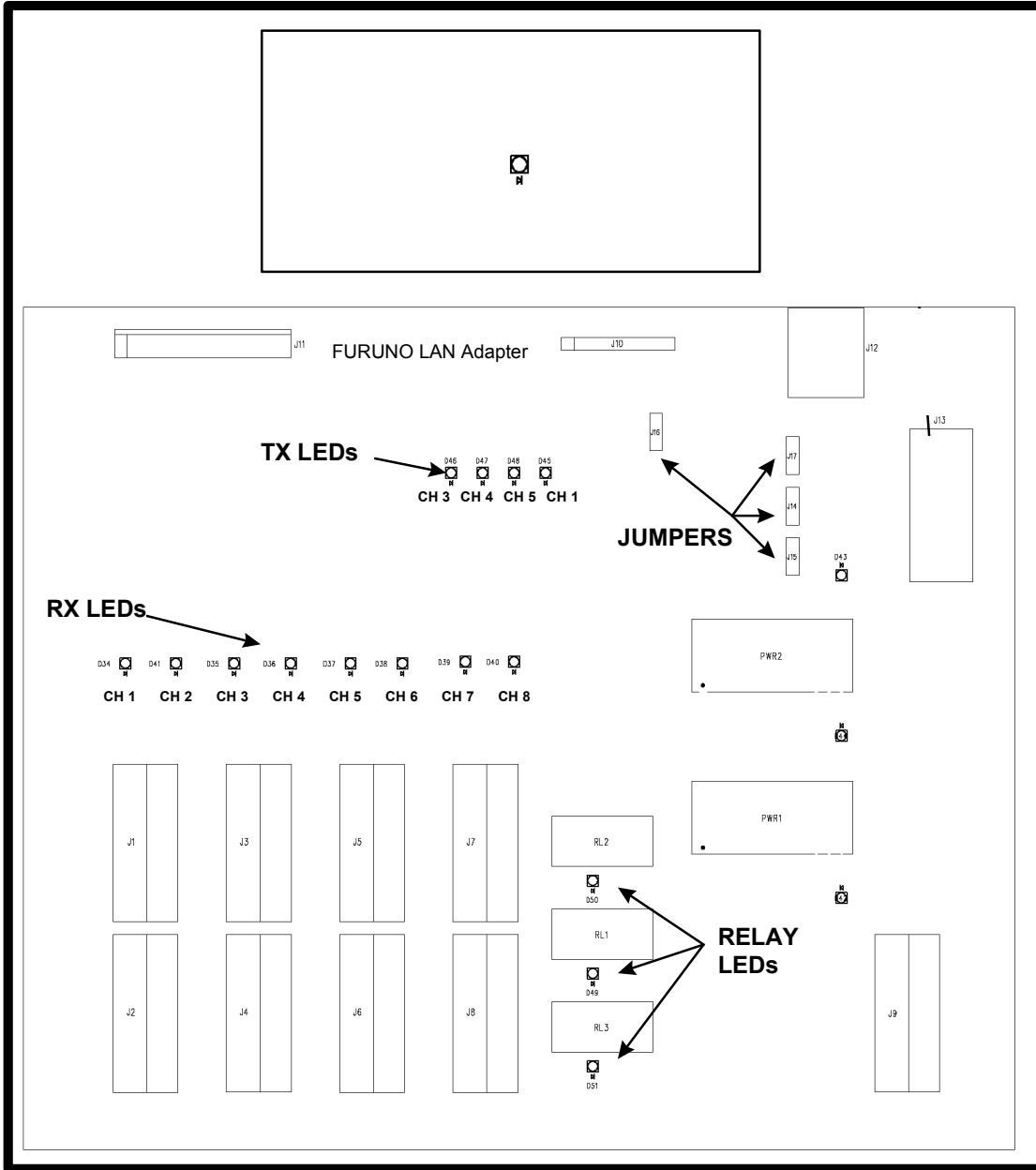


7. Select Tools and Map Network Drive again.
8. Select drive J: for the CD-ROM drive of the other ECDIS computer.
Browse the other ECDIS computer from ECDIS work group.
9. Select **EC1000C-0001\CD drive** and press OK. (Note that EC1000C-0001 should be replaced with the name of the other computer.)



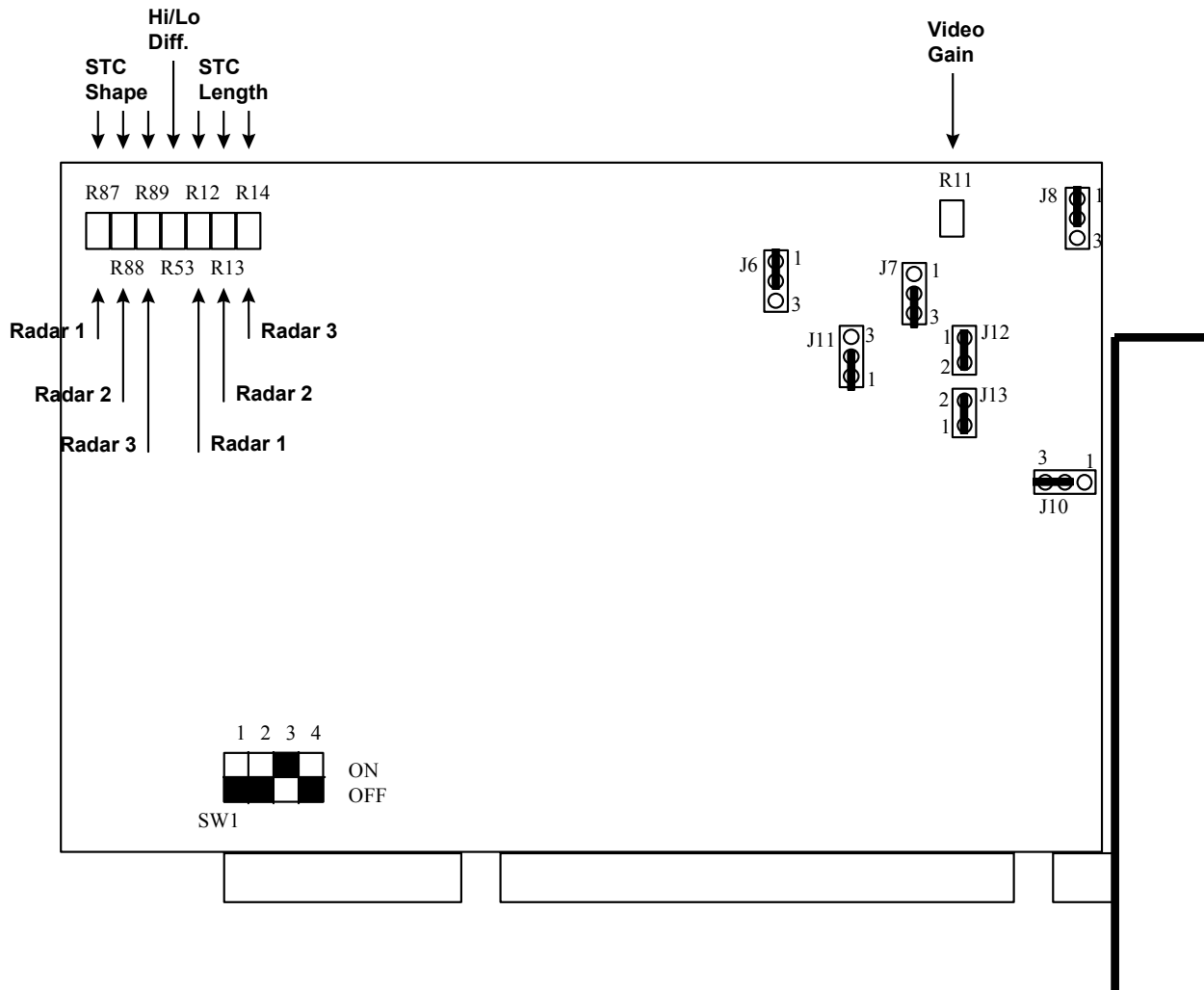
3.4 DIP Switches and Jumper Wires

3.4.1 LAN adapter EC-1010



Jumper	Position	Function
J14	TXP	Programming
	TXD1	Normal operation (Default)
J15	RXP	Programming
	RXD1	Normal operation (Default)
J17	CTS1 H-CTS1	Programming
	CTS1-GND	Normal operation (Default)
J16	GND-INIT	Programming
	INIT H-INIT	Normal operation (Default)

3.4.2 Radar overlay (EC-1000-C-R-S/1000C-CR-S only)



Potentiometer	Function
R53	Difference between HI and LO video
R11	Video gain

Radar 1	Radar 2	Radar 3	Function
R12	R13	R14	STC length
R87	R88	R89	STC shape

Note: When connecting to the FAR-2xx7 radar, remove the jumper J13 (for trigger).

3. ADJUSTMENTS

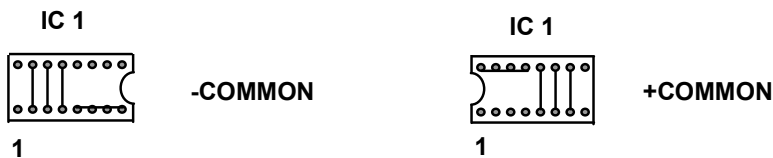
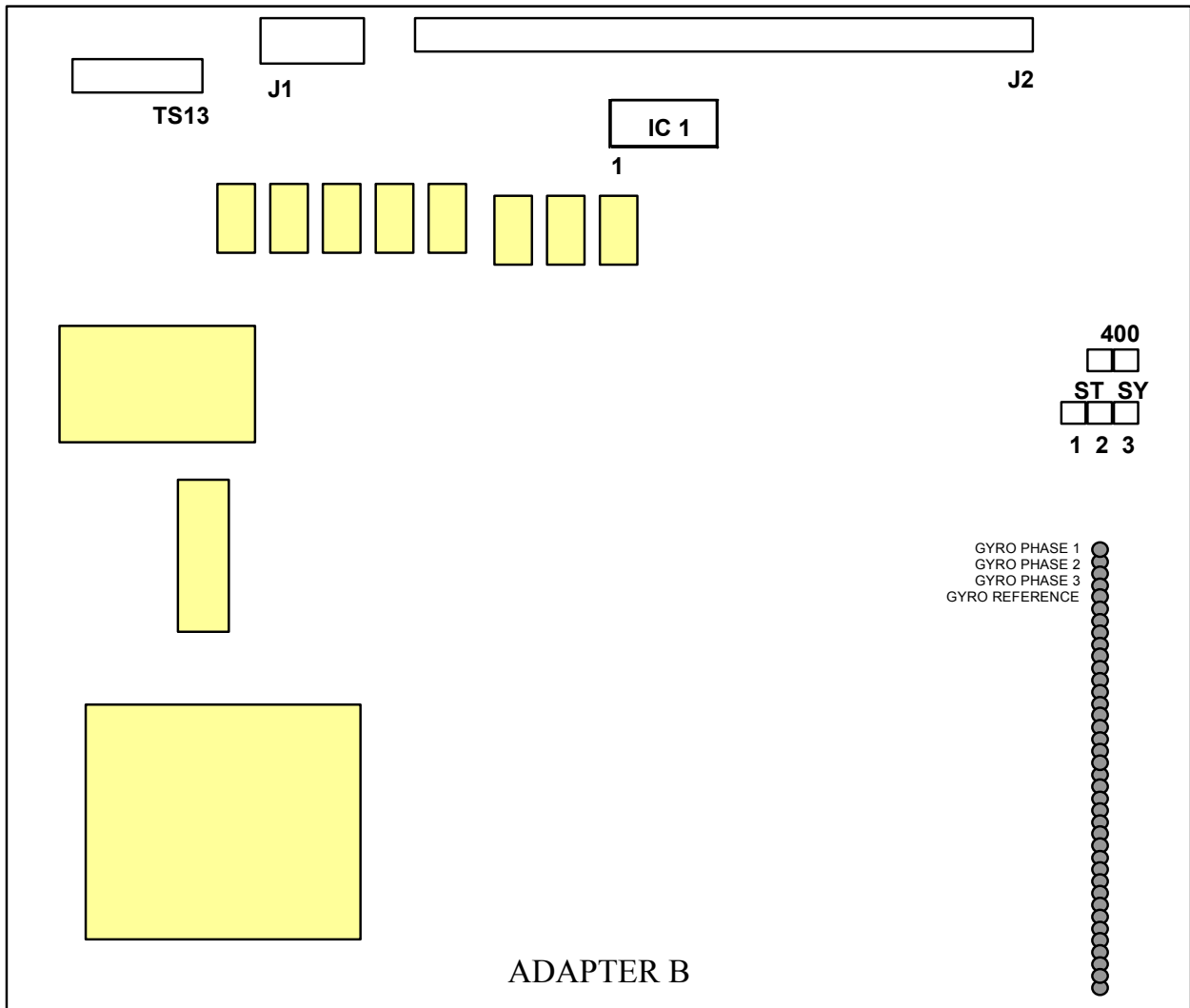
Jumper	Position	Furuno	Function
J6	1-2 2-3	1-2	Factory default
J7	1-2 2-3	2-3	Positive Video Polarity Negative Video Polarity Factory default
J8	1-2 2-3	1-2	Positive Video Polarity Factory default Negative Video Polarity
J10	1-2 2-3	2-3	Positive HL Polarity Negative HL Polarity Factory default
J11	1-2 2-3	1-2	Trigger Polarity Positive Edge Factory default Trigger Polarity Negative Edge
J12	ON		Video 75Ω terminator in use Factory default
J13	ON		Trigger 75Ω terminator in use Factory default

To set card address, use DIP switch **SW1** according to the following table:

SW1/1	SW1/2	SW1/3	SW1/4	Address
ON	ON	ON	ON	200h
OFF	ON	ON	ON	220h
ON	OFF	ON	ON	240h
OFF	OFF	ON	ON	260h
ON	ON	OFF	ON	280h
OFF	ON	OFF	ON	2A0h
ON	OFF	OFF	ON	2C0h
OFF	OFF	OFF	ON	2E0h
ON	ON	ON	OFF	300h
OFF	ON	ON	OFF	320h
ON	OFF	ON	OFF	340h
OFF	OFF	ON	OFF	360h Factory default
ON	ON	OFF	OFF	380h
OFF	ON	OFF	OFF	3A0h
ON	OFF	OFF	OFF	3C0h
OFF	OFF	OFF	OFF	3Eh

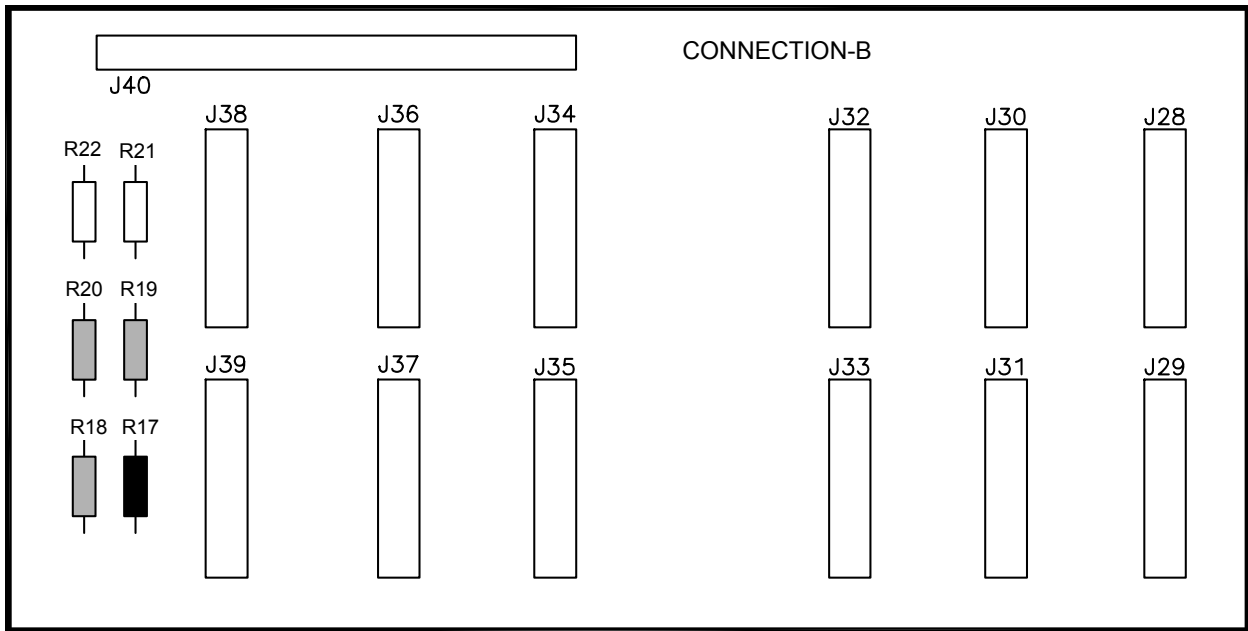
3.4.3 B adapter EC-1020

All settings of B adapter are for gyro compass.




Jumper	Position	Function
400	open	50/60 Hz Synchro
	1-2	400 Hz Synchro
ST SY	1-2	Stepper
	2-3	Synchro

3. ADJUSTMENTS



SYNCHRO 90-135VAC

STEPPER 20-48VDC

	R17	2K2	22 ohms (1W)
	R18	10K	2K7 (1W)
	R19	10K	2K7 (1W)
	R20	10K	2K7 (1W)

Factory default is SYNCHRO 90-135 VAC. If you have a STEPPER 20-48 VDC, you need to replace resistors R17, R18, R19 and R20 with values given in the figure above.

Connector J38 pin	Stepper	Synchro
S0	Common	Not used
S1	Phase 1	Phase 1
S2	Phase 2	Phase 2
S3	Phase 3	Phase 3
R1H	Not used	If peak voltage is more than 60V.
R1L	Not used	If peak voltage is less than 60V.
R2	Not used	Common

3.5 Installation of optional Furuno PP-510 printer

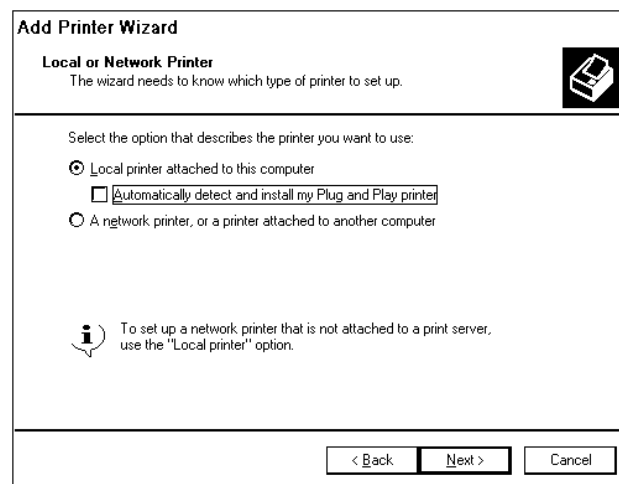
Furuno PP-510 printer can be connected to ECDIS using USB, not directly to LPT1: port. You have to use "**USB to parallel adapter**" to connect Furuno PP-510 printer to the USB port. If printer is shared then it is possible to print from all workstations in the network.

Installation of printer

1. Connect "USB to parallel adapter" between printer and ECDIS.
2. Turn on printer and ECDIS.
3. Select first "**Settings**" from Start menu and then "**Printers and Faxes**".
4. Double-click the Add Printer icon to show the following window.

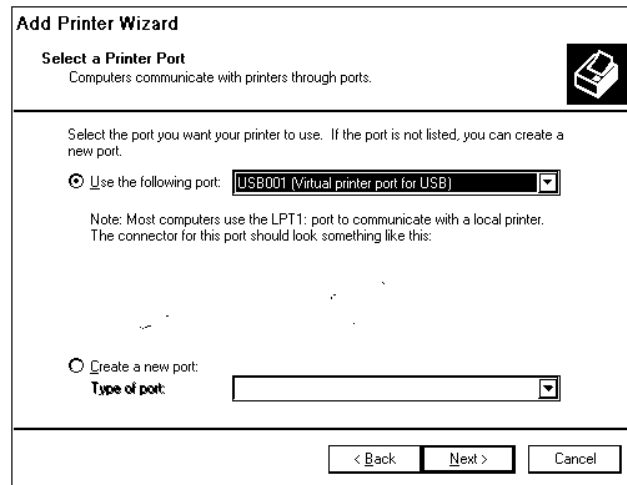


5. Press the **Next** button.
6. Select "Local printer attached to this computer".



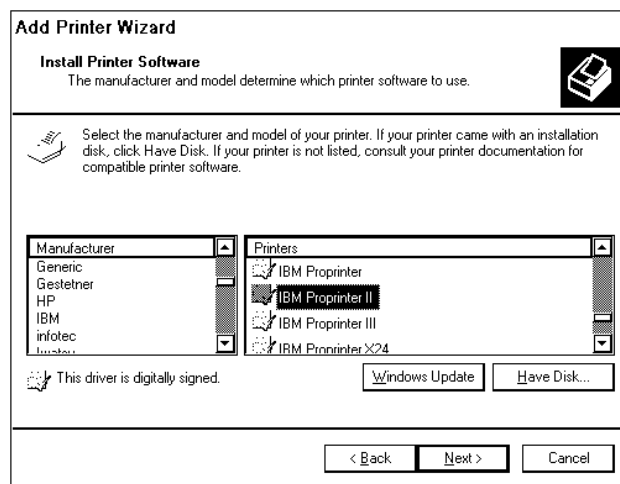
7. Press the **Next** button.
8. Select "Use the following port: USB001". (Virtual printer port for USB)

3. ADJUSTMENTS

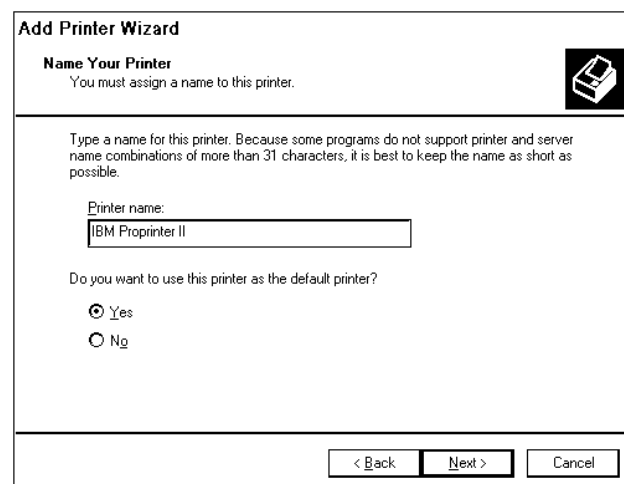


9. Press the **Next** button.

10. Select printer Manufacturer as IBM and Printer as **"IBM Proprinter II"** and press the **Next** button.



11. Enter name for printer and press the **Next** button.



12. To use a network printer, select **"Share name:"** and press the **Next** button.

Add Printer Wizard

Printer Sharing
You can share this printer with other network users.

