

REFERENCE INFORMATION
DETECTION SYSTEMS (SCANNERS)
PULP & PAPER INDUSTRY USE



NMFC 
New Machinery From China



系统构成 System components

定量传感器：PM147、Kr85、Si90、X射线；

Basis weight sensors: PM147, Kr85, Si90, X-ray;

水分传感器：宽带微波、高精微波、红外线（透射&反射）；

Moisture sensor: broadband microwave, high precision microwave, infrared (transmission & reflection);

厚度传感器：电涡流（接触式）；

Thickness sensor: eddy current (contact type);

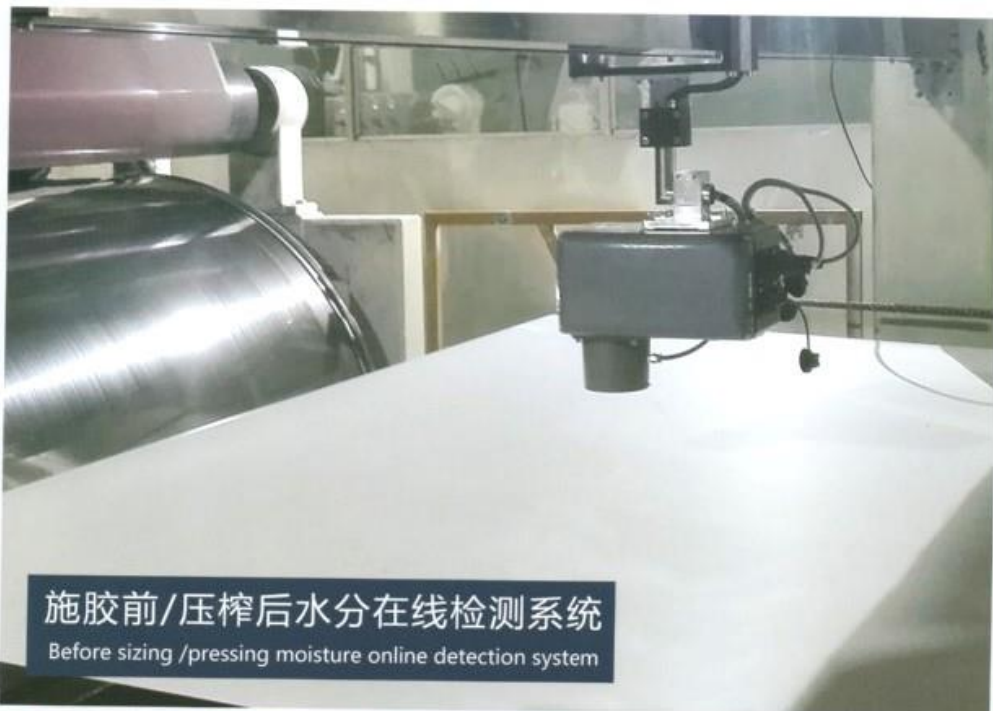
灰分传感器：X射线；

Ash sensor: X-ray;

智能扫描架：高端型Smart-taiji（O型），通用型Smart-5000型（O型）、单臂扫描架。

Intelligent Scanner: Advanced Smart-taiji (O-type), Universal Smart-5000 (O-type), single-arm gantry.

