船舶监测报警控制系统

Vessel Monitoring Alarm and Control System

使用和维护手册

Operation & Maintenance Plan

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编制：

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Catalog

1.简介

Introduction

船舶监测报警和控制系统简称(VMAC)可采集全船主机、发电机组、侧推、日用辅机、各类泵组、液位和阀门等系统或设备的状态信号，并可通过通信接口对相关系统发送控制信号。系统以良好的人机界面显示对应的状态信号和报警信号，可根据需要显示监测点的实时和历史数据，可通过延伸报警接口将报警信号外发至延伸报警系统，与综合指挥系统、远程诊断系统、VDR 等有数据接口。系统具有TCP/IP 以太网接口，可通过全船计算机网络，与其他系统交换数据。

The Vessel monitoring alarm and control system (VMAC) can collect the state signals of the whole ship's engine, generator set, side push, daily auxiliary machine, all kinds of pump sets, liquid level and valve and other systems or equipment, and can send control signals to the related system through communication interface. The system displays the corresponding state signal and alarm signal with good man-machine interface. It can display the real-time and historical data of the monitoring point according to the needs. The alarm signal can be sent out to the extended alarm system through the extension alarm interface, and it has data interface with the integrated command system, remote diagnosis system, VDR and so on. The system has TCP/IP Ethernet interface, and it can exchange data with other systems through the whole ship computer network.

主要功能特点：

Main functional characteristics:

- 实时性：通过主监控程序可以实时监视系统报警信息，及重要设备运行状态。
- Real-time:User can monitor system of alarm information on real time and the main equipment operating status, by monitoring the program.
- 同步性：主监控程序安装在各个工作站上，能够稳定实现数据的同步。
- Synchronization: The main monitor program installed in each workstation, can achieve data synchronization stably.
- 统一性：所有工作站均使用同一版本的监控程序。

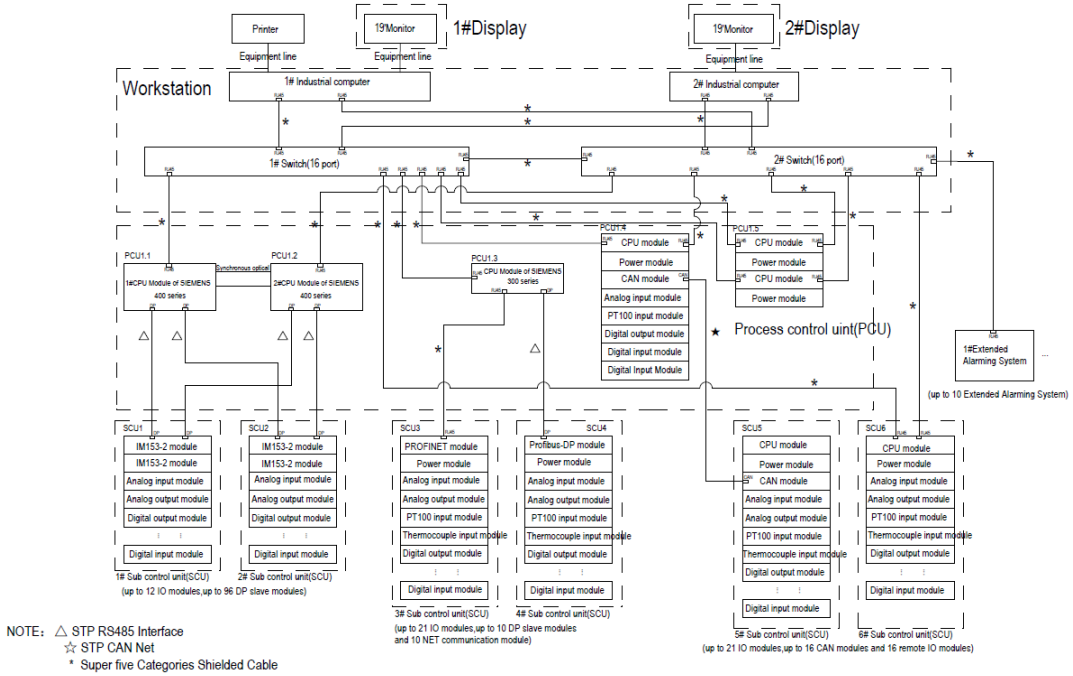
- Unity:All stations use the monitoring program of same version.
- 用户登陆机制，保证操作安全性。
- The user login mechanism, ensure the operation safety.

2.系统概述

System Overview

2.1 系统图

System Diagram



如图所示，船用监控报警控制系统由三层组成。第一层与PCU相连，以由PCU完成其监控任务。这些系统比如PMS系统、主机遥控系统，可通过Profibus DP接口与PCU相连。第二层中PCU完成测量点数据处理，控制任务的执行等任务。PCU执行所有数据的采集和处理，而控制分单元（SCU）则完成现场数据的采集和过程控制输出。SCU作为Profibus DP从站通过Profibus现场总线与PCU相连。第三层包含监视器、记录器、工作站等设备。主要的设备是工作站（OS），其包括人机界面（HMI），用于打印报警记录获得日志的打印机，以及连入工作站的延伸报警装置。

As shown in the picture, the vessel monitoring and alarm control system consists of three layers. The first level is connected to PCU to complete the

monitoring task. These systems, such as PMS system and host remote control system, can be connected to PCU through Profibus DP interface. In the second level, PCU completes data processing, control task execution and other tasks. PCU performs all data collection and processing, while control sub unit (SCU) completes field data acquisition and process control output. SCU is connected with PCU as Profibus DP slave station through Profibus field bus. The third level includes monitors, loggers, workstations and other devices. The main device is the workstation (OS), which includes the man-machine interface (HMI), the printer used to print the log record for the alarm record, and the extension alarm device connected to the workstation.

2.2 系统参数

System Topologies

船舶监测报警控制系统按照整个系统架构，可以具体分为完全冗余部分、部分冗余部以及非冗余部分，详细查看图纸示意。

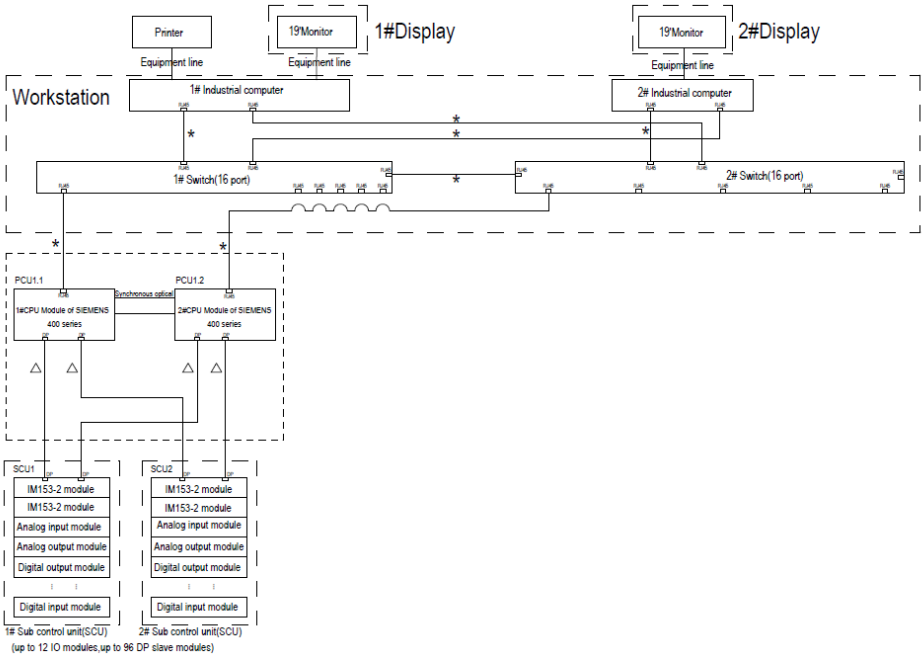
Accroding to the whole system architecture,the Vessel Monitoring Alarm and Control System can be divided into fully redundant,partly redundant and not redundant part,Please see the drawing sketch in detail.

1、 完全冗余部分

fully redundant part

船舶监测报警控制系统中包含完全冗余设计部分。主要由Process control uint(PCU)单元中的PCU1.1和PCU1.2 西门子400H CPU模块以及SCU1、SCU2 冗余IO模块。

The Vessel Monitoring Alarm and Control System includes a fully redundant design part.It is mainly composed of PCU1.1 and PCU1.2 Siemens 400H modules and SCU1and SCU2 redundant IO modules in PCU uint.



