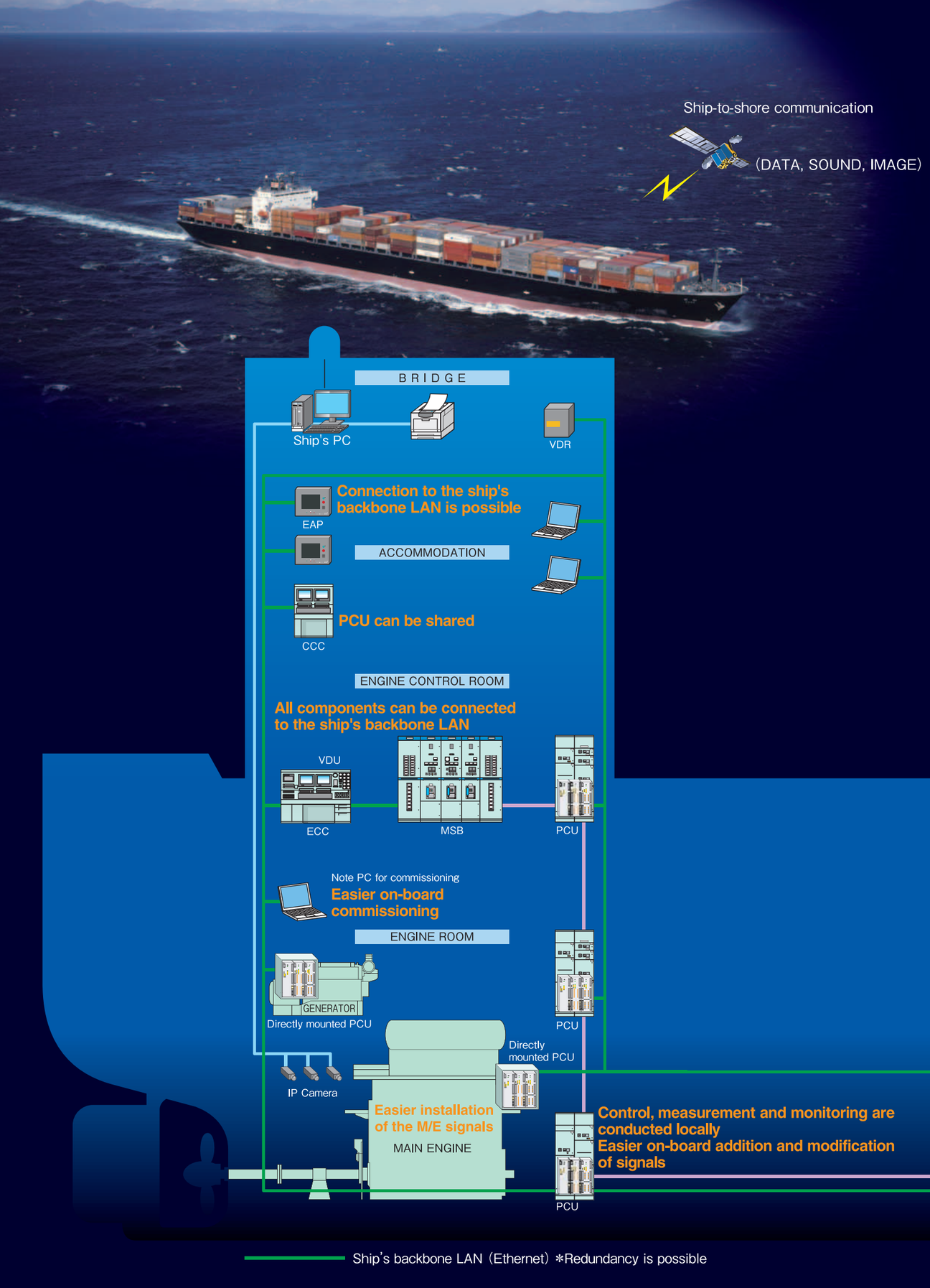
TERASAKI

Next Generation Control & Monitoring System

TERANET 50X

TERASAKI ELECTRIC CO., LTD.

Catalog L4313-E



TERANET 50X provides three solutions

High quality, high reliability, and reduced installation cost and time

Distributed integration system TERANET 50X

The TERANET 50X system can integrate functions such as engine monitoring and control, generator control, and power management, as well as cargo monitoring and control, and ballast control. Monitoring and control are conducted locally, based on I/O signals that are common throughout the system. The data is also sent to a human-machine interface (HMI) for display, and this distributed system allows for on-site control according to operating instructions from the HMI.

