Liebert® RDU-A-G2

User Manual

RDU-A G2 智能监控单元

用户手册

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RDU-A G2 Intelligent Monitoring Unit

User Manual

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艾默生网络能源有限公司为客户提供全方位的技术支持，用户可与就近的艾默生网络能源有限公司办事处或客户服务中心联系，也可直接与公司总部联系。

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艾默生网络能源有限公司

地址：深圳市南山区科技工业园科发路一号

邮编：518057

公司网址：
www.emersonnetworkpower.com.cn

客户服务热线：4008876510

E-mail：enpc.service@emerson.com

Emerson Network Power Co., Ltd.

Address: No.1 Kefa Rd., Science & Industry Park, Nanshan District 518057, Shenzhen China

Homepage: www.emersonnetworkpower.com.cn

E-mail: overseas.support@emerson.com

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第一章　产品简介

> 🕮　注意
>
> 按照 FCC 法规的 15 部分，本设备经测试发现符合 A 级数字设备限制。这些限制旨在设备运行于商业环境时，合理保护环境不受有害干扰。本设备产生、使用、并能够辐射无线电频率，如果不按照指导手册进行安装和使用，可能会对无线通讯产生有害干扰。在居民区使用该设备可能会产生有害干扰，届时需要用户自费校正干扰。

RDU-A G2 智能监控单元（简称 RDU-A G2）可实现 Web 访问、数字量输入/输出、模拟量输入/输出、传感器、UPS、空调和 PDU 等设备的接入，满足 TCP/IP、RS232/485 组网方式的要求，能根据各种应用场合的具体要求进行灵活配置。

本章主要介绍 RDU-A G2 与 RDU-A 的硬件功能差异，及其部件说明、主要功能和技术指标。

1.1　新老版本硬件功能差异

RDU-A G2 与 RDU-A 的硬件功能差异见表 1-1。

表1-1　RDU-A G2 与 RDU-A 硬件功能差异

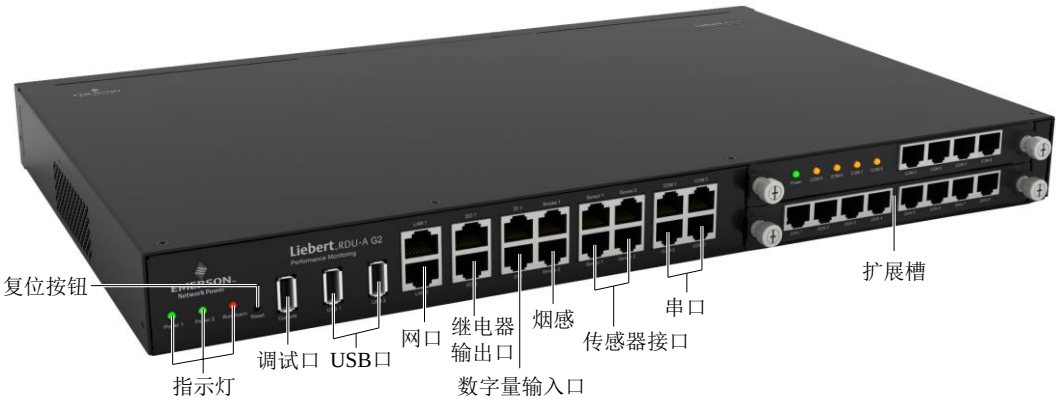
功能差异	RDU-A	RDU-A G2
电源输入	1 路外置电源	2 路内置电源，支持只接入 1 路和同时接入 2 路
扩展插槽	仅支持 1 个扩展插槽，并且只能接入 IRM-4COM 卡	支持 2 个扩展插槽，每个扩展槽都可插入 IRM-4COM 卡、IRM-8DIAI 卡、IRM-8DOAO 卡
网口	单网口且 IP 只能为手动设置	双网口且 IP 并支持 DHCP 动态获取
IRM 传感器接入	最大仅支持接入 28 个节点（28 个节点包含产品自带的 DOOR1、DOOR2、WATER、SMOKE 口的节点设备）	最大支持接入 32 个节点
USB 口	1 个，最大仅可接入 1 个 USB Modem 或摄像头	2 个，最大可支持接入 1 个 USB Modem 和 1 个摄像头，或者 2 个摄像头

1.2　部件说明

RDU-A G2 包括 RDU-A G2 主机以及选配件 IRM-4COM 卡、IRM-8DIAI 卡和 IRM-8DOAO 卡。

1.2.1　RDU-A G2 主机

RDU-A G2 主机的外观和接口如图 1-1 所示。



前视图

后视图

图1-1　RDU-A G2 外观和接口图

输入电源

RDU-A G2 主机后面板有 2 路隔离的电源输入，位置如图 1-1 所示，电源输入参数见表 1-2。

表1-2　电源输入参数

电源	输入	范围	接口
交流输入	电压	100Vac～240Vac	C14 带防脱落
	电流	＜1A	
	频率	45Hz～66Hz	

指示灯

RDU-A G2 主机后面板有 2 个指示灯，位置如图 1-1 所示，其定义见表 1-3。

表1-3　后面板指示灯定义

丝印	颜色	状态	描述
Power1	绿色	点亮	RDU-A G2 电源 1 带电
		熄灭	RDU-A G2 电源 1 断电
Power2	绿色	点亮	RDU-A G2 电源 2 带电
		熄灭	RDU-A G2 电源 2 断电

RDU-A G2 主机前面板上有 3 个指示灯，位置如图 1-1 所示，其定义见表 1-4。

表1-4　前面板指示灯定义

丝印	颜色	状态	描述
Power1	绿色	点亮	RDU-A G2 电源 1 带电
		熄灭	RDU-A G2 电源 1 断电
Power2	绿色	点亮	RDU-A G2 电源 2 带电
		熄灭	RDU-A G2 电源 2 断电
Run/Alarm	绿色/红色	绿色	无告警
		红色	告警

复位按钮

持续按下复位按钮（丝印为 Reset）4 秒，待运行/告警灯熄灭后松手，RDU-A G2 将在系统重启后恢复 IP 地址及密码为出厂默认值，默认值见表 1-6。

调试口

RDU-A G2 主机提供 1 路调试口（USB 端口，位置如图 1-1 所示），采用 USB 通信方式，通信参数见表 1-5。

表1-5　调试口通信参数

参数	波特率	数据位	奇偶校验位	停止位
数值	115200bps	8 位	无	1 位

USB 接口

RDU-A G2 主机提供 2 路 USB-A 型插座接口，可接入指定型号的摄像头或 USB Modem，位置如图 1-1 所示。

网口

RDU-A G2 主机提供 2 路网络接口，采用 10/100M 自适应的以太网口，位置如图 1-1 所示，网口默认配置见表 1-6。

表1-6　网口默认配置参数

参数 / 网卡号	IP 地址	子网掩码	默认网关
网卡 1（eth0）	192.168.0.254	255.255.255.0	192.168.0.1
网卡 2（eth1）	192.168.1.254	255.255.255.0	192.168.1.1
备注：Web 浏览器登录的密码恢复为“emerson”			

继电器输出口

RDU-A G2 主机提供 2 路继电器输出口 DO1 和 DO2，位置如图 1-1 所示，其参数见表 1-7。

表1-7　继电器输出口参数

继电器输出口	输出	范围	接口	用途
DO1/DO2	电压	11V～14V	RJ45	1．DO 输出，可接入告警灯； 2．两个端口最大总功率可支持 2.4W； 3．支持短路保护功能
	总电流	≤0.2A		

数字量输入口

RDU-A G2 主机提供 4 路数字量输入口，位置如图 1-1 所示，其参数见表 1-8。

表1-8　数字量输入口电性能参数

丝印	定义	额定输出电压	输出电流（总）	最大输出功率（总）	端口过载保护
DI1	门磁 1 接口	＋12Vdc	≤0.2A	2.4W	支持过载保护
DI2	门磁 2 接口				
Smoke1	烟雾接口 1				
Smoke2	烟雾接口 2				

传感器接口

RDU-A G2 主机提供 2 路传感器接口，包含 4 个 RJ45 接口，位置如图 1-1 所示，其参数见表 1-9。

表1-9　传感器接口电气参数

丝印	定义	额定输出电压	输出电流（总）	最大输出功率（总）	端口过载保护
Sensor1	第 1 路传感器接口	＋12Vdc	≤0.4A	4.8W	支持过载保护
Sensor2	第 2 路传感器接口				

该接口采用 RS-485 通信方式，用于接入 Emerson 智能温湿度传感器、智能温度传感器、智能数字量扩展传感器，通信参数见表 1-10。

表1-10　传感器接口通信参数

参数	波特率	数据位	奇偶校验位	停止位
数值	9600bps	8 位	无	1 位

串口

RDU-A G2 主机提供 3 个独立串口：串口 1、串口 2 和串口 3（串口 3 包含 2 个 RJ45），位置如图 1-1 所示。

该接口采用 RS-485/232C（自适应）通信方式，通信参数见表 1-11。

表1-11　串口通信参数

参数	波特率	数据位	奇偶校验位	停止位
数值	1200bps，2400bps， 4800bps，9600bps， 19200bps（可选）	5 至 8 位	Even/Odd/None/Mark/Space	1～2 位
注：不支持字长 5 位、停止位 2 位的组合方式				

1.2.2 扩展卡

IRM-4COM 卡（选配）

IRM-4COM 卡提供 4 个串口，支持以 RS232/RS485 通讯方式接入用户设备（RS284/RS232C 线序自适应），其外观如图 1-2 所示。

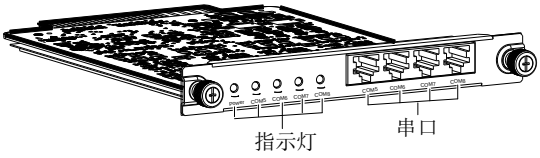


图1-2　IRM-4COM 卡

IRM-4COM 卡的指示灯定义见表 1-12。

表1-12　IRM-4COM 卡指示灯定义

丝印	颜色	状态	描述
Power	绿色	点亮	IRM-4COM 板带电
		熄灭	IRM-4COM 板掉电
COM5～COM8	黄色	闪烁	有数据收发
		熄灭	无数据收发

IRM-8DIAI 卡（选配）

IRM-8DIAI 卡提供 8 路数字量或模拟量输入接口（数字量和模拟量自适应），支持数字量/模拟量输入，其外观如图 1-3 所示。

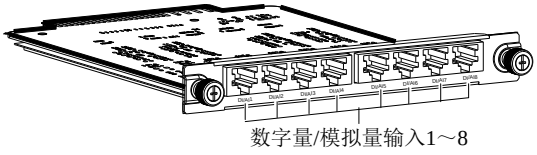


图1-3　IRM-8DIAI 卡

IRM-8DIAI 卡的接口定义见表 1-13。

表1-13　IRM-8DIAI 卡接口定义

接口名称	接口类型	丝印	定义
数字量或模拟量输入 1～8	RJ45 接口	DI/AI1～DI/AI8	数字量输入无源干结点； 模拟量输入 0～5V 或 4mA～20mA

IRM-8DOAO 卡（选配）

IRM-8DOAO 卡提供八路数字量或模拟量输出接口（数字量和模拟量自适应），支持数字量/模拟量输出，其外观如图 1-4 所示。

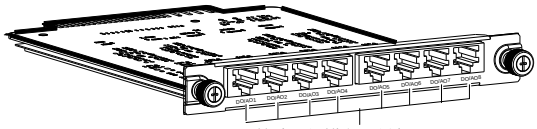


图1-4　IRM-8DOAO 卡

IRM-8DOAO 卡的接口定义见表 1-14。

表1-14　IRM-8DOAO 卡接口定义

接口名称	接口类型	丝印	定义
数字量或模拟量输出 1～8	RJ45 接口	DO/AO1～DO/AO8	数字量输出：常开触点＋常闭触点 模拟量输出：0～10V

RDU-A G2 及扩展卡线序定义

RDU-A G2 及扩展卡线序定义见表 1-15。

表1-15　RDU-A G2 及扩展卡线序定义

RJ45	DO	DI/Smoke	Sensor	COM	DOAO 卡	DIAI 卡
1	12V	12V	12V	RTS	0～10V	12V
2				NC		
3	常闭	NC	NC	TXD	常闭	AI_I
4	脱落检测	脱落检测	GND	GND	脱落检测	脱落检测
5	GND	GND			GND	GND
6	常开	DI	NC	RXD	常开	DI
7	COM		D＋	D＋	COM	
8	NC	NC	D－	D－	NC	AI_V

注：
1．RJ45 端口的线序排列为缺口向下，从左到右依次为 1～8；
2．D＋、D－为 RS485 差分信号的两种电平；
3．NC：Not Connected

1.3　主要功能

RDU-A G2 的主要功能见表 1-16。

表1-16　RDU-A G2 主要功能

主要功能	说明	
设备监控	实现对机房环境的视频监视和对不同智能设备的数据采集和处理，并且通过 Web 界面控制智能设备	
空调群控	按照一定的规则，监控和调度参与群控的各台空调，以达到降低空调能耗、延长空调整体寿命、避免群组空调间竞争运行的目的	
能耗管理	支持功率模式和电能模式的 PUE 及系统负载百分比的统计，并能显示其实时值和历史数据	
告警管理	当前告警	实时告警显示、进行当前告警确认
	历史告警	历史告警查询
	告警通知配置	1．可根据用户要求进行定制，自定义告警通知内容； 2．用户可以选择通知方式接收不同设备的不同级别的告警信息； 3．通知方式包括电子邮件、短消息、电话和 RDU 多媒体语音通知系统； 4．Email 支持 SSL 功能； 5．提供告警测试功能，测试用户是否接收到告警提醒信息； 6．根据用户配置定时发送系统运行状态

主要功能	说明				
告警管理	告警联动	1．可根据用户要求进行定制； 2．DO1 告警输出； 3．可以结合设备信号，参数和告警来控制设备； 4．有如下逻辑组件：			
		1）AND 代表与	2）OR 代表或	3）NOT 代表非	4）XOR 代表异或
		5）GT 代表大于	6）LT 代表小于	7）DS 代表延时	
数据管理	设备数据	设备主要数据查询			
	历史数据	历史数据查询			
	日志数据	日志数据查询			
	清除数据	清除历史数据和日志数据			
配置管理	设备管理	1．可动态添加、修改和删除设备，最多支持 7 个智能设备的添加； 2．可安装卸载设备类型，支持第三方设备接入			
	设备信号配置	在线修改设备名称、信号名称和告警级别			
	批量配置	上传、下载配置文件及系统文件			
系统设置	监控单元	采集 RDU-A G2 系统信息			
	网络设置	1．IP、子网掩码、网关、DNS 等相关网络信息设置； 2．上层监控系统 RDU-M 机房管理器访问 RDU-A G2 的权限设置； 3．远程服务设置			
	用户管理	增加、修改和删除用户信息			
	时间校准	校准 RDU-A G2 实时时钟			
	恢复默认	重启 RDU-A G2 和恢复默认配置			
	站点信息设置	在线修改站点信息			
	授权码管理	通过授权码完成 RDU-A G2 功能和接入能力的扩展			
	系统升级	在线升级应用程序			
	标题栏设置	设置 Web 页面上方的标题和 Logo 图片			
帮助信息	关于 RDU-A G2	显示 RDU-A G2 的产品序列号、特征码及版本信息，并提供用户手册及工具软件的下载			

1.4　技术指标

1.4.1　环境指标

RDU-A G2 的环境指标见表 1-17。

表1-17　环境条件

项目	要求
使用场所	通常为数据中心或者计算机房，一般有空调环境
工作温度	－10℃～＋60℃
相对湿度	5%RH～95%RH，无冷凝
使用环境	尘埃满足 GR-63 的室内标准。无腐蚀性气体、可燃性气体、油雾、水蒸气、滴水或盐分等
大气压力	70kPa～106kPa
存储温度	－40℃～＋70℃
冷却方式	自然冷
配电网络	TT/TN
防护等级	IP20

1.4.2　机械指标

RDU-A G2 的机械指标见表 1-18。

表1-18　机械指标

对外型号	度量	数值	误差
IRM-HOST2	高度	43mm	＜±0.5 mm
	宽度	440mm	＜±1 mm
	深度	311mm	＜±1 mm
	重量	＜8kg	
IRM-4COM IRM-8DIAI IRM-8DOAO	高度	20mm	＜±0.5 mm
	宽度	158mm	＜±1 mm
	深度	199mm	＜±1 mm
	重量	＜1kg	

1.4.3　性能指标

RDU-A G2 的性能指标见表 1-19。

表1-19　性能指标

接入部件	线缆标准	接入距离（单位：m）	最大接入数量/接入点
SENSOR1 口接入节点	标准 4 类双绞线	≤100	16[1]
SENSOR2 口接入节点	标准 4 类双绞线	≤100	16[2]
DI 口接入节点	标准 4 类双绞线	≤100	4[3]
DO 口接入节点	标准 4 类双绞线	≤100	2[4]
通过串口组网支持的设备类型数量	/	/	11[5]
通过网络（TCP IP/SNMP）组网支持的设备类型数量	/	/	16[6]
支持接入智能设备数量	标准 4 类双绞线（串口）	≤100（串口）	32[7]

注：

[1]：温度、温湿度、门磁、水浸、4DI 自身、4DO 自身、DO 设备等每个传感器或设备按照 1 个节点计算，烟感和红外每个传感器按照 4 个节点计算；只能接入组内地址为 1 设备；

[2]：接入能力同[1]，但只能接入组内地址为 2 的设备；

[3]：DI 包括机身自带 DI1、DI2、Smoke1、Smoke2 四个接口；

[4]：声光告警灯有两路接入点 DO1、DO2，两路接入点亦可作为两路开关量输出以做它用；

[5]：通过串口组网，3 个默认串口 + 4（4COM 扩展卡）* 2，最大支持 11 种设备类型；

[6]：通过网络组网（TCP IP/SNMP）组网，标准支持接入 16 种设备类型，通过购买可扩展至 32 种设备类型；

[7]：RDU-A G2 标准版本支持接入 16 个智能设备，不包括默认设备、8DIAI 及 8DOAO 设备。其中，单个 COM 级联接入设备数量不超过 4 个。通过购买可扩展至 32 个智能设备

1.4.4　产品认证

RDU-A G2 满足 CE 宣称。

第二章　硬件安装

本章介绍 RDU-A G2 的硬件安装，主要包括安装准备，安装 RDU-A G2 主机，安装扩展卡及传感器等附件。

2.1 安装准备

2.1.1 注意事项

安装 RDU-A G2 时，应注意以下事项，以避免出现意外事故对人身及设备造成伤害。

- 对 RDU-A G2 的所有安装操作，都必须在断电情况下进行
- 确保外部设备接入到正确的 RDU-A G2 端口
- 在安装过程中，安装人员需佩戴防静电手腕
- 妥善布线，确保没有重物压在电源线上，不要踩踏线缆

2.1.2 环境要求

运行环境

RDU-A G2 必须安装在室内。具体要求参见表 1-17。

防静电

为了将静电影响降到最低点，需要采取下列措施：

- 机房内保持适当的温度和湿度（参见表 1-17）
- 当人体接触电路板前，应佩戴防静电手腕，穿防静电工作服。如果在现场无防静电手腕和防静电工作服，则需用水将手部冲洗干净，并擦干

抗干扰

为了抗干扰，需要采取下列措施：

- 避免将 RDU-A G2 工作地和电力设备的接地装置或防雷接地装置合用，两者尽可能远离
- 远离强功率无线电发射台、雷达发射台、高频大电流设备
- 必要时采取电磁屏蔽的方法

2.1.3 空间要求

- 将 RDU-A G2 放置在远离热源的地方
- 建议将 RDU-A G2 安装在 19 英寸标准机柜中，在设备周围，至少留有 10mm 的空间，确保有足够的散热空间。

2.1.4 安装工具

安装工具见表 2-1。

表2-1　安装工具

工具名称	规格型号	用途
螺丝刀（十字）	100mm、200mm	安装 RDU-A G2 主机挂耳、扩展槽挡板等
数字万用表	3 位数字显示	检测电气连接

2.2　安装 RDU-A G2 主机

2.2.1　机械安装

RDU-A G2 主机采用机柜式安装。

安装步骤如下：

1．确认安装机柜已被固定好，机柜内外没有影响安装的障碍物。

2．用所附 M4 螺钉将挂耳固定在 RDU-A G2 主机两侧，RDU-A G2 的挂耳支持两种安装方式：前端安装和后端安装，分别如图 2-1 和图 2-2 所示。

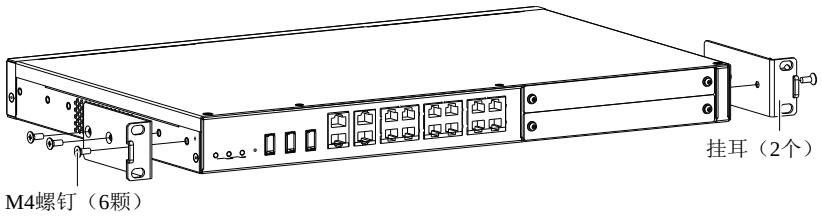


图2-1　前端安装挂耳

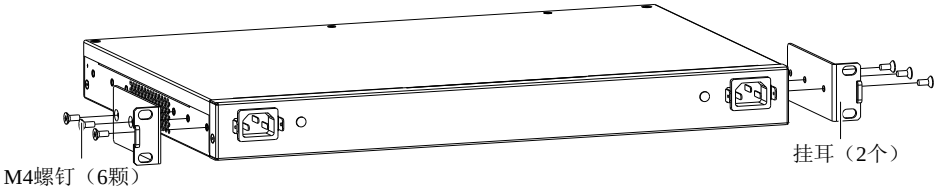


图2-2　后端安装挂耳

3．用 M6 浮动螺母将 RDU-A G2 主机通过两侧的挂耳固定在机架上。

2.2.2　电气连接

RDU-A G2 主机电气连接步骤如下所示：

1．根据供电端接口类型选择 C14 或国标线缆（RDU-A G2 附件），取出对应的电源线，一端连接到 RDU-A G2 主机的电源输入接口，并将如图 2-3 所示的防脱扣卡上。

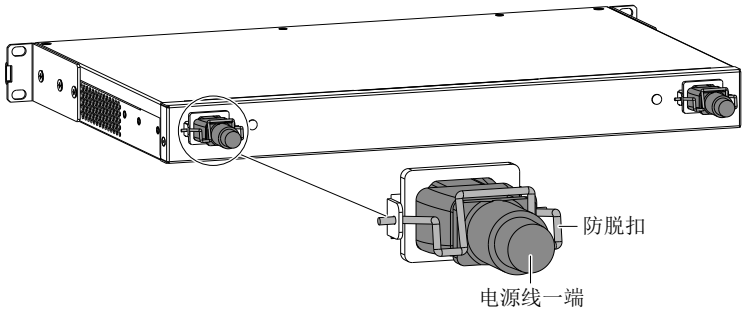


图2-3　电源防脱扣示意图

2．确保连线正确后，电源线另外一端插头接入供电电源。

🕮　注意

RDU-A G2 主机提供双电源备份供电，可选择一路供电或两路供电。输入电压：100Vac～240Vac，频率：45Hz～66Hz。

2.3 安装扩展卡及传感器附件

> 🕮　注意
>
> IRM-4COM/IRM-8DIAI/IRM-8DOAO 扩展卡为选配件，用户可选择是否购买安装。

2.3.1 安装扩展卡

扩展卡包括 IRM-4COM、IRM-8DIAI 和 IRM-8DOAO，安装步骤如下：

拆除 RDU-A G2 主机前面板上扩展槽（Slot1 或 Slot2）的挡板，将扩展卡插入 RDU-A G2 对应扩展槽内，并拧紧两侧螺钉，如图 2-4 所示。

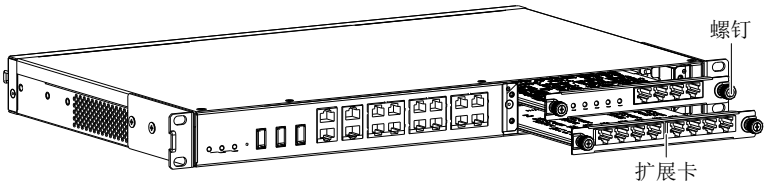


图2-4　扩展卡安装示意图

2.3.2 安装智能传感器

智能传感器包括：IRM-S01T 智能温度传感器（简称 IRM-S01T）、IRM-S02TH 智能温湿度传感器（简称 IRM-S02TH）、IRM-S04DI Phoenix 接口智能数字量输入传感器（简称 IRM-S04DI）和 IRM-S04DIF RJ45 接口智能数字量输入传感器（简称 IRM-S04DIF），其外观如图 2-5 所示。

IRM-S01T

IRM-S02TH

IRM-S04DI

IRM-S04DIF

图2-5　智能传感器

安装步骤

智能传感器的安装步骤参见对应智能传感器的用户手册：

IRM-S01T 参见《IRM-S01T 智能温度传感器用户手册》；

IRM-S02TH 参见《IRM-S02TH 智能温湿度传感器用户手册》；

IRM-S04DI 参见《IRM-S04DI Phoenix 接口智能数字量输入传感器用户手册》;

IRM-S04DIF 参见《IRM-S04DIF RJ45 接口智能数字量输入传感器用户手册》。

2.3.3 安装物理传感器

物理传感器包括：烟雾传感器、水浸传感器、红外传感器和门磁传感器。

烟雾、水浸、红外和门磁传感器有两种安装方式：

- 直接接入 RDU-A G2 后面板上的 DI 接口（丝印为 DI1、DI2、Smoke1 和 Smoke2，每个口可任意接入烟雾、水浸、红外和门磁的一种），接线线序见表 1-15。
- 通过 IRM-S04DI 或 IRM-S04DIF 接入 RDU-A G2：将传感器接入 IRM-S04DI 或 IRM-S04DIF 的数字量输入口，接线线序参见《IRM-S04DI Phoenix 接口智能数字量输入传感器用户手册》或《IRM-S04DIF RJ45 接口智能数字量输入传感器用户手册》。

第三章　RDU-A G2 的 Web 界面

本章详细介绍如何通过 Web 登录 RDU-A G2 及 RDU-A G2 的相关功能。包括登录准备、登录 RDU-A G2、RDU-A G2 主页以及菜单项。

3.1　登录准备

为保证 RDU-A G2 页面功能的正常使用，请参照本节内容选择并设置浏览器选项。

3.1.1　检查 IP 地址连通性

通过 Web 登录 RDU-A G2 前请首先确认 RDU-A G2 的 IP 地址，并测试其连通性。有关测试方法，参见 *4.2　常见问题处理*一节中的问题 5。

3.1.2　检查浏览器版本

建议使用的浏览器版本包括：**IE10** 或 **IE11**。

3.1.3　检查浏览器设置

检查 IE 常规设置

双击 IE 图标运行该软件，点击菜单**工具->Internet 选项**，点击**常规**页签中的**设置（S）**，将**检查所存网页的较新版本**选择为**每次访问网页时（E）**检查，如图 3-1 所示。

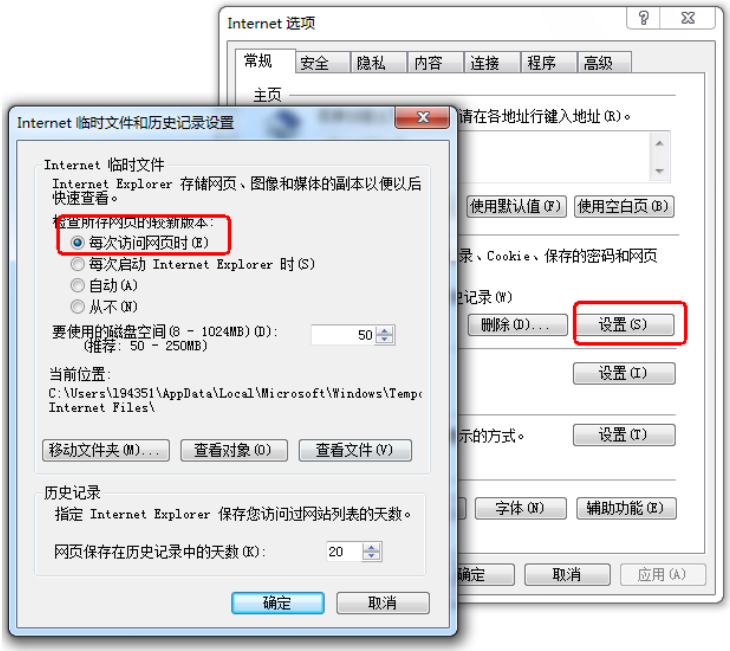


图3-1　常规设置

检查 IE 代理设置

1．双击 IE 图标运行该软件，点击菜单**工具→Internet 选项**，然后选择**连接**页签，弹出如图 3-2 所示页面。

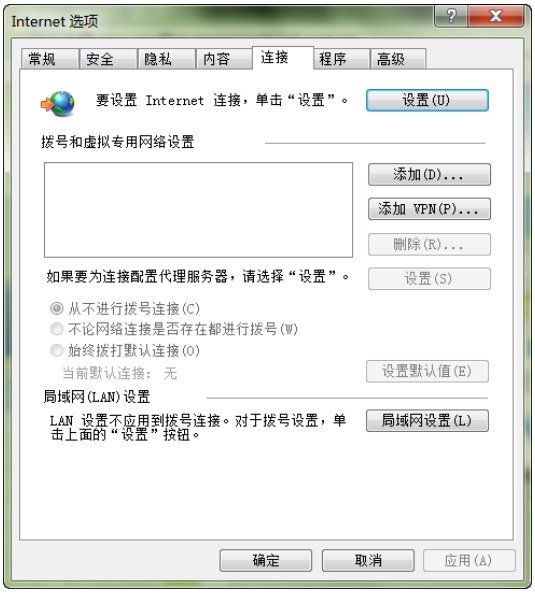


图3-2　选择**连接**页签

2．如图 3-2 所示的页面中，点击**局域网设置（L）**，弹出如图 3-3 所示页面。

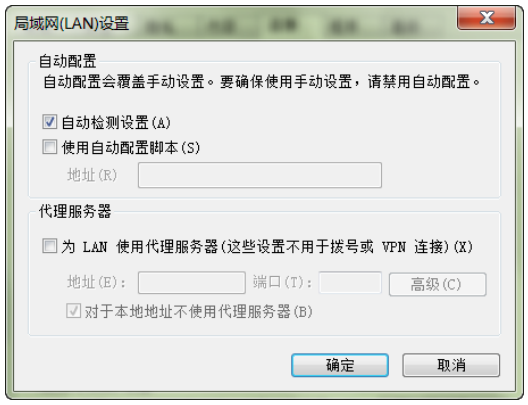


图3-3　局域网设置

3．咨询您所在网络的网络管理员，询问其是否需要进行代理配置及配置方法，如果无需代理请不要勾选任何选项。

检查 IE 安全设置

1．双击 IE 图标运行该软件，点击菜单**工具→Internet 选项**，然后选择**安全**页签，弹出如图 3-4 所示页面。

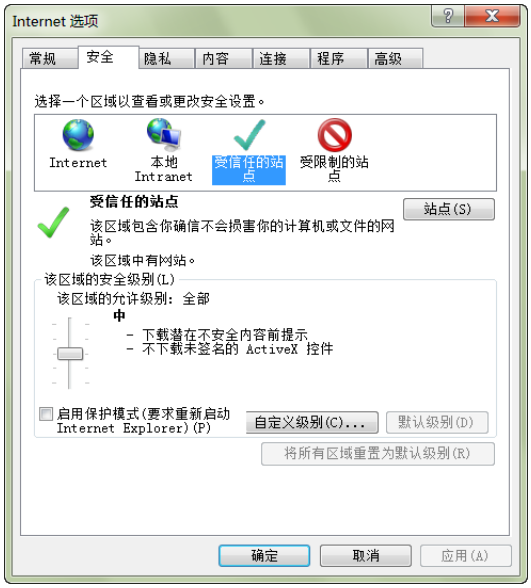


图3-4　安全设置 1

2．如图 3-4 所示，选择**受信任的站点**，点击**自定义级别（C）**，弹出如图 3-5 所示对话框。

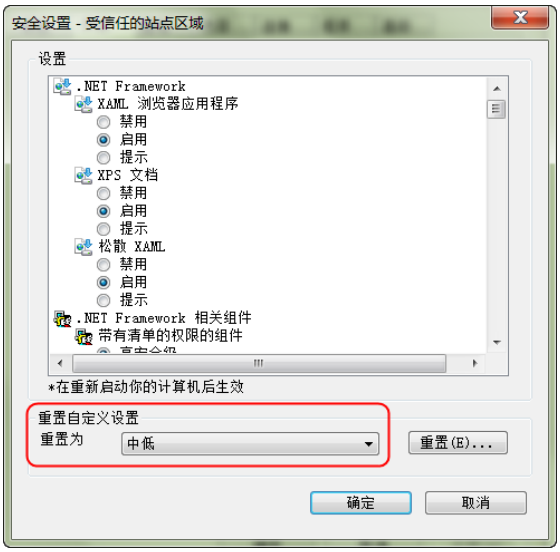


图3-5　安全设置 2

3．如图 3-5 所示，将**重置自定义设置**选为“中低”，并点击**重置（E）**按钮结束重置自定义设置。

4．如图 3-6 所示，设置启用**文件下载**。

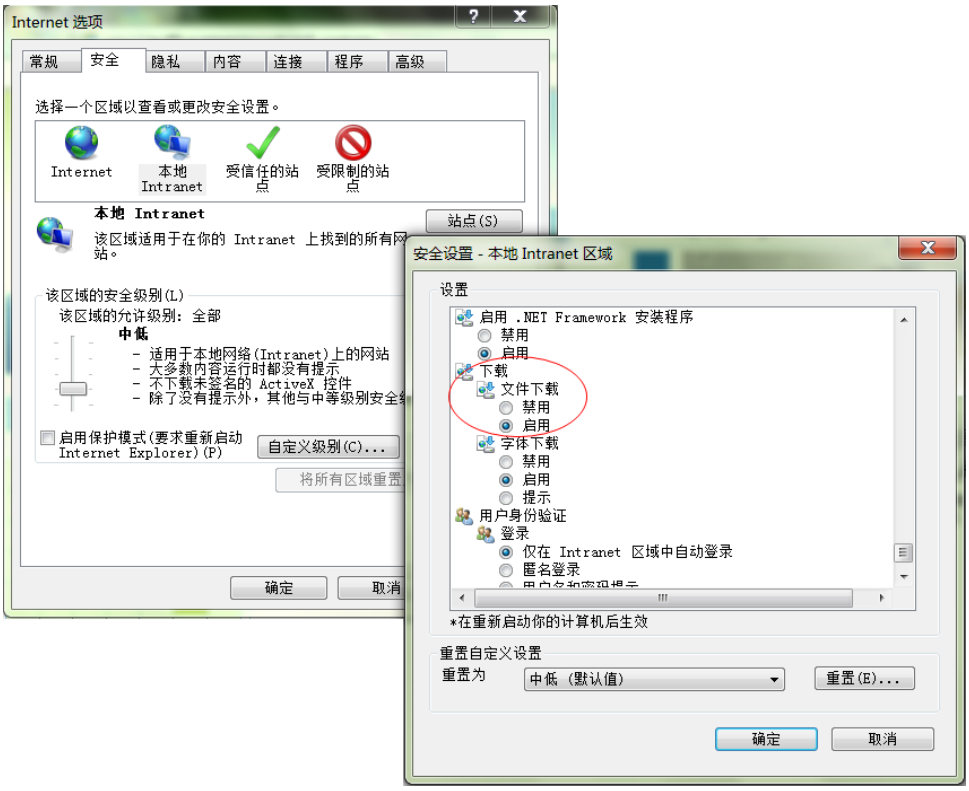


图3-6　启用文件下载

5．如图 3-7 所示，设置启用**对未标记为可安全执行脚本的 ActiveX 控件初始化并执行脚本**。

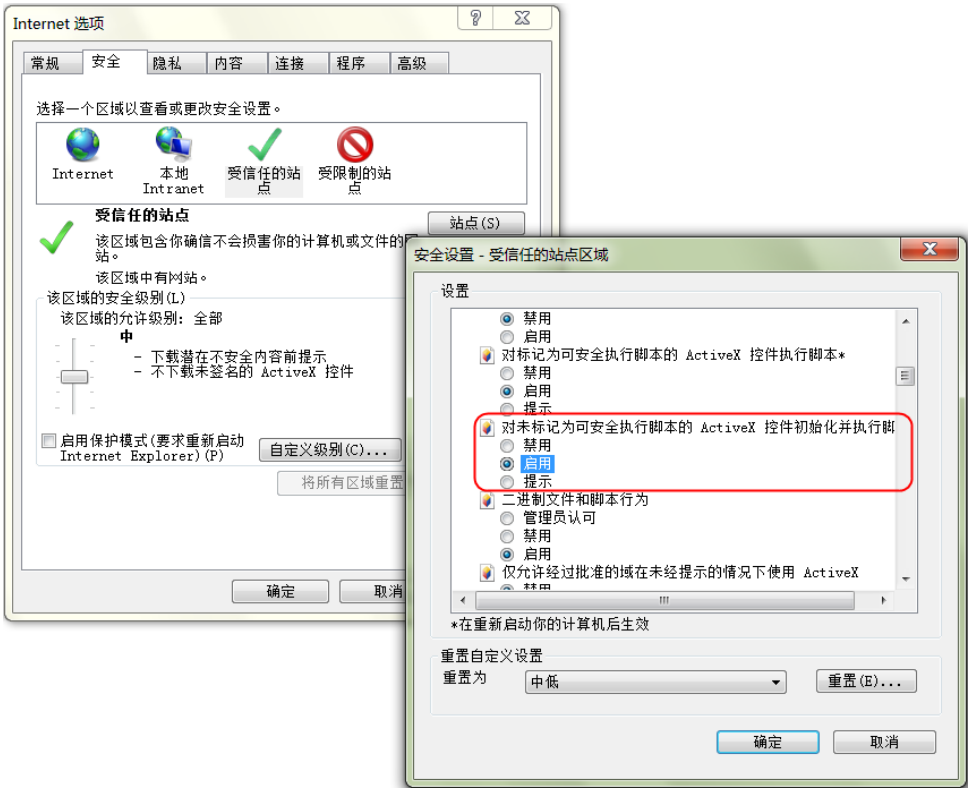


图3-7　启用 ActiveX 控件

6．如图 3-8 所示，将 RDU-A G2 的 IP 地址添加到可信站点的列表中。

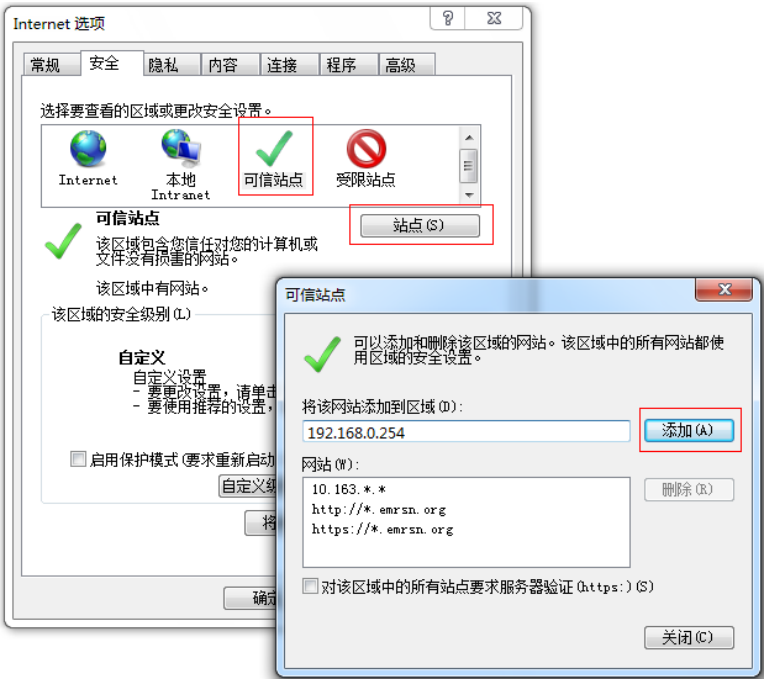


图3-8　添加可信站点

3.2　登录 RDU-A G2

3.2.1　授权开机

1．首次登录 RDU-A G2 时，启动 IE，在地址栏中输入 RDU-A G2 的 IP 地址（LAN1 默认 IP 为 192.168.0.254；LAN2 默认 IP 为 192.168.1.254），弹出授权开机页面，如图 3-9 所示，若未出现授权开机页面，参见 *4.2　常见问题处理*中的问题 5 进行处理。

图3-9　授权开机页面

2．拨打艾默生网络能源客户服务电话：400-887-6510，提供特征码至客服人员，即可获取开机密码。

3．在开机密码文本框里输入获得的开机密码，点击**确定**按钮，若开机密码正确，系统自动跳转到登录页面（见图 3-10）。

3.2.2　登录页面

1．启动 IE，在地址栏中输入 RDU-A G2 的 IP 地址，出现登录页面，如图 3-10 所示，若未出现登录页面，参见 *4.2 常见问题处理*中的问题 5 进行处理。

清澈蓝

深海蓝

图3-10　RDU-A G2 登录页面

2．在登录页面中，点击■或■选择喜欢的主题风格，■代表清澈蓝；■代表深海蓝，如图 3-10 所示。

3．输入用户名和密码（默认用户名：admin，默认密码：emerson）并单击**登录**按钮，弹出主页如图 3-12 所示。如果正确输入用户名和密码后，仍然无法访问主页，参见 *3.1.3　检查浏览器设置*，对 IE 浏览器重新进行设置。

3.2.3　取回密码

若忘记用户密码，可在登录页面，单击**忘记密码**按钮，屏幕显示取回密码页面，如图 3-11 所示。

图3-11　取回密码页面

输入您的用户名，单击**取回密码**按钮，您的密码会发送到您之前设置的邮箱或手机；点击**返回登录**按钮取消操作。

📖　注意

1．您只有事先在**短信模块和邮件服务器配置**页面正确设置了邮件或短信参数，才能收到系统发出的密码，具体的设置方法见 *3.4.4　告警管理*中的*告警通知配置*。

2．取回的密码是系统随机产生的新密码，请成功登录后自行进行修改。

3.3　RDU-A G2 主页

RDU-A G2 主页分为按设备浏览和按位置浏览，登录成功后，默认显示为按位置浏览，如图 3-12 所示。

3.3.1　按位置浏览

如图 3-12 所示，点击菜单项上方**按位置浏览**选项卡，在右侧的显示区将显示按位置浏览页面，用户可以根据机房设备的物理位置自定义显示一个平面布局图用于集中显示，经过简单的配置后，效果如图 3-12。

1．菜单项　　2．可控状态　　3．各级别实时告警数目　　4．系统标题

5．注销[当前用户]　　6．Logo　　7．**设置信号**按钮　　8．设备过滤选项

9．实时告警显示列表　　10．告警提醒设置　　11．校时链接

图3-12　RDU-A G2 主页（按位置浏览）

点击图 3-12 中**设置信号**按钮使主页进入设置状态，如图 3-13 所示。

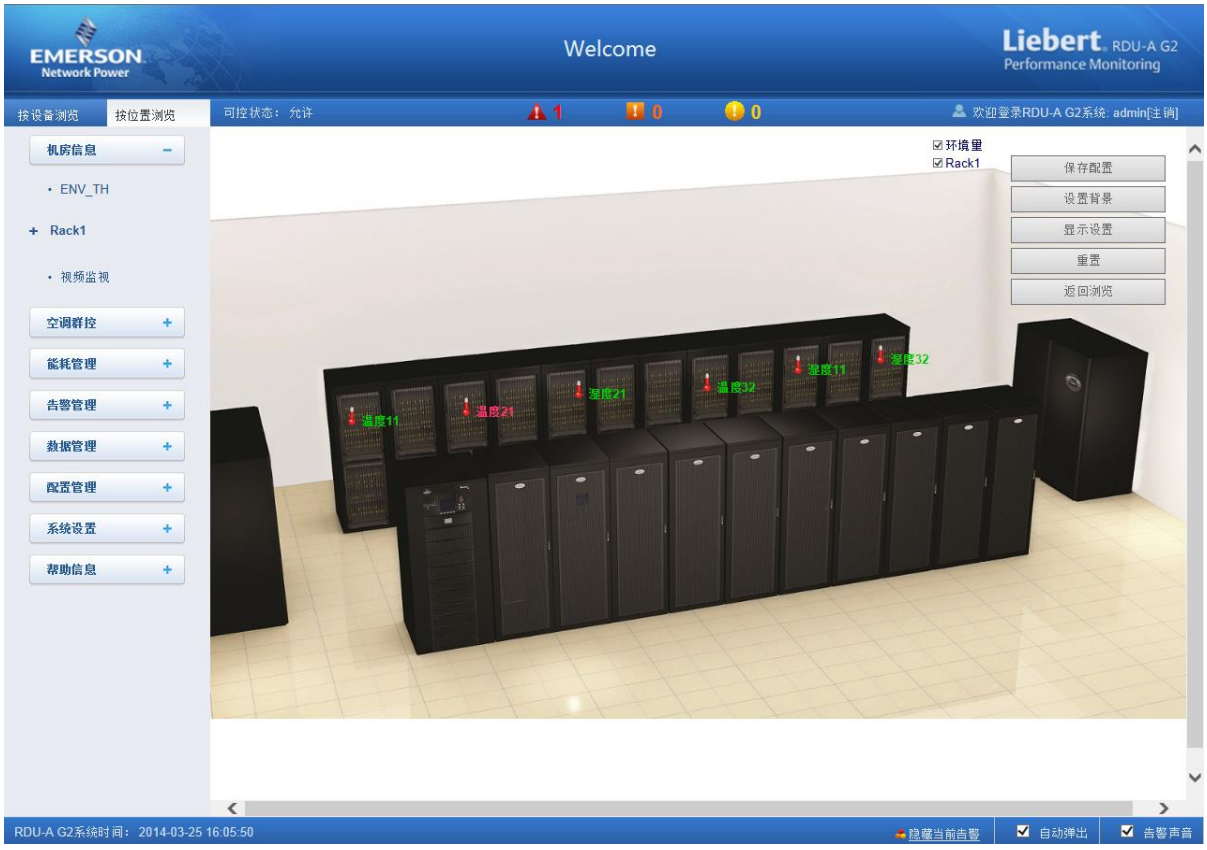


图3-13　设置页面

主页进入设置状态后，设置方法如下：

1．背景设置

点击**设置背景**按钮，弹出如图 3-14 所示页面。

- 点击**浏览…**按钮选择背景图片，选定之后，**预览**区将显示预览效果。
- 点击**上传**按钮，完成上传之后，主页将显示该背景图片。

图3-14　设置背景

📖　注意

只允许上传.gif、.jpg 及.bmp 格式的图片，最大 500K。

2．显示设置

点击**显示设置**按钮，弹出如图 3-15 所示页面。

- 选择**信号显示方式：鼠标悬浮**、**始终显示**。
- 选择**设备图标**是否显示。
- 选择设备名称后，该设备的信号将显示在下方的方框内，用户可根据需要选择要显示的设备信号，但最大不超过 4 个。

