



证券简称：永贵电器
证券代码：300351

YONGGUI
CONNECTOR



浙江永贵电器股份有限公司

Zhejiang Yonggui Electric Equipment Co.,Ltd.

北京永列科技有限公司 计轴产品介绍

Beijing Yonglex Technologies Co., Ltd.

Introduction of Axle Counter

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公司介绍

Company Introduction





北京永列科技有限公司 Beijing Yonglex Technologies Co., Ltd.

暨永贵轨道交通板块计轴信号系统总部
Headquarter of Axle Counter in Yonggui Rail Transit

北京永列科技有限公司（简称：北京永列）是浙江永贵电器股份有限公司（简称：永贵电器）于2013年7月在北京设立的控股子公司，是一家专门从事铁路信号技术与产品的研发、生产和销售的高科技企业。

Beijing Yonglex Technologies Co., Ltd. (Referred to as Beijing Yonglex) is a Holding subsidiary established in July 2013 in Beijing invested by Yonggui Group. Beijing Yonglex is a high-tech enterprise specializing in the research and development, production, and sales of railway signal technology and products.



北京永列科技有限公司 Beijing Yonglex Technologies Co., Ltd.

暨永贵轨道交通板块计轴信号系统总部
Headquarter of Axle Counter in Yonggui Rail Transit

公司于2014年通过ISO9001质量体系，2018年取得高新技术企业证书，2022年通过IRIS质量体系，取得专精特新企业证书。

Beijing Yonglex passed the ISO9001 quality system in 2014. Obtained high-tech enterprise certificate in 2018. In 2022, passed the IRIS quality system and obtained the certificate of specialized, refined, and innovative enterprise.

北京永列科技有限公司

暨永贵轨道交通板块计轴信号系统总部



YLJZ-F1/F2型计轴系统是公司拥有完全自主知识产权的高科技产品，该系统应用于轨道交通信号控制领域，在国内外同类产品中具有技术领先的优势。

The YLJZ-F1/F2 axle counting system is a high-tech product that the company has fully independent intellectual property rights. This system is applied in the field of rail transit signal control and has a technological advantage among similar products at home and abroad.

北京永列科技有限公司

暨永贵轨道交通板块计轴信号系统总部



该系统已通过欧标SIL4级安全认证，证书编号：A14097CE01/A16101CE01，该系统已成功在北京、杭州、武汉、合肥、重庆、绍兴、黄石、沈阳等多条地铁线路上应用，受到用户好评。

The system has passed the European Standard SIL4 safety certification. Certificate No is A14097CE01/A16101CE01. The system has been successfully applied on multiple metro lines in Beijing, Hangzhou, Wuhan, Hefei, Chongqing, Shaoxing, Huangshi, Shenyang, and has received high praise from users.

公司资质 Company Qualifications



High-tech Enterprise Certificate

公司资质 Company Qualifications



Specialized, Refined, and Innovative Enterprise Certificate

公司资质 Company Qualifications



ISO9001 Quality System Certificate

公司资质 Company Qualifications

认证证书

北京永列科技有限公司
中国北京市大兴区欣雅街16号院7号楼
兴创国际中心S座805室
邮编：100162

经
莱茵检测认证服务（中国）有限公司

确认，作为 IRIS 批准的认证机构，评定上述组织的管理体系已符合

IRIS 认证准则：2020
ISO/TS 22163：2017

标准的要求

18（基础设施）
计轴系统的设计开发

证书生效日期：21/01/2022
证书有效期至：11/01/2025*



签发日期：30/01/2022
证书登记号码：39 10 008 1906

该文件是实物证书的复印件，需要与实物证书同时使用才有效。

* 认证专项监督审核结果通过为文本文件有效性持续有效。

莱茵检测（地址：中国北京市东城区东直门南大街5号瑞泰国际中心B座1002室；北京海润兴达国际软件产业园内）：100071
1/1

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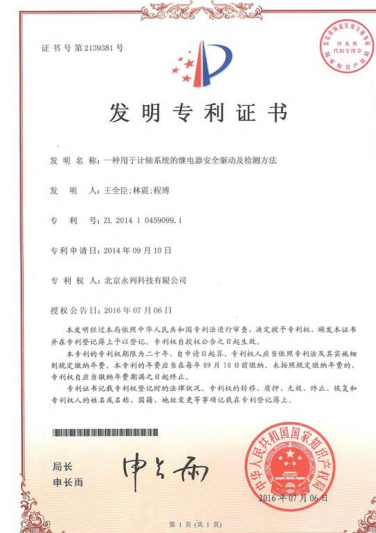


IRIS Quality System Certificate

专利技术 Patent Technology

5项
发明专利

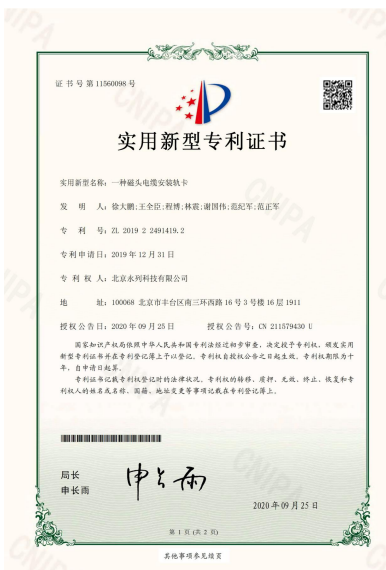
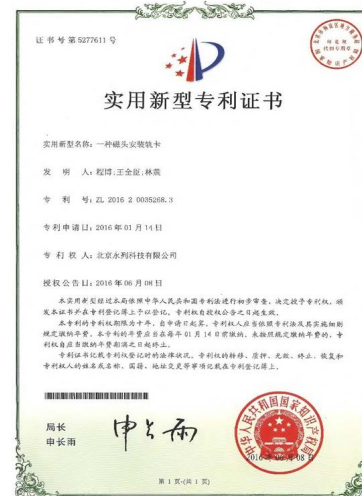
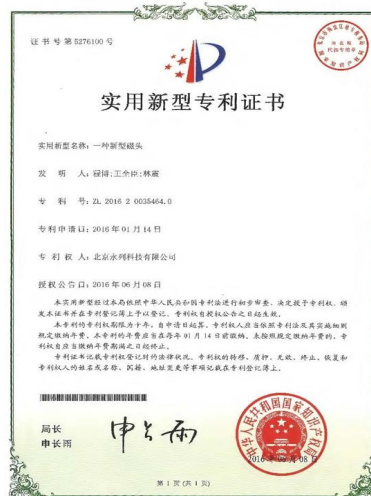
5
Invention
Patents