2、 部分冗余部分

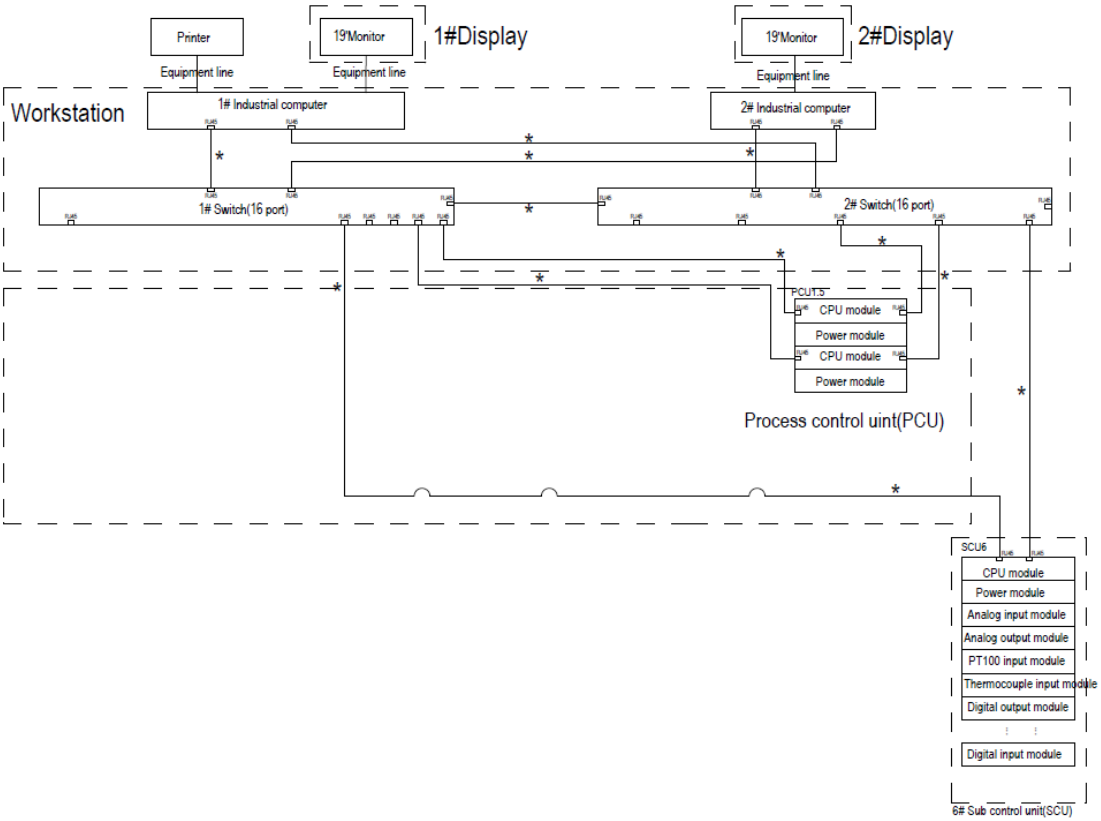
Partly redundant part

船舶监测报警控制系统中包含部分冗余设计部分。主要由Process control uint(PCU)单元中的PCU1.5（RT-PAC）CPU模块以及SCU6 IO模块。

The Vessel Monitoring Alarm and Control System includes a Partly redundant design part. It is mainly composed of PCU1.5 and SCU6 IO modules uint.

当任意一个CPU出现故障时，仍然可以和SCU6 IO模块通信；当SCU6中CPU对外的网线出现故障时，将对应的网络故障信息发送给CPU模块。

When any CPU fails,it can still communicate with SCU6 IO module;When the external network cable of CPU in SCU6 fails,the corresponding network failure information is sent to CPU module.



3、 非冗余部分

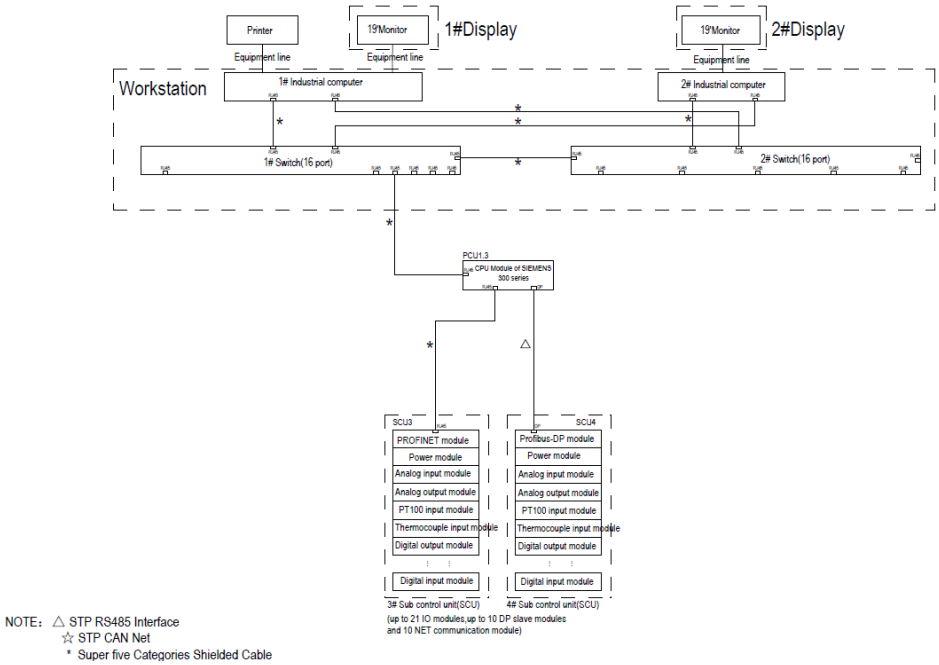
not redundant part

船舶监测报警控制系统中包含部分非冗余设计部分。主要由Process control uint(PCU)单元中的PCU1.3 CPU模块以及SCU3、SCU4 IO模块。

The Vessel Monitoring Alarm and Control System includes a not redundant design part. It is mainly composed of PCU1.3 CPU module and SCU3and SCU4 IO modules uint.

当与CPU连接的RJ45线或者是DP线出现故障时，CPU模块可以将对应的网络通信故障上传给HMI；当CPU与交换机之间的网络线出现故障时，HMI将无法获取该些模块数据信息。

When the RJ45line or DP line connected to the CPU fails,the CPU module can upload the corresponding network communication failure to the HMI;When the network line between the CPU and the switch fails ,the HMI will not be able to obtain the data information of the these modules.



4、 非冗余部分

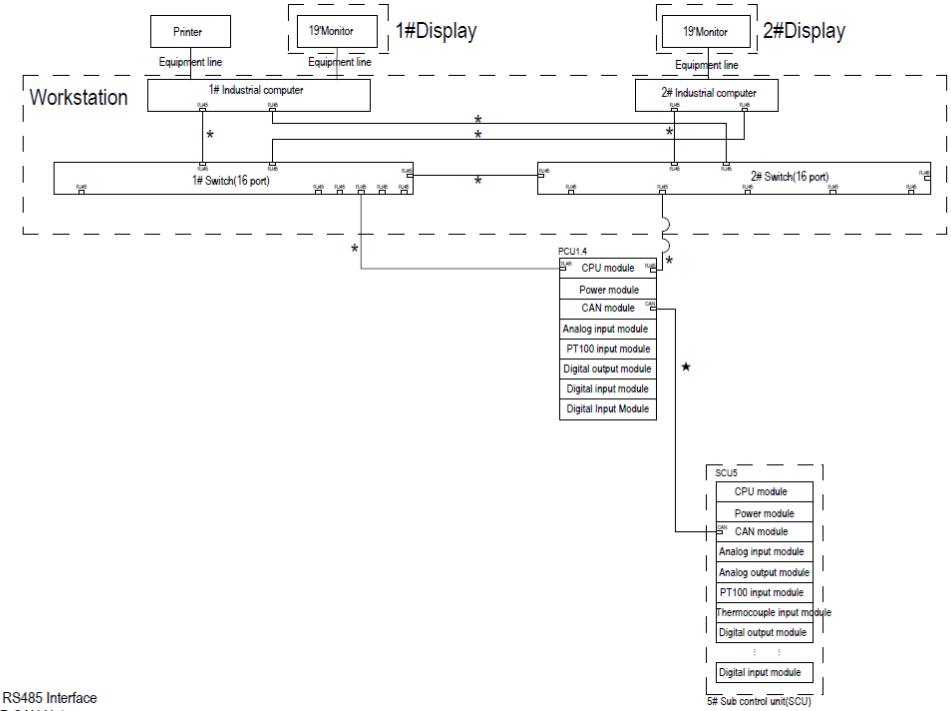
not redundant part

船舶监测报警控制系统中包含部分非冗余设计部分。主要由Process control uint(PCU)单元中的PCU1.4 CPU模块以及SCU5 IO模块。

The Vessel Monitoring Alarm and Control System includes a not redundant design part. It is mainly composed of PCU1.4 CPU module and SCU5 IO modules uint.

当与CPU任意一根网络线出现故障时，CPU模块可以将对应的网络通信故障上传给HMI；当CPU的两根网络线与交换机之间的网络线出现故障时，HMI将无法获取该些模块数据信息。

When any network line with the CPU fails,the CPU module can upload the corresponding network communication failure to the HMI;When the network line between the two network lines of the CPU and the switch fails,the HMI will not be able to obtain the data information of the these modules.



NOTE：△ STP RS485 Interface
☆ STP CAN Net
* Super five Categories Shielded Cable

2.3 系统参数

System Parameter

➢ 工作电源

Working power supply

输入电源：AC220V(+6%～-10%)；额定频率（50/60Hz）±5%，谐波小于5%。

DC24V(+20%～-20%)；双路电源自动切换，工作电源为DC24V。

The input power: AC220V (+6% to -10%);Rated frequency: (50/60Hz)±5%, and the harmonic is less than 5%.DC24V (+20% to -20%); Two way power switch automatically, and the working power is DC24V.

➢ 性能指标

Performance index

以太网，速率:10/100MB/S，MODBUS/TCP

Ethernet, rate:10/100MB/S，MODBUS/TCP

CAN 总线，速率:50K/125K/250K，CAN2.0B

CAN bus,rate:50K/125K/250K，CAN2.0B

系统响应时间：≤2S

System response time:≤2S

数据精度：1%（不含传感器自身及外部设备误差）

Data accuracy:1%(Do not contain the error of the sensor and the external equipment)

- 环境条件

Environment condition

除非另有说明，计算机监测报警和控制系统在下述条件下应能正常工作。

Unless otherwise stated, the computer monitoring alarm and control system should work normally under the following conditions.

环境温度：-10～55℃

Ambient temperature:-10～55℃

横摇：±22.5°；

Roll: ±22.5°;

横倾：±22.5°；

Heel: ±22.5°;

纵摇：±22.5°；

Pitch: ±22.5°;

纵倾：±22.5°；

Trim: ±22.5°;

- 软件环境

Software environment

通用工作站计算机系统：Windows 7/ Windows 10；

General workstation computer system: Windows 7/ Windows 10；

通用工作站计算机软件环境：紫金桥组态软件；

General workstation computer software environment: Realinfo configuration software.