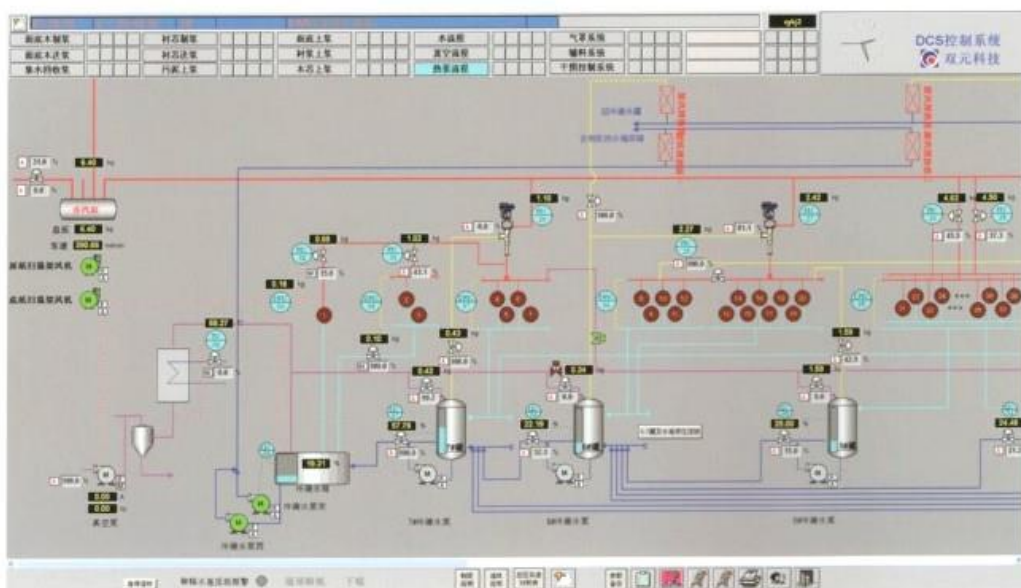
施胶控制系统 Sizing control system





蒸汽冷凝水回收控制系统 (GCS)

Steam Control System (GCS)





横幅定量控制系统

Cross direction basis weight control system



系统构成 System components

执行机构：稀释水角行程执行机构（SYCBW-H）；稀释水直行程执行机构（SYCBW-L33）。

Actuator: Dilution Water Angle Actuator (SYCBW-H); Dilution water direct route actuator (SYCBW-L33).

电机：二相步进电机；

Motor: two-phase stepper motor;

传感器：精密位移传感器；

Sensor: precision displacement sensor;

通讯：CAN总线通讯板；

Communication: CAN bus communication board;

防护等级：IP65。

Protection level: IP65.

SYCBW-H稀释水角行程执行机构

SYCBW-H Dilution Water Angle Actuator

系统包含稀释水调节执行机构、稀释水阀、白水压力控制部分，其核心部件是稀释水自动调节装置。使用本系统后，横幅定量差将得到50%以上的改善！

The system consists of dilution water adjustment actuator, dilution water valve, and a white water pressure control section.

The core component is a dilution water automatic adjustment device. the cross direction basis weight difference could be improved more than 50% !



稀释水角行程执行机构 (SYCBW-H)

功能特点 Features

1. 采用进口步进电机、精密位移传感器，确保控制精度；
Imported stepper motor and precision displacement sensor to ensure control accuracy;
2. 执行机构与QCS系统具备实时点对点定位功能，确保对位准确；
Real-time point-to-point alignment function to ensure accurate alignment;
3. 采用CAN总线控制，响应速度快，抗干扰能力强；
CAN bus control faster response and strong antijamming capability;
4. 根据纸张收缩率和扫描数据，自动映射横幅定量数据到流浆箱物理位置，具有自动横幅定量闭环控制功能；
Automatically cross direction alignment ,cross direction basis weight automatic closed-loop control is available;
5. 具有横幅定量信号接收处理、横幅位置处理、模式识别、手\自动控制功能；
With cross direction basis weight signal receiving and processing, cross direction position processing, pattern recognition, manual\automatic control function;
6. 具有相邻点联动功能，以确保控制效果；
With adjacent point linkage function to ensure the control effect;
7. 超过100套产品成功应用，产品成熟可靠。
More than 100 sets of mature and reliable products have been successfully applied.



