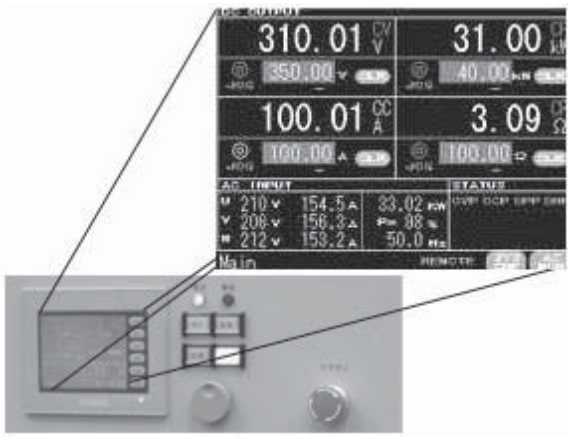
Battery Charge/Discharge Device and Systems

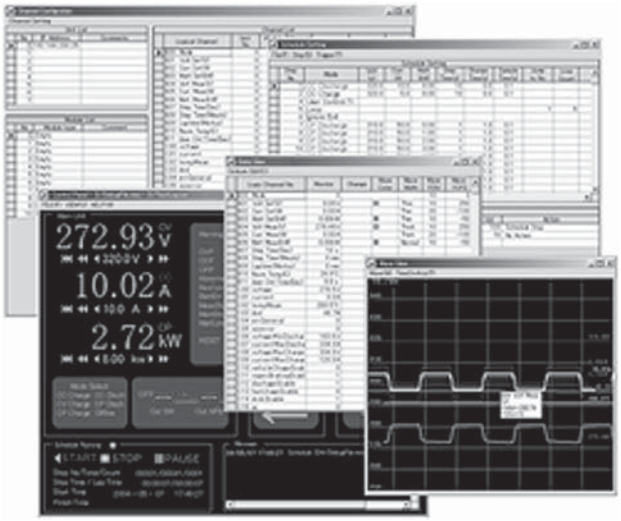
YRD series

Today, we use a range of both big and small batteries, from lithium-ion batteries in cell phones and notebook computers, to the batteries used in hybrid cars. In the development of battery-powered devices, obtaining basic data such as battery durability is essential for verifying the reliability of products. It used to be the case that in order to build such a system, it was necessary to provide a battery charge/recharge device (since there were no high-capacity products available, the power supply and load had to be furnished separately), a data logger, and accompanying software for controlling this equipment. From a time and cost perspective, this was impractical. In response to this, YAMABISHI developed a new battery charge/discharge device designed specifically for charging and discharging equipped with a dedicated data logger and software. This product is ideal for reducing the time required for developing battery-powered products.

现今，从手机，笔记本电脑使用的锂离子电池到混合动力车所使用的电池，大大小小的所有电池都在被广泛利用。在开发这些电池应用机器时，为了检验应用产品的可靠性，必须获得内置电池的耐久性能等基础数据。但是，以前在构建这样一个系统时，需要准备充放电装置（因为没有大容量的产品，所以要准备各种电源，负载），数据记录器及管理这些设备的软件，所以从时间，成本方面来说比较困难。这次，YAMABISHI 新开发出了特别适用于电池充放电的充放电装置，同时还准备了专用的数据记录器及软件。请一定利用此产品，缩短电池应用产品的开发时间。



Touch panel　触感控制面板



Software　软件

电池充放电源装置

YRD系列

Battery charge and discharge device (series regulator) YRD-ATX/TX series
电池充放电装置（串联型稳压方式）YRD-ATX/TX系列