Simple system configuration

The basic TERANET 50X system consists of process control units (PCUs), an Ethernet and video display units (VDUs). Wiring for discrete signal lines is not required since the connection with the extension alarm system or any other third-party system is made via an Ethernet for a simplified system configuration.

High reliability

This is a distributed system in which PCUs have sophisticated processing functions. This makes it possible to eliminate the server function that is prone to cause a processing or reliability bottleneck. In addition, high reliability of the system is achieved by redundant PCUs, Ethernet systems, and other items that require high reliability.

Easier installation by directly mounted PCU

Local I/O signals are not only wired into PCUs installed on various panels but also directly into the mounted PCUs that can be installed on the main engine and auxiliary engine. This simplifies installation and inspection work, and helps reduce the cost and time required for the work.

Platform function available for diagnosis of the engine system

TERANET 50X uses an open source software platform, which allows direct installation of any engine diagnosis system (software) provided by manufacturers of main engine and auxiliary engine. Moreover, adapting TERANET 50X for ship-to-shore communication specifications enables remote diagnosis from an onshore.

TERANET 50X

Superb local system PCU

■ Multifunctional PCU with a high-speed sampling feature

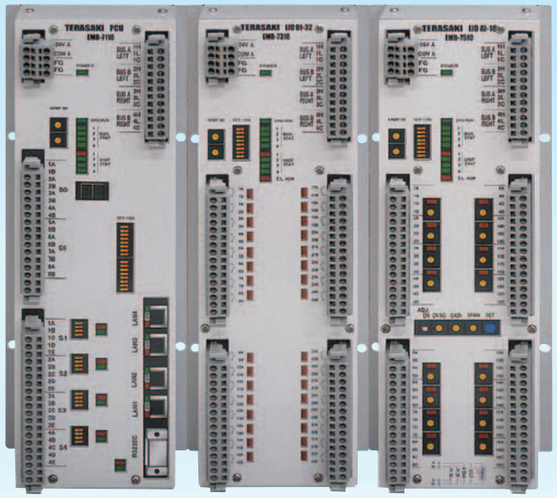
The PCU is an intelligent component that can be used for data measurement and alarm monitoring, as well as for sequence and PID control. I/O interfaces within the PCU contain DI/DO units and AI/AO units for digital and analog I/O.
The PCU performs high-speed sampling at 20 ms per measurement point, and thus timestamps at 20 ms intervals can be set to event and measurement data. This is helpful especially when detailed time series data is required for analysis such as when presumption of the primary cause of a fault.

■ Reduction of installation cost and time

The TERANET 50X system is composed of PCUs distributed throughout the ship and linked by the ship's backbone LAN (Ethernet).
Installation work can be made easier by increasing or optimizing the locations where PCUs are installed.

In addition to easy addition, modification and commissioning of system functions, on-board system configuration is possible

The types and ranges of analog I/O signals for I/O units can be modified by setting the switches of the units so that signal specifications are easily modifiable on-board. In addition, system configuration does not require proprietary devices. For example, on-board adjustment and inspection is possible by using a VDU of TERANET 50X or a laptop computer, and PCU self-configuration functions minimize configuration information that is entered externally. These features make on-board commissioning operations easier, including increasing, decreasing and modifying measurement points.



PCU DI AI

■ PCU Specification

Power Supply Voltage	24V DC -25% to +30% (18 – 31.2V)
Power Consumption	8W typ.
Operating Temperature	-10°C to +70°C
Relative Humidity	96% non-condensing
Mounting	Screws
Network	2 LAN ports ×2 (10/100 Base-T Ethernet)
I/O	1 RS-232C port, 4 RS-485 ports, and 6 DIO ports
Selftest	Power on selftest, Watch dog timer, Low voltage detection

■ DI・DO Specification

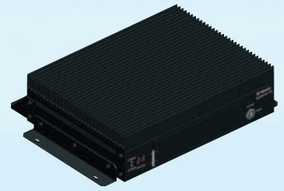
	D I	D O
Power Supply Voltage	24V DC -25% to +30% (18 – 31.2V)	24V DC -25% to +30% (18 – 31.2V)
Power Consumption	6W typ.	12W typ.
Operating Temperature	-10°C to +70°C	-10°C to +70°C
Relative Humidity	96% Non-condensing	96% Non-condensing
Mounting	Screws	Screws
Signal Type	32 Dry contacts	24 Relay outputs (2Amp 250V AC/Resistive load. 1.5Amp 250V AC/Inductive load)
Selftest	Power on selftest, Watch dog timer, Low voltage detection, Earth leakage detection	Power on selftest, Watch dog timer, Low voltage detection, Earth leakage detection