专利技术 Patent Technology

13项
实用新型专利

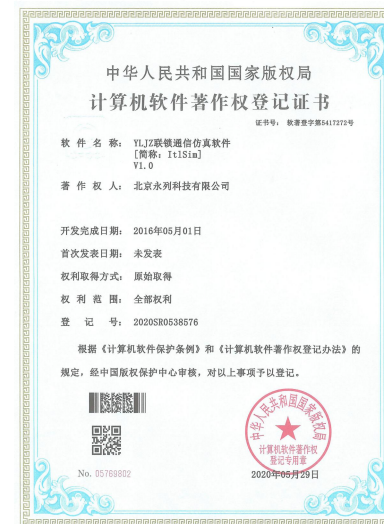
13
Utility Model
Patents



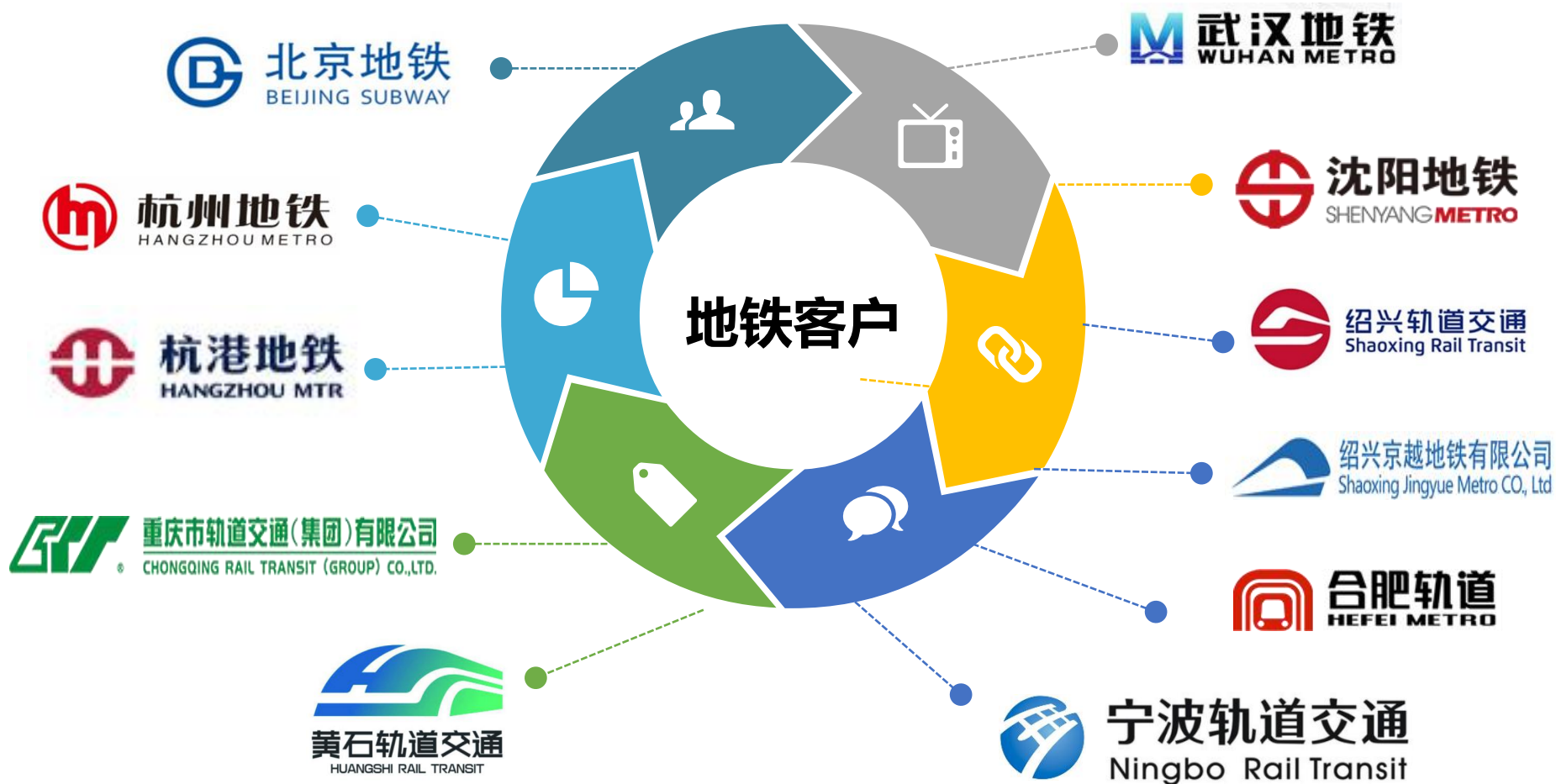
专利技术 Patent Technology

10项
软件著作权

10
Software
Copyrights



地铁客户 Metro Customers



◆ 信号集成商客户 ◆ Signal Integrator Customers



众合科技



中国中车
CRRC



国睿科技



交控科技
TRAFFIC CONTROL TECHNOLOGY



CASCO
卡斯柯



中国通号

富欣智控 | 自主创新
绿色智能



新誉集团
New United Group



株洲中车时代电气股份有限公司
ZHUZHOU CRRC TIMES ELECTRIC CO., LTD.

◆ 工程局客户 ◆ Engineering Bureau Customer



中国中铁四局集团
China tiesiju civil engineering group



CRSC 中国铁路通信信号上海工程局集团有限公司



CRSC 通号工程局集团有限公司



中国中铁 中铁武汉电气化局集团有限公司



中国中铁 中国中铁一局集团有限公司
China Railway First Bureau Group Co., Ltd

应用业绩 Performance

**Up to
June 2023**

北京地铁亦庄线（开通运营） Beijing Metro YiZhuang Line (Operation)

北京地铁5号线（开通运营） Beijing Metro Line 5 (Operation)

武汉地铁11号线东段（开通运营） WuHan Metro Line 11 (Operation)

武汉地铁7号线南延线（开通运营） WuHan Metro Line 7 (Operation)

武汉地铁蔡甸线（开通运营） WuHan Metro CaiDian Line (Operation)

武汉地铁2号线南延线（开通运营） WuHan Metro Line 2 (Operation)

杭州地铁1号线三期（开通运营） HangZhou Metro Line 1 (Operation)

杭州地铁6号线（开通运营） HangZhou Metro Line 6 (Operation)

杭州地铁9号线（开通运营） HangZhou Metro Line 9 (Operation)

合肥地铁5号线（开通运营） HeFei Metro Line 5 (Operation)

杭州地铁10号线（开通运营） HangZhou Metro Line 10 (Operation)

应用业绩 Performance

**Up to
June 2023**

杭州地铁3号线 (开通运营) HangZhou Metro Line 3 (Operation)

绍兴地铁1号线 (开通运营) ShaoXing Metro Line 1 (Operation)

黄石有轨电车 (开通运营) HuangShi Tram Line (Operation)

绍兴地铁2号线 (试运行) ShaoXing Metro Line 2 (Under Trial)

沈阳地铁2号线南延线 (试运行) ShenYang Metro Line 2 (Under Trial)

武汉光谷空轨 (试运行) WuHan Hanging Monorail Line (Under Trial)

重庆地铁2号线(在建) ChongQing Straddle Monorail Line 2(Under Con)

武汉地铁7号线北延线 (在建) WuHan Metro Line 7 Ext (Under Con)

宁波地铁6号线 (中标) NingBo Metro Line 6 (Win Bid)

宁波地铁8号线 (中标) NingBo Metro Line 8 (Win Bid)