Feature 特长

- High precision and high speed
  Uses a dropper system for high-precision, high-speed load changing. Also maintains low voltage and current ripples.
  高精度，高速度响应。
  采用串联型稳压方式，对于负荷变动能作出高精度，高速响应。并且，能将电压，电流波动控制到很小。
- Low Noise
  Switching is unnecessary, so no emission noise is generated.
  低噪音。
  因为不进行整流，所以不会发出辐射噪音。
- Charge/Discharge devices of different capacities can be combined.
  Setting Charge device of small capacity can be lowering in cost.
  充电与放电可设定为不同容量。充电端设定小容量降低成本。
- Interface (Ethernet/CAN)
  An Ethernet communication interface has been implemented, and can be automatically operated from an external PC. By mounting a CAN (Control Area Network) interface, the auto industry standard, internal data can be collected and logged in blocks from the battery controlling the CAN interface.
  界面（以太网，CAN）。
  作为通信界面，装备有以太网接口，可以在外部的 PC 控制下自动运行。并且，装备有汽车业界标准的 CAN（Control Area Network）界面，还可以所管理的 CAN 界面电池中收集内部信息，并进行统一同步。
- Local operation (touch panel/jog dial)
  Mounted with Yamabishi's common touch panel and job dial for charge/discharge devices. Using these, low-capacity bench use charge/discharge tests can be performed without a PC. Moreover, screens can be added for controls that are required as part of user test systems using the customization options (such as conductor ON/OFF)
  本机操作（触感控制面板，滚轴功能键）。
  装备有 YAMABISHI 充放电装置通用的触感控制面板与混轴功能键。可以将其作为小容量的座充，用来进行无 PC 的充放电试验。并且，用户可通过自定义添加窗口，来控制试验系统所必需的机器（例如：接触器的打开（ON）/（OFF））。

Battery charge/discharge device (regenerative inverter system) YRD-IX series
充放电装置（电力再生变换器方式）YRD-IX系列

Feature 特长

- Compact, highly efficient
  By implementing an inverter system, we were able to achieve a charge/discharge device that is not only compact, but also highly efficient (with a charge time of 85%). The regeneration of electrical power during loading creates an environmentally friendly system that uses energy efficiently.
  小型，高效。
  利用变换器方式实现了小型，高效（充电时 85%）。并且，通过加有负载时再生电力，实现了节能源，环保的系统。
- A diverse range of control modes
  The charge/discharge device supports constant current charge/discharge, constant voltage charge/discharge, constant power charge/discharge, constant resistance, discharge and pulse modes.
  多姿多彩的控制模式。
  可进行固定电流 充电 / 放电，固定电压 充电 / 放电，固定电力 充电 / 放电，固定电阻，放电，脉冲模式。
- High-speed responsiveness
  Using an optimized control circuit, we achieved high-speed responsiveness for our regenerative inverter system (10 msec charge/discharge; 10 msec transient response). (Even higher-speed responsiveness is possible.)
  实现了高速响应。
  通过控制电路的最佳化，作为电力再生变换器方式，实现了高速响应（充电 – 放电 3msec/ 充放电过量响应 5msec）。（还可制造具有更高响应速度的充放电装置）
- Interface (Ethernet/CAN)
  An Ethernet communication interface has been implemented, and can be automatically operated using an external PC. By mounting a CAN (Control Area Network) interface, the auto industry standard, internal data can be collected and logged in blocks from the battery controlling the CAN interface.
  界面（以太网，CAN）
  作为通信界面，装备有以太网接口，可以在外部的 PC 控制下自动运行。并且，装备有汽车业界标准的 CAN（Control Area Network）界面，还可从所管理的 CAN 界面电池中收集内部信息，并进行统一同步。
- Local operation (touch panel/jog dial)
  Mounted with Yamabishi's common touch panel and job dial for charge/discharge devices. Using these, low-capacity bench use charge/discharge tests can be performed without a PC. Moreover, screens can be added for control that are reguired as part of user test systems using the customization options (such as conductor ON/OFF).
  本机操作（触感控制面板，滚轴功能键）。
  装备有 YAMABISHI 充放电装置通用的触感控制面板与混轴功能键。可以将其作为小容量的座充，用来进行无 PC 的充放电试验。并且，用户可通过自定义添加窗口，来控制试验系统所必需的机器（例如：接触器的打开（ON）/（OFF））。
- Customized products
  Standard
  还可制造用户定制品。
  除了标准产品以外，还可以制造根据客户制定的容量制造产品。

Battery Charge/Discharge Device and Systems

YRD series

Specifications 规格

Battery Charge・Discharge System / Transistor Type & Pre-Regulator Type
电池充放电装置, 全晶体管式 前置调节器式