SY3M大宗物料含水率检测系统

SY3M material moisture content detection system



检测天线现场安装示意图

Schematic diagram of the installation of the detection antenna

测量原理 Measuring principle

SY3M系统采用频率接近1000MHZ的超低频微波，对被测物料进行透射，根据微波穿透介质时，水分子对其产生的微波能量衰减量来计算物料的水分含量，结合体积质量辅助检测系统就可以得出被微波透射区间物料的含水率，通过车辆或传送带的运动就可以测出整车或通过微波天线区间物料的平均含水率。SY3M系统由微波发射天线、微波接收天线、信号处理单元、电脑运算站和其它称重、测距、测速和机架等辅助单元组成。

The SY3M system uses low frequency microwaves transmit the material which frequency is close to 1000MHZ . According to the microwave energy attenuation when the microwave penetrates the medium, the moisture content of the material can be calculated. The moisture content of the material in the microwave transmission range could be draw with the volume and quality auxiliary detection system, and the average moisture content of the whole vehicle or the material passing through the microwave antenna section can be measured by the movement of the vehicle or the conveyor belt. The SY3M system consists of microwave transmitting antenna, microwave receiving antenna, signal processing unit, computer computing station, and other auxiliary units such as weighing, ranging, speed measuring, and rack.

系统功能 System function

SY3M车载纸垛微波水分仪实现了纸厂废纸收购过程的车载纸垛含水率的快速、准确的全自动测量分析，对废纸质量起了一个把关的作用。测量一车废纸水分只要不到一分钟时间！

The SY3M car paper microwave moisture meter realizes the fast and accurate automatic measurement and analysis of the moisture content of stack of paper on truck waste paper acquisition process, it could help check the quality of waste paper. It takes less than one minute to measure the moisture of a car of waste paper!

SY3M卡车在线非接触式水份监测系统具有以下优点：

The advantages of SY3M truck online non-contact moisture measuring system as follow:

1) 实现了卡车非卸载式的水份监测，使整车水份检测更加准确、直观、便捷；

Realizing the whole truck of paper moisture measurement no need to unloading, making the vehicle moisture detection more accurate, intuitive and convenient;

2) 节省了人力，减轻了人员的工作压力；

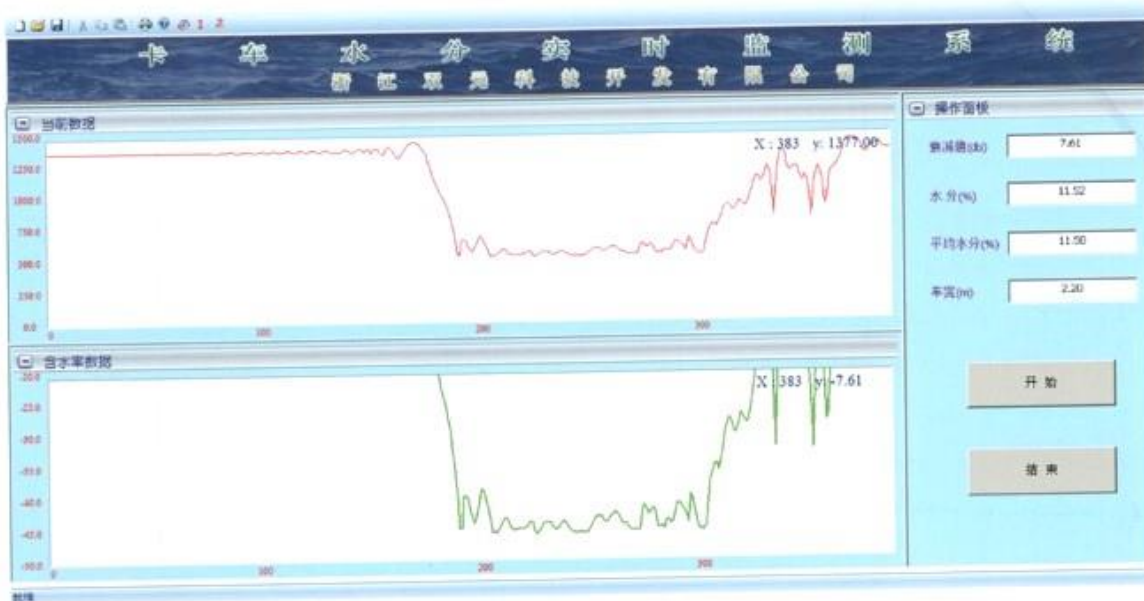
Saving manpower and reducing the work pressure of workers;

3) 在供应商与采购商之间提供了一个公平公正的数据监管手段；

Providing a fair data monitoring platform between suppliers and buyers;

4) 帮助造纸企业在原料采购上避免人为等不确定因素所造成的收购成本损失。

Help paper mill avoid the acquisition lost caused by uncertain and human factors in raw material procurement.



