



# Level Crossing Safer Track Worker System

There remains an ongoing problem with members of the public either on foot or in vehicles entering our worksites whilst works are in progress. In-turn, this puts both our workers and those members of the public at risk of injury. HRS's Level Crossing Safer Track Worker System has been designed to:

- > Prevent incursions by delivering targeted information to members of the public (via interactive signage etc.)
- > Deter potential trespassers by warning them that they are entering a restricted area
- > Detect incursions, providing workforce with instant visible and audible warnings of any potential threat
- > Enable a controlled environment for access and egress of the worksite

- > Provide a complete audit of all deployment information including incursions and safety alerts, interactions with the public and other information requested by Network Rail, it's regions, routes and supply chain.

## Operating Model

Our system integrates with existing assets and working practices with little or no change to equipment or processes and uses highly resilient technology that has been operating on safety critical infrastructure for many years. For example; should a vehicle crash through a road closure then all site alarms would be activated instantly regardless of distance or geography.

The system has been designed specifically for Network Rail's operating environment and standard operating procedures.

# How It Works

The Level Crossing Safer Track Worker System uses a combination of technology and internet-enabled physical assets to monitor the site, alert workers, and provide customer information. Prior to the works commencing on site, a digital map of the site (a geozone) is created on HRS' proprietary Internet of Things (IoT) platform. This ensures that the equipment works correctly, alerts only devices within the same site, and provides information to the people associated with that work zone.

When the site is live, Smart Cones are used at the closure points to create a closure across the road. These cones feature Intellicone-enabled lamps which incorporate motion-sensing equipment. At the road closure site, an Electronic Access Board and Customer Communication Terminal can also be used. The Electronic Access Board helps manage access and egress to site, while the Customer Communication Terminal provides information and a point of contact to members of the public. Located with the site staff in the working area are the Portable Site Alarms (PSAs).

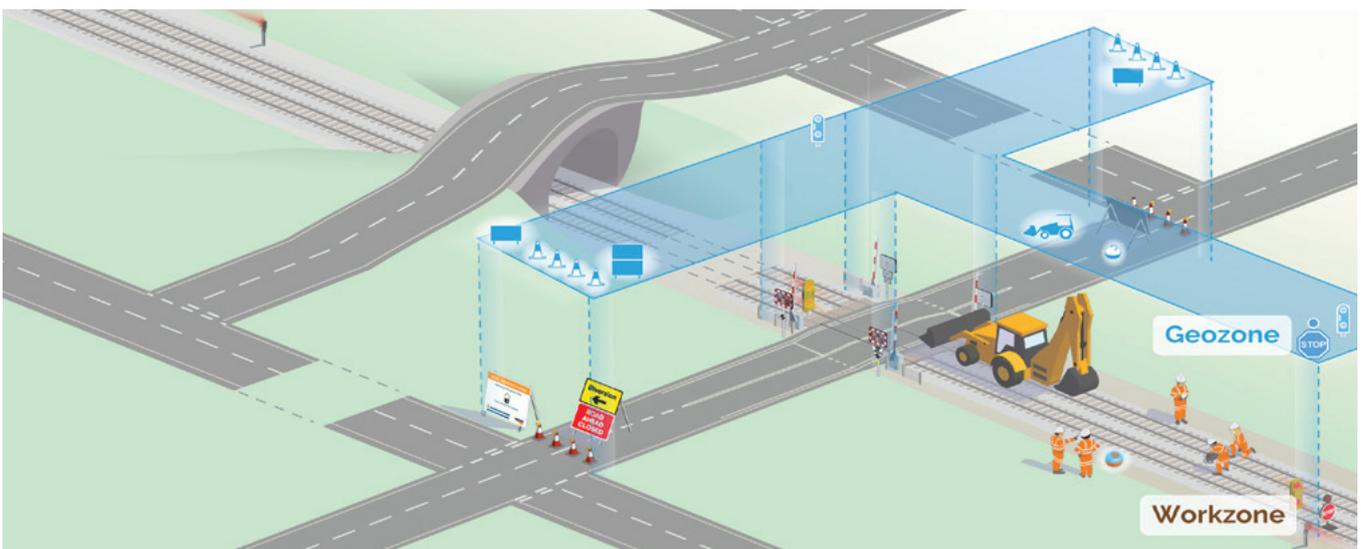
## On Site

Once the equipment is live, it connects to HRS' cloud-based device management platform. The Smart Cones form a digital perimeter around the site and connect to the PSAs. If they detect any motion – such as being moved out of the way for a vehicle to pass – they instantly emit a loud alarm to deter incursions whilst sending a signal to the PSAs, which then

activate an audio-visual alarm to alert site workers. These warnings give the site staff time to reach a place of safety if an errant vehicle were to breach the work zone and ensures workers are aware of incoming moving works vehicles.