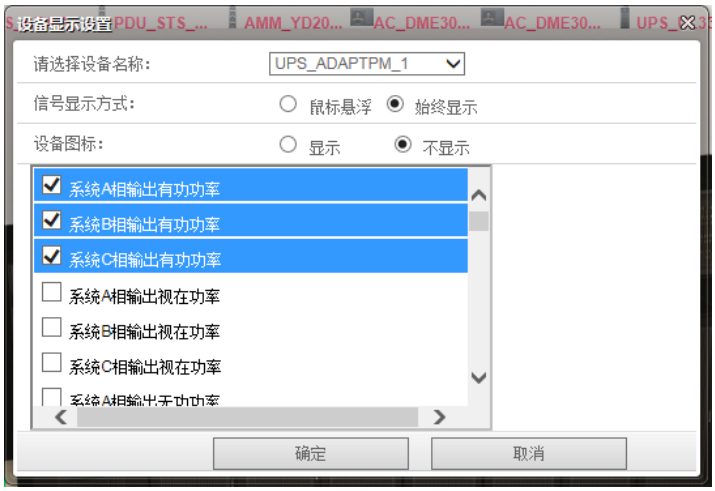


图3-15　显示设置

📖　注意

1．**信号显示方式**和**设备图标**显示方式对当前所选设备有效，不同设备可单独设置不同的显示方式。

2．设置温湿度和 DI 信号的显示方式时，选择“其他设备及传感器”进行统一设置。

3．自定义设备位置

主页进入设置状态后，在主页上显示的设备（信号）图标可按住鼠标左键进行自由拖拽。

4．重置

点击**重置**按钮，恢复按位置浏览页面到初始化状态。

5．保存配置

点击**保存配置**按钮，完成所有配置的保存并返回到浏览状态。

6．返回浏览

点击**返回浏览**按钮，由配置状态返回到浏览状态。

📖　注意

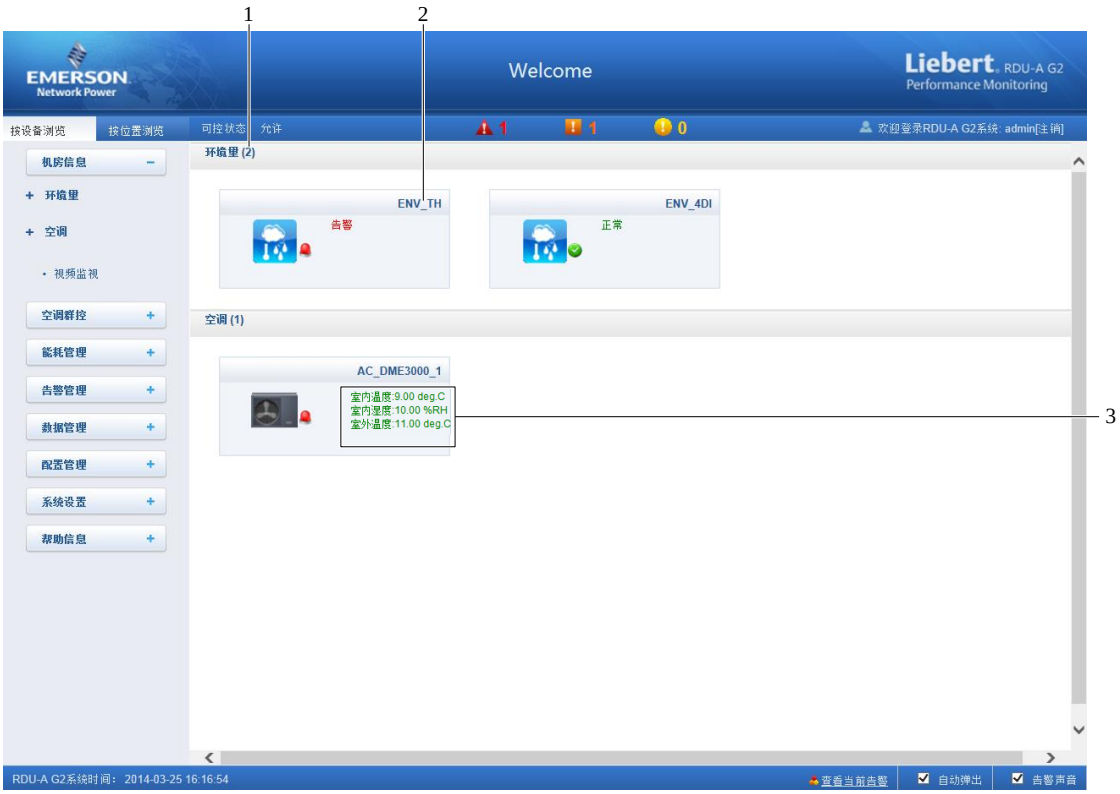
1．除上传背景外，只有在保存配置后，所有的配置才能生效并显示。

2．除上传背景外，如果配置完毕后直接点击**返回浏览**，所有的配置信息会丢失。

3.3.2　按设备浏览

如图 3-12 所示，点击菜单项上方**按设备浏览**选项卡，在右侧的显示区将显示按设备浏览页面，通过简单配置后，页面会按设备类型显示相应的信息，如图 3-16 所示。

有关具体配置方法，参见 *3.3.1　按位置浏览*一节中**显示设置**按钮相关内容的介绍。



1．该类型的设备数量　　2．设备名称　　3．设备信号值

图3-16　RDU-A G2 主页（按设备浏览）

📖　注意

1．温湿度和 4DI 在按设备浏览页面中仅显示整体状态。

2．其他设备最多配置 4 个信号用于在页面上个性化显示。

3.3.3　校时链接

页面左下方显示 RDU-A G2 系统时间，单击 RDU-A G2 系统时间，会跳转至时间校准页面，有关具体操作，详见 *3.4.7　系统设置*一节中的*时间校准*。

3.3.4　解除超时

当页面超过 **15 分钟**没有操作时，页面将变成不可控状态，如图 3-17 所示。

图3-17　可控状态

点击【**解除**】**超时**后，出现如图 3-18 所示的输入框，输入密码后，大约 5 秒后可控状态恢复正常。

图3-18　用户安全验证对话框

3.3.5　注销登录

点击主页右上角**注销**链接，出现如图 3-19 所示提示框，点击**确认**后可安全退出。

图3-19　注销登录

3.3.6　实时告警提醒设置

实时告警显示列表默认收缩于页面底部，可参照图 3-12 进行如下操作：

1．点击**查看当前告警**手动弹出实时告警显示列表；

2．勾选**自动弹出**复选框使实时告警列表在告警产生时自动弹出；

3．勾选**告警声音**复选框使系统在有告警的时候通过浏览器播放告警声音。

当实时告警被全部确认后，已开启的告警声音会自动停止，直到有新的告警产生。

3.4　菜单项

在 RDU-A G2 主页中，菜单项包括**机房信息**、**空调群控**、**能耗管理**、**告警管理**、**数据管理**、**配置管理**、**系统设置**和**帮助信息**。

3.4.1　机房信息

点击左边的**机房信息**菜单，将出现子菜单，根据**按设备浏览**和**按位置浏览**两种选择分别按设备类型和设备位置进行分类并显示，点击具体的设备会在右侧显示该设备的相关信息，包括**设备总览**、**采集信号**、**控制信号**、**设置信号**、**告警信号**。

📖　注意

1．**机房信息**中 ENV-TH 设备为虚拟设备，表示 RDU-A G2 机身上接入的所有温度及温湿度传感器且该名称不可变更。

2．**视频监视**子菜单默认不显示，当用户接入视频设备后，该菜单会自动显示。

设备总览

选择**设备总览**页签，点击**编辑**按钮可自定义总览页面，如图 3-20 所示。

1．配置控件图标　2．删除控件图标　3．返回浏览图标　4．可用控件列表　5．保存配置图标

6．同类型设备有效图标　7．恢复默认图标　8．查看历史曲线图标　9．历史数据选择图标　10．返回实时曲线图标

图3-20　设备总览

在编辑状态，点击  图标可恢复默认；点击  图标批量配置同类型其他设备；点击  图标进行保存；点击  图标将页面转换为浏览状态。

📖　注意

1．**设备总览**页面根据不同的设备类型有不同的默认控件显示方式，点击恢复默认图标即恢复到此状态。

2．某些类型的设备拥有特定的状态图，这些状态图不可删除且不可配置，仅能更新状态图位置信息，例如空调、UPS 等。

采集信号

点击**采集信号**页签，可进入采集信号页面显示选定设备的采集信号，如图 3-21 所示。

图3-21　采集信号

1．如果某个信号处于告警状态则该信号所在行显示为红色。

2．用户可单击相应的信号名进行修改或恢复默认，如图 3-22 所示。

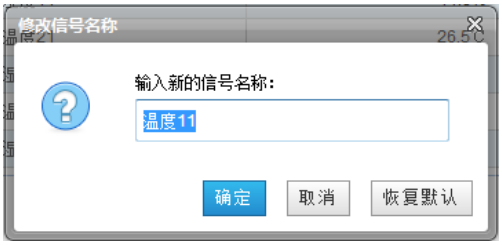


图3-22　修改信号名称

📖　注意

针对 ENV-TH 和 ENV-4DI 设备有如下说明：

1．修改**采集信号**的名称后，**控制信号**、**设置信号**和**告警信号**名称会联动修改；

2．**控制信号**、**设置信号**和**告警信号**页面禁止修改信号名称。

控制信号

点击**控制信号**页签，进入控制信号页面显示选定设备的控制信号，如图 3-23 所示。

图3-23　控制信号

1．点击**设置**按钮对该设备进行控制。

2．针对控制信号的名称（ENV-TH 和 ENV-4DI 除外），用户可点击选择相应的信号名进行修改或恢复默认，如图 3-23 所示。

设置信号

点击**设置信号**页签，进入设置信号页面显示选定设备的设置信号，如图 3-24 所示。

图3-24　设置信号

1．可针对信号进行批量设置，且每次最大批量设置 16 个信号。

2．针对**设置信号**的名称（ENV-TH 和 ENV-4DI 除外），用户可点击选择相应的信号名进行修改或恢复默认，如图 3-22 所示。

📖　注意

除 ENV-TH 设备仅显示有效的设置信号外，其余设备显示该设备所有的设置信号。

告警信号

点击**告警信号**页签，可进入告警信号页面显示选定设备的告警信号，如图 3-25 所示。

图3-25　告警信号

1．可针对告警信号的级别进行批量设置，每次最大批量设置 16 个信号。

2．针对**告警信号**的名称（ENV-TH 和 ENV-4DI 除外），用户可点击选择相应的信号名进行修改或恢复默认，如图 3-22 所示。

🕮　注意

ENV-TH 设备仅显示有效的告警信号外，其余设备显示该设备所有的告警信号。

视频监视

点击**机房信息**菜单下的**视频监视**子菜单，弹出如图 3-26 所示页面。

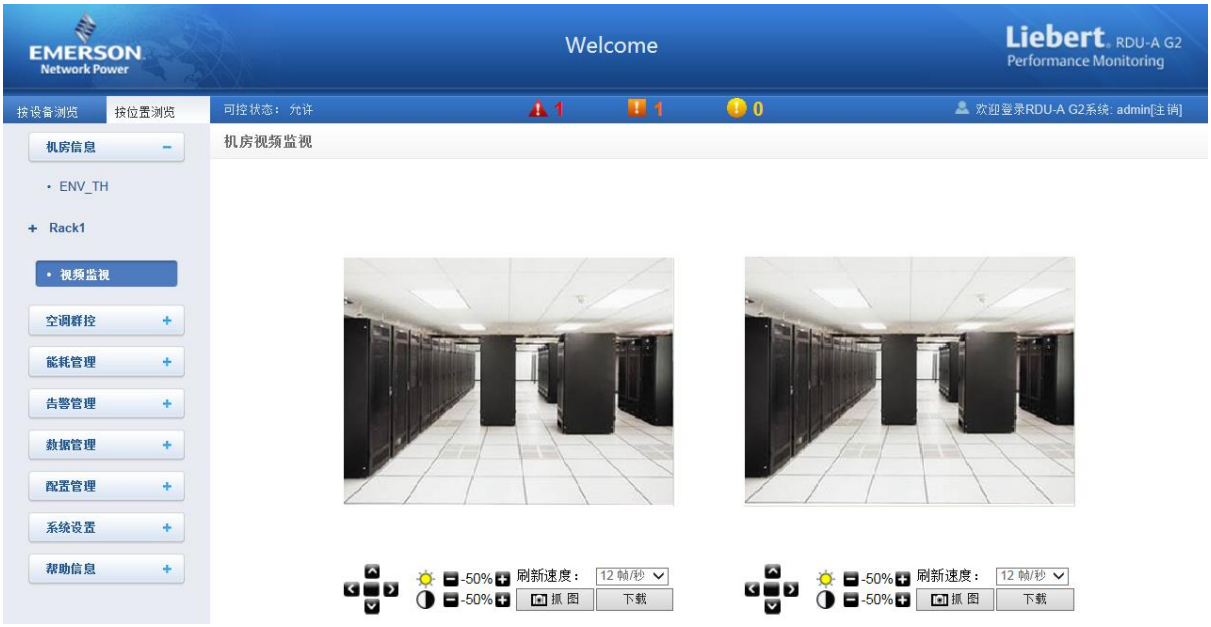


图3-26　视频监视

RDU-A G2 支持两路 USB 摄像头，图标用于调节摄像头的转向；用于调节图像的亮度；用于调节图像的对比度；**刷新速度**可通过下拉框进行选择，同时支持**抓图**和**下载**功能。

🕮　注意

1．调节摄像头转向功能只针对 RDU-A G2 专用的具有转向功能的摄像头；

2．使用视频监视功能时，请检查确认是否安装 JRE（Java Runtime Environment，版本要求为 1.5.0 及以上）。

3.4.2　空调群控

空调群控功能是按照一定的规则，监控和调度参与群控的各台空调，以达到降低空调能耗、延长空调整体寿命、避免群组空调间竞争运行的目的。

在 RDU-A G2 主页中，点击左边**空调群控**菜单，可见 2 个子菜单，包括：**运行状态**和**群控设置**。

运行状态

点击**空调群控**菜单下的**运行状态**子菜单，弹出如图 3-27 所示页面。

图3-27　运行状态页面

运行状态页面显示了所有空调群组中空调的主要运行参数。

群控设置

> 注意
>
> RDU-A G2 的空调群控功能分为两个版本：标准版本和授权版本。标准版本具有 RDU-A G2 标准软件所配置的空调群控功能；授权版本则是用户另行购买后发放的软件版本。

1．群控参数设置

点击**空调群控**菜单下的**群控设置**子菜单，弹出群控参数设置页面，标准版如图 3-28 所示，授权版如图 3-29 所示。

图3-28　群控参数设置页面（标准版）

图3-29　群控参数设置页面（授权版）

关于 RDU-A G2 群控功能说明如下：

标准版本只支持 1 个空调群组，默认为**[1]TMW**，不提供增加和删除群组功能并且群组名称不可变更，授权版本则不受此限制。

在授权版本中点击**空调群组**列表中的**单击创建空调群组**链接，可以增加新的空调群组，在完成群组参数配置后点击**增加群组**按钮保存设置，此时在左边的**空调群组**列表中会出现增加的群组。

群组参数设置页面的参数说明详见表 3-1；

在空调参数设置页面增加、修改或删除群组中的空调，请参见本节中的 *2．空调参数设置*；

在授权版本中选择**空调群组**列表中需要修改的空调群组，与增加群组步骤类似，在群组参数设置页面修改群组参数，在空调参数设置页面设置群组中的空调参数，完成修改后，点击**修改群组**按钮，保存设置；

在授权版本中选择**空调群组**列表中需要删除的空调群组，点击**删除群组**按钮，保存设置。

表3-1　群组参数设置页面参数

群组参数	默认值	下限值	上限值	备注	标准版本	授权版本
群控模式	单机	单机（0）	群控（1）	单机（0）：群组各空调单独运行；群控（1）：群组各空调参与群组逻辑运算	√	√
空调最少运行数目	1	1	群组空调数量	/		√
空调最短运行时长	30	5	180	单位：分钟		√
回风温度设定点	20	15	30	单位：℃	√	√
回风温度偏差设定	5	1	5	单位：℃	√	√
回风湿度设定点	40%	20%	60%	/		√
回风湿度偏差设定	5%	1%	10%	/		√
轮巡数目	1	1		运行数量和备机数量二者中取小值		√
轮巡周期模式	按天轮巡	按天轮巡、按周轮巡		/	√	√
周期间隔	1	1	99	按天轮巡模式	√	√
轮巡时段	1	1	7	按周轮巡模式 星期一、星期二、星期三、星期四、星期五、星期六、星期日	√	√
轮巡时间	00:00	00:00	23:00	/	√	√

群组参数	默认值	下限值	上限值	备注	标准版本	授权版本
手动轮巡一次	否	否	是	调试用	√	√
重置空调状态	否	否	是	初始化空调状态	√	√
空调开机温度	25	15	30		√	√
空调关机温度	17	15	30		√	√
注：√选中的版本表示其可配置						

注意

1．若需要 RDU-A G2 授权版本，请联系艾默生客户服务中心购买，联系电话：4008876510。

2．标准版本默认只支持 4 台艾默生 DME 系列空调。

3．RDU-A G2 最大支持 8 个群组。

2．空调参数设置

点击**空调群控**菜单下的**群控设置**子菜单，然后点击**空调参数设置**页签，弹出空调参数设置页面，如图 3-30 所示。

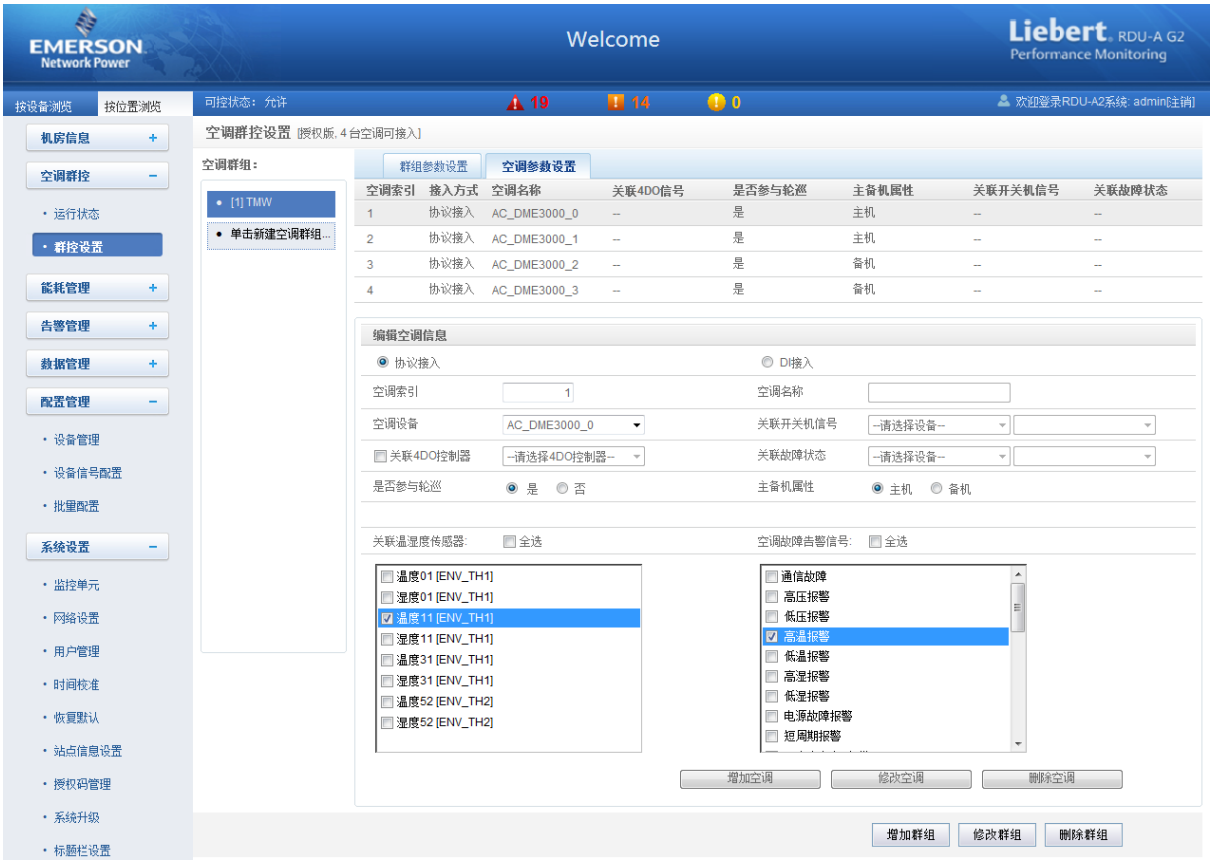


图3-30　空调参数设置页面

在空调参数设置页面中，用户可增加、修改和删除群组中的空调。

● 增加空调操作步骤如下：

1）从**空调设备**下拉框中选择需要群控的空调；

2）在**空调索引**栏中，输入空调在该群组中的索引（默认索引会从 1 开始自增）；

3）设置**关联温湿度传感器**，每个空调最大允许关联 5 个温湿度传感器（包括温湿度最大 10 个信号）。关联传感器中最高温度高于空调开机温度时，如果该空调当前运行状态为关闭，则启动该空调；最高温度低于空调关机温度时，如果该空调当前运行状态为运行，则关闭该空调。

4）设置**空调故障告警信号**，即产生哪些告警信号就判断该空调故障或不可用。每个空调最大允许设置 15 个故障告警信号，默认故障告警信号为：高温告警、高压锁定、低压锁定和排气锁定；

5）点击**增加空调**按钮增加空调即可完成增加空调操作，空调基本信息也会显示在页面上方列表中。

🕮　注意

设置的空调索引不能大于该群组空调数目。

● 修改空调操作步骤如下：

1）在空调列表中选择需要修改的空调，可修改空调索引，温湿度传感器关联和空调的故障告警信号。

2）完成修改之后，点击**修改空调**按钮即可完成修改空调操作，空调基本信息也会显示在页面上方列表中。

● 删除空调操作步骤如下：

在空调列表中选择需要删除的空调，点击**删除空调**按钮即可完成删除空调操作，空调基本信息也会从页面上方列表中删除。

🕮　注意

对空调参数修改完毕后，需点击**修改群组**按钮（如果是新建群组时点击**增加群组**按钮）使其生效，否则切换页面后数据会丢失。

3.4.3　能耗管理

能耗管理会按照用户自定义的规则显示实时和历史能耗数据，以达到帮助用户分析机房整体能耗的目的。

在 RDU-A G2 主页中，点击左边**能耗管理**菜单，可见 3 个子菜单，包括：**实时能耗**、**历史记录**和**能耗设置**。

实时能耗

点击**能耗管理->实时能耗**子菜单，会根据用户自定义的能耗设置（详见本节中的*能耗设置*），显示实时 PUE 和实时系统负载率，如图 3-31 所示。

图3-31　实时能耗

历史记录

点击**能耗管理->历史记录**菜单，会显示系统中记录的历史数据，如图 3-32 所示。

图3-32　能耗管理历史记录

注意

1．RDU-A G2 最大记录并显示 1000 条能耗历史记录。

2．当用户进行过能耗设置后，系统会根据用户的配置每间隔 24 小时保存一次记录。

3．当用户未进行能耗统计设置时，系统不会保存能耗记录。

4．当用户进行了能耗统计设置而未进行系统负载百分比设置时，系统仍会保存能耗记录，但负载率将一直为 0。

能耗设置

点击**能耗管理**->**能耗设置**子菜单，会显示如图 3-33 所示页面。

图3-33　能耗设置

1．能耗统计设置

1）用户需选择两种能耗类型完成能耗统计，为方便表述，定义 A＝IT 类设备能耗，B＝动力环境类设备能耗，C＝所有设备能耗，则规则如下：

如果配置统计 A 和 B，则 PUE＝(A＋B)/A；

如果配置统计 A 和 C，则 PUE＝C/A；

如果配置统计 B 和 C，则 PUE＝C/(C－B)；

其中，每种能耗类型最大可配置 10 个信号，每个信号可选择加减运算符。A，B 和 C 的值分别为其配置的信号值的算术和。

2）功率模式或电能模式。

● 功率模式

在功率模式中，系统会在当天 00:00:00 至次日 00:00:00 每间隔 8 小时统计一次设备功率的瞬时值，并在统计三次后计算一次平均值作为当天功率 PUE。例如：

第一次统计 IT 设备功率为(A1)8kW，所有设备总功率为(B1)10kW。

第二次统计 IT 设备功率为(A2)9kW，所有设备总功率为(B2)11kW。

第三次统计 IT 设备功率为(A3)7kW，所有设备总功率为(B3)10kW。

则当天 PUE 为：（B1＋B2＋B3）/（A1＋A2＋A3）

● 电能模式

在电能模式中，系统会在当天 00:00:00 至次日 00:00:00 每间隔 8 小时统计一次设备在此时段内使用的电能值，并在统计三次后计算一次平均值作为当天电能 PUE，统计方式类似功率模式。

🕮　**注意**

1．用户进行能耗统计配置当天系统会计算自配置时刻起至次日 00:00:00 的系统次数和统计值，并以此求平均值作为配置当天的 PUE 值。

2．如果选择**功率模式**则设备能耗需选择功率信号；反之，如果选择**电能模式**则设备能耗需选择电能信号。

2．系统负载百分比设置

用户可配置实时功率数据信号及额定功率计算系统负载百分比，其规则如下：

系统负载百分比＝实时功率 / 额定功率

其中：实时功率为页面**实时功率数据信号**右方三个功率信号之和。

3.4.4 告警管理

告警管理提供针对告警集中管理功能，使用户可以自定义告警通知及告警联动规则，并可在此完成历史告警的查询功能。

在 RDU-A G2 主页中，点击左边**告警管理**菜单，可见 4 个子菜单，包括：**当前告警**、**历史告警**、**告警通知配置**和**告警联动**。

当前告警

点击**告警管理**菜单下的**当前告警**子菜单，或参见 *3.3.6　实时告警提醒设置*，可弹出当前告警显示列表，如图 3-34 所示。

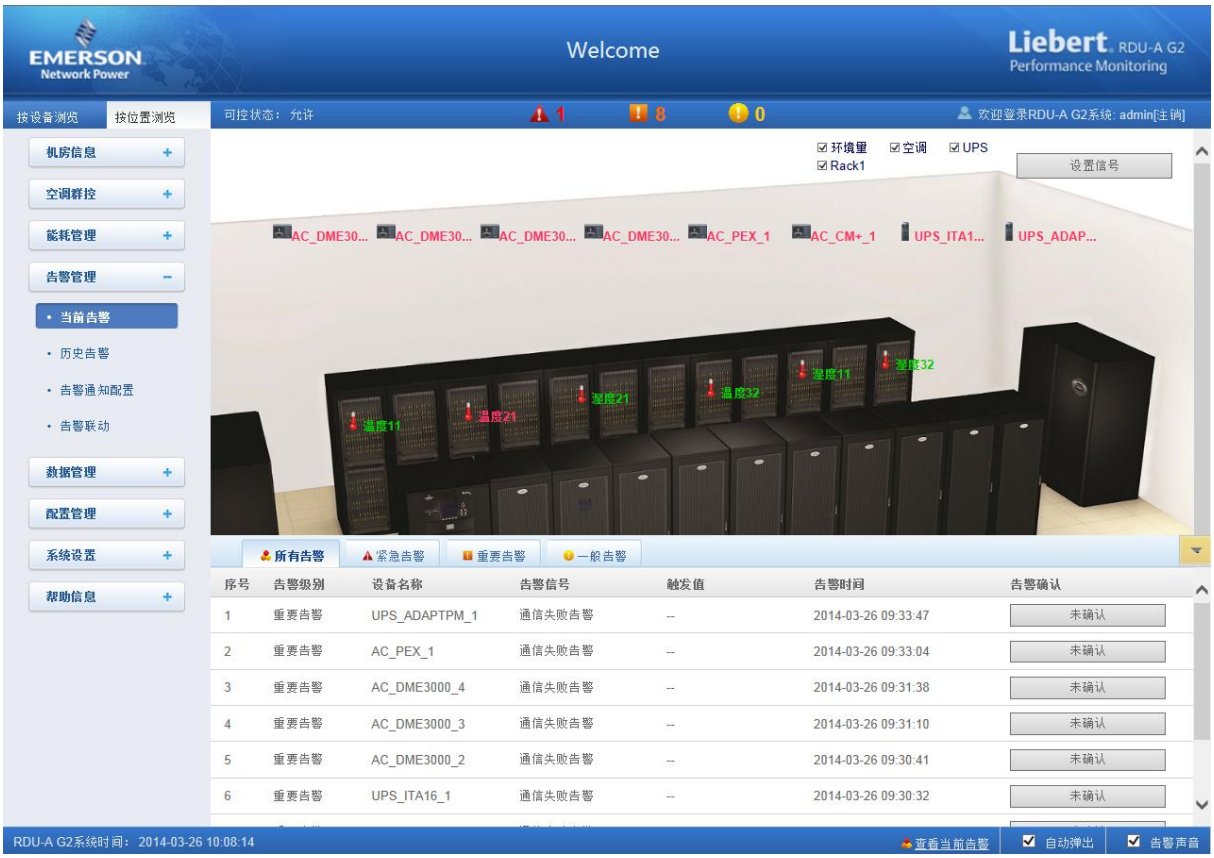


图3-34　当前告警

1．当前告警可通过点击告警列表上方的页签按告警等级显示系统当前的告警。

2．点击**未确认**按钮，进行告警确认，已确认的告警将不再参与告警联动，且告警通知只发送一次。

3．当鼠标光标位于**已确认**链接上时，会悬浮显示该告警确认信息，鼠标光标移走后自动消失，如图 3-35 所示。

图3-35　确认信息

历史告警

点击**告警管理**菜单下的**历史告警**子菜单，查看历史告警记录。选择一个设备（例如“所有设备”），并设置开始时间（例如“2014-03-26 00:00:00”）和截至时间（例如“2014-03-26 23:59:59”）。然后点击**查询**按钮，将列出开始时间到截至时间里的所有告警记录，包括的信息有：**序号**、**设备名称**、**信号名称**、**告警级别**、**触发值**、**开始时间**、**确认人**、**确认时间**和**结束时间**，如图 3-36 所示。

点击**下载查询结果**按钮还可下载查询结果。

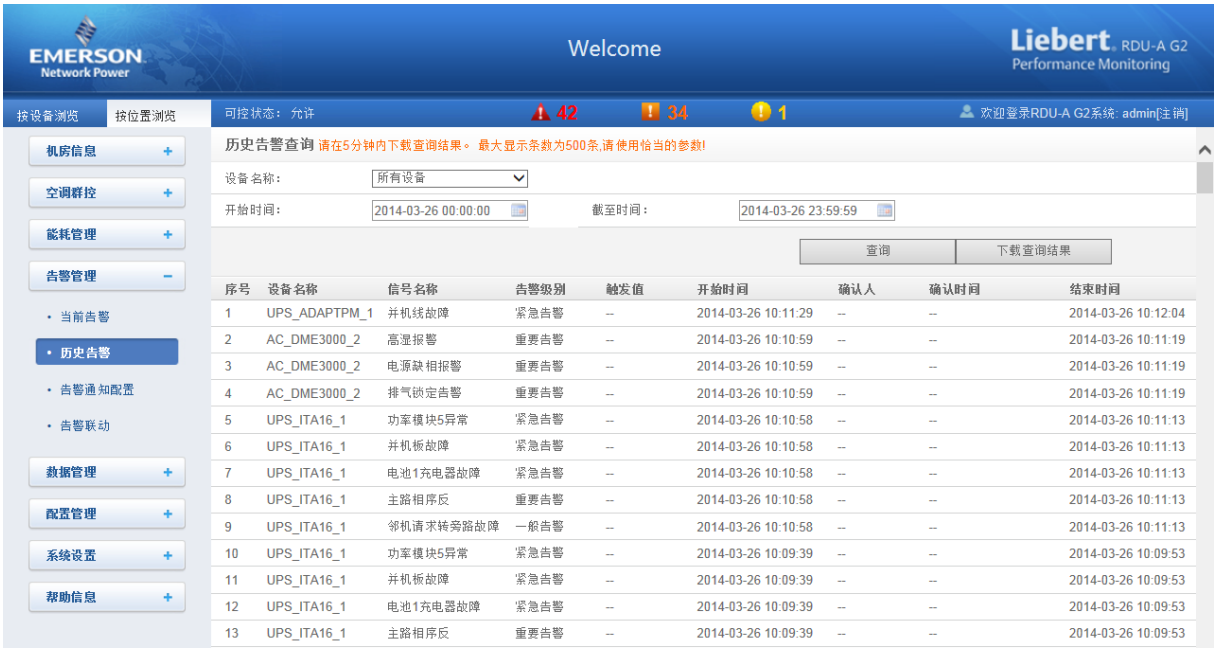


图3-36　历史告警查询

告警通知配置

1．用户告警通知配置

点击**告警管理**菜单下的**告警通知配置**子菜单，弹出如图 3-37 所示页面。用户可以选择采用哪些通知方式接收哪些设备的哪一级别告警通知，同时用户可以选择告警通知信息的语言类型，并自定义告警内容（默认包括设备名称、告警描述、告警时间和告警状态）。

点击**保存配置**按钮完成告警配置。当告警产生时会通过配置的通知方式通知用户。

注意

1．用户首先必须选择**通知方式**，页面下方的**告警通知配置表**方可编辑；

2．选择所有设备时，所有设备同时被配置相同的告警级别；

3．选择低级别告警时，此级别以上级别告警将全部选中；

4．选择某个设备的同时，最高级别告警**紧急告警**默认被选中。

图3-37　用户告警通知配置

2．短信模块和邮件服务器配置

点击**告警管理**菜单下的**告警通知配置**子菜单，然后点击**短信模块和邮件服务器配置**页签，弹出如图 3-38 所示页面。

图3-38　短信模块和邮件服务器配置

在图 3-38 所示页面中，用户可进行**短信模块配置**或 **RDU 多媒体语音通知系统配置**进行短信或电话的告警通知提醒，也可进行**邮件服务器**配置使系统通过邮件进行告警通知的提醒，同时，可通过**告警邮件信息配置**修改产品服务信息。其配置步骤如下：

● 短信模块配置

1）根据需要通过串口 1 或 USB 端口接入短信 MODEM，然后选择**端口类型**，页面会自动显示**通信参数**；

2）根据接入短信 MODEM 的型号选择**短信模块**的类型（GSM）；

3）设置短信 MODEM 的通信参数；

4）点击**保存配置**按钮，保存当前用户的短信模块配置。

📖　注意

1．如通过串口接入短信 MODEM，使用前将短信 MODEM 通信参数设置为“9600,n,8,1”。

2．如通过 USB 端口接入短信 MODEM，短信 MODEM 的通信参数采用默认值即可。

● RDU 多媒体语音通知系统设置

1）在**服务器 IP** 处输入服务器 IP 地址；

2）在**端口号**处输入端口号，默认为 13393；

3）点击**保存配置**按钮，保存多媒体语音通知系统配置。

● 邮件服务器配置

1）在**邮件服务器**处输入服务器 IP 地址或域名；

2）在对应栏输入**端口号**、**邮件用户名**、**邮件密码**和**发件箱地址**；

3）点击**保存配置**按钮，保存当前用户的邮件服务器配置。

📖　注意

1．端口号默认为 25，当选择启用 SSL 时，端口号自动变为 465；

2．默认使用艾默生邮件服务器；

3．使用 SSL 时，需确保邮件服务器支持 SSL 功能。

● 告警邮件信息配置

1）在**联系方式**处输入服务中心的邮件地址；

2）在**服务电话**处输入服务中心的电话号码。

3）点击**保存配置**按钮，保存修改后的告警邮件信息配置。

3．系统状态定时通知配置

点击**告警管理**菜单下的**告警通知配置**子菜单，然后点击**系统状态定时通知配置**页签，弹出如图 3-39 所示页面。

图3-39　系统状态定时通知配置

📖　注意

1．系统状态定时通知配置须与用户告警通知配置配合使用，否则无法选择**用户名**、**通知方式**以及**发送语言**；

2．对于系统状态定时通知，不支持电话通知方式；

3．系统状态定时通知是指给用户发送当前 RDU-A G2 整个系统的运行状态，即正常或告警状态。

1）在**用户告警通知配置**页面完成并保存发送用户、通知方式以及发送语言的设置；

2）在**系统状态定时通知配置**页面可选择是否启用系统状态通知；

3）当**启用系统状态通知**勾选为**启用**时，在**系统状态定时通知配置**页面依次设置**发送周期模式**（默认：天）、**发送间隔设置**（默认：1 天）和**发送时间设置**（默认：开始时间）。

4）点击**保存配置**按钮，保存系统状态通知配置。

告警联动

点击**告警管理**菜单下的**告警联动**子菜单以获得告警联动的功能，弹出如图 3-40 所示页面。

图3-40　告警联动配置 1

● DO1 告警输出功能

如勾选**启动 DO1 告警输出**，继电器将单独控制 DO1 口的输出，如果系统有告警产生并且告警未确认，继电器闭合；如果系统无告警或者所有告警已被确认，继电器断开，此时 DO1 不再参与联动告警。

● 联动功能

如图 3-40 所示，**符号含义**列表展示了所有命令及其用途。点击**添加**按钮增加新的告警联动表达式，如图 3-41 所示。

图3-41　告警联动配置 2

首先，选择一个运算符，例如，“OR”，表达式为“信号 1[输入 1 寄存器]或信号 2[输入 2 寄存器]＝信号 3[输出寄存器]”。

其次，当表达式中的输入或输出参数选择为**信号**时，应先在**设备名**下拉列表中选择设备名，然后在**信号类型**下拉列表中选择信号类型，最后在**信号名**下拉列表中选择信号名称，信号 1、2、3 可能是 RDU-A G2 中可利用的任意信号。

最后，当表达式中的参数选择为**寄存器**时，需要选择相应寄存器的名称，如 R(0)、R(1)等，如图 3-42 所示。

图3-42　告警联动配置 3

点击**添加**按钮添加新告警联动表达式，否则点击**取消**按钮。

若点击**添加**按钮，则如图 3-43 所示，告警联动表达式已添加，点击**保存生效**按钮使之生效。点击**删除**按钮将告警联动表达式删除，并点击**保存生效**按钮使之生效。

图3-43　告警联动配置 4

告警联动中各运算符的用法请参见表 3-2。

表3-2　告警联动运算符用法

运算符	输入 1	输入 2	参数 1	参数 2	输出	表达式
SET	/	/	P1	/	Sout/Rout	SET_ _P1_Output
AND	Sin1 /Rin1	Sin2 /Rin2	/	/	Sout/Rout	Sin1 [Rin1] AND Sin2 [Rin2]＝Sout [Rout]
OR	Sin1 /Rin1	Sin2 /Rin2	/	/	Sout/Rout	Sin1 [Rin1] OR Sin2[Rin2]＝Sout [Rout]
NOT	Sin1 /Rin1	/	/	/	Sout/Rout	Sin1 [Rin1] NOT＝Sout [Rout]
XOR	Sin1 /Rin1	Sin2 /Rin2	/	/	Sout/Rout	Sin1 [Rin1] XOR Sin2[Rin2]＝Sout [Rout]
GT	Sin1 /Rin1	/	P1	P2	Sout/Rout	Sin1 [Rin1]＞P1 时，Sout [Rout]＝1； Sin1 [Rin1]＜P1－P2 时，Sout [Rout]＝0
LT	Sin1 /Rin1	/	P1	P2	Sout/Rout	Sin1 [Rin1]＜P1 时，Sout [Rout]＝1； Sin1 [Rin1]＞P1＋P2 时，Sout [Rout]＝0

运算符	输入 1	输入 2	参数 1	参数 2	输出	表达式
DS	Sin1 /Rin1	/	P1	/	Sout/Rout	Sin1 [Rin1] DS P1 输出到 Sout [Rout]

注：

1．Sin1、Rin1、Sin2、Rin2、P1、P2、Sout、Rout 分别指代信号 1、输入 1 寄存器、信号 2、输入 2 寄存器、参数 1、参数 2、信号 3、输出寄存器；

2．逻辑运算符 AND/OR/NOT/XOR/DS 的输入信号只能选择告警信号；

3．算术运算符 GT/LT 的输入信号值只能是浮点型、整型或长整型；

4．输出信号可以为控制信号或设置信号

下面是告警联动的应用实例。

例 1：

若需接入 RDU-A G2 系统的温湿度传感器 11 出现高温告警时点亮告警灯。假设告警灯安装在 DO1 接口，则可通过以下配置完成此告警联动功能。

表达式：[温度 11 高温告警] DS P(3) [RDU-A DO1][闭合]

配置方法如图 3-44 所示。其含义为当温度 11 产生高温告警时，延时 3 秒钟后触发 RDU-A DO1 闭合，从而点亮告警灯。

图3-44　告警联动配置实例 1

例 2：

若机柜的前门或后门打开，则点亮告警灯。假设 RDU-A G2 的 DI1 和 DI2 接口分别连接着机柜的前后门磁传感器，告警灯安装在 DO1 接口，则可通过以下配置完成此告警联动功能。

表达式：[RDU-A DI1 告警] OR [RDU-A DI2 告警]＝[RDU-A DO1] [闭合]

配置方法如图 3-45 所示。其含义为当告警信号 RDU-A G2 DI1 开或 RDU-A G2 DI2 开产生告警时，触发 RDU-A G2 DO1 闭合，从而点亮告警灯。

图3-45　告警联动配置实例 2

3.4.5　数据管理

数据管理为用户提供各种类型的历史数据和日志的查询服务。

在 RDU-A G2 主页中，点击左边的**数据管理**菜单，可见 4 个子菜单，包括：**设备数据**、**历史数据**、**日志数据**和**清除数据**。

设备数据

点击数据管理菜单下的设备数据子菜单，弹出如图 3-46 所示页面，其包含**设备信息列表**和 **SNMP MIB 导出**两个子页面。

1．设备信息列表

如图 3-46 所示的页面中列出了所有设备的主要信息，点击**下载设备信息**按钮可下载查询结果。

图3-46　设备数据列表

2．SNMP MIB 导出

如图 3-47 所示，可选择导出所有设备 MIB 信号或按设备类型导出 MIB 信息，选择好后点击**下载设备信息**即可完成 MIB 信息的导出。

图3-47　SNMP MIB 信息导出

📖　注意

如果未获取 SNMP 服务授权，SNMP MIB 导出页面将不会显示，如需获取 SNMP 服务授权，请联系艾默生客户服务中心购买，联系电话：4008876510。

历史数据

点击**数据管理**菜单下的**历史数据**子菜单，弹出如图 3-48 所示页面，内有**历史数据**和**历史曲线**两个子选项卡。

图3-48　历史数据

1．历史数据

如图 3-48 所示，选择一个设备名（例如，“所有设备”），选择查询类型（例如，“历史数据”）并设置开始时间和截至时间（例如，从 2014-03-26 00:00:00 到 2014-03-26 23:59:59），然后点击**查询**按钮，将列出开始时间到截至时间里的所有历史数据。点击**下载查询结果**按钮下载所有查询结果。

2．历史曲线

如图 3-49 所示，选择一个设备名（例如，“ENV_TH1”），选择查询类型（例如，“温度 11”）并设置开始时间和截至时间（例如，从 2014-03-26 00:00:00 到 2014-03-26 23:59:59），然后点击**生成曲线**按钮，如果查询到历史数据，则会按信号生成历史曲线。

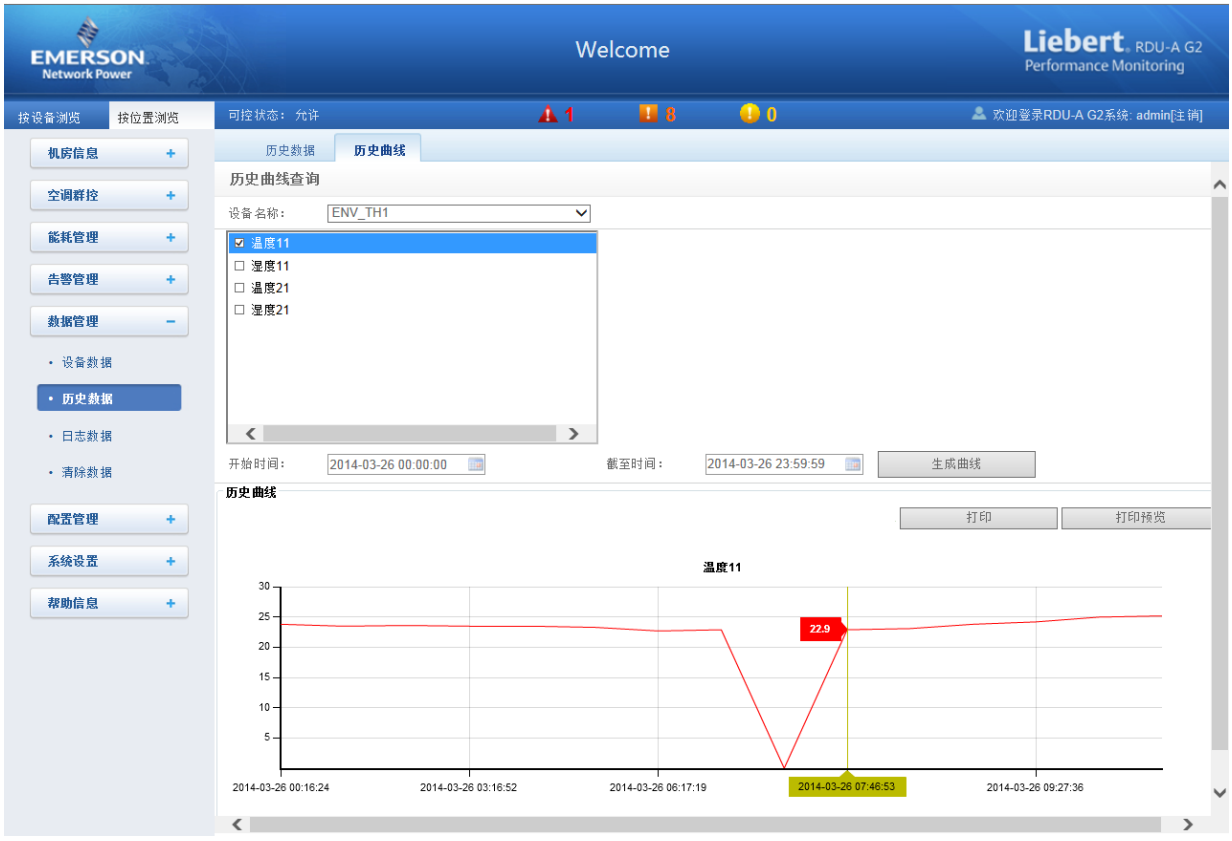


图3-49　历史曲线

日志数据

点击**数据管理**菜单下的**日志数据**子菜单，弹出如图 3-50 所示页面。

图3-50　日志数据

在图 3-50 所示页面中，选择查询类型（例如，“用户操作日志”）并设置开始时间和截至时间（例如，从 2014-03-26 00:00:00 到 2014-03-26 23:59:59），然后点击**查询**按钮，将列出开始时间到截至时间里的所有用户操作日志。点击**下载查询结果**按钮下载所有查询结果。

> 注意
>
> 查询类型为“系统日志”或“驱动日志”时，点击**查询**按钮后查询结果不会显示在页面上，而会直接以压缩包的形式下载。

清除数据

点击**数据管理**菜单下的**清除数据**子菜单，弹出如图 3-51 所示页面。

图3-51　清除数据

图 3-51 所示页面中，用户可以选择“历史告警”，然后点击**清除**按钮清除所有历史告警。同样地，用户可以清除下拉框中的其他任何可获得的数据。

3.4.6　配置管理

在 RDU-A G2 主页中，点击左边的**配置管理**菜单，可见 3 个子菜单，包括：**设备管理**、**设备信号配置**和**批量配置**。

设备管理

1．添加/修改/删除设备

点击**配置管理**菜单下的**设备管理**子菜单，弹出如图 3-52 所示页面。

图3-52　添加/修改/删除设备

图 3-52 所示的页面中，用户可以添加/修改/删除设备信息，方法如下：

● 添加设备

1）选择设备类型；

2）在**设备名称**的文本框里输入设备名称，或使用默认的设备名称；

3）选择设备类型后，**端口号**的下拉框中将自动列出此设备类型的默认端口号；如未选择设备类型，端口号不可选择；

4）在**设备地址**的文本框里输入设备地址，设备地址必须是从 1 到 XX 的阿拉伯数字，并且同一端口号下的设备地址不允许重复。有些设备类型不需要输入设备地址，此时，**设备地址**的文本框将变为灰色，并且不可编辑。当一种设备有多个模块时，需要添加模块地址，模块地址必须是从 1 到 XX 的阿拉伯数字，并且一种设备下的模块地址不允许重复；