model 型号			YRD-								
			100-5ATX	100-10ATX	200-10ATX	300-10ATX	250-20TX	250-40TX	400-50TX	500-60TX	600-100TX
method 方式			All Transistor Type 全晶体管式				Pre-Regulator Type 前置调节器式				
Max Capacity 容量			500W	1kW	2kW	3kW	5kW	10kW	20kW	30kW	60kW
Operation Mode 操作样式		Charge 充电	CV CC CP 固定电压, 固定电流, 固定电力								
		Discharge 放电	CC CP 固定电流, 固定电力								
Voltage Setting Range 电压制定范围		Charge 充电	0-100V	0-100V	0-200V	0-300V	0-250V	0-250V	0-400V	0-500V	0-600V
Constant Voltage Range 固定电压范围			10-100V	10-100V	20-200V	30-300V	25-250V	25-250V	40-400V	50-500V	60-600V
Voltage Accuracy 电压精度	Charge 充电	Input Fluctuation 输入波动	0.1%+30mV								
		Load Fluctuation 负载波动	0.1%+30mV								
Ripple 纹波噪音			0.1%rms								
Transient Response 过量响应			less than 1msec. 小于1毫秒				Charge300msec. Discharge1msec. 充电 300 毫秒 放电 1 毫秒				
Charge/Discharge Switching Time 充放电响应时间			less than 1msec. 小于1毫秒				Charge300msec. Discharge1msec. 充电 300 毫秒 放电 1 毫秒				
Current Setting Range 电流制定范围		Charge 充电	0-5A	0-10A	0-10A	0-10A	0-20A	0-40A	0-50A	0-60A	0-100A
Constant Current Range 固定电流范围			0.5-5A	0-10A	0-10A	0-10A	0-20A	0-40A	0-50A	0-60A	0-100A
Current Setting Range 电流制定范围		Discharge 放电	0-5A	0-10A	0-10A	0-10A	0-20A	0-40A	0-50A	0-60A	0-100A
Constant Current Range 固定电流范围			0-5A	0-10A	0-10A	0-10A	0-20A	0-40A	0-50A	0-60A	0-100A
Current Accuracy 电流精度	Charge 充电	Input Fluctuation 输入波动	0.1 ± 10mA								
		Load Fluctuation 负载波动	0.1 ± 10mA								
	Discharge 放电	Input Fluctuation 输入波动	0.1 ± 10mA								
		Load Fluctuation 负载波动	0.1 ± 10mA								
Interface 界面			Ethernet/CAN/(GP-IB/RS-232C Option) 以太网/CAN/(GP-IB/RS-232C 可选项)								

电池充放电源装置

YRD系列

Battery Charge / Discharging System -Re-Genarating Type　电池充放电装置, 电力再生变换器方式

model 型号			YRD-				
			50KIX	75KIX	100KIX	200KIX	300KIX
method 方式			Switching Type(Re-Generating function) 整流式（电力再生功能）				
Max Capacity 容量			50kW	75kW	100kW	200kW	300kW
Operation Mode 操作样式		Charge 充电	CV CC CP 固定电压，固定电流，固定电力				
		Discharge 放电	CV CC CP 固定电压，固定电流，固定电力				
Efficiency 效率		Charge 充电	over 85% 超过 85%				
		Discharge 放电	over 85% 超过 85%				
Power Factor 功率因数		Charge 充电	over 95% 超过 95%				
		Discharge 放电	over 95% 超过 95%				
Voltage Setting Range 电压制定范围		Charge 充电	0-50V or 0-100V or 0-200V or 0-300V or 0-400V or 0-500V or 0-600V*1 0-50V，0-100V，0-200V，0-300V，0-400V，0-500V 或 0-600V*1				
		Discharge 放电	0-50V or 0-100V or 0-200V or 0-300V or 0-400V or 0-500V or 0-600V*1 0-50V，0-100V，0-200V，0-300V，0-400V，0-500V 或 0-600V*1				
Voltage Accuracy 电压精度	Charge 充电	Input Fluctuation 输入波动	±0.5%				
		Load Fluctuation 负载波动	±0.5%				
	Discharge 放电	Input Fluctuation 输入波动	±0.5%				
		Load Fluctuation 负载波动	±0.5%				
Voltage Ripple 电压纹波噪音			0.2%rms(at FS)				
Transient Response 过量响应			under 10msec. 少于 0.01秒				
Charge/Discharge Switching Time 充放电响应时间			under 10msec.*2 少于 0.01秒				
Current Setting Range 电流制定范围		Charge 充电	0-600A*3				
		Discharge 放电	0-600A*3				
Current Accuracy 电流精度	Charge 充电	Input Fluctuation 输入波动	±0.5%				
		Load Fluctuation 负载波动	±0.5%				
	Discharge 放电	Input Fluctuation 输入波动	±0.5%				
		Load Fluctuation 负载波动	±0.5%				
Current Ripple 电流纹波噪音			1%rms(at FS)				
Interface 界面			Ethernet/CAN/(GP-IB/RS-232C Option) 以太网/CAN/（GP-IB/RS-232C 可选项）				