车载物料水分检测软件界面
Vehicle material moisture detection software interface



表面缺陷在线检测系统 (WIS)

Defect Online Inspection System (WIS)



系统构成 System components

CCD相机：加拿大DALSA 英国E2V 德国basler ；

CCD camera: DALSA(Canada), E2V(UK), basler(Germany);

工业镜头：日本RICOH 日本NIKON 德国Schneider ；

Lens: RICOH (Japan) , NIKON (Japan) , Schneider (Germany) ;

光源：LED线性光带；

Light: LED linear light strip;

机架：铝型材机架 合金钣金架；

Rack: aluminum frame , alloy sheet metal frame;

图像处理：核心专利技术图像采集卡（FPGA芯片技术）；

Image processing: Patented image acquisition card(FPGA chip technology);

计算机：DELL、研华；

Computer: DELL, Advantech;

软件：表面缺陷检测系统软件。

Software: Defect inspection System Software.

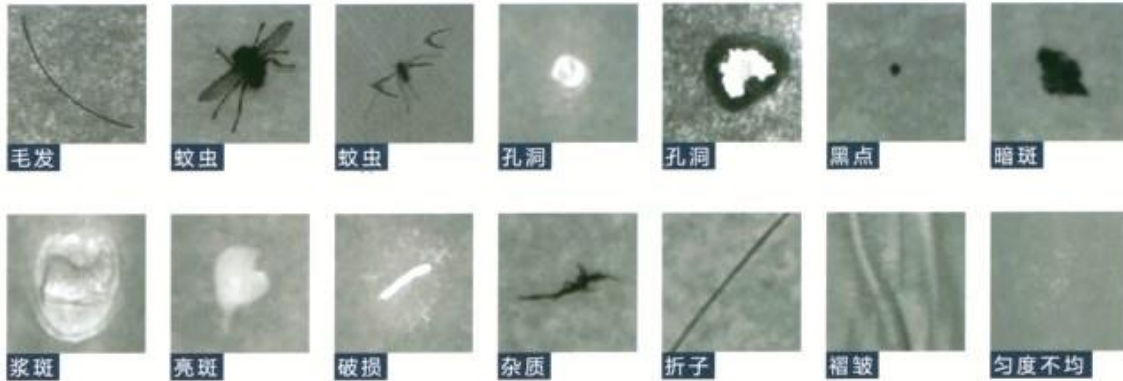
缺陷图例 Defect legend

针对造纸行业能检测出不同类型的表面缺陷，并实时以图像形式反馈出来。

Inspection types of defects and feedback as an image in real time.

检测范围：孔洞、浆块、毛发、蚊虫、异物、黑点、脏污、暗斑、亮斑、打皱、匀度不良等。

Inspection range: holes, pulp, hair, mosquitoes, foreign bodies, black spots, dirt, dark spots, bright spots, wrinkles, poor formation and so on.



行业应用：无纺布、塑料薄膜、纸张、玻璃、光伏材料、各种金属箔片、烟包、卫生用品等。

Industry applications: non-woven, plastic film, paper, glass, photovoltaic materials, various metal foils, cigarette packets, hygiene products, etc.