产品介绍

Product Introduction

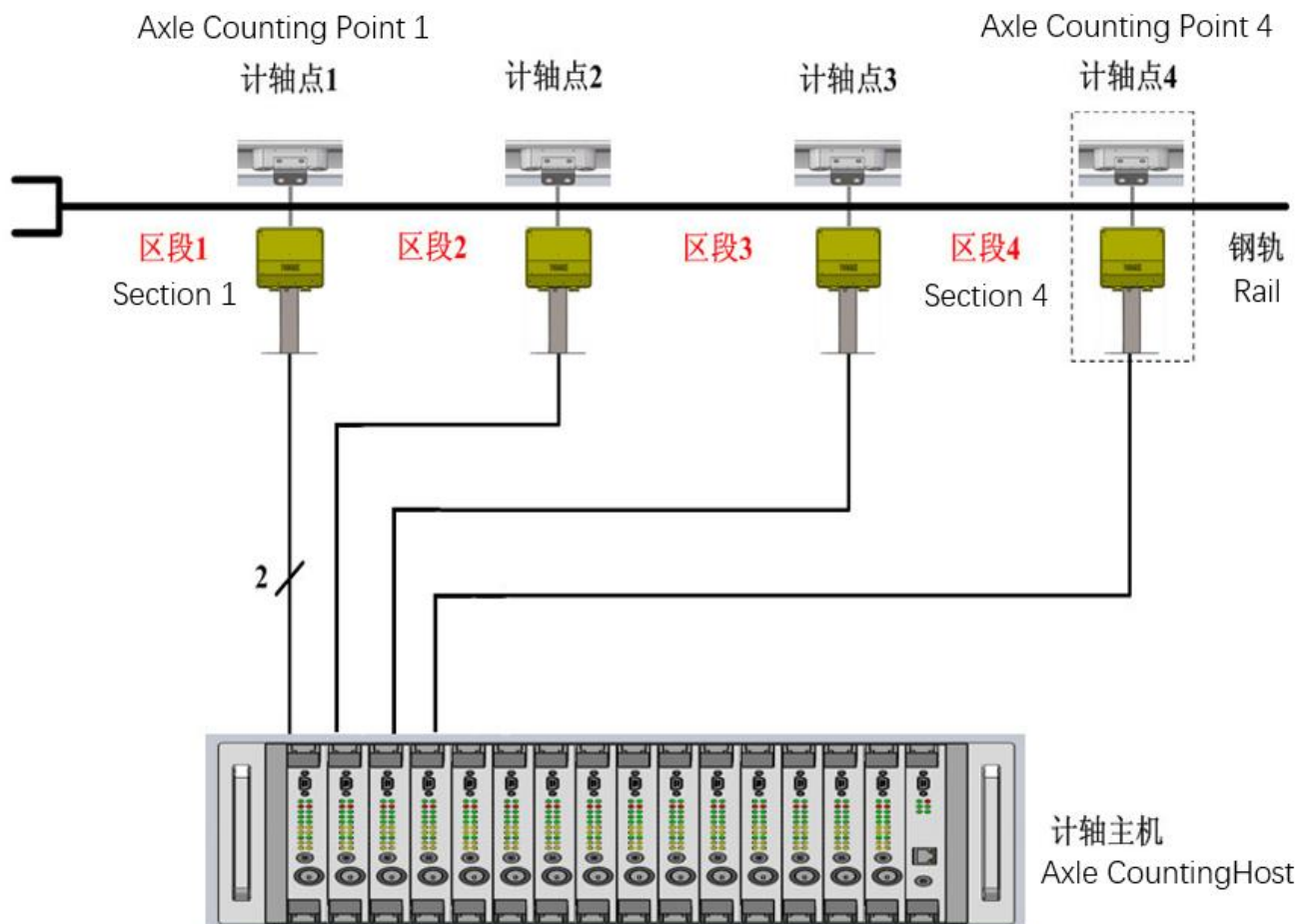


YLJZ-F1/F2型计轴系统介绍

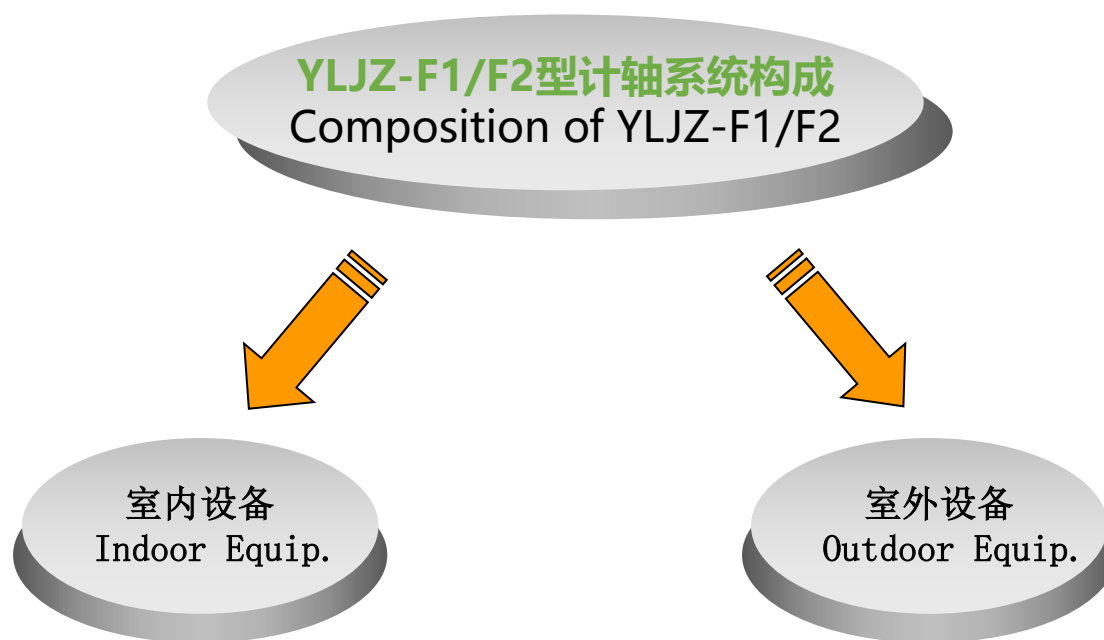
YLJZ-F1/F2型计轴系统是一种“故障倒向安全”的对轨道区段“占用/空闲”进行检测的系统。该系统由室内主机和室外计轴点组成，对通过各个计轴点的列车轮轴进行计数，从而判断轨道区段的占用或空闲，为信号控制系统提供基础信息。

The YLJZ-F1/F2 axle counting system is a "fault reverse safety" system that detects the "occupied/free" of track sections. The system consists of indoor host and outdoor axle counting point, counts the train axles passing through each axle counting point. To determine whether the track section is occupied or free, provide basic information for signal control systems.

YLJZ-F1/F2型计轴系统介绍



YLJZ-F1/F2型计轴系统结构示意图
Structure Diagram of YLJZ-F1/F2



YLJZ-F1/F2型计轴系统室内设备 Indoor Equip. of YLJZ-F1/F2



左图为计轴机柜，内含计轴主机，安装在设备室内，由计轴板和诊断板组成。计轴板完成轨道区段的“占用/空闲”检测功能，实现与微机联锁的接口。诊断板完成计轴系统的诊断功能，实现与微机监测的接口。

The left image shows the axle counting cabinet, which contains the axle counting host and is installed in the equipment room. The axle counting host consists of several axle counting boards and a diagnostic board.

➤ 单台主机最多可以连接31个室外计轴点

A single axle counting host can connect up to 31 outdoor axle counting points.

➤ 单台主机最多可以控制31个轨道区段

A single axle counting host can control up to 31 track sections.

➤ 单台机柜最多可以安装2台主机，连接62个室外计轴点、控制62个轨道区段

A single axle counting cabinet can install up to 2 axle counting hosts, connect 62 outdoor axle counting points, and control 62 track sections.

YLJZ-F1/F2型计轴系统室内设备 Indoor Equip. of YLJZ-F1/F2



- 单个区段最多可以由16个室外计轴点构成

A single section can consist of up to 16 outdoor axle counting points.

- 主机板卡支持带电插拔

The host cards support hot plugging.

- 与每个室外计轴点的连接线缆芯数为2芯/4芯

The number of connecting cable cores to each outdoor axle counting point is 2/4 cores.

- 室内外采用星型连接方式

Star shaped connection is used from each indoor axle counting board to outdoor axle counting point.

- 机柜尺寸、色号等均可根据要求进行定制，通用尺寸为高×宽×深（2250mm×600mm×800mm）

Axle counting cabinet size, color, etc. can be customized according to requirements, universal size is high × wide × depth (2250mm × 600mm × 800mm).

YLJZ-F1型计轴系统室外设备 Outdoor Equip. of YLJZ-F1

磁头传感器由发送磁头和接收磁头组成，采用卡具安装在钢轨上，钢轨外侧是发送磁头，钢轨内侧是接收磁头。磁头传感器采用完全灌封结构，防尘防水等级为IP68。

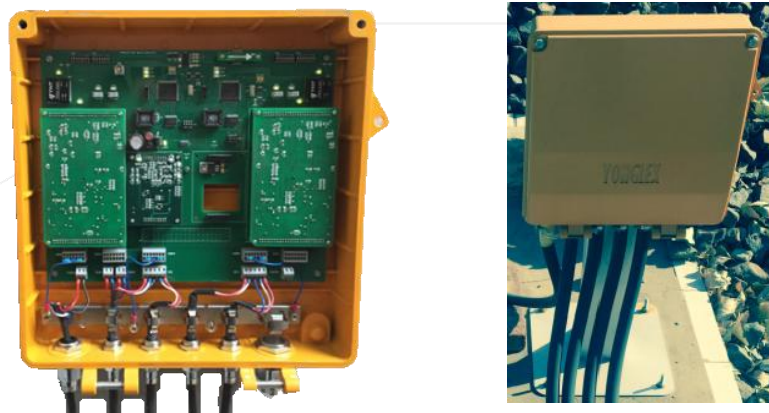
The sensor consists of a transmitting sensor and a receiving sensor, which are installed on the rail using fixtures. The outer side of the rail is the transmitting sensor, and the inner side of the rail is the receiving sensor. The sensor adopts a fully encapsulated structure, with a dustproof and waterproof grade of IP68.



YLJZ-F1型计轴系统磁头传感器
Sensor of YLJZ-F1

YLJZ-F1型计轴系统室外设备 Outdoor Equip. of YLJZ-F1

轨旁电子单元由磁头板和防护盒组成，采用安装支架固定在地面上或墙壁上。磁头板采用组合式单板结构，安装在防护盒内。防护盒为铝合金箱体，采用密封条密封，防尘防水等级为IP66。
The trackside electronic unit consists of a sensor board and a protective box, which are fixed on the ground or wall using mounting brackets. The sensor board adopts a combined single board structure and is installed in the protective box. The protective box is made of aluminum alloy and sealed with sealing strips, with a dustproof and waterproof grade of IP66.

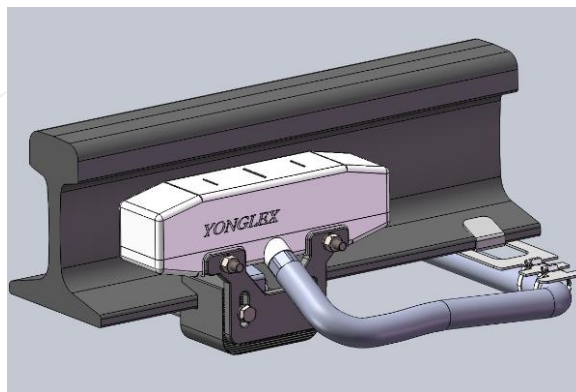


YLJZ-F1型计轴系统轨旁电子单元
Trackside Electronic Unit of YLJZ-F1

YLJZ-F2型计轴系统室外设备 Outdoor Equip. of YLJZ-F2

磁头传感器为单体结构，包括封装在一个壳体内的两个使用不同振荡频率的磁芯线圈及相应的功能电路。磁头传感器通过卡具安装在钢轨内侧/外侧。磁头传感器采用完全灌封结构，防尘防水等级为IP68。

The sensor is a single body structure, including two magnetic core coils with different oscillation frequencies packaged in a shell and corresponding functional circuits. The sensor is installed on the inner/outer side of the rail through fixtures. The sensor adopts a fully encapsulated structure, with a dustproof and waterproof grade of IP68.



