



Integrating rail telecommunications...

CHRIS ELLIOTT, account manager at **Hima-Sella**, outlines the company's latest technologies designed for the integration of rail telecommunications

The success of a modern railway network is its ability to deliver a fast and efficient service to its passengers, and to safeguard those passengers and the network's employees. To achieve this, rail operators are increasingly relying on intelligent electronic solutions; employed in their networks, and particularly at stations and in operational control rooms.

However, to date, most if not all approaches for realising the 'intelligent solutions' have centred on the use of independent, point technologies; leaving operators faced with a number of separate consoles from which to manage their networks. This can result in operator fatigue and impact the performance of the railways.

The optimum approach is to have a fully integrated system that enables rail operators to control centrally all of their operational and retail telecommunication assets. Such a solution has been devised by systems integration specialist Hima-Sella.

In safe hands

Established in 1974, Hima-Sella is recognised for its 'engineered solutions' for safety, control and automation applications. The company

is active in the oil & gas, petrochemical, rail, steel and power industries, and current services include completely integrated systems, panel building, sub-assemblies, product development and on-site support. Worthy of particular note is that in 2001, Hima-Sella received the first CASS certificate; awarded for functional safety management in accordance with IEC 61508.

Recent multi-million pound contracts won by Hima-Sella in the rail sector, in which the company has been active since the early 1980s, include the supply of SDO/CSDE for the entire Sub Surface Line Network of London Underground and the supply of an Integrated Communications Control System for UK Rail Network.

Using proven commercial-off-the-shelf (COTS) software technologies, Hima-Sella has recently designed a solution capable of providing a simple and effective common point of control (for network operators) via a fully integrated human computer interface (HCI).

Utilising industry proven SCADA software and hardware, Hima-Sella's 'integrated Communications Management System' (iCMS) toolset is based on a client-server arrangement, which allows for multiple users and which affords high integrity through the server being

of a dual redundant RAID architecture.

The HCI user interface has been designed in line with well-known industry standards (E1050 A2) to provide flexible and fully configurable applications. This ensures that an installed solution will meet the necessary human factor requirements of a modern operational control point.

Operational & performance benefits

When developing its iCMS toolset, Hima-Sella set out to ensure that the integration of new and/or existing communication systems would result in several beneficial gains; gains that could be categorised as either **Operational** or **Performance**.

Operational benefits include: a common point of control; an effective user interface; a simplified routine of operation; reduced operational training; and retained sub-system individuality. **Performance** benefits include: assisted control functionality; improved monitoring of assets; the flexibility to undertake independent system upgrades; being engineered to recognised standards; and improved system reliability.

Taking into account the engineering

approach, and observing the key beneficial objectives, Hima-Sella developed its iCMS product as an integrated solution for three key applications, namely:

- Management of retail telecommunications (station management);
- Management of operational telecommunications (line management); and
- Effective Monitoring and Operational Assets (SCADA & asset management).

Station management

Traditionally, rail stations and large transport interchanges have been supplied with a variety of telecommunication systems. These have been procured, designed, engineered and installed in isolation, resulting in relatively cluttered and, by extension, ineffective operations rooms.

The approach from Hima-Sella to this environment is to utilise its iCMS application to provide a single point of control for all existing and new communications infrastructure. This replaces the traditional multi-console operations position with a simple, efficient and cost-effective solution.

Operators are presented with the direct control of station communications equipment via a touch screen HCI workstation. Simple station area maps are populated with active icons that respond to a strict alarm and event regime when an asset becomes active. These are controlled via dedicated operational menus for each sub-system. Typical station communication sub-systems include: CCTV; Public Address (PAVA); PC Digital Voice Announcers; and Passenger Help Points.

The iCMS application can enhance operational awareness of assets, not previously monitored, by the use of its SCADA package. Hima-Sella, through its HSD10000 Remote Terminal Unit (RTU), can utilise Programmable Logic Controller (PLC) technologies to provide extensive remote monitoring of station sub-systems equipment. These can be installed in equipment rooms around the station to gather performance and availability data on non-communication assets such as: fire evacuation systems; lifts & escalators; ticket machines; fan & ventilation systems; and station power supplies.

By centralising the provision of this information, operational personnel can maximise the availability of all station assets, employing maintenance activities immediately.

This leads to the delivery of a more efficient and effective service, as required by the modern transport interchange.

Line management

Like stations, line control rooms or Service Control Centres (SCC) have suffered from an independent approach to the delivery of their operational systems. A typical line controller may have four or five communications assets to manage as well as dealing with the safe operation of the signalling system. Quick, effective and correct operation of these assets is essential to providing a good, safe service.

Whilst integrating all of these systems would be beneficial, it is important to recognise the limit to which integration should be applied.

For SCC applications, integration should be limited to the communication systems. Integrating a signalling system directly with the communication systems is achievable but would result in the communication assets being engineered to a far greater level of safety than required. The objective for SCC installations is to move towards providing control of the railway via two user interfaces – instead of the traditional five or six.

Adapted to meet the requirements of line management, Hima-Sella utilises its iCMS solution for the common point of control for all operational communication systems.

The flexibility of the HCI design means that the iCMS solution, even though supplied as a separate system, can be engineered so that its appearance is similar or identical to that of the signalling system. This approach of commonality reduces the level of training required by personnel as mimic layouts, alarm & event regimes and menus are familiar.

However, care is taken during the design process to ensure that operators can identify which system appears on which console. Typical operational communication assets that can be integrated include: Signal Post Telephones (SPT); Tunnel Telephones (TT); Train Radio (GSM-R); Long Line Public Address (LLPA); Long Line Closed Circuit Television (LLCCTV); Customer Information Systems (CIS); and Standard Telephone Networks (such as PABX).

The application of iCMS for line management can be enhanced with the use of the HSD10000 RTU equipment to

gather information on the performance and availability of assets such as: traction earth detection; signalling, telecommunications and traction power supplies; tunnel ventilation systems; and station system alarms.

Effective monitoring

All of the information generated within the iCMS, whether supplied as a solution for station or line management, can be enhanced with the use of third-party Data Warehouse and Performance Management and Information Systems (PMIS).

These applications can be fed directly with the event and alarm data captured by the iCMS SCADA facilities and used to generate operational trending and reports; and many rail operators are already exploring the use of combining real operational data with IT performance tools to assess how well the railway is operating.

Conclusion

The Hima-Sella iCMS solution has been developed using industry-proven software and hardware technologies. The iCMS application utilises a 'COTS' software toolset, developed in a variety of industrial SCADA applications.

Already in operation in the UK rail industry, the software product has been used to integrate retail telecommunications assets such as CCTV and PAVA, as well as the management of SCADA information.

To enhance its solution for the management of line communications, Hima-Sella has integrated its iCMS product with the Funkwerk DIKOS 310 solution of telecommunications. This provides effective control, routing and management of all operational telephony such as SPT, TT and PABX applications.

The development of iCMS has been achieved by Hima-Sella through utilisation of proven market technologies, existing product partnerships and the company's experience in the delivery of integrated safety critical and control applications. ■

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See Hima-Sella at Railtex on Stand G41

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