TT Electronics

HMI Solutions

For Rail

HMI technologies for Rail

Control Panel Assemblies

Fully customised and integrated control panels with multi-discipline design and manufacturing expertise to provide fully assembled and tested units. Using the latest HMI technologies, we provide a customised service, full system integration and cost reduction.

- **Design and approvals support**
- **PCB assembly**
- **Integration and build**
- **Incorporating capacitive and membrane switch technology, slider controls, joysticks, tracker balls, rubber keypads, touch screens and displays**

Thin Film Backlighting

Patented thin film backlighting technology to drive customised illuminated control panels and display solutions that can isolate illumination providing a range of options from flashing sequences, secret-until-lit signage and and animated colour changes.

- **Low profile, typically 1.5mm**
- **Low weight**
- **Low power consumption**
- **Up to 13mm panel thickness using glass, acrylic or polycarbonate for hostile environments**

Capacitive and Resistive Touch Technology

Design and integration of both Projected Capacitive and Resistive touch technologies into our customer's interface requirements.

Projective Capacitive

- Innovative technology
- Reverse bonded to robust, waterproof and vandal resistant materials, including acrylics and polycarbonates up to 6mm thicknesses
- No moving parts. Easy to clean
- Multi-touch and gesture control
- High quality low profile backlighting in a thin package size

Resistive

- Established technology widely used in rail applications
- Haptic feedback
- Multiple construction methods available
- Active or passive switching
- Backlit options available including NVIS

Membrane Keypads

Fully customised membrane keypads with or without PCB integration and control panel assemblies.
We can incorporate almost any interface technologies including capacitive glide pads, joysticks, tracker balls, touch pads, mechanical switches and touch screen solutions. Materials include Polyester (textured, gloss or chrome effect finish), PVC (textured or gloss finish), Polycarbonate (textured or gloss finish) and Stainless Steel foil (brushed, etched and printed).

- **Sealing to IP65, IP67 or IP69K**
- **Tactile or non-tactile key response**
- **Dome, pillow or rim embossing**
- **Chemical and UV resistant overlay materials**
- **RFI / EMC / ESD protection**
- **LCD module integration**
- **PS/2, USB keyboard encoding**

Rail, Rolling, Stock, Transport Infrastructure, Access Control and Communication

As market leaders in design-led HMI solutions, we deliver proven technologies to meet global rail industry specifications.

We provide complex and innovative interface solutions including multi-technology integration into sub-assemblies or fully assembled and tested control units.
We provide a complete design, prototype, manufacturing and test, fully managed from concept to delivery.

We have a proven track record in the demands of the rail, rolling stock and transport infrastructure sectors where a rugged, reliable and functional solution is required.

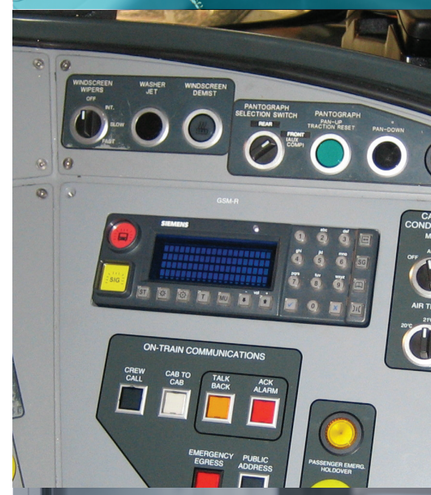
Our products are installed on global rail networks and rolling stock including Eurostar, Netherlands Rail, Network Rail, London Underground and Australian Rail.

Full certification to industry standards:

- EN50155:2001 Electronic equipment to be used on rolling stock
- BS EN61373:1999 Railway applications, rolling stock equipment, shock and vibration tests
- EN50121-3-2:2000 Railway applications, electromagnetic compatibility – Part 3-2 rolling stock, apparatus

Applications

- GSM-R communication
- Cab (GUI) panels
- Cab switch panels
- Access control switches
- Turnstile interfaces
- Platform information systems
- Ticket machines
- Emergency call panels
- Seat control panels
- Mood lighting



HMI Projects for Rail

GSM-R Communications Control Panel

Delivery of mobile GSM-R communications control panel and a fully tested, ‘ready to run’ HMI solution for Siemens Mobility for Network Rail and Netherlands Rail. Full compliance to EN rail standards.

Platform Intercom Panel

Design and manufacture of rail platform HMI solution installed on the London Underground which included next generation technology for emergency call and intercom. Design incorporated 6mm vandal resistant anti-reflective toughened glass, 15 inch capacitive touchscreen, capacitive switches and thin film backlit illumination.

Driver Cab Control Panels

From concept to delivery, we have over 30 years proven expertise in the design, manufacture and integration of control panel assemblies installed in train driver cabs worldwide. Designs incorporate capacitive and membrane switch technology, slider controls, joysticks, tracker balls, touchscreens and full PCB assembly and test.

HMI Keypads for Station Turnstiles

Integration of custom designed membrane keypads, capacitive switching technology and thin film backlighting solutions for access control used on transport infrastructure including ticketing turnstiles and point of display and communication systems.

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