5）选择或输入设备位置；

6）在**通信参数**的文本框里输入通信参数，在设备类型确定的情况下，**通信参数**的文本框上会显示通信参数的提示语，其中包括该设备类型通信参数格式和默认通信参数；

7）点击**添加设备**按钮，弹出如图 3-53 所示信息，同时在设备列表中增加一条设备信息；

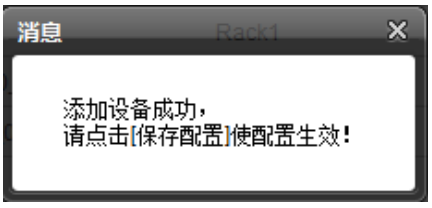


图3-53　提示信息 1

8）点击**保存配置**按钮，弹出如图 3-54 所示信息；

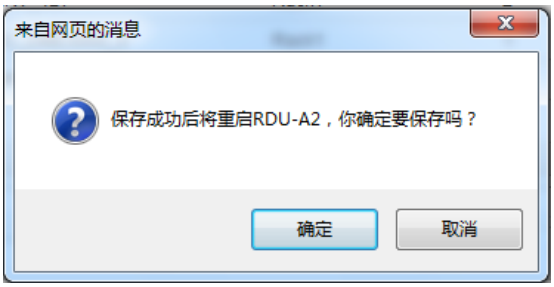


图3-54　提示信息 2

若点击**取消**按钮，新添设备无效；若点击**确定**按钮，弹出用户安全验证对话框，如图 3-18 所示。

9）输入当前用户的登录密码，点击**确定**按钮，校验通过后将跳转到系统重启界面，如图 3-55 所示；

图3-55　系统重启页面

系统重启后，新添加的设备生效。

10）重新登录 RDU-A G2 Web 系统，新添加的设备将显示在设备管理页面的列表中。

🕮　注意

系统默认可以添加 16 个智能设备，不包含 RDU-A G2 自身、ENV-TH、ENV-4DI、8DIAI 卡和 8DOAO 卡，通过授权可扩展接入能力。如需扩展接入能力，请联系艾默生客户服务中心购买，联系电话：4008876510。

● 删除设备：

1）在设备列表中选择需要删除的设备；

2）点击**删除设备**按钮将设备删除；

3）点击**保存配置**按钮使删除设备生效，具体操作与增加新设备相同。

🕮　注意

点击**删除设备**按钮前，如果更改了此设备的相关信息，则该设备不能删除。

● 修改设备：

1）在设备列表中选择需要修改的设备；

2）修改设备信息；

3）点击**修改设备**按钮修改设备信息；

4）点击**保存配置**按钮使修改设备生效，具体操作与增加新设备相同。

在**添加/修改/删除设备**页面进行了添加、修改或删除操作后，未点击**保存配置**按钮使配置生效，在离开该页面时会弹出提示信息如图 3-56 所示，提示用户保存配置。

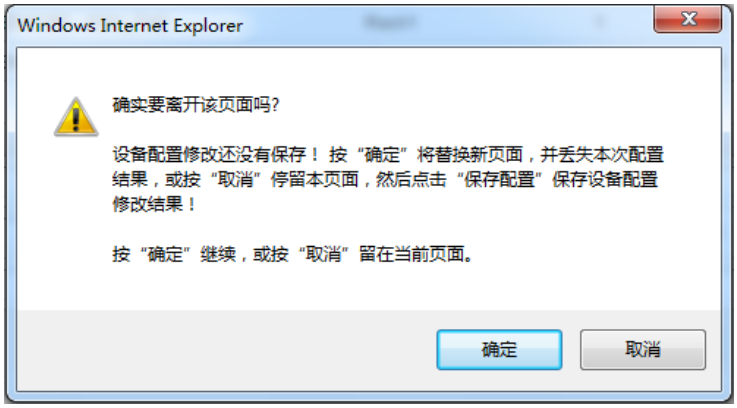


图3-56　提示信息 3

📖　注意

保存配置按钮可以一次性保存所有操作结果。

2．安装/卸载设备类型

点击**配置管理**菜单下的**设备管理**子菜单，然后点击**安装/卸载设备类型**页签，弹出如图 3-57 所示页面。

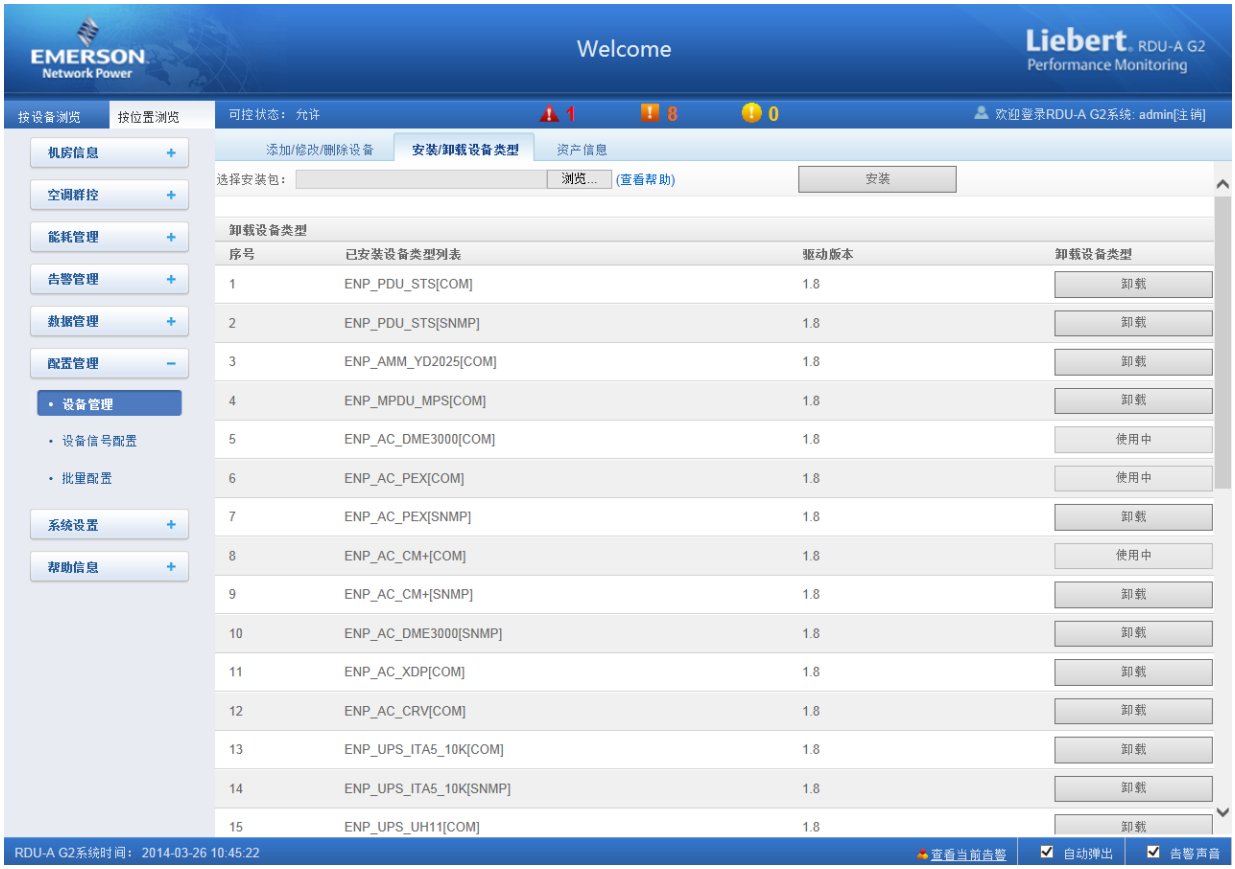


图3-57　安装/卸载设备类型

点击**浏览...**按钮，可以从本地目录上传驱动配置包（.iru 文件格式），点击**安装**按钮，安装新的设备类型。

📖　注意

系统支持的设备类型数量与系统剩余空间和驱动配置包本身大小有关，但最多不超过 64 个。

页面右下部分显示已安装设备的设备类型信息，点击**卸载**按钮，弹出确认对话框，如图 3-58 所示。

图3-58　确认对话框

点击**确定**按钮，弹出用户安全验证对话框，如图 3-18 所示。输入当前用户的登录密码，点击**确定**按钮，即可卸载相应的设备类型。

注意

1．安装时，如果设备类型存在，且设备驱动版本高于待安装的驱动时，将无法重复安装该设备类型；

2．如果安装包没有版本信息或者版本信息与软件版本不匹配，也无法安装该设备类型；

3．如果有设备使用此设备类型，**卸载**按钮将变为灰色，显示**使用中**，无法卸载该设备类型。

3．资产信息

点击**配置管理**菜单下的**设备管理**子菜单，然后点击**资产信息**页签，弹出如图 3-59 所示页面。

图3-59　资产信息

资产信息可设置**设备型号**、**设备厂家**、**设备条码**、**用户编码**、**启用日期**和**过保日期**六类信息；

任意选择一个设备则相应的资产信息即显示在页面下方的输入框内；

修改后点击**确定**按钮，修改后的结果将显示在页面上方的列表内；

全部修改完毕，点击**保存配置**按钮对资产信息进行保存。

注意

如果是新添加的设备，其默认的资产信息为“--”。

设备信号配置

点击**配置管理**菜单下的**设备信号配置**子菜单，弹出如图 3-60 所示页面。

图3-60　修改设备名

图 3-60 所示的页面中，用户可以修改设备名称。输入新的设备名称后，点击**设置**按钮进行批量设置。

📖　注意

设备名称和信号名称字符可以是英文字母、数字、空格和下划线，其它字符无效。

点击**修改信号**，弹出如图 3-61 所示页面。

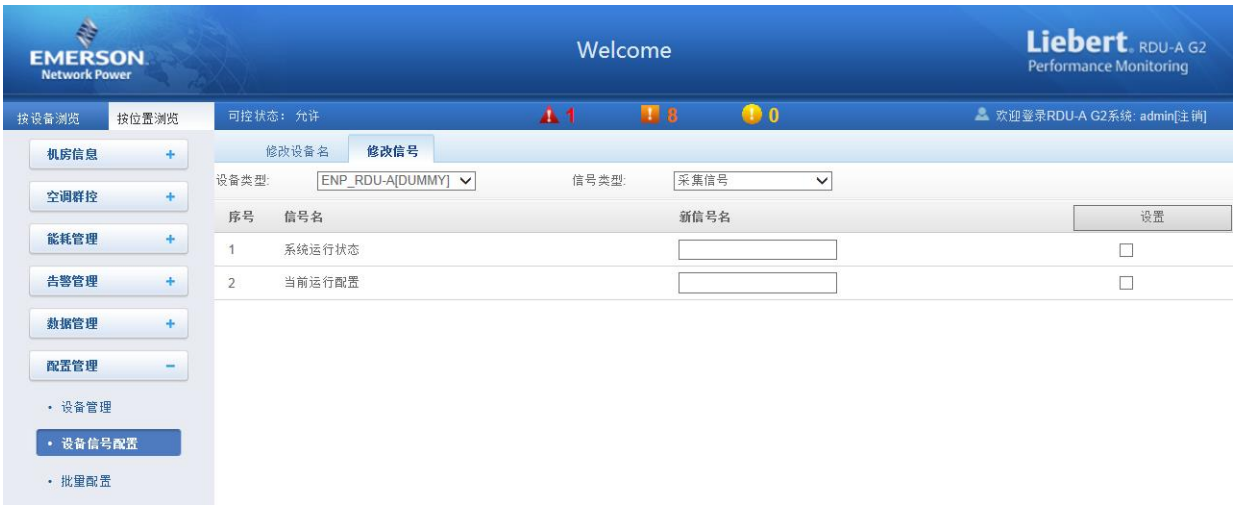


图3-61　修改信号

图 3-61 所示的页面中，用户可以按设备类型修改信号名称信息和告警信号的告警级别。选择**设备类型**和**信号类型**，输入新的信号名，点击**设置**按钮进行批量设置。

📖　注意

1．对于 ENV-TH 和 ENV-4DI，系统具有信号名称联动修改功能，即修改采集信号名称，相应的控制信号、设置信号和告警信号名称随之修改，因此该页面只对采集信号提供修改信号名称功能。

2．在此修改的信号名称将作为设备默认的信号名称使用。

批量配置

点击**配置管理**菜单下的**批量配置**子菜单，弹出如图 3-62 所示页面。

图3-62　批量配置

用户可执行**上传**和**下载**操作，完成系统批量配置。

📖　注意

1．只有 admin 用户才有执行批量配置的权限，如果无法执行批量配置，请点击**查看帮助**获取帮助信息。

2．批量配置的文件下载到本地后是加密的。

3.4.7　系统设置

在 RDU-A G2 主页中，点击左边的**系统设置**菜单，可见 7 个子菜单，包括：**监控单元**、**网络设置**、**用户管理**、**时间校准**、**恢复默认**、**站点信息设置**、**授权码管理**、**系统升级**和**标题栏设置**。

监控单元

监控单元子菜单是针对 RDU-A G2 系统自身的信号进行设置，包括**采集信号**、**设置信号**和**告警信号**，如图 3-63 所示。

图3-63　监控单元（采集信号）

关于监控单元中**采集信号**、**设置信号**、**告警信号**三个页签的操作方法，参见 *3.4.1　机房信息*。

📖　注意

在**设置信号**页签中如果设置**当前告警阻塞**为“阻塞”，则出现当前告警时阻塞告警，这种情况下：

1．当前告警中除当前告警阻塞告警外，其余全部结束；

2．**当前告警阻塞**的“阻塞”设置在 24 小时后自动解除。

网络设置

1．IP 设置

点击**系统设置**菜单下的**网络设置**子菜单，弹出如图 3-64 所示页面。

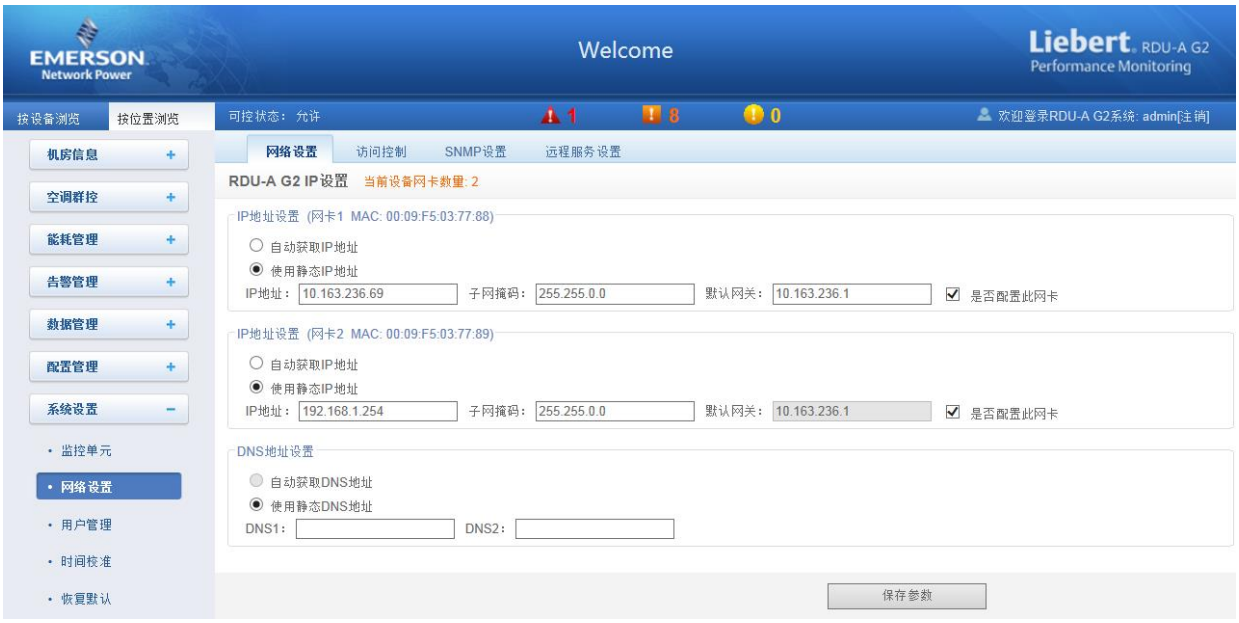


图3-64　IP 设置

RDU-A G2 提供 DHCP 动态获取和手动静态设置两种 IP 设置方式，同时支持 DNS 域名解析。

如图 3-64 所示的页面中，用户可以配置的网络参数如下：IP 获取方式**及地址**、**子网掩码**、**默认网关**、**DNS1**（首选 DNS 服务器）和 **DNS2**（备用 DNS 服务器）。修改网络参数之后，点击**保存参数**按钮使参数生效。

🕮　注意

1．如果网卡 1 和网卡 2 都选择使用静态 IP 地址的话，DNS 地址不能自动获取。

2．修改 IP 地址之后，用户需用新网络地址重新登录 RDU-A G2，默认跳转至网卡 1 的 IP 地址。

2．访问控制

点击**系统设置**菜单下的**网络设置**子菜单，然后点击**访问控制**页签，弹出如图 3-65 所示页面。

图3-65　访问控制

添加访问者时，在**易睿管理器 IP** 文本框中输入新的易睿管理器 **IP** 地址，点击**添加访问者**按钮完成配置。

注意

1．系统最多可以添加 3 个易睿管理器 IP 地址。

2．如果在添加访问者时选择使用代理，则还需对代理服务器进行配置。

3．SNMP 设置

点击**系统设置**菜单下的**网络设置**子菜单，然后点击 **SNMP 设置**页签，可对 SNMP 代理进行配置，RDU-A G2 系统的 SNMP 代理支持 V2 和 V3 两种版本：

如图 3-66 所示，SNMP V2 的具体设置方法如下：

1）设置 **NMS IP**（SNMP 代理数据接收端的主机 IP 地址）；

2）设置是否发送 Trap：“允许”、“禁止”；

3）其它参数保持默认值。

图3-66　SNMP（V2）设置

如图 3-67 所示，SNMP V3 的具体设置方法如下：

1）设置 **NMS IP**（SNMP 代理数据接收端的主机 IP 地址）；

2）选择是否 Trap 发送：“允许”、“禁止”；

3）设置**用户名**；

4）选择**用户类型**：“认证并加密”、“认证不加密”、“不认证不加密”；

5）选择**认证类型**：“MD5”、“SHA”；

6）选择**加密类型**：“DES”；

7）自定义设置认证算法和加密算法的密码。

注意

1．在 SNMP V2 的基础上，SNMP V3 加入了用户认证和加密策略；

2．如果**用户类型**选择了“不认证不加密”策略，则**认证类型**和**加密类型**下拉框变灰，无法进行设置；

3．现阶段**加密类型**只支持“DES”；

4．用户需自定义 8 个字符以上的认证和加密密码，并且该密码必须与 SNMP 代理数据接收端的主机设置的密码相同，否则无法解密接收。

完成参数设置后，点击**增加**按钮，即可增加 NMS；

如需修改 NMS 设置，选中需要修改的 NMS，修改设置，然后点击**修改**按钮保存设置；

如需删除 NMS，选中需要删除的 NMS，然后点击**删除**按钮删除 NMS。

图3-67　SNMP（V3）设置

> 注意
>
> RDU-A G2 默认不提供 SNMP 代理服务，若需要 SNMP 服务授权，请联系艾默生客户服务中心购买，联系电话：4008876510。

4．远程服务器设置

点击**系统设置**菜单下的**网络设置**子菜单，然后点击**远程服务设置**页签，弹出如图 3-68 所示页面。

图3-68　远程服务设置

远程服务设置包括**远程服务请求**、**取消远程服务**及**本地主机更换**三个部分，同时用户可对远程服务系统的通信参数进行设置。

- 远程服务请求：用于建立远程托管关系

1）在**客户名称**文本框中输入自定义的客户名称；

2）选择**远程服务客户联系人**，当联系人选定时，会显示相应的电话及 Email；

> 注意
>
> 远程服务客户联系人需事先在**系统设置->用户管理**中进行设置，且必须提供电话或者 Email，否则无法进行托管请求。具体设置方法参见本节中的*用户管理*。

3）选择**报表生成周期**：“月”、“季度”；

4）点击**确定**按钮发送远程托管请求。

● 取消远程服务：用于取消已经建立的托管服务

选择**取消远程服务**，点击**确定**按钮发送命令取消当前的远程服务。

📖　注意

取消远程服务只在已建立远程托管服务的前提下有效，否则点击**确定**按钮会提示失败。

● 本地主机更换：用于远程服务中本地主机的更换

当建立远程服务的主机要退出，但又想保留已经建立的远程服务关系时，用户需更换本地主机加入远程服务，具体的设置方法同**远程服务请求**，此外加入被替换主机的硬件序列号即可。

5．安全设置

只有管理员才能浏览和配置**安全设置**。

点击**系统设置**菜单下的**网络设置**子菜单，然后点击**安全设置**页签，弹出如图 3-69 所示页面。

图3-69　安全设置

安全设置的内容包括 **Web 访问方式**和 **Web 访问安全策略**两个部分。

● Web 访问方式：选择访问 Web 页面可采用的协议是 HTTP 还是 HTTPS。默认为 HTTP 协议。

选择后，点击**保存**按钮，浏览器提示用户等待，如图 3-70 所示。

图3-70　系统重启 Web 服务器

等待的时间到达后，浏览器显示新的访问超链接，如图 3-71 所示。点击其中的超链接，即可出现以新的 Web 访问方式启动的用户登录界面。

图3-71　显示新的 Web 访问连接

📖　**注意**

只有在 Web 访问方式采用 HTTPS 的情况下，才允许移动终端 APP 连接 RDU-A G2。

- Web 访问安全策略：选择是否启用 Web 访问安全策略。默认为启用。

Web 访问安全策略包括 4 个部分：账户锁定策略、登录验证码、密码复杂度策略、密码过期策略。

1）账户锁定策略：

同一个有效用户连续登录失败 5 次后，不可再输入密码进行登录操作，只有等到指定的时间过后，才可以继续登录。admin 账户不会被锁定。

管理员可将目前处于锁定状态的账户进行重置解锁。具体操作步骤参见下一节**用户管理**中的**解锁**。

锁定时间的长短可以在图 3-69 中**账户锁定时间**编辑框中配置，默认为 5 分钟。

2）登录验证码：

用户登录时，一旦输入了错误的用户名或密码，系统立即显示一个验证码，要求下一次登录时必须输入此验证码，如图 3-72 所示。

图3-72　登录要求输入验证码

3）密码复杂度：

用户密码长度至少为 6 个字符；密码中至少包含以下字符中的两种：大写英文字符(A~Z)，小写英文字符(a~z)，数字(0~9)和非字母字符(!,$,#,%等)。

启用 Web 访问安全策略时，不影响已有用户帐户的密码，但新建用户账户或修改已有用户密码时，新密码必须符合此复杂度要求。

4）密码过期策略：

用户账户密码从被创建或修改时刻开始，在指定时间之内有效。有效时间长度可以在图 3-69 中**用户密码有效期**编辑框中配置，范围为 0～999 天，默认 90 天。0 天表示密码永不过期。

密码有效时间长度对除 admin 之外的所有其他账户适用，admin 账户密码永不过期。

管理员可以刷新某个帐户的有效期，新的有效期从设置的时刻开始，至有效时间长度到达为止。具体操作步骤参见下一节**用户管理**中的**刷新有效期**。

用户管理

点击**系统设置**菜单下的**用户管理**子菜单，弹出如图 3-69 所示页面。

图3-73　用户管理

图 3-73 所示页面中，用户可以增加用户，修改用户和删除用户。

● 增加用户

1．在**用户名**的文本框里输入用户名；

2．选择用户的权限；

3．配置用户密码，密码不能为空，且至少 6 位字母或数字；

4．在**确认密码**文本框中重复输入密码；

5．（可选）输入用户电话号码，电话号码可以使用以下数字和字符：0123456789、＋；

6．（可选）输入邮件地址；

7．（可选）输入允许通过移动终端 APP 访问 RDU-A G2 的移动终端的序列号；

8．点击**增加用户**按钮，将弹出用户安全验证对话框，如图 3-18 所示。输入当前用户的登录密码，点击**确定**按钮，增加新用户。

📖　注意

1．用户名只能使用英文字母、数字以及-和_，并且首字符必须为字母或数字。

2．如果启用了 Web 访问安全策略，对密码有更多的要求，参见“安全设置”一节。

3．允许最多输入两个绑定手机序列号，以逗号分隔。

4．如果未输入绑定序列号，则系统会绑定最先两个从 APP 登录的移动设备的序列号。

5．绑定后，系统只允许所绑定的移动终端从 APP 访问 RDU-A G2。如果要重新绑定，只需修改或删除绑定序列号即可。

● 删除用户

1．在用户名单中选择需要删除的用户；

2．点击**删除用户**按钮，将弹出确认对话框，如图 3-74 所示。

图3-74　确认对话框

3．点击**确定**按钮，将弹出用户安全验证对话框，如图 3-18 所示。输入当前用户的登录密码，点击**确定**按钮，将所选用户删除。

🕮　注意

admin 用户不可删除。

● 修改用户

1．在用户名单中选择需要修改的用户；

2．修改用户信息；

3．点击**修改用户**按钮，将弹出用户安全验证对话框，如图 3-18 所示。输入当前用户的登录密码，点击**确定**按钮，使修改后的用户信息生效。

登录 RDU-A G2 的用户可分为 4 个用户组，他们分别具有不同的安全级别和用户权限，具体信息参见表 3-3。

表3-3　用户安全级别

安全级别	用户组	用户权限
A 级	管理员	管理员拥有全部权限：发送控制命令到智能设备；浏览、控制、修改参数；上传和下载文件；修改、增加、删除用户信息；空调群控参数设置；系统固件升级；修改账户有效期；解锁已锁定的用户帐户
B 级	工程师	工程师拥有以下权限：发送控制命令到智能设备；浏览、控制、修改参数；下载文件；修改自身用户信息（账户有效期和锁定状态除外）
C 级	操作员	操作者可发送控制命令到智能设备
D 级	浏览者	所有用户均能浏览设备信息

在图 3-73 所示页面中，选择当前用户，可以进行**短信/电话告警通知测试**和**电子邮件告警通知测试**。

使用该测试功能前，需先对当前用户进行短信模块和邮件服务器配置，具体信息参见 *3.4.4　告警管理*中的*告警通知配置*。

● 短信/电话告警通知测试

输入**电话号码**，点击**短信/电话告警通知测试**按钮，测试当前用户的电话号码是否接通。若用户收到测试短信和电话，表示测试成功。否则测试失败，请检查当前用户的电话号码是否正确，短信 MODEM 连接是否正确。

● 电子邮件告警通知测试

输入**邮件地址**，点击**电子邮件告警通知测试**按钮，测试当前用户的邮箱地址是否正确。若收到测试邮件，表示测试成功，否则测试失败，请检查以上信息是否输入正确。

● 刷新有效期

如果启用了 Web 访问安全策略，界面上会显示所选用户的账户到期时间。管理员点击**刷新有效期**按钮，即可为所选用户刷新新的密码有效期，新的有效期起止时间参见**网络设置**一节 **Web 访问安全策略**中的**密码过期策略**。

● 解锁

如果启用了 Web 访问安全策略，对于已锁定的账户，管理员点击**解锁**按钮，即可为其解锁。参见**网络设置**一节 **Web 访问安全策略**中的**账户锁定策略**。

🕮　注意

增加、修改用户时，必须输入电话号码或邮件地址，否则无法完成设置。

时间校准

点击**系统设置**菜单下的**时间校准**子菜单可以校准时钟。图 3-75 所示页面中，RDU-A G2 可以从时间服务器上自动获取时间。依次输入**主服务器**和**从服务器**的 IP 地址，输入**校时间隔**、选择**时区**和**校时协议类型**，然后点击**设置**按钮使得设置生效。

图3-75　时间校准

RDU-A G2 也可以获取本机时间，选择**使用当前时间校时**并点击**获取本机时间**按钮来获得本机时间，然后点击**设置**按钮使新时间生效。

🕮　注意

时间校准默认选择**使用当前时间校时**。

恢复默认

点击**系统设置**菜单下的**恢复默认**子菜单，弹出如图 3-76 所示页面。

图3-76　恢复默认

点击**重启 RDU-A G2** 按钮，实现系统重启。

点击**恢复默认**按钮，恢复 RDU-A G2 至默认设置。

> 注意
>
> 如果用户使用恢复功能，RDU-A G2 会恢复原始配置方案。在恢复操作之后，请确认等待 1 分钟再通过网络重新进入 RDU-A G2 以使其进行完整的初始化工作。

站点信息设置

点击**系统设置**菜单下的**站点信息设置**子菜单，弹出如图 3-77 所示页面。

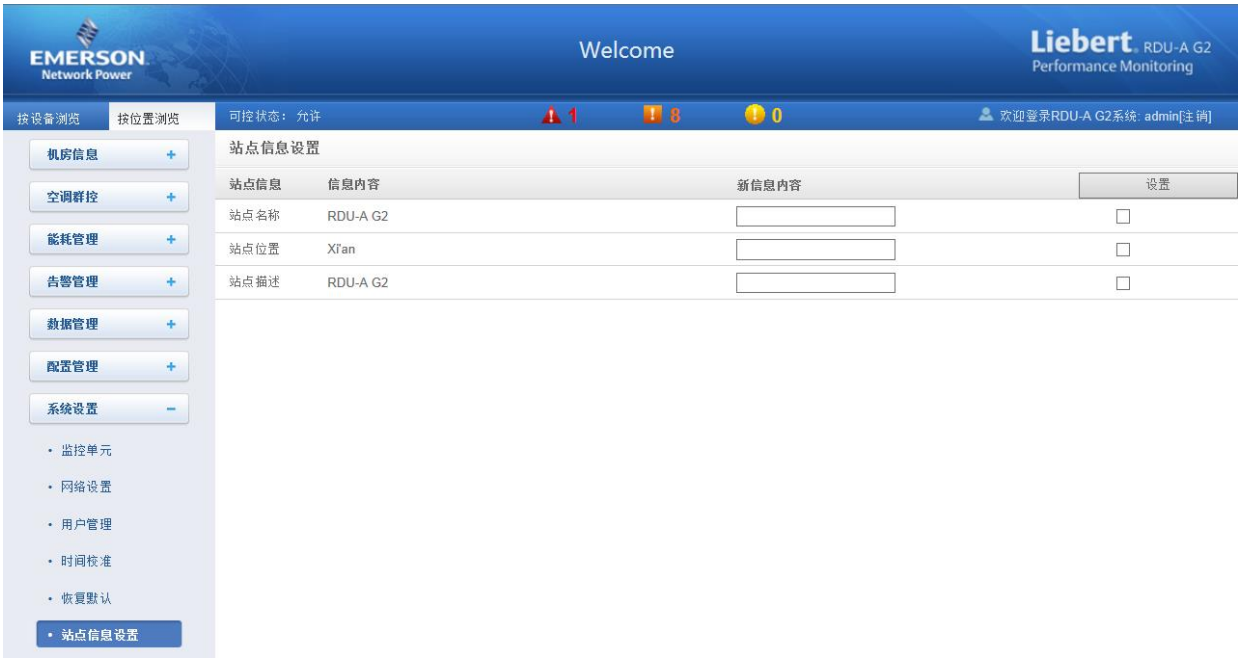


图3-77　站点信息设置

如图 3-77 所示，用户可以修改 RDU-A G2 的站点信息，包括**站点名称**、**站点位置**和**站点描述**。

授权码管理

点击**系统设置**菜单下的**授权码管理**子菜单，弹出如图 3-78 所示页面。

图3-78　授权码管理

在**授权码管理**页面，用户可完成受限权限的授权（如 SNMP 服务）和已有授权查看功能，当用户获取授权码后，在授权码输入框输入合法的授权码，点击**保存**按钮完成安装。RDU-A G2 的可授权的功能见表 3-4。

表3-4　RDU-A G2 授权功能概述

授权功能	描述
空调群控	授权空调群控版本及参与空调群控空调数，可授权接入最大 32 台空调参与群控
SNMP 服务	授权开放 SNMP 代理服务
最大设备接入数量	授权扩展最大设备接入数量，可扩展至 32 个设备

🕮　注意

1．部分功能的授权码安装成功后必须重启系统后才会生效。

2．接入 IRM4-COM 扩展卡后，最大设备接入数量将自动增加 4。

系统升级

点击**系统设置**菜单下的**系统升级**子菜单，弹出如图 3-79 所示页面。

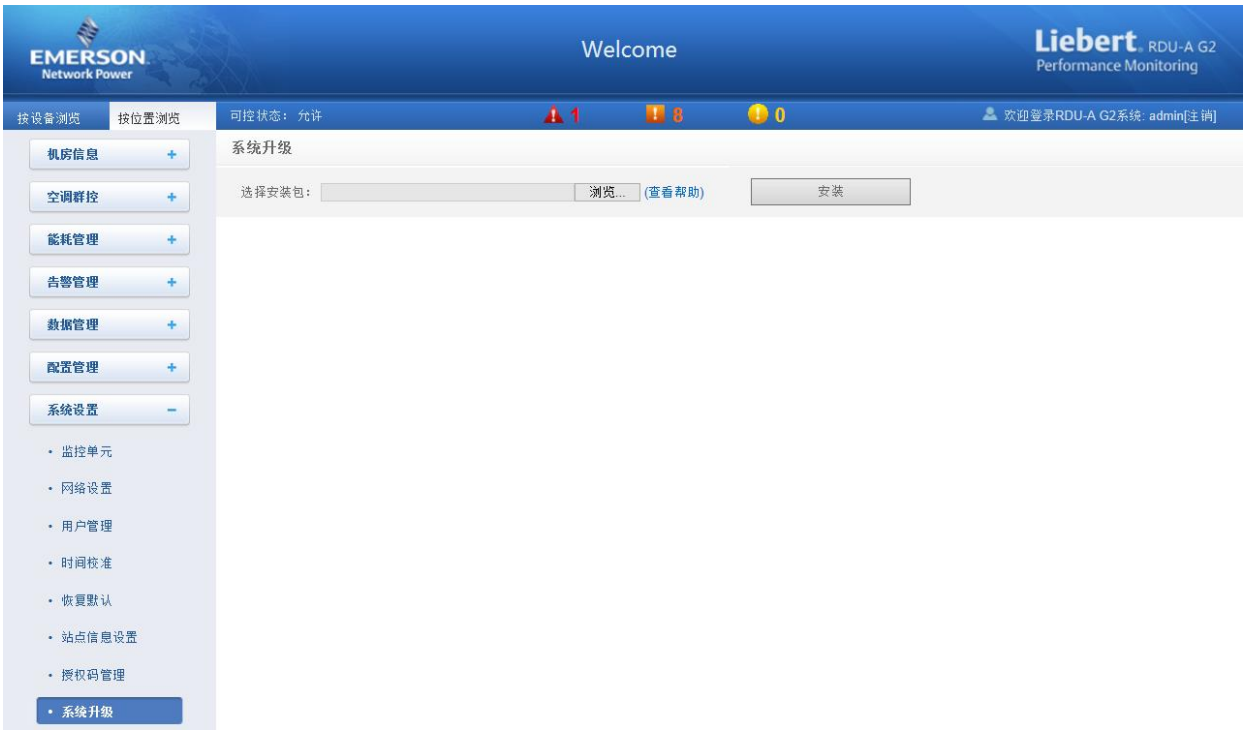


图3-79　系统升级

图 3-79 所示的页面中，点击**浏览...**按钮从本地目录下载升级包（.rdu 文件格式），然后点击**安装**按钮，进行固件升级。

🕮　注意

RDU-A G2 支持增量升级功能。

标题栏设置

点击**系统设置**菜单下的**标题栏设置**子菜单，弹出如图 3-80 所示页面。

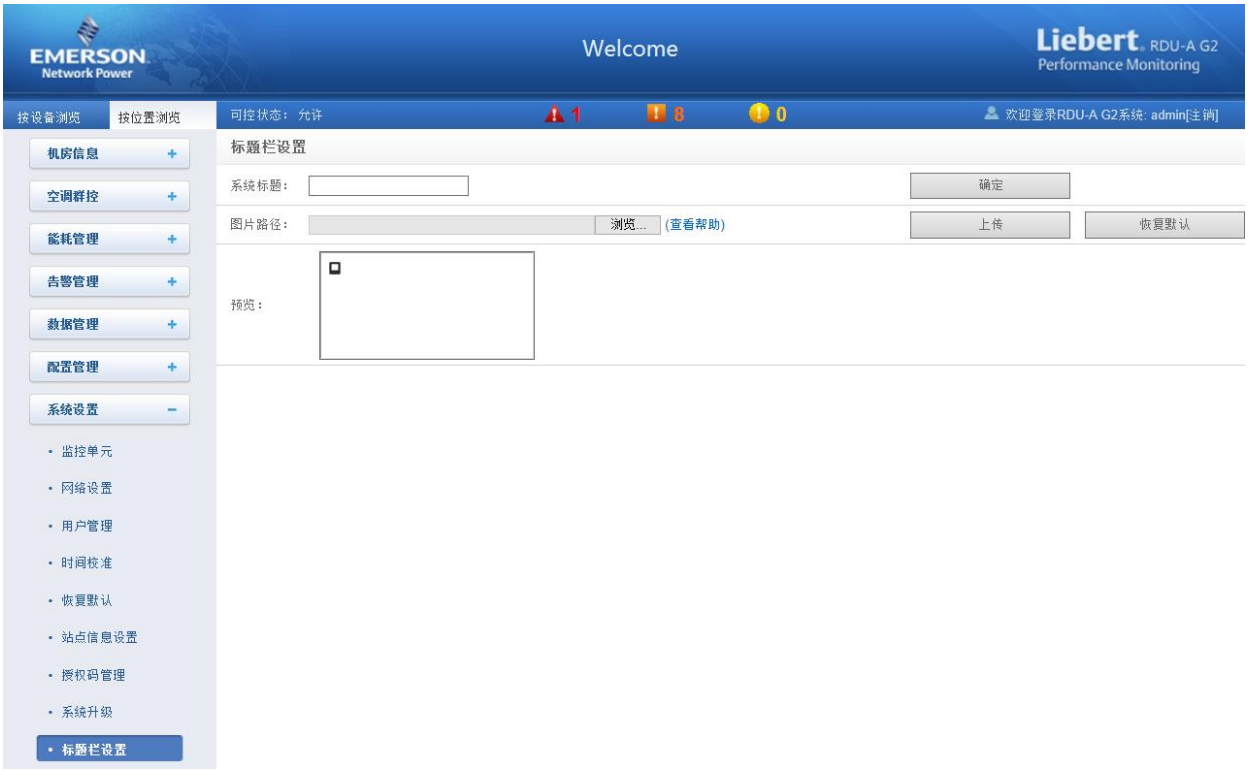


图3-80　标题设置

图 3-80 所示的页面中，用户可上传系统 Logo 图片替换页面右上方的 Logo 图片，点击**浏览…**按钮，选择需要上传的 Logo 图片，然后点击**上传**按钮将文件上传到 RDU-A G2。只允许上传[.gif]或[.bmp]或[.jpg] 或[.png]格式的图片到 RDU-A G2 里，且图片大小不超过 500K。点击**恢复默认**按钮可以恢复默认 Logo 图片。

用户也可修改页面正上方的系统标题 **Welcome**。在**系统标题**文本框里输入自定义系统标题，点击**确定**按钮使之生效。

3.4.8　帮助信息

在 RDU-A G2 主页中，点击左边的**帮助信息**菜单，可见 1 个子菜单：**关于 RDU-A G2**。

关于 RDU-A G2 页面显示 RDU-A G2 的**软件版本**、**序列号**、**特征码**等信息并提供用户手册和工具软件的下载链接，如图 3-81 所示。

图3-81　关于 RDU-A G2

第四章　维护

本章介绍 RDU-A G2 的维护，包括恢复默认设置和常见问题处理。

4.1　恢复默认设置

恢复默认设置可通过软件和硬件两种方式完成。

有关软件恢复，参见 *3.4.7　系统设置*一节中的*恢复默认*。

硬件恢复包括恢复 RDU-A G2 管理员密码（默认用户名：admin，密码：emerson）和 RDU-A G2 的 IP 地址（有关默认 IP 地址，参见 *1.2.1　RDU-A G2 主机*一节中的*网口*）。方法为：持续按下复位按钮（见图 4-1）4 秒，待运行/告警灯熄灭后松手，RDU-A G2 将在系统重启后恢复 IP 地址及密码。

图4-1　复位按钮

4.2　常见问题处理

问题 1：RDU-A G2 主机上电后，电源指示灯怎么不亮？

答：请检查电源线缆连接是否正确。

问题 2：插入 IRM-4COM\IRM-8DIAI\IRM-8DOAO 扩展卡后，POWER 灯不亮或者串口不工作，如何处理？

答：POWER 灯不亮，请检查扩展卡是否插偏或完全插入；如果插入正常，RDU-A G2 会自动完成重启动作，如果 RDU-A G2 没有重启，请尝试重新插入扩展卡。

问题 3：如何处理串口通信不正常？

答：首先，请确认设备通讯模式是否匹配，RDU-A G2 机身串口及扩展板串口为 RS-232/RS-485 自适应串口；其次，请确认通信参数的配置是否正确。

问题 4：如何处理继电器输出口不能正常控制用户设备？

答：请检查用户设备端子线序是否正确，具体信息见表 1-15。

问题 5：在 RDU-A G2 通信正常情况下，为什么没有出现 RDU-A G2 的登录页面？

答：出现以上问题有三种解决措施：

第一步：请确认 IP 地址正确性。

RDU-A G2 有两块网卡，请确认网线是否插错接口。

如果是静态 IP 地址，有关 RDU-A G2 的默认 IP 值，参见 *1.2.1　RDU-A G2 主机*一节中的*网口*；如果已经设置为 DHCP 方式获取 IP，请参见*问题 6* 查看当前 IP。

第二步：请确认 IP 地址的连通性。

确认 IP 地址连通性可使用 PING/ping 命令，方法如下：

1）点击左下角图标，在框中输入“cmd”，如图 4-2 所示。

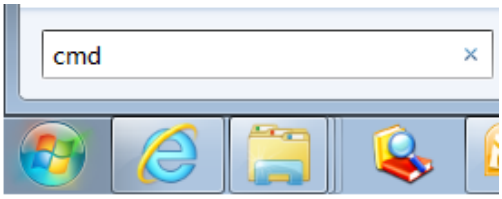


图4-2　输入“cmd”

2）按下回车键，将弹出图 4-3 所示页面。在命令行输入“ping”和 IP 地址，（例如 ping 10.163.162.135）查看是否通信成功。

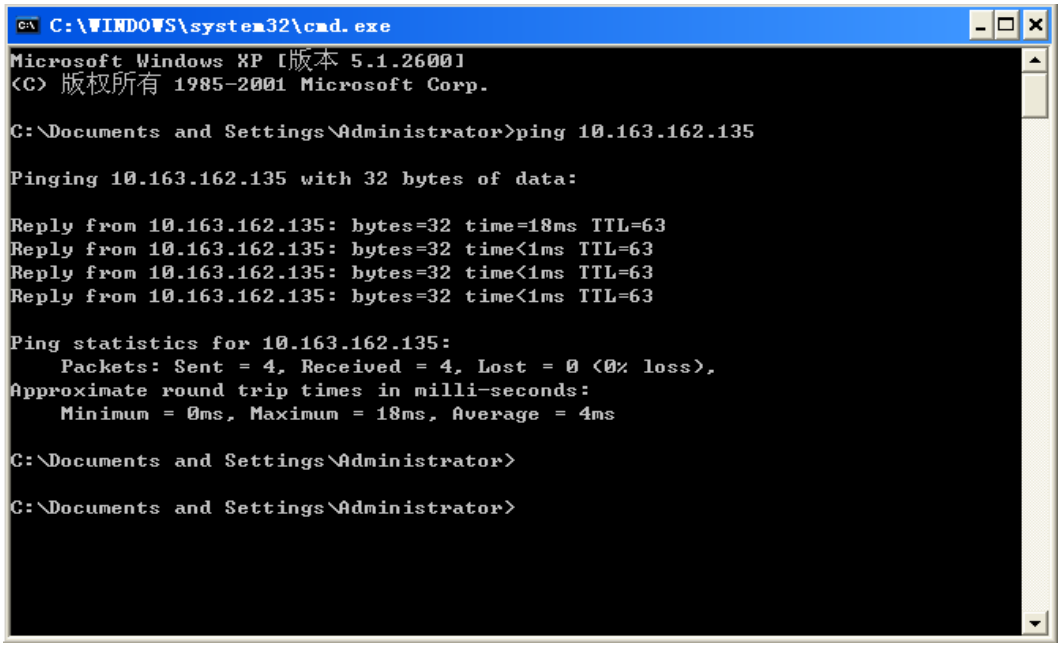


图4-3　通信测试

第三步：如果经过上述两步还是未能使网络连通，请使用机身上复位按钮恢复默认 IP。

第四步：参见 *3.1　登录准备*完成相关操作。

问题 6：设置 DHCP 后，如何查看当前 IP 地址？

答：在设置 DHCP 后，需通过串口的形式访问 RDU-A G2 用于获取当前 IP 地址，方法如下：

第一步：*参见 3.4.8　帮助信息*，下载调试口（Console）的 USB 驱动，安装至用户计算机。

第二步：通过 RDU-A G2 主机包装中的 USB 电缆连接 RDU-A G2 机身 Console 口和电脑 USB 接口，并利用串口工具（如 SecureCRT）连 RDU-A G2。

第三步：输入用户名“rduadmin”和密码“emerson”登录 RDU-A G2 系统，输入命令 setip1 并键入回车，查看网卡 1 的 IP 地址、子网掩码和网关。网卡 2 的网络参数查看方法与网卡 1 类似，输入命令为 setip2，如图 4-4 所示。

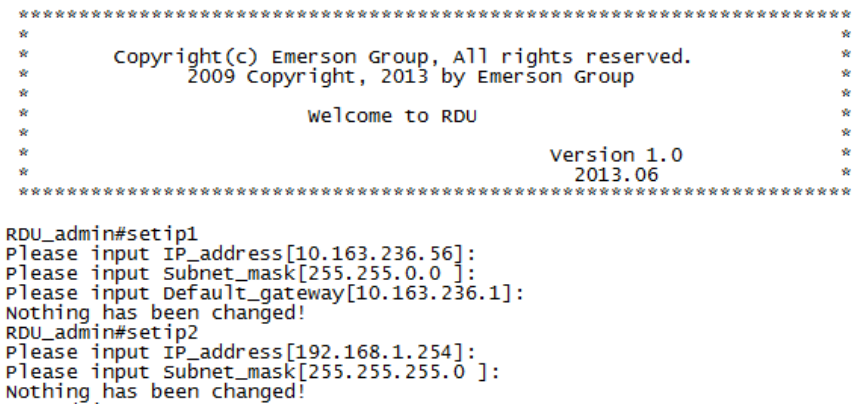


图4-4　查看网络参数

问题 7：如何进行传感器故障排查？

故障现象 1：智能传感器无显示，且不能显示在 RDU-A G2 网页上。

答：按以下步骤进行排查：

1）确认智能传感器是否接入 RDU-A G2 的 SENSOR 口，同时组内地址为 1 的只能接入 SENSOR1，组内地址为 2 的只能接入 SENSOR2；

2）检查接入线缆是否完好，接头压线是否完好，以及是否是直通网线；

3）检查智能传感器是否正常；

4）确保传感器地址不为 00；

5）如接入多个智能传感器，确保传感器地址不重复，并按照步骤 2、3 逐个排查。

故障现象 2：智能传感器告警灯常亮。

答：将智能传感器返回艾默生各地办事处服务中心维修。

故障现象 3：RDU-A G2 历史告警中有智能传感器频繁通信失败告警。

答：检查网线卡扣是否完好无损，检查网线连接是否有松动。

问题 8：用户已选择深海蓝主题，但浏览 RDU-A G2 的 Web 界面时，页面仍然为清澈蓝主题，如何处理？

答：点击**[当前用户]注销**按钮，返回登录界面，点击■图标选择深海蓝主题，重新登录系统即可。

问题 9：告警产生后，没有接收到邮件或短信通知，或在告警没有结束情况下，邮件或短信通知次数少于 3，怎么处理？

答：按以下步骤进行排查：

1）请检查短信模块和邮件服务器配置是否正确，参见 *3.4.4　告警管理*中的*告警通知配置*；

2）如果没有接收到短信通知，请确认电话卡是否已欠费停机；

3）如果没有接收到邮件通知，请点击菜单数据管理->日志数据，查询告警通知发送日志是否有发送邮件失败的记录。如果有，则表示网络忙或邮件服务器通信忙。

附录一　缩略词

AC	Alternating Current	交流
CA	Critical Alarm	紧急告警
DC	Direct Current	直流
DI	Digital Input	数字输入
IE	Internet Explorer, a Web browser developed by Microsoft@	微软开发的网页浏览器
FAQ	Frequently Asked Questions	常见问题处理
FTP	File Transfer Protocol, used to transfer large chunks of data	文件传输协议，用于传输大量数据
HTML	Hypertext Mark-Up Language, used to create Web pages	超文本链接标示语言，用于创建网页
HTTP	Hypertext Transfer Protocol, used to convey HTML	超文本传输协议，用于链接 HTML
JRE	Java Runtime Environment	Java 运行环境
LED	Light Emitting Diode	发光二极管
Linux	A UNIX-like operating system with open source, developed under Free Software Foundation (FSF)	一种带有开放源码的 UNIX 操作系统，由免费软件基金会开发
LLP	Local Language Package	本地语言包
LUI	Local User Interface	本地用户接口
MA	Moderate Alarm	重要告警
NA	No Alarm	无告警
LA	Low Alarm	一般告警

附录二 标准配置清单

序号	项目描述	数量	单位
1	RDU-A G2 智能监控单元	1	EA
2	《RDU-A G2 智能监控单元安装调试手册》	1	EA
3	小五金件--21 英寸挂耳	2	EA
4	小五金件--RDU 线卡	2	EA
5	电线电缆-IEC60320 C13 Plug-IEC60320 C14 Plug-H05VV-F-3C-1mm^2-Black-2000mm-EU	2	EA
6	小五金件--挂耳	2	EA
7	采购成套电缆-UH52SA1SL2-UH52SA1Z UPS 电源 USB 电缆－ROHS	1	EA
8	采购成套电缆--UHRK1S241SL62-UHRK1S241Z-2KVA/输入电缆-ROHS	2	EA
9	标准件-GB819.1-2000-十字槽沉头螺钉 M4×10	6	EA
10	成套或其它标签--合格证标签	1	EA

附录三　有毒有害物质或元素标识表

部件名称	有毒有害物质或元素					
	铅	汞	镉	六价铬	多溴联苯	多溴联苯醚
	Pb	Hg	Cd	Cr^{6+}	PBB	PBDE
制成板	×	○	○	○	○	○
线缆	×	○	○	○	○	○
○：表示该有毒有害物质在该部件所有均质材料中的含量在 SJ/T-11363－2006 规定的限量要求以下； ×：表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T11363－2006 规定的限量要求						
艾默生网络能源有限公司一直致力于设计和制造环保的产品，我们会通过持续的研究来减少和消除产品中的有毒有害物质。以下部件或者应用中含有有毒有害物质是限于目前的技术水平无法实现可靠的替代或者没有成熟的解决方案： 1．制成板含有铅；2．线缆含有铅						
关于环保使用期限的说明：本产品的环保使用期限（已标识在产品本体），是指在正常使用条件和遵守本产品的安全注意事项的情况下，从生产日起本产品含有的有毒有害物质或元素不会对环境、人身和财产造成严重影响的期限						
适用范围：RDU-A G2 智能监控单元						

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Chapter 1 Product Introduction

Note

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

RDU-A G2 intelligent monitoring unit (RDU-A G2 for short) can realize Web accessing, digital input/output, analog input/output and connections with equipment such as sensor, UPS, air conditioner and PDU. It can meet the requirements of TCP/IP, RS232/485 networking modes and can be flexibly configured according to various application conditions.