If you want to share this printer, you must provide a share name. You can use the suggested name or type a new one. The share name will be visible to other network users.

Do not share this printer
 Share name:

< Back Next > Cancel

13. These fields can be left blank. Press the **Next** button.

Add Printer Wizard

Location and Comment
You have the option of supplying a location and description of this printer.

You can describe the location and capabilities of this printer. This information may be helpful to users.

Location:

Comment:

< Back Next > Cancel

14. To print test pages after installation, select "Yes" and press the **Next** button.

Add Printer Wizard

Print Test Page
To confirm that the printer is installed properly, you can print a test page.

Do you want to print a test page?

Yes
 No

< Back Next > Cancel

3. ADJUSTMENTS

15. When installation is ready completed, the following window appears.



16. Press the **Finish** button.

Installation of shared printer

If you want to print from a workstation other than the one to which the printer is directly connected, you have to install Printer software to the workstation in following way:

1. Select first "**Settings**" from Start menu and then "**Printers and Faxes**"
2. Double Click Add Printer icon.
3. Following window appears, and then press the **Next** button.



4. Select "**A network printer, or a printer attached to another computer**", and then press the **Next** button.

Add Printer Wizard


Local or Network Printer
The wizard needs to know which type of printer to set up.

Select the option that describes the printer you want to use:

Local printer attached to this computer

Automatically detect and install my Plug and Play printer

A network printer, or a printer attached to another computer

 To set up a network printer that is not attached to a print server, use the "Local printer" option.

< Back Next > Cancel

5. Select "**Connect to this printer (or to browse for a printer, select this option and click next)**".

Add Printer Wizard

Specify a Printer
If you don't know the name or address of the printer, you can search for a printer that meets your needs.

What printer do you want to connect to?

Browse for a printer

Connect to this printer (or to browse for a printer, select this option and click Next):

Name:

Example: \\server\printer

Connect to a printer on the Internet or on a home or office network:

URL:

Example: http://server/printers/myprinter/.printer

< Back Next > Cancel




6. Press the **Next** button.
7. Click printer name, and then press the **Next** button.

Add Printer Wizard

Browse for Printer
When the list of printers appears, select the one you want to use.

Printer:

Shared printers:

	ECDIS
	\\EC1000C-0001\IBM Proprietary II
	IBM Proprietary II

Printer information

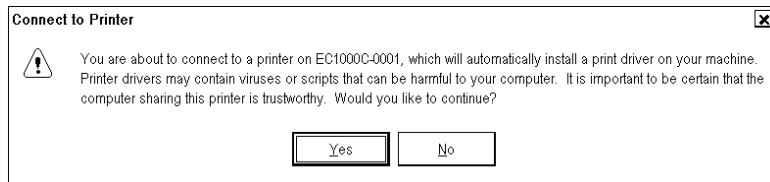
Comment:

Status: Ready Documents waiting: 0

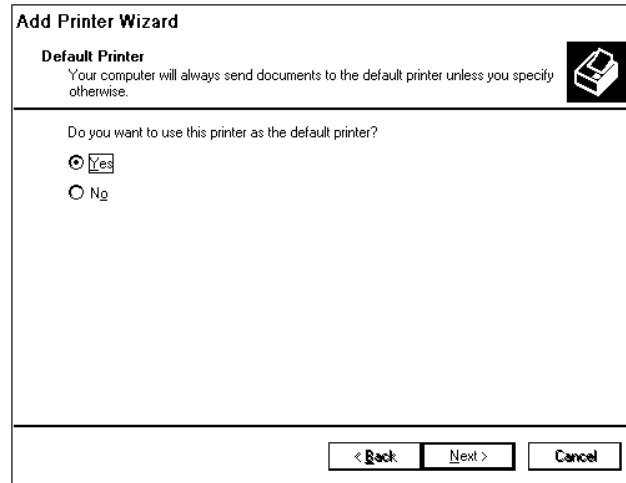
< Back Next > Cancel

8. Press the **Yes** button.

3. ADJUSTMENTS



9. Select **Yes**.



10. Press **Next** button.

11. When installation is completed successfully, the following window appears.

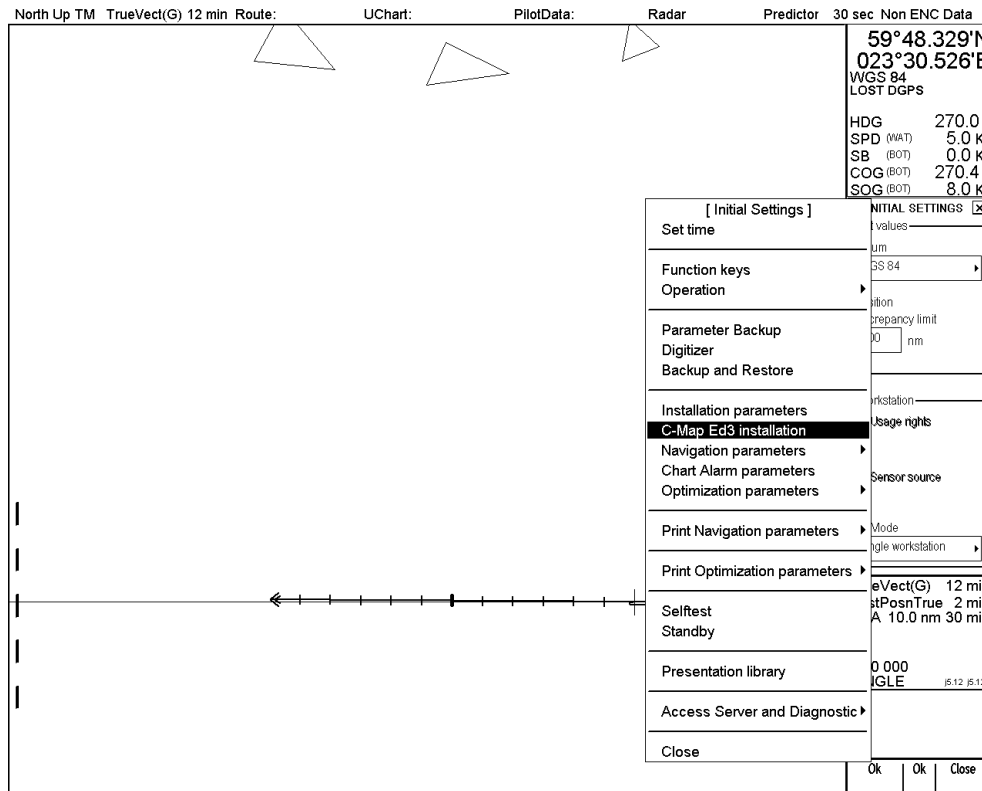


12. Press the **Finish** button.

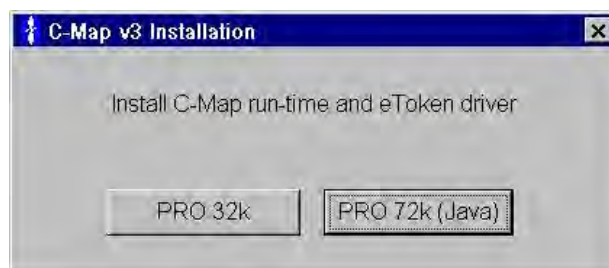
3.6 Activation of CM-93/3

To use CM-93/3 charts, you have to activate eToken (the dongle for system ID) of CM-93/3 as follows:

1. Start ECDIS.
2. Select "C-Map Ed3 installation" from Menu -> Initial settings.



3. C-Map Installation dialog box appears. Click the **PRO 72k (JAVA)** button.



4. The FURUNO ECDIS eToken installation dialog box appears. Insert eToken to USB port. And click the **Continue** button.

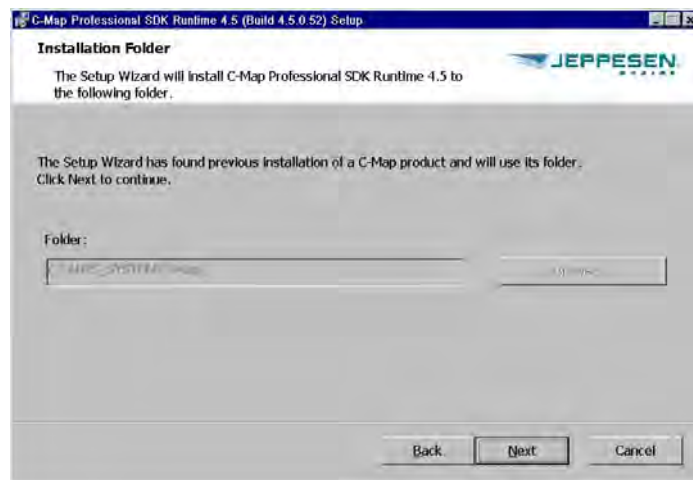


5. Click **Next** button.

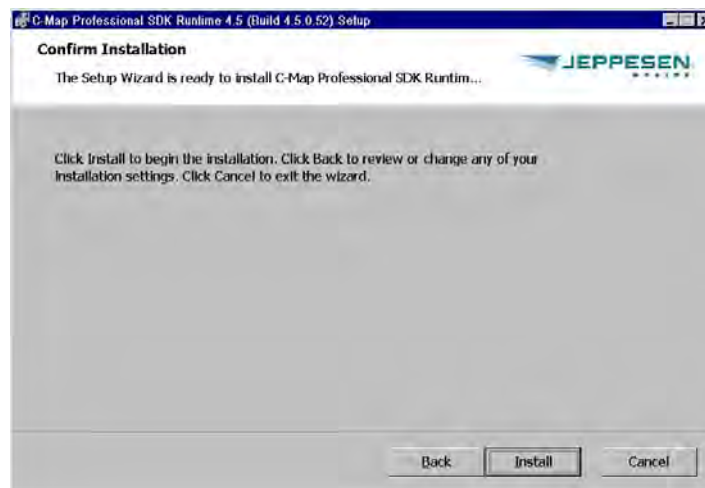
3. ADJUSTMENTS



6. Click **Next** button.



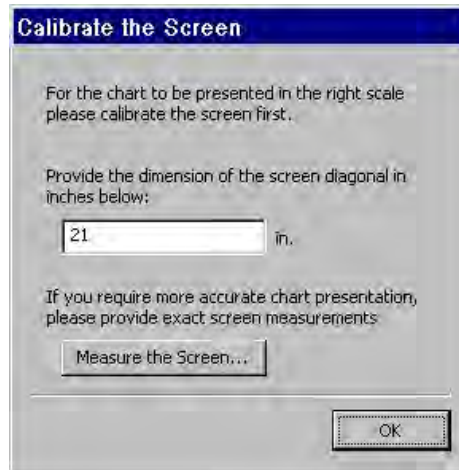
7. Click **Install** button.



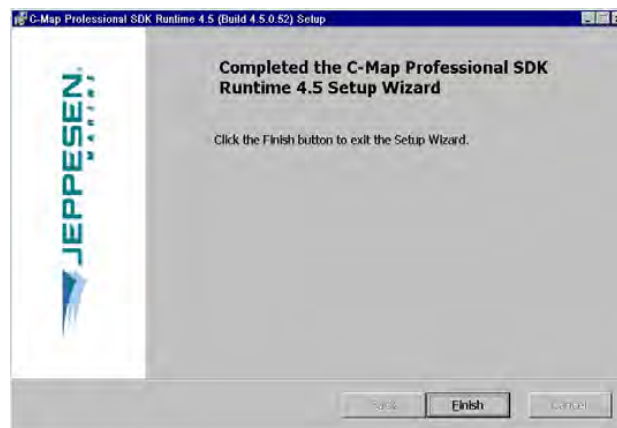
8. Click **No** button.



9. Click **OK** button.



10. When Installation is completed the following window appears.



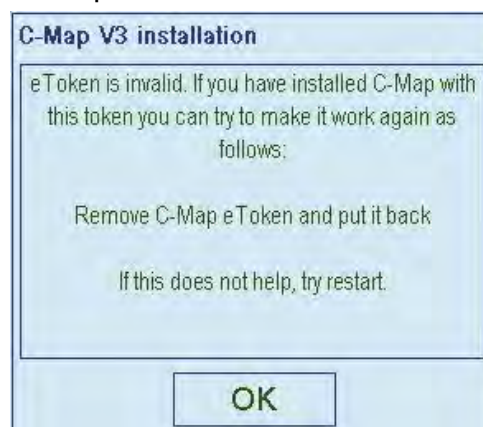
11. Click **Finish** button. Then following window appears.



12. Click "X". Chart drawing software restarts automatically.

If the following window appears, you have not removed all licenses from ECDIS.

You have to remove eToken from USB-port and restart ECDIS computer and then start Re-installation of eToken at step 13.



3. ADJUSTMENTS

13. If you need to re-install eToken, do the following procedures.

1. Start ECDIS.

2. Select "C-Map Ed3 installation" from Menu -> Initial Settings.

14. C-Map Installation dialog appears. Click the **Uninstall** button.



15. Remove eToken and click **Continue** button.



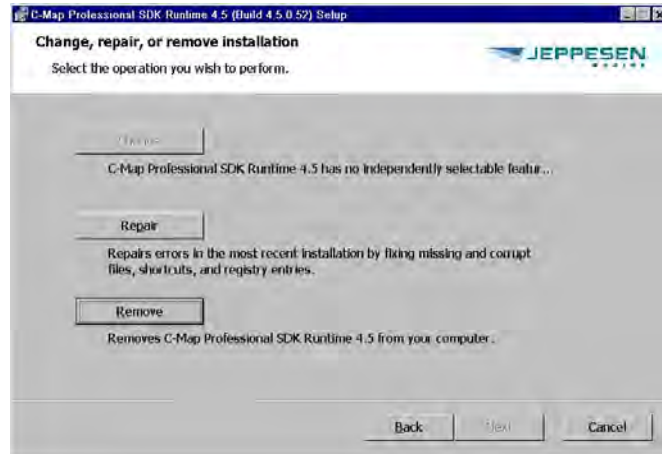
16. Click **Next** button.



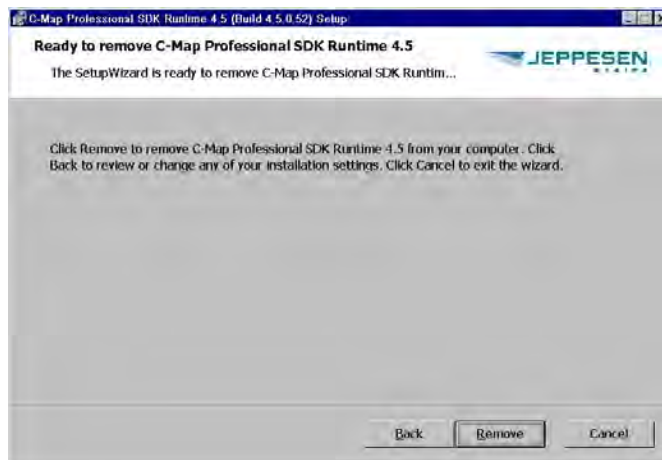
17. Click **Next** button.



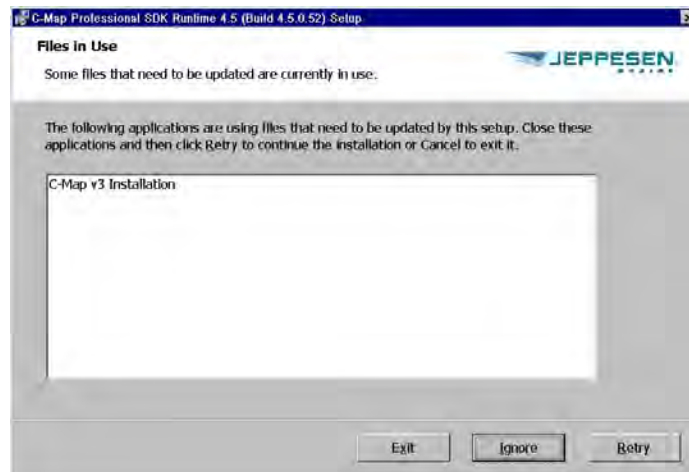
18. Click **Remove** button.



19. Click **Remove** button.

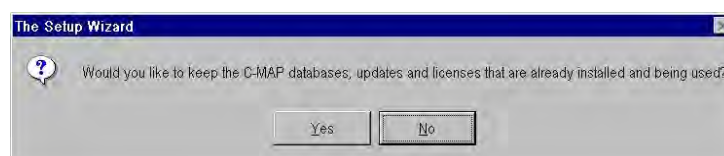


20. Click **Ignore** button.



21. The Setup Wizard dialog appears.

Click **No** button.



22. Click **Yes** button.

3. ADJUSTMENTS

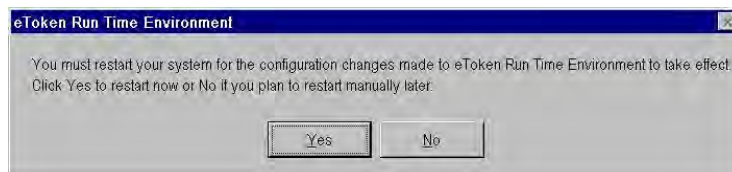


23. When Un-installation is completed the following window appears.



24. Click **Finish** button and restart the ECDIS computer.

If the following window appears, click **Yes** button and restart ECDIS computer.



25. Start Installation of C-Map Installation in step 2.

3.7 Reinstall of ECDIS software

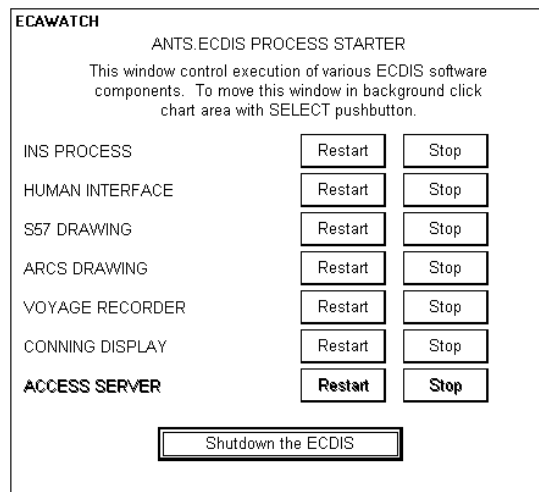
Important things to do before reinstall

When you upgrade ECDIS system some information will be removed permanently from the hard disk. Some of the information you may need later, therefore if it is necessary make a paper copy of Voyage Log files and ship parameters (ship.prm). Make also notes of manual reinstalls which you have to make manually again after reinstalling.

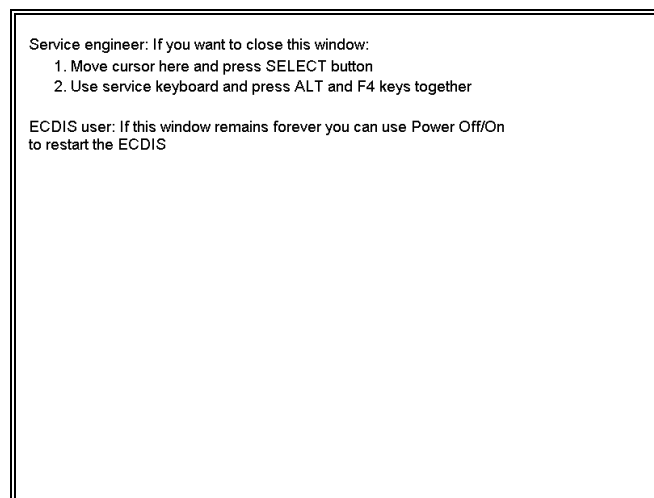
Loading of ECDIS software

You can reinstall ECDIS software by using the ECDIS installation CD-ROM. Connect the service keyboard and mouse, then reinstall ECDIS software as follows:

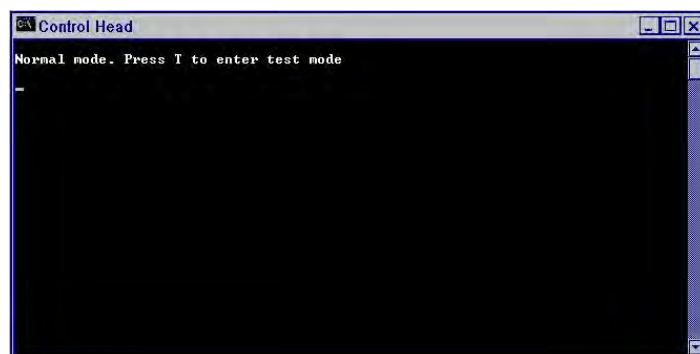
1. You already have ECDIS installed and you have to shut down ECDIS program before you can make a new installation. To shut down ECDIS program, click the **Shutdown the ECDIS** button.



2. Then you will get an empty screen which prevents normal user from entering the operating system. Close the empty screen by clicking Alt and F4 keys of the service keyboard together.



3. Close Control Head program. Use Alt+Tab keys to activate Control Head program on display. Use X in upper right corner to close Control Head.



4. Insert the CD-ROM for installation to the processor unit, and then select **Run** from the **Start** menu. Type the name as shown here to run ECDIS software installation.

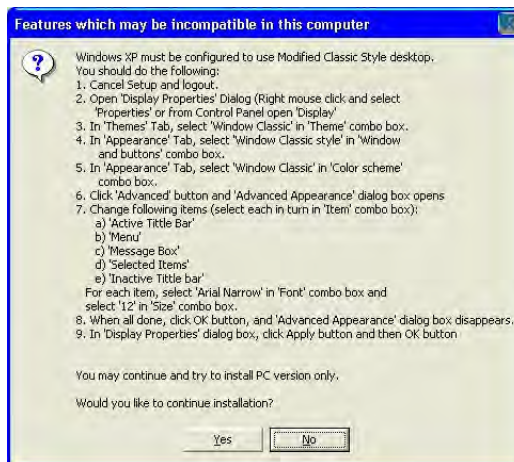


3. ADJUSTMENTS

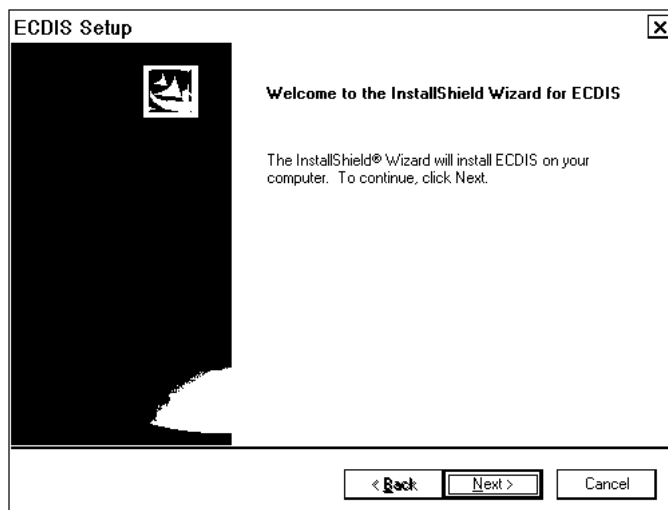
5. A **System Information** window appears, click **Yes** button to continue the installation.