■ AI・AO Specification

	A I	A O
Power Supply Voltage	24V DC -25% to +30% (18 – 31.2V)	24V DC -25% to +30% (18 – 31.2V)
Power Consumption	16W typ.	16W typ.
Operating Temperature	-10°C to +70°C	-10°C to +70°C
Relative Humidity	96% Non-condensing	96% Non-condensing
Mounting	Screws	Screws
Signal Type	16ch The kind of the signal of each channel is selectable based on the following table Current: 4-20mA 2or3-Wire Pt RTD: Pt100Ω 0-200 Pt100Ω 0-800 Voltage: DC -10 - +10V DC 0 – 5V DC 0 - 2V Potentio-meter: 0 - 1KΩ 0 - 2KΩ Contact: Dry contact	8ch The kind of the signal of each channel is selectable based on the following table Current: 4-20mA Voltage: DC 0 – 5V
Selftest	Power on selftest, Watch dog timer, Low voltage detection, Earth leakage detection	Power on selftest, Watch dog timer, Low voltage detection, Earth leakage detection

Highly reliable VDU

Computer systems used for ships require high reliability and should be maintenance-free.
The computer system used for TERANET 50X has achieved three "-lesses": fan-less, HDD-less, and battery-less.
These three "-lesses" provide highly reliable and maintenance-free operation.



■ VDU (Marine computer) Specification

Power Supply Voltage	24V DC -25% to +30% (18 – 31.2V)
Power Consumption	35W Max (without USB Device)
Operating Temperature	0°C to +55°C
Relative Humidity	96% Non-condensing
Weight	6.1kg
Mounting	Screws
CPU	Intel Core2Duo Processor (1.06GHz).
Memory	3.5GB DDR2 RAM
Network	2 LAN ports (10/100/1000 Base-T Ethernet).
External Storage	Solid state disk, 8GB SATA
I/O	2 RS-232C ports, 1 DVI-D, 1 VGA 3 AUDIO ports (MIC IN, LINE IN, and LINE OUT), 1 CF CARD I/F, 6 USB 2.0 ports, 2 D/Is, 4 D/Os, 3 RAS outputs
Resolution	UXGA (1600×1200), Actual colour
RAS	Monitoring of CPU temperature, Voltage monitoring, Watch dog timer, SSD monitoring (S.M.A.R.T)
OS	Windows Embedded standard 7

Extension alarm system directly connectable to the ship's backbone LAN

The extension alarm system contained in TERANET 50X can be connected directly to the backbone LAN of the ship.
The extension alarm system does not process alarms based on results generated by the central system, but rather directly based on data sampled by the PCU.
This independence of the extension alarm system means that the alarm processing function does not depend on other systems, thus it can improve the reliability of the system. In addition, direct connectability to the backbone LAN enables a system configuration that uses LAN cables installed throughout the ship, which eliminates the need to install lines specifically for the alarm system.

■ EAP (Extention Alarm Panel) Specification

Type		Ethernet type	RS-485 type
LCD	Size	7 inch wide	
	Panel	Colour TFT (Thin Film Transistor) active matrix with touch panel	
	Max. Colours	65,536	
	Backlight	LED type	
		Dimmer : 0-100% with auto dimmer	
Communication Network	Type	Dual Ethernet LAN Interface	Single EIA RS-485. Half duplex
	Speed	10/100Mbps	115.2Kbps
	Max. Length	100m	Main line:300m Sub line:300m
	Connector	RJ-45	5.0mm pitch Connector 4-pole
	Number of Port	2 ports	1 port
Power Supply Voltage		24V DC -45% to +30% (13.2 – 31.2V)	
Power Consumption		9.6W typ.	8.4W typ.
Power Supply Connector		5.0mm pitch Connector 4-pole	
I/O Signal	Ext. Buzzer Output	24V(0.3A) Voltage output	
	Ext. Accept Input	Switch input with no voltage	
Facility	2 Buzzers	Alarm buzzer, Clicking sound buzzer	
	2 Switches	Test, Buzzer stop	
	2 LED Indicators	System run, Alarm	
Operating Temperature		0°C to +55°C	
Relative Humidity		96% Non-condensing	
Mounting		Wall mounting, Flush mounting	