YLJZ-F2型计轴系统磁头传感器
Sensor of YLJZ-F2

YLJZ-F2型计轴系统室外设备 Outdoor Equip. of YLJZ-F2

接线盒用于磁头传感器尾缆和计轴电缆之间的接续，接线盒内部为WAGO端子，将4芯磁头尾缆与4芯计轴电缆进行一对一接续。接线盒通过支架安装，既可以固定在地面，也可以固定在隧道壁上。接线盒为复合材料箱体，采用密封圈密封，防尘防水等级为IP66。

The Junction Box is used for connecting the tail cable of the sensor and the axle counter cable. The inside of the Junction Box are WAGO terminals, which connects the 4-core sensor tail cable and the 4-core axle counter cable one-on-one. The Junction Box is installed through a bracket, which can be fixed on the ground or on the tunnel wall. The Junction Box is made of composite material and sealed with a sealing ring, with a dustproof and waterproof grade of IP66.



YLJZ-F2型计轴系统轨旁接线盒
Junction Box of YLJZ-F2

SIL4安全证书 SIL4 Safety Certificate

Certificate

ID-Number: SHA14097CE02

CENELEC Railway Standards

Inspection Body TÜV Rheinland (Shanghai) Co., Ltd.
Owner of Certificate Beijing Yonglex Technologies Co., Ltd.
Room 1911, Building 3, So Boss&Box Center, No.16 Nansanhuan West Road, Fengtai District, Beijing, P.R. China.

Type designation/
Product tested Generic Application YLJZ-F1 Axle Counter Equipment
Manufacture Beijing Yonglex Technologies Co., Ltd.
Room 1911, Building 3, So Boss&Box Center, No.16 Nansanhuan West Road, Fengtai District, Beijing, P.R. China.

Bases of Assessment ¹⁾ EN 50126:2017, EN 50128:2011, EN 50129:2018
SIL 4 according to EN 50129:2018

Assessment Report / Date ²⁾ SHA14097RE05 V1.0, 2020-11-17

Assessment Result ³⁾ The chosen safety procedures, safety methods and safety targets for the design and development of the Generic Application YLJZ-F1 Axle Counter Equipment as well as their application evidence are regarded as suitable to achieve the Safety Integrity Level 4 as defined in the Safety Case-ID JF1-S13013, Version 0.9.0, dated 2020-11-05.
The Generic Application YLJZ-F1 Axle Counter Equipment is regarded to fulfil the quantitative and qualitative safety requirements according to EN 50129:2018 for a SIL4 system and fit to serve in a generic or specific application. For safe operation of Generic Application YLJZ-F1 Axle Counter Equipment in a generic or specific application, the conditions and constraints in the Safety-Related Application Conditions-ID JF1-S13015, Version 0.6.0, dated 2020-10-16, shall be considered.

Validity Validity for the configuration of the Generic Application YLJZ-F1 Axle Counter Equipment as described in the Safety Case-ID JF1-S13013, Version 0.9.0, dated 2020-11-05.

¹⁾ Further codes and standards to be applied are contained in the referenced assessment report.

²⁾ This assessment report is an integral part of the certificate.

³⁾ The assessment result is justified in detail in the assessment report.

Date: 2020-11-17

TÜV Rheinland Group
Am Grauen Stein
51105 Cologne, Germany

Steven Chen
Certification Representative
(Steven K.C. Chen)

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YLJZ-F1型安全证书
Safety Certificate of YLJZ-F1

Inspection Certificate

ID-Number: A16101CE01

The Client has demonstrated that the Object of Conformity Assessment fulfils the stated Bases of Assessment. The assessment was carried out according to the TÜV Rheinland internal assessment methodology.

Inspection Body TÜV Rheinland (Shanghai) Co., Ltd.
TÜV Building I, No.177, Lane 777,
West Guangzhong Road Jingan District, Shanghai

Client/Manufacturer Beijing Yonggui Technologies Co., Ltd.
Room 805, Building 7(Xingchuan International Center Block S),
No.16 Xinya Street, Daxing District, Beijing, China.

Object of Conformity Assessment Generic Product YLJZ-F2 Axle Counter Equipment V1.0 as specified in the YLJZ-F2 Axle Counter Safety Case-ID JF2-S13013, version 0.2.0, dated 2022-08-01

Basis of Assessment EN 50126-1:2017, EN 50126-2:2017, EN 50128:2011, EN 50129:2018
SIL 4 according to EN 50129:2018

Associated Assessment Report / Date ¹⁾ A16101RF01, 2022-08-10

Inspection Result The procedures and methods selected by the client/manufacturer and documented in the safety case are considered to be suitable for the development of the object of the conformity assessment according to EN 50129:2018, SIL 4.

Condition For the operation of the object of conformity assessment, safety-related conditions for the operation according to chapter 6.5 of the report A16101RE01 shall be adhered.

¹⁾ This assessment report is an integral part of the certificate.

Issued: 2022-08-10

Steven Chen
Accredited Signatory
(Steven K.C. Chen)

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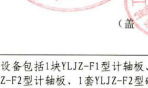
YLJZ-F2型安全证书
Safety Certificate of YLJZ-F2

型式试验报告
Type Test Report

报告编号: MCDL-2022-492-F第 1 页 共 17 页

机械工业仪器仪表综合技术经济研究所测量控制设备及系统实验室
机械工业测量控制设备及网络质量检测中心

检 测 报 告

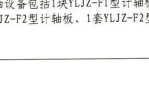
产品名称	计轴设备	规格型号	YLJZ-F1 & YLJZ-F2	商标	—
委托单位	北京永列科技有限公司	单位地址	北京市大兴区欣维街16号院7号楼 兴创国际中心S座805室		
检测类别	委托检测	样品方式	送样	到样日期	2022年04月25日
检测地点	机械工业仪器仪表综合技术经济研究所 测量控制设备及系统实验室	送样数量	1套	送样人员	马秋凤
样品编号/机号		22-452			
检测依据	TB/T 1447-2015《铁路信号产品绝缘电阻》 TB/T 1448-2018《铁路通信信号产品的绝缘耐压》 GB/T 2423.1-2008《电工电子产品环境试验 第2部分: 试验方法 试验A: 低温》 GB/T 2423.2-2008《电工电子产品环境试验 第2部分: 试验方法 试验B: 高温》 GB/T 2423.4-2008《电工电子产品环境试验 第2部分: 试验方法 试验D: 恒定湿热试验(12h+12h 循环)》 GB/T 2423.3-2016《环境试验 第2部分: 试验方法 试验Ca: 恒定湿热试验》 TB/T 2846-2015《铁路地面信号产品振动试验方法》 GB/T 2423.5-2019《环境试验 第2部分: 试验方法 试验Ea 和导则: 冲击》 GB/T 4208-2017《外壳防护等级(IP代码)》				
检测日期	2022年05月06日~07月09日	检测条件	温度	20.1℃~28.4℃	湿度 28.9%~52.75RH
检测结论	机械工业仪器仪表综合技术经济研究所测量控制设备及系统实验室/机械工业测量控制设备及网络质量检测中心受北京永列科技有限公司委托, 依据检测依据栏中标准的相应条款要求, 对其送检的1套YLJZ-F1 & YLJZ-F2型计轴设备进行了绝缘电阻、绝缘耐压、低温、高温、高温运行、交变湿热和恒定湿热试验, 对其中的1套YLJZ-F1型轨旁电子单元进行了振动和外壳防护等级(IP66)试验, 对其中的1套YLJZ-F1型磁头传感器和1套YLJZ-F2型磁头传感器进行了振动、冲击和外壳防护等级(IP68)试验。 检测结果见本报告的2页至第6页。				
编制	2022年07月13日				
审核	2022年07月14日				
批准	2022年07月15日				
有关说明	受试的1套YLJZ-F1 & YLJZ-F2型计轴设备包括1块YLJZ-F1型计轴板、1套YLJZ-F1型磁头传感器、1套YLJZ-F1型轨旁电子单元、1块YLJZ-F2型计轴板、1套YLJZ-F2型磁头传感器、2块联锁板				
备注	检测项目中YLJZ-F1型磁头传感器和YLJZ-F2型磁头传感器的振动试验项目由分包实验室“北京朗博检测有限公司”(CMA认定编号: 180121340695, CNAS认可编号: L9885)完成。				