6. If the Windows Classic style is not in use the following window appears. Follow the instructions to enable the Classic style.

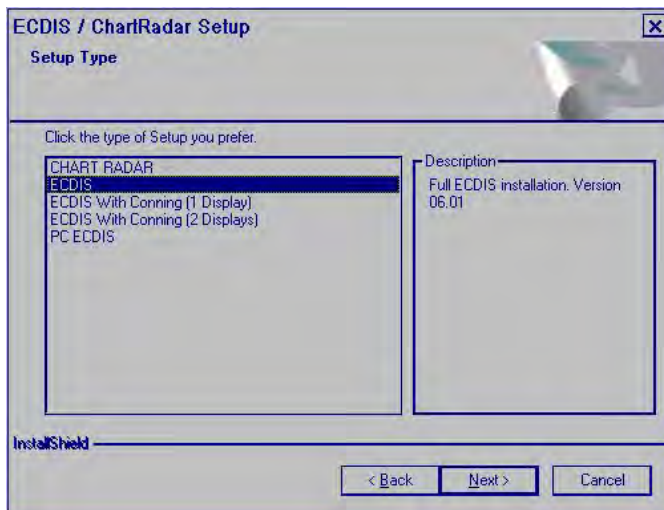


7. Click the **Next** button.

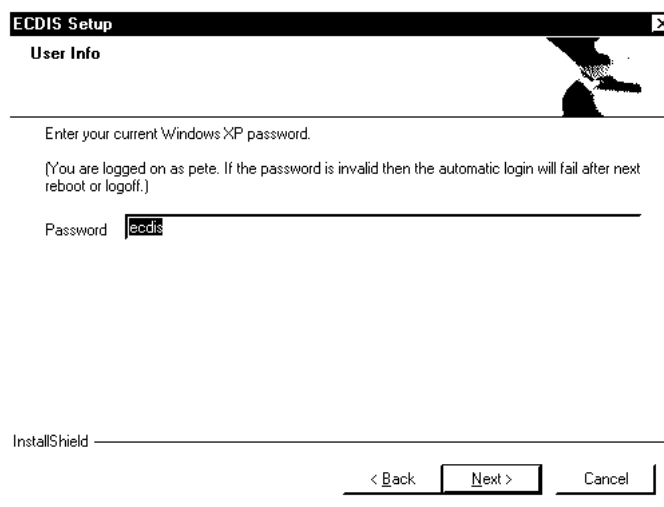


8. Select desired Setup Type.

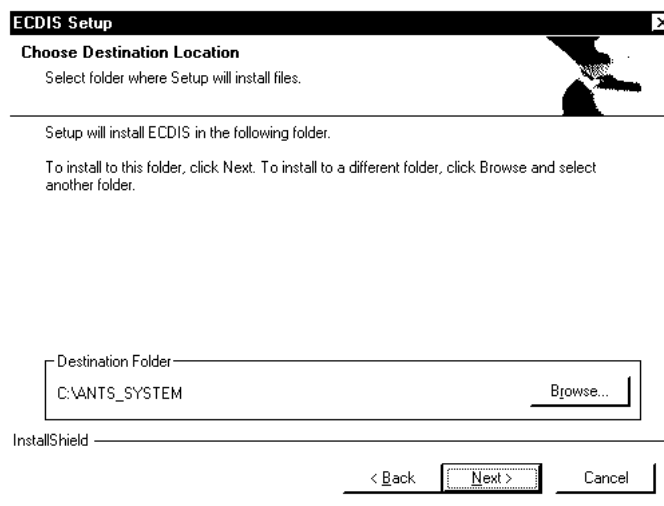
Note: This example is full ECDIS installation without Conning Display.



9. Enter password “ecdis” for ecdis user and click the **Next** button.



10. Select destination location for ECDIS and click the **Next** button.



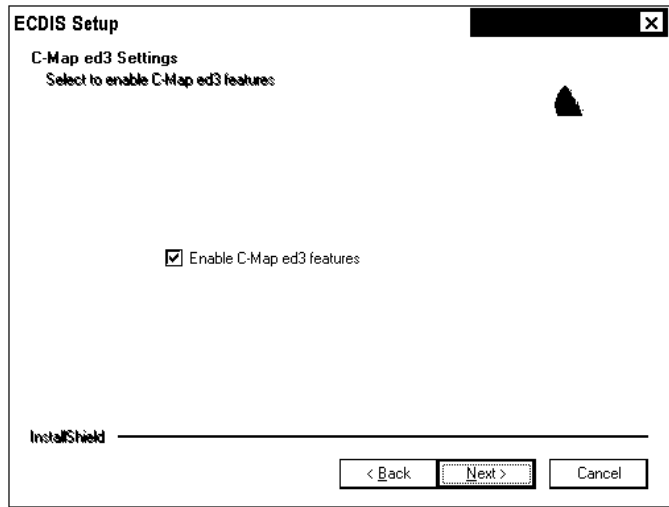
3. ADJUSTMENTS

11. Select the components to be installed and click the **Next** button.

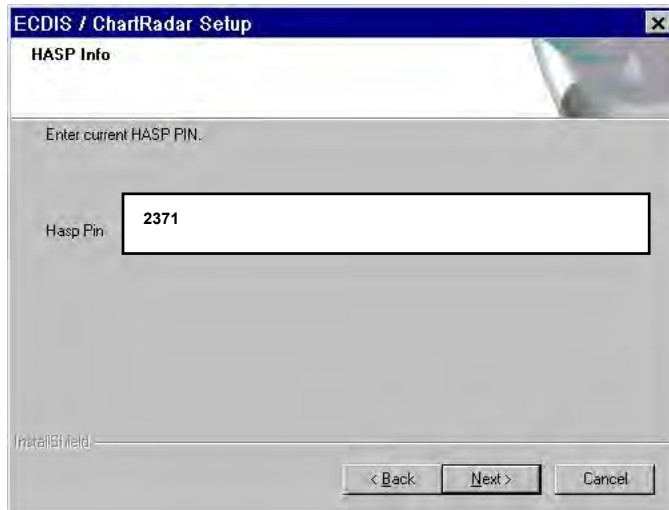
Note: Check “Analog Radar Overlay” when the processor unit contains the optional Analog Radar Overlay board.



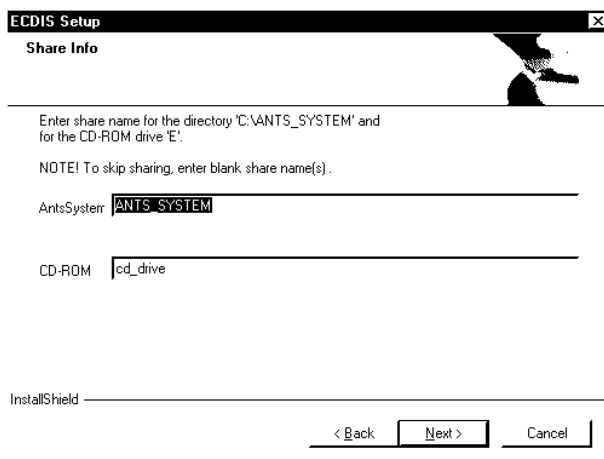
12. Check selection box if C-Map ed. 3 is used.



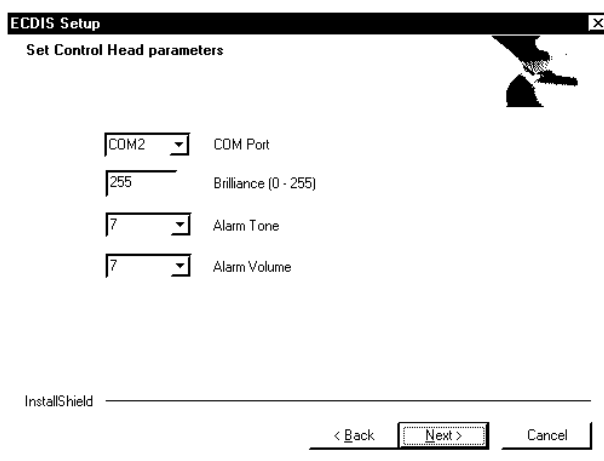
13. Enter HASP PIN Number “2371” and click the **Next** button.



14. Sharing information can be entered here and then click **Next** button.



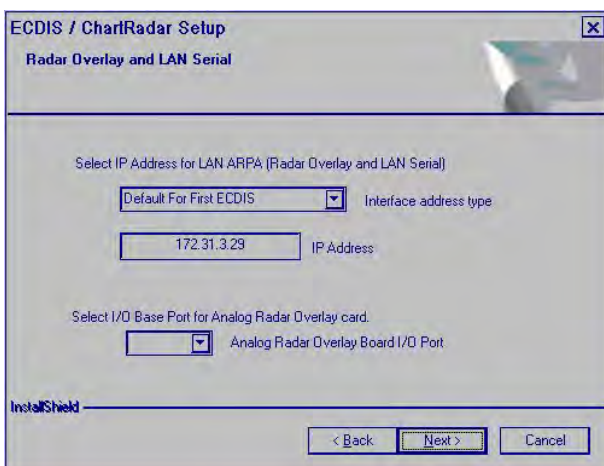
15. Select a COM Port for the Control Head, set other parameters as appropriate, and click the **Next** button.
COM Port: "COM2" only
Alarm Tone: "7" only



16. Select Monitor type, calibration and Control Port for display, and click the **Next** button.



17. Set ECDIS and IP Address for ARPA. Set I/O base port for Radar Overlay, and click the **Next** button.



3. ADJUSTMENTS

18. Set LAN Adapter parameters and click the **Next** button.

Example of first ECDIS default settings with two LAN Adapters.

ECDIS Setup

LAN Adapter parameters
Set IP addresses and check if this ECDIS is sensor source for LAN Adapter (Sensor source both initializes and sends output to device).

Default For First ECDIS Interface addresses

10.0.0.180 ECDIS IP for LAN Adapters

LAN Adapter IP		ID	This ECDIS is
10.0.0.190	<input checked="" type="checkbox"/> Install 1	2	<input checked="" type="checkbox"/> Sensor Source for 1
10.0.0.191	<input checked="" type="checkbox"/> Install 2	3	<input checked="" type="checkbox"/> Sensor Source for 2
For Future Use	<input type="checkbox"/> Install 3	4	<input type="checkbox"/> Sensor Source for 3
For Future Use	<input type="checkbox"/> Install 4	5	<input type="checkbox"/> Sensor Source for 4

InstallShield

< Back Next > Cancel

Example of second ECDIS default settings with one LAN Adapter.

ECDIS / ChartRadar Setup

LAN Adapter parameters
Set IP addresses and check if this ECDIS is sensor source for LAN Adapter (Sensor source both initializes and sends output to device).

Default For Second ECDIS Interface addresses

10.0.0.181 ECDIS IP for LAN Adapters

LAN Adapter IP		ID	This ECDIS is
10.0.0.192	<input checked="" type="checkbox"/> Install 1		<input checked="" type="checkbox"/> Sensor Source for 1
10.0.0.193	<input type="checkbox"/> Install 2		<input type="checkbox"/> Sensor Source for 2
For Future Use	<input type="checkbox"/> Install 3		<input type="checkbox"/> Sensor Source for 3
For Future Use	<input type="checkbox"/> Install 4		<input type="checkbox"/> Sensor Source for 4

InstallShield

< Back Next > Cancel

19. Select files to be deleted from ECDIS, and click the **Next** button.

Note: When upgrading from version 05.xx software, check all boxes to erase corresponding items.

Chart Display Setting Files:

Check here to return settings for the chart display and symbol display to the default.

ARCS/S57 Group files:

Check here to delete all groups made of some cells.

S57 Senc files:

Check here to delete all SENC files of ENC chart saved from CD-ROM.

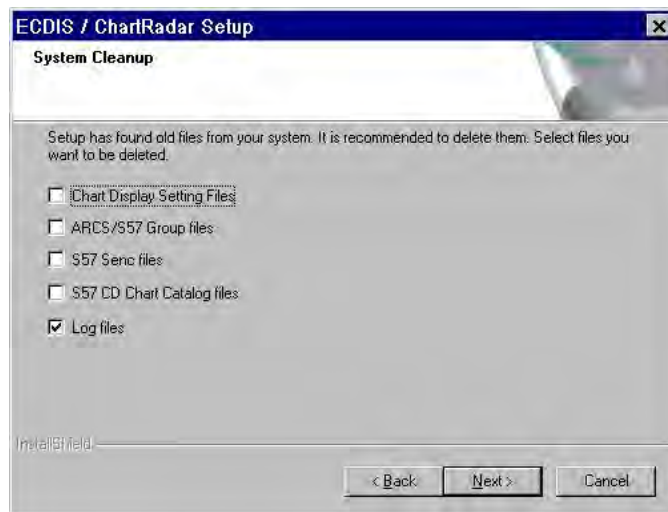
Note: When loading the chart data with different version, check this item.

S57 CD Chart Catalog files:

Check here to delete information for CD-ROM saved.

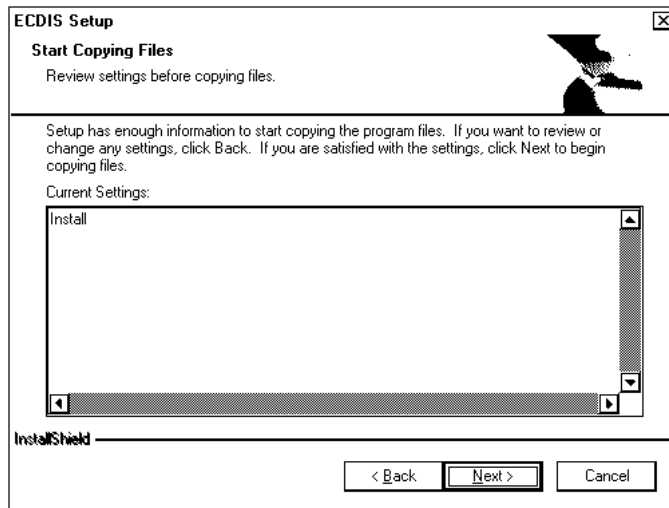
Log files:

Check here to delete the information memorized in the log file:
date, L/L, speed, course, position/gyro offset, SOG, COG, danger target, used chart, scale, alarms, MOB and event.

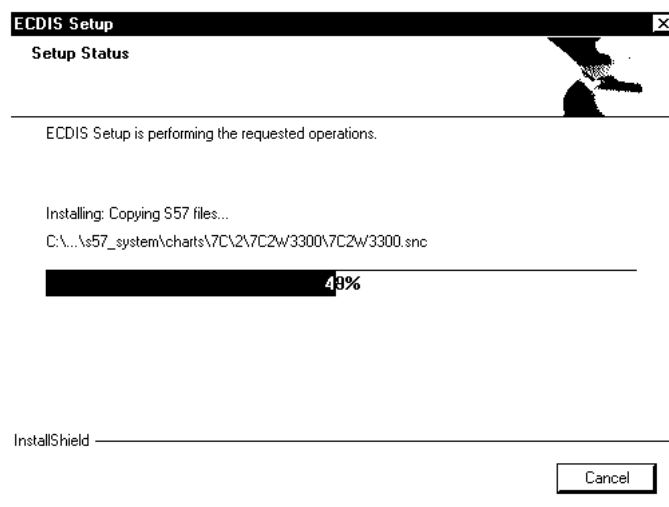


3. ADJUSTMENTS

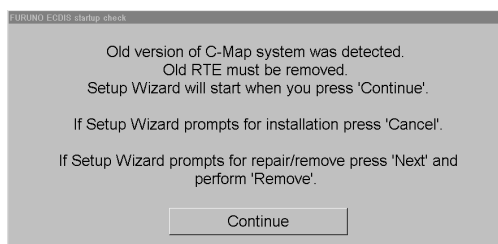
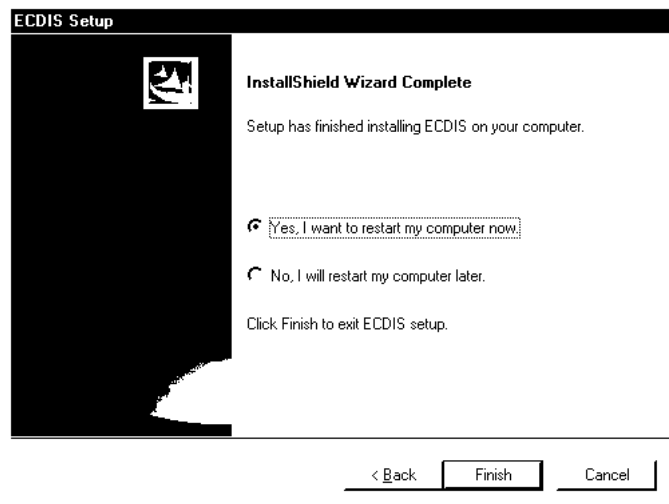
20. Click the **Next** button.



21. Setup progress is shown with a progress bar.



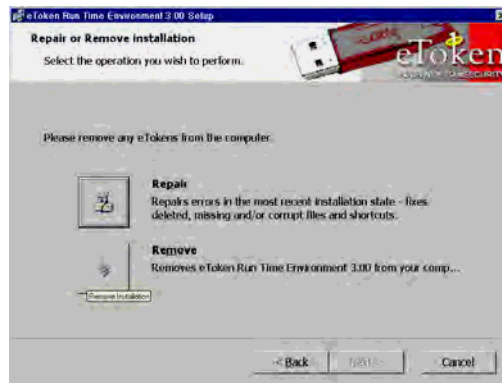
22. Click the **Finish** button to restart ECDIS. Then, the ECDIS program starts automatically.



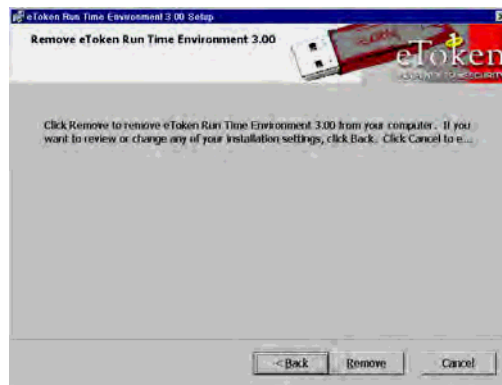
23. Click the **Continue** button.



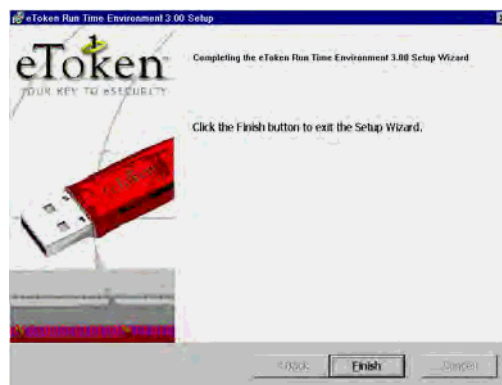
24. Click the **Next** button.



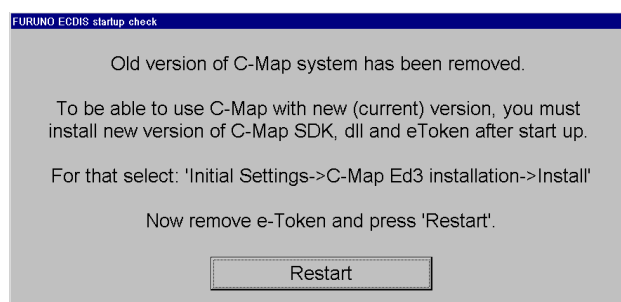
25. Click the **Remove** button.



26. Click the **Remove** button.



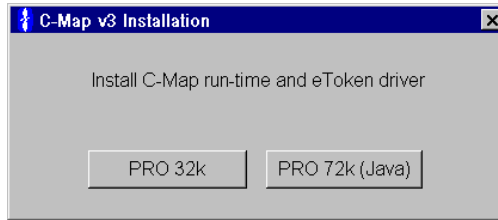
27. Click the **Finish** button,
then click the **Restart**
button.



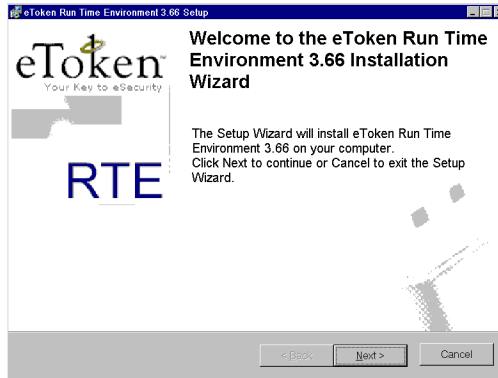
3. ADJUSTMENTS

When your eToken has the label with “Furuno eT 3xxxx” (produced until Feb., 2012)

28. Select Main Menu and Initial Settings in order, then click the **C-Map Ed3 installation** button.



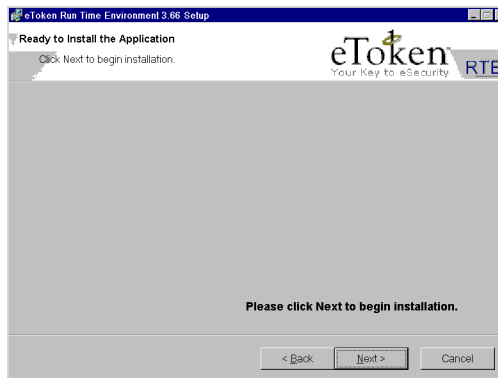
29. Click the **PRO 32k** button.



30. Click the **Next** button.



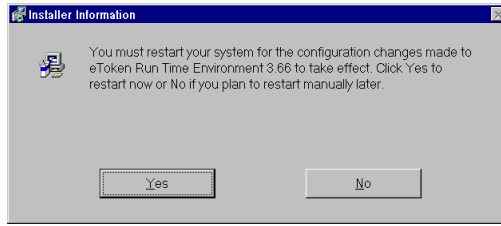
31. Check “**I accept the license agreement**”, then click the **Next** button.



