

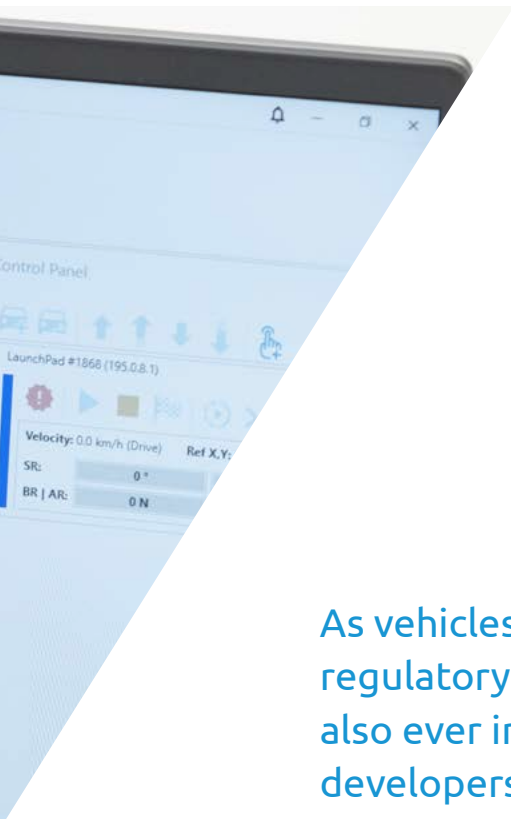
Ground Traffic Control™

Simplifying the management, control and monitoring of proving ground traffic.



Introducing Ground Traffic Control™





As vehicles become increasingly sophisticated, regulatory and consumer testing demands are also ever increasing. At the same time, vehicle developers are achieving a shorter time-to-market than ever before. Consequently, test teams are confronted with an exponential increase in the volume and complexity of testing and proving grounds have never been busier.

How do you manage this volume and complexity of test activity? Ground Traffic Control (GTC™) was developed to help you meet these challenges. GTC is a centralised software platform for monitoring and controlling a diverse range of test track traffic, including robot-controlled vehicles, human-driven vehicles, and ADAS target platforms.

Offering a comprehensive overview of all testing activities, it allows teams to monitor not only their own operations but also those of other teams sharing the facility.

It streamlines complex testing processes, provides features to reduce the risk of unwanted collisions and is scalable and upgradeable to accommodate future testing requirements.

Key features

GTC is a centralised management system to monitor and control proving ground traffic. The system is built within AB Dynamics' Track Applications Suite, our comprehensive track testing software ecosystem that includes all of our industry-leading applications.



High-level monitoring

GTC provides live tracking and visualisation of all connected vehicles and test objects, whether from mobile or fixed base stations. This feature ensures a live overview of all ongoing activities resulting in enhanced operator awareness.



Automatic system detection

GTC automatically identifies and integrates all AB Dynamics systems on the network – simplifying setup and enabling teams to get testing sooner.



Supports up to 20 connected systems

GTC can monitor and control up to 20 concurrently connected systems including robot-driven vehicles, driverless vehicles and ADAS target platforms.



Customisable interface

GTC allows users to tailor screen layouts to suit their specific operational needs. With support for multi-screen setups, teams can dedicate displays to different aspects of testing, enhancing monitoring capabilities and improving situational awareness.



Remote test abort

If a user detects a potential hazard, they can remotely stop a single test object or stop all managed test traffic with the press of a button.



Compatibility

GTC is compatible with a broad range of track testing equipment, including human-driven traffic, vehicles fitted with driving robots or our by-wire control system, and our comprehensive portfolio of ADAS target platforms.

The benefits of GTC™

Streamline test management

GTC provides centralised visibility of your proving ground test traffic, improving coordination and communication between test teams, enabling smoother operations and minimising delays.

Boost efficiency

GTC automates key aspects of test traffic management, reducing the need for manual intervention and enabling operators to handle more traffic.

Protect your assets

By actively monitoring all vehicles and platforms, GTC reduces the risk of collisions and damage in complex, high-traffic test environments.

Tailor to your needs

GTC is available in variants to fit your operational needs and budget. GTC Core is ideal for small-scale operations and GTC Pro for advanced driverless durability testing and in environments where there are multiple teams concurrently operating.

Scale for future growth

GTC is built to scale alongside your evolving testing demands, supporting anything from small tests to complex, multi-vehicle scenarios.