This chapter introduces hardware function difference between the RDU-A G2 and the RDU-A, component descriptions, main functions and technical specifications.

1.1 Hardware Function Difference Between New And Old Version

The hardware function difference between the RDU-A G2 and the RDU-A is given in Table 1-1.

Table 1-1 Hardware function difference between the RDU-A G2 and the RDU-A

Function difference	RDU-A	RDU-A G2
Power input	One route of external power	Two routes of external power, supportive of connecting only one route and connecting both routes
Expansion slot	Supportive of only one expansion slot, which is exclusively for IRM-4COM card	Supportive of two expansion slots, which can be inserted with IRM-4COM card, IRM-8DIAI card and IRM-8DOAO card
Network port	Single network port, and the IP can only be manually set	Duel network ports, supportive of DHCP dynamic addressing
IRM sensor connection	Only 28 nodes (including the node devices connected to the provided DOOR1, DOOR2, WATER, SMOKE ports) can be connected at most	At most 32 nodes can be connected
USB port	One piece, which can be connected with only one USB Modem or camera at most	Two pieces, which can be connected with one USB Modem plus one camera or two cameras

1.2 Component Descriptions

RDU-A G2 includes RDU-A G2 host and options: IRM-4COM card, IRM-8DIAI card and IRM-8DOAO card.

1.2.1 RDU-A G2 Host

The appearance and interfaces of RDU-A G2 host are shown in Figure 1-1.

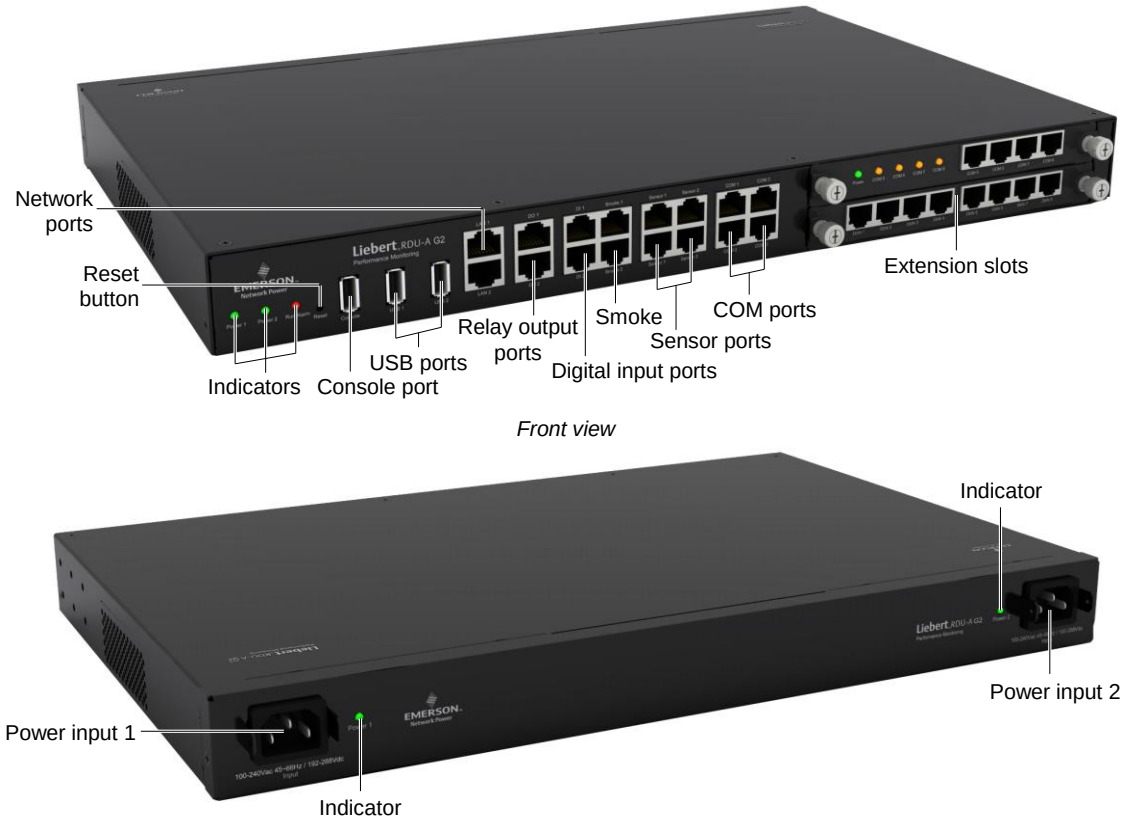


Figure 1-1 Appearance and interfaces of RDU-A G2

Input power

The rear panel of RDU-A G2 host provides two routes of isolated power input, as shown in Figure 1-1. See Table 1-2 for the power input parameters.

Table 1-2 Power input parameters

Power	Input	Range	Interface
AC input	Voltage	100Vac ~ 240Vac	C14 with anti-disengaging design
	Current	< 1A	
	Frequency	45Hz ~ 66Hz	

Indicators

The rear panel of RDU-A G2 host provides two indicators, as shown in Figure 1-1. See Table 1-3 for their definitions.

Table 1-3 Definitions of indicators on the rear panel

Silk print	Color	Status	Description
Power1	Green	On	Power 1 of RDU-A G2 is live
		Off	Power 1 of RDU-A G2 is off
Power2	Green	On	Power 2 of RDU-A G2 is live
		Off	Power 2 of RDU-A G2 is off

The front panel of RDU-A G2 host provides three indicators, as shown in Figure 1-1. See Table 1-4 for their definitions.

The indicator description of the RDU host is shown in Table 1-4.

Table 1-4 Definitions of indicators on the front panel

Silk print	Color	Status	Description
Power1	Green	On	The power 1 of the RDU is live
		Off	The power 1 of the RDU is off
Power2	Green	On	The power 2 of the RDU is live
		Off	The power 2 of the RDU is off

Silk print	Color	Status	Description
Run/Alarm	Green/Red	Green	No alarm
		Red	Alarm

Reset button

Press and hold the reset button (silk print: Reset) for four seconds, release your hand until the run/alarm indicator turns off, the IP address and password of the RDU-A G2 will be restored to factory defaults after the system restarts. See Table 1-6 for the defaults.

Console port

The RDU-A G2 host supplies a console port (USB port, see Figure 1-1 for its position), which adopts USB communication mode. The communication parameters are given in Table 1-5.

Table 1-5 Communication parameters of console port

Parameter	Baud rate	Bit	Parity	Stop bit
Value	115200bps	8 bits	None	1 bit

USB port

The RDU-A G2 host supplies two USB-A type socket ports for connecting camera or USB Modem of designated model. Its position is shown in Figure 1-1.

Network port

The RDU-A G2 host supplies two network ports which adopt 10/100M self-adaptable Ethernet ports. Its position is shown in Figure 1-1. See Table 1-6 for default configuration of the network ports.

Table 1-6 Default configuration parameters of the network ports

Parameter / Network card	IP address	Subnet mask	Default gateway
Network card 1 (eth0)	192.168.0.254	255.255.255.0	192.168.0.1
Network card 2 (eth1)	192.168.1.254	255.255.255.0	192.168.1.1
Note: The login password of the Web browser will be restored to ‘emerson’			

Relay output port

The RDU-A G2 host supplies two relay outputs: DO1 and DO2. Their positions are shown in Figure 1-1. See Table 1-7 for their parameters.

Table 1-7 Relay output port parameter

Parameter	Value	Range	Port	Usage
DO1/DO2	Voltage	11V ~ 14V	RJ45	1. DO output, and it can connect to an alarm lamp; 2. The total power of the two ports is supportive of up to 2.4W; 3. Supportive of short-circuit protection function
	Total current	≤ 0.2A		

Digital input port

The RDU-A G2 host supplies four digital input ports. Their positions are shown in Figure 1-1. See Table 1-8 for their parameters.

Table 1-8 Electric parameters of digital input port

Silk print	Definition	Rated output voltage	Output current (total)	Maximum output power (total)	Overload protection of the port
DI1	Door status 1 port	+12Vdc	≤ 0.2A	2.4W	Supportive of overload protection
DI2	Door status 2 port				
Smoke1	Smoke port 1				
Smoke2	Smoke port 2				

Sensor port

The RDU-A G2 host supplies two routes of sensor ports, which include four RJ45 interfaces. Their positions are shown in Figure 1-1. See Table 1-9 for their parameters.

Table 1-9 Electric parameters of sensor port

Silk print	Definition	Rated output voltage	Output current (total)	Maximum output power (total)	Overload protection of the port
Sensor1	First route of sensor port	+12Vdc	≤ 0.4A	4.8W	Supportive of overload protection
Sensor2	Second route of sensor port				

The port adopts RS-485 communication mode, used to connect Emerson intelligent temperature & humidity sensor, intelligent temperature sensor and intelligent digital expansion module. See Table 1-10 for its communication parameters.

Table 1-10 Communication parameters of sensor port

Parameter	Baud rate	Bit	Parity	Stop bit
Value	9600bps	8 bits	None	1 bit

COM port

The RDU-A G2 host supplies three independent COM port, namely, COM1, COM2 and COM3 (COM3 includes two RJ45 interfaces). Their positions are shown in Figure 1-1.

The port adopts RS-485/RS-232C (adaptive) communication mode. See Table 1-11 for the communication parameters.

Table 1-11 Communication parameters of COM port

Parameter	Baud rate	Bit	Parity	Stop bit
Value	1200bps, 2400bps, 4800bps, 9600bps, 19200bps (optional)	5 ~ 8 bits	Even/Odd/None/Mark/Space	1 ~ 2 bits
Note: The combination mode of 5-bit word size and 2-bit stop bit is not supported				

1.2.2 Expansion Card

IRM-4COM card (optional)

The IRM-4COM card provides four series ports, which support connecting user equipment (RS284/RS232C line sequence is adaptive) in RS232/ RS485 communication mode. Its appearance is shown in Figure 1-2.

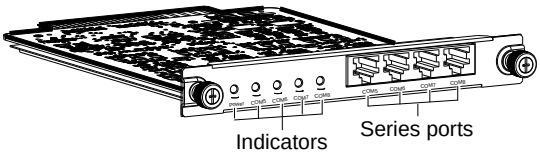


Figure 1-2 IRM-4COM card

See Table 1-12 for the indicator definition of IRM-4COM card.

Table 1-12 Indicator definition of IRM-4COM card

Silk print	Color	Status	Description
Power	Green	On	IRM-4COM card is powered on
		Off	IRM-4COM card is powered off
COM5 ~ COM8	Yellow	Blinking	Data received and sent
		Off	No data received or sent

IRM-8DIAI card (optional)

The IRM-8DIAI card supplies eight digital / analog input interfaces (digital and analog are adaptive), which support digital/ analog input. Its appearance is shown in Figure 1-3.

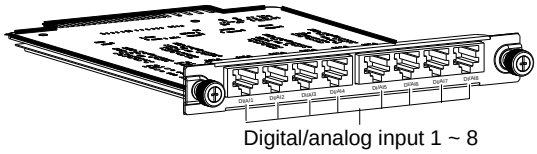


Figure 1-3 IRM-8DIAI card

See Table 1-13 for the interface definition of IRM-8DIAI card.

Table 1-13 Interface description of IRM-8DIAI card

Interface	Type	Silk print	Definition
Digital / analog input 1 ~ 8	RJ45 interface	DI/AI1 ~ DI/AI8	Digital input: passive dry contact; Analog input: 0 ~ 5V or 4mA ~ 20mA

IRM-8DOAO card (optional)

The IRM-8DOAO card supplies eight digital / analog output interfaces (digital and analog are adaptive), which support digital/ analog output. Its appearance is shown in Figure 1-4.

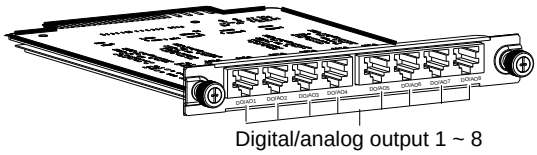


Figure 1-4 IRM-8DOAO card

See Table 1-14 for the interface definition of IRM-8DOAO card.

Table 1-14 Interface description of IRM-8DOAO card

Port	Type	Silk print	Definition
Digital / analog input 1 ~ 8	RJ45 interface	DO/AO1 ~ DO/AO8	Digital output: normally-open contact + normally-closed contact; Analog output: 0 ~ 10V

Line sequence definition of RDU-A G2 and expansion cards

See Table 1-15 for the line sequence definition of RDU-A G2 and expansion cards.

Table 1-15 Line sequence definition of RDU-A G2 and expansion cards

RJ45	DO	DI/Smoke	Sensor	COM	DOAO card	DIAI card
1	12V	12V	12V	RTS	0～10V	12V
2				NC		
3	Normally-closed	NC	NC	TXD	normally-closed	AI_I
4	Disengaging detection	Disengaging detection	GND	GND	Disengaging detection	Disengaging detection
5	GND	GND			GND	GND
6	Normally-open	DI	NC	RXD	Normally-open	DI
7	COM		D＋	D＋	COM	
8	NC	NC	D－	D－	NC	AI_V

Note:
1. The line sequence of RJ45 interface is 1 to 8 from left to right, with the gap downwards;
2. The D+, D- are two kinds of levels of the RS485 differential signal;
3. NC: Not Connected

1.3 Main Functions

The main functions of RDU-A G2 are listed in Table 1-16.

Table 1-16 Main functions of RDU-A G2

Main function	Description
Device monitoring	Realizing camera viewing in data center; getting and handling the data of different intelligent devices and controlling them through Web interface

Main function	Description	
AC TeamWork	Monitoring and controlling each AC which participates in the AC teamwork according to a certain rule, to achieve the goals of reducing AC power consumption, prolonging AC life-span and avoiding competition among ACs in the team	
Energy Consumption	Supportive of PUE statistic and system load percentage statistic in both power mode and electric energy mode, and capable of displaying real-time valve and historic data	
Alarm Management	Current alarm	Displaying alarm in real time, and confirming the current alarm
	History alarm	Querying the history alarm
Alarm Management	Alarm notification	1. Can be customized according to user requirements, that is, alarm notification content can be customized; 2. You can choose the communication mode to receive alarm information of different level from different equipment; 3. The communication mode includes Email, SMS, phone and RDU voice notification system; 4. Email supports SSL function; 5. Supplying alarm test function to test whether or not users have received the alarm notification information; 6. Sending the system running status periodically according to user configuration
	Actions	1. Can be customized according to user requirements; 2. DO1 alarm output; 3. Can combine equipment signals, parameters and alarm to control equipment; 4. Having the following logic components: 1) AND, which represent AND command 2) OR, which represent OR command 3) NOT, which represent NOT command 4) XOR, which represent XOR command 5) GT, which represent GT command 6) LT, which represent LT command 7) DS, which represent DS command
Data & History	Device information	Querying the main data of equipment
	History data	Querying the history data
	History log	Querying the log data
	Clear history	Clearing the history data and log data
Device Options	Device management	1. Can add, modify and delete equipment actively, and support adding seven pieces of intelligent equipment at most; 2. Can install and uninstall equipment type and support connecting third party equipment
	Signal setting	Modifying equipment name, signal name and alarm level online
	Batch configuration	Updating and downloading configuration files and system files
System Options	Monitoring unit	Collecting the system information of RDU-A G2-A
	Network setting	1. Setting the network information such as IP, subnet mask, gateway and DNS; 2. Controlling whether the upper monitoring system (RDU-M manager) can visit the RDU-A G2; 3. Remote service setting
	User management	Adding, modifying and deleting user information
	Date/time setting	Calibrating the real time clock of RDU-A G2-A
	Restore system	Rebooting the RDU-A G2 and restoring default configuration
	Site setting	Modifying site information online
	License management	Completing expansion of RDU-A G2 function and connecting capacity through license
	System upgrade	Upgrading the application program online
	System title	Setting title and logo picture at the top of the Web page
Help	About RDU-A G2	Displaying serial number, identify code and software version, and supplying links for downloading user manual and tool software

1.4 Technical Specifications

1.4.1 Environment Specifications

See Table 1-17 for the environment specifications of RDU-A G2.

Table 1-17 Environment conditions

Item	Requirement
Application location	Usually in data center or computer room, with air conditioner
Working temperature	-10ºC ~ +60ºC
Relative humidity	5%RH ~ 95%RH, no condensing
Working environment	Dust: compliant with the indoor requirements of GR-63. No corrosive gas, flammable gas, oily mist, steam, water drops or salt
Air pressure	70kpa ~ 106kpa
Storage temperature	-40ºC ~ +70ºC
Cooling	Natural cooling
Power distribution network	TT/TN
Protection level	IP20

1.4.2 Mechanical Specifications

See Table 1-18 for the mechanical specifications of RDU-A G2.

Table 1-18 Mechanical specifications

External model	Measurement	Valve	Error
IRM-HOST2	Height	43mm	< ±0.5 mm
	Width	440mm	< ±1 mm
	Depth	311mm	< ±1 mm
	Weight	<8kg	
IRM-4COM IRM-8DIAI IRM-8DOAO	Height	20mm	< ±0.5 mm
	Width	158mm	< ±1 mm
	Depth	199mm	< ±1 mm
	Weight	<1kg	

1.4.3 Performance Specifications

See Table 1-19 for the performance specifications of RDU-A G2.

Table 1-19 Performance specifications

Connected component	Cable standard	Connected distance (unit: m)	Connected number / connection point
Connecting node of SENSOR1	Standard category 4 twisted-pair cable	≤ 100	16[1]
Connecting node of SENSOR2	Standard category 4 twisted-pair cable	≤ 100	16[2]
Connecting nodes of DI ports	Standard category 4 twisted-pair cable	≤ 100	4[3]
Connecting nodes of DO ports	Standard category 4 twisted-pair cable	≤ 100	2[4]
Connecting nodes of COM ports	Standard category 4 twisted-pair cable	≤ 100	16[5]

Note:
[1]: For temperature, temperature and humidity, door status, water, 4DI, 4DO, DO devices and so on, each sensor or device is calculated as one node; for smoke and infrared sensors, each sensor is calculated as four nodes; only capable of connecting devices whose address within the group is 1;
[2]: The connecting capacity is the same as [1], however, it can only connect devices whose address within the group is 2;
[3]: DI includes four ports: DI1, DI2, Smoke1, Smoke2, which are provided on the RDU-A G2;
[4]: Visual and audible alarm lamp has two connecting nodes: DO1, DO2. The two connecting nodes can also be for other use as two routes of digital output;
[5]: The RDU-A G2 can connect up to 16 intelligent devices, not including the default devices, 8DIAI and 8DOAO devices. The connected devices of single COM cascade cannot exceed four

1.4.4 Product Certificate

RDU-A G2 satisfies CE allege.

Chapter 2 Hardware Installation

This chapter introduces the hardware installation of RDU-A G2, including installation preparation, installing RDU-A G2 host, and installing accessories of expansion cards and sensors.

2.1 Installation Preparation

2.1.1 Note

When installing RDU-A G2, take the following precautions to avoid damage to personnel and devices by accident.

- Always cut off the power before performing any installation operation on RDU-A G2
- Ensure that the external devices are connected to the correct RDU-A G2 ports
- Wear an ESD wrist-wrap during installation
- Arrange the wires properly, and do not put any heavy objects on the wires or stamp the wires

2.1.2 Environmental Requirement

Operating environment

The RDU-A G2 must be installed indoors. See Table 1-17 for the detailed requirements.

Anti-static requirement

Take the following measures for minimizing static influences:

- Maintain proper temperature and humidity in the machine room (See Table 1-17)
- Wear antistatic clothing and an ESD wrist-wrap when contacting with the circuit board; if antistatic clothing or ESD wrist-wraps are unavailable, wash your hands and dry them instead

Anti-EMI requirement

Take the following measures for anti-EMI purpose:

- The RDU-A G2 working ground cannot share with the ground device or SPD ground of electrical power equipment. Instead, place them away from each other as far as possible
- Keep the RDU-A G2 away from large-power radio transmitter, radar, or high-frequency large current electrical equipment
- Use electromagnetic shielding if necessary

2.1.3 Space Requirement

- Keep the RDU-A G2 as far as possible away from heat sources
- It is recommended to install the RDU-A G2 into a 19" standard cabinet. Keep at least 10mm clearance around the RDU-A G2 for heat dissipation

2.1.4 Installation Tool

The required installation tools are listed in Table 2-1.

Table 2-1 Installation tools

Tool	Specification	Usage
Cross screwdriver (cross)	100mm, 200mm	Installing brackets, dummy plates for expansion slots of RDU-A G2 host
Digital multimeter	3.5-bit digital display	Inspecting the electrical connection

2.2 Installing RDU-A G2 Host

2.2.1 Mechanical Installation

The RDU-A G2 host can be installed in a cabinet.

The installation procedures are as follows:

1. Confirm that the cabinet has been secured, with no obstacles inside or outside it.

2. Fasten the hangers onto both sides of the RDU host with accessory M4 screws; there are two methods for installing the hangers: installing on the front end and installing on the back end, as shown in Figure 2-2 and Figure 2-3.

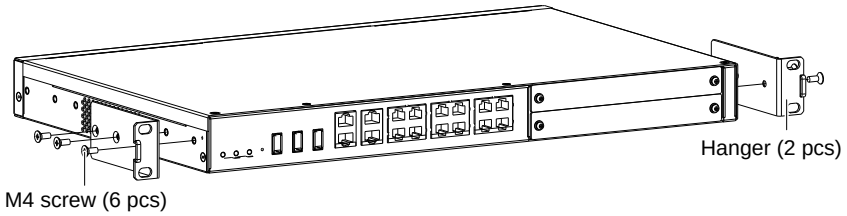


Figure 2-1 Installing the hangers on the front end

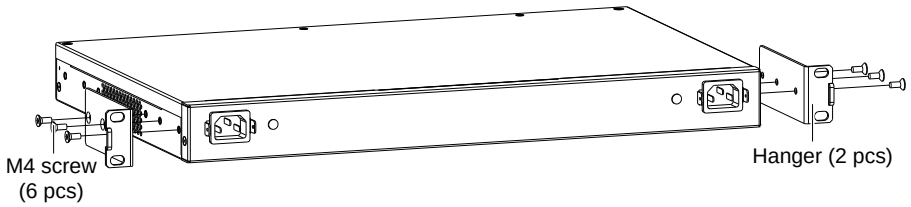


Figure 2-2 Installing the hangers on the back end

3. Use M6 floating nuts to fasten the hangers of RDU-A G2 host to the cabinet.

2.2.2 Electrical Connection

The electrical connection procedures of the RDU-A G2 host are as follows:

1. Select a C14 or national standard cable (RDU-A G2 accessories) based on the port type of the power supply end. Take out the corresponding power cable, and insert one end of the power cable into the power input interface of the RDU-A G2 host, and install the anti-disengaging fastener shown in Figure 2-3.

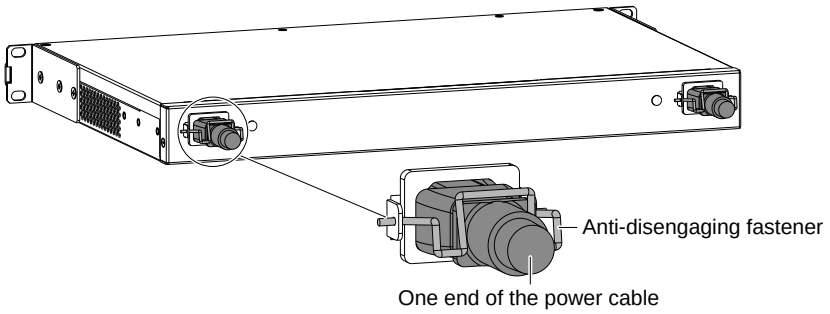


Figure 2-3 Anti-disengaging fastener

2. Ensure that the connection is correct. Connect the other end of the power cable to the mains supply.

Note

The RDU-A G2 host provides dual power supplies to supply power; you can select one or two route(s) of power supply. The input voltage ranges from 100Vac to 240Vac, and the frequency ranges from 45Hz to 66Hz.

2.3 Installing Accessories Of Expansion Cards And Sensors

Note

The IRM-4COM/IRM-8DIAI/IRM-8DOAO expansion card is optional, and you can choose whether to buy and install it or not.

2.3.1 Installing Expansion Cards

The expansion cards include IRM-4COM, IRM-8DIAI and IRM-8DOAO. The installation procedures are as follows:

Remove the dummy plate for expansion slot (Slot1 or Slot2) on the front panel of RDU-A G2 host, insert the expansion card into the corresponding expansion slot of RDU-A G2, and fasten the screws on both sides, as shown in Figure 2-4.

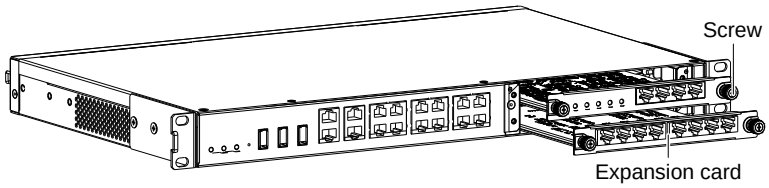


Figure 2-4 Installing expansion cards

2.3.2 Installing Intelligent Sensors

The intelligent sensors include: IRM-S01T intelligent temperature sensor (IRM-S01T for short), IRM-S02TH intelligent temperature and humidity sensor (IRM-S02TH for short), IRM-S04DI intelligent digital input sensor with Phoenix ports (IRM-S04DI for short), IRM-S04DIF intelligent digital input sensor with RJ45 ports (IRM-S04DIF for short). Their appearances are shown in Figure 2-5.

IRM-S01T

IRM-S02TH

IRM-S04DI

IRM-S04DIF

Figure 2-5 Intelligent sensors

Installation procedures

For the installation procedures of the intelligent sensors, refer to the corresponding intelligent sensor user manuals:

Refer to *IRM-S01T Intelligent Temperature Sensor User Manual* for IRM-S01T;

Refer to *IRM-S02TH Intelligent Temperature And Humidity Sensor User Manual* for IRM-S02TH;

Refer to *IRM-S04DI Intelligent Digital Input Sensor With Phoenix Ports User Manual* for IRM-S04DI;

Refer to *IRM-S04DIF Intelligent Digital Input Sensor With RJ45 Ports User Manual* for IRM-S04DIF.

2.3.3 Installing Physical Sensors

The physical sensors include smoke sensor, water logging sensor, infrared sensor and door status sensor.

There are two installation modes for smoke sensor, water logging sensor, infrared sensor and door status sensor.

- Directly connected to DI port on the rear panel of RDU-A G2. (Silk print: DI1, DI2, Smoke1 and Smoke2. Each port can be connected with anyone of smoke sensor, water logging sensor, infrared sensor and door status sensor at will.) See Table 1-15 for the line sequence of cable connection.
- Connected to RDU-A G2 through IRM-S04DI or IRM-S04DIF: connect the sensor to the digital input port of IRM-S04DI or IRM-S04DIF. For the line sequence of cable connection, refer to *IRM-S04DI Intelligent Digital Input Sensor With Phoenix Ports User Manual* or *IRM-S04DIF Intelligent Digital Input Sensor With RJ45 Ports User Manual*.

Chapter 3 Web Page Of RDU-A G2

This chapter expounds how to access RDU-A G2 through Web, and relative functions, including login preparation, log in RDU-A G2, RDU-A G2 homepage and menus.

3.1 Login Preparation

To ensure that the RDU-A G2 page function can be normally used, please refer to this section for selecting and setting browser options.

3.1.1 Checking IP Address Connectivity

Before logging in RDU-A G2 through Web, please first confirm the IP address of RDU-A G2, and test its connectivity. Refer to Q5 in *4.2 FAQ* for the test method.

3.1.2 Checking Browser Version

The recommended browser version includes: **IE10** or **IE11**.

3.1.3 Checking Browser Setting

Checking IE General setting

Double-click the icon of IE to run the software, click the menus of **Tools** -> **Internet Options**, then click the **Settings** button on the **General** tab, and select **Every time I visit the webpage** for **Check for newer versions of stored pages**, as shown in Figure 3-1.

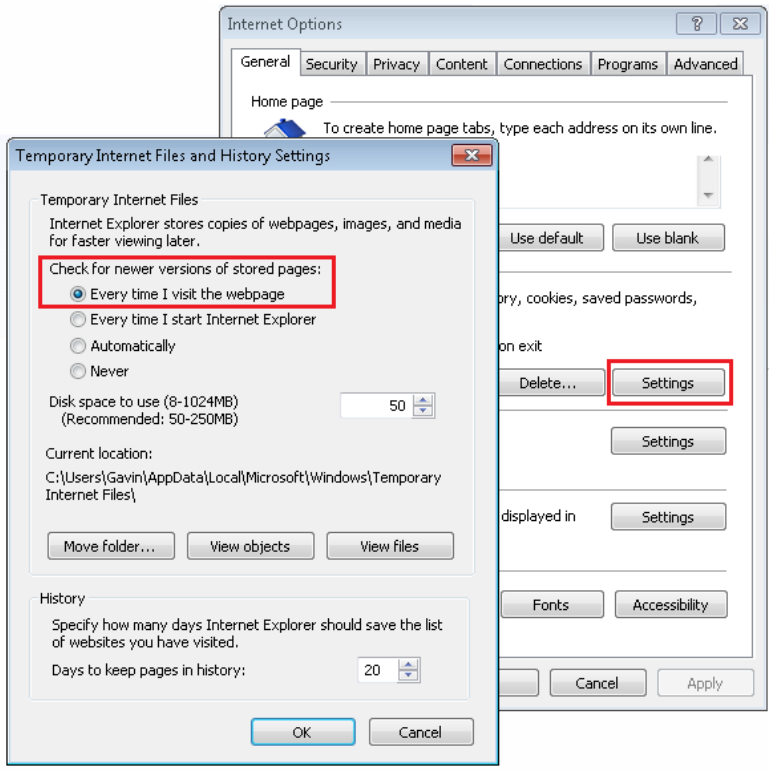


Figure 3-1 General setting

Checking IE proxy setting

1. Double-click the icon of IE to run the software, click the menus of **Tools** -> **Internet Options** and then choose the **Connections** tab to pop up the window shown in Figure 3-2.

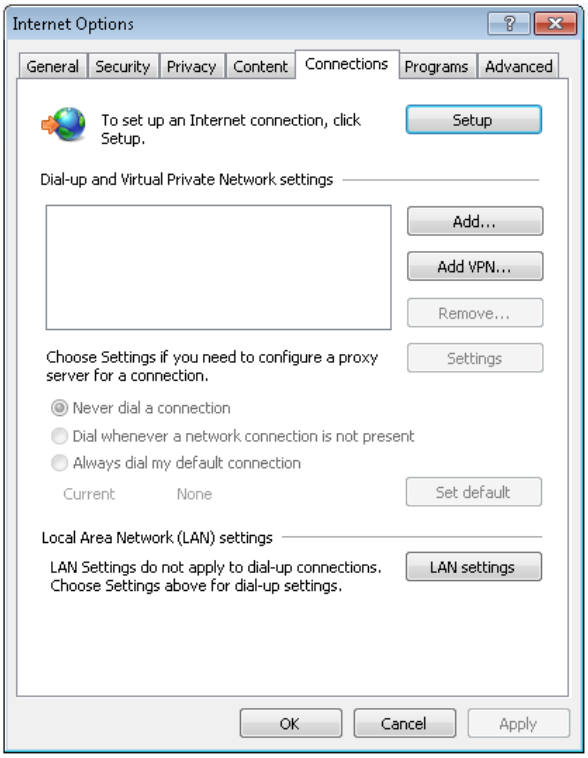


*Figure 3-2 Choosing the **Connections** tab*

2. In the window shown in Figure 3-2, click the button **LAN Settings** to pop up the window shown in Figure 3-3.

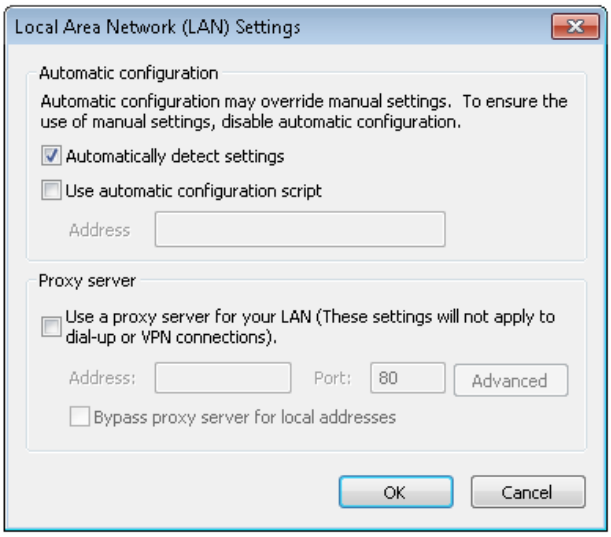


Figure 3-3 LAN setting

3. Consult the network manager of your area, ask if you need to set a proxy server and get the configuration method. If there is no need to set a proxy server, do not tick any option.

Checking IE security setting

1. Double-click the icon of IE to run the software, click the menus of **Tools** -> **Internet Options** and then choose the **Security** tab to pop up the window shown in Figure 3-4.

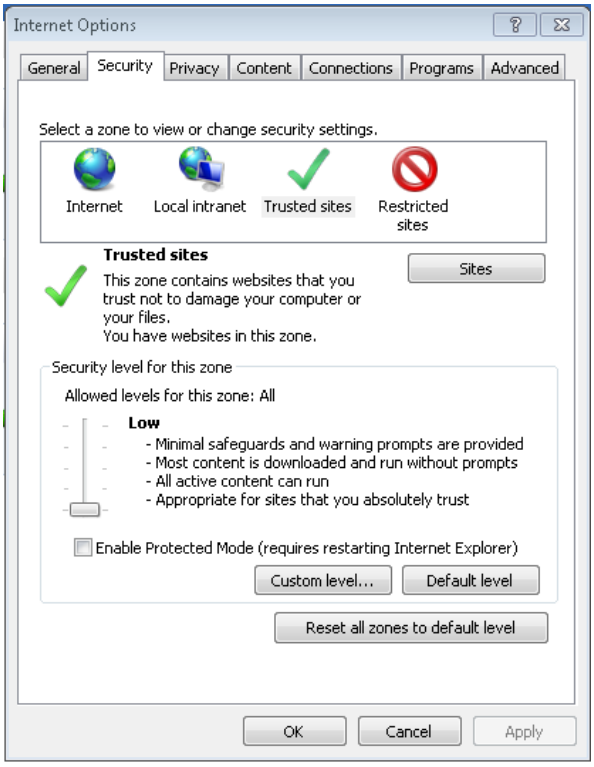


Figure 3-4 Security setting 1

2. In the window shown in Figure 3-4, choose **Trusted sites** and click the **Custom level** button to pop up the window shown in Figure 3-5.

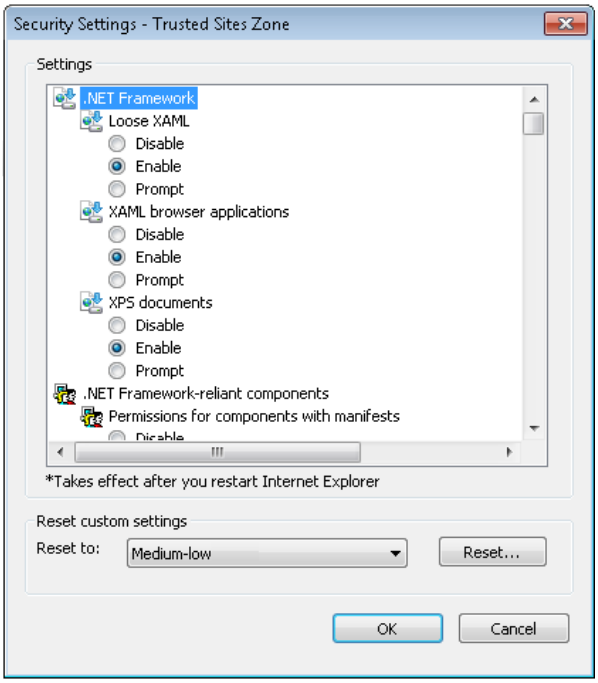


Figure 3-5 Security setting 2

3. In the window shown in Figure 3-5, set 'Medium-low' for the security level. Click the **Reset** button to finish **Reset custom settings**, at last, click **OK**.

4. In the window shown in Figure 3-6, set **Enable** for **File download**.

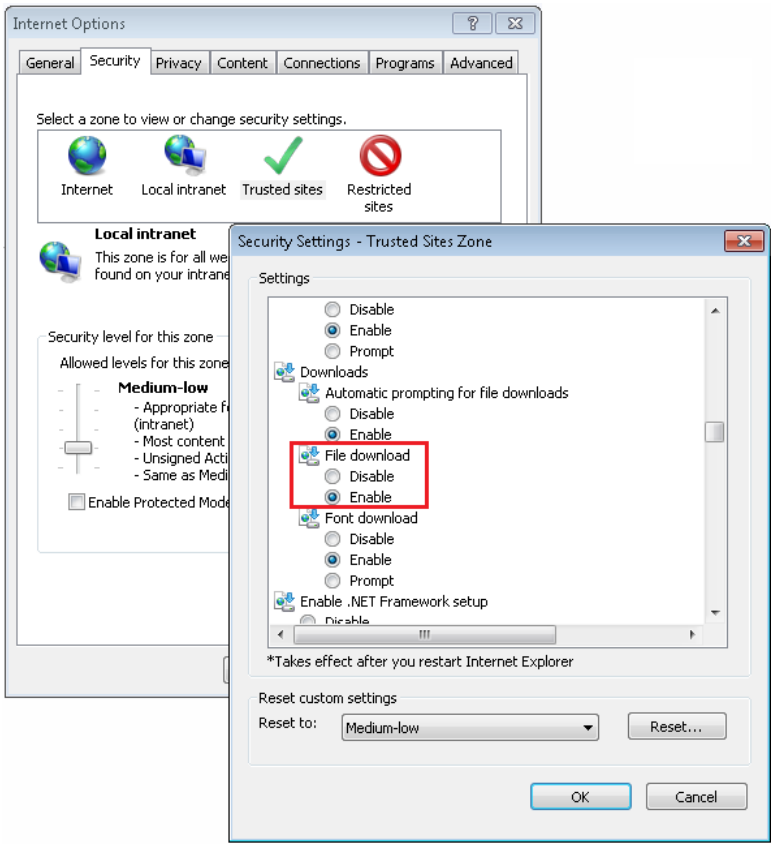


Figure 3-6 Enabling file download

5. In the window shown in Figure 3-7, set **Enable** for **Initialize and script ActiveX controls not marked as safe for scripting**.

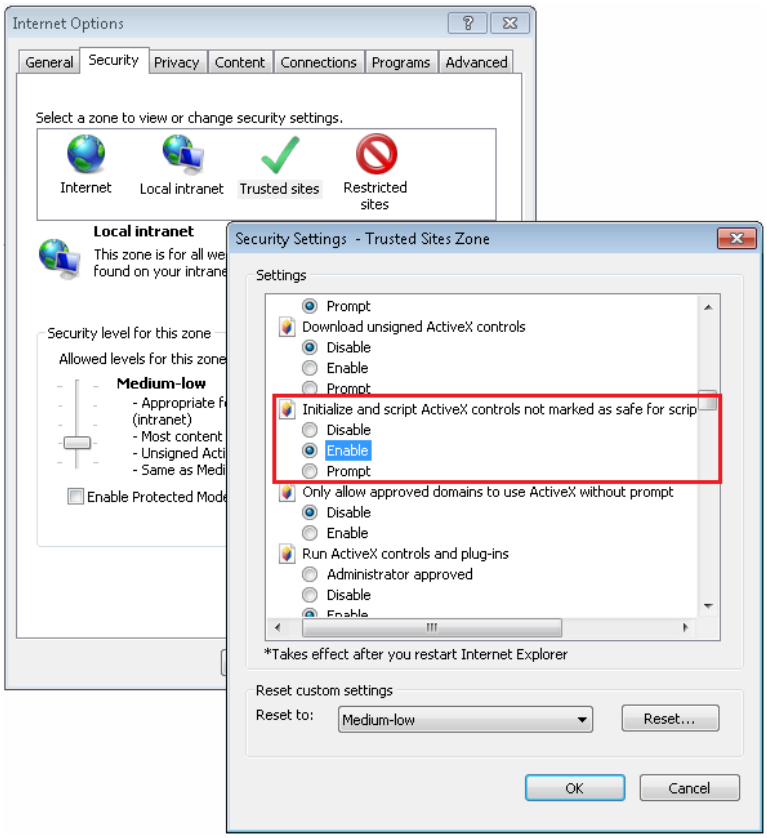


Figure 3-7 Enabling ActiveX controls

6. In the window shown in Figure 3-8, add the IP address of the RDU-A G2 into the trusted site list.

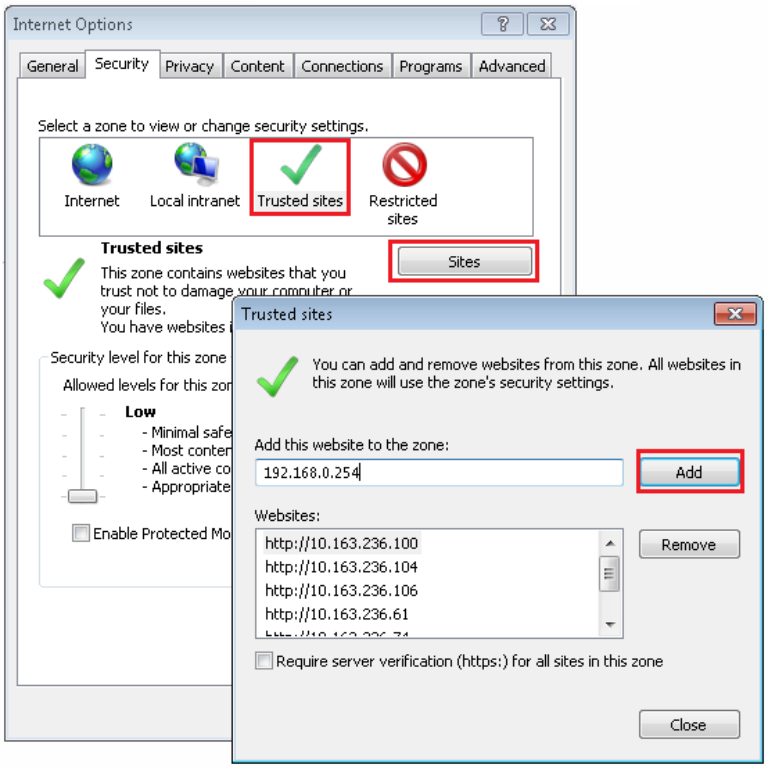


Figure 3-8 Adding trusted sites

3.2 Log In RDU-A G2

3.2.1 Authorizing Boot-Strap

1. When logging in RDU-A G2 for the first time, open the IE browser, and enter the IP address of the RDU-A G2 (the default IP of LAN1 is 192.168.0.254; the default IP of LAN2 is 192.168.1.254) in the address box, the authorizing boot-strap page will appear, as shown in Figure 3-9. If the authorizing boot-strap page does not appear, refer to *Q5* in *4.2 FAQ*.