功能特点 Features

1. 顶尖机器视觉检测技术，100%全幅检测，实时检测纸张表面缺陷；
Advanced machine vision inspection technology, 100% inspection, real-time detection of paper defects;
2. 核心专利技术图像采集卡，拥有全球领先的处理速度（640M/s）；
Patented image acquisition card, with world's leading processing speed (640M/s);
3. 欧美进口高端CCD工业相机保证图像拍摄精度；
High-end CCD industrial camera imported from Europe and America ensure image capture accuracy;
4. 高级LED线性光带满足各种纸张检测需求；
Advanced LED Linear light source suitable for variety of paper testing;
5. 缺陷信息自动分类和统计，方便分析缺陷产业的原因；
Automatic classification and statistics of defect information, which is convenient for analyzing the causes of defective industries;

功能特点 Features



6. 缺陷自动报警、打标（可选）、自动记录和判别缺陷类型、保存缺陷图片信息；
Defect automatic alarm, marking (optional), automatic recording and discriminating defect types, saving defect picture information;
7. 对于周期性纸病进行报警，提示用户可能产生该类纸病的故障设备；
Alarming for periodic paper diseases, Indicates the impossible fault device which may cause this kind of paper disease;
8. 系统在检测区域可按列分区；根据分区盘切要求进行分区设定，系统及自动生成分区切位；
The system can be partitioned by column in the detection area; Partition Settings are made according to partition disk cutting requirements, and the system automatically generates the partition cut position;
9. 自动保存缺陷历史数据，可按时间轴实时查询，便于产品质量追溯；
Automatically save the defect historical data, which can be queried in real time according to the time axis, which is convenient for product quality traceability;
10. 高级远程互联网技术，随时快速远程技术服务；
Advanced Remote internet technology make remote technical service at any time possible;
11. 十六年的研发制造历史，超过2000套产品成功应用，产品成熟可靠。
Sixteen years of R&D and manufacturing history, more than 2,000 sets of mature and reliable products have been successfully applied.

系统构成 System components

可调式热泵系统、可调热泵+多段供气组合系统、多段供气系统。

Adjustable heat pump system, adjustable heat pump + multi-stage gas supply system, multi-stage gas supply system.

可调热泵 Adjustable heat pump

可调喷嘴式热泵其特点是热泵本身配置了调节机构，在热泵进口工作蒸汽管线上无需设置调节阀，利用新鲜高压蒸汽源，抽吸带动烘缸尾气提升它们的热焓，进一步利用新鲜蒸汽的势能，以达到提高纸机车速、增加产量、降低能耗、优化纸机运行的目的。

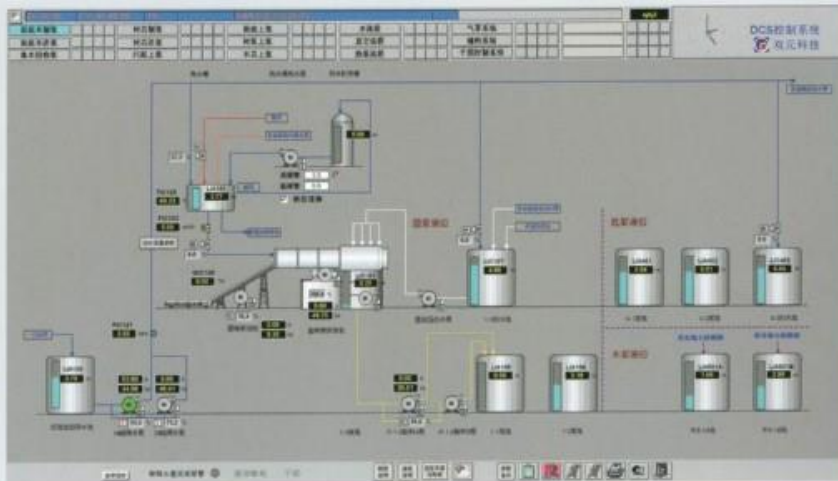
The adjustable nozzle type heat pump is included regulating mechanism, and no more valve is required on the working steam line of the heat pump, Fresh high pressure steam source drive the drying cylinder exhaust gas to enhance enthusiasm, further utilizing fresh steam energy to increasing paper machine speed, production, reducing energy consumption, and optimizing paper machine operation.