MCDL-3008-02

报告编号: MCDL-2022-493-H第 1 页 共 26 页

机械工业仪器仪表综合技术经济研究所测量控制设备及系统实验室
机械工业测量控制设备及网络质量检测中心

检 测 报 告

产品名称	计轴设备	规格型号	YLJZ-F1 & YLJZ-F2	商标	—
委托单位	北京永列科技有限公司	单位地址	北京市大兴区欣维街16号院 7号楼兴创国际中心S座805室		
检测类别	委托检测	样品方式	送样	到样日期	2022年04月25日
检测地点	机械工业仪器仪表综合技术经济研究所 测量控制设备及系统实验室	送样数量	1套	送样人员	马秋凤
样品编号/机号		22-452			
检测依据	TB/T 3498-2018《铁路通信信号设备雷击试验方法》 GB/T 24338.5-2018《轨道交通 电磁兼容 第4部分: 信号和通信设备的发射与抗扰度》				
检测日期	2022.04.26~2022.07.05	检测条件	温度	19.7℃~25.9℃	湿度 41.2%~45.3RH
检测结论	机械工业仪器仪表综合技术经济研究所测量控制设备及系统实验室/机械工业测量控制设备及网络质量检测中心受北京永列科技有限公司委托, 依据检测依据栏中的标准, 对其送检的1套YLJZ-F1 & YLJZ-F2型计轴设备进行了静电放电、射频电磁场、数字通信设备的射频电磁场、电快速瞬变脉冲群、浪涌、射频场感应的传导骚扰、工频磁场、脉冲磁场、电源端口发射、机箱端口发射、雷击试验。 经检测, 受试样品的静电放电、射频电磁场、数字通信设备的射频电磁场、电快速瞬变脉冲群、浪涌、射频场感应的传导骚扰、工频磁场、脉冲磁场符合检测依据所列标准的评定要求, 雷击符合检测依据所列标准的A类评定要求, 电源端口发射、机箱端口发射符合检测依据标准的限值要求。				
编制	2022年07月06日				
审核	2022年07月07日				
批准	2022年07月08日				
有关说明	受试的1套YLJZ-F1 & YLJZ-F2型计轴设备包括1块YLJZ-F1型计轴板、1套YLJZ-F1型磁头传感器、1套YLJZ-F1型轨旁电子单元、1块YLJZ-F2型计轴板、1套YLJZ-F2型磁头传感器、2块联锁板和1块诊断板。				
备注					

MCDL-376H-02

中国轨道交通协会技术装备委员会专家评审 Expert Review by China Rail Transit Association

中国城市轨道交通协会技术装备专业委员会

评审意见

编号: 2016005	
项目名称: 北京永列自主研发的 YLJZ-F1 型计轴系统评审意见	
申请单位: 北京永列科技有限公司 北京地铁运营公司通信信号分公司	
时间: 2016 年 7 月 31 日	地点: 北京
专家: 李新文 (组长) 朱翔 段晨宁 王道敏 郑生全	

评审意见:

1. 北京永列研发的 YLJZ-F1 型计轴系统由轨旁计轴磁头、轨旁电子单元、计轴主机等组成, 实现列车占用检测功能。
2. 北京永列研发的 YLJZ-F1 型计轴系统采用分布式模块化结构, 板卡种类少, 支持计轴板带电热插拔, 检测报警到板卡级。
3. 北京永列研发的 YLJZ-F1 型计轴系统具有完全自主知识产权, 并获得多项专利, 整体技术达到国内领先水平。
4. 北京永列研发的 YLJZ-F1 型计轴系统获得第三方安全认证机构出具的 SIL4 级安全认证证书, 通过了第三方进行的型式试验检测, 并在北京地铁亦庄线宋家庄停车场进行了现场运用试验。

1

中国城市轨道交通协会技术装备专业委员会

专家组一致同意北京永列研发的 YLJZ-F1 型计轴系统通过评审。

建议在运营线路上进行现场试用并推广使用。

附件一: 《北京永列自主研发的 YLJZ-F1 型计轴系统评审意见》
(专家组)

附件二: 《北京永列自主研发的 YLJZ-F1 型计轴系统评审申请》

附件三: 《北京永列自主研发的 YLJZ-F1 型计轴系统评审参会人员名单》

二〇一六年七月三十一日

2

● 专家评审意见:

Expert Review Opinions:

1. 北京永列研发的YLJZ-F1型计轴系统由轨旁计轴磁头、轨旁电子单元、计轴主机等组成，实现列车占用检测功能。

The YLJZ-F1 axle counting system developed by Beijing Yonglex consists of trackside sensors, trackside electronic units, axle counting hosts, etc., achieving train occupancy detection function.

2. 北京永列研发的YLJZ-F1型计轴系统采用分布式模块化结构，板卡种类少，支持计轴板带电热插拔，检测报警到板卡级。

The YLJZ-F1 axle counting system developed by Beijing Yonglex adopts a distributed modular structure with fewer types of boards and supports hot plugging of the axle counting board, and detects alarms to the board level.

3. 北京永列研发的YLJZ-F1型计轴系统具有完全自主知识产权，并获得多项专利，**整体技术达到国内领先水平**。

The YLJZ-F1 axle counting system developed by Beijing Yonglex has fully independent intellectual property rights and has obtained multiple patents, and the overall technology has reached the leading level in China.

- 专家评审意见:

Expert Review Opinions:

4. 北京永列研发的YLJZ-F1型计轴系统获得第三方安全认证机构出具的SIL4级安全认证证书，通过了第三方进行的型式试验检测，并在北京地铁亦庄线宋家庄停车场进行了现场运用试验。

The YLJZ-F1 axle counting system developed by Beijing Yonglex has been issued the SIL4 safety certificate by a third-party safety certification agency, and has passed type testing by a third party, and has been on-site operation test in the Songjiazhuang parking of the Yizhuang line of Beijing Metro.

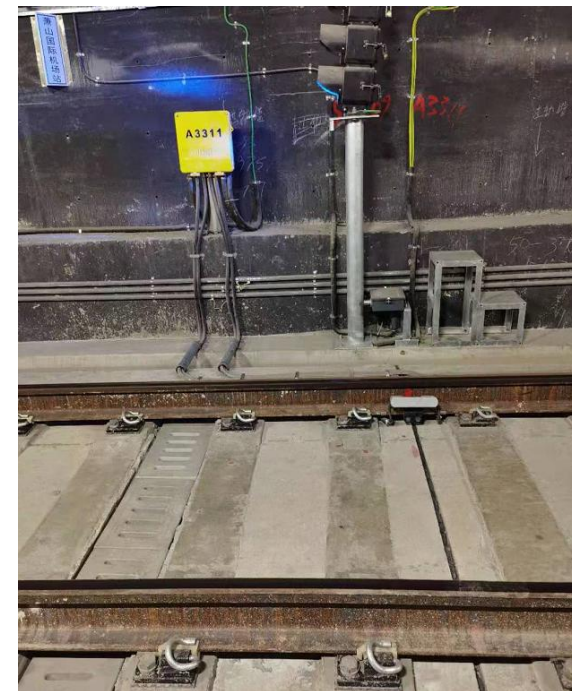
专家组一致同意北京永列研发的YLJZ-F1型计轴系统通过评审。

The expert group unanimously agreed that the YLJZ-F1 axle counting system developed by Beijing Yonglex has passed the review.

建议在运营线路上进行现场试用并推广使用。

It is recommended to conduct on-site trials and promote their use on operational lines.