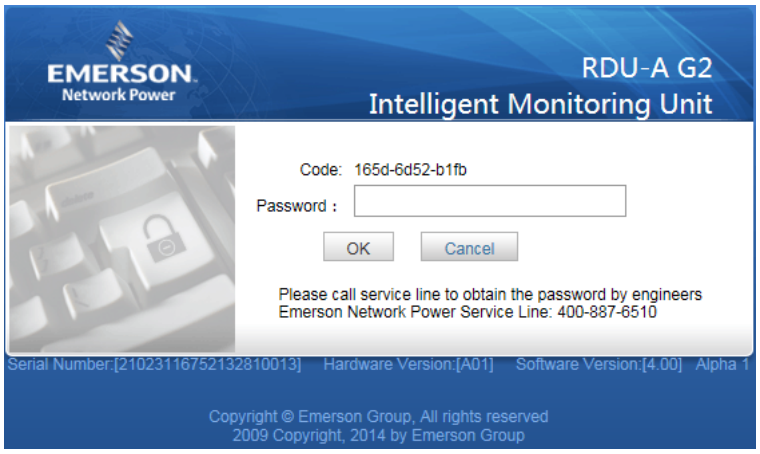


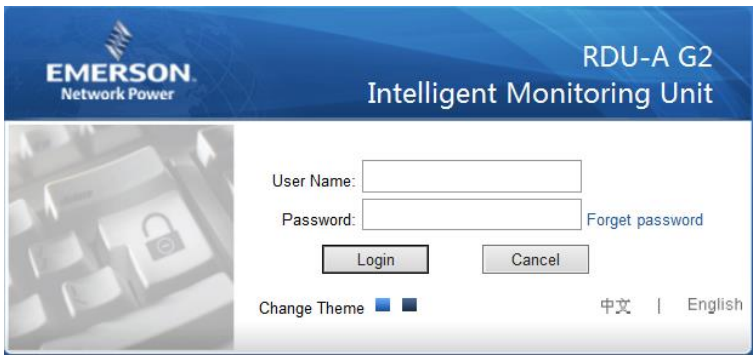
Figure 3-9 Authorizing boot-strap page

2. Call the customer service hotline of Emerson Network Power Co., Ltd.: 400-887-6510, tell the code to the customer service personnel, and you will get the password.

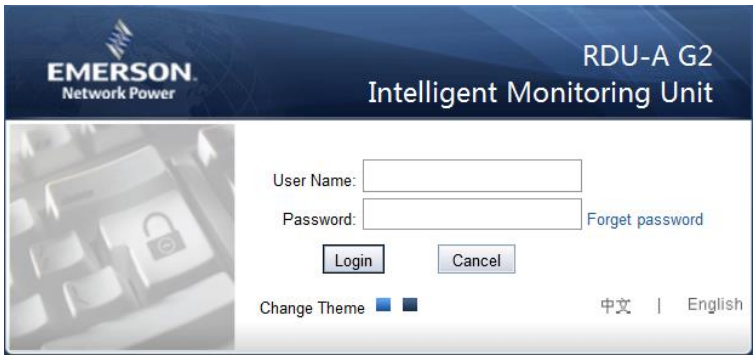
3. Type the gotten password in the textbox of **Password**, and then click **OK**. If the password is correct, the system will jump to the login page automatically (see Figure 3-10).

3.2.2 Login Page

1. Open the IE browser, and enter the IP address of the RDU-A G2 in the address box, the login page will appear, as shown in Figure 3-10. If the login page does not appear, refer to *Q5* in *4.2 FAQ*.



Crystal blue



Ocean blue

Figure 3-10 Login page of RDU-A G2

2. On the login page, select a preferable theme by clicking ■ or ■: ■ means crystal blue; ■ means ocean blue, as shown in Figure 3-10.

3. Type the username and password (default username: 'admin', default password: 'emerson'), and click the **Login** button, the homepage will appear, as shown in Figure 3-12. If you cannot visit the homepage after entering correct username and password, refer to *3.1.2 Checking IE Setting* and set the IE browser again.

3.2.3 Getting Password

If you forget the password, click the **Forget Password** button on the login page, and the screen will display the page of getting password, as shown in Figure 3-11.

Figure 3-11 Page of getting password

Type your username, and click the **Get Password** button, your password will be sent to the email box or phone which you have configured before. Clicking the **Return Login** button cancels the operation.

Note

1. Only when you have correctly configured the email and SMS parameters on the **SMS and Email Server Configuration** page can you receive the password sent by the system. Refer to *Alarm Notification* in *3.4.4 Alarm Management* for detailed setting method.

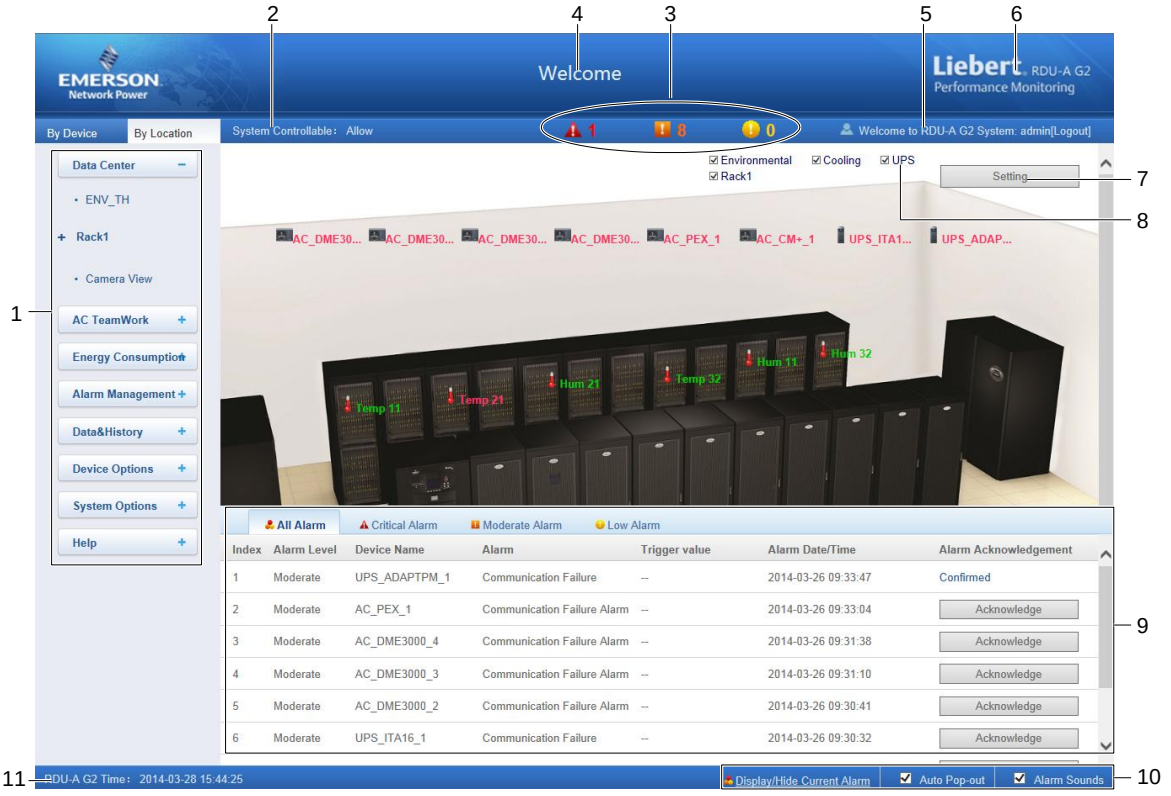
2. The gotten password is a random new password generated by the system; please modify the password after logging in the system successfully.

3.3 Homepage Of RDU-A G2

The homepage of RDU-A G2 can be viewed by device or by location. After successful login, the homepage is displayed by location by default, as shown in Figure 3-12.

3.3.1 Viewing By Location

As shown in Figure 3-12, click **By Location** in the upper part of menu items, the display area at right side will display the page viewed by location. You can self-define a plane layout for centralized display according to physical locations of devices in the machine room. After simple configuration, the effect is shown in Figure 3-12.



1. Menu item
2. Controllable status
3. Current number of every level alarm
4. System title
5. [User] Logout
6. Logo
7. **Setting** button
8. Device filter options
9. Real-time alarm displaying list
10. Alarm pop-out setting
11. Time calibrating link

Figure 3-12 Homepage of RDU-A G2 (by location)

Clicking the **Setting** button shown in Figure 3-12 enters setting status of the homepage, as shown in Figure 3-13.

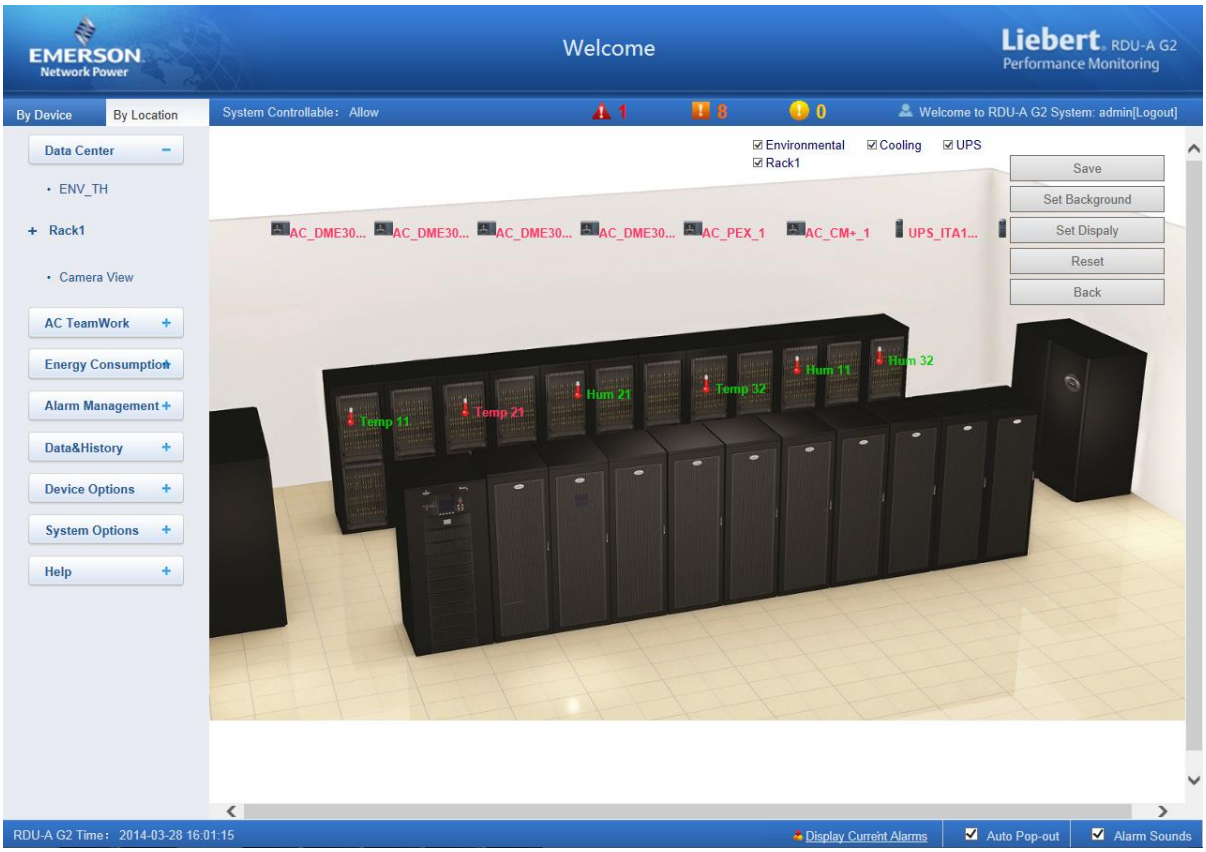


Figure 3-13 Setting page

After the homepage enters setting status, the setting method is as follows:

1. Background setting

Click the Set Background button, the window shown in Figure 3-14 pops up.

- Click the **Browse…** button to choose the background picture, after it is chosen, the **Preview** area will display the preview effect.
- Click the **Upload** button, after the picture is uploaded, the page will display the background picture.

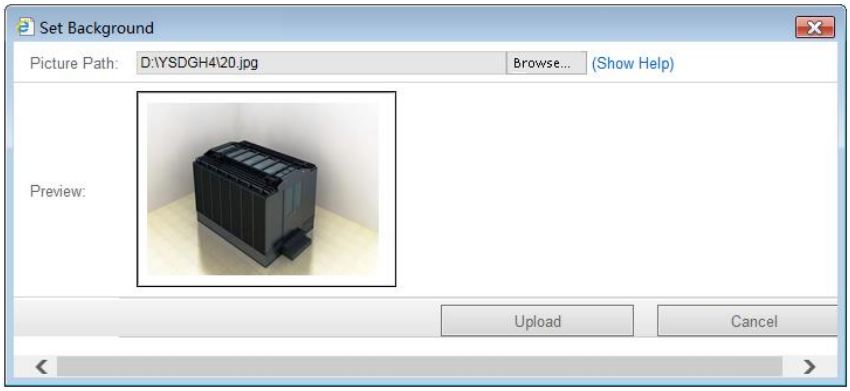


Figure 3-14 Setting background

Note

Only .gif, .ipg and .bmp format pictures are allowed to be uploaded, and the picture size cannot exceed 500K.

2. Display setting

Click the **Set Display** button, the window shown in Figure 3-15 pops up.

- Select the **Signal Display** mode: **Mouse hover**, **Always**.
- Select whether to display **Device icon**.

●After select the device name, the device signals will be displayed in the lower box. You can select the device signals to be displayed according to your needs, however, the selected signals cannot exceed 4.

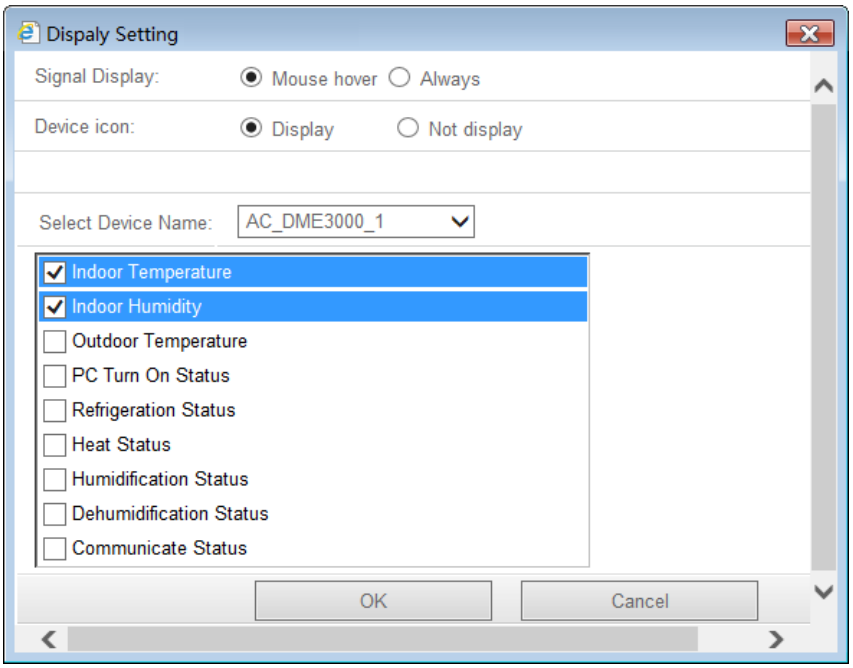


Figure 3-15 Display setting

Note

1. **Signal Display** mode and **Device icon** options are applicable to the currently-selected device. For different devices, their display mode can be set to be different independently.

2. For the display mode of temperature, humidity and 4DI signals, select 'Other Devices or Sensors' and perform settings.

3. Self-define the device location

After the homepage enters setting status, drag the device (signal) icon on the homepage to change its location at will.

4. Reset

Click the **Reset** button, the homepage viewed by location will be restored to initial status.

5. Save

Click the **Save** button, all configuration will be saved and the page returns to view status.

6. Back

Click the **Back** button, the homepage will return to view status from setting status.

Note

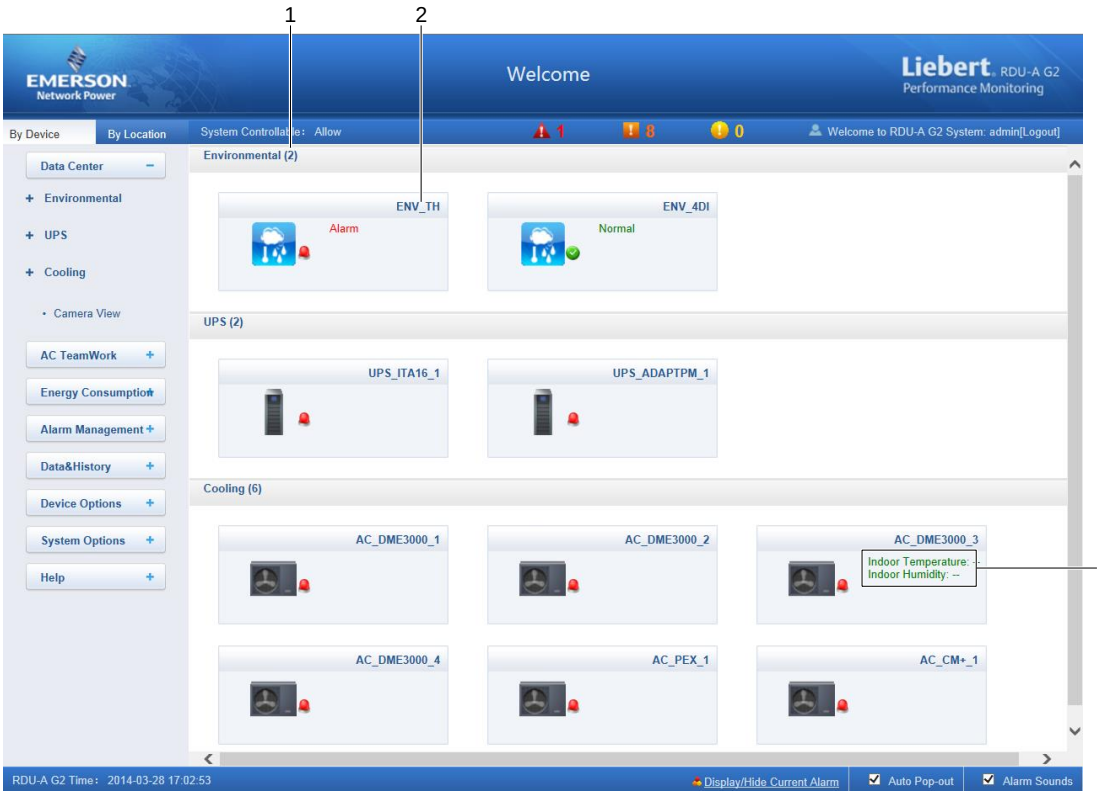
1. Except for uploading background, only after you click the **Save** button, the configuration can take effect and be displayed.

2. Except for uploading background, if you click the **Back** button directly after configuration, all configuring information will be lost.

3.3.2 Viewing By Device

As shown in Figure 3-12, click **By Device** in the upper part of menu items, the display area at right side will display the page viewed by device. After simple configuration, the homepage will display corresponding information according to device type, as shown in Figure 3-16.

For the detailed configuration method, refer to relative descriptions about the **Set Display** button in *3.3.1 Viewing By Location*.



1. Device number of this type 2. Device name 3. Device signal valve

Figure 3-16 Homepage of RDU-A G2 (by device)

Note

1. For temperature, humidity and 4DI sensors, the page viewed by device only displays the whole status.
2. For other devices, the page viewed by device displays four signals at most.

3.3.3 Time Calibrating Link

The lower left part displays the system time of RDU-A G2. Clicking the system time of RDU-A G2 will jump to the time calibrating page. For detailed operation, refer to *Date/Time Setting* in *3.4.7 System Options*.

3.3.4 Clearing Time-Out

When there is no operation on the page within 15min, the page will become uncontrollable, as shown in Figure 3-17.

Figure 3-17 Controllable status

Click **[Clear] Time-out**, the input box shown in Figure 3-18 will appear. After typing the password, the controllable status will become normal after about 5s.

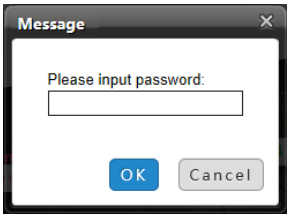


Figure 3-18 Dialog box of Security authentication

3.3.5 Logout

Click the **Logout** link at the upper right corner of the homepage, the prompt box shown in Figure 3-19 will appear, clicking **OK** will log out safely.

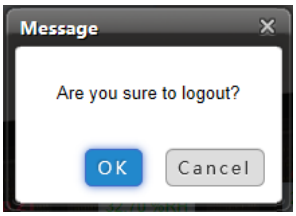


Figure 3-19 Logout

3.3.6 Real-Time Alarm Pop-Up Setting

The real-time alarm displaying list is contracted on the bottom of the page by default. You can perform the following operation by referring to Figure 3-12:

1. Click **Display/Hide Current Alarm** manually, and the real-time alarm displaying list will pop up;
2. Tick **Auto Pop-out**, and the real-time alarm displaying list will pop up when an alarm is generated;
3. Tick **Alarm Sounds**, and the system will play alarm sound through the browser when an alarm is generated.

After the real-time alarms have all been confirmed, the turned-on alarm sound will stop and be on when a new alarm occurs.

3.4 Menu Items

On the homepage of RDU-A G2, the menu items include **Data Center**, **AC TeamWork**, **Energy Consumption**, **Alarm Management**, **Data&History**, **Device Options**, **System Options** and **Help**.

3.4.1 Data Center

Click the **Data Center** menu in the left, the submenus will appear. According to the two selections of **By Device** and **By Location**, the submenus will be classified and displayed according to device type and device location respectively. Clicking the specific device, the right part will display the relative information of the device, including **Overview**, **Sampling**, **Control**, **Setting** and **Alarm**.

Note

1. ENV-TH in **Data Center** is a dummy device, which indicates all temperature sensors, and temperature and humidity sensors connected to RDU-A G2, and the name cannot be changed.
2. The **Camera View** submenu is not displayed by default. When you connect video devices, the menu will be displayed automatically.

Overview

Click the **Overview** tab, and click the **Edit** button, you can define the overview page, as shown in Figure 3-20.

1. Signal configuration icon
2. Remove component icon
3. Back to browse icon
4. Component list
5. Save icon
6. 'Effective to same type of equipment' icon
7. Restore icon
8. View history chart icon
9. History data selection icon
10. View real chart icon

Figure 3-20 ***Overview*** *tab*

In editing status, clicking the icon can restore default; clicking the icon can configure the same type of other devices; click the icon can save the configuration; click the icon can return to view status.

Note

1. The **Overview** page has different default display mode of components for different device type, and clicking the restore icon will restore to this state.

2. Certain types of devices (such as air conditioner, UPS) have special status charts, which cannot be deleted or configured. However, the locations of these status charts can be changed.

Sampling

Clicking the **Sampling** tab can enter the sampling page, which displays sampling signals of selected device, as shown in Figure 3-21.

Figure 3-21 Sampling signals

1. If some signal is in alarm status, it will be displayed in red.

2. You can click the corresponding signal name for modifying or restoring, as shown in Figure 3-22.

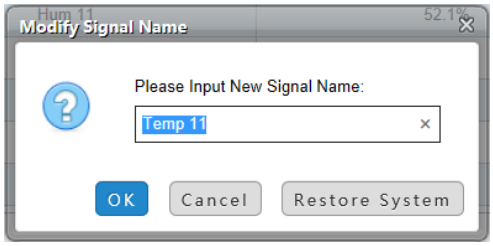


Figure 3-22 Modifying signal name

Note

For ENV-TH and ENV-4DI devices, see the following descriptions:

1. After modifying the name of **Sampling** signals, the names of **Control**, **Setting** and **Alarm** will be modified at the same time;

2. On the **Control**, **Setting** and **Alarm** pages, it is prohibited from modifying the signal name.

Control

Clicking the **Control** tab can enter the control page, which displays control signals of selected device, as shown in Figure 3-23.

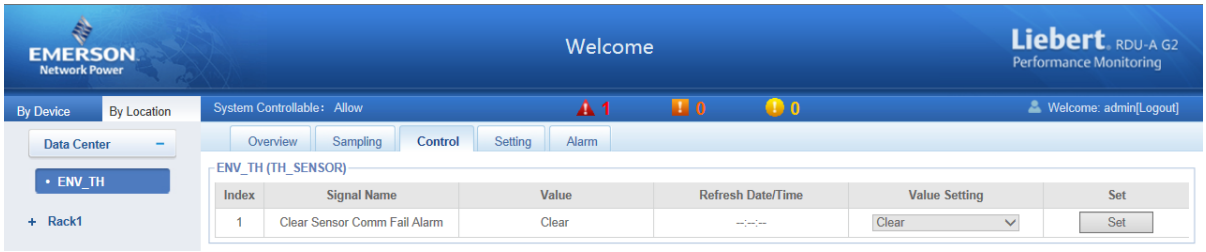


Figure 3-23 Control signals

1. Clicking the **Set** button can control the device.

2. For the name of **Control** signals (except ENV-TH and ENV-4DI), you can click the corresponding signal name for modifying or restoring, as shown in Figure 3-23.

Setting

Clicking the **Setting** tab can enter the setting page, which displays setting signals of selected device, as shown in Figure 3-24.

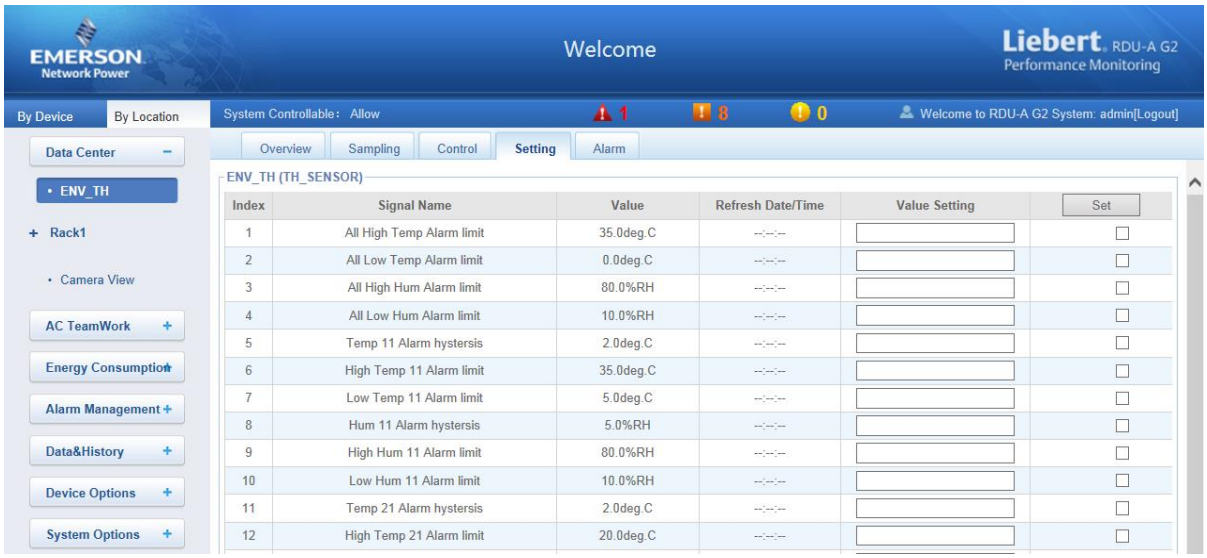


Figure 3-24 Setting signals

1. You can set several signals at the same time, and at most 16 signals can be set at the same time for each time.

2. For the name of **Setting** signals (except ENV-TH and ENV-4DI), you can click the corresponding signal name for modifying or restoring, as shown in Figure 3-22.

Note

The ENV-TH device only displays effective setting signals, however, other devices displays all setting signals.

Alarm

Clicking the **Alarm** tab can enter the alarm page, which displays alarm signals of selected device, as shown in Figure 3-25.

Index	Signal Name	Alarm Level	Update Alarm Level	Set
1	High Temp 11 Alarm	Critical	Critical	
2	Low Temp 11 Alarm	Critical	Critical	
3	Temp 11 Invalid Alarm	Critical	Critical	
4	Temp 11 Comm Fail Alarm	Moderate	Moderate	
5	High Hum 11 Alarm	Critical	Critical	
6	Low Hum 11 Alarm	Critical	Critical	
7	Hum 11 Invalid Alarm	Critical	Critical	
8	High Temp 21 Alarm	Critical	Critical	
9	Low Temp 21 Alarm	Critical	Critical	
10	Temp 21 Invalid Alarm	Critical	Critical	
11	Temp 21 Comm Fail Alarm	Moderate	Moderate	
12	High Hum 21 Alarm	Critical	Critical	
13	Low Hum 21 Alarm	Critical	Critical	
14	Hum 21 Invalid Alarm	Critical	Critical	
15	High Temp 32 Alarm	Critical	Critical	
16	Low Temp 32 Alarm	Critical	Critical	
17	Temp 32 Invalid Alarm	Critical	Critical	
18	Temp 32 Comm Fail Alarm	Moderate	Moderate	
19	High Hum 32 Alarm	Critical	Critical	
20	Low Hum 32 Alarm	Critical	Critical	
21	Hum 32 Invalid Alarm	Critical	Critical	

Figure 3-25 Alarm signals

1. You can set alarm level of several alarm signals at the same time, and at most 16 signals can be set at the same time for each time.

2. For the name of **Alarm** signals (except ENV-TH and ENV-4DI), you can click the corresponding signal name for modifying or restoring, as shown in Figure 3-22.

Note

The ENV-TH device only displays effective alarm signals, however, other devices displays all alarm signals.

Camera View

Click the **Camera View** submenu under the **Data Center** menu, the page shown in Figure 3-26 pops up.

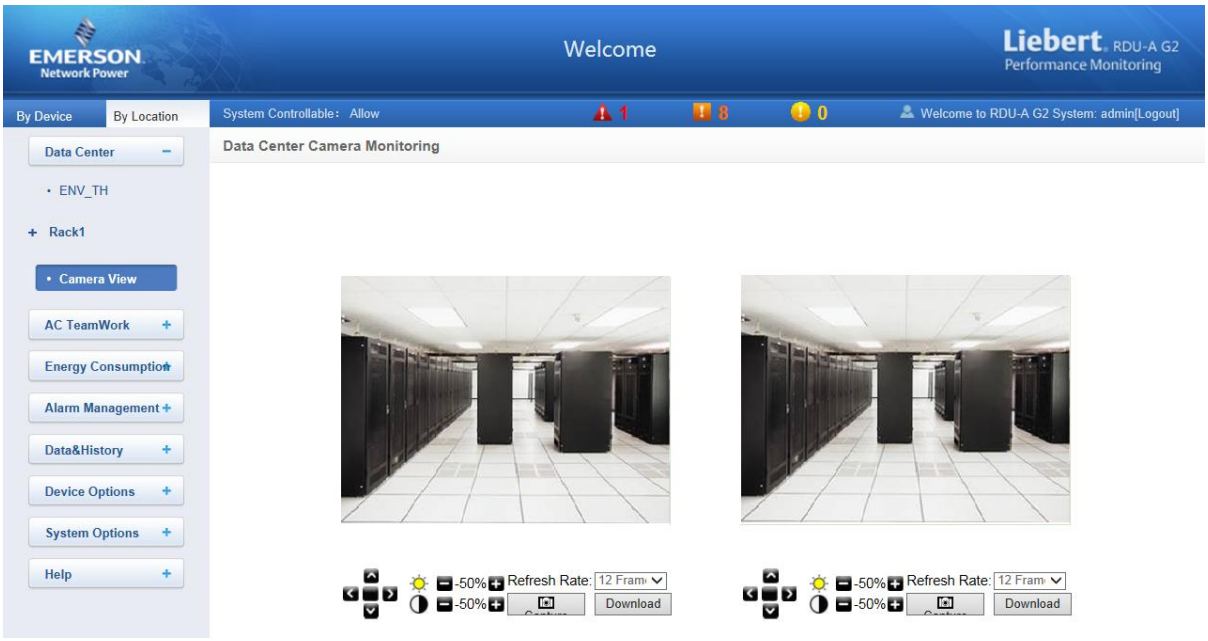


Figure 3-26 Camera view

The RDU-A G2 supports two routes of USB cameras. The icon is used to adjust the camera turning; is used to adjust the picture bright; is used to adjust the picture contrast; **Refresh Rate** can be selected through the drop-down boxes. Meanwhile, it supports **Capture** and **Download** functions.

Note

1. The function of adjusting the camera turning is only for the RDU-A G2 dedicated camera which has the turning function;
2. When using the camera view function, please check and ensure that JRE (Java Runtime Environment, version: 1.5.0 and above) is installed.

3.4.2 AC TeamWork

The AC teamwork function is used to monitor and control each AC which participates in the AC teamwork according to a certain rule, to achieve the goals of reducing AC power consumption, prolonging AC life-span and avoiding competition among ACs in the team.

On the RDU-A G2-A homepage, click the **AC TeamWork** menu in the left, two submenus will appear, including **TeamWork Status** and **TeamWork Setting**.

TeamWork Status

Click the **TeamWork Status** submenu under the **AC TeamWork** menu, the page shown in Figure 3-27 pops up.

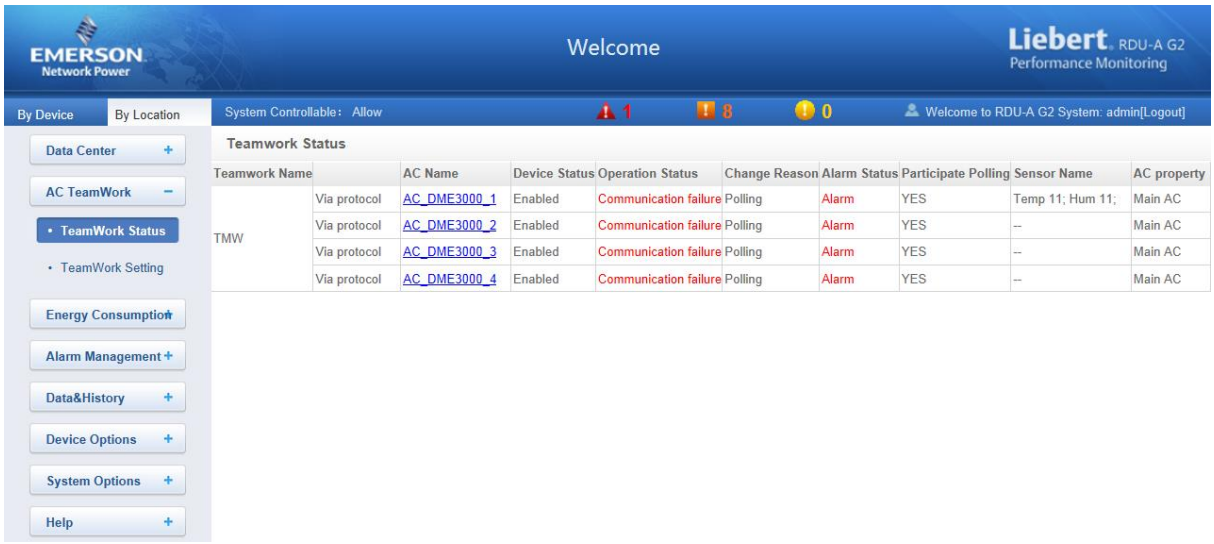


Figure 3-27 TeamWork status page

The TeamWork status page displays the main AC running parameters in all AC teams.

TeamWork Setting

Note

The AC Teamwork function of RDU-A G2 is available in two versions: standard version and authorized version. The standard version has the AC Teamwork function configured with the RDU-A G2 standard software; the authorized version is a software version which needs to be purchased separately.

1. Teamwork Parameters

Click the **TeamWork Setting** submenu under the **AC TeamWork** menu, the teamwork parameters setting page pops up, the standard version is shown in Figure 3-28, and the authorized version is shown in Figure 3-29.

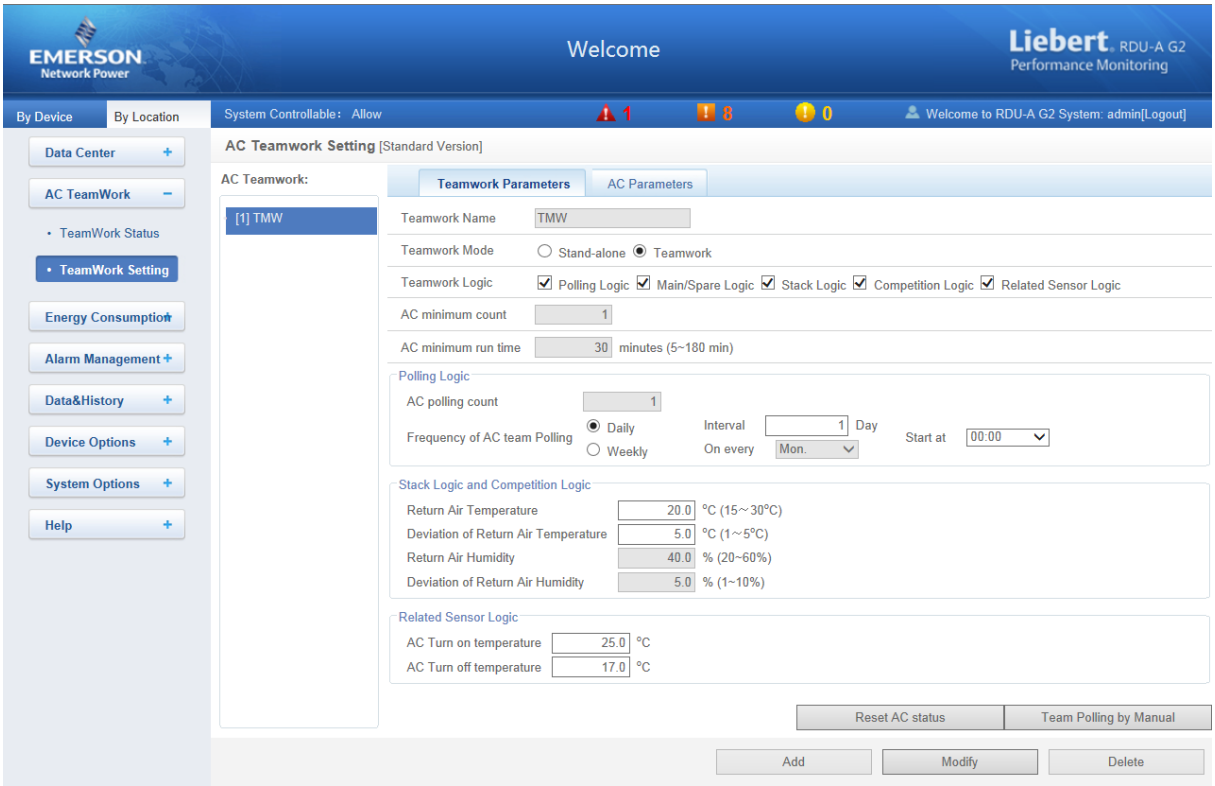


Figure 3-28 Teamwork parameters setting page (standard version)

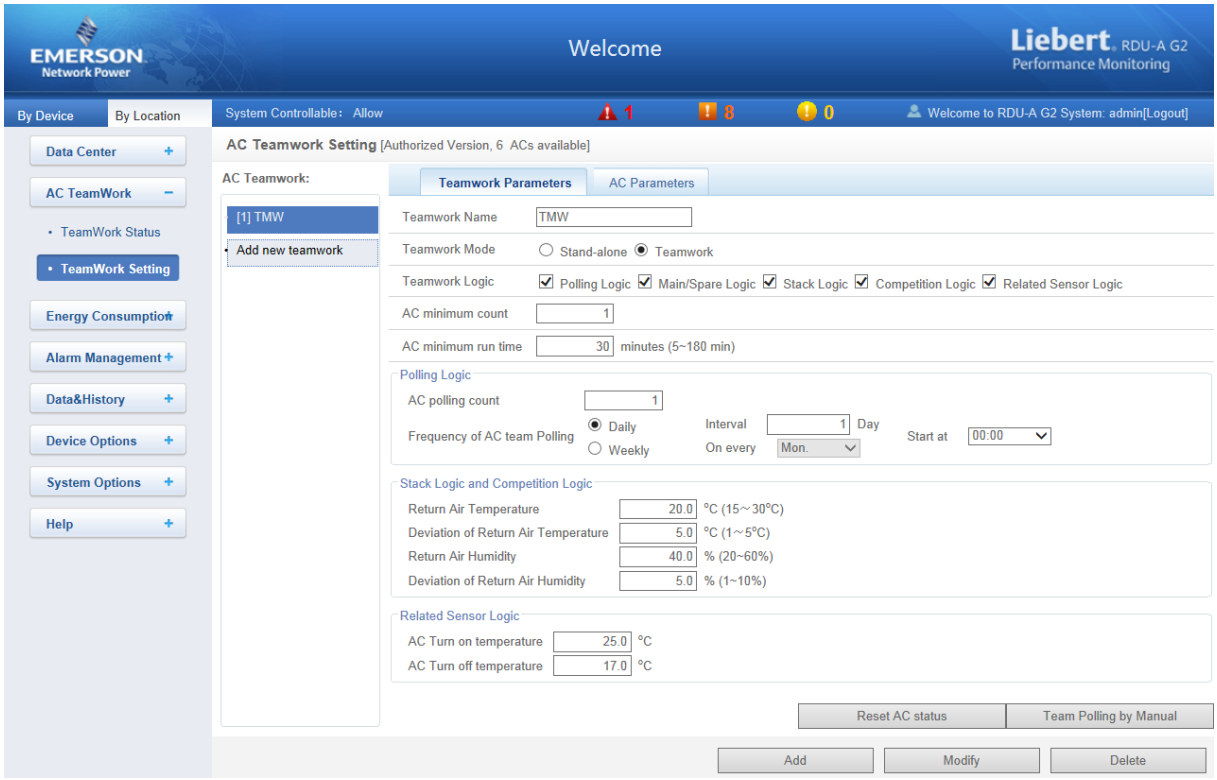


Figure 3-29 Teamwork parameters setting page (authorized version)

As for the AC Teamwork function of RDU-A G2 standard version, the descriptions are as follows:

The AC Teamwork function only supports one AC team, **[1]TMW** by default, without adding and deleting functions; meanwhile, the team name cannot be changed. However, the authorized version does not have such limit.

Click the **Click here to add teamwork** link in the **AC Teamwork** list, you can add a new AC team. After the team parameters are configured, click the Add button to save the setting, at this time, the new-added team will be displayed in the left **AC Teamwork** list.

For detailed parameter descriptions of the teamwork parameters setting page, see Table 3-1.

Add, edit or delete AC in the team on the AC parameters setting page, refer to *2. AC Parameters* in this section;

Select the AC team which needs to be edited in the **AC Teamwork** list. Similar to the adding team procedures, edit the team parameters on the teamwork parameters setting page, and set the AC parameters in the team on the AC parameters setting page. After editing, click the **Modify** button (see Figure 4-20) to save the setting;

Select the AC team which needs to be deleted in the **AC Teamwork** list, and click the **Delete** button to save the setting.

Table 3-1 Parameters on the teamwork parameters setting page

Team parameters	Default	Low limit	Upper limit	Notes	Standard version	Authorized version
Teamwork Mode	Single-alone	Single-alone (0)	Teamwork (1)	Single-alone (0): Each AC in the team operates separately; Teamwork (1): Each AC in the team participates in team Boolean calculation	√	√
AC minimum count	1	1	AC number in the team	/		√
AC minimum run time	30	5	180	Unit: min		√
Return air temperature	20	15	30	Unit: °C	√	√
Deviation of return air temperature	5	1	5	Unit: °C	√	√

Team parameters	Default	Low limit	Upper limit	Notes	Standard version	Authorized version
Return air humidity	40%	20%	60%	/		√
Deviation of return air humidity	5%	1%	10%	/		√
AC polling count	1	1		Lower value between the running AC number and the backup AC number	√	√
Frequency of AC team polling	Daily	Daily, Weekly		/	√	√
Interval	1	1	99	Daily mode	√	√
On every	1	1	7	Weekly mode Mon, Tue, Wed, Thur, Fri, Sat, Sun	√	√
Start at	00:00	00:00	23:00	/	√	√
Team polling by manual	No	No	Yes	Used for test	√	√
Reset AC status	No	No	Yes	Initializing AC status	√	√
AC Turn on temperature	25	15	30		√	√
AC Turn off temperature	17	15	30		√	√
Note: √ means the corresponding version can be configured						

Note

1. If you need the RDU-A G2 authorized version, please contact the Emerson customer service center and purchase it. The contact telephone number is 4008876510.

2. Only four Emerson DME series ACs with standard configuration are supported by default.

3. RDU-A G2 supports at most eight teams.

2. AC Parameters

Click the **TeamWork Setting** submenu under the **AC TeamWork** menu, and then click the **AC Parameters** button, the AC parameters setting page pops up, as shown in Figure 3-30.

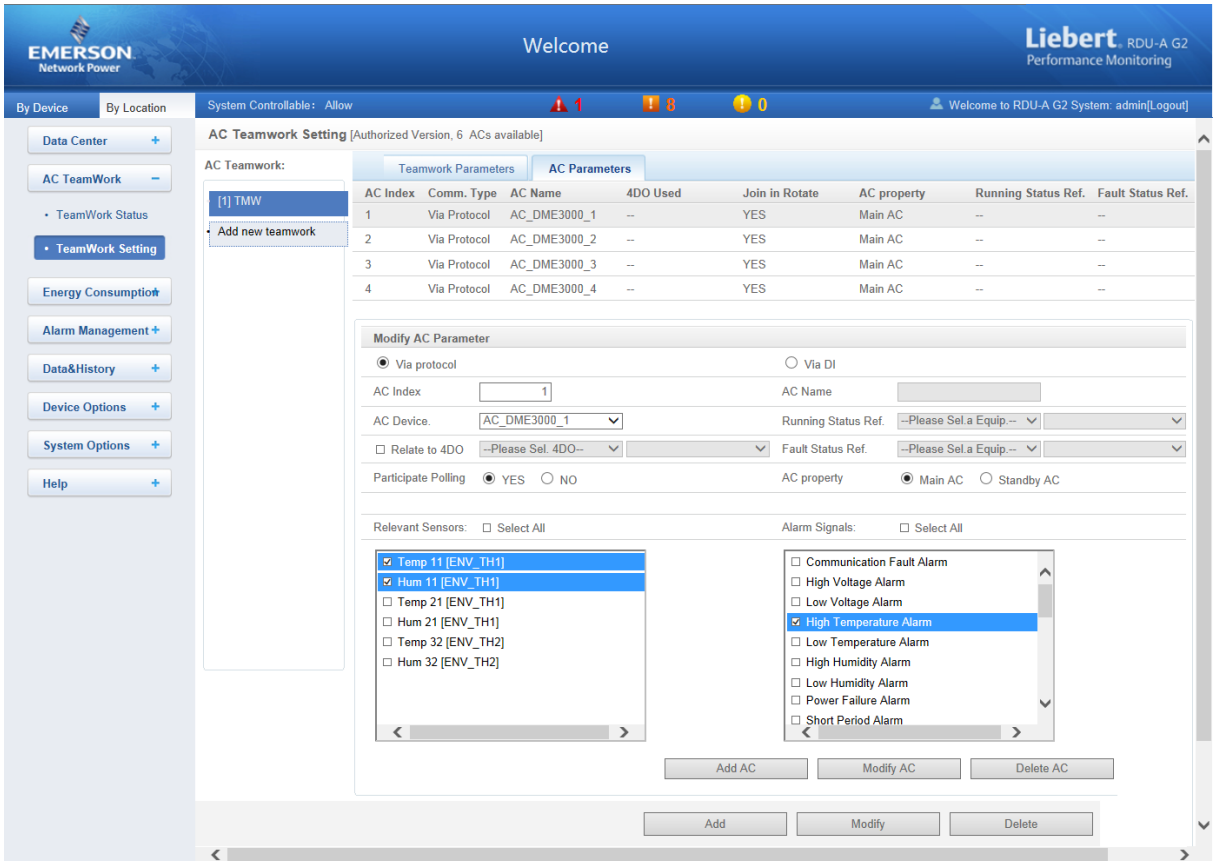


Figure 3-30 AC parameters setting page

On the AC parameters setting page, you can add, edit and delete AC in the team.

●The procedures for adding an AC are as follows:

1) Select the AC which needs to participate in teamwork from the drop-down box of **AC Device**;

2) In the **AC Index** field, type the index of the AC in the team (The AC index will be automatically added from 1);

3) Set the temperature sensors and temperature & humidity sensors related to the AC. Each AC can be related to relevant signals of at most five temperature sensors and temperature & humidity sensors (including at most ten signals of temperature and humidity). When the highest temperature of the related sensors is higher than the AC Turn on temperature, if the air conditioner is off at the time, the air conditioner will start; when the highest temperature of the related sensors is lower than the AC Turn off temperature, if the air conditioner is on at the time, the air conditioner will stop.