*1 Over 600V Option
600V 以上（选项）
*2 Faster Switching Time Option
高速度切换（选项）
*3 Over 600A Option
600A 以上（选项）

Charge/Discharge Software

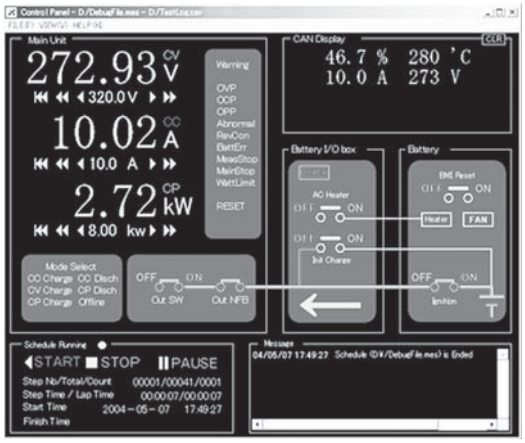
Feature 特长

- Simple operation
  Dedicated software for performing battery characteristic tests. Even without any knowledge of programming, users can get started with just a few settings.
  使用简单。
  为进行电池特性试验而设计的专用软件。即使用户不具备编程知识，也只需设定几处便可开始使用。
- Scheduled operation
  Can be operated automatically using pre-programmed schedules and triggers.
  任务计划运行。
  可利用预先编制好的任务计划与触发器进行自动运行。
- Multi-channel operation
  Data logging for multiple charge and discharge devices connected via Ethernet can be controlled individually.
  Different schedules can be run on individual charge/discharge devices, and the same schedule can be run on multiple devices, such as for production equipment.
  Charge/discharge devices of different capacities and different types can be combined, and additional channels can be set up easily.
  多通道运行。
  可分别控制通过以太网连接在一起的多个充放电装置，数据记录器。
  可利用各充放电装置执行不同的任务计划，并且还可以推测生产设备等，利用多个充放电装置执行同一个任务计划。
  可很方便地增设通道，从而可以将不同容量，不同方式的充放电装置搭配在一起使用。

Software specifications 软件规格

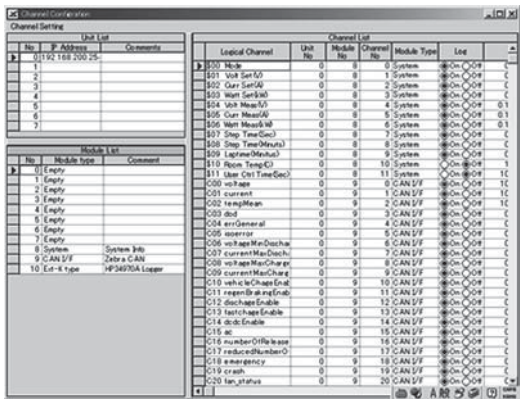
- **Manual charge/discharge control**
  You can select from the following operation modes;
  Constant current charge/discharge
  Constant power charge/discharge
  Constant voltage charge/discharge
  Controls output (on/off).
  Warning indications
  Displays warnings, including warnings for excess voltage, current surges, excess power, and excess heat.
  Schedule operation controls
  Control of schedule operations, including start, stop, and discontinuation, and displays elapsed time.
  Reading and saving charge/discharge files
  Saves channel allocation and schedule/trigger programes to a disc.

  手动充放电管理
  可选择以下工作模式。
  固定电流 充电 / 放电
  固定电力 充电 / 放电
  固定电压 充电 / 放电
  进行输出的打开关闭管理。
  警报显示
  显示过电压，过电流，过电力，过热等警报。
  任务计划运行管理
  进行开始，停止，暂停等任务计划的管理与显示经过时间。
  充放电配置文件的读入，保存
  将通道分配表，任务计划 / 触发程序保存至磁盘。



- **Logical channel settings**
  Unit no., module no. and channel no. combinations are labeled (logical channel name) and entered. Management of channels is simple using trigger settings.
  Module settings
  Sets the module inserted in the data logger.
  Unit settings
  Sets IP address of the unit when collecting data simultaneously from multiple data loggers.