杭州地铁1号线三期
HangZhou Metro Line 1 Phase III



绍兴地铁2号线
ShaoXing Metro Line 2



武汉地铁7号线南延线 South Extension Line of WuHan Metro Line 7



武汉光谷悬挂式空轨项目
WuHan GuangGu Hanging Monorail Line



重庆2号线跨坐式单轨项目 ChongQing Straddle Monorail Line 2



黄石有轨电车项目 HuangShi Tram Line

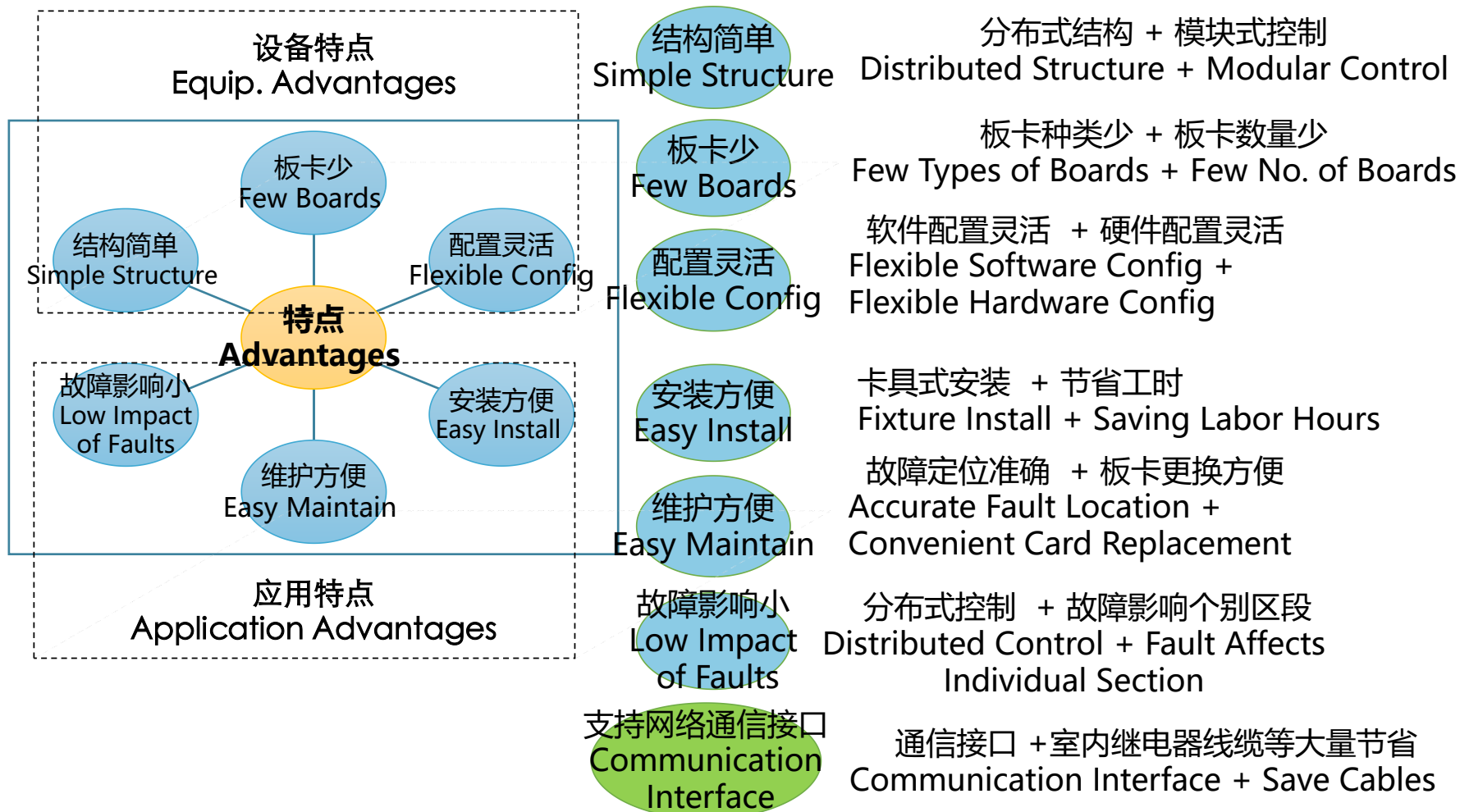


技术亮点

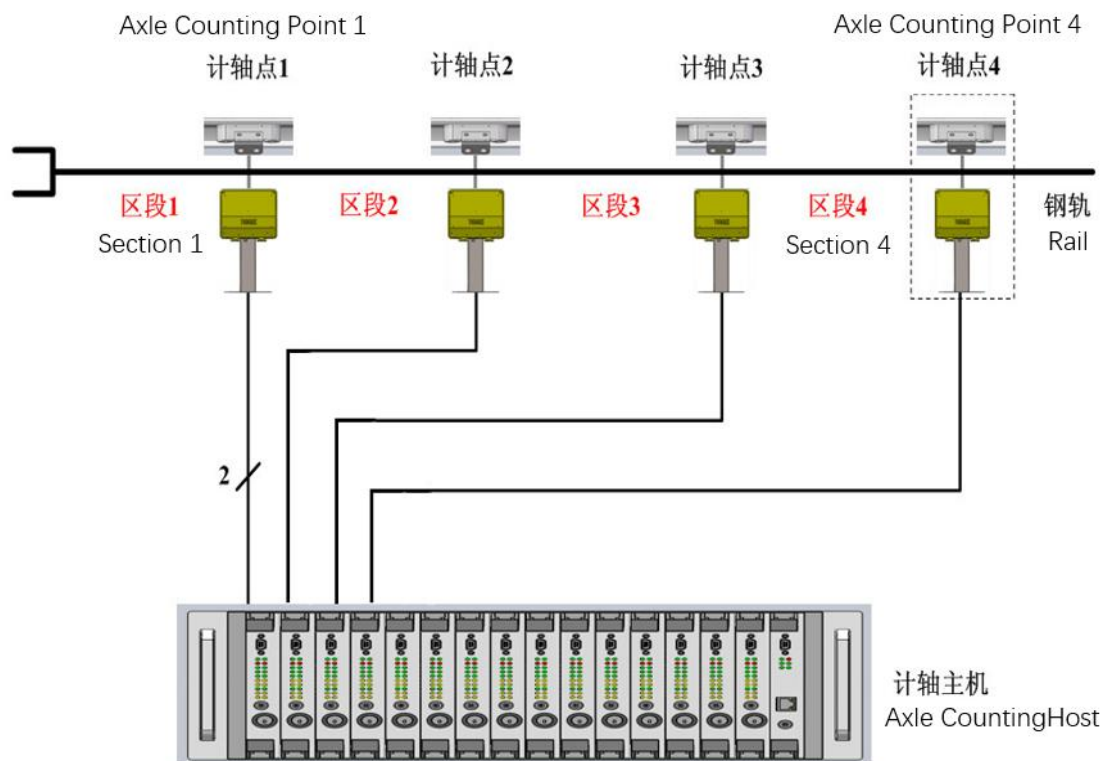
Technology Advantages



YLJZ-F1/F2型计轴系统特点 Advantages of YLJZ-F1/F2



➤ **系统结构简单：分布式结构 + 模块式结构**
Simple Structure: Distributed Structure + Modular Control



计轴主机最简单
The simplest axle counter host

➤ 板卡少：种类少 + 数量少

Few Boards: Few Types of Boards + Few No. of Boards

种类少(Few Types of Boards):

室内2种板卡(2 types of boards indoor):

--计轴板(axle counting board)

--诊断板(diagnostic board)

室外1种板卡(1 type of board outdoor):

--磁头板 (仅F1有该板卡)

sensor board(only for YLJZ-F1)

数量少(Low Quantity):

F1板卡数量=2*计轴点数量 + 1

Boards Quantity of F1 = 2*detection points + 1

F2板卡数量=计轴点数量 + 1

Boards Quantity of F2 = detection points + 1



故障点少、便于维护

Low Faults Points + Easy Maintain

➤ **支持热插拔：**

Support Hot Plugging:

室内全部板卡支持带电插拔。

All boards indoor support hot plugging.



便于故障处理

Easy to Troubleshoot

缩短故障恢复时间

Shorten Fault Recovery Time

➤ **电源数据耦合传输：**

Power Data Coupling Transmission:

F1每个室外计轴点采用4芯电缆（实用2芯、备用2芯）

4 cores cable for each point of F1(2 cores used, 2 cores standby)

F2每个室外计轴点采用6芯电缆（实用4芯、备用2芯）

6 cores cable for each point of F2(4 cores used, 2 cores standby)



节省电缆

Save Cables

降低工程造价

Reduce Project Costs

➤ 充分的共用计轴点：

Adequate shared axle counting points:

F1联锁区分界处的计轴点可以共用。

The axle counting points at the interlocking boundary can be shared for F1.

F2联锁区分界处的计轴点需要分设。

The axle counting points at the interlocking boundary have to be separated for F2.



减少计轴点数量

Reduce the number of axle counting points

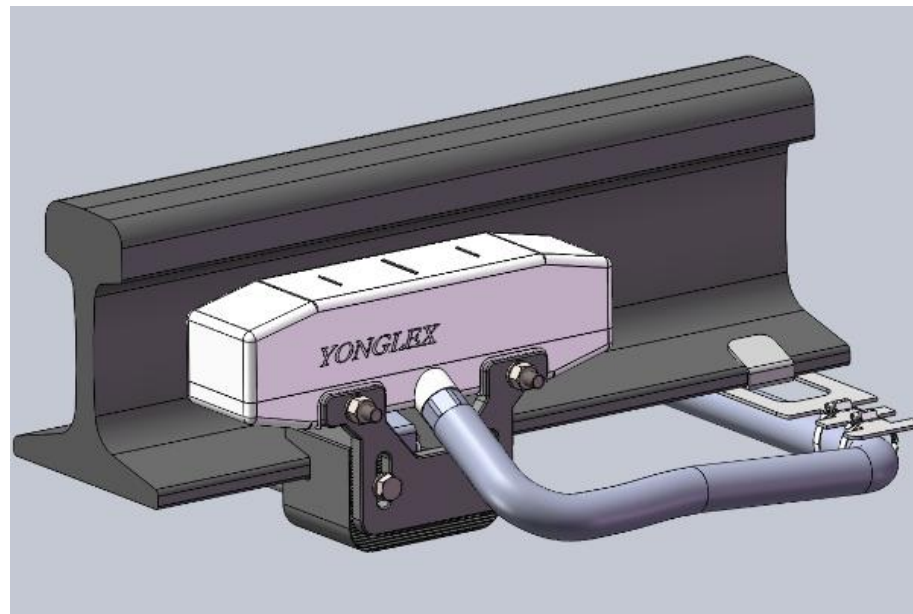
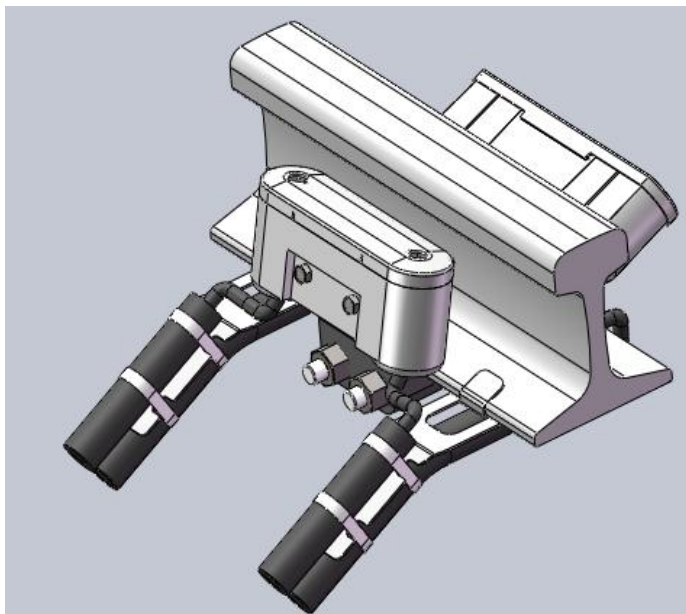
降低工程造价

Reduce Project Costs

➤ 卡具安装方式(Fixture Installation):

钢轨无需打孔，采用卡具安装。

Rail does not require drilling, Install using fixtures.