延伸报警器：自带组态软件。

Extension alarm: self-equipped configuration software

2.3 报警点输入输出

Alarm point input and output

系统报警输入/输出通过标准的I/O 模块执行，I/O 模块包括了：

The system alarm input / output is executed through the standard I/O module, and the I/O module includes:

- 数字量输入模块
- Digital input module
- 数字量输出模块
- Digital output module
- 模拟量输入模块
- Analog input module
- 模拟量输出模块
- Analogoutput module
- 热电阻输入模块
- Thermal resistance input module
- 热电偶输入模块
- Thermocouple input module

系统除具备标准的I/O 模块外，还具有标准的串行数据接口的通信模块，通过标准的模块或以太网通信，完成与主机、发电机组、配电板、液位遥测、阀门遥控等系统等三方厂家的设备接口能力。

In addition to the standard I/O module, the system also has a standard serial data interface communication module. Through the standard module or Ethernet communication, system can communicate with the host, generator set, distribution board, liquid level telemetry, valve remote control of other Manufactors

2.4 系统设备功能

System Equipment Function

➢ **通用工作站(OS)**
General Workstation(OS)

通用工作站一般由2 套互相备用的计算机(含电脑主机、显示器、鼠标和键盘、打印机、不间断电源)组成，具体根据详细设计图纸确定。通用工作站是本系统的人机操作界面，轮机员通过此界面完成对被监测系统的各项检查和查询。可通过监控界面调用被监测参数的历史数据、报警记录等信息。可显示各被监测

系统的模拟状态图，使操作员对被监测设备和监测数据一目了然。轮机员通过鼠标和键盘可完成对系统的全部操作，包括调用、打印、查询各数据。通用工作站互相备用，操作员可在任意一台工作站上进行操作。

General workstations are generally composed of 2 sets of standby computers (including computer host, display, mouse and keyboard, printer, uninterrupted power supply), and are determined according to the detailed design drawings. The general workstation is the man-machine operation interface of the system. The inspecting and inquiring of the monitored system is done by the engineer through this interface. The monitoring data can be invoked by monitoring interface, such as historical data, alarm records and so on. The simulated state diagram of each monitoring system can be displayed, so that the operator can see the monitored equipment and monitoring data at a glance. The engineer can complete all operations of the system through mouse and keyboard, including calling, printing and querying all data. Universal workstations are spare for each other, and operators can operate on any workstation.

- **数据处理单元**

  Process control unit

数据处理单元主要执行数据获取及数据处理任务。PCU 柜通常安装于集控室，包含 CPU 模块，通信模块，信号输入输出模块等。

PCU performs all data acquisition and processing。PCU cabinets are usually installed in the central control room, include CPU module, communication module and signal input and output module.

- **分控制单元**

  Sub control unit

分控制单元主要执行现场数据采集和控制输出，完成对所有被监测数据的信号采集，无需操作员进行操作。SCU 柜主要包含 ET200M 模块，CPU 模块和信号输入输出模块等。

The control sub unit (SCU) completes field data acquisition and process control output, mainly completes the signal collection of all monitored data without operator. SCU cabinets include ET200M module, CPU module and signal input and

output module.

- **延伸报警器**

  The extended alarm

延伸报警单元可根据客户需求配置其所需要求的各种设备信息和报警信息，能安装于轮机长室、大管轮室、二管轮/三管轮室、餐厅、会议室、健身房等地点（具体地点根据详细设计图纸确定）。

The extension alarm unit can configure the various equipment information and alarm information required by the customer. It can be installed in the chief engineer room, the second engineer room, the third / forth room, the dining room, the conference room, the gym and so on.(The specific location is determined by the detailed design drawings)

- **轮机员安全报警模块**

  The engineer security alarm module

轮机员安全报警为系统的一个功能组成模块，用户确保当班轮机员的人生安全。当值班轮机员进行机舱巡视时，需激活对应此模块的功能，轮机员应在设定的时间内进行复位操作。如超时未进行复位，则会触发全船报警。

Engineer safety alarm as a function of the system modules, the user to ensure the life safety of the duty engineer. When the duty crew travels in the engine room, we need to activate the function corresponding to this module. The engineer should reset operation at the set time. If the time is not reset, the whole ship will be alerting.

2.5 系统软件

System software

系统软件包括控制器CPU 软件、上位机组态软件、延伸屏软件。

The system software includes controller CPU software, PC configuration software and extension screen software.

- 西门子CPU 软件：采用Step7及博途编程软件，各系统设计固化，无需用户更改。

  The Siemens CPU software: using Step7 and TIA Protal programming software, the design of the curing system, the user need not change.

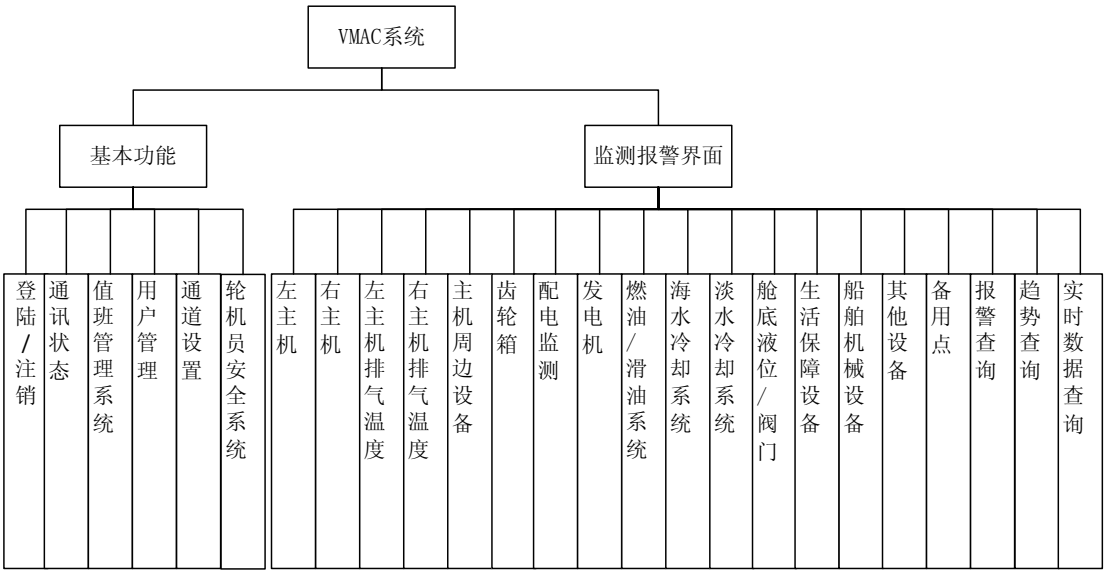
- RT-PAC CPU 软件：采用NApro编程软件，各系统设计固化，无需用户更改。

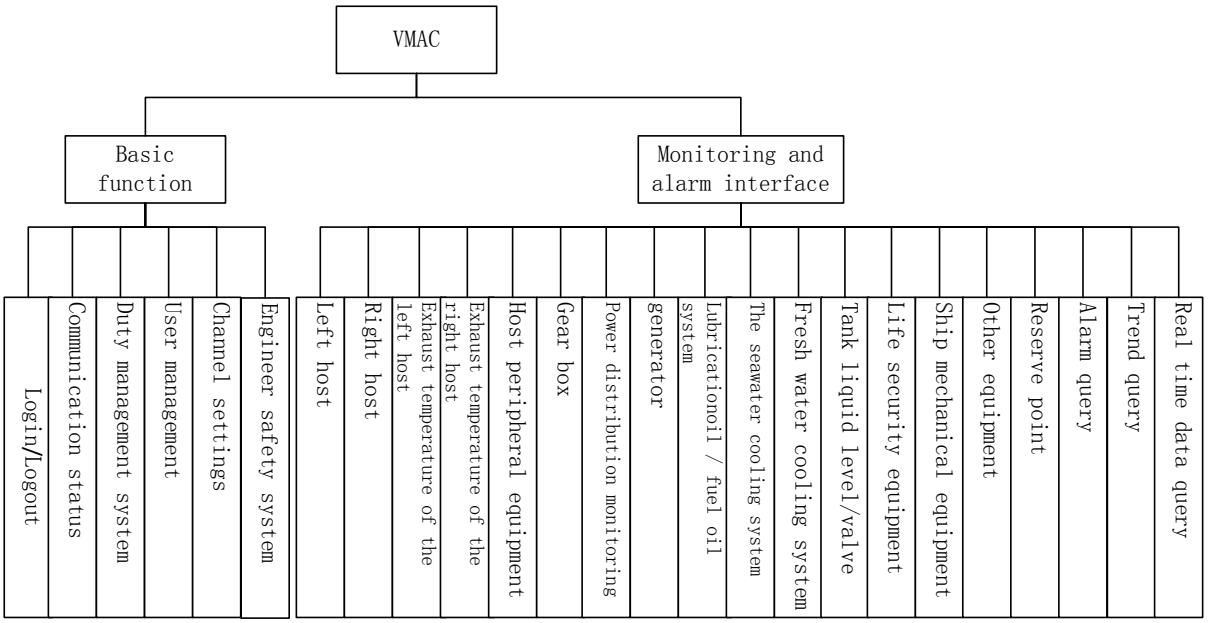
The RT-PAC CPU software: using NApro programming software, the design of the curing system, the user need not change.

- 上位机组态软件：采用紫金桥组态软件 6.5 版本。
  Host computer configuration software: Realinfo configuration software version 6.5.
- 延伸屏软件：采用北尔电子 ix Developer 2.40 SP3。
  Extension screen software: Beijer Electronics ix Developer 2.40 SP3.

船舶监测报警控制系统主要功能包括常规显示、报警查询、通道设置、用户管理、趋势查询等页面，以下为典型功能和界面(具体功能应用依据设计院详细设计)：

Vessel Monitoring Alarm and Control System include regular display, alarm query, channel setting, user management, trend query and other pages. The following are typical functions and interfaces (specific functional applications are designed by the Design Institutein detail).





