Located in Stockport, Cheshire and Ashby-de-la-Zouch, Leicestershire, Hima-Sella has easy access to the motorway network, mainline railways and International Airports. Hima-Sella has custom built offices and workshops providing:
The success of a modern railway network is the ability to deliver a fast and efficient service to passengers. The increasing demand from rail operators is driving a strategy to provide simple and cost effective solutions. This demand covers not only the operation of the railway but the ongoing availability of assets.

Rail operators are increasing the number of intelligent electronic solutions throughout the rail network, designed to improve operational performance and reliability. The traditional approach for this has seen equipment delivered adhoc and independently leaving unsupportable assets from which to manage the railway. This can result in high maintenance costs to extend the equipment life.

Hima-Sella, using its 40 years’ experience as a system integrator delivering safety critical control applications, has developed a solution that enables rail operators to deliver a high performance of its assets. Using a combination of proven ‘COTS’ hardware and software, plus the design of industry specific interface technologies, Hima-Sella has designed a Remote Terminal Unit (RTU) capable of providing a simple and cost effective solution for substation control.

Utilising the Mitsubishi PLC software and hardware, Hima-Sella has developed its TRACKLINK® RTU for the specific control of traction power. Designed to meet the requirements of new and legacy installations, the solution is flexible in its configuration. Its core components consist of central processing, discrete input and output modules, communications and signal conditioning interface cards.

TRACKLINK® RTU Overview

The TRACKLINK® RTU solution has been developed with the use of industry proven technologies. It has full Network Rail product acceptance (PADS reference PA05/06125) and is complaint to the applicable Specification for Remote Control Equipment standard NR/L2/ELP/27229-2.

The TRACKLINK® RTU solution utilises ‘COTS’ PLC hardware and software supplied by its partner Mitsubishi Electric and developed for a variety of industrial SCADA and control applications.

Already in operation in the UK rail industry, the Mitsubishi Q-Series PLC equipment has been used for signalling, power and rail asset solutions.

To enhance its capability for traction power control, the PLC is connected to interface cards designed by Hima-Sella to deliver signal conditioning and protection from the plant. These interface cards provide the necessary marshalling for the TRACKLINK® RTU.

For connection to the telecommunications infrastructure, the TRACKLINK® RTU uses proven modem equipment that enables both serial and Ethernet based protocols. The solution also supports recognised legacy protocols.
Serial Protocols:
Rail Industry Standards
IEC 60870-5-101
IEC 60870-5-104
DNP 3.0
Legacy Systems

RTU Operational Benefits:
• Multi System Compatibility
• Effective Local User Interface
• Simplified Routine of Operation
• Reduced Operational Training
• Direct Interface to Substation

RTU Performance Benefits:
• Assisted Control Functionality
• Improved Monitoring of Assets
• Flexibility to undertake independent System Upgrades
• Engineered to Recognised Standards
• Improved System Reliability

DNP3 IP Network Protocols
Local Diagnostics & Control HMI
Protection Relays & Switchgear
IEC 61850 (KEMA Certified)
IEC 60870-5-103 MODBUS
Hardwired I/O Cards
TRACKLINK® RTU
Technical Description

Overview
The Hima-Sella TRACKLINK® RTU has been designed as a flexible solution for substation applications. It can be supplied in a single wall mounted or floor standing cabinet, or as a distributed solution. Using COTS hardware, industry proven equipment and Hima-Sella’s expertise in traction SCADA, the TRACKLINK® RTU meets the needs of a modern electrified network.

The TRACKLINK® RTU has been designed to meet the requirements of the Network Rail Standard NR/L2/ELP/27229 – 2 Specification for Remote Control Equipment. The design encompasses proven applications, our expertise and application knowledge. The TRACKLINK® RTU consists of the following components:

- Mitsubishi Q Series PLC
- TRACKLINK® Interface Cards
- Telecommunications Equipment
- Intelligent Device Interfaces
- Battery Backed Power Supplies
- Panel Mounted HMI

The TRACKLINK® RTU acts as a slave system to the master control SCADA. On an instruction from the SCADA, the TRACKLINK® RTU issues switching commands to the substation equipment and then relays back the plant status as single bit alarms. Where required analogue readings can be taken from transducer equipment and relayed to the SCADA to provide voltage and current levels.

Intelligence and Control
Central to the TRACKLINK® RTU is the Programmable Logic Controller (PLC). The PLC provides the TRACKLINK® RTU with its Intelligence and Control. The core PLC build consists of a Central Processor Unit (CPU), Communications and Input and Output Modules. These modules are fitted to a high speed backplane to enable fast data transfer between the modules and the central SCADA.