32. Click the **Next** button.

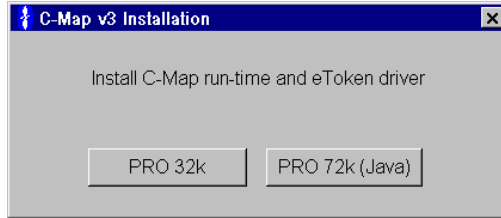


33. Click the **Finish** button.

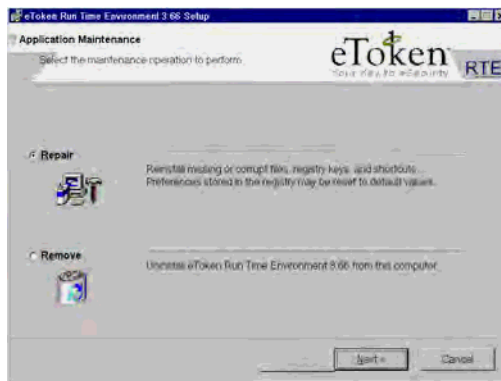


34. Click the **Yes** button to restart Windows.

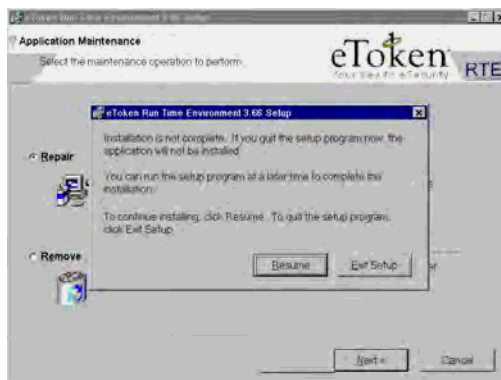
35. Select Main Menu and Initial Settings in order, then click the **C-Map Ed3 installation** button.



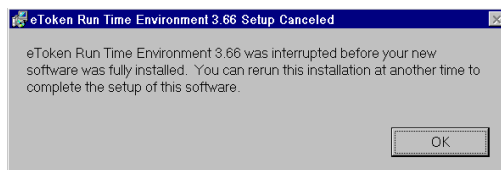
36. Click the **PRO 32k** button.



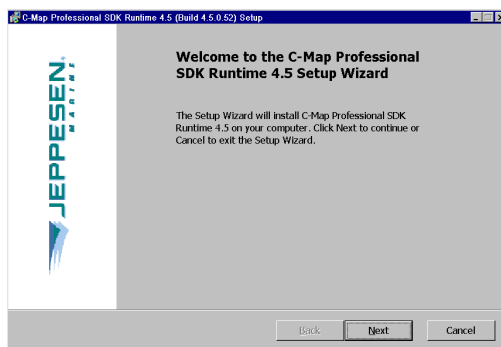
37. Click the **Cancel** button.



38. Click the **Exit Setup** button.

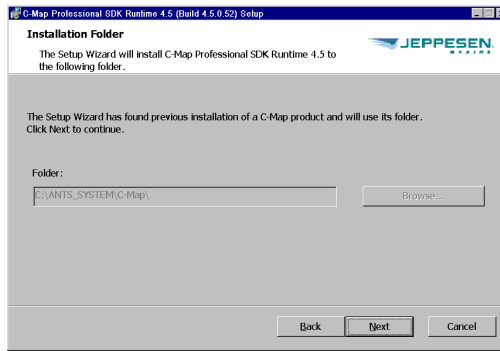


39. Click the **OK** button.

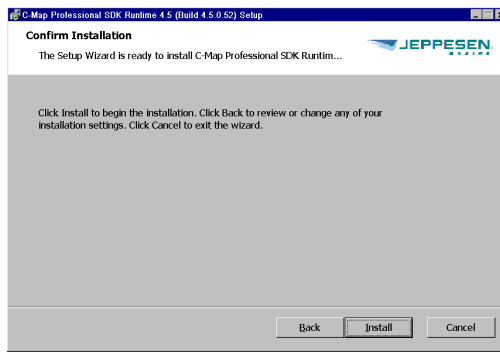


3. ADJUSTMENTS

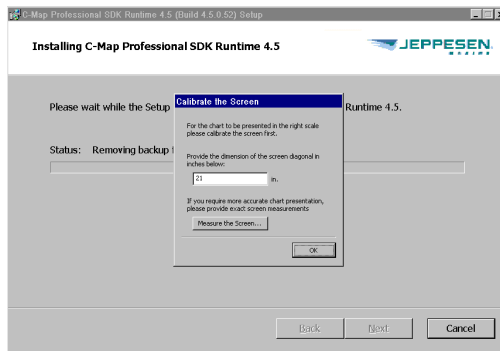
40. Click the **Next** button.



41. Click the **Next** button.



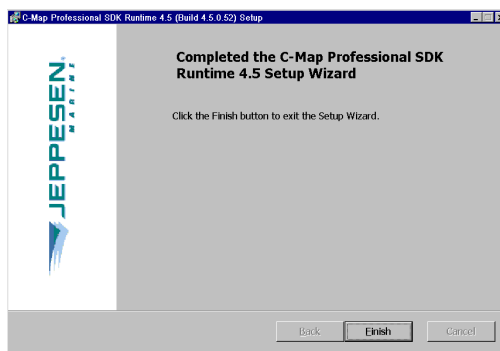
42. Click the **Install** button to start the installation.



43. Click the **OK** button.



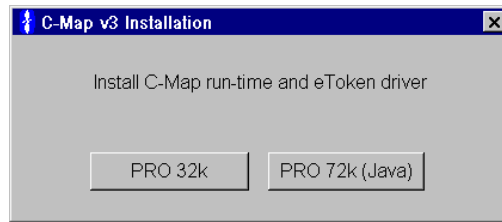
44. Attach the eToken to EC-1000C, then click the **OK** button.



45. Click the **Finish** button.

When your eToken has the label “Furuno JeT 3xxxx” (produced Feb., 2012 and later)

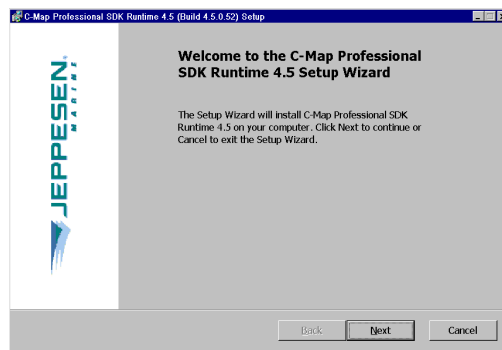
28. Select Main Menu and Initial Settings in order, then click the **C-Map Ed3 installation** button.



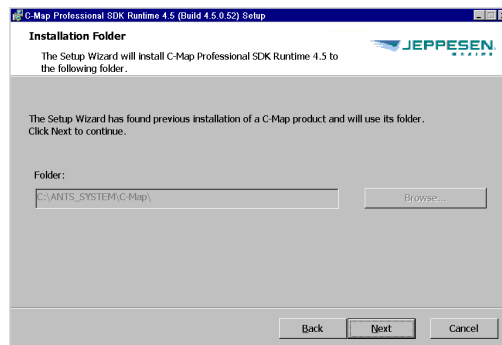
29. Click the **PRO 72k (Java)** button.



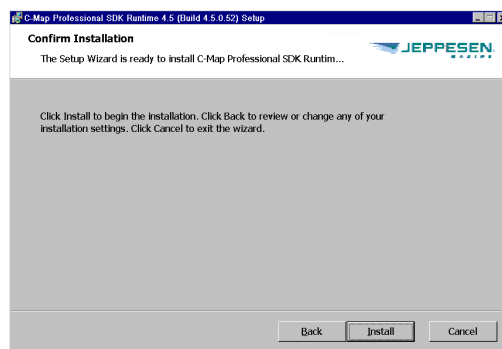
30. Click the **Continue** button.



31. Click the **Next** button.

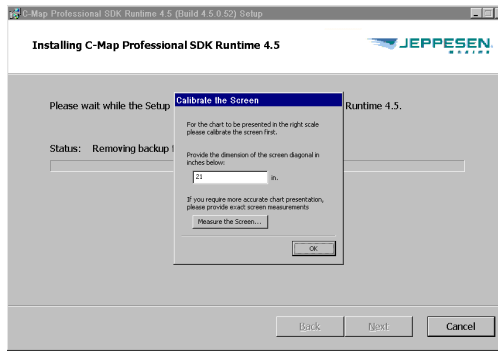


32. Click the **Next** button.



3. ADJUSTMENTS

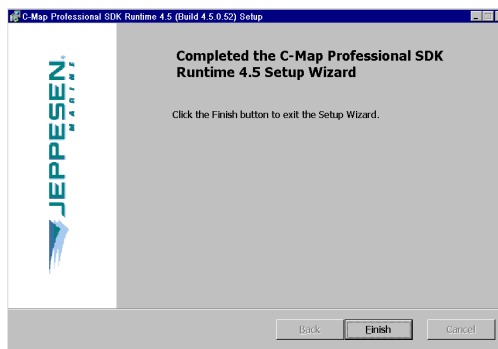
33. Click the **Install** button to start the installation.



34. Click the **OK** button.



35. Attach the eToken to EC-1000C, then click the **OK** button.



36. Click the **Finish** button.

Important things to do after reinstall

After you have reinstall ECDIS program, you will need to initialize ECDIS to restore previous state.

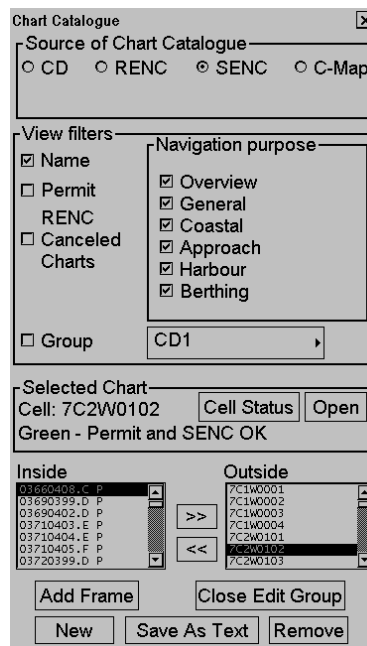
The following occurs when the ECDIS is reinstalled:

- Chart detail settings are restored to default values. For information about how to set desired values, see "Control of visible chart features" in the Operator's Manual.
- Navigation sensor settings are deleted. Select navigation sensors from the Sensor page.
- SENC format of S57 charts is removed. See the procedure below for how to convert S57 charts to SENC format.
- Manual updates are removed. Make Manual Updates based on the Notes you made before Upgrade.

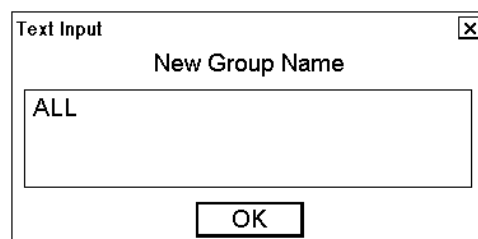
How to convert already loaded S57 charts into SENC format

You can reconvert hard disk stored charts S57 into SENC format by doing the following:

1. Open the Chart Menu.
2. Choose "Chart Catalogue" .

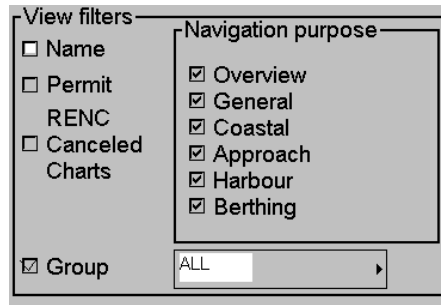


3. Push the **New** button.
4. Create a group named "ALL", and click **OK** button.

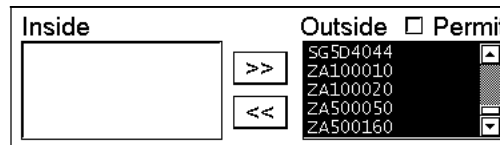


3. ADJUSTMENTS

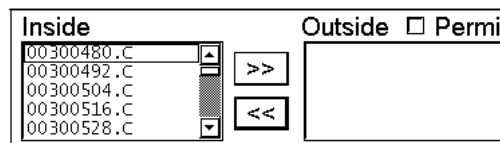
5. Click “Group” in the View filters, and then choose “ALL”.



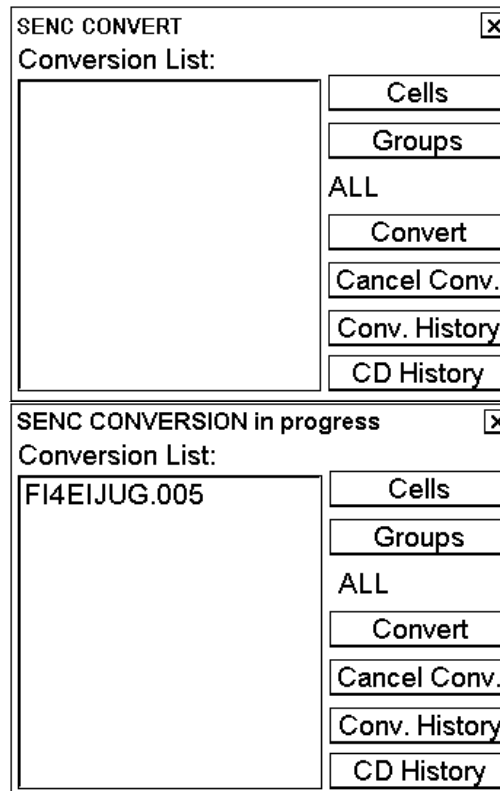
6. Choose all available charts in the Outside window at the bottom of the window.



7. Click << button to set group “ALL” as active.



8. Open the SENC Convert window from the Chart Menu and activate conversion for the group “ALL.” Click the **Convert** button to start conversion for the Group “ALL.”



You will get a list of charts to be converted to SENC format. (Content of **Conversion List** depends on charts loaded into ECDIS.)

When conversion is completed, the **Conversion List** will be empty again.

For details, see the section “How to use SENC Convert window to initiate SENC conversion” in the Operator’s Manual.

How to set the EC-1000C as No.2

When using two EC-1000C with Multi-workstation mode, set one as No.2 as below.

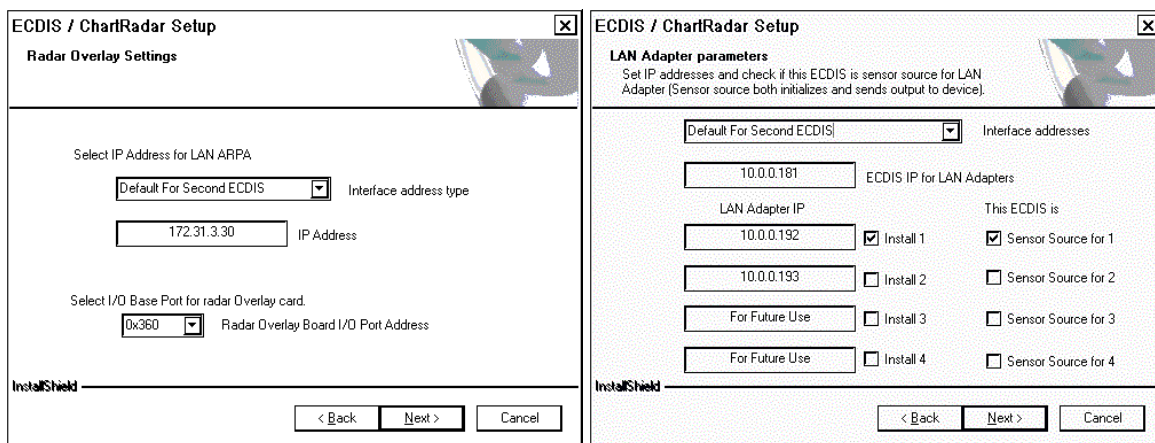
How to change IP address of OS

The EC-1000C has two LAN ports, Local Area Connection (IP address: 172.31.3.29) and Local Area Connection2 (10.0.0.180). Change IP addresses for No.2 as below, referring to paragraphs 3.1.1 and 3.1.2.

Interface	No.2 IP address
Local Area Connection	172.31.3.30
Local Area Connection2	10.0.0.181

How to change IP address of ECDIS program

Change the ECDIS program (IP address, etc.) to one for No.2 using the CD-ROM. Choose “Default For Second ECDIS” at Interface address type/Interface address screen to set IP address to No.2.



How to change IP address of LAN adapter

Change the IP address of LAN adapter to the one for No.2. Start 7188xw.exe referring to section 3.3. When setting the first LAN adapter, do the following:

1. Type “setip 10.0.0.192”, and click the Enter key.
2. Type “sercotr /d=4 /p=15001 /r=15000 /f=1 /n=8 /m=0 /e0=10.0.0.181”.
3. Confirm that the program version is same with it for the EC-1000C.
4. Set the parameter depending on the relation with the EC-1000C.

Status	IP Address	Parameters
First LAN Adapter (No.1 ECDIS)	10.0.0.190 (Default)	sercotr /d=2 /p=15001 /r=15000 /f=1 /n=8 /m=0 /e0=10.0.0.180 (Default)
Second LAN Adapter (No.1 ECDIS)	10.0.0.191	sercotr /d=3 /p=15001 /r=15000 /f=9 /n=8 /m=0 /e0=10.0.0.180
First LAN Adapter (No.2 ECDIS)	10.0.0.192	sercotr /d=4 /p=15001 /r=15000 /f=1 /n=8 /m=0 /e0=10.0.0.181
Second LAN Adapter (No.2 ECDIS)	10.0.0.193	sercotr /d=5 /p=15001 /r=15000 /f=9 /n=8 /m=0 /e0=10.0.0.181

3.8 How to Access to Installation Parameters (USB type)

Installation parameters have limited access, and are controlled by the specified USB memory or a password. To access the installation parameters menu by a USB memory, create the folder "service.pas" in the USB memory and connect the USB memory to the EC-1000C. If you do not have a USB memory, enter the password to access to the menu. When the window for password appears on the display, enter "6", "1", "4", "2" ("M+GA" shown on the display), and click the left button and the OK button to show the installation parameters menu.

1. Connect the USB memory which contains "service.pas" file (if you have the USB memory).
2. Click the **MENU** key on the control unit to open the menu.
3. Roll the wheel to choose Initial Settings, and then push the wheel.
4. Locate the cursor on the ▲ next to INITIAL SETTINGS to show the Initial settings menu.
5. Roll the wheel to choose Installation parameters and push the wheel.
6. When the USB memory is not connected, you are asked to enter the password at this stage. Enter it as shown above to show the Installation parameters.

Note: Password cannot be entered in version 05.55 software; use USB memory.

4. INPUT/OUTPUT SIGNALS

Introduction

The main method for transferring data between a sensor and the ECDIS is IEC 61162-1 Ed.1 or IEC 61162-1 Ed.2 Standard serial communication link.

In the standard configuration, the system has one serial communication channel interface, LAN adapter type EC-1010, to communicate with up to eight external devices in serial format. As an option, second LAN adapter can be connected for max. 16 serial channels in total.

Optionally the ECDIS can be interface to analog signals through a B adapter type EC-1020. For communication with ECDIS this analog adapter use, one serial channel from the LAN adapter.

Standard interfaces

Gyro compass

- One serial input type of gyro compass (IEC 61162-1 Ed.1 or Ed.2 message \$XXHDT..., min 1 message per second. With radar overlay the recommendation is 5 messages per second.)

Speed log

- One serial input type of dual-axis speed log (IEC 61162-1 Ed.1 or Ed.2 message \$XXVBW.... or NMEA V1.5 message \$PKVBW... or NMEA V1.5 message \$PSALL, min 1 message per 2 seconds).

Positioning equipment

- Two positioning equipment can be connected using one of the following communication protocols:
 - IEC 61162-1 Ed.1 messages \$XXGLL, \$XXVTG and \$XXZDA
 - IEC 61162-1 Ed.1 messages \$XXGGA, \$XXVTG and \$XXZDA
 - IEC 61162-1 Ed.2 messages \$XXDTM, \$XXGLL, \$XXVTG and \$XXZDA
 - IEC 61162-1 Ed.2 messages \$XXDTM, \$XXGGA, \$XXVTG and \$XXZDA
- **Notes:**
 - Min message rate is 1 message per 5 seconds
 - Recommended rate is 1 message per second
 - Alternatives 1, 2 and 3 has separate talker identifier selection for VTG and GLL/GGA/PAT.
 - Message \$XXZDA should only be used with one of the position equipment.
 - Only alternatives 2 and 3 have Differential-flag for DGPS use.
 - Only equipment, which has fixed datum (like WGS-84) in their position message should be used. Alternatives 6 and 7 check that the used datum is WGS84.

4. INPUT/OUTPUT SIGNALS

ARPA Radar

- Two ARPA radars can be connected using one of the following communication protocols.
 - IEC 61162-1 Ed.1 or Ed.2 standard messages \$XXOSD and \$XXTTM for input and messages \$ECGLL, \$ECDTM, \$ECDPT and \$ECMWV for output. Targets numbered from 1 to 100 are accepted in TTM message. The datum of GLL message is fixed and it is WGS84 (for serial interface only).
 - FURUNO interface with IEC 61162-1 Ed.1 standard messages \$XXOSD and \$XXTTM for input and messages \$IIGLL, \$IIOSD for output + proprietary messages for user charts, routes, curved ebl, etc (for serial interface and LAN).

AIS transponder equipment

- One serial input interface (IEC 61993-2 Ed.1 message !XXVDM, message types 1,2,3 and 5, min 1 message per 10 seconds)
- **Notes:**
 - Max. 1500 simultaneous AIS targets can stored for display purposes.
 - Max. 200 simultaneous AIS targets out of 1500 stored can be displayed.

Trackpilot

- Serial data interface based on NMEA V1.5 messages for EMRI SEM-200 or FURUNO FAP-2000 Trackpilot (IEC 62065 category B and C for TCS)
- Or serial data interface based on NMEA messages for YOKOGAWA autopilot (NOTE: IEC 62065 type approval of category B for TCS)
- Or serial data interface based on NMEA messages for TOKYO KEIKI autopilot (NOTE:IEC 62065 type approval category C for TCS)

External interfaces

Echo Sounder

- One serial input type echo sounder (IEC 61162-1 Ed.1 or Ed.2 message \$XXDBT... , min 1 message per 5 seconds)

Wind measuring device

- One serial input type wind sensor (IEC 61162-1 Ed.1 or Ed.2 message \$XXMWV..., min 1 message per 10 seconds)

Water temperature measuring device

- One serial input type wind sensor (IEC 61162-1 Ed.1 or Ed.2 message \$XXMTW..., min 1 message per 10 seconds)

Positioning equipment

- One additional positioning equipment

Gyro compass

- One analog type of gyro compass (90-135VAC Synchro 1:360 or 20-48 VDC Stepper 1/6°)

Speed log

- One analog pitot log (200 pulses/nm)

Rate of Turn Gyro compass

- ROT information has following alternative sources:
- ROT can be calculated from the ordinary gyro system heading.
- ROT can be received from a serial type Gyro compass (\$XXROT...).
- ROT can be received from a ROT gyro with analogic voltage output (+/- 10 V).
- ROT can be received from a serial type dual-axis speed log, if it is equipped with a ROT gyro and if it sends message \$PKDRU....