Versions and applications

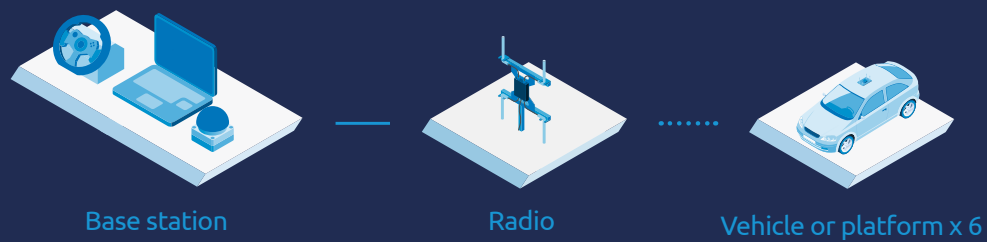
GTC covers a diverse range of applications and is particularly suited to durability, misuse and ADAS testing. To ensure the solution best suits your specific requirements we offer two tailored versions: GTC Core and GTC Pro.

GTC™ Core

GTC Core is a streamlined, software-only solution that provides essential tools for managing driverless vehicles and ADAS platforms. GTC Core enables one user to manage up to six connected systems.

It is best suited for small-scale testing with driverless vehicles or platforms and is perfect for regulatory and consumer ADAS test scenarios.