The programming of the CPU module is derived using a standard function blocks. The core software build has been created for the supply of small, medium and large applications. This enables simple mapping of the I/O for each TRACKLINK® RTU once the design has been agreed.

Telecommunications
A range of communications modules are available to provide a number of options when connecting the TRACKLINK® RTU to the SCADA. These consist of serial and Ethernet based devices. The TRACKLINK® RTU has been pre-configured to use the following industry proven protocols:

- Legacy System Protocols
- DNP3 (Serial / IP)
- IEC 60870-5-(101/103/104)
- IEC 61850 (KEMA Certified)

Intelligent Interfaces
With the implementation of modern switchgear into substations, network operation and performance data is now available via industry standard protocols from Intelligent Electronic Devices (IED). With the increase use of IED technologies the TRACKLINK® RTU has been equipped with a dedicated PLC module designed for interfacing with these devices. The C Controller module uses specific software and a KEMA certified IEC61850 (client 7 server) and GOOSE Messaging protocol for connection multiple IED equipment.

The C Controller module contains the application to interrogate the IED device and relay this information via a DNP3/IP protocol to the SCADA. The C Controller is a standard PLC module and can be fitted to the PLC backplane at any time allowing existing TRACKLINK® RTU installations to be enhanced at a later stage.
RTU Key Features
The RTU solution has been designed to deliver not only a function but to also implement key features and benefits. These are as follows:

- Scalable I/O Configurations
- Dummy and Mass Trip CB Options
- Distributed I/O Applications
- COTS Based Technologies
- Dual Processor Option
- Reduced Installation Costs
- Future Proof Design
- Interchangeable Modules to reduce downtime
- Flexible Enclosure Design
- Reduced Spares Holding
- Reduced Maintenance Costs
- Master Slave Architecture
- Multiple Protocol Implementation
- Battery Back-Up

Digital Input Interface Card
The TRACKLINK® 10000 Digital Input Interface Card provides marshalling and protection for the PLC Digital Input Module. Supplied as a standard 32 individual isolated channels, each marshalling terminal is fitted with an isolating link and LED for active indication.

Connection between the PLC and the interface card is via a dedicated multicore cable. The interface card can be connected to the plant equipment using either dedicated field supplies or the use of a PCB supply.

The card is fitted with a power monitoring fault relay to indicate power failure on the card and is fuse protected.

Control Output Interface Card
The TRACKLINK® 10001 Control Output Interface Card provides marshalling and protection for the PLC Digital Output Module and its corresponding Digital Input Module for indication. The standard unit is supplied with 16 relay outputs and 16 individual input channels. Each marshalling terminal if fitted with an isolating link and LED for active indication.

The optional unit is supplied with 8 x Circuit Breaker (CB) control outputs and 8 pairs of individually isolated CB indications. The unit can be supplied to incorporate Mass Trip and Dummy CB configurations.

Connection between the PLC and the interface card is via a dedicated multicore cable. The interface card can be fitted inside the TRACKLINK® RTU enclosure or supplied for installation into 3rd Party CB Cabinets.

The card is fitted with a power monitoring fault relay to indicate power failure on the card and is fuse protected.

Analogue Input Interface Card
The TRACKLINK® 10002 Analogue Input Interface Card provides marshalling and protection for the PLC Analogue Module. The standard unit is supplied with 16 individually isolated input channels. Each marshalling terminal is fitted with an isolating link to receive a 0-20mA input signal.

Connection between the PLC and the interface card is via a dedicated multicore cable. The interface card can be connected to the plant equipment using standard cabling. The card is fitted with voltage supply monitoring and is fuse protected.
Local Control HMI
To aid the performance of the TRACKLINK® RTU a local panel mounted HMI can be supplied. Using the proven COTS based Mitsubishi GOT series; the HMI can be configured to provide a range of features to aid the operation, commissioning and maintenance of the TRACKLINK® RTU.

Standard configurations are supplied with an initial display mode of operation that facilitates instant access to the current status of the plant. This includes:

- Single Line Diagram
- Plant Status Alarms
- Analogue Values
- Documentation and Plant Drawings

Further functionality can be accessed via a two stage key switch and password login screen which include:

- Control of Plant
- Instantaneous Trending of Data
- Historic Trending of Data
- Plant Statistics and Alarm Frequencies
- Diagnostics
- Historical Event File Storage

The HMI is fully configurable to meet the requirements of a modern application.