Main propeller

- One or two propellers having RPM and pitch with analog interface.
- 2-kohm potentiometers installed in all propellers.
- Reference voltage to potentiometers (+/-12v), supplied from the ECDIS.
- Each analog input is associated with a status signal (closed contact) which indicates the availability of the analog signal.

4. INPUT/OUTPUT SIGNALS

Thrusters

- One bow and one stern thruster with analog interface.
- 2-kohm potentiometers installed in all thrusters.
- Reference voltage to potentiometers (+/-12v) supplied from the ECDIS.
- Each analog input is associated with a status signal (closed contact) which indicates the availability of the analog signal.

Rudder

- One or two rudder indicators
- Rudder indicators have the following sources:
 - Both actual and order can be received from a track pilot with serial data.
 - Actual can be received from analog interface and order can be received from a track pilot in serial data.
 - Both actual and order can be received from analog interface.
 - Or alternatively port and starboard rudder feedback can be received from analog interface.
 - Both actual and other can be received from IEC 61162-1 (\$xxRSA).
- Analog interface for rudder has following specification.
 - 2-kohm potentiometers installed in the steering gear system.
 - Reference voltage to potentiometers (+/-12v) supplied from the ECDIS.
 - Typically the same rudder feed back unit can be used also for track Pilot system. (A dual-potentiometer in the feed back unit is then required)
 - Each analog input is associated with a status signal (closed contact) which indicates the availability of the analog signal.

Engine start air pressure

- One engine start air pressure analog interface.
- 2-kohm potentiometers installed in engine start air pressure.
- Reference voltage to potentiometer (+/-12v) supplied from the ECDIS.
- Analog input is associated with a status signal (closed contact) which indicates the availability of the analog signal.

Air pressure

- One air pressure analog interface.
- typical instrument is a VAISALA pressure sensor having current output.

Fuel consumption

- One fuel pump with analog interface
- Analog input is associated with a status signal (closed contact) which indicates the availability of the analog signal.

Route backup and restore for FURUNO GP-80

- One serial input/output for Furuno DGPS receiver GP-80 (IEC 61162-1 Ed. 1 based proprietary message)

Route backup to external equipment

- One serial output to external equipment (IEC 6162-1 Ed. 1 message = \$xxDTM, \$xxWPL, \$xxRTE) Route data are output when route monitor is selected on ECDIS.

Speed Pilot

- One serial data interface (IEC 61162-1 Ed.1 based proprietary messages)

Alarm Management and Watch Safety System (AMWSS)

- One serial data interface (IEC 61162-1 Ed.1 based proprietary messages)

Alarm outputs

- ROUTE MONITOR: OUTSIDE CHANNEL LIMIT alarm as open contact (Contact closed is No Alarm)
- ROUTE MONITOR: WAYPOINT APPROACH alarm as open contact (Contact closed is No Alarm)
- ECHO: DEPTH BELOW LIMIT alarm as open contact (Contact closed is No Alarm)
- NAVIGATION SENSOR ALARM as open contact (Contact closed is No Alarm) from B adapter
- ECDIS failure as open contact (Contact close is No Failure)
- Any ECDIS ALARM as open contact (Contact close is No Alarm)
- Operator Fitness notice as closed contact (Contact open is No Activity)
- BACKUP NAVIGATOR ALARM as open contact (Contact close is No Alarm)

Alarm inputs

- Alarm inputs have following sources:
 - Serial messages from EMRI Central Alarm Management
 - Closed/Open contact inputs (max 8 pieces) from B adapter

4. INPUT/OUTPUT SIGNALS

Radar Overlay

- Video: min 2 Vpp, max 5 Vpp, positive or negative polarity
- Trigger: min 5 V, max 30 V, positive or negative polarity, zero distance
- Headline: min 5 V, max 30 V, positive or negative polarity
- Azimuth: min 5 V, max 30 V, positive polarity, 128...1024 pulses / 360°
- Selection: 2 pieces of selection inputs to define parameter set selection for Radar Overlay. The inputs are coded and give a possibility to define three alternative radars. Selection input: min 5 V, max 24 V.

5. RADAR SWITCH (OPTION)

To connect two radars excepting FAR-21x7/28x7 series, use the optional radar switch.

Type	Code No.	Remarks
CP03-29501	008-544-940	For 12 VDC
CP03-29502	008-544-950	For 24 VDC

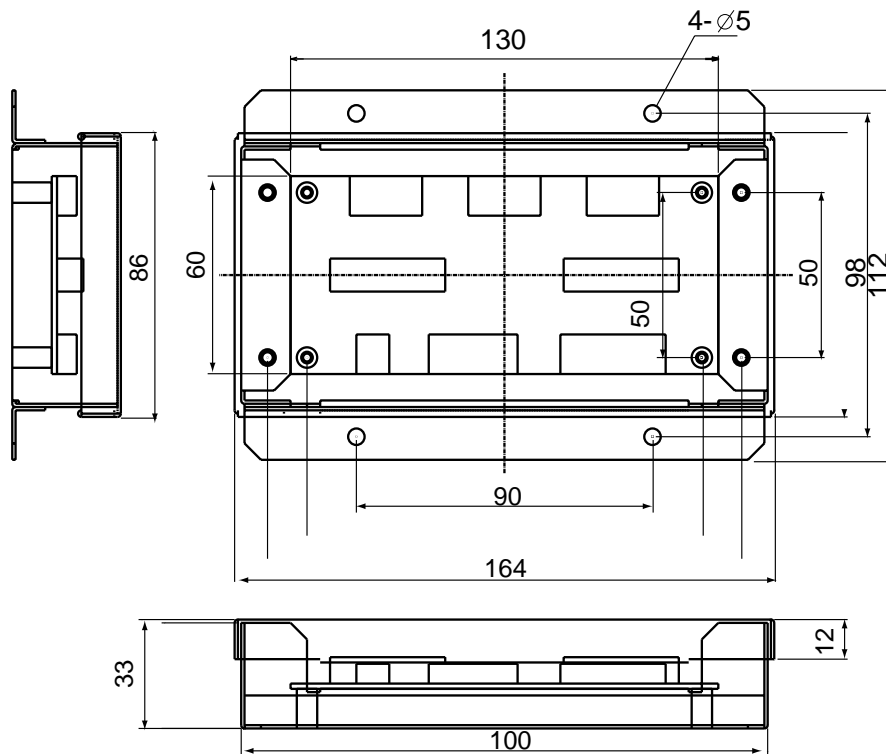
Contents

See the packing lists attached at the back of this manual

Mounting

Radar switch

Mount the switch at the mounting position with four tapping screws (M4, local supply).

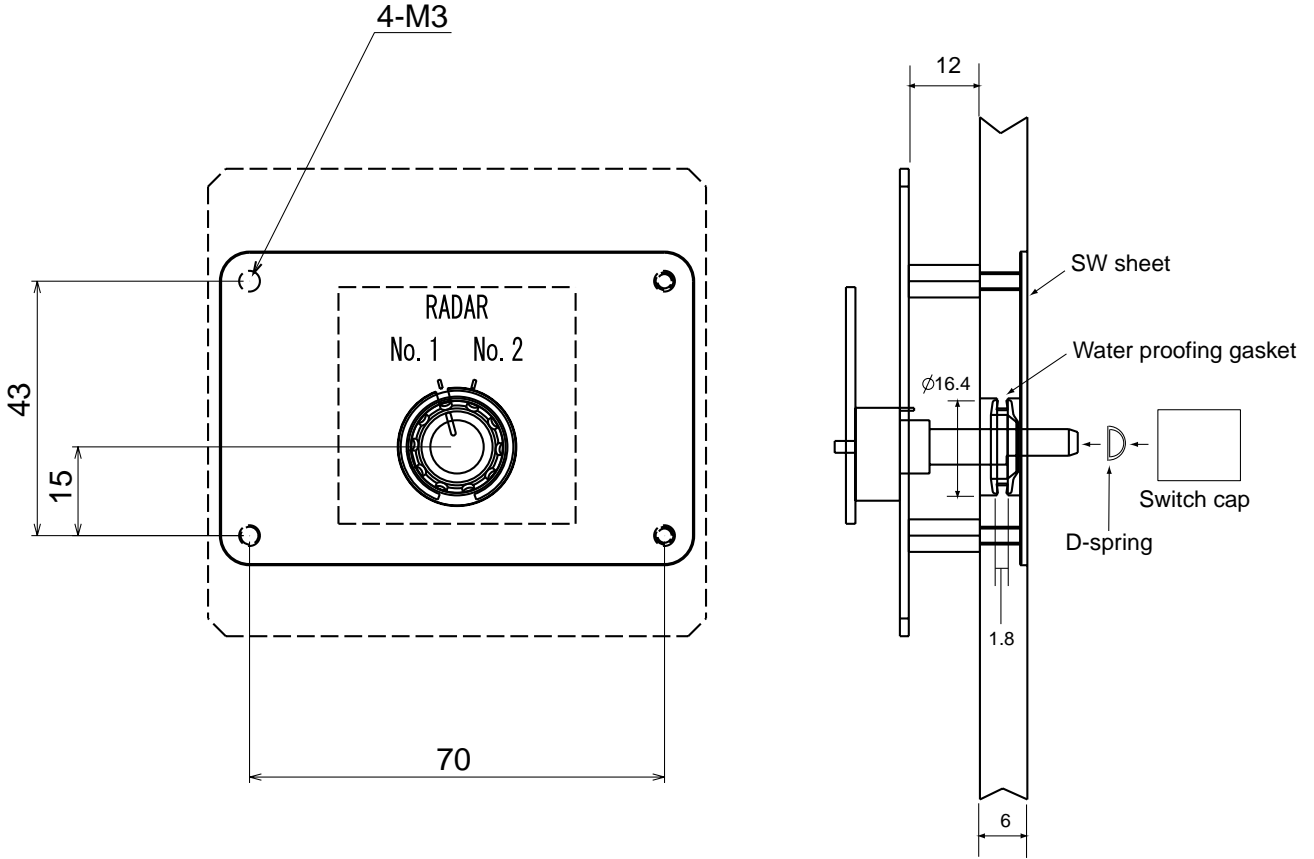


Radar switch

5. RADAR SWITCH (OPTION)

Radar selector

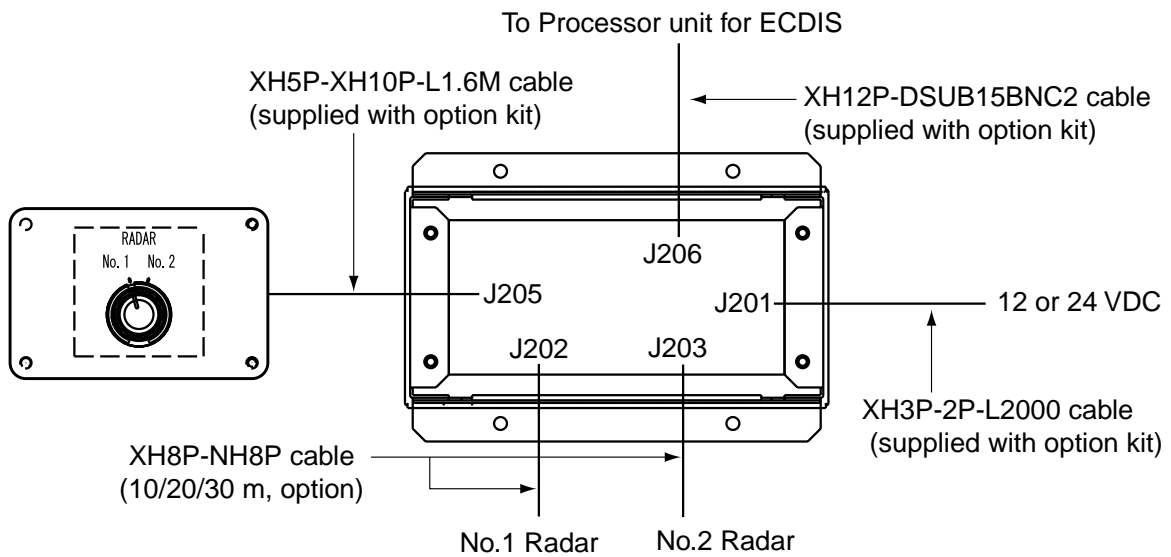
Make five holes (one for toggle switch) to mount the switch on the desktop or bulkhead as below.



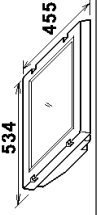


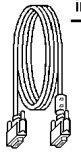

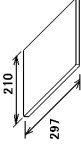
Radar selector

Connection

Connect cables as below.



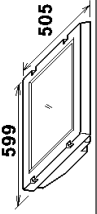


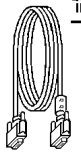
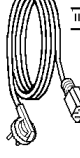
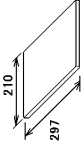
03GR-X-9851 -7 1/1
A-1
PACKING LIST
MU-2010E-DVI5/-HK

NAME	OUTLINE	DESCRIPTION/CODE No.	QTY
ユニット			
表示部 DISPLAY UNIT		MU-2010E/-HK 000-083-404-00 ***	1
予備品			
予備品 SPARE PARTS		SPO3-14700 008-549-730-00	1
付属品			
付属品 ACCESSORIES		FP03-09810 008-536-010-00	1
工事材料			
INSTALLATION MATERIALS			
DVIケーブル DVI CABLE		CABLE DIGITAL DVI 5M 999-999-137-00	1 (*1)
ケーブル組品 CABLE ASSEMBLY		00619-001 000-171-765-10	1
図書			
DOCUMENT			
取扱説明書(和/英) OPERATOR'S MANUAL (JP/EN)		OMC-41222-* 000-159-669-1*	1

(*)1)は、タミコードに付き、注文できません。
(*1) THIS CODE CANNOT BE ORDERED.
コード番号末尾の「*」は、選用品の代表コードを表します。
CODE NUMBER ENDING WITH "*" INDICATES THE CODE NUMBER OF REPRESENTATIVE MATERIAL.

型式/コード番号が2段の場合、下段より上段に代わる選用品であり、どちらかが入っています。なお、品質は変わりません。
TWO TYPES AND CODES MAY BE LISTED FOR AN ITEM. THE LOWER PRODUCT MAY BE SHIPPED IN PLACE OF THE UPPER PRODUCT. QUALITY IS THE SAME.
(略図の寸法は、参考値です。DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

03GR-X-9852 -7 1/1
A-2
PACKING LIST
MU-2310E-DVI5/-HK

NAME	OUTLINE	DESCRIPTION/CODE No.	QTY
ユニット			
表示部 DISPLAY UNIT		MU-2310E/-HK 000-083-405-00 ***	1
予備品			
予備品 SPARE PARTS		SPO3-14700 008-549-730-00	1
付属品			
付属品 ACCESSORIES		FP03-09810 008-536-010-00	1
工事材料			
INSTALLATION MATERIALS			
DVIケーブル DVI CABLE		CABLE DIGITAL DVI 5M 999-999-137-00	1 (*1)
ケーブル組品 CABLE ASSEMBLY		00619-001 000-171-765-10	1
図書			
DOCUMENT			
取扱説明書(和/英) OPERATOR'S MANUAL (JP/EN)		OMC-41222-* 000-159-669-1*	1

(*)1)は、タミコードに付き、注文できません。
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TWO TYPES AND CODES MAY BE LISTED FOR AN ITEM. THE LOWER PRODUCT MAY BE SHIPPED IN PLACE OF THE UPPER PRODUCT. QUALITY IS THE SAME.
(略図の寸法は、参考値です。DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

PACKING LIST EC-1000C-21, 28/-HK、EC-1000C-CR-21, 28/-HK

03GR-X-9856-17 1/1

A-4

NAME	OUTLINE	DESCRIPTION/CODE No.	Q' TY
ユニット UNIT			
制御部 PROCESSOR UNIT		EC-1000C-CR-*	1
		000-083-517-00 **	
ECDIS LAN7アダプタ ECDIS LAN ADAPTER		EC-1010/-HK	1
		000-020-054-00 **	
ECDIS B7アダプタ ECDIS B ADAPTER		EC-1020	1
		000-010-107-00	

予備品 SPARE PARTS			
予備品 SPARE PARTS		SP03-14800	1
		000-083-570-00	

付属品 ACCESSORIES			
PS/2分配ケーブル PS/2 KEYBOARD/MOUSE Y CABLE		ASYG-CABLE-FU-PS2	1
		000-173-402-10	
キーボード KEYBOARD		WK7506	1
		000-168-795-10	
マウス MOUSE		KM-731	1
		000-172-978-00	
CD-ROM		2450036-	1
CD-ROM		001-007-880-00	
CD-ROM (06. **)		2450023-	1
CD-ROM		001-008-890-01	

工事材料 INSTALLATION MATERIALS		CP03-29110	
ナナヘ セムズB WASHER HEAD SCREW (B)		MAX8 G2700W MBN12	14
		000-163-200-10	

1.コード番号末尾の[**]は、選択品の代表コードを表します。
CODE NUMBER ENDING WITH "**" INDICATES THE CODE NUMBER OF REPRESENTATIVE MATERIAL
2.(*)印は、ダミーコードに付き、注文できません。
(*)1 THIS CODE CANNOT BE ORDERED.

(略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

NAME	OUTLINE	DESCRIPTION/CODE No.	Q' TY
センカコウセン WIRE ASSEMBLY		KPVV-SB0.3-2PL2000A	1
		000-152-257-11	
取付板 MOUNTING PLATE		14-058-2081-2	2
		100-321-352-10	

工事材料 INSTALLATION MATERIALS			
電源ケーブル POWER CABLE		K15031H51836R	1
		000-164-988-00	

図書 DOCUMENT			
取扱説明書(英) OPERATOR'S MANUAL (EN)		OME-41224-*	1
		000-174-436-1*	
装備要領書(英) INSTALLATION MANUAL (EN)		IME-41220-*	1
		000-149-775-1*	
取扱説明書(英) OPERATOR'S MANUAL (EN)		OME-41220-*	1
		000-174-708-1*	
操作要領書(英) OPERATOR'S GUIDE (EN)		OSE-41220-*	1
		000-149-767-1*	
ドングルインフォメーションシート DONGLE INFORMATION SHEET			1
		999-999-085-0*	(*)1

型式/コード番号が2段の場合、下段より上段に代わる過渡期品であり、どちらが入っています。なお、品質は変わりません。
TWO TYPES AND CODES MAY BE LISTED FOR AN ITEM. THE LOWER PRODUCT MAY BE SHIPPED IN PLACE OF THE UPPER PRODUCT. QUALITY IS THE SAME.

C4122-Z05-N

PACKING LIST EC-1000C-21, 28/-HK、EC-1000C-R-21, 28/-HK

03GR-X-9853-16 1/1

A-3

NAME	OUTLINE	DESCRIPTION/CODE No.	Q' TY
ユニット UNIT			
制御部 PROCESSOR UNIT		EC-1000C-*	1
		000-083-517-00 **	
ECDIS LAN7アダプタ ECDIS LAN ADAPTER		EC-1010/-HK	1
		000-020-054-00 **	

予備品 SPARE PARTS			
予備品 SPARE PARTS		SP03-14800	1
		000-083-570-00	

付属品 ACCESSORIES			
PS/2分配ケーブル PS/2 KEYBOARD/MOUSE Y CABLE		ASYG-CABLE-FU-PS2	1
		000-173-402-10	
キーボード KEYBOARD		WK7506	1
		000-168-795-10	
マウス MOUSE		KM-731	1
		000-172-978-00	
CD-ROM		2450036-	1
CD-ROM		001-007-880-00	
CD-ROM (06. **)		2450023-	1
CD-ROM		001-008-890-01	

工事材料 INSTALLATION MATERIALS		CP03-29100	
ナナヘ セムズB WASHER HEAD SCREW (B)		MAX8 G2700W MBN12	14
		000-163-200-10	
取付板 MOUNTING PLATE		14-058-2081-2	2
		100-321-352-10	

1.コード番号末尾の[**]は、選択品の代表型式/コードを表します。
CODE NUMBER ENDING WITH "**" INDICATES THE CODE NUMBER OF REPRESENTATIVE MATERIAL
2.(*)印は、ダミーコードに付き、注文できません。
(*)1 THIS CODE CANNOT BE ORDERED.

(略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

NAME	OUTLINE	DESCRIPTION/CODE No.	Q' TY
工事材料 INSTALLATION MATERIALS			
電源ケーブル POWER CABLE		K15031H51836R	1
		000-164-988-00	

図書 DOCUMENT			
取扱説明書(英) OPERATOR'S MANUAL (EN)		OME-41224-*	1
		000-174-436-1*	
取扱説明書(英) OPERATOR'S MANUAL (EN)		OME-41220-*	1
		000-174-708-1*	
操作要領書(英) OPERATOR'S GUIDE (EN)		OSE-41220-*	1
		000-149-767-1*	
装備要領書(英) INSTALLATION MANUAL (EN)		IME-41220-*	1
		000-149-775-1*	
ドングルインフォメーションシート DONGLE INFORMATION SHEET			1
		999-999-085-0*	(*)1

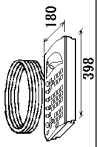


型式/コード番号が2段の場合、下段より上段に代わる過渡期品であり、どちらが入っています。なお、品質は変わりません。
TWO TYPES AND CODES MAY BE LISTED FOR AN ITEM. THE LOWER PRODUCT MAY BE SHIPPED IN PLACE OF THE UPPER PRODUCT. QUALITY IS THE SAME.

C4122-Z04-M

PACKING LIST
RCU-018-E/-HK、RCU-018-A-E/-HK、RCU-018-N-E/-HK

03GR-X-9854 -2 1/1

A-5

NAME	OUTLINE	DESCRIPTION/CODE No.	QTY
ユニット			
操作部 CONTROL UNIT		RCU-018-E/A/N 000-082-662-00 ***	1
付属品			
付属品 ACCESSORIES		FPO3-09850 008-535-610-00	1
工事材料			
工事材料 INSTALLATION MATERIALS		CP03-25604 008-539-850-00	1

ユニット番号末尾の[**]は、選択品の代表コードを表します。
CODE NUMBER ENDING WITH "**" INDICATES THE CODE NUMBER OF REPRESENTATIVE MATERIAL.

