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# ORBIS

## Bench Test Equipment for Testing Critical Railway Components

**T**ransit authorities rely on bench test equipment (BTE) to ensure critical components affecting train safety and availability are in a state of good repair.

Due to a consolidation of BTE suppliers in recent years, transit authorities are left with few options to choose from and standardised systems provide limited options for customisation.

ORBIS, a US-based veteran-owned small business is disrupting the market and achieving strong growth by offering solutions that are fully customised to the unique needs of each application. ORBIS BTE solutions also provide maximum flexibility and a lower total cost of ownership.

### Bench Test Equipment

The term bench test equipment (BTE) refers to automated test equipment used to perform full functional testing of critical components in the rail industry.

Brake controllers, master controllers, operator interfaces (aka hostler panels), and some circuit card assemblies (CCAs) are examples of critical components. These are often labelled as line replaceable units (LRUs) as it is typically more cost-effective to replace rather than repair the units based on time, expertise, or concerns about voiding manufacturer warranties.

### Consultative Approach

ORBIS engineers go beyond the testing requirements to uncover the unique needs of each customer



and application. Unlike competitors that offer variations of a standard tester, ORBIS delivers solutions that are purpose-built to help customers achieve complete test coverage while taking into account other factors such as user skill levels and the transit authority's maintenance strategy. ORBIS BTE systems are not configured by choosing from standard options in a catalogue.

#### ORBIS Flexible Bench Test Equipment

ORBIS's customers agree. The **principal equipment engineer at a major US transit authority described her experience with working with ORBIS** as follows:

*"ORBIS worked well with our supplier to deliver a BTE that fit our needs. It was a rewarding experience and their attention to detail and listening to our needs was evident during our final acceptance of the BTE."*

### Maximum Flexibility

Customised solutions are only part of what makes ORBIS unique. Their solutions also employ a number of state-of-the-art features to maximise flexibility and minimise total cost of ownership.



### Customisable Form Factor

Unlike universal test systems, ORBIS BTE solutions come in all shapes and sizes and are designed to maximise functionality while minimising floorspace. A traditional full-height rack mount cabinet, full-size workbench with an integrated instrument rack, or a workstation designed collaboratively with the customer are just a few examples.

### Modular Hardware

To minimise dependence on a single vendor and allow for incremental upgrades over time, ORBIS's flexible BTE utilizes PXI modular instrumentation. PXI, which stands for PCI eXtensions for Instrumentation is a modular PC-based instrumentation platform designed for high-performance measurement and automation applications requiring a rugged form factor. There are currently more than 1,500 available modules from multiple vendors such as National Instruments and Keysight.

### Mass Interconnect

An interface test adapter (ITA) is a mass interconnect solution that provides a reliable connection between the instrumentation and the device under test (DUT). Test fixtures, along with unit-specific cabling and connectors can be swapped out in minutes.

In order to retain the modularity and flexibility of the PXI platform, it is important to match the instrumentation with the right interconnect system. ORBIS utilises the SCOUT interconnect system from MAC Panel, which incorporates PCBs and flex circuits to eliminate custom wiring connections between the DUT and instrumentation.



PXI Instrumentation with MAC Panel's SCOUT® Mass Interconnect Solution



Controls are highlighted in blue to guide the system operator



Orbis Labs BTE - CLS: ON MDS: MAN. FWD OTPB: OFF DM: OFF MH: EMER - FAT Step 11

Rotate the Mode Direction Switch clockwise to the MAN. FWD position.

Press and hold the OVERTRAVEL push-button while moving the Main Handle upward to the EMER position.

Release the OVERTRAVEL push-button.

Back OK Abort

By utilising an ITA in most designs, ORBIS makes it easy to test multiple LRUs or CCAs on a single BTE system. This approach often reduces the total number of test systems needed, lowering both capital and maintenance costs.

## User Interface

ORBIS has developed a modular and flexible software architecture that can be reused, which reduces development time while allowing for a high degree of customisation. ORBIS's flexible BTE software also allows its end customers to modify or create new tests without the need for programming.

ORBIS developed its flexible BTE software with the user in mind. The intuitive user interface guides the user through test procedures with a mix of written instructions and 3D images.

## Guided Troubleshooting

ORBIS designs BTE systems with the goal of replacing written manuals

and procedures. Existing procedures and domain knowledge is translated into software, helping new and less experienced users to be more productive in less time.

Intelligent sequencing allows the flow to change based on prior test results. For example, a failed test may launch a manual troubleshooting screen along with detailed instructions to pinpoint the source of the failure to the board or component level. Repairing rather than replacing a unit can significantly reduce spare parts costs.

ORBIS's BTE solutions also provide easy access to technical documentation such as schematics and troubleshooting guides when they are needed, saving time and reducing the need for printed manuals.