安装简单(Simple installation)
不损伤钢轨(No damage to rail)

➤ **支持网络通信接口：**

Supporting network communication interfaces:

支持计轴与联锁之间的以太网通信接口。

Support Ethernet communication interface
between axle counting and interlocking



取消大量继电器

Cancel a large number of relays

节省空间和成本

Save space and costs

➤ **完善的自诊断功能：**

Comprehensive self diagnosis function

诊断板可以将故障定位到板级。

The diagnostic board can locate faults at the board level



故障快速定位

Quick fault location

信息实时上传

Real time information upload

- **应用范围广 (wide range of applications)**
- 地铁线路 (Metro Lines): 工字钢轨 (Universal Rail)**
 - 有轨线路 (Tram Lines): 槽型钢轨 (Grooved Rail)**
 - 单轨线路 (Straddle Monorail Line): 跨坐式钢筋混凝土梁 (Straddle type reinforced concrete beam)**
 - 空轨线路 (Hanging Monorail Line): 悬挂式钢梁 (Hanging steel beam)**



产品多种应用
Multiple applications
便于用户选型
Easy for users to choose

系统接口

System Interface



电源接口

Power Interface

单台机柜电源需求如下 (Power requirements for single cabinet):

- 交流220V电源1 3A 给室内计轴主机供电
AC220V1 3A Power for Indoor Host
- 交流220V电源2 3A 给室内计轴主机供电
AC220V2 3A Power for Indoor Host
- 直流120V电源1 5A 给室外计轴点供电（仅F1需要）
DC120V1 5A Power for Outdoor Equip(only for F1)
- 直流120V电源2 5A 给室外计轴点供电（仅F1需要）
DC120V2 5A Power for Outdoor Equip(only for F1)
- 直流24V电源 2A 给轨道继电器及复零输入供电
DC24V 2A Power for Relay and Reset

复零接口

Reset Interface

- 复零的目的是在设备上电后、调试期间或在设备出现干扰时清除计轴区段。

The purpose of Reset is to clear section after the system is powered on, during commissioning or when the section has disturbed.

- 复零是一个安全作业程序，必须在操作和维护人员规章制度中加以明确定义。

Reset is a safe operation procedure that must be clearly defined in the rules and regulations of operation and maintenance personnel.

- 本系统支持两种常用的复零方式：直接复零和预复零。

The system supports two commonly used reset methods: direct reset and pre reset.

- 每个区段可以同时定义3个复零输入：外部复零输入1、外部复零输入2和计轴板上的钥匙/按钮复零输入。

Each section can define three reset inputs simultaneously: external reset input 1, external reset input 2, and key/button reset input on the axle counter board.

复零接口

Reset Interface

- 直接复零：执行复零前，操作员必须确保区段内无车。计轴板一旦接收到直接复零命令，在计轴板检查无禁止复零的技术条件时（例如持续故障等），将使该区段立即出清。

Direct reset: Before performing reset, the operator must ensure that there are no vehicles in the section. Once the axle counter board receives a direct reset command, it will immediately clear the section when there are no technical conditions prohibiting (such as continuous faults).

复零接口

Reset Interface

- 预复零：计轴板一旦接收到预复零命令，计轴板检查无禁止复零的技术条件（例如持续故障等），随后操作员指挥列车低速通过区段（清扫），计轴板检查计轴点的正确运行，只有当进入和离开该区段的轴数相同时，计轴板才会使该区段出清。

Pre reset: Once the axle counting board receives the pre reset command, it checks no technical conditions that prohibit reset (such as continuous faults). Then, the operator commands the train to pass through the section at low speed (cleaning), and the axle counting board checks for the correct operation of the axle counting point. Only when the number of axles entering and leaving the section is the same, will the axle counting board clear the section.

- 建议将计轴板上的钥匙/按钮输入配置为直接复零，将外部输入配置为预复零。

It is recommended to configure the key/button input on the axle counter board as direct reset, and configure the external input as pre reset.

联锁接口

Interlocking Interface

- 继电器接口方式：每个区段设有一个轨道继电器和一个复零继电器。

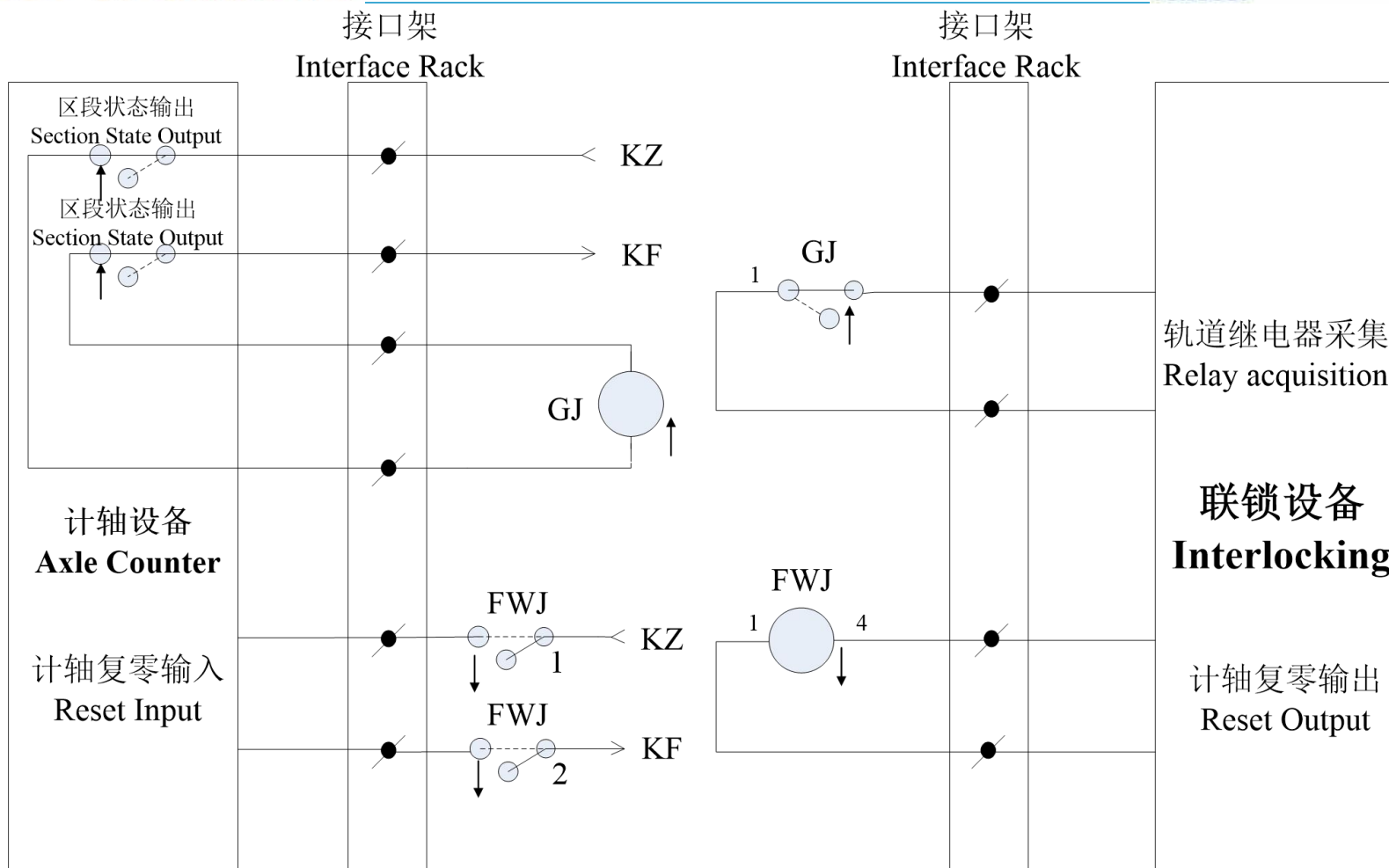
Relay Interface: Each section is equipped with a track relay and a reset relay.