If workers request access to site using the Electronic Access Board, a responsible person can use the PSA to temporarily de-activate the alarm system to enable workers to move cones and access or egress site safely. All alarms and deactivations are logged for reporting purposes.

The Customer Communication Terminal is another way to prevent unauthorised entry to sites by providing members of the public a quick and convenient way to access help. The terminals can be configured to connect customers to on-site staff or to a control room for help via an intercom. Alternatively, the intercom can play a pre-recorded message which can be updated remotely if needed. Another unique feature of the terminals is that they can display a QR code that links to diversion information. When scanned with a smartphone camera, the code will open the diversion route within a mapping application such as Google Maps. This can help reduce the frustration members of the public feel when faced with a level crossing closure by providing them with the information they require to navigate around the closure. Each terminal sign face is easily customised to meet client requirements, for improved brand recognition.



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## Live Remote Reporting

Each work zone is available to view on our on-line customer portal. The physical assets are all tracked and can be viewed at any time from any internet-enabled device. This shows a live map of the site, including the equipment status and if there are any current alarms. This can also provide data relating to the start and end times of level crossing closures, requests for access, egress and help, and the number of sensors active on site can also be displayed. If a breach occurs, the timing and location of these are recorded. In addition, HRS provides Application

Program Interfaces (APIs) that allow the system to be integrated with client systems for automatic reporting.

Historical and real-time information are powerful tools and can help drive significant operational efficiencies. For example, incursion maps can be created to understand where incursions are taking place and identify any hotspots. This can help inform future works in the area, as well as best practice on other sites.

## The Equipment

All HRS services are connected via secure and resilient cloud-based systems which have been operating faultlessly for many years in harsh environments and working conditions. These systems have a proven track record and have been shown to reduce site incursions by members of the public by 50%, whilst also improving compliance with required work access protocols. The physical assets are designed to be easy to deploy, being geo-located prior to the works commencing so that they self-configure when placed within a pre-defined work zone. Set up is as simple as turning them on.

### Portable Site Alarm (PSA)

The PSAs are located with the workforce to warn them of a site incursion or site access by authorised vehicles. They connect to the device management platform and are triggered by any movement detected by the Intellicone-enabled lamps, or any approved requests for site access from the EABs. These visual and audible warnings are capable of being heard over plant and machinery.

### Specification

- > Waterproof robust housing (IP66)
- > Onboard GPS and quad-band GSM/GPRS with multi-network SIM and private APN
- > Multi-tone siren with mute function at 95-98dB with frequencies designed to be heard over background noise and through ear defenders
- > Internal batteries with 40-hour life. External battery packs available that extend life to 500 hours

### Intellicone Dorman Lamp

Standard Dorman static lamps are converted into Smart Lamps by integrating HRS' proprietary motion sensor technology, which enables the lamps to detect motion. Deployed on traffic cones, the lamps have been programmed to detect movement but also designed to filter out and identify minor motion caused by weather conditions, such as a wind.



**Blue**  
Access request mode



**Yellow**  
Access granted mode (alarm temporarily de-activated)



**Purple**  
Alarm mode

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# The Equipment



## Customer Communication Terminal

The terminals are self-contained units that are designed to be mounted onto an A-frame for quick and easy deployment. Each sign face can be customised to display information the client feels is relevant to the works. They are fully rechargeable and may be combined with external battery packs for long-lasting operation.

### Specification

- > Waterproof robust housing designed to fit onto standard A-frame
- > Onboard GPS and quad-band GSM/GPRS with multi-network SIM and private APN
- > Microphone and speaker set suitable for outdoor operation
- > Ability to relay messages uploaded onto HRS portal on demand
- > Internal batteries with 72-hour life. External battery packs available that extend life to 500 hours
- > Customisable sign plate



## Electronic Access Board

The boards make it possible for workers to easily request access to site. Once access has been requested, the PSA situated within the site will issue an alert to notify the person responsible, who can then grant permission by pressing the access button on the control fascia. This will temporarily disable the electronic perimeter. The perimeter will re-arm on reset by the person responsible or automatically after 5 minutes.

### Specification

- > Waterproof robust housing designed to fit onto standard A-frame
- > Onboard GPS and quad-band GSM/GPRS with multi-network SIM and private APN
- > Microphone and speaker set suitable for outdoor operation
- > Ability to relay messages depending on action (i.e. person moving cones, person requesting access) and send alerts to responsible person on site
- > Internal batteries with 72-hour life. External battery packs available that extend life to 500 hours
- > Customisable sign plate

## About HRS

HRS's mission is to provide technology-based safety solutions that will help to significantly reduce injuries and fatalities in temporary work zones, whilst providing the travelling public with accurate real-time information. Our digital solutions have been proven to safeguard workers on many occasions whilst also delivering net cost savings in temporary traffic management.