制浆造纸过程控制系统(DCS)

Pulp and Paper Process Control System (DCS)



制浆DCS
Pulping DCS
system

系统构成 System components

CPU模块：SIMATIC S7-300/400系列 AS410系列；

CPU module: SIMATIC S7-300/400 series AS410 series;

I/O模块：ET200M ET200S ET200SP；

I/O module: ET200M ET200S ET200SP;

机 柜：仿威图标准机柜,防潮抗震；

Cabinet: Imitation of the standard cabinet, waterproof and shockproof;

计算机：DELL SIEMENS；

Computer: DELL SIEMENS;

软 件：SIMATIC WinCC PCS7；

Software: SIMATIC WinCC PCS7;

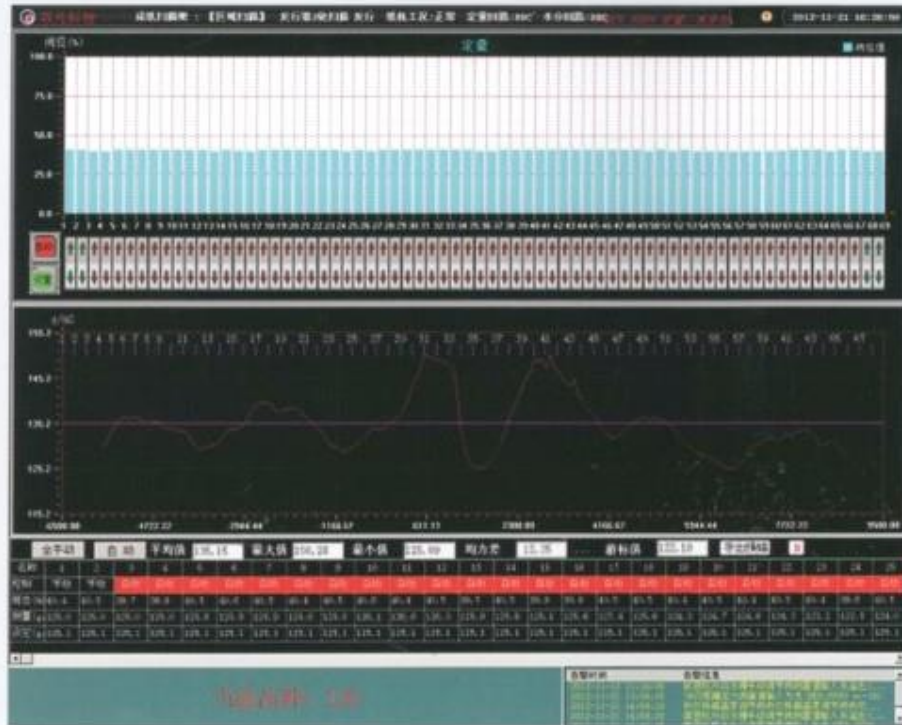
网 络：光纤 网线。

Network: Optical fiber network cable.