3. 操作指南

Operation finger

3.1 系统启动

System start-up

系统软件采用组态软件实现前台界面。电脑开机时，本系统自动运行。

The system software uses configuration software to realize the foreground interface. When the computer starts, the system will run automatically.

如系统不自动运行。请按住鼠标左键拖动桌面上  的图标，开始菜单→所有程序→启动项中，使其开机自启动。

If the system does not automatically run. Please hold the left button of the mouse to drag the icon  on the desktop,Start menu→All programs→Start-up item, to make it start automatically.

在运行时如果遇到死机或正常退出，想要再次进入的话可以双击桌面上的系

统运行器起动程序 

进入系统运行界面。

If you encounter a crash or normal exit at running time and you want to enter again, you can double-click the 

to enter the system operation interface.

3.2 软件保护

Software protection

本系统软件在开发调试完成后，即进行开发加密，防止因意外造成的不必要的损失和故障。如见到以下界面,请勿重复尝试进入系统开发功能！

After the development and debugging, the system software is developed and encrypted, so as to prevent unnecessary losses and failures caused by accidents. If you see the following interface, do not try to enter the system development function again.

3.3 功能说明

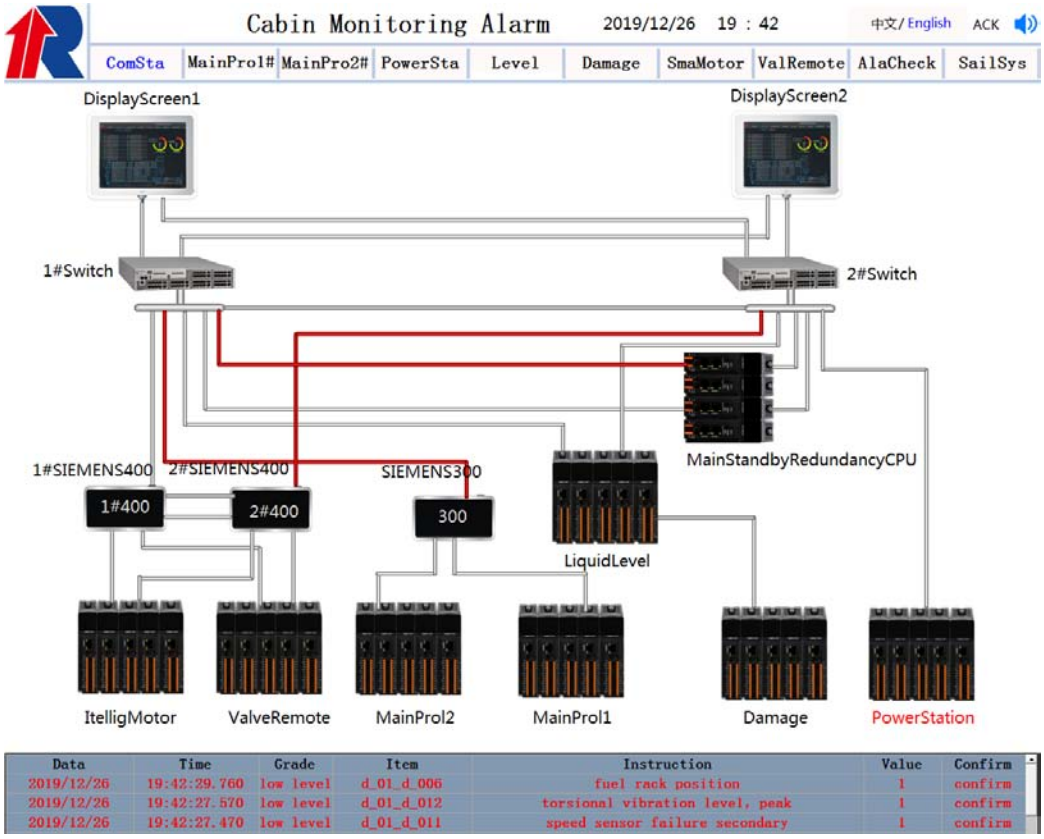
Functional description

3.3.1 系统功能

System function

下图所示系统页面（注：因软件系统不断优化更新，以下软件界面均为参照，具体按实际设计为准）

The system page is shown below. (Note: as the software system is constantly optimized and updated, the following software interfaces are referenced, specifically according to the actual design).



➢ 菜单栏

Menu bar

系统左侧为菜单栏，用于选择和打开不同系统监控界面。并可对系统报警进行定位。

On the left side of the system is the menu bar, which is used to select and open different system monitoring interfaces. And it can locate the system alarm.

菜单栏按钮未选中时为黑色 MainPro1# ，按钮选中时为蓝色 MainPro1# 。

The menu bar button is black when it is selected MainPro1#,The button is blue when the button is selected MainPro1#.

相关系统中有新的报警，按钮会变为红色闪烁 主推进 对应子菜单按钮 左主机 也会变为红色并闪烁。报警恢复单未确认时，按钮仍为红色闪烁；确认报警时，按钮为红色不闪烁；当报警确认并恢复时，按钮恢复正常显示。

There are new alerts in related systems, and buttons will turn red 主推进 Corresponding sub-menu button 左主机 will also turn red and flicker. When the alarm recovery single is unconfirmed, the button is still red. When the alarm is confirmed, the button is not red. When the alarm is confirmed and recovered, the button is restored to normal display.

➢ **报警速显窗口**

The alarm speed display window

系统中报警速显窗口时刻显示最新3条报警消息。窗口中红色文字表示报警存在，黄色文字表示已确认报警，绿色文字表示已恢复报警。如需查看详细报警信息，请点击菜单栏“报警查询”按钮进入查询页面。

In the system,the alarm window is displayed the latest 3 alarm messages in time. The red text indicates the presence of the alarm. The yellow text indicates the confirmed alarm. The green text indicates that the alarm has been restored. If you want to see the detailed alarm information, please click the menu bar "alarm inquiry" button to enter the query page.

Data	Time	Grade	Item	Instruction	Value	Confirm
2019/12/26	19:42:29.760	low level	d_01_d_006	fuel rack position	1	confirm
2019/12/26	19:42:27.570	low level	d_01_d_012	torsional vibration level, peak	1	confirm
2019/12/26	19:42:27.470	low level	d_01_d_011	speed sensor failure secondary	1	confirm

3.3.2 操作功能

Operation function

➢ **登陆/注销**

Login/Logout

本系统中，相关控制操作需要权限。

In this system, the relevant control operations require permissions.

登陆/注销 功能实现对权限的控制，防止误操作。

Login/Logout can realize the control of authority and prevent incorrect operation

未登陆时，按下“登陆”按钮弹出登陆界面；已登陆时，按下“注销”按钮弹出注销界面。

If you don't log on, press the” landing” button to pop up the landing interface. When you have logged in, press the "Cancel" button to pop up the interface of cancel.

注销界面中，可修改当前用户登陆密码。点击“改变口令”即可打开“修改口令”界面。

In the logoff interface, the user login password can be modified. Click "change password" to open the "modify password" interface.

➢ **通讯状态**

Communication state

“通讯状态”界面，显示本系统自检状态。可即时发现系统中各个模块的运行状态。如有通讯错误、模块损坏可发出声光报警提示。

The” communication state” interface displays the self checking state of the system. It can detect every module's running state instantly. If there are communication errors and module damage, sound and light alarm can be issued.

“通讯状态”界面通过 点击“系统主页”→ 按钮进入。

The “communication status” interface is entered by clicking the” system home “button.

模块报警处理：

Module alarm processing:

单个模块：当单个模块报警时。请到相应采集箱（采集板）中找到该模块。将模块上下卡口拉出后，拔下模块重新安装紧固。即可恢复。

Single module: when a single module alarm. Please find the module in the corresponding collection box (acquisition panel). After pulling the module up and down the bayonet, pull the module off and reinstall it. It can be recovered.

多个模块：当同一采集箱（采集板）中多个模块同时报警。请将该采集箱（采集板）断电。确认所有模块，网线已紧固。然后通电，重启系统。

Multiple modules: multiple modules in the same collection box (acquisition board) are alerting at the same time. Please cut off the collection box (collection board). Confirm all modules, the wire is fastened. Then turn on the power and restart the system.

采取相关措施仍无法排除故障，请联系相关人员进行处理。

Related measures can not be excluded, please contact the relevant personnel for processing.

- **值班管理系统**

  Duty management system

“值班管理系统”界面，显示轮机员值班相关功能，并可进行相关操作。

The “duty management system” interface, display the engineer on duty related functions, and related operations.

“通讯状态”界面通过 点击“系统主页”→ 按钮进入。（需要系统管理员权限）

Click the bottom of“system home page” to go into the“Communication status” interface(Need system administrator permissions).

“值班管理系统”分三个部分：值班员选择，轮机员安全系统、轮机员呼叫。

The "duty management system" is divided into three parts: the duty selection, the engineer safety system and the engineer's call.

1. 值班员选择：可选择当前值班人员，确认后在所有延伸报警器上均显示当前值班人员。

Selection of duty officer: The current duty officer can be selected, and the current duty personnel are displayed on all extension annunciator after confirmation.

2. 轮机员安全系统：用于保证值班轮机员的人生安全。系统开启后，根据设定时间倒计时（一般为30分钟），倒计时5分钟时触发预报警，倒计时为0时触发全船报警。轮机员安全系统包含2个启动按钮和6个复位按钮。

Marine engineer safety system: It is used to ensure the safety of the engineer on

duty. After the system is opened, the countdown is set according to the set time (usually 30 minutes). The countdown is triggered at 5 minutes, and the alarm is triggered in whole vessel when the countdown is 0. The crew safety system consists of 2 start buttons and 6 reset buttons.

启动按钮用于启动本系统，开始倒计时。关闭系统请到集控台软件操作。

Start button is used to start the system and start countdown. TO close the system, please operate the console software.