  逻辑通道设定
  登记单元编号，模块编号，通道编号的组合，并赋予其权限（逻辑通道名称）。
  可通过设定触发器等很方便地管理通道。
  模块设定
  设定插入了数据记录器的模块。
  单元设定
  从多个数据记录器同时收集数据时，设定单元的 IP 地址。



充放电软件

Schedule settings

Performs charging and discharging following pre-set programs (steps). In addition to charge/discharge directions, control directions, such as jump and loop, may be used. Data for scheduled operations is saved as a log file.

Trigger settings

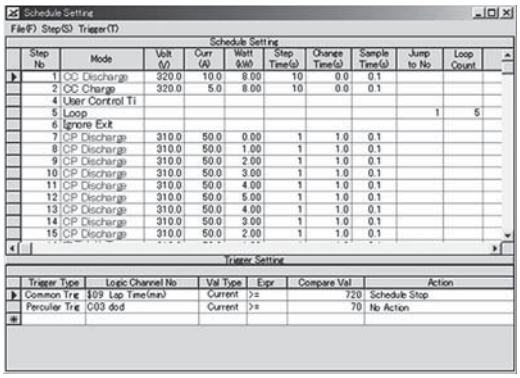
If logical channel values specified during scheduled charging and recharging deviate from the tolerance values, defined operations (next step/suspension of operation) are run. In addition to instantaneous values, variations within a specified period of time can also be selected. For example, you can control the way the device switches over to discharge to prevent a rise in temperature during full charges.

任务计划设定

根据预先设定好的程序（步骤）进行充放电。除充放电命令外，还可使用跳过，循环等控制命令。任务计划运行过程中的数据保存作日志文件。

触发器设定

如在按任务计划充放电时指定的逻辑通道值与判定值不符，则执行预先定义好的动作（跳至下一步 / 停止运行）。逻辑通道的值除了瞬间值外，还可选择指定时间内的变化量。比如说，可进行各种控制，比如发现充满电时电池温度有所上升后切换到放电。



Main panel

Specifies the unit (charge/discharge device) connected to the network.

Specifies IP address and predetermined schedules.

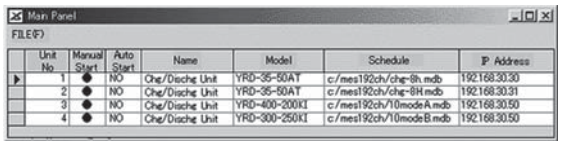
Enables mixed control of charge/discharge devices with different capacities and different systems.

主控制面板

指定连接到网络上的单元（充放电装置）。

指定 IP 地址，已设定好的任务计划。

可将不同容量，不同方式的充放电装置搭配到一起，加以管理。

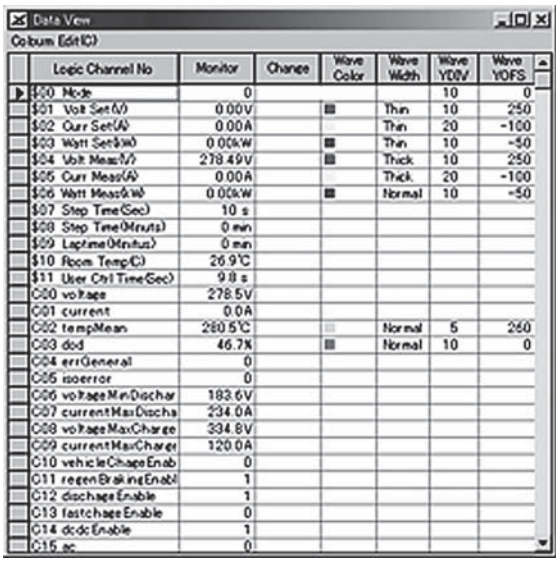


Data view

Logical channels can be monitored as numerical values. When viewing wave patterns in the Web view, wave pattern color and line width can be specified.