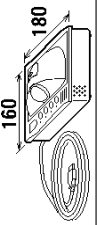


型式コード番号が2段の場合、下段より上段に代わる過渡期品であり、どちらが入っています。なお、品質は変わりません。
TWO TYPES AND CODES MAY BE LISTED FOR AN ITEM. THE LOWER PRODUCT MAY BE SHIPPED IN PLACE OF THE UPPER PRODUCT. QUALITY IS THE SAME.
(略図の寸法は、参考値です。DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

C4122-Z01-C

PACKING LIST
RCU-015FEA-E/-HK

03GR-X-9855 -1 1/1

A-6

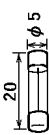
NAME	OUTLINE	DESCRIPTION/CODE No.	QTY
ユニット			
操作部 CONTROL UNIT		RCU-015FEA-E/-HK 000-082-663-00 ***	1
付属品			
付属品 ACCESSORIES		FPO3-09860 008-535-690-00	1
工事材料			
工事材料 INSTALLATION MATERIALS		CP03-25604 008-539-850-00	1

ユニット番号末尾の[**]は、選択品の代表コードを表します。
CODE NUMBER ENDING WITH "**" INDICATES THE CODE NUMBER OF REPRESENTATIVE MATERIAL.

型式コード番号が2段の場合、下段より上段に代わる過渡期品であり、どちらが入っています。なお、品質は変わりません。
TWO TYPES AND CODES MAY BE LISTED FOR AN ITEM. THE LOWER PRODUCT MAY BE SHIPPED IN PLACE OF THE UPPER PRODUCT. QUALITY IS THE SAME.
(略図の寸法は、参考値です。DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)


C4122-Z02-B

CODE NO. 000-083-570
 TYPE SPO3-14800
 BOX NO. P
 03GR-X-9301-2 1/1

SHIP NO.	SPARE PARTS LIST FOR				U S E		REMARKS/CODE NO.	
	ITEM NO.	NAME OF PART	OUTLINE	DWG. NO. OR TYPE NO.	QUANTITY WORKING PER SET	QUANTITY SPARE	REMARKS/CODE NO.	
	1	Ca-X FUSE		FGMB 250V 5A PBF	4	4	000-157-570	
MFR'S NAME	FURUNO ELECTRIC CO., LTD.	DWG NO.	C4122-P01-C	1/1				

(船図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

CODE NO. 008-549-730
 TYPE SPO3-14700
 BOX NO. P
 03GR-X-9302-3 1/1


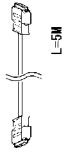
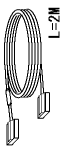
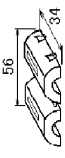
SHIP NO.	SPARE PARTS LIST FOR				U S E		REMARKS/CODE NO.	
	ITEM NO.	NAME OF PART	OUTLINE	DWG. NO. OR TYPE NO.	QUANTITY WORKING PER SET	QUANTITY SPARE	REMARKS/CODE NO.	
	1	Ca-X FUSE		FGMB 250V 2A PBF FGMB 2A 250V	4	4	000-157-497-10 000-122-000-00	
MFR'S NAME	FURUNO ELECTRIC CO., LTD.	DWG NO.	C4122-P02-D	1/1				

(船図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)
 型式/Ca-X'番号が2段の場合、下段より上段に代わる連絡部品であり、どちらかが入っています。 なお、品質は変わりません。
 TWO TYPES AND CODES MAY BE LISTED FOR AN ITEM. THE LOWER PRODUCT MAY BE SHIPPED IN PLACE OF THE UPPER PRODUCT. QUALITY IS THE SAME.

CODE NO.	000-083-501-00	036R-X-9405-5	1/1
TYPE	CP03-29500		

工事材料表

INSTALLATION MATERIALS

番号 NO.	名称 NAME	略図 OUTLINE	型名/規格 DESCRIPTIONS	数量 Q'TY	用途/備考 REMARKS
1	コネクタ組品 CONNECTOR ASSY.		DSUB9P3-A CODE NO. 000-150-677-11	1	
2	コネクタ組品 CONNECTOR ASSY.		DSUB9P-DSUB9P-L5.0M CODE NO. 000-150-675-11	1	
3	ケーブル組品LAN LAN CABLE ASSEMBLY		MOD-Z072-020+ CODE NO. 000-167-175-10	1	
4	EMIシールド EMI CORE		RFC-10 CODE NO. 000-141-085-10	1	

型式/コード番号が2段の場合、下段より上段に代わる通線部品であり、どちらが入っています。なお、品質は変わりません。
TWO TYPES AND CODES MAY BE LISTED FOR AN ITEM. THE LOWER PRODUCT MAY BE SHIPPED IN PLACE OF THE UPPER PRODUCT.
QUALITY IS THE SAME.
(略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

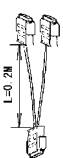

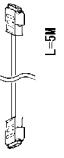


FURUNO ELECTRIC CO., LTD.

C4122-M05-D

CODE NO.	000-083-507-00	036R-X-9406-5	1/1
TYPE	CP03-29600		

工事材料表

INSTALLATION MATERIALS

番号 NO.	名称 NAME	略図 OUTLINE	型名/規格 DESCRIPTIONS	数量 Q'TY	用途/備考 REMARKS
1	コネクタ組品 CONNECTOR ASSY.		DSUB9P3-A CODE NO. 000-150-677-11	1	
2	コネクタ組品 CONNECTOR ASSY.		DSUB9P3-B CODE NO. 000-150-678-11	1	
3	コネクタ組品 CONNECTOR ASSY.		DSUB9P-DSUB9P-L5.0M CODE NO. 000-150-675-11	2	
4	ケーブル組品LAN LAN CABLE ASSEMBLY		MOD-Z072-020+ CODE NO. 000-167-175-10	1	
5	EMIシールド EMI CORE		RFC-10 CODE NO. 000-141-085-10	1	

型式/コード番号が2段の場合、下段より上段に代わる通線部品であり、どちらが入っています。なお、品質は変わりません。
TWO TYPES AND CODES MAY BE LISTED FOR AN ITEM. THE LOWER PRODUCT MAY BE SHIPPED IN PLACE OF THE UPPER PRODUCT.
QUALITY IS THE SAME.
(略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)



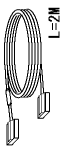
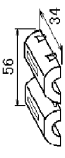
FURUNO ELECTRIC CO., LTD.

C4122-M06-D

CODE NO.	000-083-502-00	036R-X-9408-3	1/1
TYPE	CP03-29510		

工事材料表

INSTALLATION MATERIALS

番号 NO.	名称 NAME	略図 OUTLINE	型名/規格 DESCRIPTIONS	数量 Q'TY	用途/備考 REMARKS
1	コネクタ組品 CONNECTOR ASSY.		DSUB9P3-A CODE NO. 000-150-677-11	1	
2	コネクタ組品 CONNECTOR ASSY.		DSUB9P-DSUB9P-L10.0M CODE NO. 000-150-676-11	1	
3	ケーブル組品LAN LAN CABLE ASSEMBLY		MOD-Z072-020+ CODE NO. 000-167-175-10	1	
4	EMIシ7 EMI CORE		RFC-10 CODE NO. 000-141-085-10	1	

型式/コード番号が2段の場合、下段より上段に代わる通達部品であり、どちらが入っています。なお、品質は変わりません。
TWO TYPES AND CODES MAY BE LISTED FOR AN ITEM. THE LOWER PRODUCT MAY BE SHIPPED IN PLACE OF THE UPPER PRODUCT.
QUALITY IS THE SAME.
(略図の寸法は、参考値です。参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

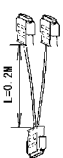

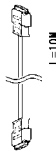
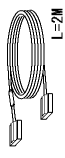

FURUNO ELECTRIC CO., LTD.

C4122-M08-D

CODE NO.	000-083-508-00	036R-X-9409-3	1/1
TYPE	CP03-29610		

工事材料表

INSTALLATION MATERIALS

番号 NO.	名称 NAME	略図 OUTLINE	型名/規格 DESCRIPTIONS	数量 Q'TY	用途/備考 REMARKS
1	コネクタ組品 CONNECTOR ASSY.		DSUB9P3-A CODE NO. 000-150-677-11	1	
2	コネクタ組品 CONNECTOR ASSY.		DSUB9P3-B CODE NO. 000-150-678-11	1	
3	コネクタ組品 CONNECTOR ASSY.		DSUB9P-DSUB9P-L10.0M CODE NO. 000-150-676-11	2	
4	ケーブル組品LAN LAN CABLE ASSEMBLY		MOD-Z072-020+ CODE NO. 000-167-175-10	1	
5	EMIシ7 EMI CORE		RFC-10 CODE NO. 000-141-085-10	1	

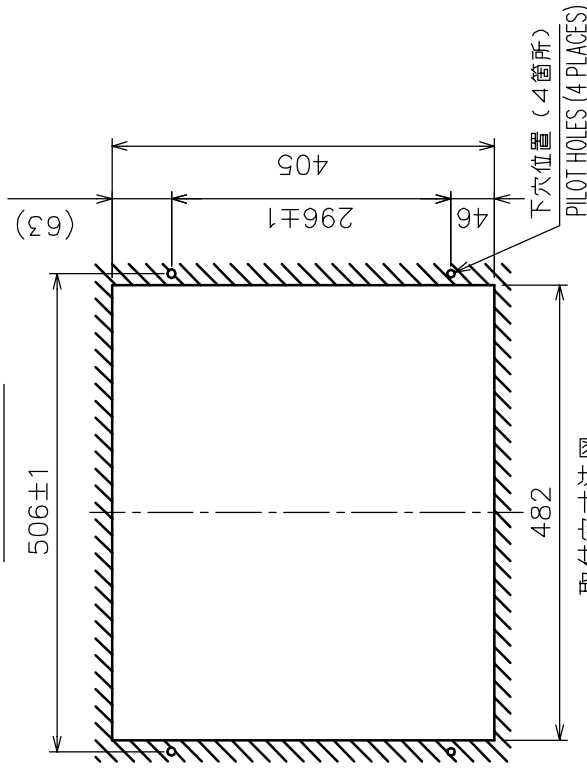
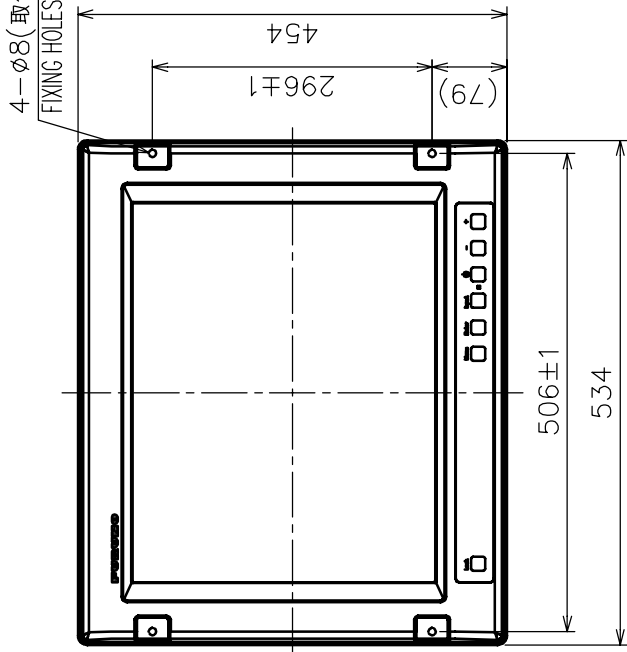
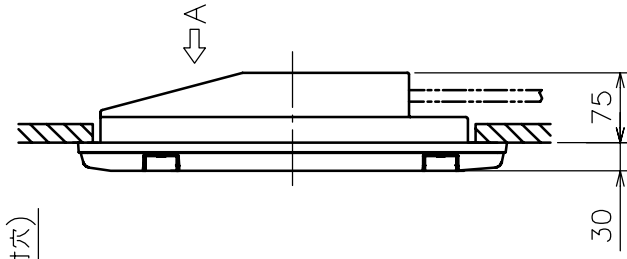
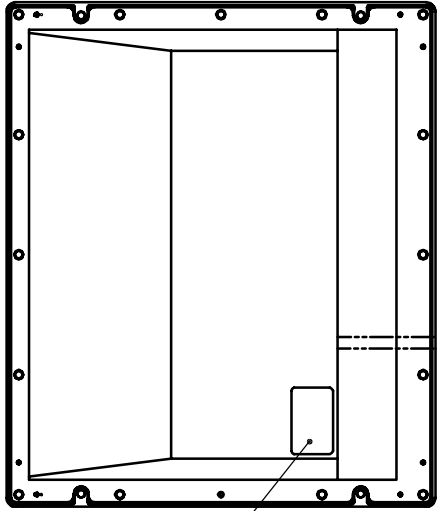
型式/コード番号が2段の場合、下段より上段に代わる通達部品であり、どちらが入っています。なお、品質は変わりません。
TWO TYPES AND CODES MAY BE LISTED FOR AN ITEM. THE LOWER PRODUCT MAY BE SHIPPED IN PLACE OF THE UPPER PRODUCT.
QUALITY IS THE SAME.
(略図の寸法は、参考値です。参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

FURUNO ELECTRIC CO., LTD.

C4122-M09-D

表 1 TABLE 1

寸法区分 (mm) DIMENSIONS	公差 (mm) TOLERANCE
$L \leq 50$	± 1.5
$50 < L \leq 100$	± 2.5
$100 < L \leq 500$	± 3
$500 < L \leq 1000$	± 4



- 注記 1) 指定外の寸法公差は表 1 による。
 2) 取付用ネジはプラスタックピンネジ 6×30 を使用のこと。
- NOTE 1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
 2. USE SELF-TAPPING SCREWS 6x30 FOR FIXING THE UNIT.

DRAWN Jun 17, '05	E. MIYOSHI	TITLE MU-201CE
CHECKED TAKAHASHI, T	FCR-2107 series	名称 表示部 (埋込装置)
APPROVED Y. Hatai	FEA-2107	外寸図
SCALE 1/8	WISS 10 #106 kg	NAME MONITOR UNIT (FLUSH MOUNT)
DWG.No. C4122-G08-B	24-005-200G-0	OUTLINE DRAWING

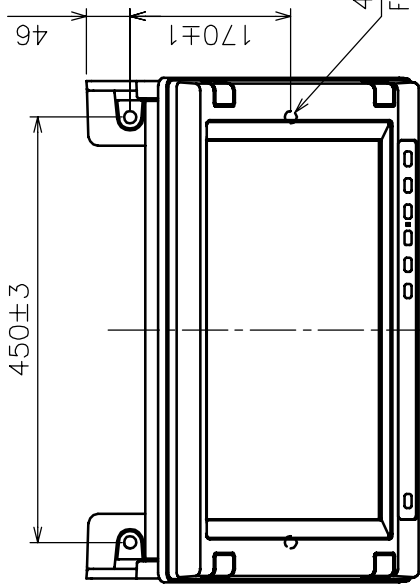
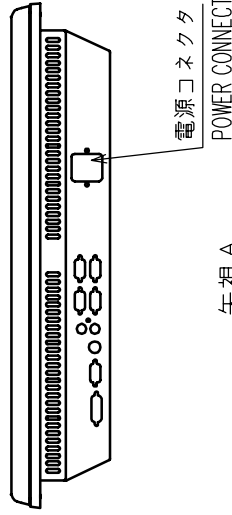
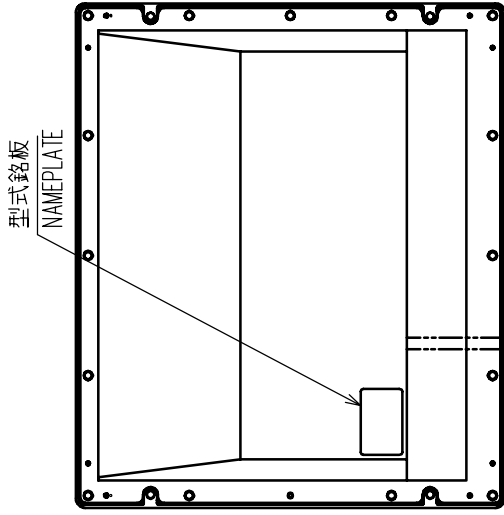
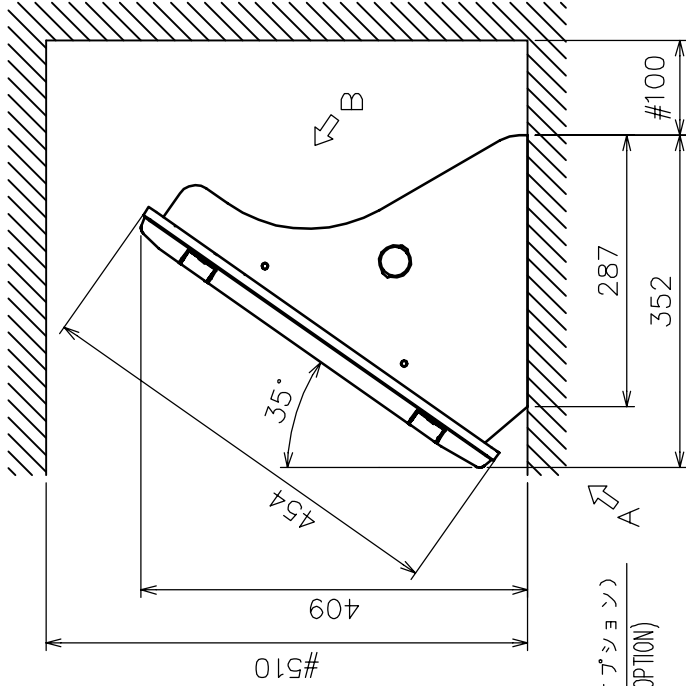
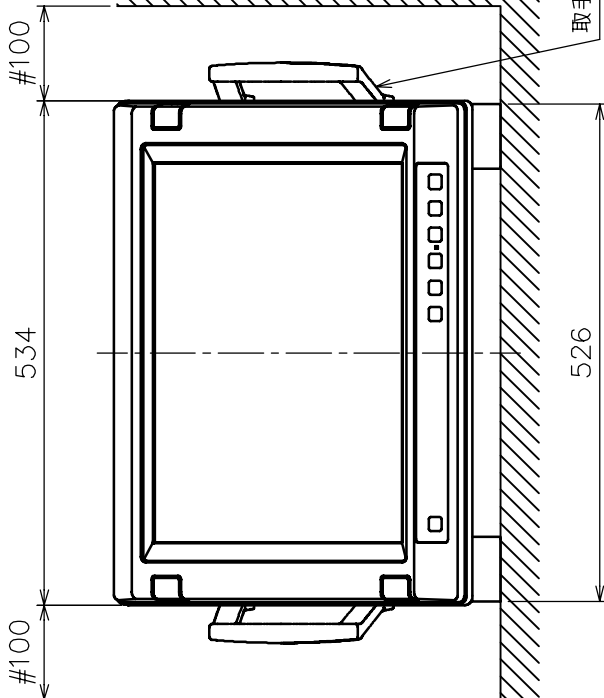


表 1 TABLE 1

寸法区分 (mm) DIMENSIONS	公差 (mm) TOLERANCE
$L \leq 50$	± 1.5
$50 < L \leq 100$	± 2.5
$100 < L \leq 500$	± 3
$500 < L \leq 1000$	± 4



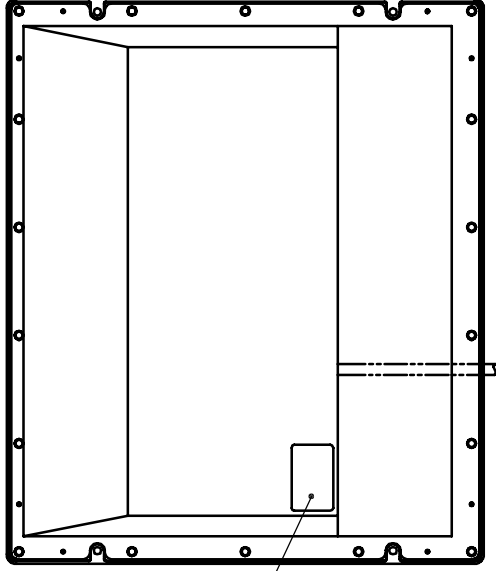
- 注 記 1) #印寸法は最小サービス空間寸法とする。
 2) 指定外の寸法公差は表1による。
 3) 取付用ネジはM10ボルトまたはコーチボルト呼び径9を使用のこと。
- NOTE 1. # MINIMUM SERVICE CLEARANCE.
 2. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
 3. USE M10 BOLTS OR COACH SCREWS $\phi 9$ FOR FIXING THE UNIT.