复位按钮用于复位倒计时时间。（重新开始倒计时）

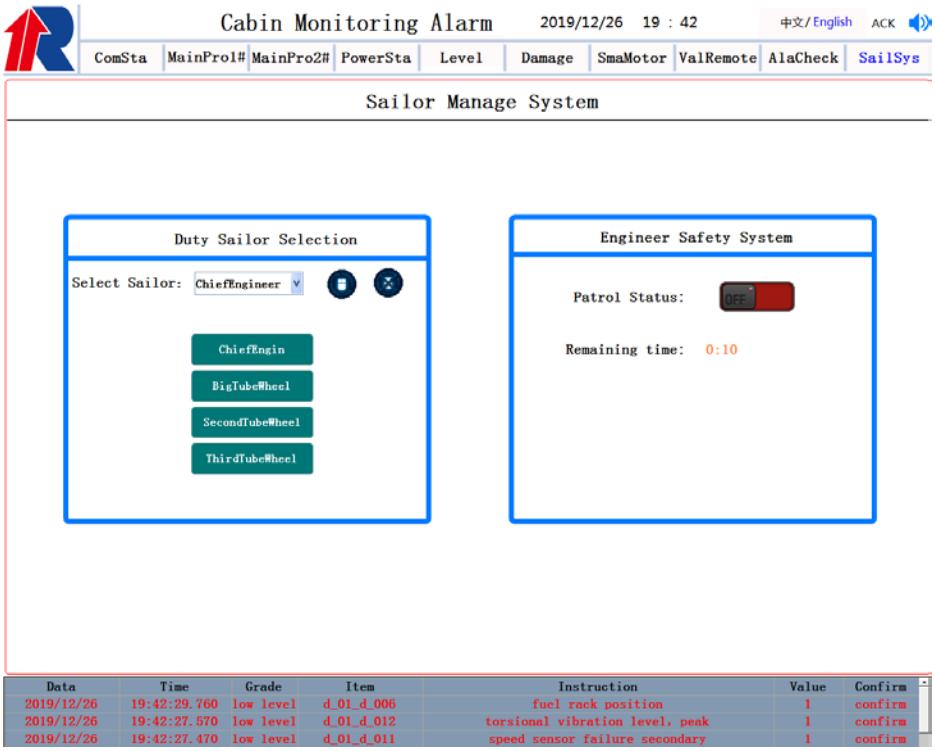
The reset button is used to reset the countdown time. (restarting the countdown)

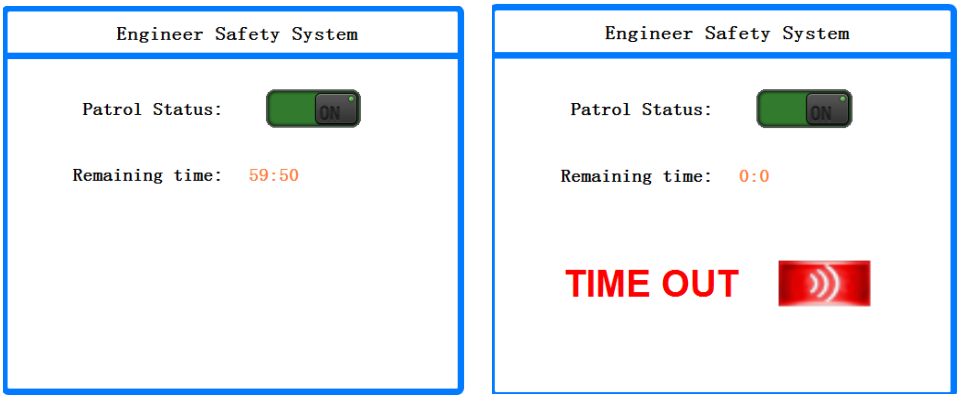
按钮用于打开和关闭轮机员安全系统

The button is used to open and close the engineer's safety system

3. 轮机员呼叫：用于呼叫轮机员。选定所要呼叫的轮机员舱室后，点击  按钮。相关延伸屏会显示呼叫信息，并发出提示声音。

Engineer calling: Used for calling the engineer. After selecting the calling cabin of the engineer, click the button  . The related extension screen will display the calling information and prompt the voice.





➢ 用户管理

User management

“用户管理”界面，用于管理系统用于。只有“系统管理员”才可进入操作。用于添加、修改、删除系统用户。

The “user management” interface is used for management system. Only the "system administrator" can enter the operation.It is used to add, modify, and delete system users.

“用户管理”界面通过 点击“系统主页”→ 按钮进入。（需要系统管理员权限）

The “user management” interface is entered by clicking the “system home” button. (Need system administrator privileges)

船舶监测报警控制系统中“值班管理系统”、“用户管理”、“通道设置”等部分需要管理员权限登陆方可进行操作。

Vessel Monitoring Alarm and Control System, "duty management system", "user management" and "channel setup" need administrator's permission to login.

➢ **通道设置**

Channel setting

通道设置，用于设置采集数据的相关报警和显示内容。

Channel setting is used to set relevant alarm and display content of collected data collection.

“通道设置”界面通过点击“系统主页”→ 按钮进入。（需要系统管理员权限）

The “channel setup” interface is entered by clicking the” system home” button . (Need system administrator privileges)

通道设置根据数据区域划分，可选择相关设备下的开关量和模拟量进行修改。选中要修改的测点，修改配置后，点击“设置”按钮进行参通道设置。报警限值等重要数据存储与控制模块TF卡中。

The channel settings can be modified according to the data area division, the switch quantity and analog volume of the related device can be selected and set. Select the points to be modified, modify the configuration, and click the settings button to set up the reference channel. The alarm limits and other important data is stored and controlled in the TF card.

注意：请不要随意修改工作站电脑的IP地址。否则会导致相关数据无法同步！

Note: please do not modify the IP address of the workstation computer at will. Otherwise, the related data can not be synchronized!

3.4 界面说明

3.4 Interface description

3.4.1 主推进

Main propulsion

点击菜单栏“主推进”打开主推进子菜单。

Click on the menu bar "main push" to open the main propulsion sub menu.

子菜单包含：左主机、右主机、左主机排气温度、右主机排气温度、主机周边设备、齿轮箱等相关菜单。点击进入后可显示各个相关设备的测点状态。

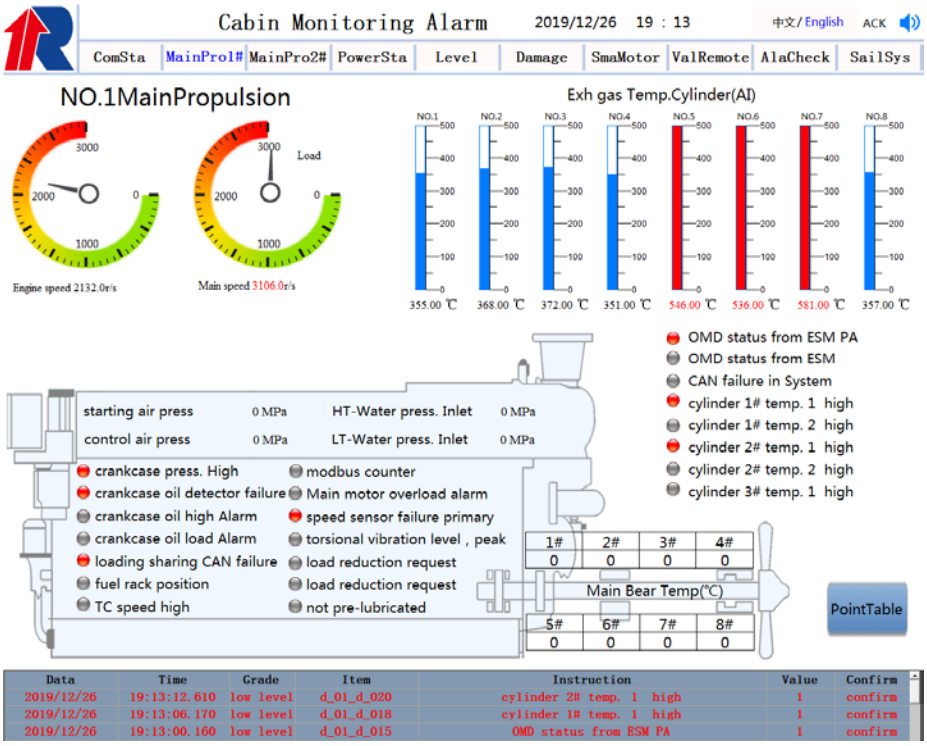
The sub menu includes: left main engine, right main engine, left main engine exhaust temperature, right main engine exhaust temperature, host peripheral equipment, gear box and other related menu. Click to enter can show the status of each device.

➢ 左主机

Left host

点击菜单栏“主推进”打开主推进子菜单，点击“左主机”按钮进入该界面。查看左主机运行状态参数。

Click on the menu bar"main propulsion", open the main propulsion sub menu, and click the” left host” button to enter the interface. Check the running state parameters of the left host.



➢ 右主机

Right host

同左主机

Like the left host

➢ 左主机排气温度

Exhaust temperature of the left host

点击菜单栏“主推进”打开主推进子菜单，点击“左主机排气温度”按钮进入该界面。查看左主机排气温度状态。

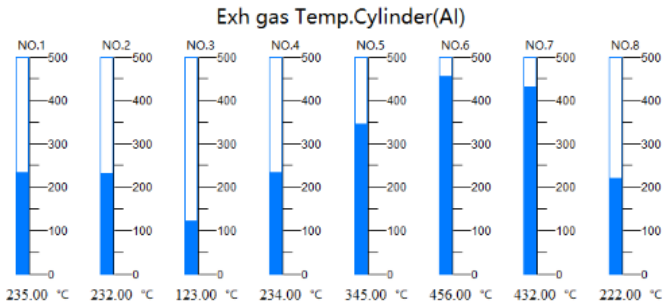
Click on the menu bar "main propulsion"to open the main propulsion sub menu, and click the "left main engine exhaust temperature" button to enter the interface. Check the exhaust temperature state of the left host.

