



The Customer – Sydney Trains

A major new central control room (CCR) was needed to enable train operators to visually monitor, minimise and manage delays. When incidents did occur on the Sydney Trains network, rail commuters will receive swift and accurate information.

ICP Global was chosen in 2018 by Sydney Trains for the design, integration and set up of a new KVM matrix desk control facilities within the new ROC : Rail Operations Centre, located within Alexandria NSW. The proposed solution must operate “24x7” with emphasis on reliability and redundancy.

With the integration of the IHSE Enterprise matrix KVM control systems, the ROC brings together three separate Sydney trains divisions under one roof: Rail Management centre and two signalling controller divisions.

The entire ROC project is valued at just under \$300 million and due to be fully operational by June 2019.

The Challenge

Integrating two levels of the ROC, Level_2 two data centre rack rooms, and Level_3 twenty-nine various operator desks configurations in various user system configuration scenarios. The envisaged enterprise KVM matrix solution was to address:

- connecting and switching multiple Sydney Trains OVDS (Operational Visual Display Screen – USB keyboard & mouse switching only) and non-OVDS systems (standard WinTel based systems) to multiple operator desks.

- Real-time sharing of systems.
- mixture of fibre (Level_3 CCR operator desks) and CATx (Level_2 two data centre rack rooms) cable connections.
- Using a single keyboard and mouse set, desk operators could access and control multiple systems displayed on their desk.
- Any localised desk operators' systems looped back into the enterprise KVM matrix solution allowing the single keyboard a mouse set to access it as needed with the multiple systems already displayed on their desk.
- Desk operators not only accessing their standard workflow configuration but also accessing systems outside of their standard workflow configuration by inserting a non-standard workflow system onto a predefined operator's screen - various system switching scenarios:

The single keyboard and mouse set would “free-flow” over the newly inserted system as well as the standard systems within the reconfigured workflow.

The amended workflow to be reconfigured back to its original standard workflow configuration.

- Use of a simple integrating control device to initiate the insertion of a non-standard workflow system within an operator's desk workflow configuration and then to revert back to the original workflow configuration: various system switching scenarios.
- Remote real-time KVM matrix system monitoring over IP.
- Real-time KVM matrix redundancy for 24x7 uptime.

The Solution

The solution required the installation of two IHSE Enterprise K480-160 (160 port) multi-user multi-system KVM matrix switches within Level_2 data centre rack rooms CER_A and CER_B and extending up to CCR on Level_3 using a combination of both CATx and fibre cabling.

The K480-160 KVM matrix switch allows both CATx and fibre cabling to be integrated through its CATx and fibre IO Slot boards. Both rack rooms within Level_2 are internally wired with CATx cabling allowing non-OVDS and OVDS systems to be attached to the CATx IO boards (480-C8). The 480-C8 boards internally connect to the fibre IO boards (480-S8) that lead up to Level_3 CCR operators over fibre cable.

The CATx system CPU transmitters located in CER_A and CER_B are housed within a 1RU 6 slot chassis (474-BODY6) allowing up to a maximum of 6 transmitters.

Connected over fibre from CCR Level_3, CON (console) and localised CPU units installed within the operator desks are housed within a 1RU 474-BODY6 chassis. Localised desk operator systems have a fibre CPU that is looped back to Level_2 providing K480-160 KVM matrix integration and access.

To achieve a single set flow keyboard and mouse free-flow environment, operational desk CON units are integrated with the IHSE U-Switch 4 Port keyboard and mouse unit. This allows a single keyboard and mouse set to be used across the multiple systems attached through the desk operators CONs.

The K480-160 multi-user multi-system KVM matrix switch system has been designed to allow desk operators to access and display systems that are not within their standard desk operational workflow on pre-designated desk screens.

This allows the desk operators to invoke a system within rack rooms CER_A or CER_B, or a localised system, and display and interact with that invoked system on its pre-designated screen. This also allows the invoked system to be instantaneously switched and shared across multiple operator desks.

In order to effortlessly and smoothly manage the operator's workflow, desk operators can access various non-OVDS system switching scenarios through the IHSE four button X-Key USB device, or in the case of operational desks 25 and 26, the integrated X-Key and/or OSD (On Screen Display) menu. OVDS system switching is invoked through the integrated Extron TLP touch screen.

The X-Key buttons and TLP touch screen app icons are pre-programmed through the IHSE Tera Tools macro and API features. Once pressed, the keyboard, mouse and video signals for the pre-programmed system(s) located within rack rooms CER_A and CER_B are connected to operator's desk local CON unit(s). Both the X-Key and TLP touch screen have a reconfiguration feature that resets the operator's desk to their initial configuration.

The Benefits

Integrating the IHSE U-Switch, a single keyboard and mouse set shared between screens and systems reduces the number of computer devices on the operator desks. This makes it simpler and quicker for operators to interact across separate computers without having to choose between several keyboards and mice.

The use of the X-Key and Extron touch screen control switching devices allows operators to quickly switch between different pre-programmed operational systems scenarios. These pre-programmed devices allow for a smoother workflow when alternating between various systems.

The K480-160 multi-user multi-system KVM matrix switches are modular redundant systems comprising of an internal main backplane allowing the insertion and removal of the following hot swappable components providing 24x7 uptime:

- 480-C8 – CATx 8 port IO board
- 480-S8 – Fibre 8 port IO board
- Dual power supplies
- Fans
- Fan filters
- Controller board

The entire IHSE ROC solution can be administered and controlled through the Graphic User Interface (GUI) based IHSE Management software tool kit: Tera Tool. The Tera Tool resides on any Microsoft

based PC system, or laptop, interfacing to the K480-160 over IP through the Sydney Trains network or as a direct connect.

The IHSE Tera Tool management software allows for:

- Setting up and/or interrogation of CON (User Station) or CPU (Transmitter – PC) units
- setting up users : user accounts and their associated systems
- monitoring critical point or failure alerts through various SNMP agents and Syslogs
- K480-160 system health check queries
- firmware updates as required
- Application and integration of third party APIs – Extron

ROC Various Operator Desk Configurations



ROC Solution Overview