4) Set **Alarm Signals**, that is, when the selected alarm signals are generated, judge that the AC is faulty or cannot be used. At most 15 fault or alarm signals can be set for each AC, and the default fault or alarm signals include: High Temperature Alarm, High Pressure Lock, Low Pressure Lock and Exhaust Lock.

5) Click the **Add AC** button to add an AC, and the AC basic information will be displayed in the upper list of the page.

Note

The AC index cannot be set larger than the AC number of the team.

●The procedures for editing an AC are as follows:

1) Select the AC which needs to be edited in the AC list, and edit the AC rotate index, related temperature & humidity sensors and AC fault or alarm signals.

2) After editing, click the **Modify AC** button to complete modifying, and the AC basic information will be displayed in the upper list of the page.

●The procedures for deleting an AC are as follows:

Select the AC which needs to be deleted, and click the **Delete AC** button to complete deleting, and the AC basic information will be deleted from the upper list of the page.

Note

After modifying the AC parameters, you need to click the **Modify** button (click the **Add** button after adding a new teamwork) to make it take effect, or the data will be lost after you leave the page.

3.4.3 Energy Consumption

The energy consumption page displays real time and historical energy consumption data according to user-defined rule, to achieve the goal of helping user analyze whole energy consumption of the machine room.

On the RDU-A G2 homepage, click the **Energy Consumption** menu in the left, three submenus will appear, including **Current PUE**, **History PUE** and **Calculation Setting**.

Current PUE

Click **Energy Consumption** -> **Current PUE** submenu, the page will display real time PUE and real time load percent according to user-defined energy consumption setting (refer to *Calculation Setting* in this section), as shown in Figure 3-31.

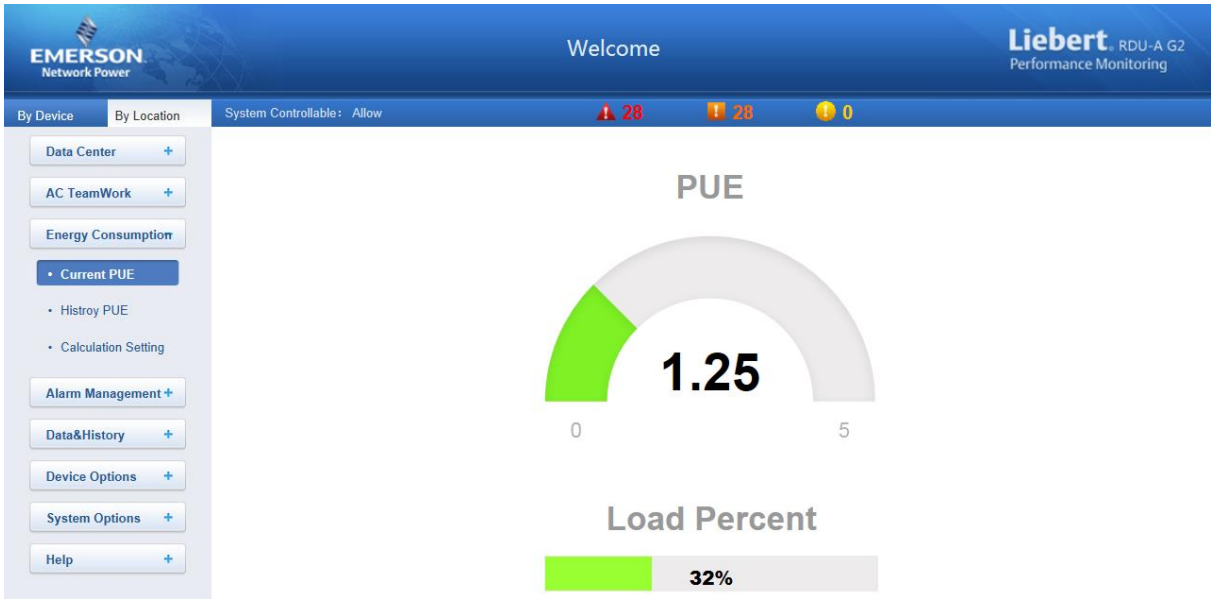


Figure 3-31 Current PUE

History PUE

Click **Energy Consumption** -> **History PUE** submenu, the page will display the historical data recorded in the system, as shown in Figure 3-32.

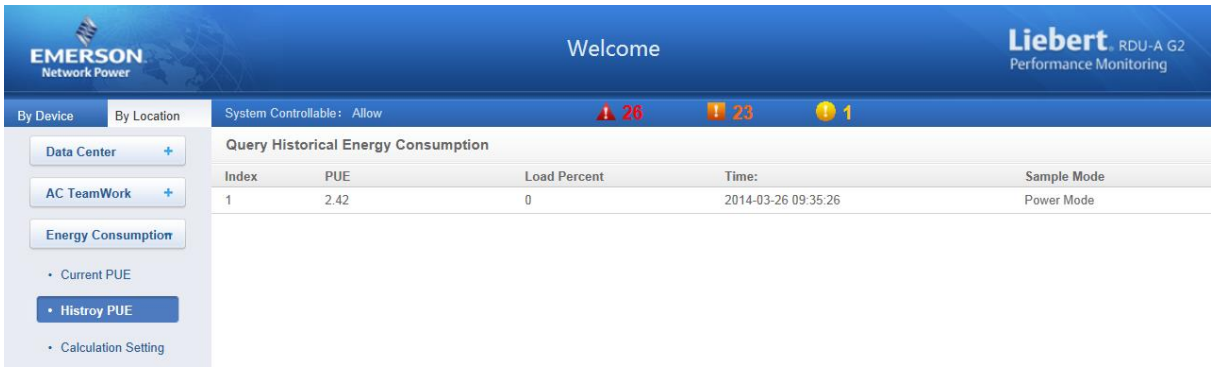


Figure 3-32 History PUE

Note

1. The RDU-A G2 can record and display up to 1000 pieces of PUE historical records.
2. After you perform calculation setting, the system will save a piece of record every 24h according to your configuration.
3. If you do not perform calculation setting, the system will not save the PUE records.
4. If you perform calculation setting but do not perform system load percentage setting, the system will still save the PUE records, but the load percent will always be 0.

Calculation Setting

Click **Energy Consumption** -> **Calculation Setting** submenu, the page shown in Figure 3-33 will appear.

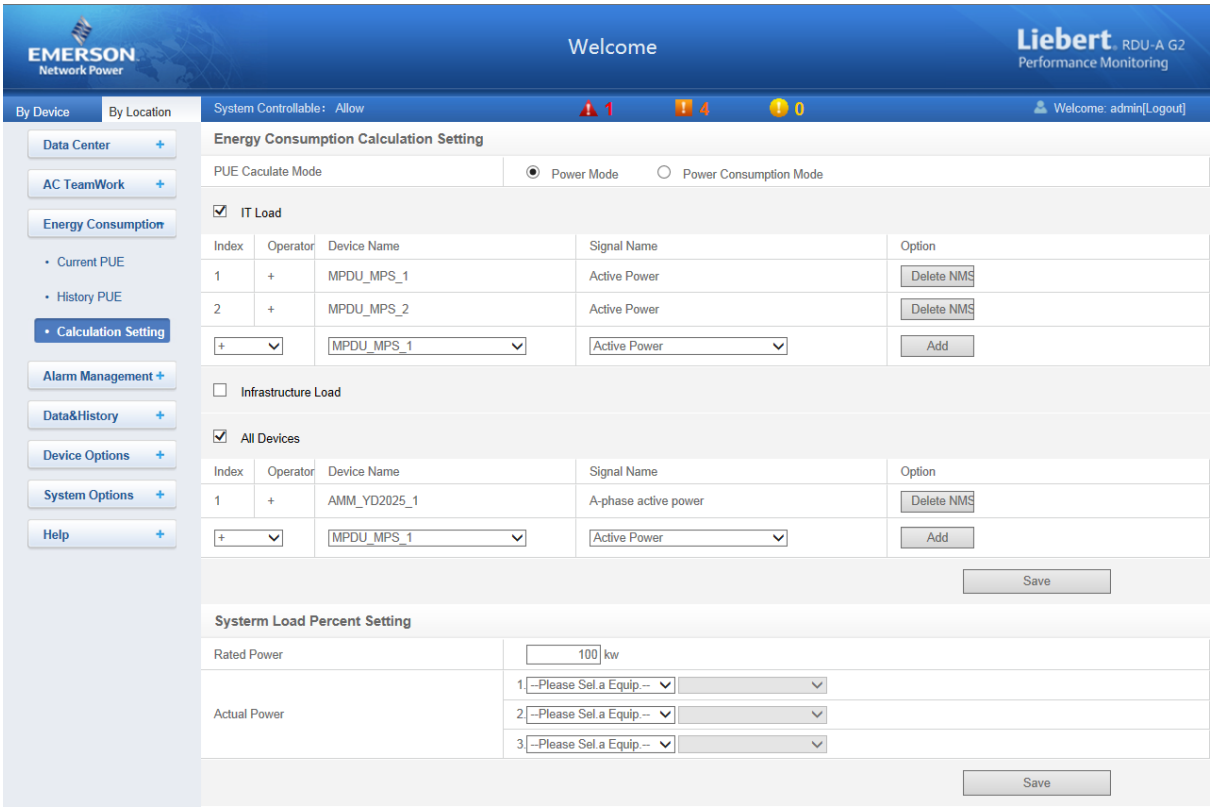


Figure 3-33 Calculation Setting

1. Energy Consumption Calculation Setting

1) You can select two types of devices for Energy Consumption Calculation. To facilitate illustration, we define that: A = Energy Consumption of IT load, B = Energy Consumption of Infrastructure load, C = Energy Consumption of all devices. The rules are as follows:

If you configure calculating A and B, PUE = (A + B)/A;

If you configure calculating A and C, PUE = C/A;

If you configure calculating B and C, PUE = C/(C - B);

Among the above formula, the valve of A, B or C is the summary of the three signals configured at left side of the page.

2) Power Mode or Power Consumption Mode

●Power Mode

In Power Mode, the system will count an instantaneous valve of device power every 8h from 00:00:00 to 00:00:00 on next day, and calculate an average valve of a day after three times of counting as the power PUE of that day.

For instance:

In the first counting, the IT load power is (A1) 8kW, and all device power is (B1) 10kW.

In the second counting, the IT load power is (A2) 9kW, and all device power is (B2) 11kW.

In the third counting, the IT load power is (A3) 7kW, and all device power is (B3) 10kW.

The power PUE of that day: (B1+B2+B3)/(A1+A2+A3）

●Power Consumption Mode

In Power Consumption Mode, the system will count the device power consumption valve within 8h every 8h from 00:00:00 to 00:00:00 on next day, and calculate an average valve of a day after three times of counting as the power consumption PUE of that day. The counting mode is similar to that of power mode.

Note

1. On the day you perform Calculation Setting, the system will calculate the counting times and valves from the setting time to 00:00:00 on next day, and use them to calculate an average valve as the PUE of that day.

2. If **Power Mode** is selected, you need to select power signals; if **Power Consumption Mode** is selected, you need to select power consumption signals.

2. System Load Percent Setting

You can configure the actual power and rated power to calculate the system load percent, and the rules are as follows:

System load percent = actual power / rated power

Among the above, the actual power is summary of the three power signals on the right of **Actual Power**.

3.4.4 Alarm Management

The Alarm Management menu supplies alarm centralized management function, enabling you of self-defining alarm notification and alarm linkage rules, and viewing historic alarm.

On the RDU-A G2 homepage, click the **Alarm Management** menu on the left, four submenus appear, including **Current Alarm**, **History Alarm**, **Alarm Notification** and **Alarm Actions**.

Current Alarm

Click **Current Alarm** submenu under the **Alarm Management** menu, or refer to *3.3.6 Real-Time Alarm Prompt Setting*, the current alarm list will pop up, as shown in Figure 3-34.

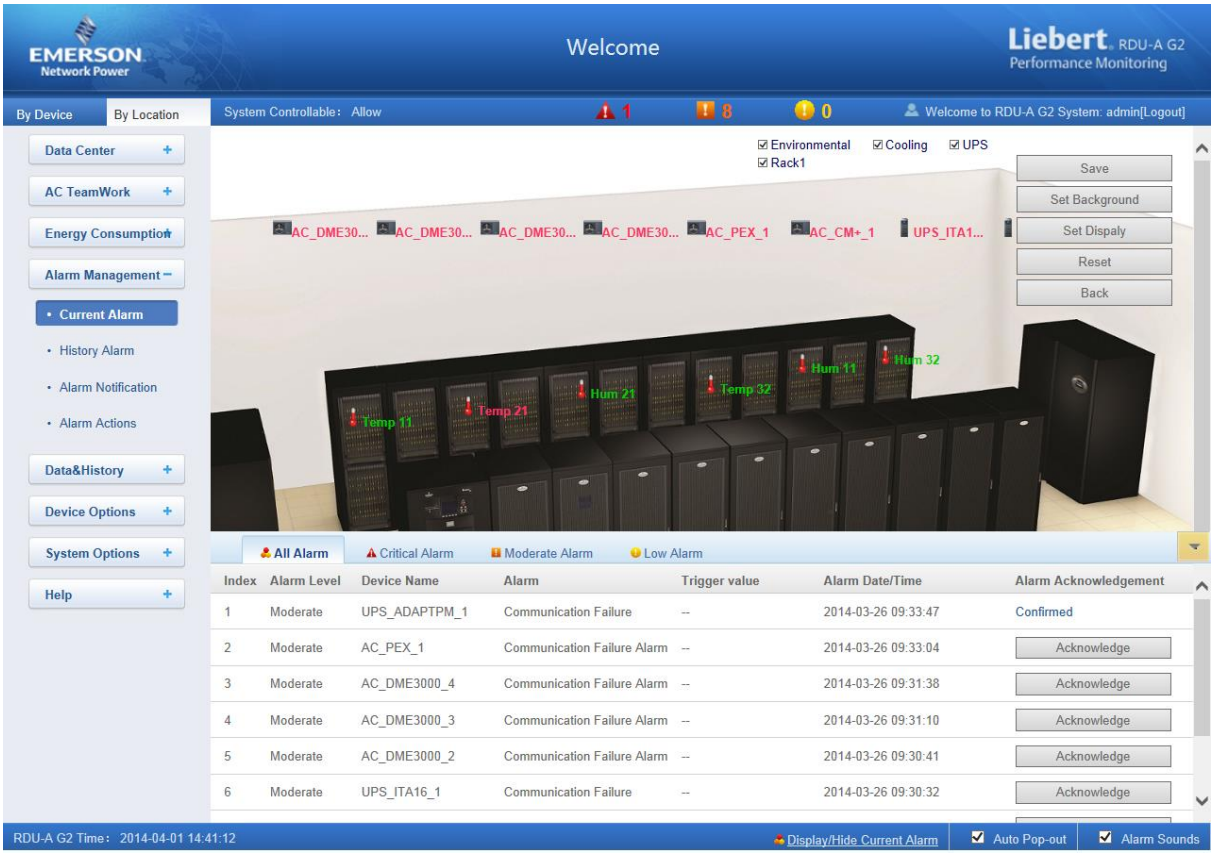


Figure 3-34 Current alarm

1. You can click the tabs above the alarm list to view current alarms according to alarm levels.

2. Click the **Acknowledge** button to confirm the alarm. The confirmed alarm will not participate in alarm linkage, and the alarm notification is sent once only.

3. When the mouse is located on the **Confirmed** link, the alarm confirming information will be hovered; when you move the mouse, the information will disappear, as shown in Figure 3-35.

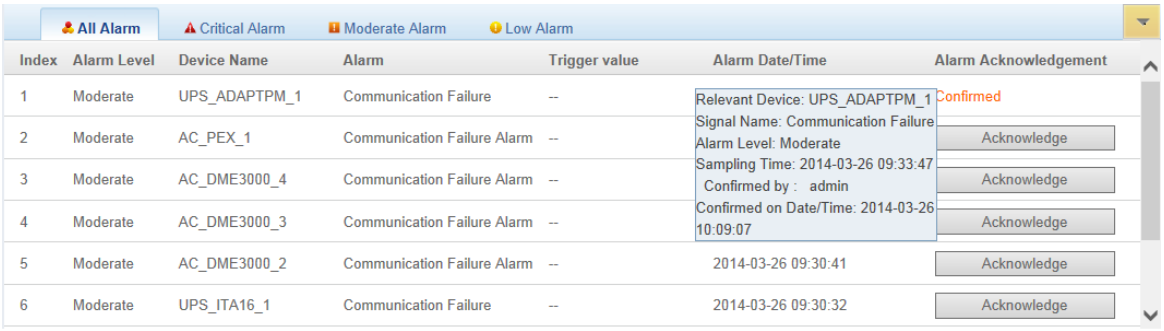


Figure 3-35 Confirming information

History Alarm

Click **History Alarm** submenu under the **Alarm Management** menu to look over historical alarm records., Select a device (for instance, 'All Device') and set the start time and end time (for instance, from 2014-03-26 00:00:00 to 2014-03-26 23:59:59). Then click the **Query** button, all alarm records generated between the start time and end time will be listed, including: **Index**, **Device Name**, **Signal Name**, **Alarm Level**, **Trigger valve**, **Start Date/Time**, **Confirmed by**, **Confirmed on Date/Time** and **End Date/Time**, as shown in Figure 3-36.

Click the **Download** button to download the query results.

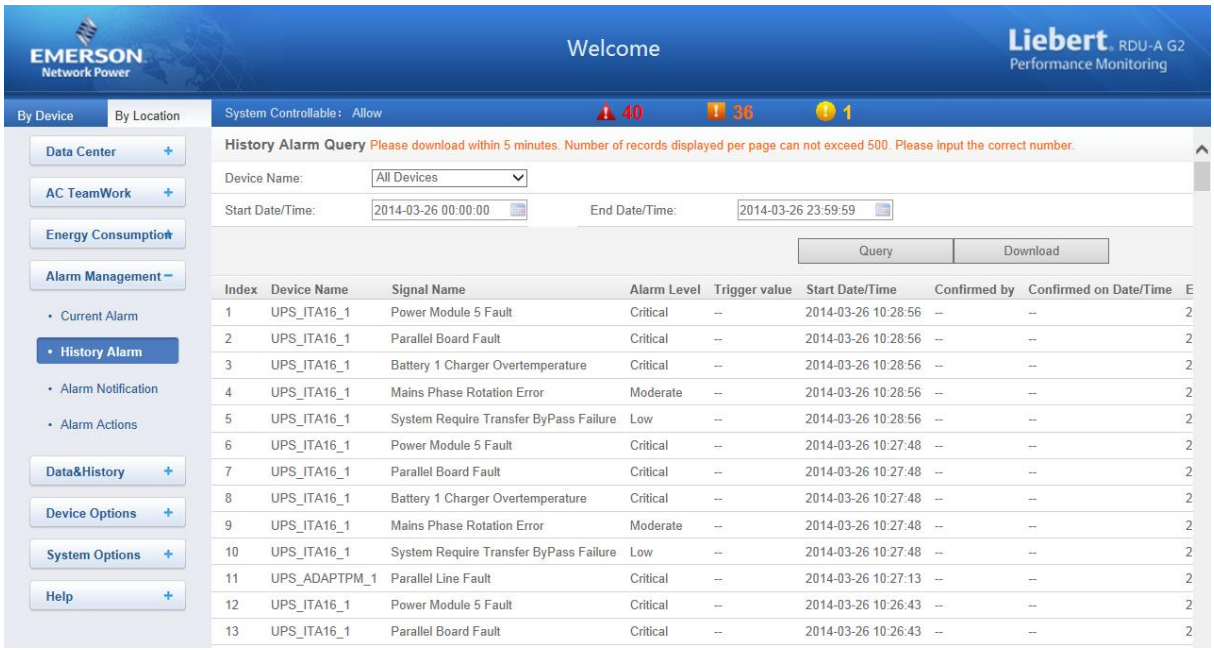


Figure 3-36 History alarm query

Alarm Notification

1. Alarm Notification Configuration

Click the **Alarm Notification** submenu under the **Alarm Management** menu, the page shown in Figure 3-37 pops up. You can choose the notification method to receive notification of chosen level alarm from chosen equipment, meanwhile, you can also choose the language of alarm notification information and customize the alarm content (including Equip name, Alarm description, Alarm TIME and Alarm state by default).

Click the **Save** button to finish the alarm configuration. When an alarm is generated, the system will notify users through the chosen notification method.

Note

1. Users must tick the notification method first in the **Notification by** check boxes, and then the alarm table below can be edited;
2. When all devices are chosen, all devices will be configured with the same alarm level;
3. When low level alarm is chosen, the alarm level above this level will also be chosen;
4. When some device is chosen, the highest level **Critical Alarm** will be chosen by default.

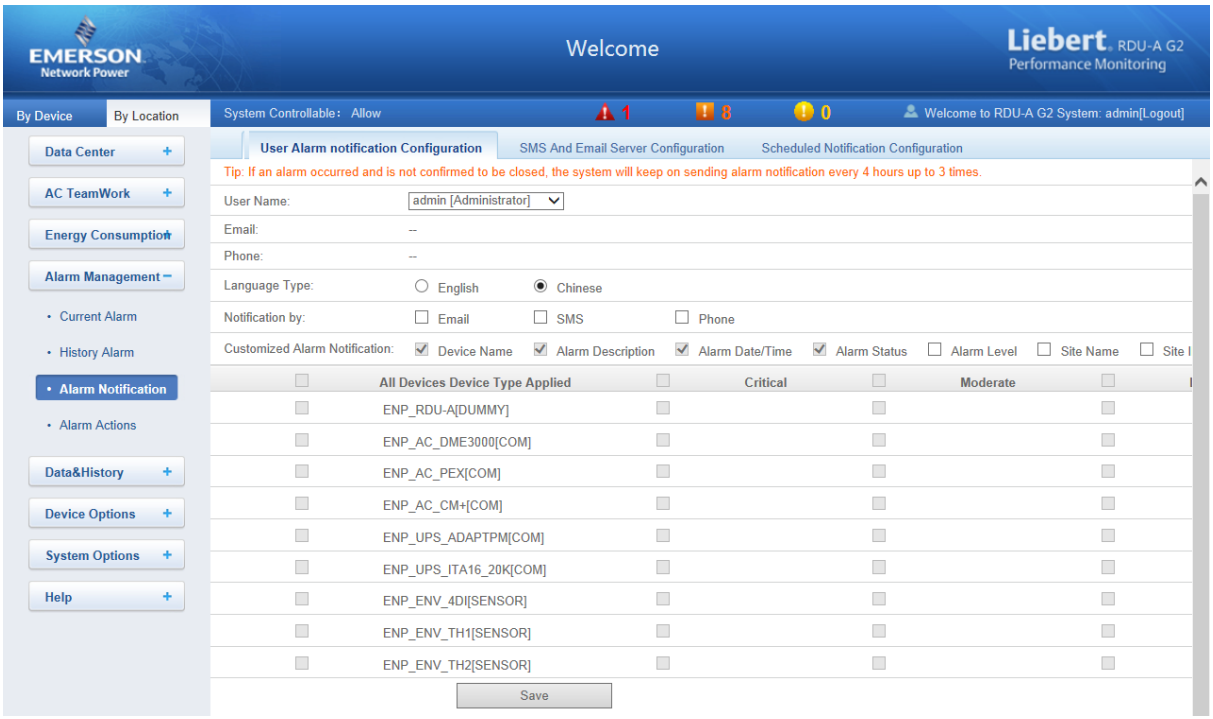


Figure 3-37 Alarm notification configuration

2. SMS/Email Server Configuration

Click the **Alarm Notification** submenu under the **Alarm Management** menu, and then click the **SMS/Email Server Configuration** tab, the page shown in Figure 3-38 pops up.

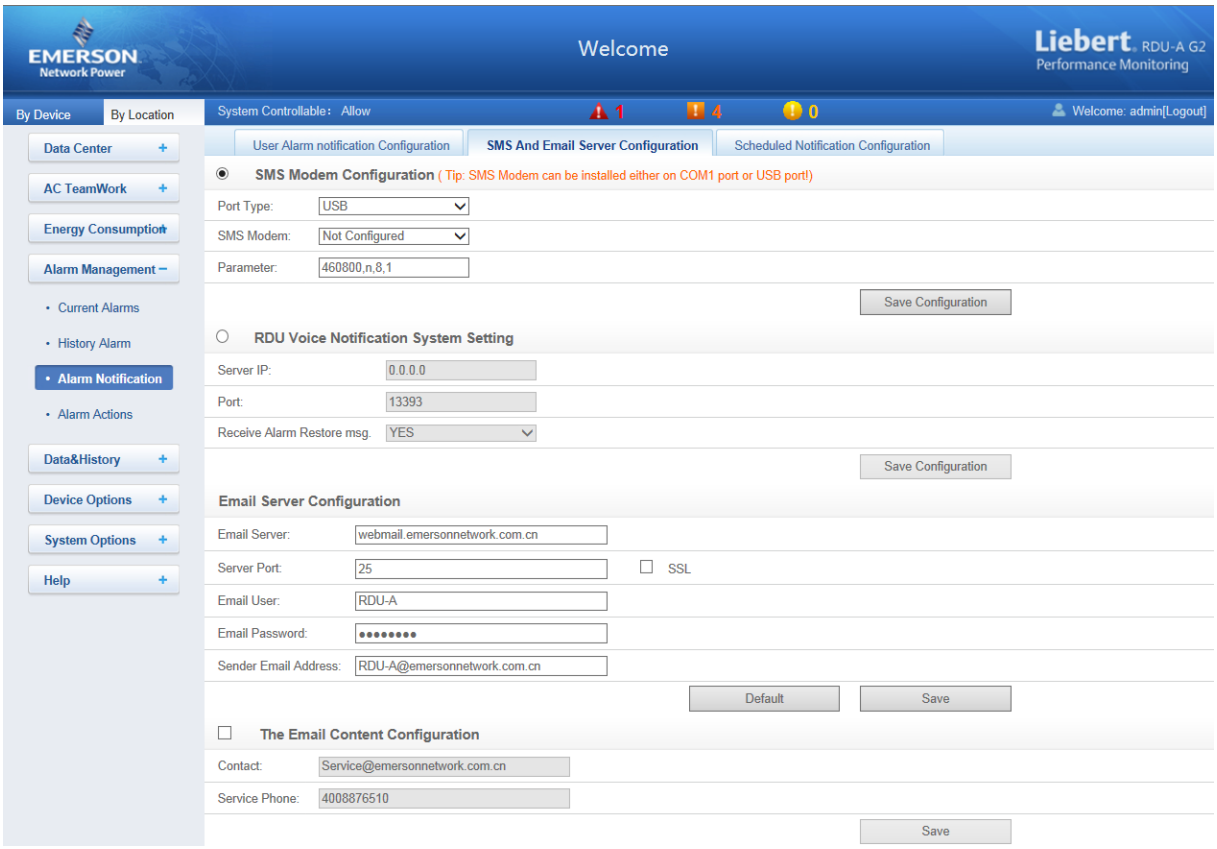


Figure 3-38 SMS/Email server configuration

On the page shown in Figure 3-38, you can perform **SMS Modem Configuration** and **RDU Voice Notification System Setting** for alarm notification reminding through SMS or phone, you can also perform **Email Server Configuration** for alarm notification reminding through email, the procedures are as follows:

●SMS Modem Configuration

1) Connect an SMS Modem through COM1 port or USB port according to need, and choose **Port Type**, the page will display **Parameter** automatically;

2) Choose **SMS Modem** (GSM) according to the SMS Modem type;

3) Set the communication parameter of the SMS Modem;

4) Click the **Save** button to save the configuration of current user's SMS Modem.

Note

1. If the SMS Modem is connected through COM1 port, set the communication parameter of the SMS Modem as '9600,n,8,1' before using it, the setting procedures are as follows:

2. If the SMS Modem is connected through USB port, use the default value of the communication parameter of the SMS Modem.

●RDU Voice Notification System Setting

1) Type the server IP address in the **Server IP** field;

2) Type the port number in the **Port** field, and the default is 13393;

3) Click the **Save** button to save the voice notification system setting.

●Email Server Configuration

1) Type the server IP address or domain name in the **Email Server** field;

2) Type the **Server Port**, **Email User**, **Email Password** and **Sender Email Address** in the corresponding fields;

3) Click the **Save** button to save the configuration of current user's Email server.

Note

1. The **Server Port** is 25 by default. When SSL is chosen, the **Server Port** will become 465 automatically;

2. The **Email User** is RDU-A by default;

3. When using SSL, you need to ensure that the Email server supports SSL function.

3. Scheduled Notification Configuration

Click the **Alarm Notification** submenu under the **Alarm Management** menu, and then click the **Scheduled Notification Configuration** tab, the page shown in Figure 3-39 pops up.

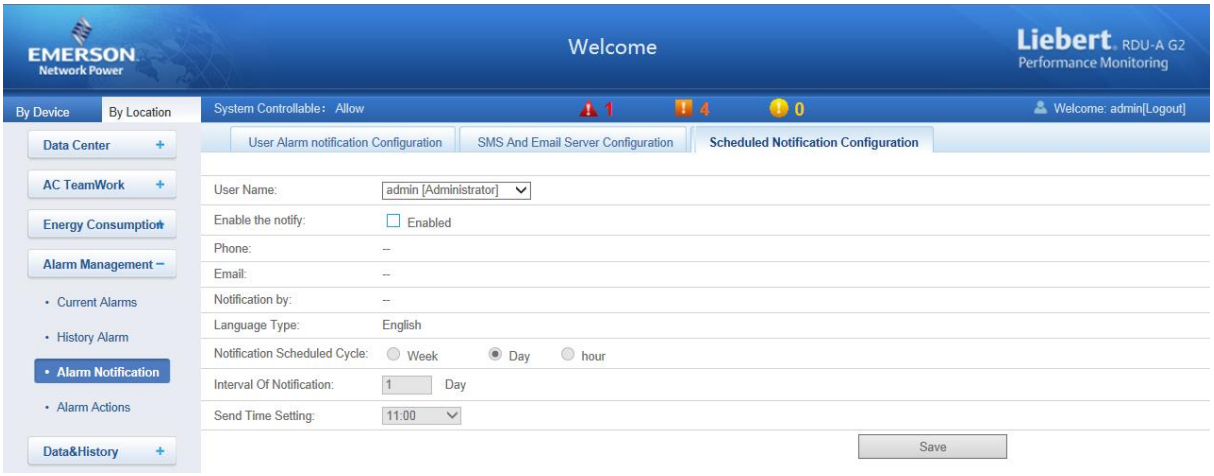


Figure 3-39 Scheduled notification configuration

Note

1. Scheduled notification configuration must be used together with alarm notification configuration; otherwise, you cannot select **User Name**, **Notification by** and **Language type**;

2. For scheduled notification configuration, the notification method 'Phone' is not supported;

3. The scheduled notification means sending the running state of the RDU-A G2 system (normal or alarm) to the user.

1) First of all, on the **Alarm Notification Configuration** page, complete and save the setting of **User**, **Notification by** and **Language type**.

2) On the **Scheduled Notification Configuration** page, set the **Notification Enabled Period** (setting range: 8:00 ~ 20:00), **Notification Scheduled Cycle** (default: Day), **Interval of Notification** (default: Day) and **Send Time Setting** (default: start time).

3) Click the **Save** button to save the system notification configuration.

Alarm Actions

Click the **Alarm Actions** submenu under the **Alarm Management** menu to obtain the alarm linkage function, the page shown in Figure 3-40 pops up.

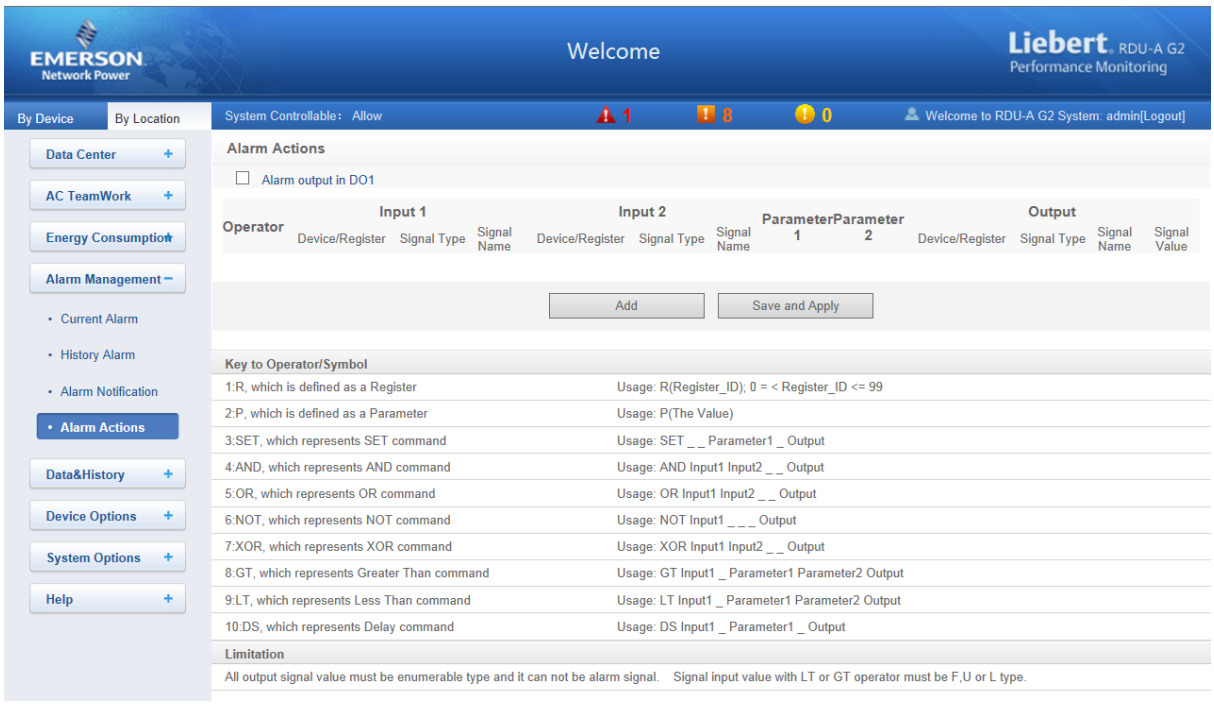


Figure 3-40 Alarm linkage configuration 1

●Alarm output in DO1

If **Alarm output in DO1** is ticked, the relay will control the output of DO1 port separately. If the system has an alarm and the alarm has not been confirmed, the relay will be closed; if the system has no alarm or all alarms have been confirmed, the relay will be open, at this time, DO1 will not participate in alarm linkage any more.

●Linkage function

As shown in Figure 3-40, the **Key to Operator/Symbol** list shows all the commands and their usages. Click the **Add** button to add new alarm linkage expression, as shown in Figure 3-41.

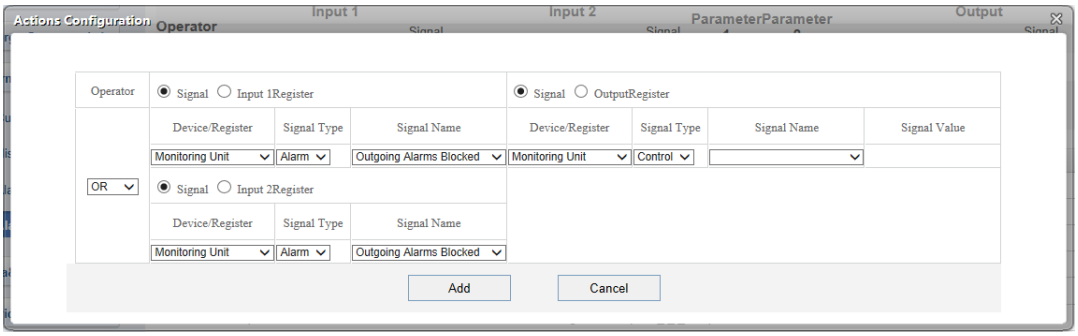


Figure 3-41 Alarm linkage configuration 2

Firstly select a command, for instance, 'OR'. In this case, the expression is 'signal 1 [Input1 Register] OR signal 2 [Input2 Register] = signal 3 [Output Register]'.

Secondly, when **Signal** is chosen for the input and output parameters, first choose the equip name from the drop-down lists of **Equip/Register**; then choose the signal type from the drop-down lists of **Signal Type**; at last choose the signal name from the drop-down lists of **Signal Name**; signal 1, 2, 3 can be any available signals of the RDU-A G2-A.

Thirdly, when **Register** is chosen for the parameters, users need to type the register name in the textbox of the register, for instance, R(0), R(1) and so on, as shown in Figure 3-42.

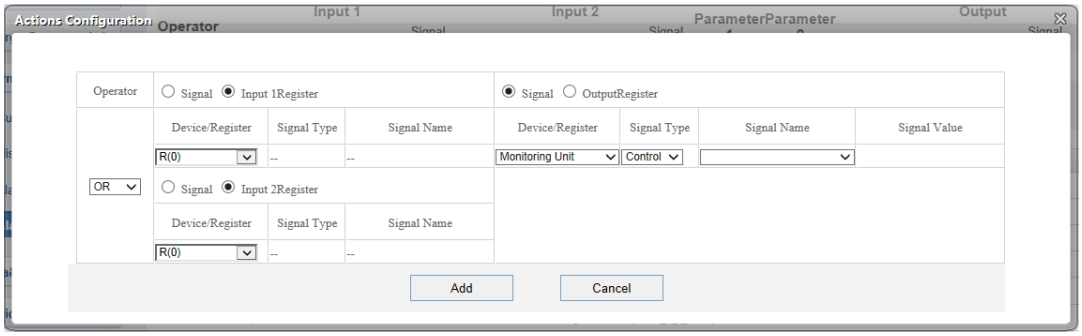


Figure 3-42 Alarm linkage configuration 3

Click the **Add** button to add the new alarm linkage expression, otherwise click the **Cancel** button.

If you click the Add button, as shown in Figure 3-43, an alarm linkage expression is added. Click the **Save and Apply** button to make it effective. Click the **Delete NMS** button to delete the PLC expression, and click the **Save and Apply** button to make the setting effective.

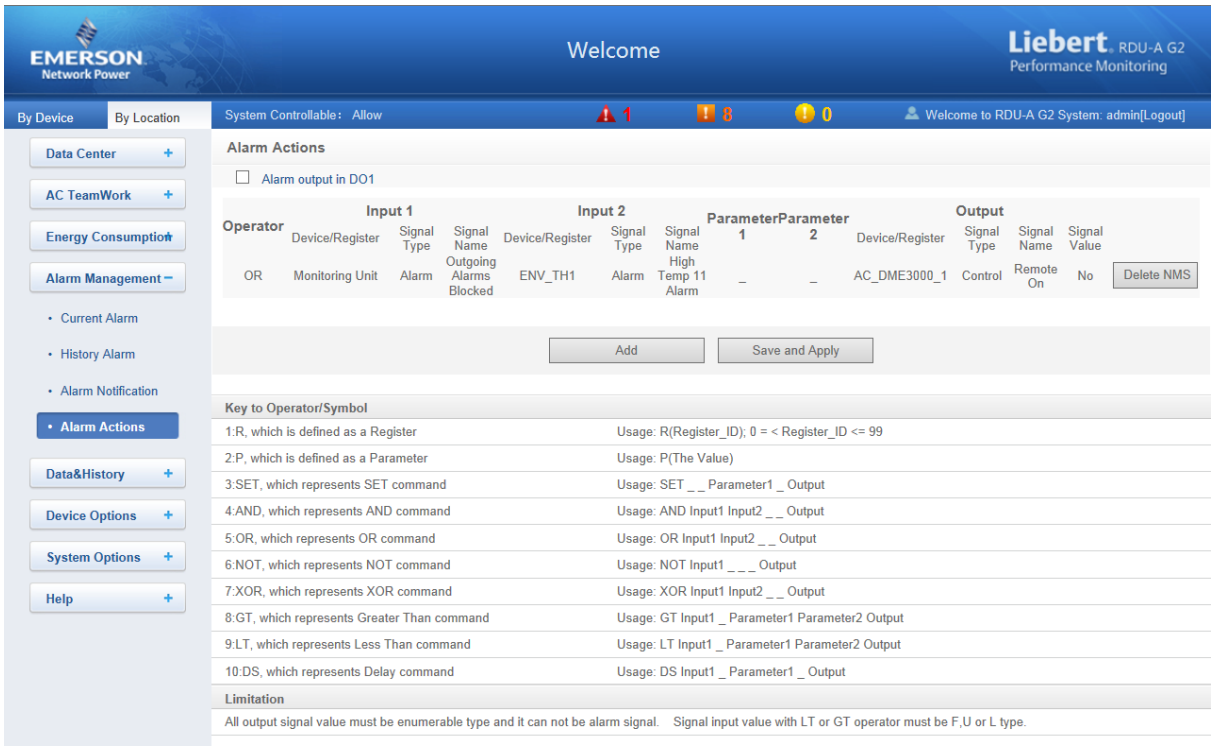


Figure 3-43 Alarm linkage configuration 3

The operator usages in the alarm linkage are listed in Table 3-2.

Table 3-2 Operator usages in the alarm linkage

Operator	Input 1	Input 2	Param1	Param2	Output	Expression
SET	/	/	P1	/	Sout/Rout	SET_ _P1_Output
AND	Sin1 /Rin1	Sin2 /Rin2	/	/	Sout/Rout	Sin1 [Rin1] AND Sin2 [Rin2] = Sout [Rout]
OR	Sin1 /Rin1	Sin2 /Rin2	/	/	Sout/Rout	Sin1 [Rin1] OR Sin2[Rin2] = Sout [Rout]
NOT	Sin1 /Rin1	/	/	/	Sout/Rout	Sin1 [Rin1] NOT = Sout [Rout]
XOR	Sin1 /Rin1	Sin2 /Rin2	/	/	Sout/Rout	Sin1 [Rin1] XOR Sin2[Rin2] = Sout [Rout]
GT	Sin1 /Rin1	/	P1	P2	Sout/Rout	When Sin1 [Rin1] > P1, Sout [Rout]=1; When Sin1 [Rin1] < P1 - P2, Sout [Rout]=0
LT	Sin1 /Rin1	/	P1	P2	Sout/Rout	When Sin1 [Rin1] < P1, Sout [Rout]=1; When Sin1 [Rin1] > P1 + P2, Sout [Rout]=0
DS	Sin1 /Rin1	/	P1	/	Sout/Rout	Sin1 [Rin1] DS P1 output to Sout [Rout]

Note:
1. Sin1, Rin1, Sin2, Rin2, P1, P2, Sout, Rout respectively refer to Signal 1, Input1 Register, Signal 2, Input2 Register, Parameter 1, Parameter 2, Signal 3, Output Register;
2. The input signal of logic operator AND/OR/NOT/XOR/DS can only be alarm signal;
3. The input signal value of arithmetic operator GT/LT can only be float, int or long int;
4. All output signals can only be control signals, and the output signal value must be enumerated type

The following illustrates the alarm linkage with examples:

Example 1:

If it is required that when the temperature and humidity sensor of RDU-A G2 system generates a high temperature alarm, the alarm lamp turns on. Suppose that the alarm lamp is mounted on the DO1 port, you can achieve the alarm linkage function through the following configuration:

Expression: [High Temp 11 Alarm] DS P(3) [RDU-A DO1] [Close]

The configuration method is shown in Figure 3-44. When the High Temp 11 Alarm is generated, RDU-A DO1 will close after a delay of 3s, thus the alarm lamp turns on.

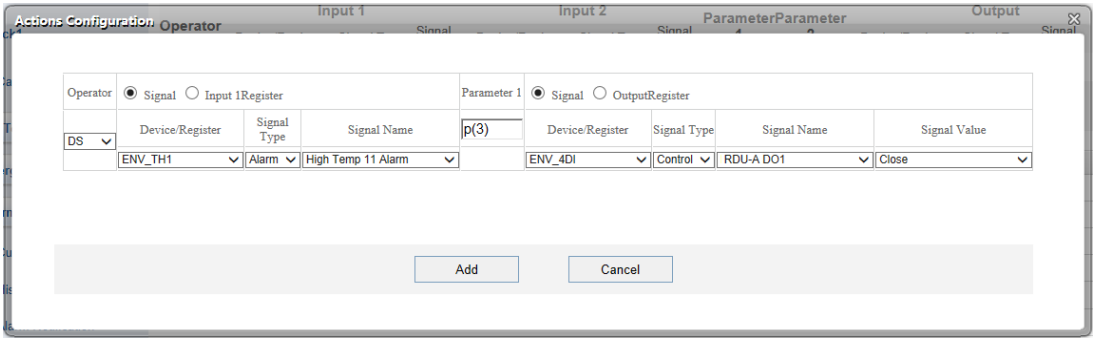


Figure 3-44 Example 1 for alarm linkage

Example 2:

If it is required that when the front door or back door of the rack is open, the alarm lamp turns on. Suppose that the DI1 and DI2 ports of the RDU-A G2 are respectively connected with the door status sensors on the front and back door, and the alarm lamp is mounted on the DO1 port. You can achieve the alarm linkage function through the following configuration:

Expression: [RDU-A DI1 Alarm] OR [RDU-A DI2 Alarm] = [RDU-A DO1] [Close]

The configuration method is shown in Figure 3-45. When the alarm signal of RDU-A G2 DI1 Open or RDU-A G2 DI2 Open generates an alarm, RDU-A G2 DO1 will close, thus the alarm lamp turns on.

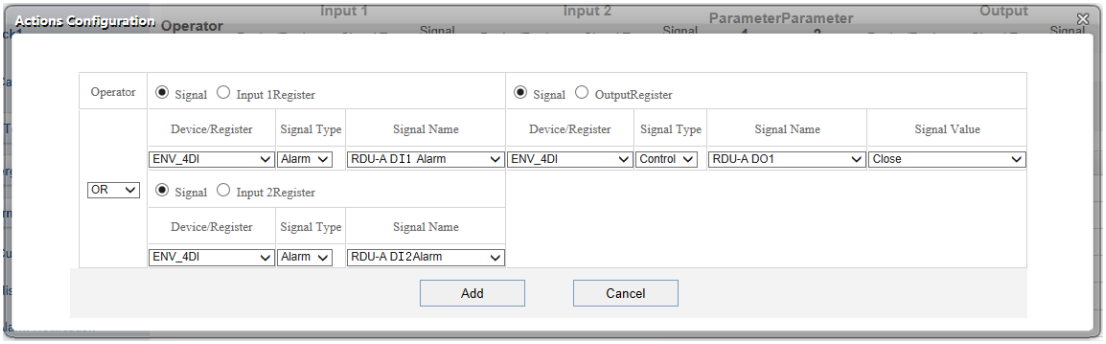


Figure 3-45 Example 2 for alarm linkage

3.4.5 Data & History

The **Data & History** menu supplies query service of all types of historical data and logs for the user.

On the RDU-A G2 homepage, click **Data & History** in the left part, four submenus appear, including: **Device Information**, **History Data**, **History Log** and **Clear History**.

Device Information

Click the **Device Information** submenu under the **Data & History** menu, the page shown in Figure 3-46 pops up. The page includes two tabs: **Device Information List** and **Export SNMP MIB**.

1. Device Information List

As shown in Figure 3-46, the page lists the main information of all equipment. Click the **Download** button to download the query result.