DRAWN Jun 17, '05	E. MIYOSHI	TITLE MU-201CE
CHECKED TAKAHASHI, T	FCR-2107 series	名称 表示部 (卓上装備)
APPROVED Y. Hatai	FEA-2107	外寸図
SCALE 1/8	WSS 16 #104 kg	NAME MONITOR UNIT (TABLETOP MOUNT)
DWG.No. C4122-G09-A	24-005-220G-0	OUTLINE DRAWING

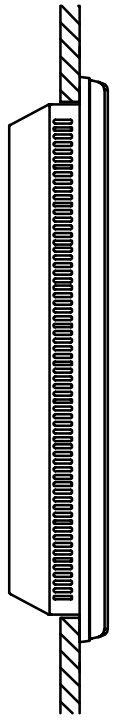
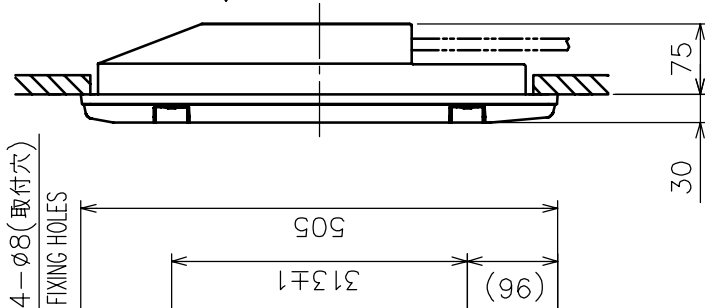
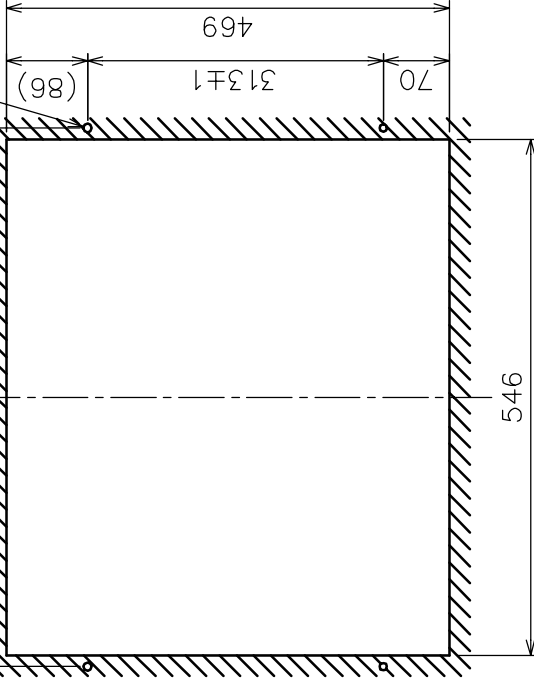
表 1 TABLE 1

寸法区分 (mm) DIMENSIONS	公差 (mm) TOLERANCE
L ≤ 50	±1.5
50 < L ≤ 100	±2.5
100 < L ≤ 500	±3
500 < L ≤ 1000	±4

矢視 A
VIEW A



下穴位置 (4箇所)
PILOT HOLES (4 PLACES)

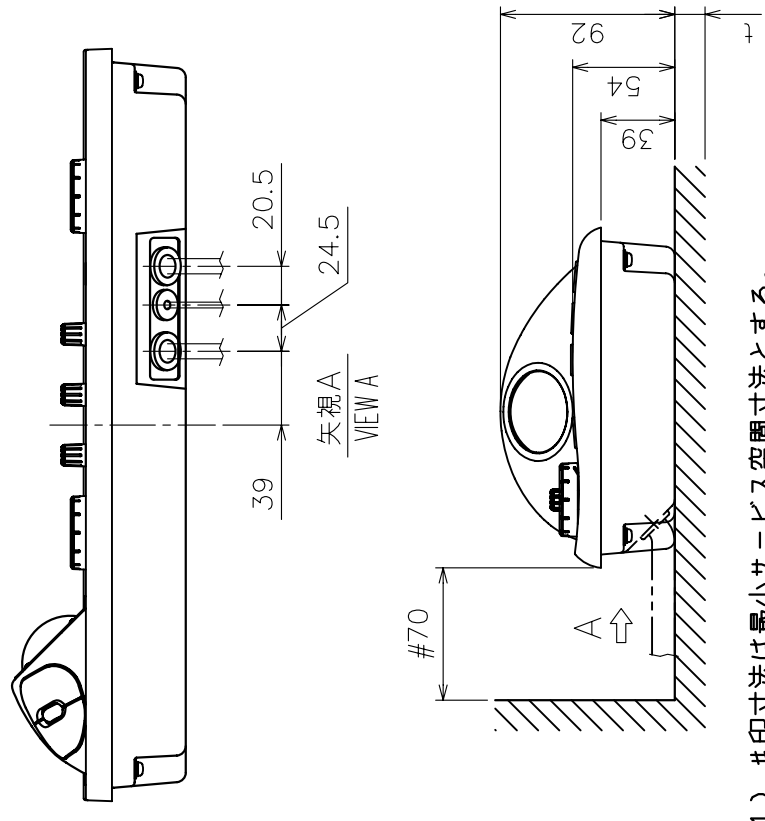


- 注記 1) 指定外の寸法公差は表 1 による。
2) 取付用ネジはプラスタッピングネジ 6×30 を使用のこと。
- NOTE 1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
2. USE SELF-TAPPING SCREWS 6x30 FOR FIXING THE UNIT.

DRAWN	Jun 17, '05	E. MIYOSHI	TITLE	MU-231CE
CHECKED		TAKAHASHI, T	名称	表示部 (埋込装備)
APPROVED		Y. Hatai	外寸図	
SCALE	1/8	MASS 15 ±0.04 kg	NAME	MONITOR UNIT (FLUSH MOUNT)
DWG.No.	C4123-G02-B			OUTLINE DRAWING
				24-005-210G-0

表 1 TABLE 1

寸法区分 (mm) DIMENSIONS	公差 (mm) TOLERANCE
L ≤ 50	± 1.5
50 < L ≤ 100	± 2.5
100 < L ≤ 500	± 3



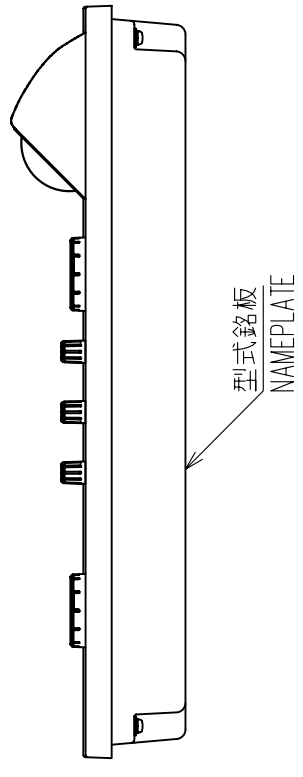
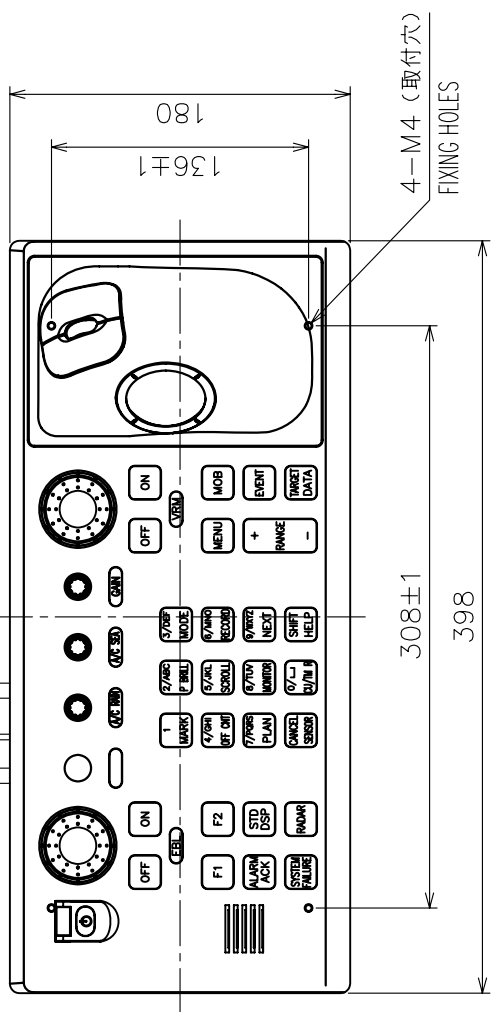
- 注 記 1) # 印寸法は最小サービス空間寸法とする。
 2) 指定外の寸法公差は表 1 による。
 3) 取付にはセムスネジ B (M4x12) を使用のこと。取付板厚 (t) は $2 \leq t \leq 4$ とする。それ以外はネジ長さを $(t + 7.8) \pm 2$ とする。

- NOTE 1. # MINIMUM SERVICE CLEARANCE.
 2. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
 3. USE SEMS-B SCREWS (M4x12) FOR FIXING THE UNIT. THICKNESS (t): $2 \leq t \leq 4$ OR SCREW LENGTH: $t + 7.8 \pm 2$.

制御用ケーブル
CONTROL CABLE

トラックパイロット部用ケーブル (オプション)
TRACKPILOT CABLE (OPTION)

リモート操作部用ケーブル (オプション)
REMOTE CONTROL CABLE (OPTION)



DRAWN	Sep. 29 '06 E. MIYOSHI	TITLE	RCU-018
CHECKED	TAKAHASHI, T	名称	操作部 (卓上装備)
APPROVED	Y. Hotoi	外寸図	
SCALE	1/4	NAME	CONTROL UNIT (TABLETOP MOUNT)
DWG.No.	C4122-G03-B	OUTLINE DRAWING	

取付穴
6-φ8

FIXING HOLES

150±1

150±1

52

440±1

470

型式銘板
NAMEPLATE

#100

404

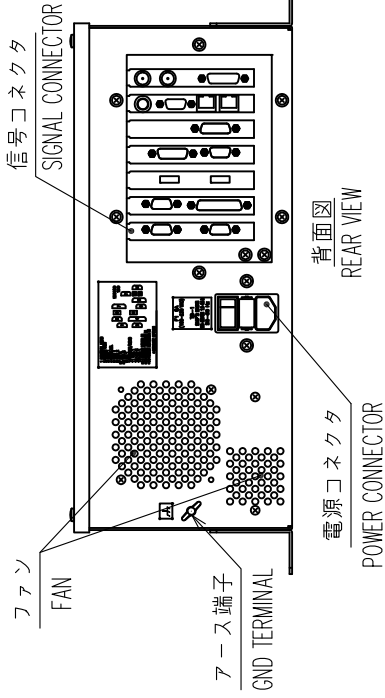
#100

176

173

表1 TABLE 1

寸法区分 (mm) DIMENSION	公差 (mm) TOLERANCE
L ≤ 50	±1.5
50 < L ≤ 100	±2.5
100 < L ≤ 500	±3
500 < L ≤ 1000	±4



#100

531

(122)

409

399

CDドライブ
CD DRIVE

注記

- #1印寸法は最小サービス空間寸法とする。
- 指定外の寸法公差は表1による。
- 取付用ネジはM6ボルトまたはコーチボルト呼び径φ6を使用のこと。
- 装備ケーブアルはサービス時、本体を前方に十分引き出せるよう余裕を持たせること。
- 装備方法は床置きのみとする。

NOTE

- #1 MINIMUM SERVICE CLEARANCE.
- TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
- USE M6 BOLTS OR COARCH SCREWS φ6 FOR FIXING THE UNIT.
- KEEP SUFFICIENT CABLE LENGTH BEHIND THE UNIT FOR MAINTENANCE.
- MOUNTING LOCATION IS FLOOR ONLY.

DRAWN 25/Sep/09 I.YAMASAKI

CHECKED 25/Sep/09 I.TAKENO

APPROVED 26/Oct/09 R.Esumi

SCALE 1/6 MASS 17 kg

DWG.No. C4122-G01-E

REF.No. 24-005-500G-2

TITLE EC-1000C

名称 制御部 (床置装備)

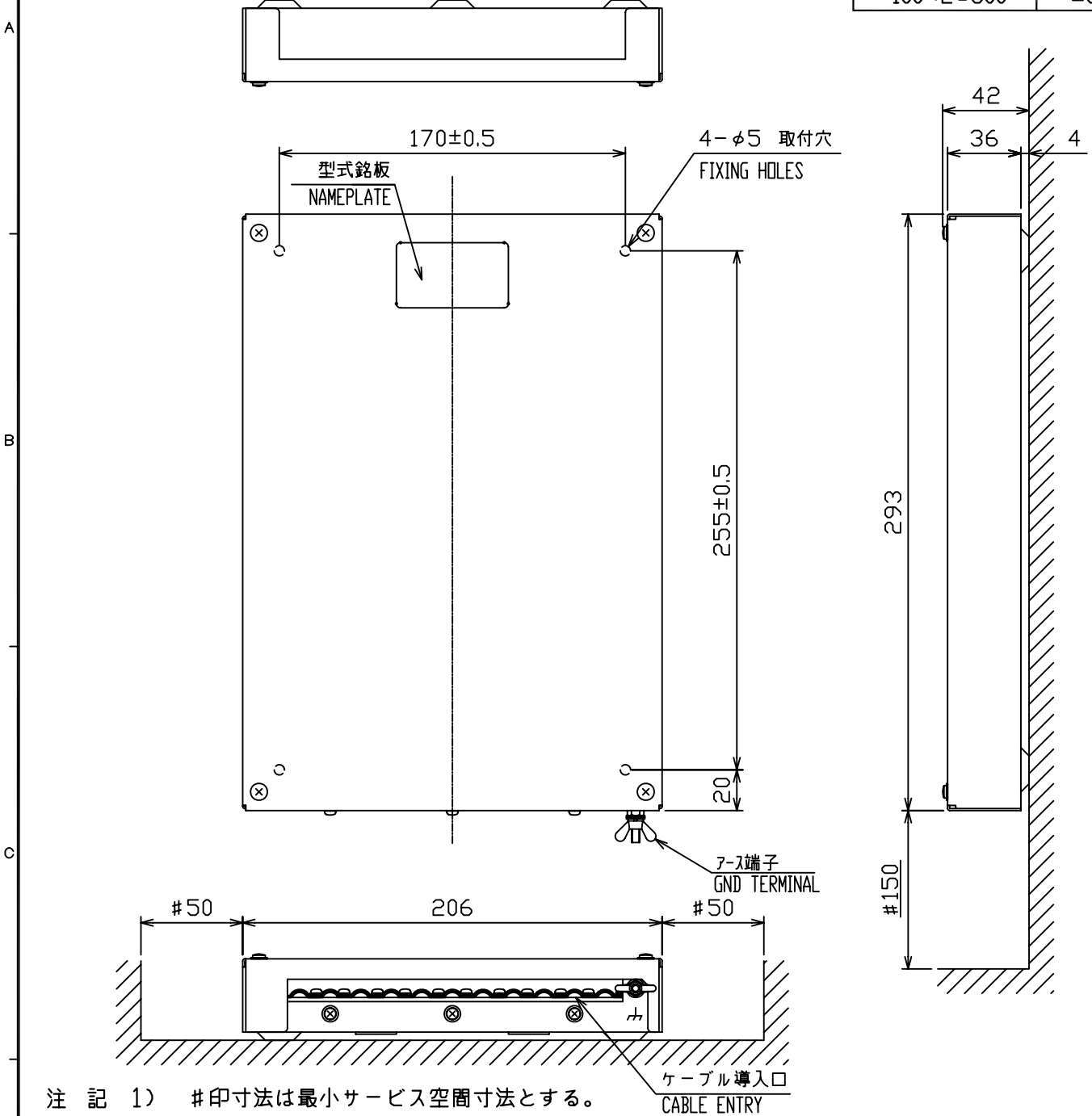
外寸図

NAME PROCESSOR UNIT (FLOOR MOUNT)

OUTLINE DRAWING

表1 TABLE 1

寸法区分 (mm) DIMENSION	公差 (mm) TOLERANCE
$L \leq 50$	± 1.5
$50 < L \leq 100$	± 2.5
$100 < L \leq 500$	± 3



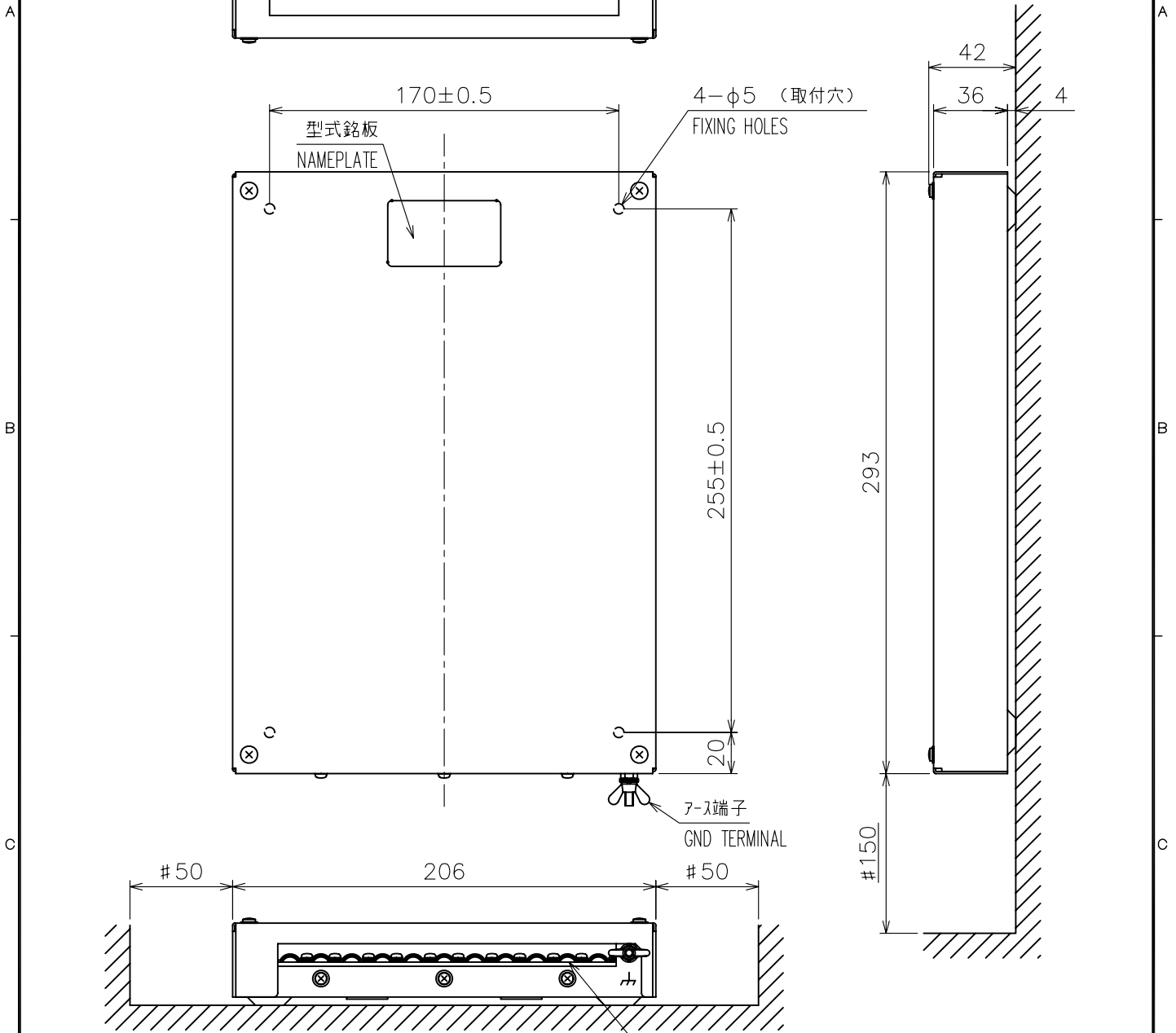
- 注記 1) #印寸法は最小サービス空間寸法とする。
 2) 指定外の寸法公差は表1による。
 3) 取付用ネジはトラスタップネジ呼び径4×20を使用のこと。

- NOTE 1. # MINIMUM SERVICE CLEARANCE.
 2. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
 3. USE SELF-TAPPING SCREWS $\phi 4 \times 20$ FOR FIXING THE UNIT.

DRAWN Mar. 26 '07 T.YAMASAKI	TITLE EC-1010
CHECKED Mar. 26 '07 T.TAKENO	名称 ECDIS LANアダプタ
APPROVED Mar. 28 '07 R.Esumi	外寸図
SCALE 1/3	NAME ECDIS LAN ADAPTER
MASS 1.8 ±10% kg	
DWG No. C4122-G02-C	REF. No. 24-005-300G-2
	OUTLINE DRAWING

表1 TABLE 1

寸法区分 (mm) DIMENSION	公差 (mm) TOLERANCE
$L \leq 50$	± 1.5
$50 < L \leq 100$	± 2.5
$100 < L \leq 500$	± 3



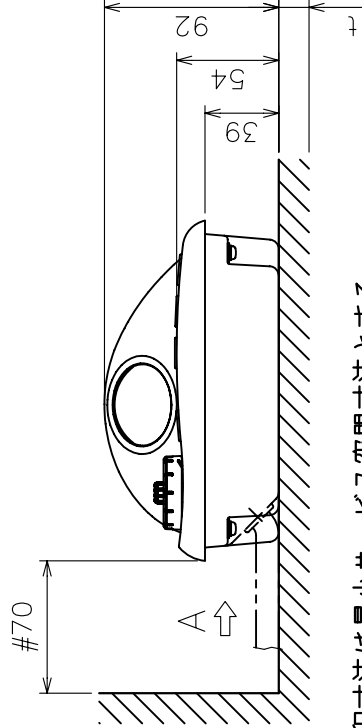
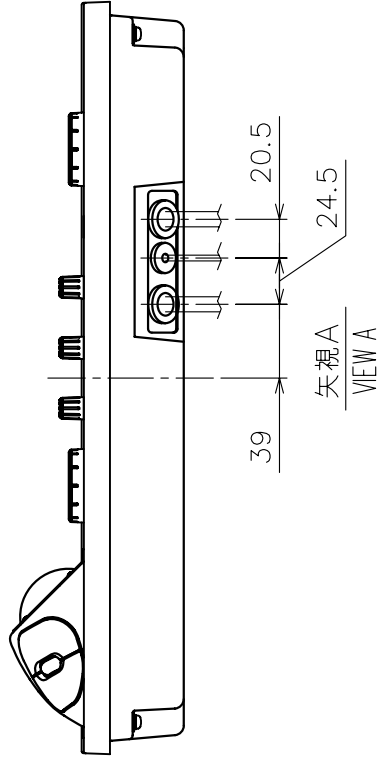
- 注記 1) #印寸法は最小サービス空間寸法とする。
 2) 指定外の寸法公差は表1による。
 3) 取付用ネジはトラスタツピンネジ呼び径4×20を使用のこと。

- NOTE 1. #: MINIMUM SERVICE CLEARANCE.
 2. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
 3. USE SELF-TAPPING SCREWS $\phi 4 \times 20$ FOR FIXING THE UNIT.

DRAWN Mar. 26 '07 T.YAMASAKI	TITLE EC-1020
CHECKED Mar. 26 '07 T.TAKENO	名称 ECDIS Bアダプタ
APPROVED Mar. 28 '07 R.Esumi	外寸図
SCALE 1/3 MASS 1.9 ±10% kg	NAME ECDIS B-ADAPTER
DWG.No. C4120-G06-C	REF.No. 24-005-310G-2
OUTLINE DRAWING	

表 1 TABLE 1

寸法区分 (mm) DIMENSIONS	公差 (mm) TOLERANCE
L ≤ 50	± 1.5
50 < L ≤ 100	± 2.5
100 < L ≤ 500	± 3



- 注 記 1) #印寸法は最小サービス空間寸法とする。
 2) 指定外の寸法公差は表 1 による。
 3) 取付にはセムスネジB (M4x12) を使用のこと。取付板厚 (t) は $2 \leq t \leq 4$ とする。それ以外はネジ長さを $(t + 7.8) \pm 2$ とする。

NOTE 1. # MINIMUM SERVICE CLEARANCE.

2. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.