1. 排气温度异常报警时，柱状图及下方数据以红色显示。

When the exhaust temperature is abnormal, the histogram and the bottom data are displayed in red.

2. 排气温度与平均温度偏差达到一定值数值时，发生报警。（默认为50℃，可在通道设置中修改）。

When the deviation between exhaust temperature and average temperature reaches a certain value, an alarm occurs. (The default is 50 C, which can be modified in channel settings).



➢ 右主机排气温度

Exhaust temperature of the right host

同左主机排气温度

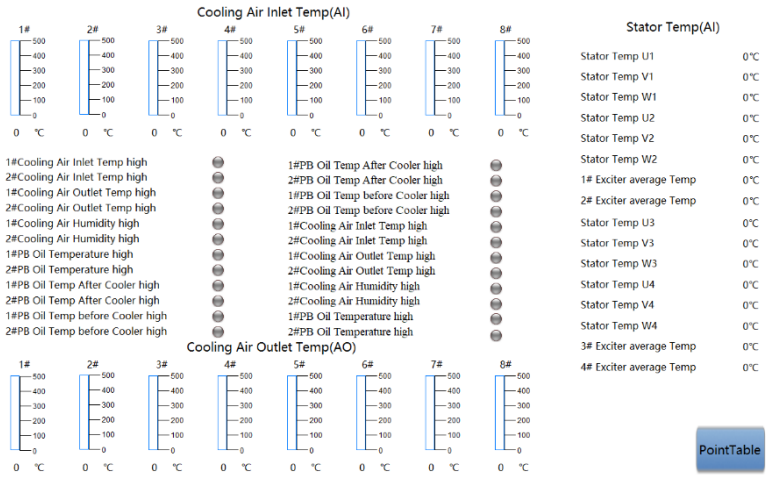
Like the exhaust temperature of the left host

➢ 主机周边设备

Host peripheral equipment

点击菜单栏“主推进”打开主推进子菜单，点击“主机周边设备”按钮进入该界面。查看主机周边设备状态。

Click on the menu bar"main propulsion" to open the main propulsion sub menu, and click on the “host peripheral device“button to enter the interface. Look at the state of the device around the host.



3.4.2 电站

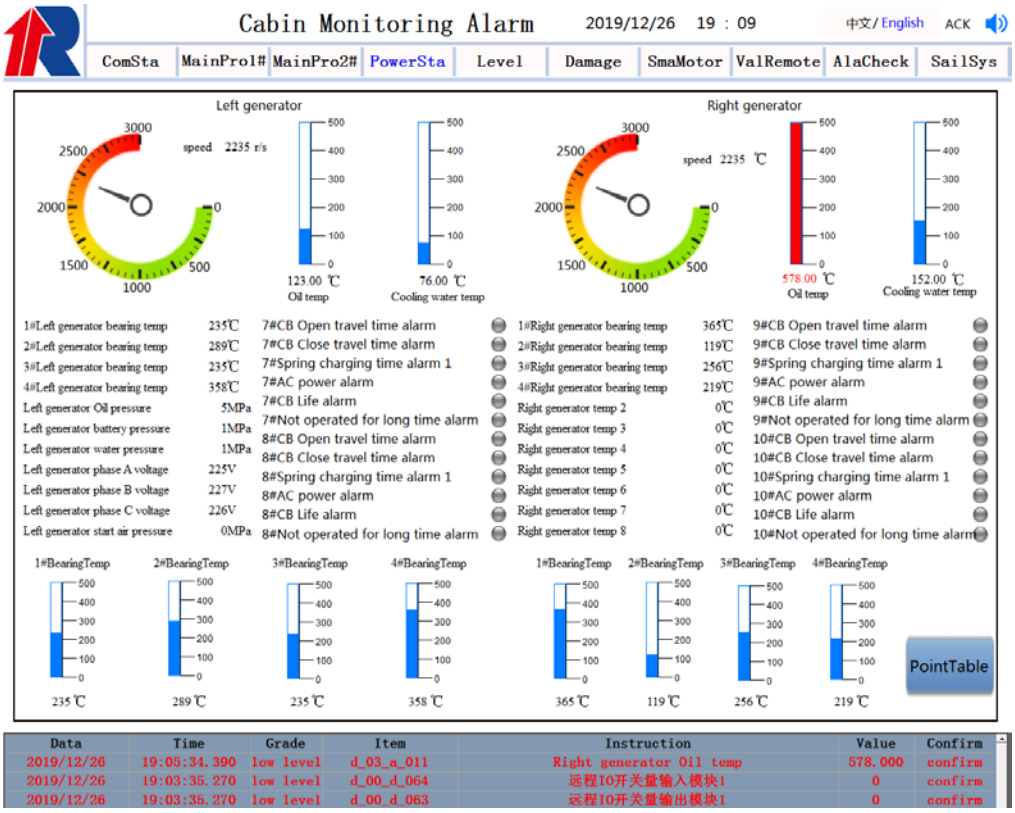
Power station

点击菜单栏“电站”打开电站子菜单。

Click on the menu bar "power station" to open the power plant submenu.

子菜单包含：配电监测、发电机等相关菜单。点击进入后可显示相关设备状态。

The sub menu includes: distribution monitoring, generator and other related menus. Click enter to display the status of the related device.



➢ 配电监测

Power distribution monitoring

点击菜单栏“电站”打开电站子菜单，点击“配电监测”按钮进入界面。查看配电状态。

Click on the menu bar "power station" to open the power plant sub menu, click the "power distribution monitoring" button to enter the interface. Check the distribution state.

配电监测界面和直观查看发电机状态和汇流排状态。

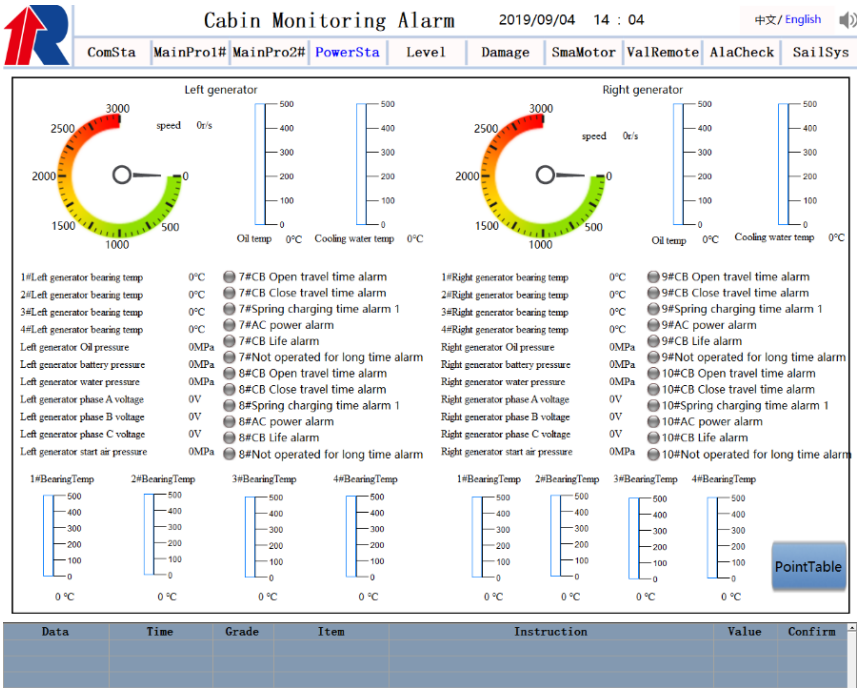
Distribution monitoring interface and intuitive view of generator state and bus state.

➢ 发电机

Generator

点击菜单栏“电站”打开电站子菜单，点击“发电机”按钮进入界面。查看发电机状态。

Click on the menu bar "power station" to open the power plant sub menu, click the "generator" button to enter the interface. Check the state of the generator.



3.4.3 辅助设备

Auxiliary equipment

点击菜单栏“辅助设备”打开辅助设备子菜单。

Click the “auxiliary device” on the menu bar to open the auxiliary device submenu.

子菜单包含：燃油/滑油系统、海水冷却系统、淡水冷却系统、舱底液位、生活保障设备、船舶机械设备等相关菜单。点击进入后可显示相关设备状态。

Submenu includes: fuel oil / lubricatingoilsystem, sea water cooling system, fresh water cooling system, tank bottom liquid level, life support equipment, ship machinery and other related menus. Click enter to display the status of the related device.

➢ 滑油/燃油系统

Lubricationoil / fuel oil system

点击菜单栏“辅助设备”打开子菜单，点击“滑油/燃油系统”按钮进入界面。查看滑油/燃油系统状态。

Click on the menu bar, "auxiliary device" to open the submenu, click the "lubricating oil / fuel oil system" button to enter the interface. Check the state of the lubricating oil / fuel oil system.

- **海水冷却系统**

The seawater cooling system

点击菜单栏“辅助设备”打开子菜单，点击“海水冷却系统”按钮进入界面。查看海水冷却系统状态

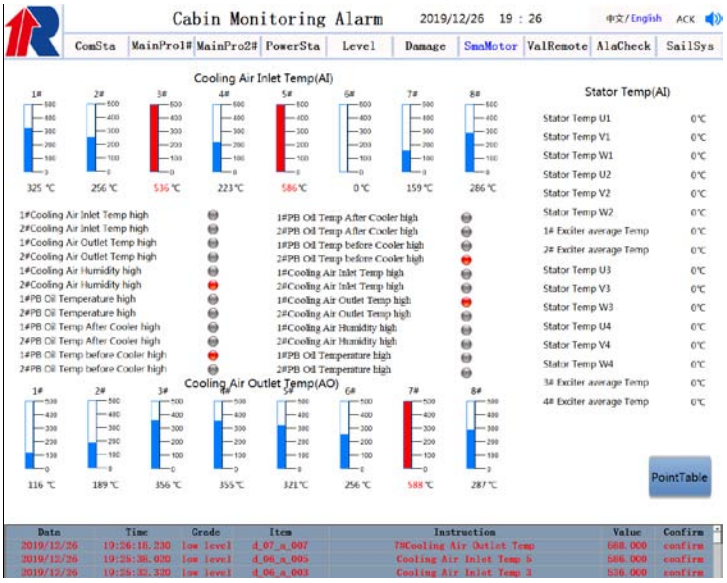
Click on the menu bar"auxiliary device to open the submenu, click the "sea water cooling system" button to enter the interface. Look at the state of the seawater cooling system

- **淡水冷却系统**

Fresh water cooling system

点击菜单栏“辅助设备”打开子菜单，点击“淡水冷却系统”按钮进入界面。查看淡水冷却系统状态。

Click on the menu bar "auxiliary device" to open the submenu, click the "fresh water cooling system" button to enter the interface. Check the state of the fresh water cooling system.