## Exceptional Service and Support

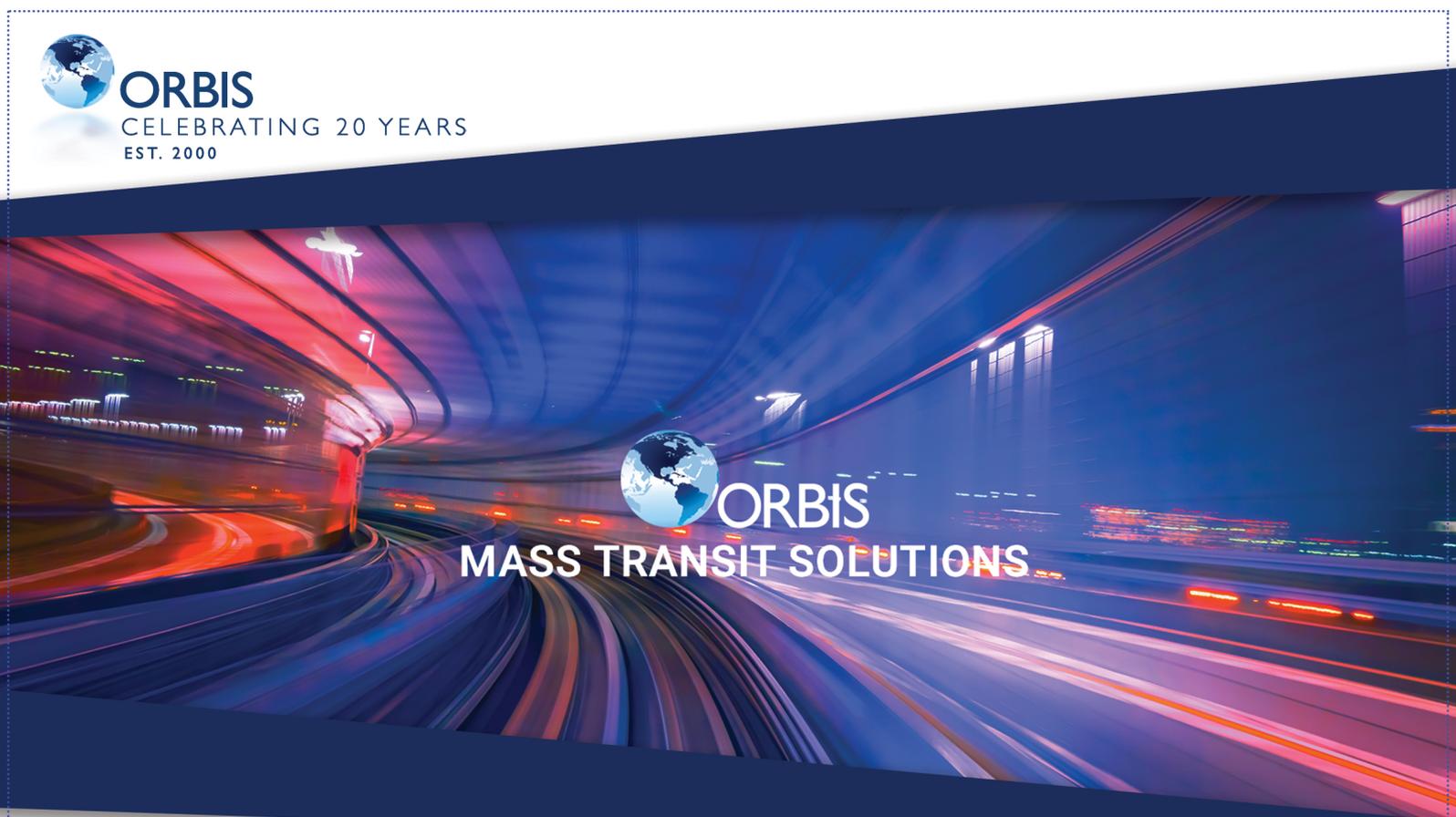
The team at ORBIS is committed to customer success.

All systems are designed and manufactured with strict adherence to their ISO9001:2015-certified quality management system. ORBIS provides ultra-responsive customer support which includes direct communication with project engineers.

Customers agree. **According to an engineer at a Tier 1 supplier** "ORBIS provided exceptional service and proved to be instrumental in our success. ORBIS consistently went above and beyond our expectations to achieve – and even exceed – the project's requirements and deliver on time."

## Final Thoughts

ORBIS's commitment to delivering flexible BTE solutions is centred around listening to their customers to determine the best solution for their specific needs. Please visit [www.orbisinc.net/masstransit](http://www.orbisinc.net/masstransit) to learn more or contact Bryan Nadeau at [BryanNadeau@orbisinc.net](mailto:BryanNadeau@orbisinc.net) to discuss how they can help you be successful with your next project.



**ORBIS**  
**MASS TRANSIT SOLUTIONS**

## ONE SIZE DOES NOT FIT ALL

### WHAT WE PROVIDE

**BENCH TEST EQUIPMENT**  
ORBIS develops bench test equipment for ensuring critical assets are in a good state of repair.

**R&D TEST STANDS**  
ORBIS helps Tier 1 and Tier 2 suppliers bring products to market faster by providing automated test systems for product verification and validation.

**ENGINEERING SERVICES**  
ORBIS provides reverse engineering and design services to help organizations overcome obsolescence challenges and extend program lifecycles.

### CUSTOMIZED BENCH TEST EQUIPMENT (BTE) SOLUTIONS FROM ORBIS

Building on a scalable hardware and software platform, ORBIS Flexible BTE solutions are fully customized for each Line Replaceable Unit (LRU) or Circuit Card Assembly (CCA). Our guided setup and diagnostics reduce or eliminate the need for external documentation and enable technicians to repair units in the field and lower maintenance costs.

#### SOLUTION BENEFITS:

- Test multiple LRUs and CCAs on a single tester
- Easy-to-use with guided troubleshooting and repair
- Add or modify tests without programming
- Connectivity with enterprise databases and asset management software

[WWW.ORBISINC.NET/MASSTRANSIT](http://WWW.ORBISINC.NET/MASSTRANSIT)

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