- 通信接口方式：计轴与联锁间采用冗余的以太网通信、安全协议。

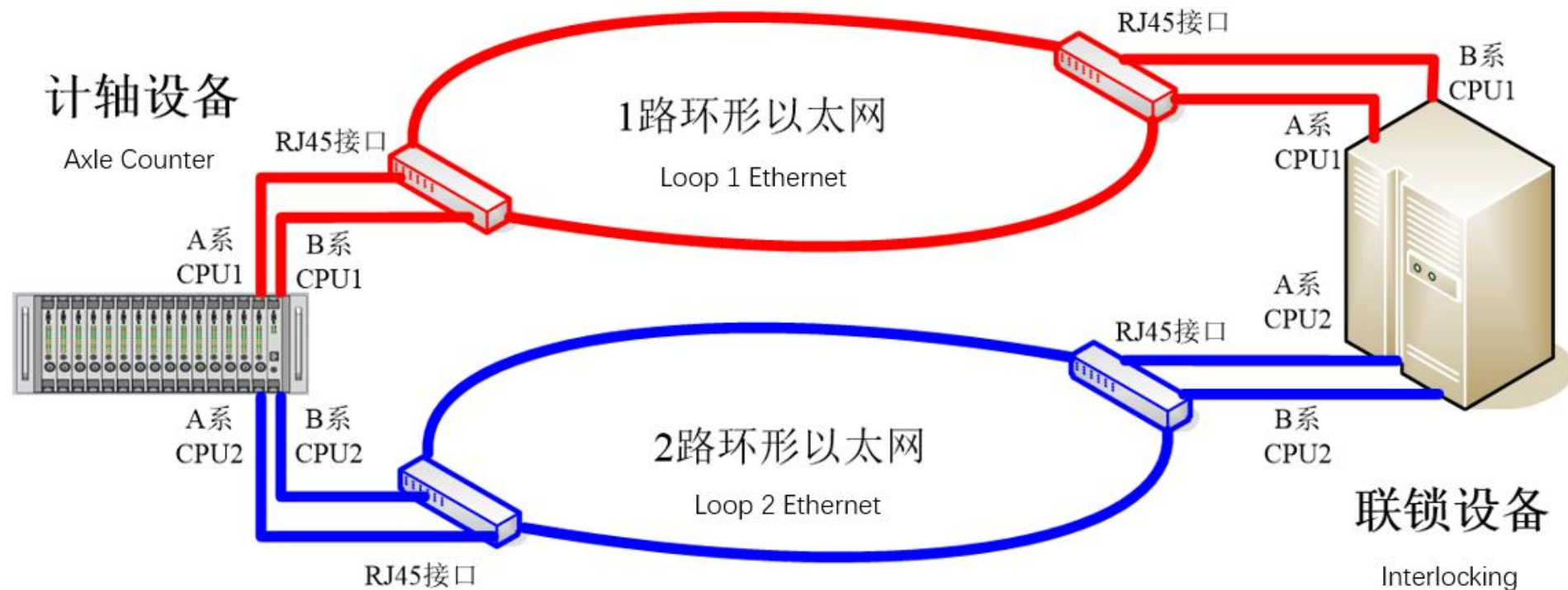
Communication Interface: Redundant Ethernet communication and security protocol are used between axle counter and interlocking.

- 接口原理如下：

Interface Principle as below:



继电器接口原理示意图
Diagram of Relay Interface



通信接口原理示意图
Diagram of Communication Interface

监测接口

MSS Interface

系统配置的诊断板可以实现计轴系统的诊断功能，将计轴系统的状态信息主动上传到微机监测系统。

The diagnostic board configured by the system can achieve the diagnostic function of the axle counting system, actively uploading the status information of the axle counting system to MSS system.

可以提供如下接口(Interfaces as below can be provided):

➤RS232接口

RS232 Interface

➤RS422接口

RS422 Interface

➤RS485接口

RS485 Interface

➤以太网接口

Ethernet Interface

监测接口

MSS Interface

可以提供如下信息 (Informations as below can be provided):

➤ 各计轴点的状态，包括磁头漂移、磁头故障、通信故障；

The status of each axle counting point, including sensor drift, sensor failure, and communication failure.

➤ 各轨道区段的状态，包括空闲、占用、受扰、复位、轴数；

The status of each track section, including free, occupied, disturbed, reset, and number of axles.

➤ 各板卡的状态，包括板卡正常、故障。

The status of each board, including normal and fault.

电缆接口

Cable Interface

室外计轴点到室内分线柜的电缆:

Cable from Outdoor detection point to Indoor distribution cabinet:

- 采用经铁道部鉴定的低烟无卤阻燃计轴专用电缆WDZC-PJZL23型4芯计轴电缆（通信4芯组），实用2芯备用2芯；

WDZC-PJZL23 type 4-core axle counter cable (communication 4-core group), Low smoke zero halogen flame retardant axle counter cable identified by the Ministry of Railways, is used, 2 cores used and 2 cores standby.

- 当室外计轴点距室内主机 0~5km 时，采用直径0.9mm的计轴电缆；

When the outdoor axle counting point is 0-5km away from the indoor host, use an axle counting cable with a diameter of 0.9mm.

- 当室外计轴点距室内主机 5~13km 时，采用直径1.4mm的计轴电缆；

When the outdoor axle counting point is 5-14km away from the indoor host, use an axle counting cable with a diameter of 1.4mm.

电缆接口

Cable Interface

计轴机柜到室内分线柜的电缆：

Cable from axle counter cabinet to distribution cabinet:

➤采用低烟无卤阻燃屏蔽双绞线：DWZR-RYYSP 2*0.5 mm²。

Adopt Low smoke zero halogen flame retardant shielded twisted pair: DWZR-RYYSP 2*0.5 mm²

计轴机柜到组合架的电缆：

Cable for axle counter cabinet to combined rack:

➤采用低烟无卤阻燃多股软线：DWZR-RYY 0.4 mm²。

Adopt Low smoke zero halogen flame retardant multi strand flexible cord: DWZR-RYY 0.4 mm²

电缆接口 Cable Interface

计轴机柜到电源屏的电缆：

Cable for axle counter cabinet to Power supply rack:

➤采用低烟无卤阻燃多股软线：DWZR-RYY 2*4 mm²。

Adopt Low smoke zero halogen flame retardant multi strand flexible cord: DWZR-RYY 2*4 mm²

地线电缆：

Cable for Grounding:

➤采用低烟无卤阻燃多股软线：DWZR-BYR 25 mm²。

Adopt Low smoke zero halogen flame retardant multi strand flexible cord: DWZR-BYR 25 mm²

地线接口

Grounding Interface

- 室内计轴机柜接地：采用25mm² 多股铜芯塑料软线接入综合接地系统。

Indoor axle counter cabinet grounding: 25mm² Multi strand copper core plastic flexible wire is connected to the integrated Earthing system.

- 室外计轴防护盒接地（仅F1需要）：采用25mm² 多股铜芯塑料软线接入区间综合接地系统。

Outdoor axle counter protection box grounding (only required for F1): 25mm² Multi strand copper core plastic cord is connected to the section integrated Earthing system.

- 计轴电缆屏蔽层接地：屏蔽层在室内分线柜处单端接地。

Grounding of the shielding layer of the axle counter cable: The shielding layer is grounded at a single end at the indoor distribution cabinet.

- 计轴机柜到室内分线柜的屏蔽双绞线屏蔽层接地：屏蔽层在分线柜处单端接地。

Grounding of the shielded twisted pair shielding layer from the axle counter cabinet to the indoor distribution cabinet: The shielding layer is grounded at a single end at the distribution cabinet.

技术服务

Technology Service



企业使命：打造中国最好的计轴系统

Corporate mission: To create the best axle counting system in China

核心理念：为客户提供最优技术服务

Core concept: providing customers with the best technical services

最优服务理念の6条标准：

6 Standards for the Best Service Concept:

- 最好的计轴系统(The best axle counting system)
- 最优的技术方案(The optimal technical solution)
- 最及时的供货送达(Timely delivery of supply)
- 最有效的技术培训(The most effective technical training)
- 最有力的运营保障(The most powerful operational guarantee)
- 最让客户满意的售后服务(The most satisfactory after-sales service for customers)

北京永列技术服务部
Beijing Yonglex Technical Service Department

台州计轴技术服务中心
TaiZhou Axle Counter Service Center

杭州计轴技术服务中心
HangZhou Axle Counter Service Center

重庆计轴技术服务中心
ChongQing Axle Counter Service Center

绍兴计轴技术服务中心
ShaoXing Axle Counter Service Center

武汉计轴技术服务中心
WuHan Axle Counter Service Center



证券简称：永贵电器
证券代码：300351

永列计轴 中国最好用的计轴！
Yonglex Axle Counter The best axle counter in China!

期待您的信任和支持！
Looking forward to your trust and support!

谢谢！ Thanks!

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