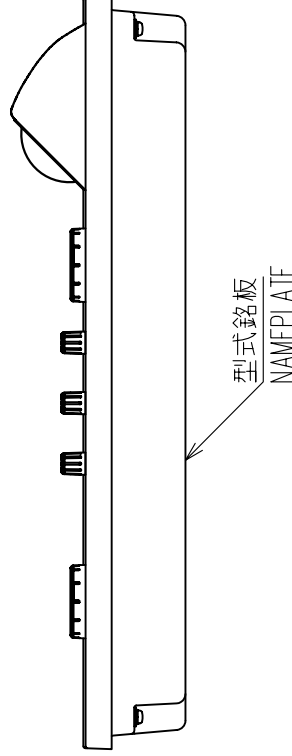
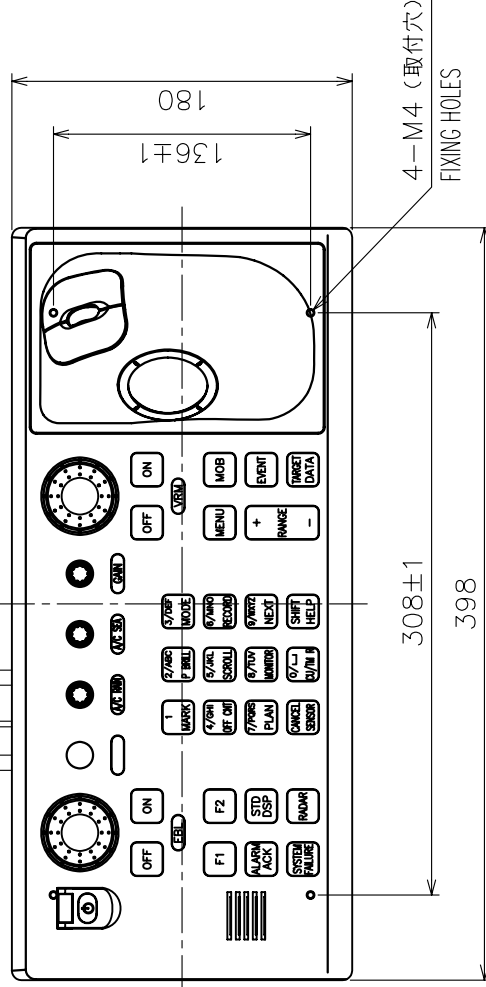
3. USE SEMS-B SCREWS (M4x12) FOR FIXING THE UNIT. THICKNESS (t): $2 \leq t \leq 4$ OR SCREW LENGTH: $t + 7.8 \pm 2$.

1 2 3 4 5

制御用ケーブル
CONTROL CABLE

トラックパイロット部用ケーブル (オプション)
TRACKPILOT CABLE (OPTION)

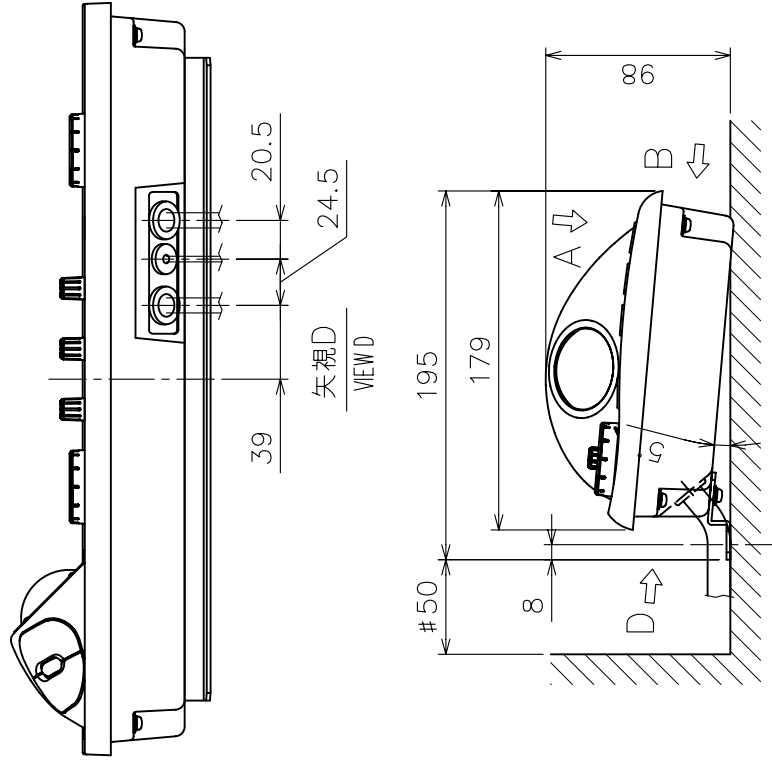
リモート操作部用ケーブル (オプション)
REMOTE CONTROL CABLE (OPTION)



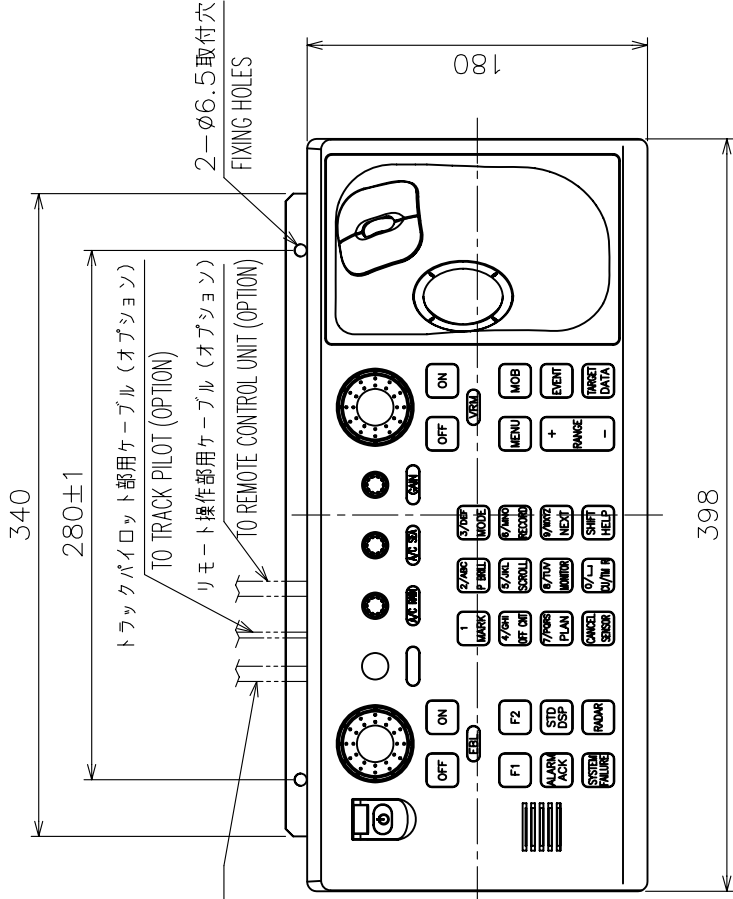
DRAWN	titles	RCU-018
Sep. '06 E. MIYOSHI	名称	操作部 (卓上装備)
TAKAHASHI, T	外寸図	
Y. Hotoi	NAME	CONTROL UNIT (TABLETOP MOUNT)
1/4 MASS 3.7	質量はケーブル (10m) を含む	
C4122-G03-B	24-005-750G-1	OUTLINE DRAWING

表 1 TABLE 1

寸法区分 (m.m) DIMENSIONS	公差 (m.m) TOLERANCE
L ≤ 50	± 1.5
50 < L ≤ 100	± 2.5
100 < L ≤ 500	± 3



制御部ケーブル
TO PROCESSOR UNIT



398
矢視A
VIEW A

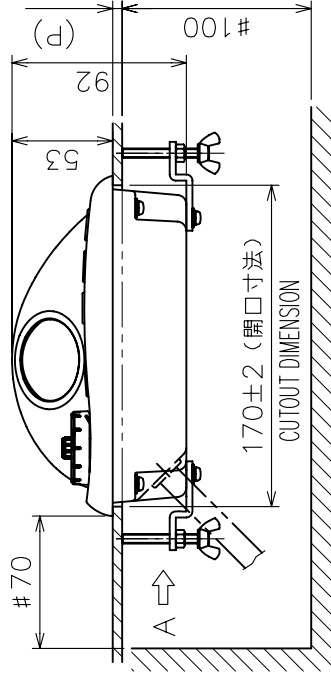
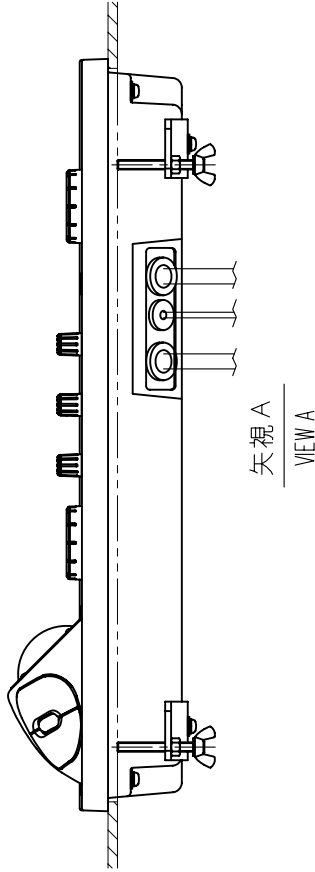
矢視B
VIEW B

- 注記 1) #印寸法は最小サービス空間寸法とする。
 2) 指定外の寸法公差は表1による。
 3) 取付用ネジはトラスタップピンネジ呼び径6、またはM6ボルトを使用のこと。
- NOTE 1. # MINIMUM SERVICE CLEARANCE.
 2. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
 3. USE SELF-TAPPING SCREWS #6 OR M6 BOLTS FOR FIXING THE UNIT.

DRAWN Sep. 29, '06	E. MIYOSHI	TITLE RCU-018
CHECKED	TAKAHASHI, T	名称 操作部 (取付金具装備)
APPROVED	Y. Hatohi	外寸図
SCALE 1/4	FEA-2107 質量ケーブル (10m) を含む 質量 4.0 kg MASS W/ 10m CABLE	NAME CONTROL UNIT (TABLETOP MOUNT W/ FIXTURE)
DWG No.	C4122-G05-B	OUTLINE DRAWING
	24-005-752G-1	

表 1 TABLE 1

寸法区分 (mm) DIMENSIONS	公差 (mm) TOLERANCE
L ≤ 50	± 1.5
50 < L ≤ 100	± 2.5
100 < L ≤ 500	± 3

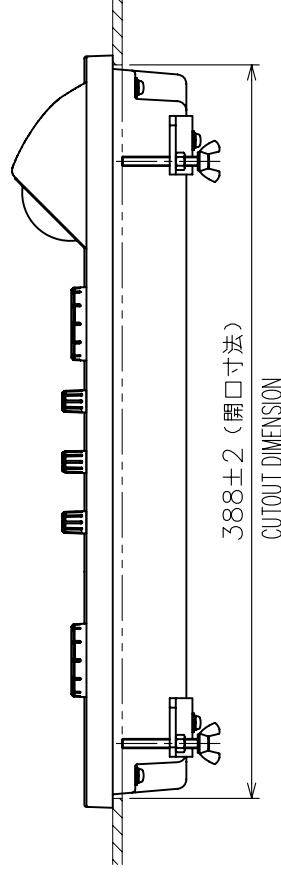
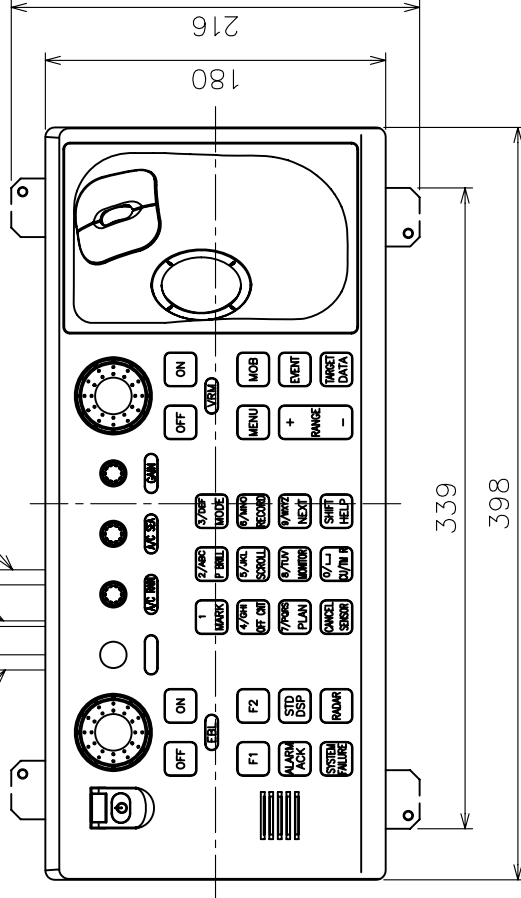


制御部ケーブル
TO PROCESSOR UNIT

トラックパイロット部ケーブル (オプション)
TO TRACK PILOT (OPTION)

リモート操作部ケーブル (オプション)
TO REMOTE CONTROL UNIT (OPTION)

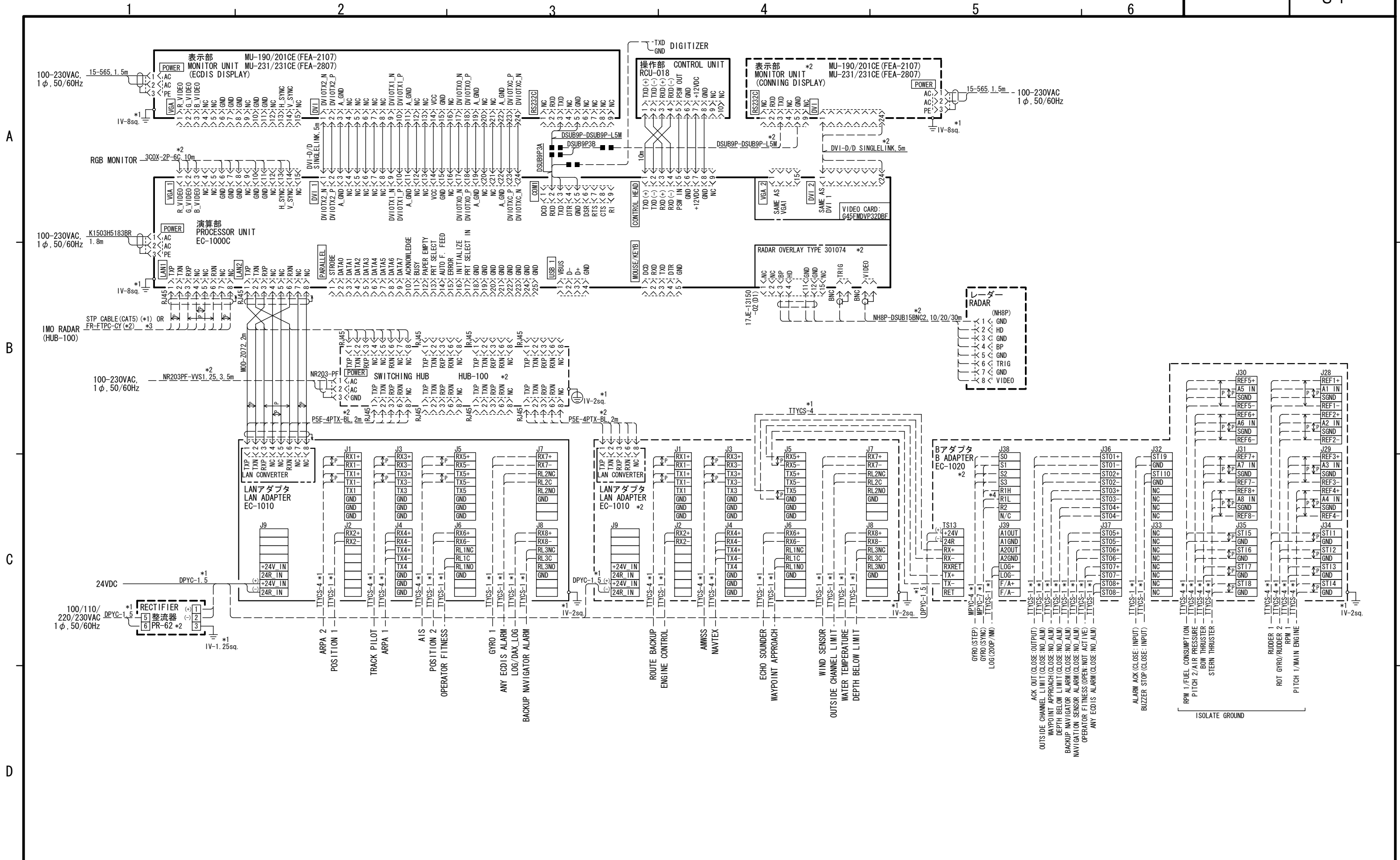
TO TRACK PILOT (OPTION)



- 注 記 1) #印寸法は最小サービス空間寸法とする。
2) 指定外の寸法公差は表1による。
3) 壁の厚さ(P)は最大20とする

- NOTE 1. #: MINIMUM SERVICE CLEARANCE.
2. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
3. THICKNESS (P) IS 20 MM MAX.

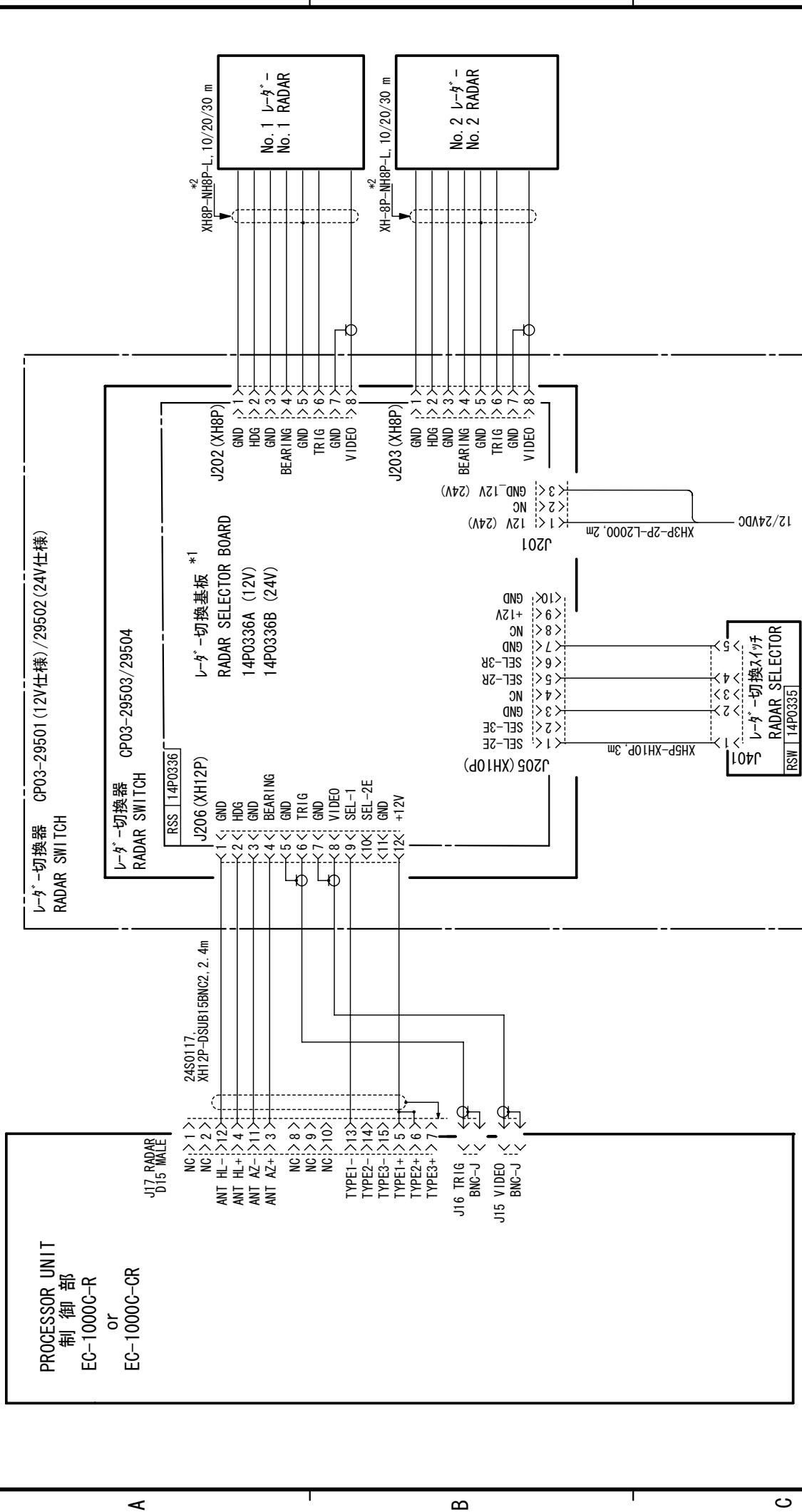
DRAWN Sep. 29, '06 E. MIYOSHI	TITLE RCU-018
CHECKED TAKAHASHI, T	名称 操作部 (埋込装備)
APPROVED Y. Hatai	外寸図
SCALE 1/4 MASS 3.8 #104質量ケーブル (10m) を含む kg MASS W/ 10m CABLE	NAME CONTROL UNIT (FLASH MOUNT)
DWG.No. C4122-G07-B	OUTLINE DRAWING 24-005-751G-1



注記
 * 1) 造船所手配。
 * 2) オプション。
 * 3) LAN1ポートを他のECDIS/レーダーのLANポートと直接つなぐ場合は、クロスケーブルを使用すること。
 * 4) ロータ電圧により切替。R1H:90-135V、R1L:90V以下。

NOTE
 *1: SHIPYARD SUPPLY.
 *2: OPTION.
 *3: USE A CROSS LAN CABLE WHEN LAN1 PORT IS CONNECTED TO ANOTHER ECDIS/RADAR LAN PORT DIRECTLY.
 *4: CONNECT ACCORDING TO ROTOR VOLTAGE; R1H:90-135V、R1L: WITHIN 90V.

DRAWN	27/Apr/2011 T. YAMASAKI	TITLE	FEA-2107/2807
CHECKED	27/Apr/2011 H. MAKI	名称	電子海図情報表示装置
APPROVED	1/May/2011 Y. NISHIYAMA		相互結線図
SCALE	MASS	NAME	ECDIS
DWG. No.	C4122-C01-N	REF. No.	24-005-6001-3
		INTERCONNECTION DIAGRAM	



DRAWN MAR. 28. '05 E. MIYOSHI	TITLE FEA-2107/2807 (CP03-29501/29502)
CHECKED TAKAHASHI, T	名称 レーダー切換器
APPROVED Y. Hatai	相互結線図
DWG. No. C4122-003-B	NAME RADAR SWITCH
	INTERCONNECTION DIAGRAM

NOTE
 *1) 12/24V仕様を選択。
 *2) オプション。