Typical GTC™ Core setup



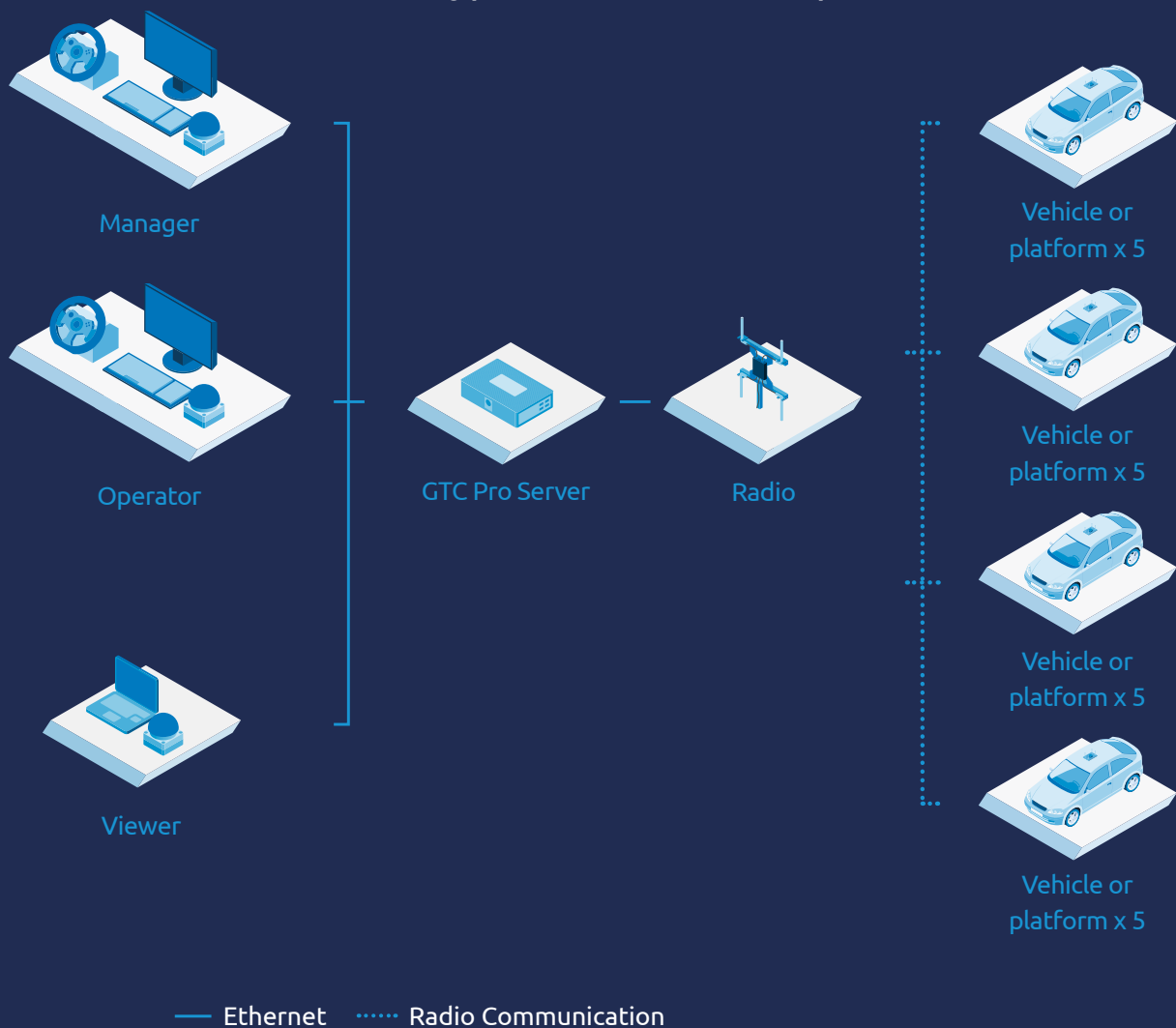
— Ethernet Radio Communication

GTC™ Pro

GTC Pro is our combined software-hardware solution. Its GTC Pro Server provides enhanced capabilities for managing multi-vehicle test scenarios, enabling up to 12 base station users to manage up to 20 concurrently connected systems. It also offers real-time collision checking and enhanced traffic management features.

GTC Pro is designed for large, complex testing environments with multiple vehicles and platforms, or multiple test teams operating in the same area. It is perfect for complex ADAS and AV scenarios, mileage accumulation, durability and misuse testing.

Typical GTC™ Pro setup



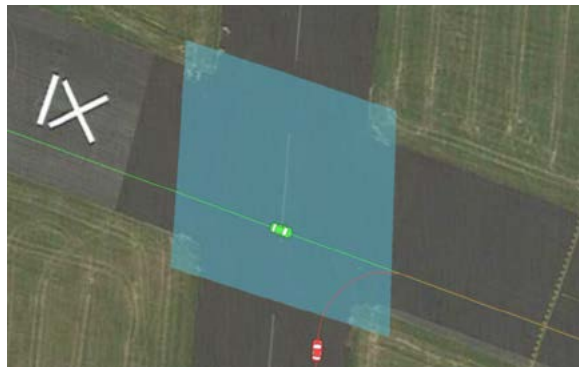
GTC™ Pro risk mitigation features

GTC provides a range of features to mitigate the risks associated with track testing. Alongside GTC Core's enhanced situational awareness and the ability for operators to remotely stop all test traffic, GTC Pro provides additional powerful safeguarding features:

Geofenced zones

GTC Pro allows users to define virtual zones within the proving ground.

These geofenced areas enable users to define zone-specific rules, for example, enabling collision checking between vehicles or limiting the number of vehicles that can enter a zone, as shown in this example.



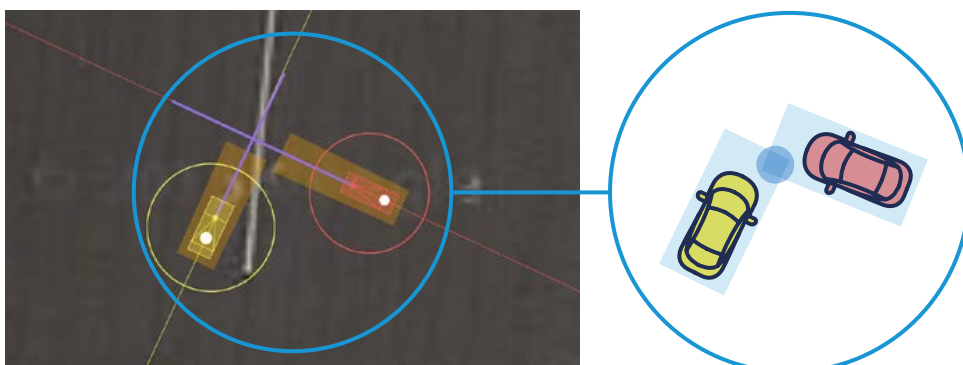
Real-time collision checking

Using precise GNSS/IMU data, GTC Pro monitors the position, speed, and heading of each vehicle or platform and intervenes to automatically stop objects when an unwanted collision is imminent. This helps to reduce the workload of the system operator and is an essential capability when running scenarios with high traffic density.

GTC Pro offers real-time collision checking based on both the position of vehicles or platforms and their planned paths.

Position-based collision checking

The Stop Zone feature predicts where vehicles will stop, based on their current positions, trajectories and Abort Stopping parameters. The moment the Stop Zones of any two vehicles overlap, they will each receive an Abort Stop command and automatically stop to avoid a collision.