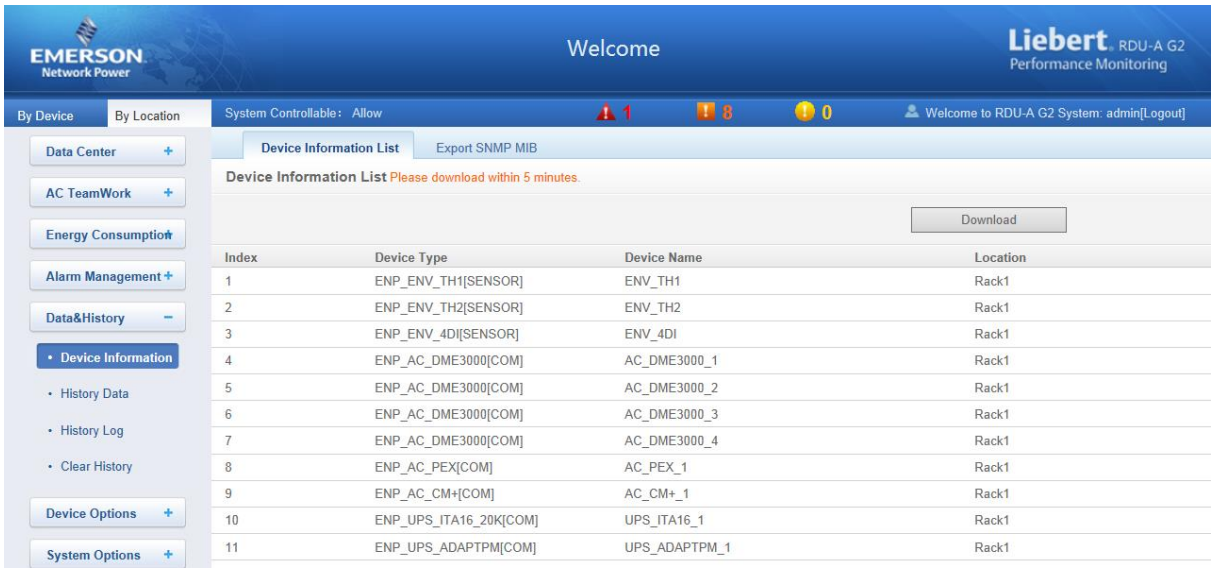


Figure 3-46 Device information list

2. Export SNMP MIB

As shown in Figure 3-47, you can select **Export All Device MIB** or **Export MIB By Device**. After selection, click the **Download** button to export MIB information.

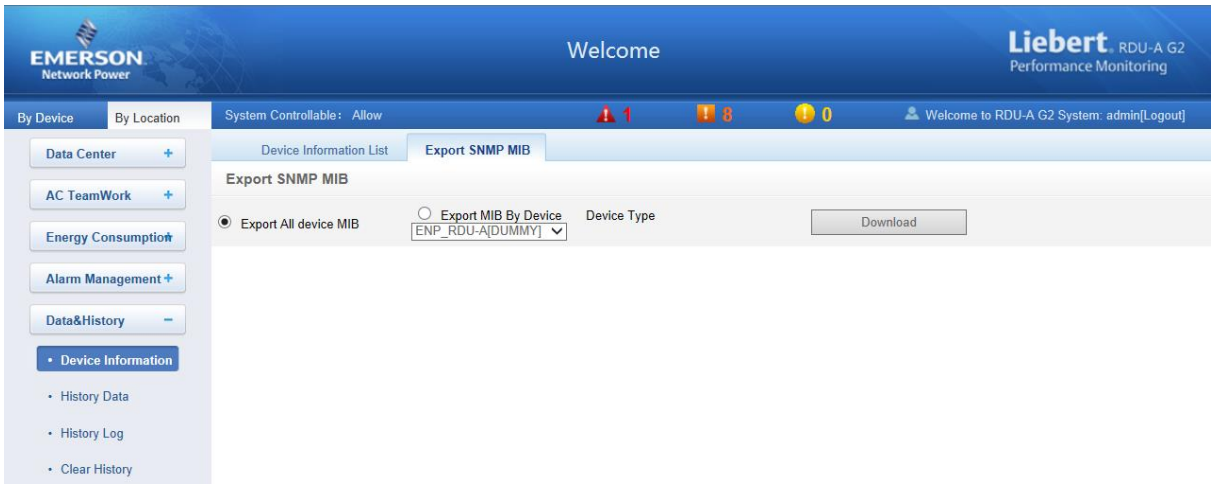


Figure 3-47 Export SNMP MIB

Note

If you do not get the SNMP service authorization, the **Export SNMP MIB** page will not appear. If you need to get the SNMP service license, please contact Emerson customer service center for purchase, and the contact number is 4008876510.

History Data

Click the **History Data** submenu under the **Data & History** menu, the page shown in Figure 3-48 pops up. The page has two tabs: **History Data** and **Historical Curve**.

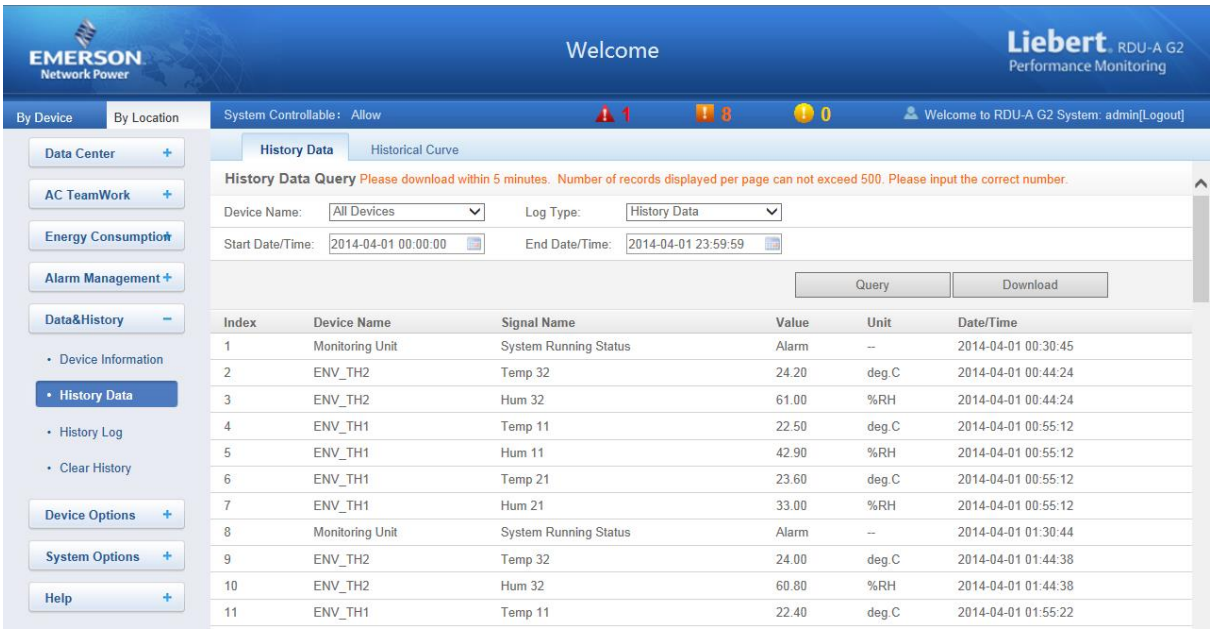


Figure 3-48 History data

1. History Data

As shown in Figure 3-48, choose a device（for instance, 'All Devices'）and the Log Type (for instance, 'History Data'), and set the start time and the end time (for instance, from 2014-04-01 00:00:00 to 2014-04-01 23:59:59). Then click the **Query** button, all the history data during the time will be listed, click the **Download** button to download the query result.

2. Historical Curve

As shown in Figure 3-49, choose a device（for instance, 'ENV_TH1'）and the Log Type (for instance, 'Temp 11'), and set the start time and the end time (for instance, from 2014-04-01 00:00:00 to 2014-04-01 23:59:59). Then click the **Show Curve** button, if history data are queried, a historical curve of the signal will be shown.

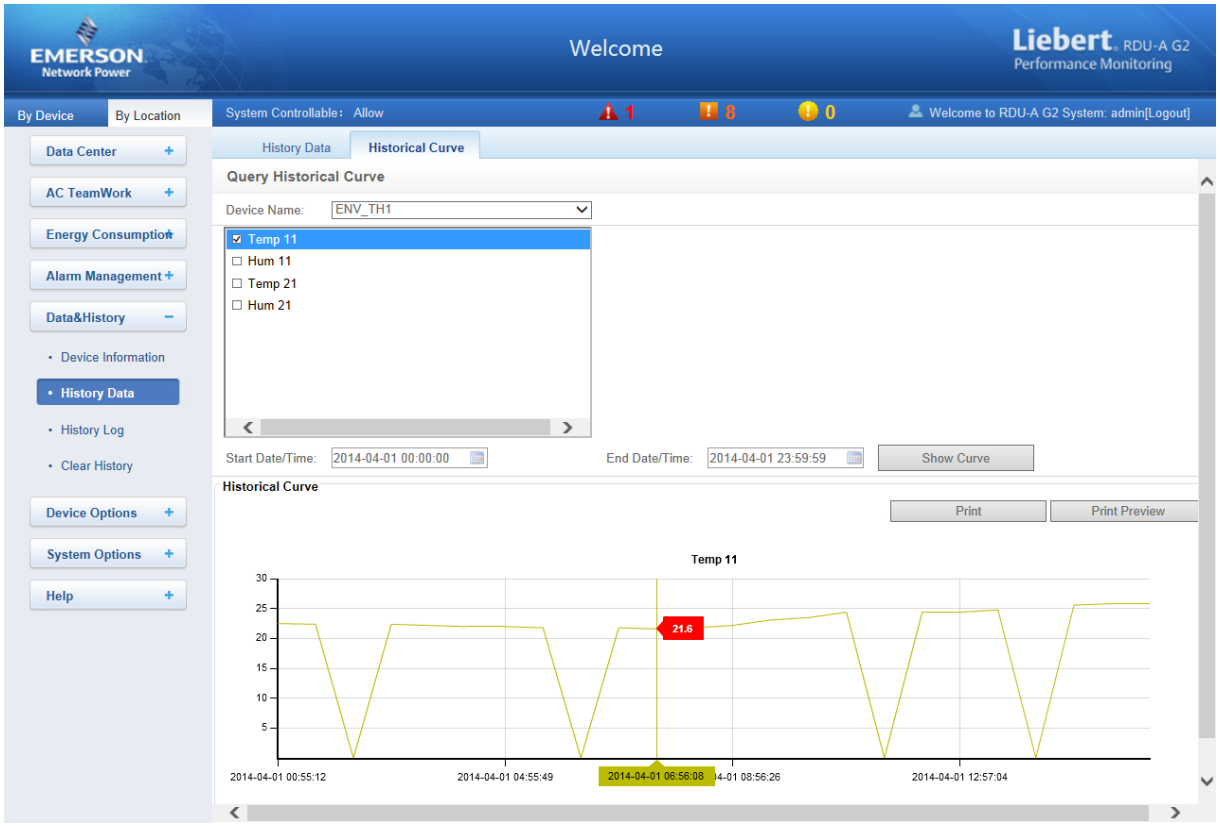


Figure 3-49 Historical curve

History Log

Click the **History Log** submenu under the **Data & History** menu, the page shown in Figure 3-50 pops up.

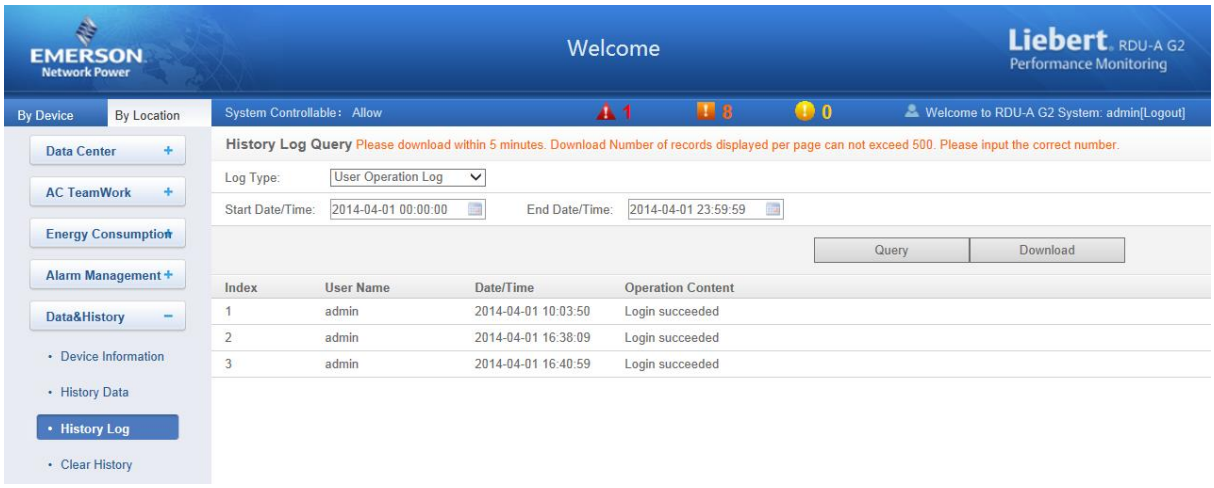


Figure 3-50 History log

On the page shown in Figure 3-50, choose the log type (for instance, 'User Operation Log') and set the start time and the end time (for instance, from 2014-04-01 00:00:00 to 2014-04-01 23:59:59). Then click the **Query** button, all user operation logs during the time will be listed, click the **Download** button to download the query result.

Note

When the log type is selected as 'System Log' or 'Driver Log', after clicking the **Query** button, the query result will not be displayed on the page, instead, it will be directly downloaded as a zip file.

Clear History

Click the **Clear History** submenu under the **Data & History** menu, the page shown in Figure 3-51 pops up.

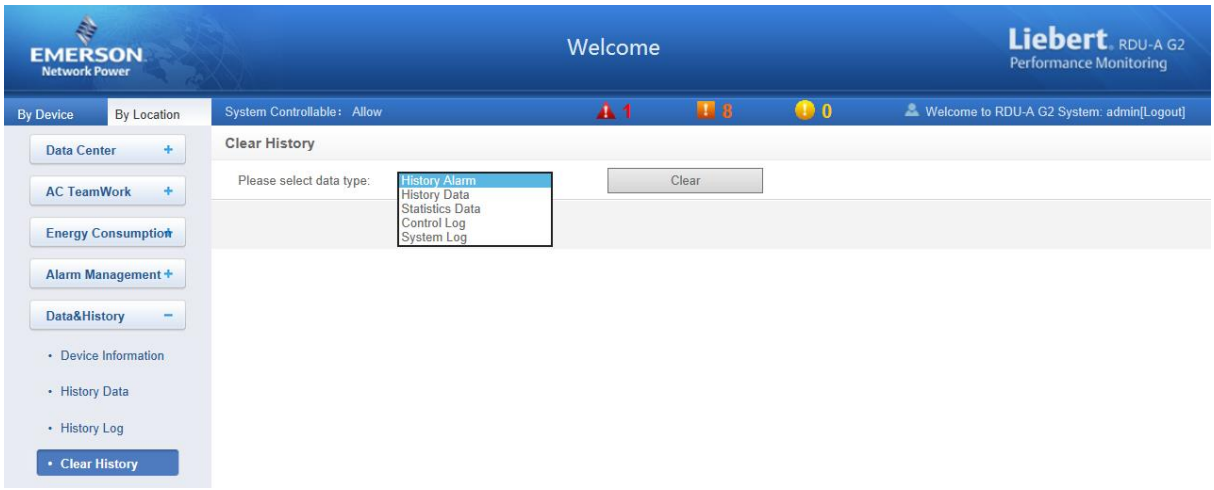


Figure 3-51 Clear history

As shown in Figure 3-51, you can choose 'History Alarm' and click the **Clear** button to clear all the history alarm. In the same way, you can clear any other getable data in the drop-down box.

3.4.6 Device Options

On the RDU-A G2 homepage, click **Device Options** in the left part, three submenus will appear, including **Device Management**, **Signal Setting** and **Batch Configuration**.

Device Management

1. Add/Modify/Delete Device

Click the **Device Management** submenu under the **Device Options** menu, the page shown in Figure 3-52 pops up.

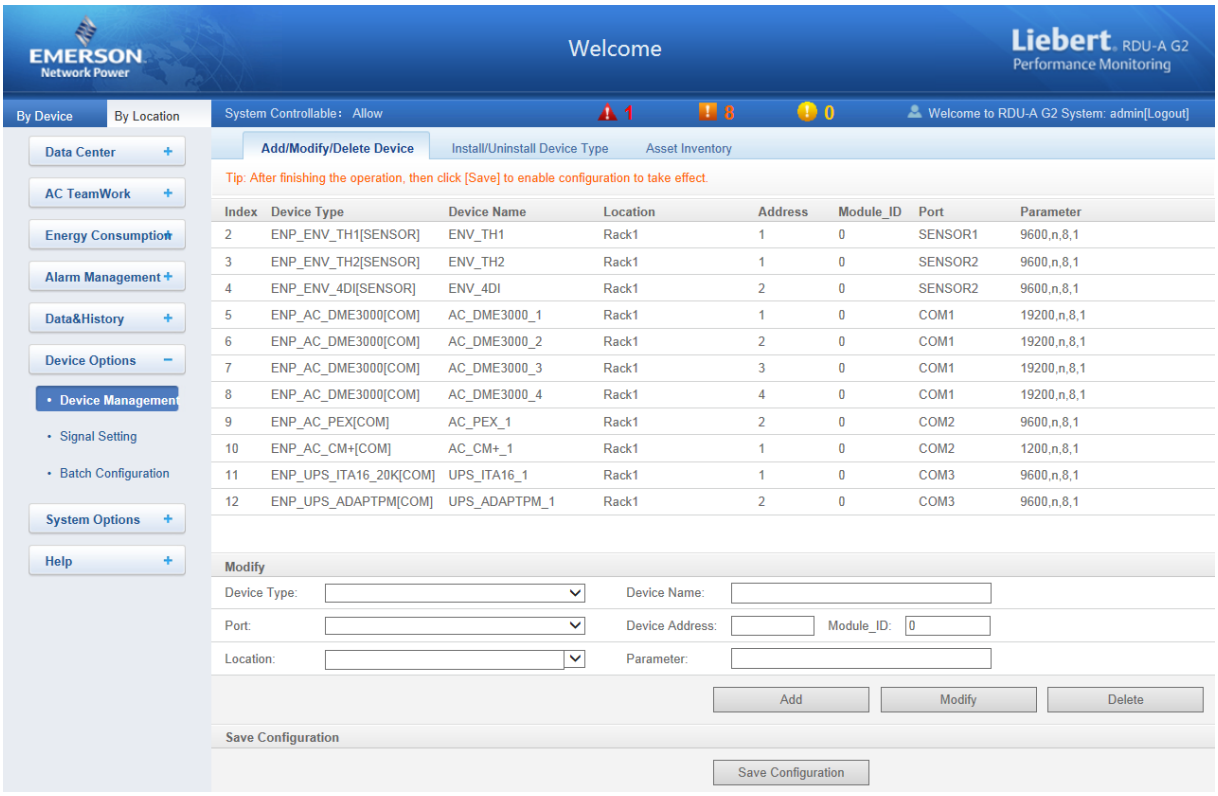


Figure 3-52 Add/modify/delete equipment

As shown in Figure 3-52, you can add/modify/delete a new device, the procedures are as follows:

●Adding a new device

1) Choose the device type in the **Device Type** textbox;

2) Type the device name in the **Device Name** textbox, or use the default device name;

3) After the device type is chosen, the drop-down box of **Port** will list the default port number(s) of the device type automatically; if the device type is not chosen, the port number cannot be chosen;

4) Type the device address, which must be numbers from 1 to xx, in the **Device Address** textbox. The device addresses under the same port number must be different; for some device types, you need not type the device address, at this point, the **Device Address** textbox turn gray and cannot be edited. When one kind of device has many models, you need to type the model ID, which must be numbers from 1 to xx. The model IDs under one kind of device must be different;

5) Choose or type the device location;

6) Type the communication parameter in the **Parameter** textbox. In the event that the device type is certain, the communication parameter prompt information will appear in the **Parameter** textbox, including the communication parameter format and default communication parameter of the equip type;

7) Click the **Add** button, the page shown in Figure 3-53 pops up, at the same time, a piece of new device information will be added in the device list;

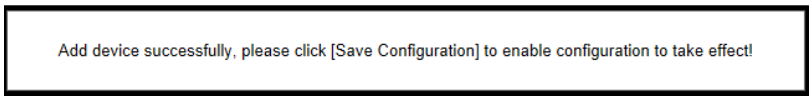


Figure 3-53 Prompt information 1

8) Click the **Save Configuration** button, the page shown in Figure 3-54 pops up;

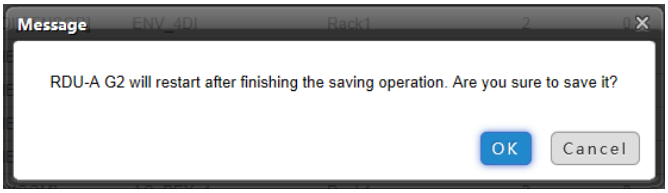


Figure 3-54 Prompt information 2

If clicking the **Cancel** button, the added equipment fails; if clicking **OK**, the dialog box of Security authentication pops up, as shown in Figure 3-18.

9) Type the login password of current user, and click **OK**. The reboot page pops up, as shown in Figure 3-55;

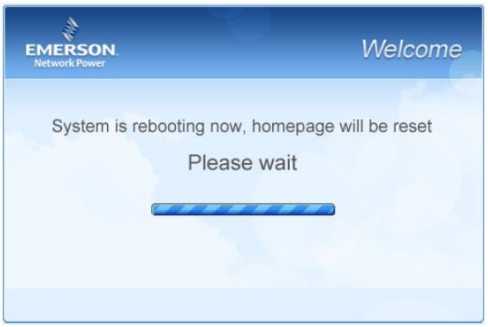


Figure 3-55 Reboot page

After the system reboots, adding a device becomes effective.

10) Log in the RDU-A G2 webpage again and the added device will appear in the list on device management page.

Note

Up to 16 intelligent devices (excluding RDU-A G2 itself, ENV-TH, ENV-4DI, 8DIAI card and 8DOAO card) can be added in the system by default. Through authorization, the connecting capacity can be expanded. If you need to expand the connecting capacity, please contact Emerson customer service center for purchase, and the contact number is 4008876510.

●Deleting a device

1) Choose the device which needs to be deleted in the device list;

2) Click the **Delete** button to delete the device;

3) Click the **Save Configuration** button to make the settings become effective, and the detailed procedures are the same as those of adding a new device.

Note

Before clicking the **Delete** button, if the device information has been modified, it cannot be deleted.

●Modifying a device

1) Choose the device which needs to be modified in the device list;

2) Modify the device information;

3) Click the **Modify** button to make the setting effective;

4) Click the **Save Configuration** button to make the settings become effective, and the detailed procedures are the same as those of adding a new device.

After adding, modifying or deleting procedures, if you leave the **Add/Modify/Delete Device** page without clicking the **Save Configuration** button to make the settings effective, the prompt information will pop up to remind you, as shown in Figure 3-56.

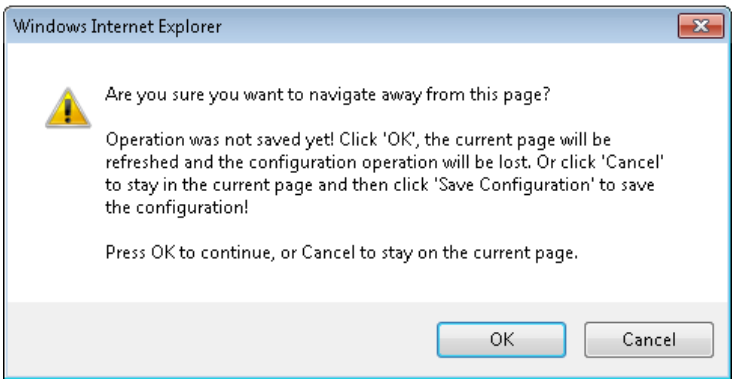


Figure 3-56 Prompt information 3

Note

Clicking the **Save Configuration** button can save all the operations at one time.

2. Install/Uninstall Device Type

Click the **Device Management** submenu under the **Device Options** menu, and then click the **Install/Uninstall Device Type** tab, the page shown in Figure 3-57 pops up.

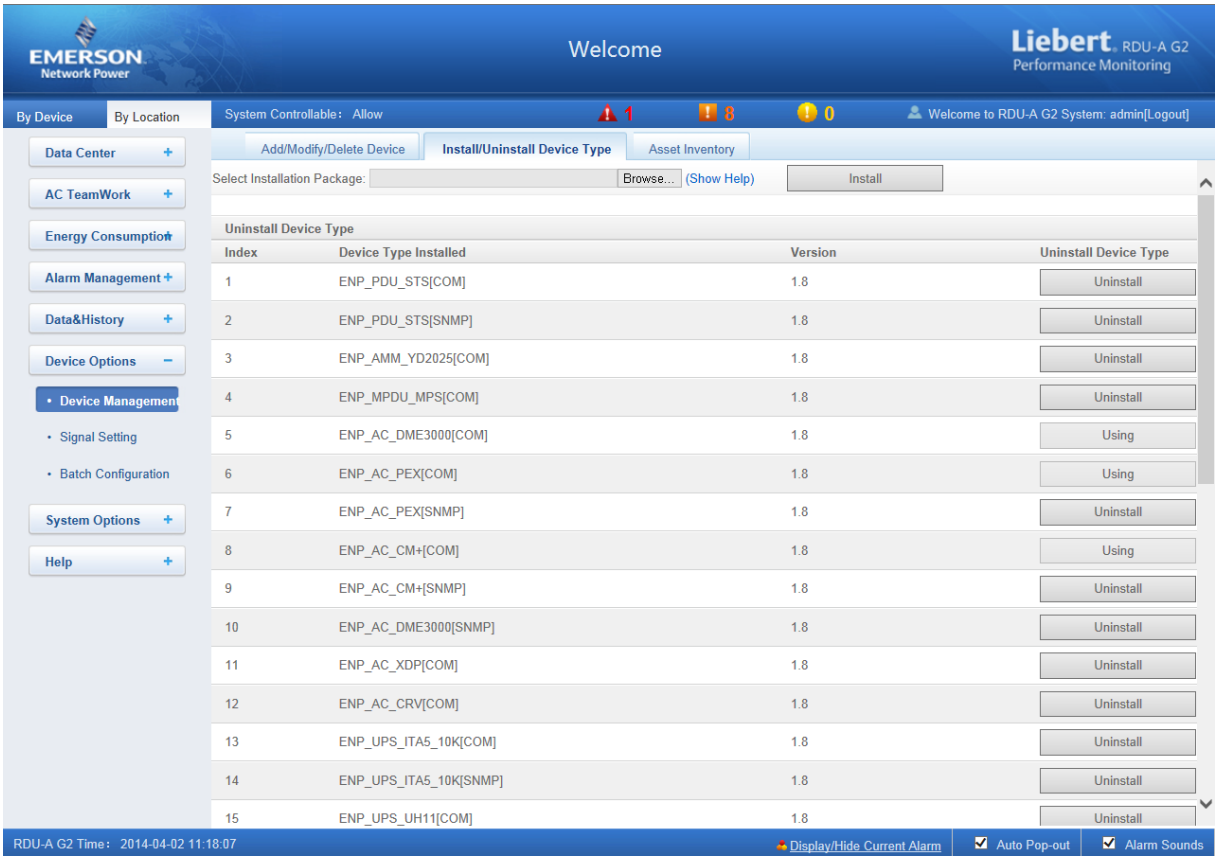


Figure 3-57 Install/Uninstall Device Type

Click the **Browse…** button to download configure package (file format of .iru) from local content, and click the **Install** button to install the new device type.

Note

The device type number supported by the system is related to the system remaining memory and the size of driver configuration package, but the number cannot exceed 64.

The page displays the installed device type information in the lower right part. Click the **Uninstall** button, the confirming dialog box pops up, as shown in Figure 3-58.

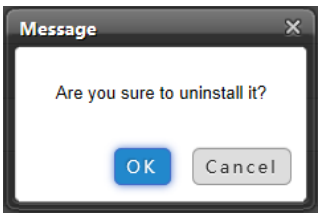


Figure 3-58 Confirming dialog box

Click **OK**, the dialog box of Security authentication pops up, as shown in Figure 3-18, type the login password of current user, and click **OK** to uninstall the corresponding equipment type.

Note

1. While installing device type, if the device type exists and the device driver has a higher version than the driver to be added, it cannot be installed repeatedly;

2. If the installation pack has no version information, or the version information does not match the software version, the device type cannot be installed.

2. If some device uses the device type, the **Uninstall** button becomes gray, displaying **Using**, and the device type cannot be uninstalled.

3. Asset Inventory

Click the **Device Management** submenu under the **Device Options** menu, and then click the **Asset Inventory** tab, the page shown in Figure 3-59 pops up.

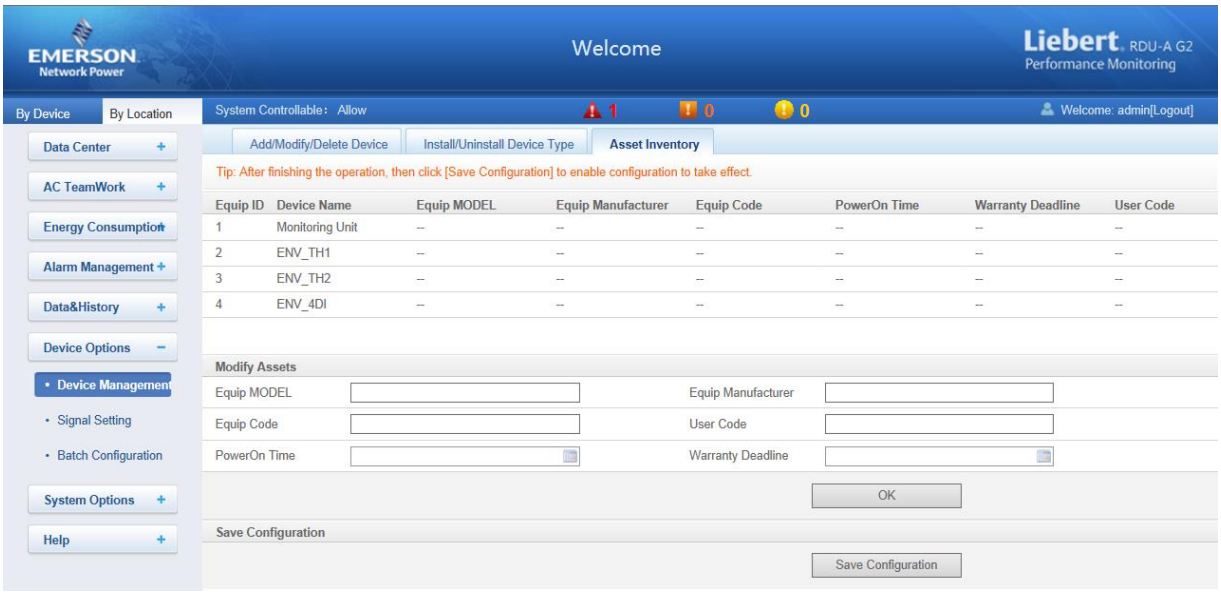


Figure 3-59 Asset Inventory

On the Asset Inventory page, you can set six items: **Equip Model**, **Equip Manufacturer**, **Equip Code**, **User Code**, **PowerOn Time** and **Warranty Deadline**.

Choose a device, and the corresponding asset information will be displayed in the textboxes at lower part of the page;

After self-defining and modifying, click the **Modify** button, the modified result will be displayed in the list at upper part of the page;

After all modifying is done, click the **Save Configuration** button to save the asset information.

Note

For newly-added device, its default asset information is '—'.

Signal Setting

Click the **Signal Setting** submenu under the **Device Options** menu, the page shown in Figure 3-60 pops up.

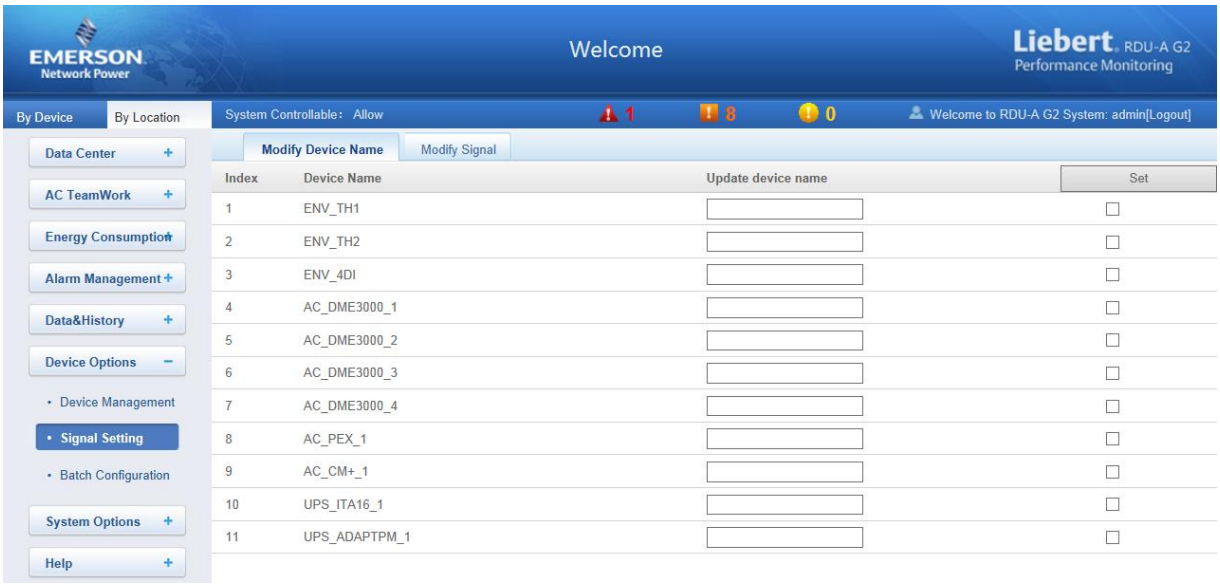


Figure 3-60 Modify device name

On the page shown in Figure 3-60, you can modify the device name. Type the new device name and click the **Set** button to make all setting effective.

Note

The characters of device name and signal name can be English letters, digits, space and underline, other characters are invalid.

Click **Modify Signal**, the page shown in Figure 3-61 pops up.

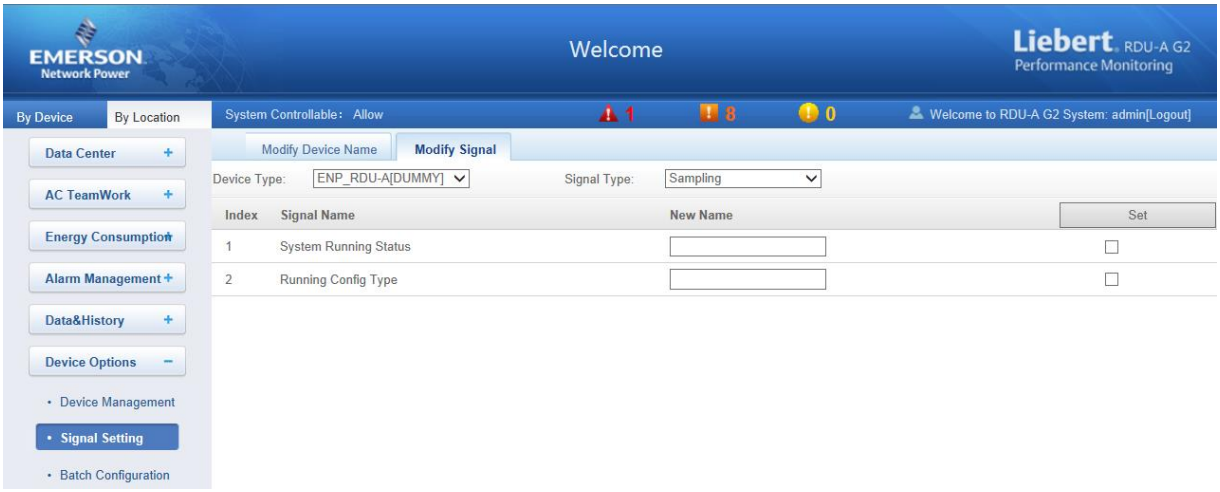


Figure 3-61 Modify signal

On the page shown in Figure 3-61, you can modify the signal name as well as the alarm level of the alarm signal. Choose **Device Type** and **Signal Type**, type the new signal name, and click the **Set** button to make it effective.

Note

1. For Env TH and Env 4DI, the system has the linkage modifying function for the signal name, that is, when the sampling signal name is modified, the names of corresponding control signal, setting signal and alarm signal will be modified as well. Therefore, the page only supplies the function of modifying sampling signal name.

2. The signal name modified here will be used as default signal name of the device.

Batch Configuration

Click the **Batch Configuration** submenu under the **Device Options** menu, the page shown in Figure 3-62 pops up.

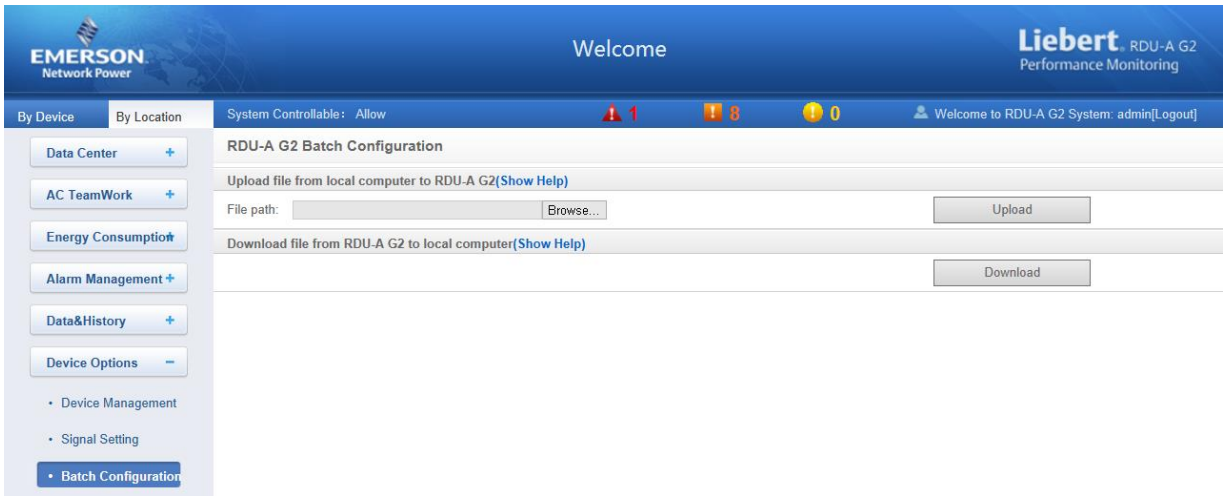


Figure 3-62 Batch configuration

On the page, you can perform **Upload** and **Download** operations to complete batch configuration.

Note

1. Only 'admin' has the authority of batch configuration. If you fail in performing batch configuration, please click **Show Help** to view the help information.
2. The batch configuration file is encrypted after downloaded to local.

3.4.7 System Options

On the RDU-A G2 homepage, click the **System Options** menu in the left part, seven submenus appear, including: **Monitoring Unit**, **Network Setting**, **User Management**, **Date/Time Setting**, **Restore System**, **Site Setting**, **License Management**, **System Upgrade** and **System Title**.

Monitoring Unit

The **Monitoring Unit** submenu is used to set the signals of RDU-A G2 system, including **Sampling**, **Setting** and **Alarm** signals, the page is shown in Figure 3-63.

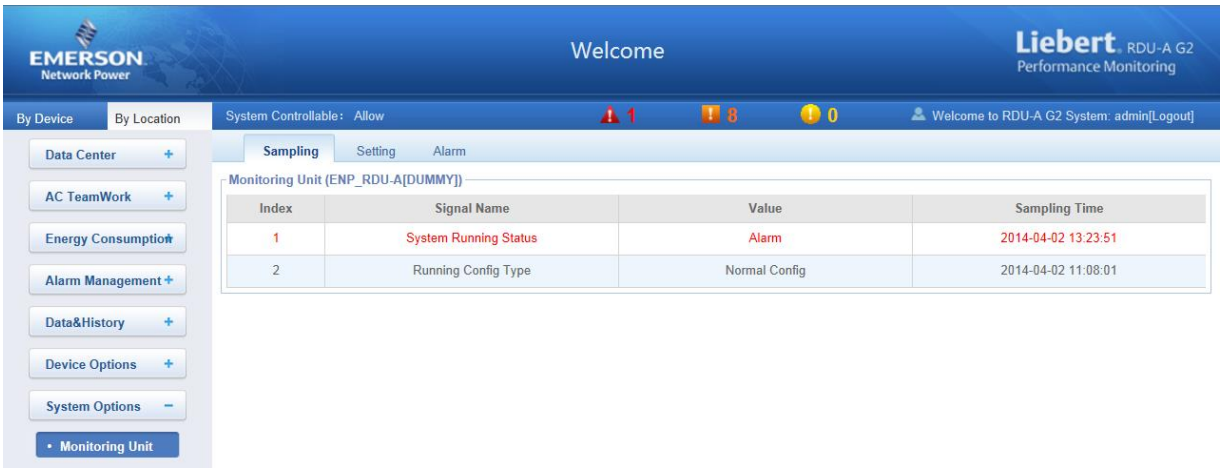


Figure 3-63 Monitoring unit (Sampling)

As for the operation method of the three tabs of **Sampling**, **Setting** and **Alarm** on the Monitoring unit page, refer to *3.4.1 Data Center*.

Note

On the **Setting** tab, if you set 'Blocked' for **Outgoing Alarm Blocked**, when an alarm occurs, it will be blocked, in this case:

1. Among the current alarms, except 'Outgoing Alarms Blocked', other alarms will all end;
2. The 'Blocked' setting for **Outgoing Alarm Blocked** will be automatically cleared in 24h.

Network Setting

1. IP Setting

Click the **Network Setting** submenu under the **System Options** menu, the page shown in Figure 3-64 pops up.

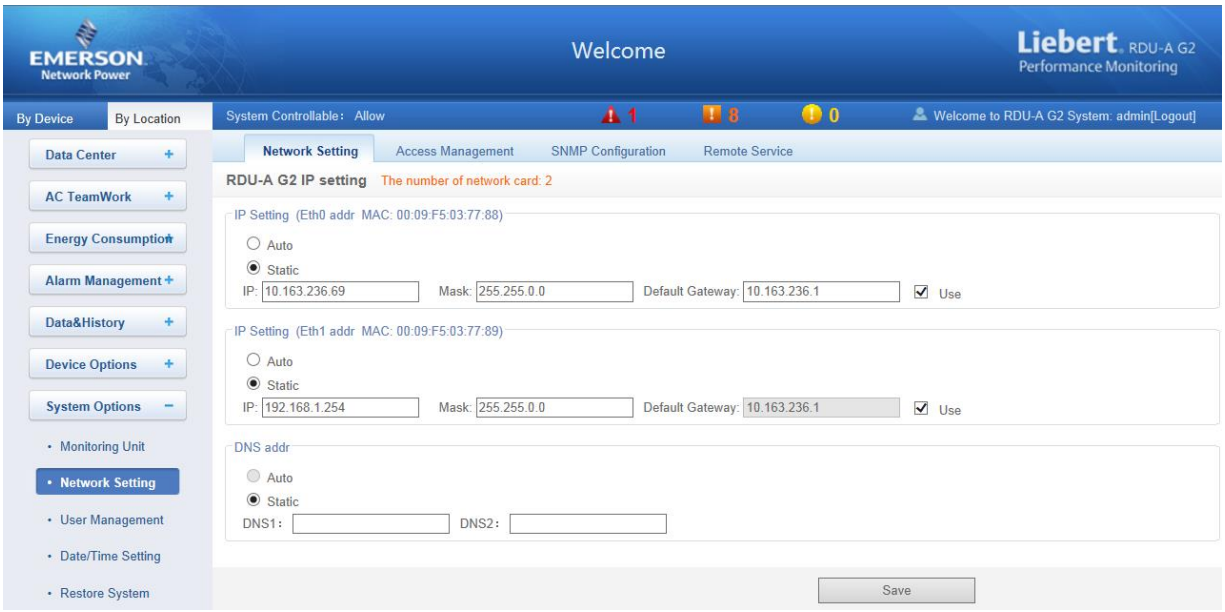


Figure 3-64 IP setting

The RDU-A G2 supplies two IP setting methods: DHCP auto addressing and manual static addressing, meanwhile, it supports DNS.

On the page shown in Figure 3-64, you can configure the network parameters, such as IP addressing mode, **IP**, **Mask**, **Default Gateway**, **DNS1** (Preferred DNS server) and **DNS2** (Alternate DNS server). After modifying the network parameters, click the **Save** button to make the setting effective.

Note

1. If network card 1 and network card 2 both use Static IP, the DNS address cannot be automatically obtained.

2. After modifying the IP address, you must use the new IP address to re-login the RDU-A G2. The system will jump to the IP address of network card 1 by default.

2. Access Management

Click the **Network Setting** submenu under the **System Options** menu, and then click the **Access Management** tab, the page shown in Figure 3-65 pops up.

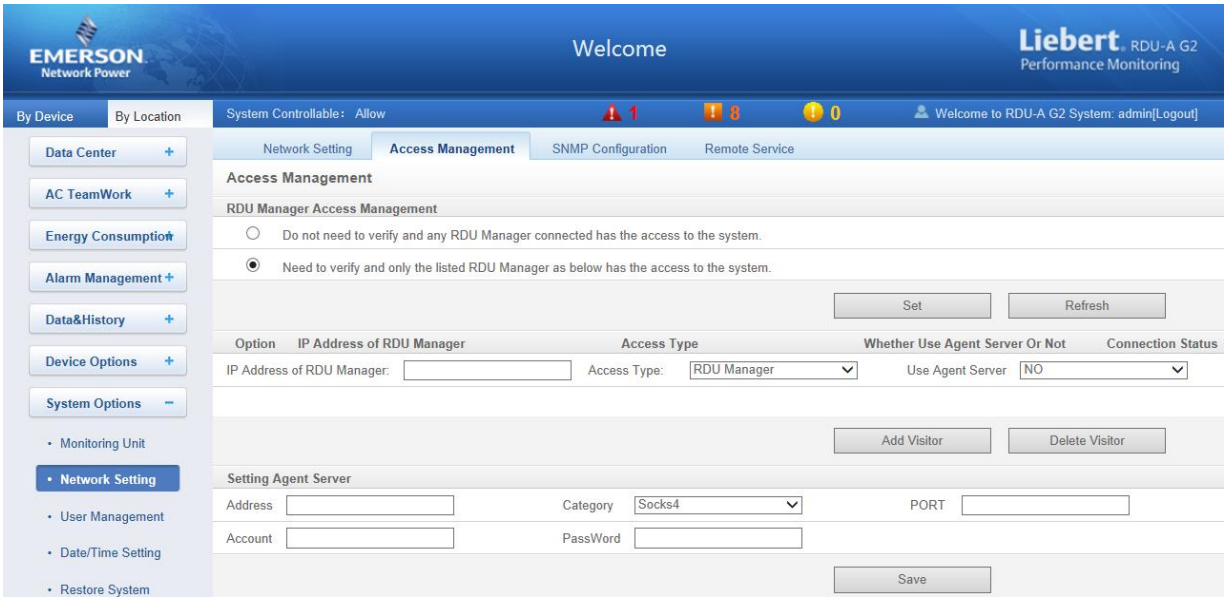


Figure 3-65 Access management

In the event of adding visitor, in the textbox of **IP Address of RDU Manager**, type the new IP address of the RDU manager, and click the **Add Visitor** button to finish the configuration.

Note

1. Up to three RDU manager IP addresses can be added in the system.
2. In the event of adding visitor, if you select to use an agent, you also need to configure the agent server.

3. SNMP Configuration

Click the **Network Setting** submenu under the **System Options** menu, and then click the **SNMP Configuration** tab, you can configure SNMP agent. The RDU-A G2 system supports V2 and V3 versions of SNMP agent.