数据查看器

可利用数值监测逻辑通道。并且如波形查看器上显示波形，可指定波形颜色，线宽。

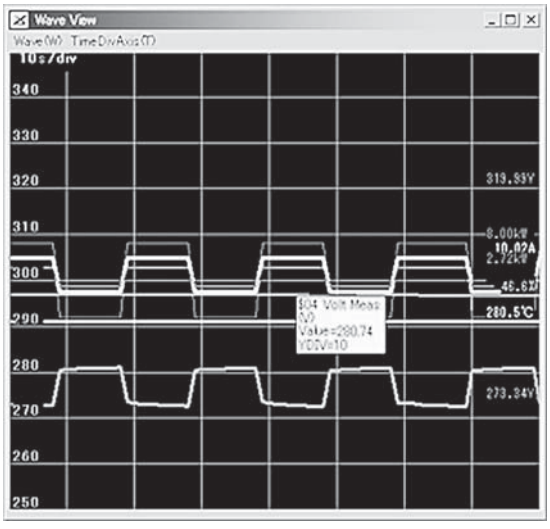


Wave view

Logical channel values are displayed as oscilloscope-like wave patterns. Wave color and line width can be specified for the data view. Time lines can be selected from 10/20/30/60 seconds. Also equipped with a function that displays datailed wave data when specific screen areas are selected.

波形查看器

以示波器那样的波形显示逻辑通道的值。可利用数据查看器指定波形颜色，线宽。并且，可从 10/20/30/60 秒中选择一个时间作为时间轴。其还具备在窗口上某处单击一下，显示该处详细波形信息的功能。



Charge/Discharge Software 充放电软件

Data logger MES-192CH 数据记录器 MES-192CH

● **Highly expandable**
Up to 8 modules, which can accommodate 24 channels each, can be stored in the data logger.
Moreover, by linking multiple data loggers using a LAN cable, you can measure the voltage and temperature for up to 1,536 channels.

扩展性强
数据记录器中内置了 8 个模块，每个模块可输入 24 个通道。并且，通过用 LAN 线缆将数据记录器互相连接起来，最多可测量 1536 个通道的电压，温度。

● **High-speed sampling**
With an AD converter built into the module, the impact on sampling time due to an increase in the number of channels is minimized. The minimum sampling time of 100 ms does not change even if the number of channels is increased.

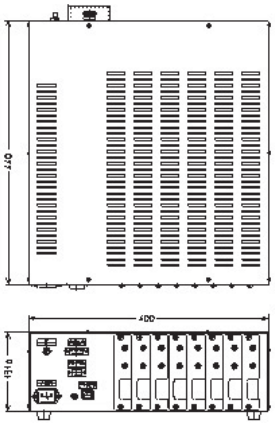
高速取样
因为模块内内置有 AD 变频器，所以可通过增加通道数减轻对取样时间的影响。最小取样时间 100ms 即使通道数增加，也不会改变。

● **Long-life**
A semiconductor (high-compression PhotoMOS relay) is used for the multiplexer, so there is no need to worry about the duration of contact as with other logger products that use relay. In addition, DC200V is supplied between channels to eliminate channel-to-channel compression problems associated with other semiconductor multiplexer loggers, allowing the cell voltage of batteries connected serially to be measured without any problems.

使用寿命长
因为多路器中使用了半导体（发光继电器－高耐压品），所以不需要象其他使用继电器的记录器产品那样，注意接点的寿命，并且它还能确保通道间耐压为 DC200V，而这也是其他半导体多路器的记录器所存在的问题，它可以毫无问题地测量串联着的电池组的电池电压。

Data Logger 数据记录器

Input Signal	DC0-20V(1mV Resolution) Thermo Couple T,K 型 (0.1C Resolution)	输入信号	DC0 ～ 20V(1mV 分辨) 热电偶 T，K 型（0.1℃分辨）
Input Channel	Max 1536 Channel 24Channel (1Module) 8Module (1Unit) 8Unit (1System)	输入通道	最多 1536 个通道 24 个通道 (1 个模块) 8 个模块 (1 个组合) 8 个组合 (1 个系统)
Sampling Time	0.1s-60s (All Channel at once)	取样时间	0.1 ～ 60 秒 (全通道同时进行取样)
Withstand Voltage	between channel DC200V between module DC500V	耐电压	通道之间 DC200V 模块之间 DC500V
Interface	to Host ; PC Ethernet (TCP/IP) to Charge&Discharge ; Original Serial Communication	界面	以太网 (TCP/IP)
CPU	32bitRISC made by YAMABISHI	CPU	内置 YAMABISHI 制造的 32bit RISC 微型计算机
Dimensions (mm) Weight (kg)	W400 D440 H130 10kg	尺寸 (mm) 重量 (kg)	W400×D440×H130 10kg



System Block Diagram 系统结构图