Position and path-based collision checking

The Path Course feature looks at the future paths of the vehicles and identifies if they are on a collision course. Collision checking only intervenes when necessary and slows the vehicle down by as little as required to maintain the desired separation. In this example, the red vehicle slows to let the green vehicle through the junction and once the green vehicle is sufficiently ahead, the red vehicle follows.



Abort stop control

For immediate intervention, all user levels can use an abort button to halt all vehicle and platforms instantly, ensuring quick responses to unexpected situations. This feature also applies to GTC Core.

User authority management

GTC Pro's password-protected user levels ensure that safety-critical parameters can only be modified by authorised team members, while providing flexible options for managing your team.



Managers can carry out all functions as well as configure equipment and define test parameters



Operators can run tests within the pre-configured test environment with a streamlined user interface



Viewers can only monitor traffic and send Abort Stop commands

Specification

Key features

	GTC™ Core	GTC™ Pro
Intuitive start, stop, abort, trigger and rejoin controls	✓	✓
Maximum number of concurrent systems connected	6	20
Maximum number of concurrent base station users	1	12
Enhanced map display with support for Bing maps	✓	✓
Configurable data panel	✓	✓
Automatic detection of all systems on network	✓	✓
High-level monitoring of all systems on the network	✓	✓
Products supported		
/ Driving robots (PowerPMAC-based systems)	✓	✓
/ Flex-0™	✓	✓
/ LaunchPad™	✓	✓
/ GST™	✓	✓

Setup and display

	GTC™ Core	GTC™ Pro
Computer hardware	PC	PC and GTC Pro Server
User mode		
/ Individual	✓	
/ Manager		✓
/ Operator		✓
/ Viewer		✓
Optional Python scripting		✓
Recommended installation		
/ Mobile base station	✓	✓
/ Static control centre		✓
Interface customisation		
/ User definable vehicle colours and icons	✓	✓
/ Custom screen layouts	✓	✓

Setup and display (continued)

	GTC™ Core	GTC™ Pro
Real-time information display		
/ Map view and vehicle cards	✓	✓
/ Customisable live robot data	✓	✓
/ Live inter-vehicle grid	✓	✓
Compatible accessories		
/ USB abort button	✓	✓
/ Logitech driving force racing wheel and floor pedals	✓	✓
/ Microsoft Xbox controller	✓	✓
/ Logitech Extreme 3D Pro joystick	✓	✓
/ Thrustmaster USB joystick	✓	✓

Additional GTC Pro features

Real-time collision checking

Position-based	GNSS/IMU collision detection system monitors vehicle and platform position, heading and speed to automatically avoid collisions
Position and path-based	Enhanced collision checking taking account of the planned path of vehicles and platforms

User-configurable Rule Zones

- / Limit the number of vehicles in an area
- / Set course-specific speed limits
- / Customise collision checking

GTC™ Pro Sever

Dimensions	187 x 137 x 42 mm
Weight	0.86 kg
Temperature rating	Ambient operating temperature: 0 to +45 °C
Power input	12V 2A supply provided by AB Dynamics