As shown in Figure 3-66, the specific setting method of SNMP V2 is as follows:

1) Set **NMS IP** (host IP address of SNMP agent data receiving end);

2) Set **Trap Level**: 'Enable' or 'disable';

3) Keep defaults for other items.

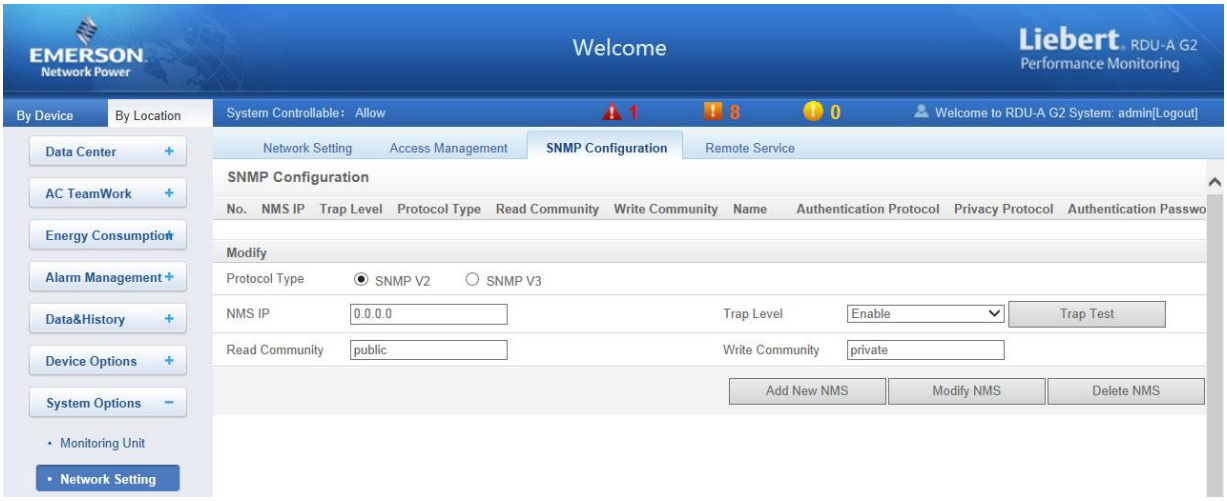


Figure 3-66 SNMP V2 setting

As shown in Figure 3-67, the specific setting method of SNMP V3 is as follows:

1) Set **NMS IP** (host IP address of SNMP agent data receiving end);

2) Set the **Trap Level**: 'Enable' or 'disable';

3) Set the **Name**;

4) Set the **User Type**: 'Authenticated & Encrypted', 'Authenticated & Not Encrypted', 'Not Authenticated & Not Encrypted';

5) Select **Authentication Protocol**: 'MD5', 'SHA';

6) Select **Privacy Protocol**: 'DES';

7) Self-define **Authentication Password** and **Privacy Password**.

Note

1. On the base of SNMP V2, SNMP V3 adds user authentication and privacy strategies.
2. If you select 'Not Authenticated & Not Encrypted' for **User Type**, the drop-down boxes of **Authentication Protocol** and **Privacy Protocol** will become gray, so you cannot set them;
3. Currently, only 'DES' is supported for **Privacy Protocol**.
4. You need to self-define **Authentication Password** and **Privacy Password**, which contain at least 8 characters, and be the same as the password set by the host of SNMP agent data receiving end, or it cannot be decrypted and received.

After parameter setting, click the **Add** button to add NMS;

If you need to modify NMS setting, select the NMS which needs to be modified, modify the setting and then click the **Modify** button to save the setting;

If you need to delete NMS, select the NMS which needs to be deleted, and then click the **Delete** button to delete the NMS.

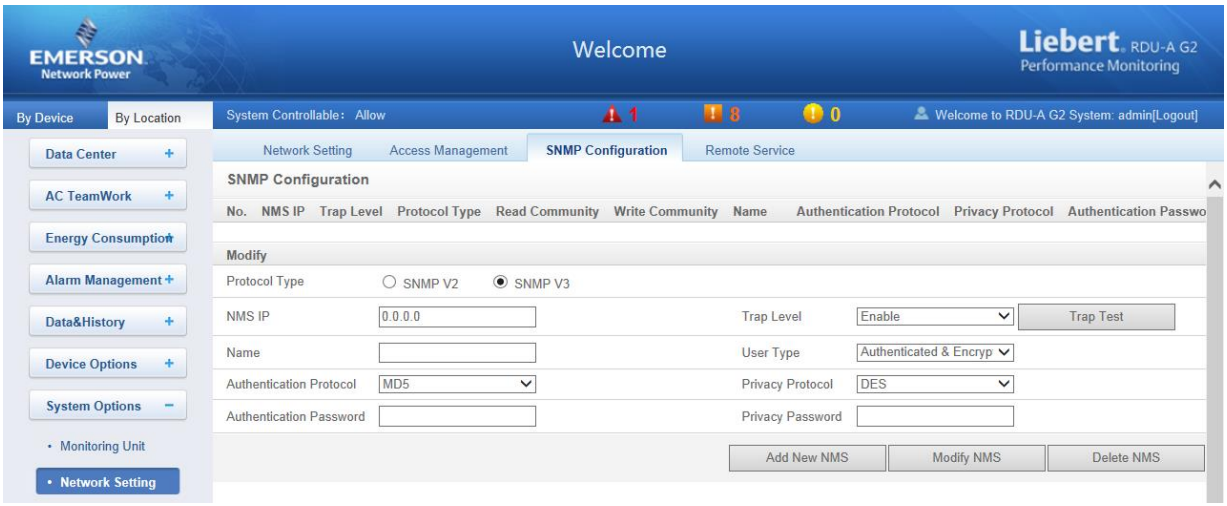


Figure 3-67 SNMP V3 setting

Note

The RDU-A G2 does not supply SNMP agent service by default. If you need SNMP service license, please contact Emerson customer service center for purchase, and the contact number is 4008876510.

4. Remote Service

Click the **Network Setting** submenu under the **System Options** menu, and then click the **Remote Service** tab, the page shown in Figure 3-68 pops up.

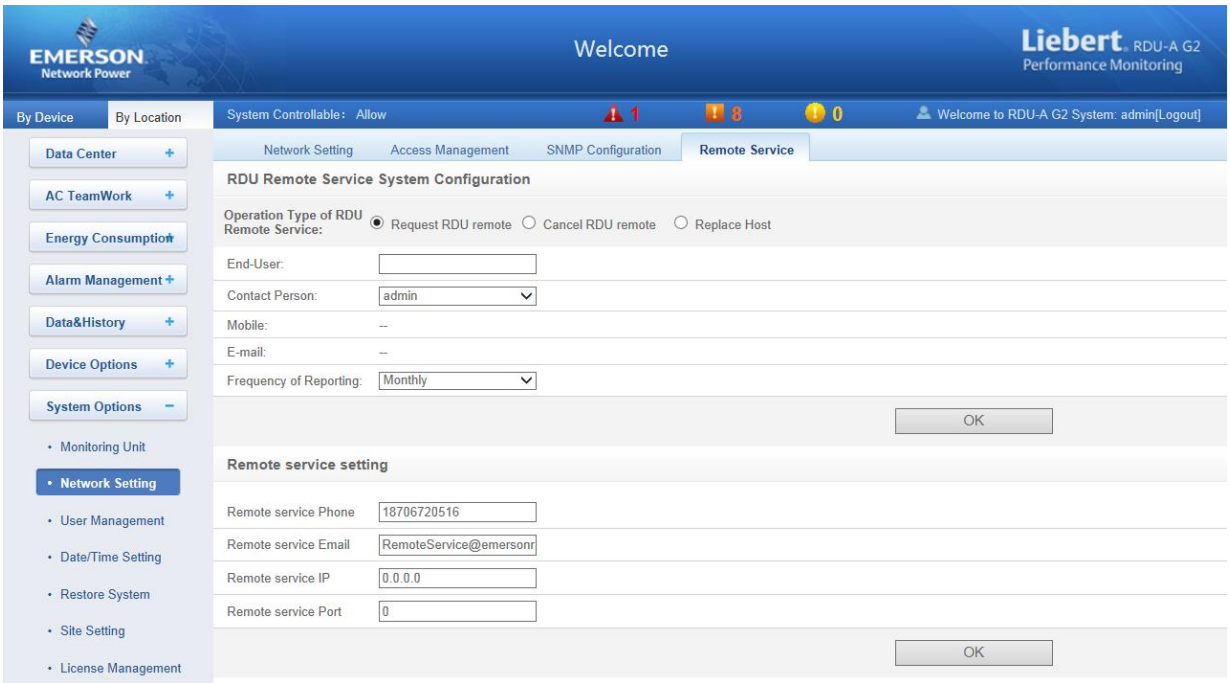


Figure 3-68 Remote service setting

The remote service setting includes three parts: **Request RDU remote**, **Cancel RDU remote** and **Replace Host**.

- Request RDU remote: used to establish remote service relationship

1) Type the self-defined customer name in the **End-User** textbox;

2) Choose the contactor for remote service in the **Contact Person** textbox, when the contactor is chosen, the corresponding mobile and email will be displayed;

Note

The contactor for remote service must be set through **System Options** -> **User Management** in advance, and you must provide the mobile or email, or the service request cannot be conducted. Refer to *User Management* in this section for detailed setting method.

3) Choose **Frequency of Reporting**: 'Monthly', 'Seasonal';

4) Click **OK** to send the remote service request.

●Cancel RDU remote: used to cancel the established remote service

Choose **Cancel RDU remote** and click **OK** to send a command to cancel the current remote service.

Note

Canceling the remote service is effective only under the precondition that the remote service has been established, otherwise, a prompt of failure will pop up after you click **OK**.

●Replace Host: used to replace the local host during remote service

When the host that has established remote service need to quit, but you want to remain the established remote service relationship, you need to replace the local host to participate in the remote service. The detailed setting method is the save as **Request RDU remote**, besides, type the hardware serial number of the replaced host.

User Management

Click the **User Management** submenu under the **System Options** menu, the page shown in Figure 3-69 pops up.

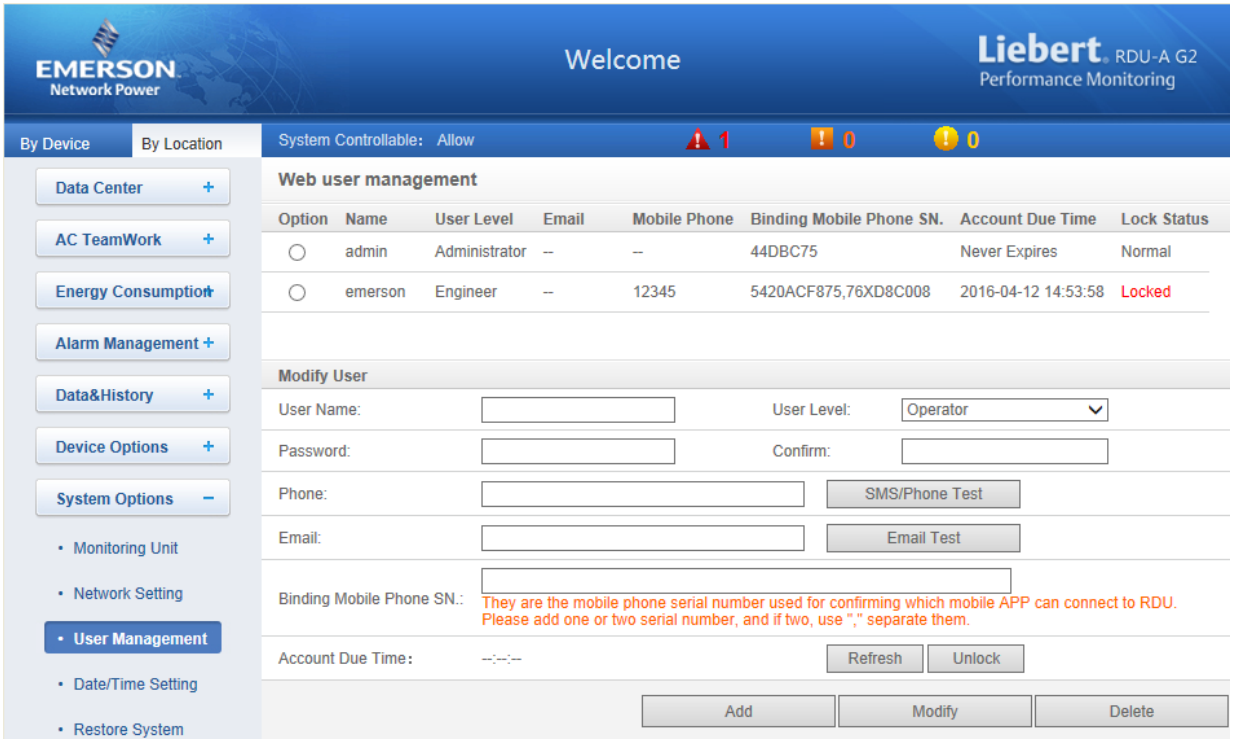


Figure 3-69 User management

On the page shown in Figure 3-69, you can add user, modify user and delete user.

●Add user

1. Type username in the **User Name** textbox;
2. Choose the user authority;
3. Configure the user password, which cannot be vacant and should contain at least six letters or digits.
4. Re-type the password in the **Confirm** textbox;
5. (Optional) Type the user telephone number, which can use the following digits and characters: 0123456789, +;
6. (Optional) Type the email address;
7. Click the **Add** button, the dialog box of Security authentication pops up, as shown in Figure 3-18. Type the login password of current user, and click **OK** to add a new user.

Note

The characters of username can only be English letters, digits, -, and _. In addition, the initial characters must be letters or digits.

●Delete user

1. Choose the user which needs to be deleted in the username list;

2. Click the **Delete** button to pop up the confirming dialog box, as shown in Figure 3-70.

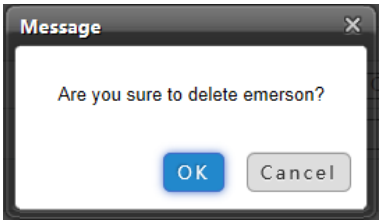


Figure 3-70 Confirming dialog box

3. Click **OK**, the dialog box of Security authentication pops up, as shown in Figure 3-18. Type the login password of current user, and click **OK** to delete the chosen user.

Note

The user of 'admin' cannot be deleted.

●Modify user

1. Choose the user which needs to be modified in the username list;

2. Modify the user information;

3. Click the **Modify** button, the dialog box of Security authentication pops up, as shown in Figure 3-18. Type the login password of current user, and click **OK** to make the modified user information effective.

Users who access RDU-A G2 can be divided into four user groups, and they have different security level and user authority, see Table 3-3 for detailed information.

Table 3-3 User security level

Security level	User group	User authority
Level A	Browser	All users can browse equipment information
Level B	Operator	The operators can send control command to intelligent equipment
Level C	Engineer	The engineers can get the following access: Send control command to intelligent equipment; Browsing, controlling and modifying parameters; Download files; Modifying user information of their own
Level D	Administrator	The administrator can get full access: Send control command to intelligent equipment; Browsing, controlling and modifying parameters; Upload and download files; Modifying, adding and deleting user information; AC teamwork parameter setting; System upgrade

On the page shown in Figure 3-69, choose the current user, you can perform **SMS/Phone Test** and **Email Test**.

Before using the test function, users need to configure the SMS/Email server of current user, refer to *Alarm Notification* in *3.4.4 Alarm Management* for details.

●SMS/Phone Test

Type the phone number in the **Phone** field, and click the **SMS/Phone Test** button to test that the telephone number of current user can be gotten through. If users receive the test SMS and telephone, the test is successful; if not, the test fails, please check that the telephone number is correct and the SMS Modem is properly connected.

●Email Alarm Notify Test

Type the email address in the **Email** field, and click the **Email Test** button to test that the email address of current user is correct. If users receive the test email, the test is successful; if not, the test fails, please check that the information above is correctly typed.

Note

When adding, modifying user, you must type the phone number or the email address, or the setting cannot be completed.

Date/Time Setting

Clicking the **Date/Time Setting** submenu under the **System Options** menu can synchronize the time. On the page shown in Figure 3-71, RDU-A G2 can get time from the time servers automatically. Type IP address in the **Primary server** textbox and **Secondary server** textbox in sequence, type a figure in **Interval to calibrate system time** textbox, select the **Time zone** and **Calibrating Protocol**, and then click the **Set** button to make the setting effective.

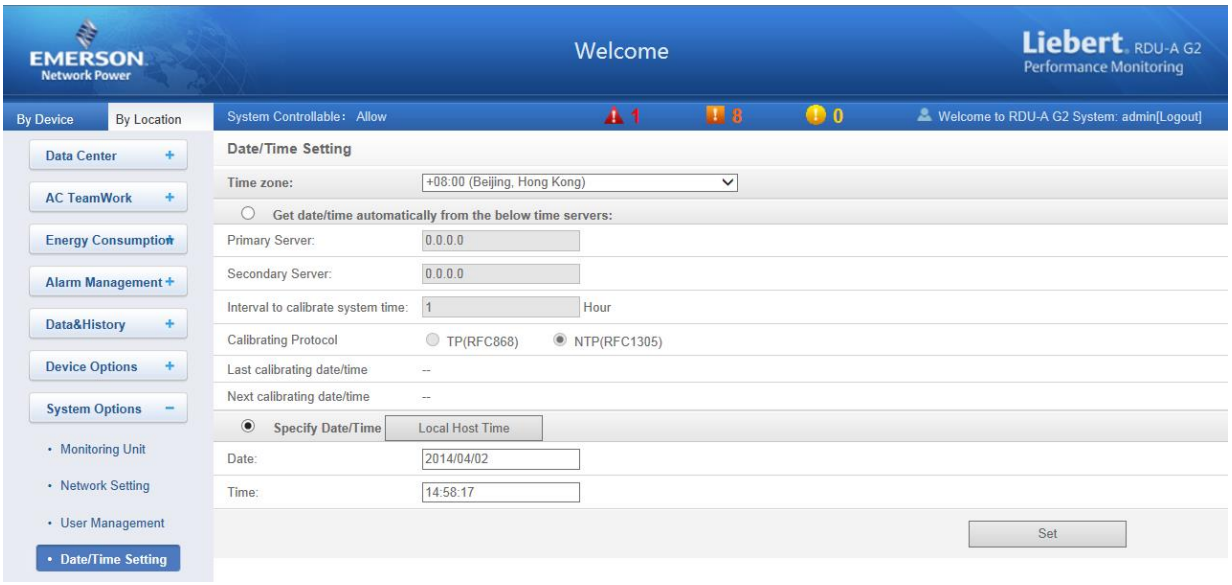


Figure 3-71 Date/time setting

The RDU-A G2 can also get the local time. Choose **Specify Date/Time**, click the **Local Host Time** button to get the local time, and then click the **Set** button to make the new time effective.

Note

Time calibration adopts **Specify Date/Time** by default.

Restore System

Click the **Restore System** submenu under the **System Options** menu, the page shown in Figure 3-72 pops up.

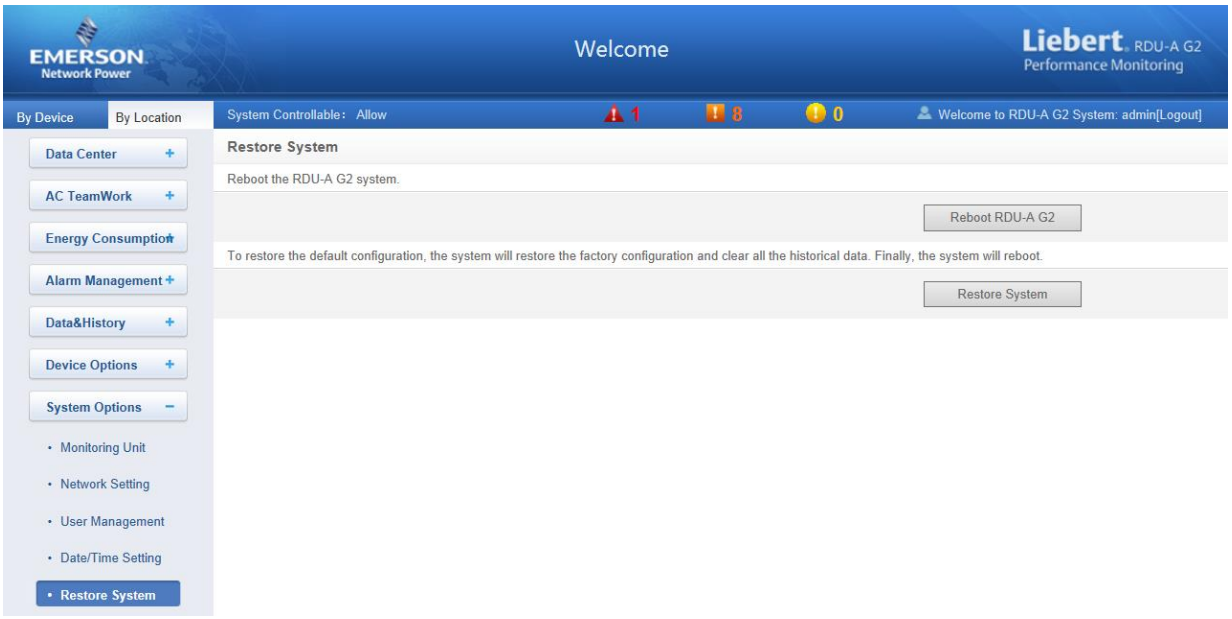


Figure 3-72 Restore System

Click the **Reboot RDU-A G2** button to reboot the system.

Click the **Restore System** button to restore all the default settings.

Note

If you use the restore function, the RDU-A G2 may lose the original configuration solution. After the restore operation, make sure to wait one minute for the RDU-A G2 conducting complete initializing work before re-accessing it through Web.

Site Setting

Click the **Site Setting** submenu under the **System Options** menu, the page shown in Figure 3-73 pops up.

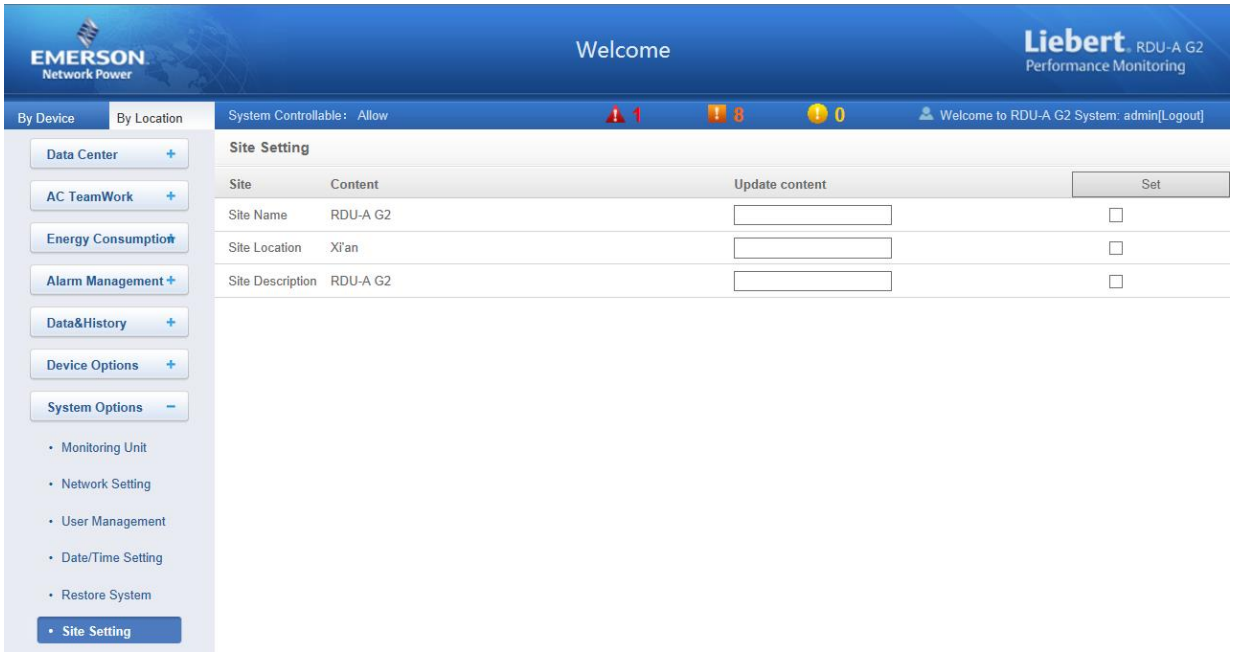


Figure 3-73 Site information setting

On the page shown in Figure 3-73, you can modify the site information of RDU-A G2, including **Site Name**, **Site Location** and **Site Description**.

License Management

Click the **License Management** submenu under the **System Options** menu, the page shown in Figure 3-74 pops up.

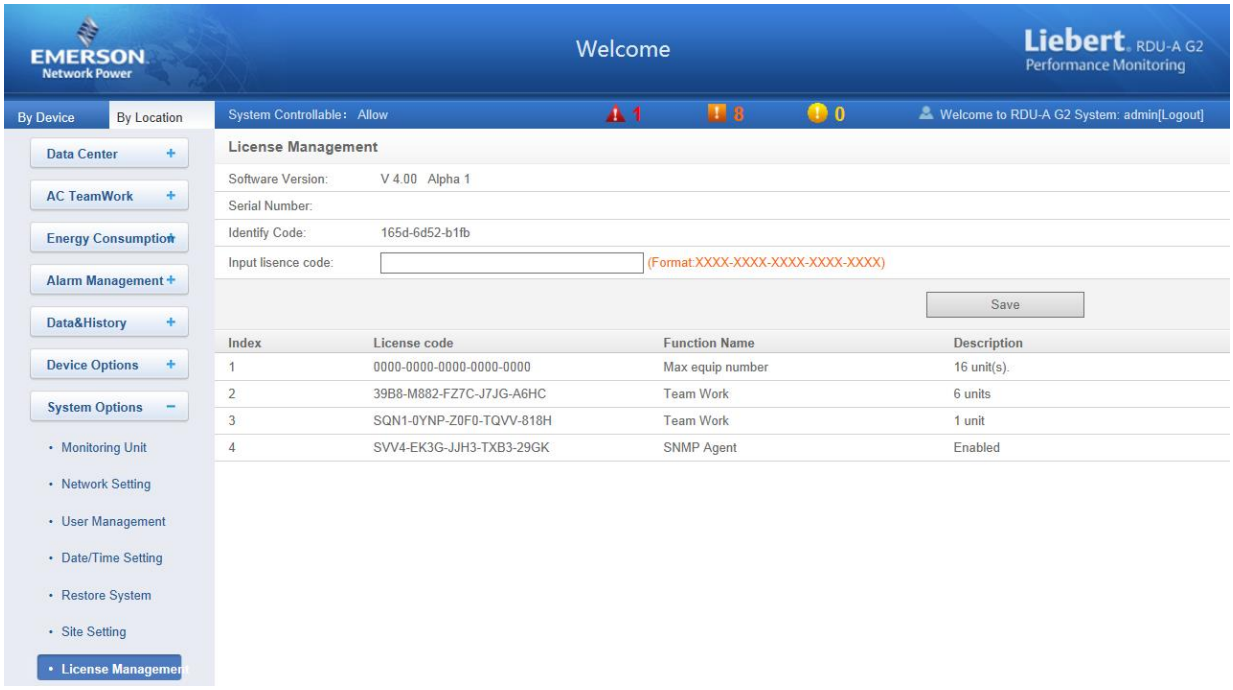


Figure 3-74 License Management

On the **License Management** page, you can conduct authorization of limited service (such as SNMP service) and view authorized functions. After you get the license code, input legal license code in the textbox, and click the **Save** button to finish installing. See Table 3-4 for the functions which can be authorized by the RDU-A G2.

Table 3-4 Overview of RDU-A G2 authorized functions

Authorized functions	Descriptions
AC TeamWork	AC TeamWork authorized version and AC number participating in AC TeamWork, at most 32 ACs can be authorized to participating in AC TeamWork
SNMP service	SNMP agent service is open to user through authorization
Maximum connecting number	Maximum connecting number is expanded to 32 devices through authorization

Note

1. After installing license code of some function successfully, you must reboot the system for taking effect.
2. After connecting the IRM4-COM expansion card, 4 will be added to the maximum connecting number.

System Upgrade

Click the **System Upgrade** submenu under the **System Options** menu, the page shown in Figure 3-75 pops up.

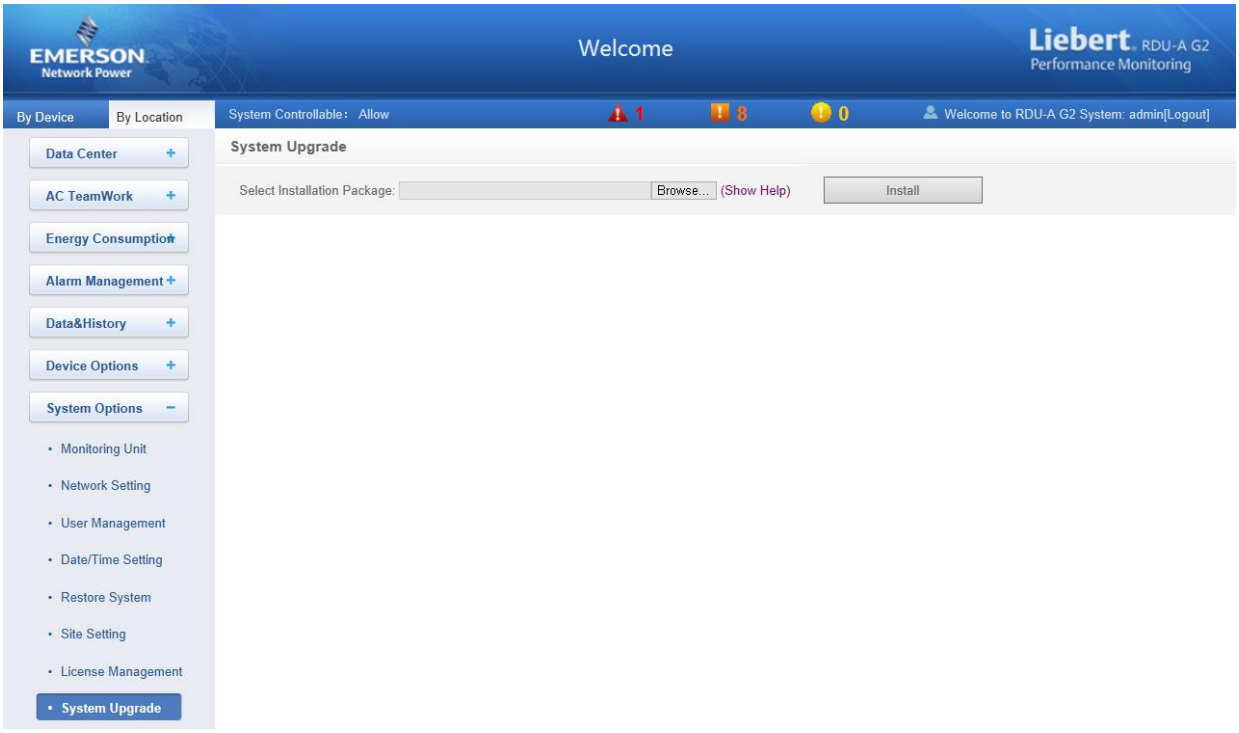


Figure 3-75 Site information setting

On the page shown in Figure 3-75, click the **Browse…** button to download configure pack (.rdu file format) from the local catalogue, and then click the **Install** button to upgrade the system.

Note

The RDU-A G2 supports incremental upgrading function.

System Title

Click the **System Title** submenu under the **System Options** menu, the page shown in Figure 3-76 pops up.

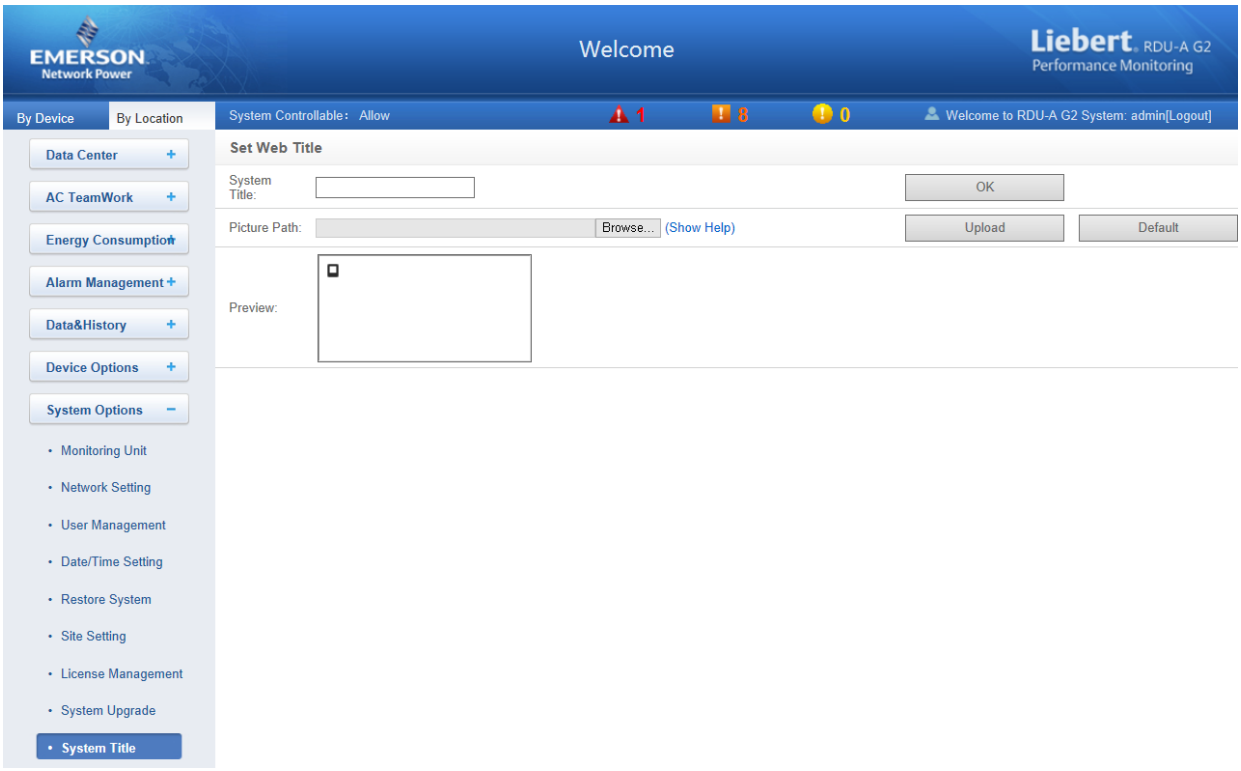


Figure 3-76 Title setting

As shown in Figure 3-76, you can replace the Logo picture in the upper right part by uploading system Logo picture. Click the **Browse…** button, choose the needed Logo picture and click the **Upload** button to upload the file to RDU-A G2. Only [.gif], [.bmp], [.jpg] and [.png] format pictures are allowed, and the picture size should be less than 500K. Clicking the **Default** button can restore the default Logo picture.

You can also change the system title **Welcome** at the top of the page. Type the customized title in the **System Title** textbox and click **OK** to make it effective.

3.4.8 Help

On the RDU-A G2 homepage, click the **Help** menu in the left part, one submenu appears: **About RDU-A G2**.

The **About RDU-A G2** page displays **Software Version**, **Serial Number** and **Identify Code** of RDU-A G2, and supplies download links for user manual and tools, as shown in Figure 3-77.

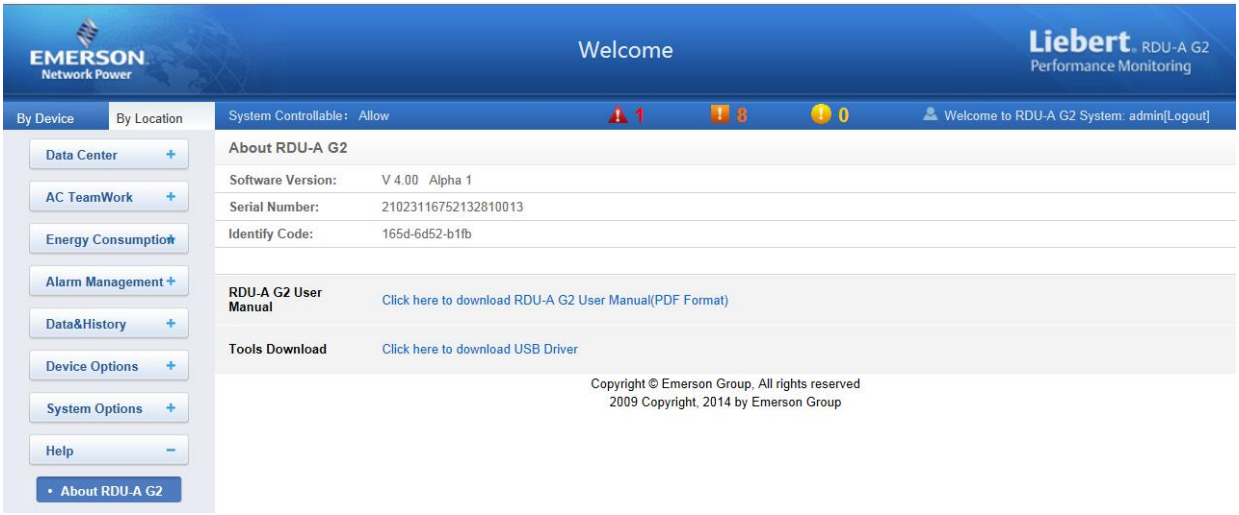


Figure 3-77 About RDU-A G2

Chapter 4 Maintenance

This chapter expounds the maintenance of RDU-A G2, including restoring default setting and troubleshooting.

4.1 Restoring Default Setting

Restoring default setting can be finished through two modes: software or hardware.

For software restoring, refer to *Restore System* in *3.4.7 System Options*.

Hardware restoring includes restoring RDU-A G2 admin password (default username: admin, password: emerson) and RDU-A G2 IP address (for default IP address, refer to *Network port* in *1.2.1 RDU-A G2 Host*). The methods is: press and hold the reset button (see Figure 4-1) for four seconds, release your hand until the run/alarm indicator turns off, the IP address and password of the RDU-A G2 will be restored to factory defaults after the system restarts.

Figure 4-1 Reset button

4.2 FAQ

Q1: After RDU-A G2 is powered on, why the power indicator is not on?

A: Please check that the power cable is connected correctly.

Q2: How to deal with that the POWER indicator is not on or the COM port does not work after the IRM-4COM\IRM-8DIAI\IRM-8DOAO expansion card is inserted?

A: The POWER indicator is not on, please check that the expansion card is inserted correctly and completely; If it is inserted normally, the RDU-A G2 will restart automatically, if the RDU-A G2 does not restart, please try to insert the expansion card again.

Q3: How to deal with that the communication of COM port is abnormal?

A: Firstly, ensure that the device communication mode is matched. The COM ports on the RDU-A G2 and the expansion card are RS-232/RS-485 adaptive ports; secondly, please ensure that the communication parameters are correctly configured.

Q4: How to deal with that the relay output port cannot control user equipment normally?

A: Check that the line sequences of user equipment terminals are correct, see Table 1-15 for details.

Q5: How to deal with that there is no access to RDU-A G2 login page when the RDU-A G2 communication is normal?

A: There are three measures to solve the problem:

Step 1: Ensure that the IP address is correct;

The RDU-A G2 has two network cards, please ensure that the network cable is connected to the correct port.

If it is static addressing, refer to *Network port* in *1.2.1 RDU-A G2 Host* for default IP of RDU-A G2; if it is set to get IP in DHCP mode, please view the current IP by referring to *Q6*.

Step 2: Ensure the connectivity of IP address.

To ensure the connectivity of IP address, you can use PING/ping command, and the method is as follows:

1) Click the icon at the lower left corner, and type ‘cmd’ in the textbox, as shown in Figure 4-2.

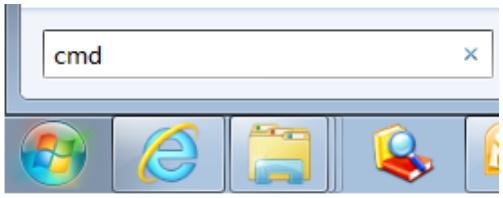


Figure 4-2 Typing ‘cmd’

2) Press the Enter key, the page shown in Figure 4-3 pops up. Type ‘ping’ and IP address in the command line (for instance, ‘ping 10.163.162.135’) and check whether the communication is successful.

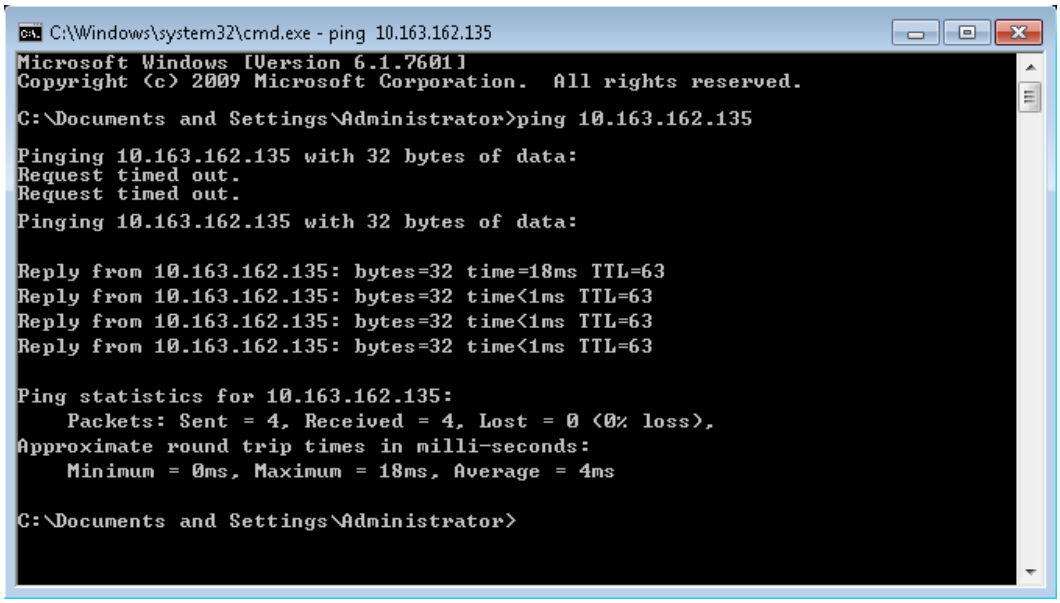


Figure 4-3 Communication test

Step 3: If the above-mentioned steps cannot handle the problem, please use the Reset button on the host to restore default IP.

Step 4: Refer to *3.1 Login Preparation* to complete relevant operations.

Q6: After setting DHCP, how to view the current IP address?

A: After setting DHCP, you need to visit the RDU-A G2 through COM port to get the current IP address. The method is as follows:

Step1: Refer to *3.4.8 Help*, download USB driver of console port, and install it in the user computer.

Step2: Use the USB cable in the RDU-A G2 host package to connect the Console port on the RDU-A G2 to the computer USB port, and use a COM port tool (such as SecureCRT) to connect the RDU-A G2.

Step3: Type username ‘rduadmin’ and password ‘emerson’ to log in the RDU-A G2 system, type command ‘setip1’ and press the Enter key, to view the IP address, subnet mask and gateway. The method of viewing network parameters of network card 2 is the same as that of network card 1, type command ‘setip2’, as shown in Figure 4-4.

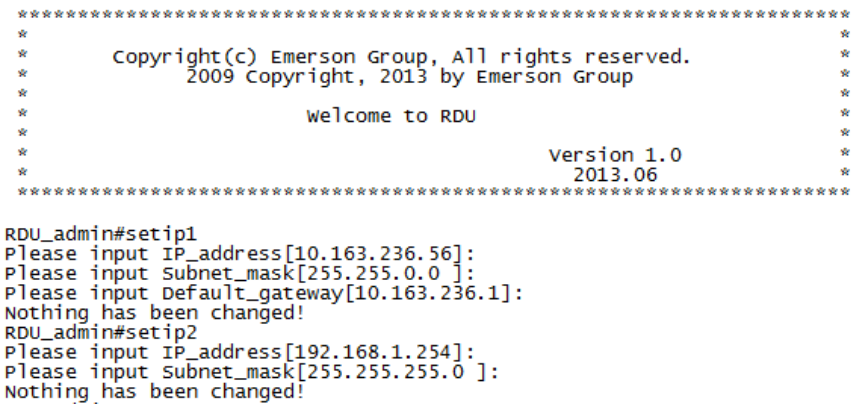


Figure 4-4 Viewing network parameters

Q7: How to perform troubleshooting of sensor?

Fault 1: The intelligent sensor has no display, and it cannot be displayed on the RDU-A G2 webpage.

A: Please perform troubleshooting according to the following procedures:

1) Ensure that the intelligent sensor is connected to the SENSOR port of the RDU-A G2; meanwhile, the sensor whose address within the group is 1 can only be connected to SENSOR1; the sensor whose address within the group is 2 can only be connected to SENSOR2;

2) Check that the connected cable is intact and it is straight network cable, and the connector is intact;

3) Check that the intelligent sensor is normal;

4) Ensure that the sensor address is not 00;

5) If multiple intelligent sensors are connected, ensure that the sensor addresses are not the same, and perform troubleshooting according to procedures 2 and 3 one by one.

Fault 2: The alarm indicator of the intelligent sensor is on.

A: Send the intelligent sensor back to the service center of Emerson local office for repair.

Fault 3: There are frequent communication failure alarms of intelligent sensors in the History Alarm of RDU-A G2.

A: Check that the network cable connector is intact, and that the network cable connection is not loosened.

Q8: You have chosen the ocean blue theme, but the page still adopts crystal blue theme while you are viewing the webpage of the RDU-A G2, how to deal with it?

A: Click the **[User] Logout** button to return the login page, click the  icon to choose the ocean blue theme, and log in the system again.

Q9: After an alarm is generated, you do not receive any email or SMS notification; or when the alarm does not finish, the email or SMS notification is less than three times, how to deal with it?

A: Please perform troubleshooting according to the following procedures:

1) Please check that the SMS/Email server configuration is correct, refer to *Alarm Notification* in *3.4.4 Alarm Management*.

2) If you do not receive the SMS notification, please check that the phone is out of service because of overdue payment;

3) If you do not receive the email notification, please click the menu Data & History -> History Log to query the system log and check whether there is a record of failure in sending email. If so, it indicates that the network is busy or the email server communication is busy.

Appendix 1 Abbreviation

AC	Alternating Current
CA	Critical Alarm
DC	Direct Current
DI	Digital Input
IE	Internet Explorer, a Web browser developed by Microsoft@
FAQ	Frequently Asked Questions
FTP	File Transfer Protocol, used to transfer large chunks of data
HTML	Hypertext Mark-Up Language, used to create Web pages
HTTP	Hypertext Transfer Protocol, used to convey HTML
JRE	Java Runtime Environment
LED	Light Emitting Diode
Linux	A UNIX-like operating system with open source, developed under Free Software Foundation
LLP	Local Language Package
LUI	Local User Interface
MA	Moderate Alarm
NA	No Alarm
LA	Low Alarm

Appendix 2 Standard Configuration List

No.	Item description	Quantity	Unit
1	RDU-A G2 Intelligent Monitoring Unit	1	EA
2	RDU-A G2 Intelligent Monitoring Unit Installation & Commissioning Manual	1	EA
3	Metal Fittings/Ironware--21-inch hanger		
4	Metal Fittings--RDU cable clamp		
5	Cable and wire,IEC60320 C13 Plug,IEC60320 C14 Plug,H05VV-F,3C,1mm^2,Black,2000mm,EU		
6	Metal Fittings/Ironware--hanger		
7	Outsourced Cable Set,UH52SA1SL2,USB Cable for UH52SA1Z UPS power ,ROHS		
8	Outsourced Cable Set,,UHRK1S241SL62-UHRK1S241Z-2KVA/input cable-ROHS		
9	Standard Component,GB819.1-2000, Cross-head countersunk head screws M4 × 10		
10	Label Set Or Other label of Certificate		

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