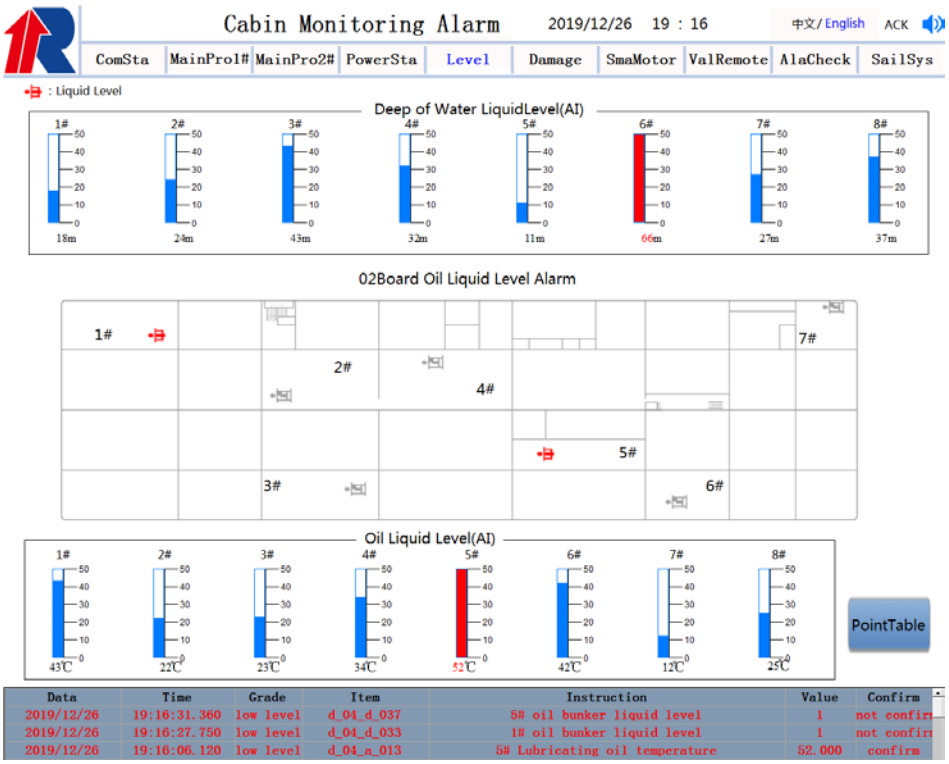


➢ **舱柜液位/阀门**

Tank liquid level/valve

点击菜单栏“辅助设备”打开子菜单，点击“舱柜液位/阀门”按钮进入界面。查看舱柜液位/阀门状态。可在界面控制，通过通信对阀门进行控制。

Click on the menu bar "auxiliary device" to open the submenu, click the "Tank liquid level / valve" button to enter the interface. Check the tank liquid level / valve status. It can be controlled at the interface and controlled by communication.



➢ **生活保障设备**

Life security equipment

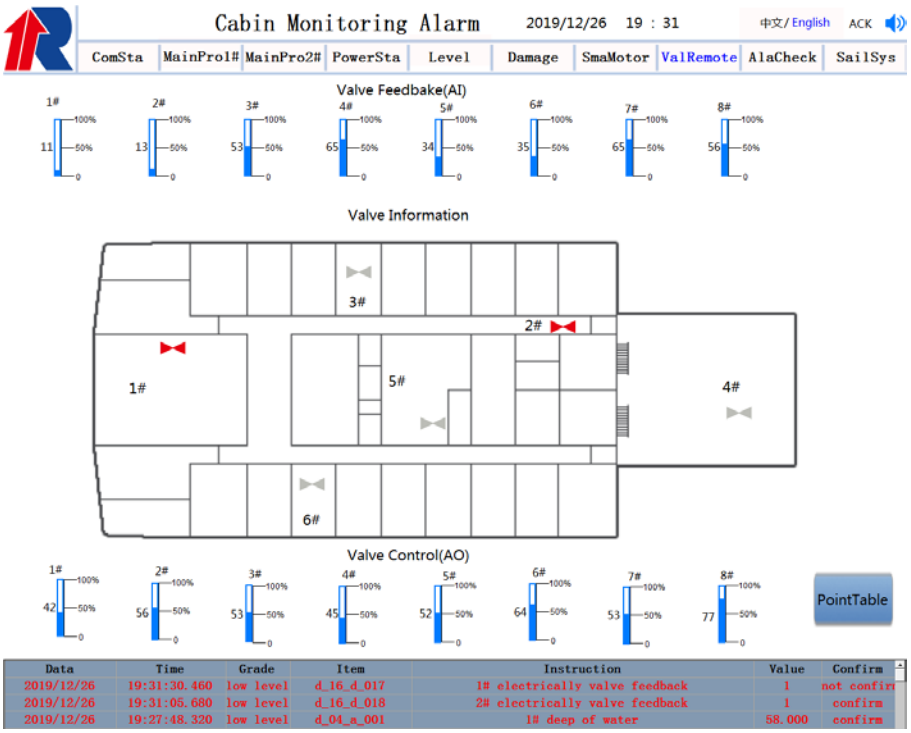
点击菜单栏“辅助设备”打开子菜单，点击“生活保障设备”按钮进入界面。查看生活保障设备状态。

Click on the menu bar "auxiliary device"to open the submenu, click the "life support device" button to enter the interface. Check the state of life security equipment.

生活保障设备包括：热水循环、电加热系统，生活污水系统，中央空调、间接空调系统，伙食冷藏、制淡装置。

Life support facilities include: hot water circulation, electric heating system,

domestic sewage system, central air conditioning, indirect air conditioning system, food cold storage and light production device.



➢ **船舶机械设备**

Ship mechanical equipment

点击菜单栏“辅助设备”打开子菜单，点击“船舶机械设备”按钮进入界面。查看船舶机械设备状态。

Click on the menu bar "auxiliary device" to open the submenu, click the "ship machinery and equipment" button to enter the interface. Check the state of the ship's machinery and equipment.

船舶机械设备界面中可查看各种泵的运行状态和报警。以及其他设备的相关状态。

The operation state and alarm of various pumps can be seen in the interface of ship mechanical equipment. And the related state of other devices.

3.4.4 其他设备报警

Other equipment alarm

点击菜单栏“其他设备报警”打开其他设备报警子菜单。

Click on the menu bar, "other devices alarm", open the other device alarm sub

menu.

子菜单包含：其他设备、备用电等相关菜单。

The submenu includes: other devices, standby power and other related menus.

➢ **其他设备**

Other equipment

点击菜单栏“其他设备报警”打开子菜单，点击“其他设备”按钮进入界面。查看其他设备状态。

Click on the menu bar "alarm on other devices" to open the submenu, click the "other device" button to enter the interface. Look at other device states

此界面中包含减摇鳍的状态和倾角指示。

This interface includes the status and dip indication of fin stabilizer.

3.4.5 报警查询

Alarm query

点击菜单栏“报警查询”打开详细报警列表界面。

Click on the menu bar "alarm query" to open the detailed alarm list interface.

界面中可选择查询实时报警、历史报警。历史报警可根据条件进行查询。

The interface can select real-time alarm and historical alarm. The historical alarm can be inquired according to the conditions.

功能：1.确认报警

Function: Confirm the alarm

2.报表打印

Report printing

3.实时打印选择：选中实时打印时，每条报警记录更新打印机均会打印该条记录。

Real time print selection: when selecting real-time printing, every alarm record is updated, and the printer will print the record.

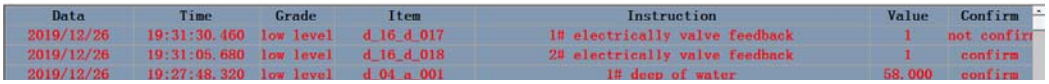
4.定时打印设置：选中定时打印时，系统会根据设置时间，定时打印24小时内所有报警记录。“设置”按钮用来设置定时打印时间。

Timed print settings: when the timer is selected, the system will print all the alarm records within 24 hours according to the setup time. The “setup” button is

used to set the time to print regularly.

注：打印机连接与集控室一号工作站（左侧），打印功能需在一号工作站进行。

Note: printer connection to centralized control room 1 workstation (left side), printing function should be carried out at workstation No. 1.



3.4.6 数据查询

Data query

点击菜单栏“数据查询”打开其数据查询子菜单。

Click on the menu bar "data query" to open its data query submenu.

子菜单包含：趋势查询、实时数据查询等相关菜单。

Sub menus include: trend query, real-time data query and other related menus.

4. 安装与维护

Installation and maintenance

4.1 软件安装

Software installation

4.1.1安装紫金桥组态软件

Installation of the configuration software of the Realinfo.

1. 打开我公司提供安装光盘。进入“紫金桥”目录。双击 

图标，运行组态安装平台。显示如下界面：

Open installation disc of our company. Enter the "Zijin bridge" directory. Double click the icon 

to run the configuration installation platform. The following interface is shown:

2. 鼠标点击“安装主程序”，进入主程序安装过程。按照默认设置点击“下一步”按钮，直至完成安装。

Mouse click "install main program", enter the main program installation process. Click the “next” button according to the default settings until the installation iscompleted.