Options and upgrades

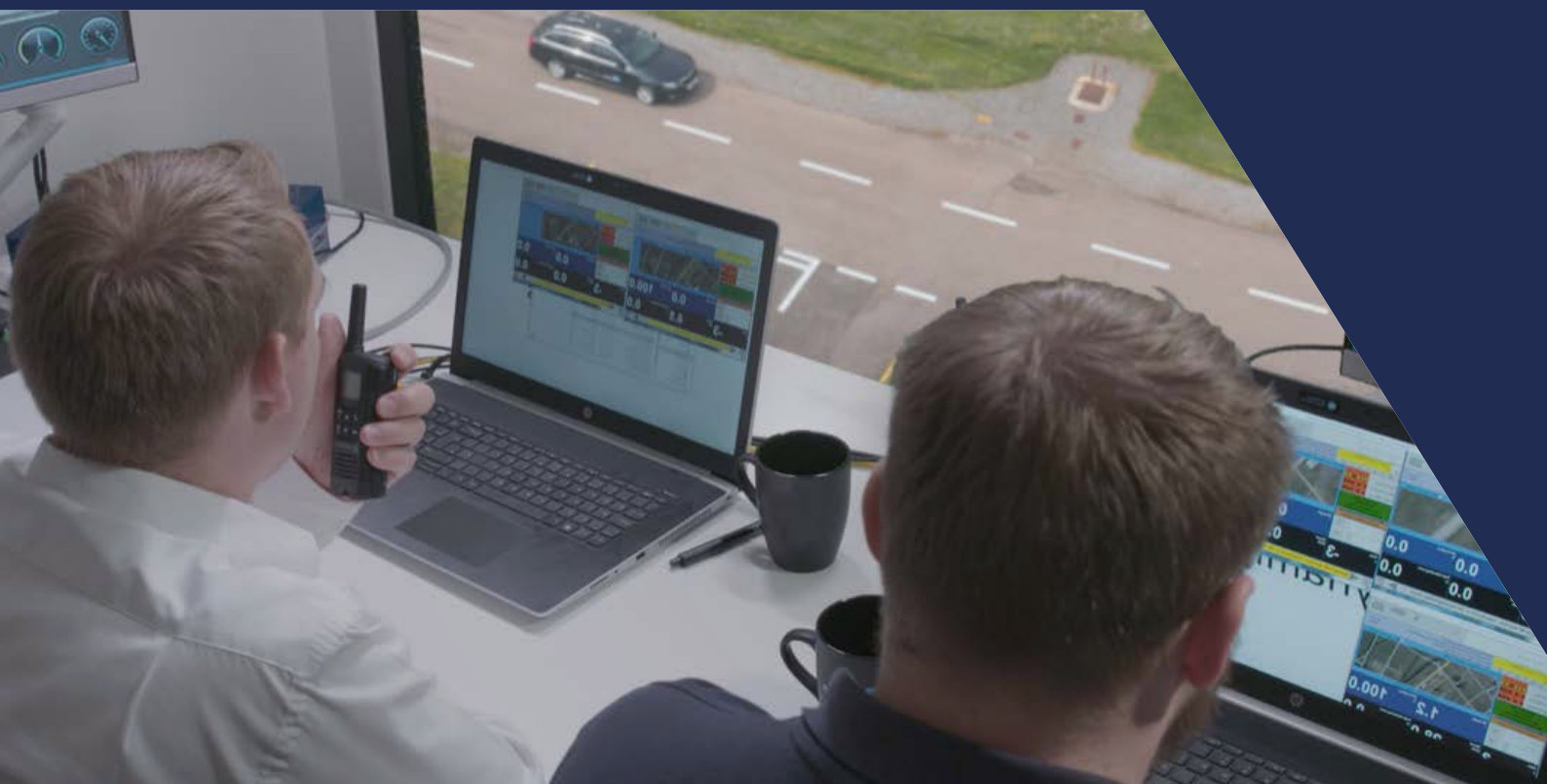
There are a range of options and upgrades available with GTC Pro to tailor the system to specific testing requirements.

Python scripting

Available as an upgrade, Python scripting enables the integration with third-party applications and the customisation of warnings and alerts.

Concurrent user options

With the concurrent user upgrade, multiple user types can operate the system simultaneously. For example, the Operator user level can be used by the test team on the ground while the control tower staff use the Viewer profile.





GTC Remote™

The GTC Remote is a wireless remote control for single-platform testing. Acting as a compact, hand-held base station, it provides all the basic features necessary to undertake simple ADAS test scenarios. It uses simplified workflows and includes a touchscreen user interface, vehicle control input device, radio and e-stop. It is particularly well suited to pedestrian testing as these are typically short-distance scenarios, where the platform can be visually monitored from a single location.

Warranty and support

GTC products are backed by a comprehensive support package. The standard one-year Silver support includes software updates and remote technical assistance via email, phone, and online. Hardware components come with a 12-month warranty, which can be extended to 24 months for added peace of mind.

AB Dynamics provides global support through a network of highly trained specialists, with dedicated support teams strategically located worldwide to ensure prompt and efficient assistance.



About AB Dynamics

When you choose a solution engineered by AB Dynamics, you're benefiting from proven hardware, trusted software, 40 years of knowledge and experience, plus unrivalled service and support.

Our range of automotive testing, verification and validation solutions encompass dynamics, suspension and steering characterisation, durability, advanced driver assistance systems and autonomy.

We pride ourselves on delivering solutions that enable the development of safer, more enjoyable, efficient, and eco-friendly vehicles. As a key partner to the global automotive industry, our customers include the top 25 vehicle manufacturers, Tier 1 suppliers, test facilities and autonomous vehicle developers.

As part of the AB Dynamics Group of companies, we offer a wide range of vehicle autonomy, simulation, and testing solutions. As a group, we enable customers to develop and test vehicles in laboratory and virtual environments, validate on the track before finally evaluating vehicles in the real world on public roads.



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