TRACKLINK® P2P Controller
As an enhancement to the TRACKLINK® RTU, Hima-Sella has developed a point – point (P2P) solution for the monitoring and controlling of remote devices.

The TRACKLINK® P2P Controller utilises the plant isolation capabilities of the TRACKLINK® RTU, combined with built in processor and modem equipment to provide a low cost solution for remote I/O. Designed on a single platform, the TRACKLINK® P2P Controller can control several circuit breakers from a standard unit. The standard unit includes:

- Powerful Universal Processor
- On Board Modem
- 5KV Plant Isolation
- 4 CB and 8 CB Configuration Options

Typical applications for the TRACKLINK® P2P Controller include the control of Motor Operated Switches (MOS), Controlled Track Switches (CTS) and Negative Short Circuiting Devices (NSCD).

Traditionally the architecture for remote devices is based on a point to point configuration. This requires a master unit installed in the substation and a slave unit installed near to or within the track device enclosure.

The functionality of the TRACKLINK® P2P enables the slave unit to be installed up to 1Km from the master unit with the addition of modem equipment. The unit is supplied in an IP67 housing pre wired to keyed connectors (Power, Communications and Plant). This allows the installation contractor to pre wire cables to the plant ahead of the final equipment installation and commissioning.
Proven Delivery Capability

“...a flexible approach to a successful project delivery...”

Hima-Sella has developed a strong reputation of proven expertise in the supply of safety critical and control systems to the UK transport industry. Through its partnerships with key product suppliers and its in-house engineering capabilities, the company offers complete turnkey project capability which includes design, manufacture, engineer, test, installation management and commissioning.

Hima-Sella's reputation as a proven service provider is also maintained through its team of dedicated technical support personnel.

Project Management and Delivery
Successful project management and delivery have a significant influence on the reputation of Hima-Sella in the UK transport market. All projects are assigned a dedicated project delivery team whose main role is to ensure that project milestones are achieved, client satisfaction is exceeded and that a philosophy of flexibility to delivery is constantly maintained.

Strong communication is the key to the success of projects and the Hima-Sella project teams are encouraged to develop strong relationships with the client team. This is strengthened by the company’s UK based project delivery teams. On successful completion of all factory activities, the project teams have the necessary experience to provide site installation management and commissioning of the equipment.

Consultancy and Design
The success in providing sound engineered solutions for the transport industry has been achieved by the experience of the engineering teams. This experience is best utilised during the consultancy and design stages of a project.

The engineering team’s valuable knowledge and experience can be called upon to improve the value of feasibility studies, risk assessment and whole life costing activities. In respect of safety applications, dedicated TUV approved functional safety engineers are on hand to advise and/or produce detailed functional design form any applications.

Systems Integration and Testing
The successful implementation of a system relies not only on thorough design processes but also extensive engineering and systems integration principles. The Hima-Sella engineering teams utilise engineering procedures that have been proven through the implementation of many projects.

Hima-Sella’s philosophy of a flexible, modular and open architecture design ensures integration of all equipment to third party applications. Detailed independent and fully integrated testing procedures are performed in-house proving system functionality in a safe environment before final commissioning tests are undertaken at site.

Systems Support
Hima-Sella has an established, dedicated team of technical support engineers who ensure that clients receive maximum benefit and reliability during the operational life of a system.

These highly trained and skilled engineers provide a range of services including 24/7 technical support and site attendance, operational and maintenance training, system modifications and upgrades. All of these services are designed to ensure that individual clients are offered the most cost effective solutions to maintain system availability, and reliability.
Located in Stockport, Cheshire and Ashby-de-la-Zouch, Leicestershire, Hima-Sella has easy access to the motorway network, mainline railways and International Airports. Hima-Sella has custom built offices and workshops providing:

- **Consultancy**
  - Feasibility • Risk Assessment • Reliability Studies
  - Whole Life Costing

- **Project Management**
  - On time delivery of project • Regular customer contact
  - Agreed milestones to monitor progress

- **Design**
  - Detailed Design • Functional Logic • Auto CAD

- **Engineering**
  - Functional Design Specification
  - System Design Requirements Specification

- **Manufacturing**
  - Panel Build • System Build • System Integration

- **Testing**
  - In-house • Factory Acceptance Testing • Site Acceptance Testing

- **Installation and Commissioning**
  - System Installation and Integration • Support during Startup

- **Technical Support**
  - 24 hour call out support • Upgrades/Modifications
  - Maintenance (IEC 61508 life cycle)

- **Training**
  - Hardware/Software Design • Maintenance and Servicing
  - Customised courses