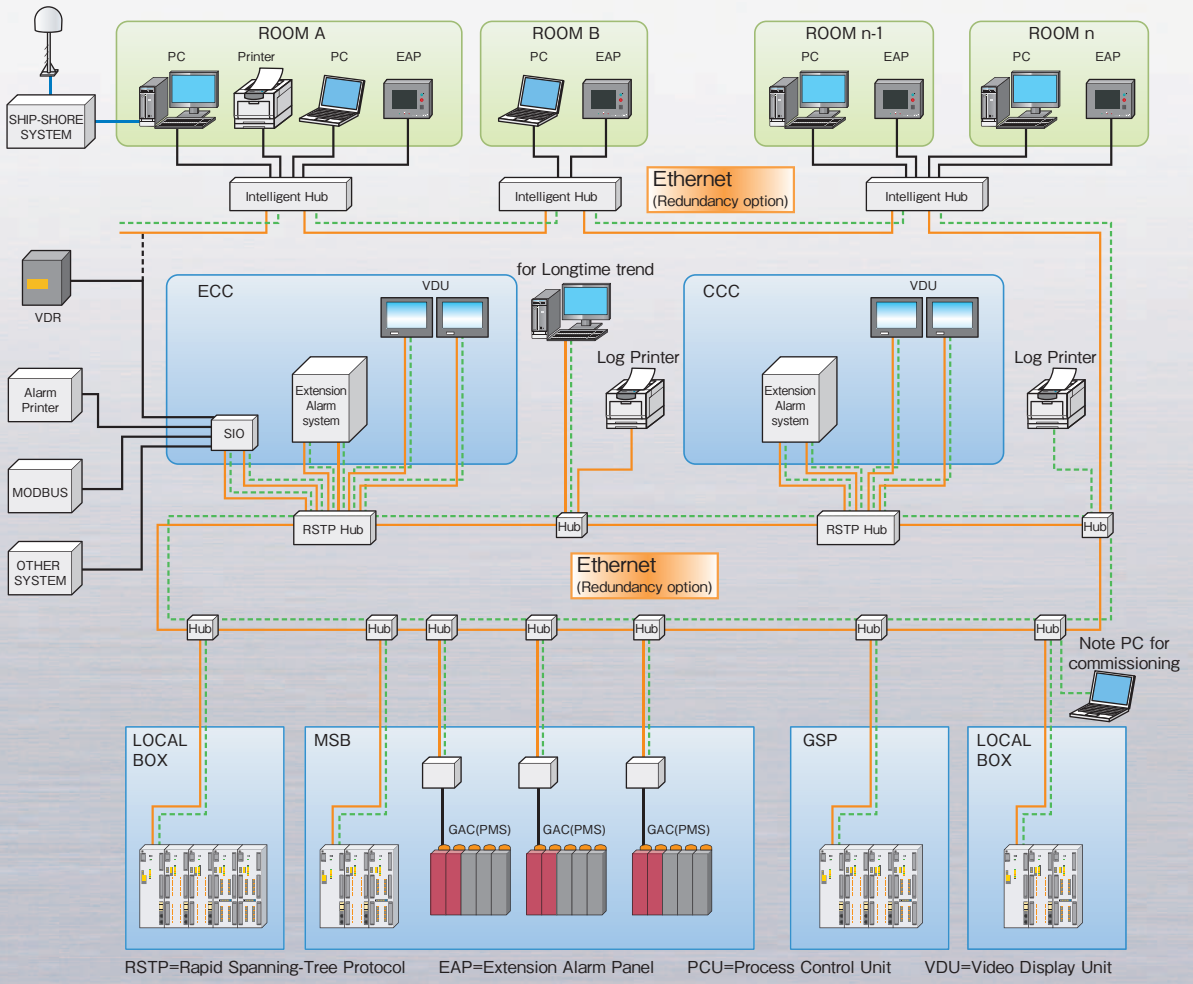
Managed Ethernet Switch (RSTP Hub) supports to build a highly reliable network.

The Ethernet, core of the TERANET 50X system, can be configured into a loop form and it causes to improve the network reliability. To meet a requirement mentioned above, we newly developed a highly intelligent managed Ethernet Switch which conforms to RSTP (Rapid Spanning Tree Protocol) for constructing a loop form network. Besides RSTP, it also conforms to SNMP (Simple Network Management Protocol) and VLAN (Virtual Local Area Network), and improves both maintainability and security at the same time.
Furthermore, basic settings can be easily made by using rotary switches and a DIP switch, so it can be easier to configure network.

■ RSTP HUB Specification

Power supply Voltage	24V DC -25% to +30% (18 – 31.2V)
Power Consumption	6W typ.
Operating Temperature	-10°C to +70°C
Relative Humidity	96% Non-condensing
Weight	0.93kg
Mounting	Screws
Selftest	Power on selftest, Watch dog timer
LAN interface	8 × RJ45 ports (10BASE-T/100BASE-TX automatic recognition)
Principal functions	RSTP, SNMP, VLAN, QoS
I/O Signal	CPU run output

System Configuration



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AUG. 2013 Printed in JAPAN

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