3. 鼠标点击“安装驱动”，进入驱动程序安装过程。按照默认设置点击“下一步”按钮，直至完成安装。

Mouse click "install driver" to enter the installation process of the driver. Click the “next” button according to the default settings until the installation is completed.

4. 至此完成组态平台安装。

To complete the configuration platform installation.

5.完成安装后请重启计算机。

Please restart the computer after the installation is completed.

4.1.2安装软件程序

Install software program

1. 打开我公司提供安装光盘。复制“海MAC”目录到D盘根目录下。

Open installation disc of our company. Copy the "Sea MAC" directory to the D root directory.

2. 点击系统“开始”按钮，选择“所有程序”—>“紫金桥监控组态软件” —>“工程管理器”，打开如下界面

Click the system “start” button, select “all programs” - >“Zijin bridge monitoring configuration software” - >"Engineering Manager", open the following interface.

3. 点击“搜索工程”，选中“D:/ MAC”目录，点击“确定”按钮。

Click "Search Engineering", select "D:/ MAC" directory, click the "confirm" button.

4. 选中3步中选择的工程，点击“进入运行”，即可进入激励柜程序。

Select the project selected in the 3 step, click "enter into operation", and then enter the incentive cabinet program.

5. 以上1~4步为首次运行程序操作步骤。再次运行，点击系统“开始”按钮，“所有程序”—>“紫金桥监控组态软件” —>“系统运行器”，即可运行监测报警系统。

1~4 steps are the first steps to run the program. Run again, click the system "start" button, "all programs" - >"purple bridge monitoring configuration software" - >"system runner", can run monitoring and alarm system.

4.2 模块安装

Module installation

步骤A：

Step A:

沿底板槽位方向，将模块由上到下慢慢滑入。

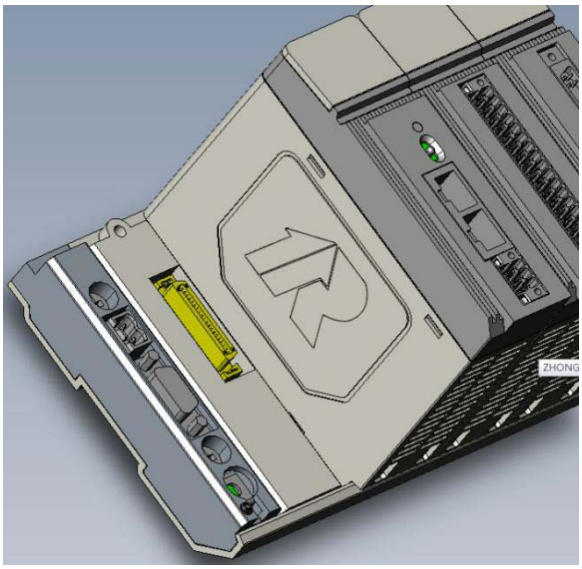
In the direction of the bottom slot, the module is slowly slipped from top to bottom.

步骤B：

Step B:

使模块平移到最下方，模块底部顶到铝型材卡扣。

The translation module to the bottom, bottom to top module aluminum buckle.



步骤C：

Step C:

将模块向下按紧，使模块与底板的接插件完全接触，同时保证模块的紧固螺钉能插入到底板的螺纹孔。

The module is pressed down to make the module fully contact with the connector of the bottom plate, and the fastening screw of the module can be inserted into the thread hole of the board.

注意：模块向下按时如果感觉到阻力过大，说明模块没卡紧下面的卡扣，应再推动模块继续下移。

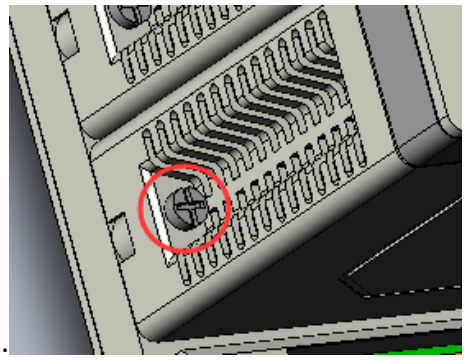
Note: if the module feels too much resistance on time, the module does not fasten the button below, and the module should continue to move down.

步骤D：

Step D:

上紧紧固螺钉。

Tighten the fastening screws.



最终，多个RT-PAC模块组合安装如图所示。

Finally, multiple RT-PAC modules are assembled and installed as shown in the figure.

4.3 常见故障及排除方法

Common fault and elimination method

当系统正常运行过程中，监控界面弹出如下对话框：

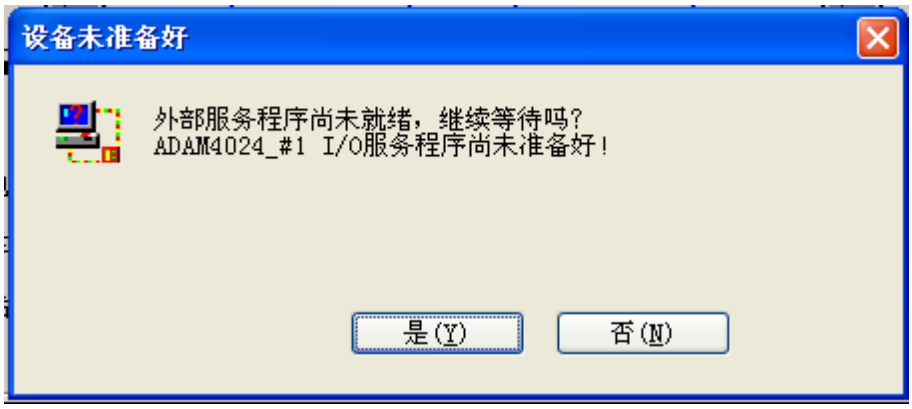
When the system is running normally, the monitoring interface pops up as follows:

排除方法：请按提示事项排查，如检查完后还出现该对话框，请与设备供应商联系。

Troubleshooting: please check according to the prompts. If the dialog box appears after the check, please contact the equipment supplier.

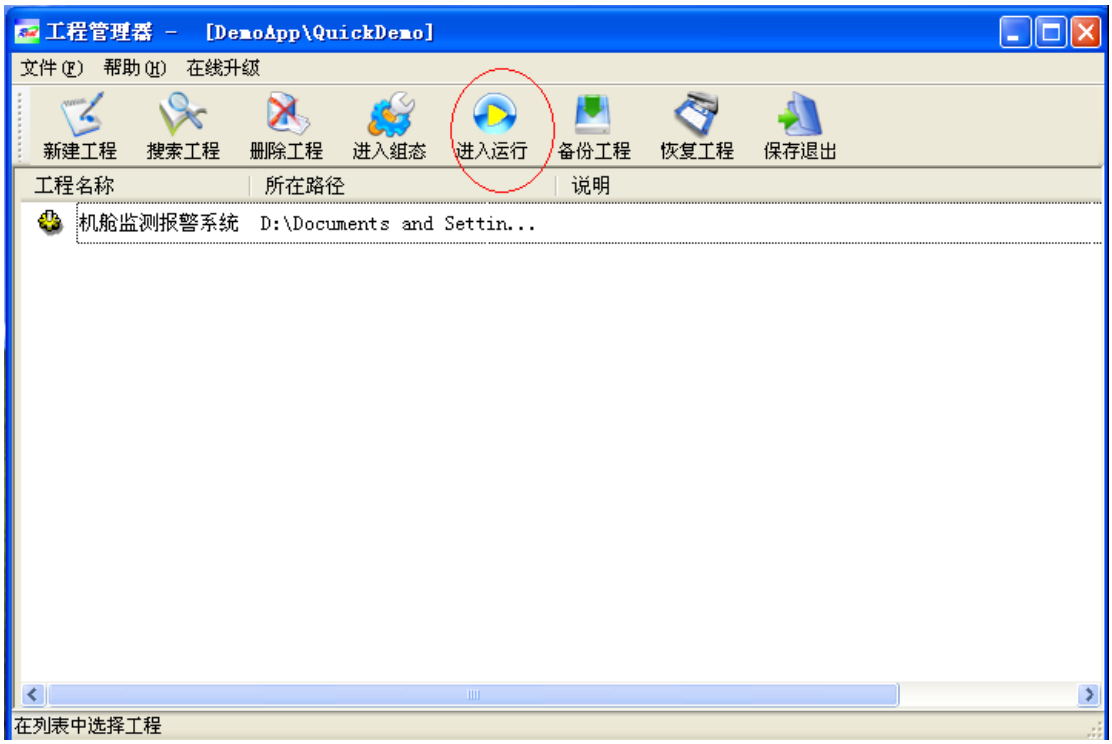
当系统正常运行过程中，监控界面弹出如下对话框：

When the system is running normally, the monitoring interface pops up as follows:



排除方法：请分别单击“是”按钮，若再次出现，请退出组态软件后再次启动，启动界面如下：

Troubleshooting: click the “Yes” button separately. If it appears again, please exit the configuration software and start again.The starting interface is as follows:



选中工程并单击“进入运行”，此时弹出密码对话框，输入密码后即可重启组态软件。

Select the project and click "enter into operation". At this time, the password dialog box is popped up, and the configuration software can be restarted after entering the password.

在检查前务必断开DC24V 电源。如果检查过程中未断开模块的电源可能会损害模块。

Be sure to disconnect the DC24V power supply before checking. If a module's power is not disconnected during the inspection, it may damage the module.

4.4 延伸屏维护

Extension screen maintenance

系统延伸报警屏如需更换或检修，请确保系统断电！

If the system extension alarm screen needs to be replaced or overhauled, please ensure that the system is power-off.

延伸屏软件错误请联系我们！

Extension screen software error please contact us!

5.联系我们

Contact us

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