功能特点 Features

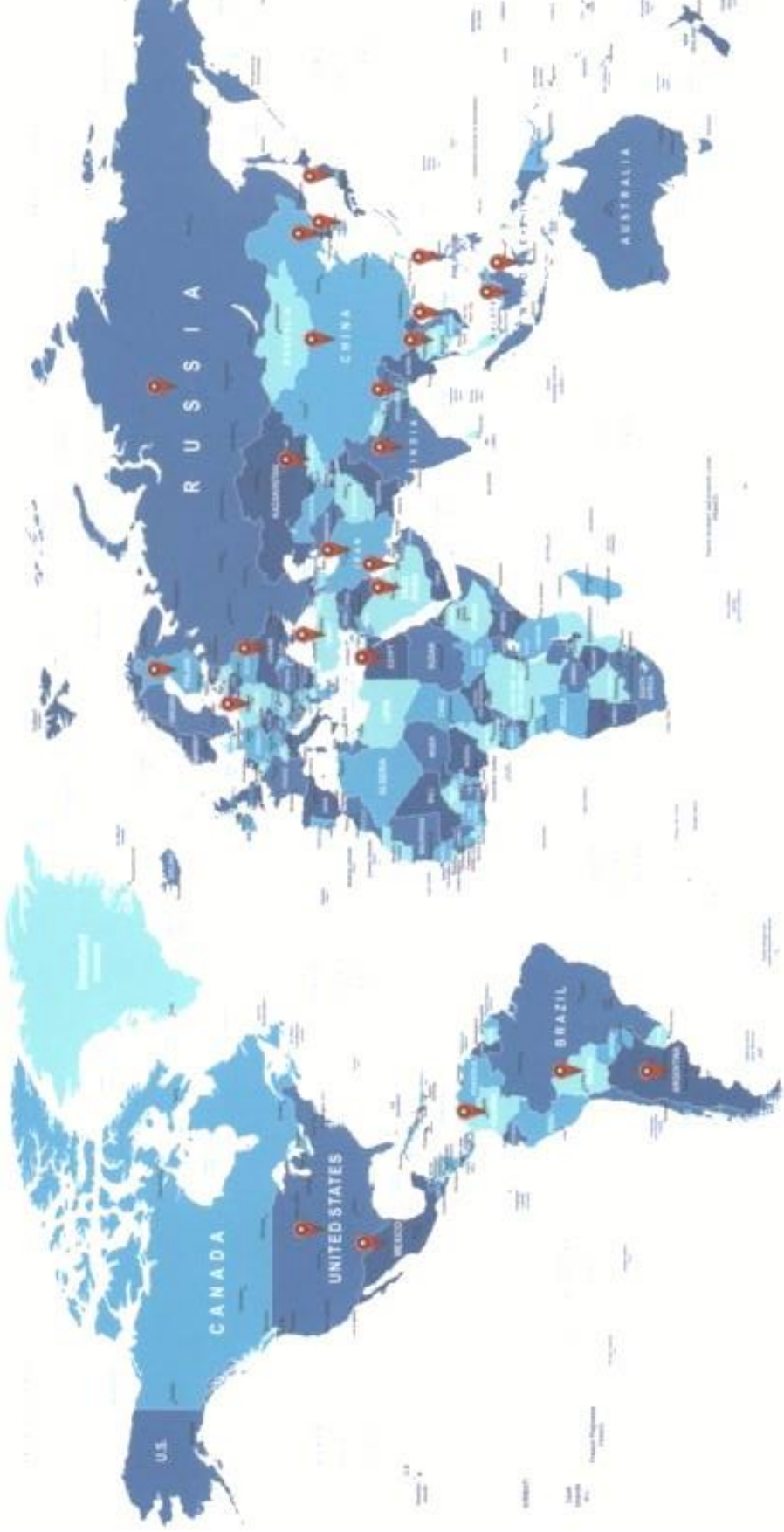
1. 功能强大的PLC，适用于制浆造纸过程任何过程自动控制；
Powerful PLC, especially designed for automatic control of any process in the pulp and papermaking process;
2. 高度可靠性和稳定性，解决方案满足最复杂任务要求；
Reliability and stability, the solution bases on the most complex mission requirements;
3. 功能分级的CPU以及种类齐全的模板，为制浆造纸过程控制找到最佳解决方案；
Functionally CPU and various of templates to find the best solution for pulp and paper process control;
4. 实现分布式系统和扩展通讯能力都很便捷，组成系统灵活自如；
Distribute extend communication capabilities are convenient, and the system is flexible;
5. 集中的，友好的人机界面，操作简单；
Concentrated, friendly man-machine interface, easy to operate;
6. 使用STEP7语言编程软件，编程语言支持；
Use STEP7 language programming software;
7. 高级远程互联网技术，随时快速远程技术服务；
Advanced remote internet technology, fast and remote technical service are available;
8. 资深造纸工艺专家团队，确保提供最合理最完善DCS控制解决方案。
Team of experienced paper craft experts ensure the most reasonable and complete solutions.



图一 横幅定量闭环控制之前纸张横幅定量变化曲线
 paper cross direction basis weight curve before closed-loop control



图二 横幅定量闭环控制后纸张横幅定量波动得到了根本的改善
 cross direction basis weight fluctuation fundamentally improved after closed-loop control



全球业务分布图 Global business map