INTREPID
CONTROL SYSTEMS
www.intrepidcs.com

DRIVEN BY YOUR DATA

WE ARE THE EXPERTS

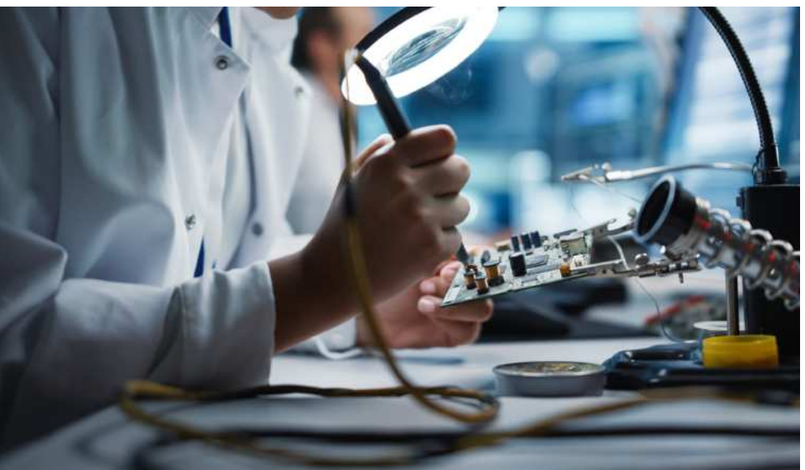
Established in 1994, Intrepid brings vast knowledge and experience of vehicle networks to provide simple and innovative solutions for your application needs. We provide cutting-edge software and hardware tools to support a wide range of sectors.

HERE TO SUPPORT YOU

Intrepid is well-regarded for its exceptional customer service, with a commitment to fostering strong relationships with our esteemed customers to meet their continuous needs. Our headquarters in Detroit are equipped with advanced technology, allowing us to produce our innovative product solutions in-house. Our specialised teams are on hand to provide support for your applications, including expert technical advice and training when necessary.

UNPARALLELED EXPERIENCE

Our team is comprised of experts from various backgrounds, including OEMs, Tier 1s, and other industry network specialists. We continually enhance our expertise by actively participating in key industry committees and working groups, ensuring we remain at the forefront of innovation.



APPLICATIONS

SERVING A WIDE RANGE OF INDUSTRIES

Our versatile solutions are trusted across a diverse range of industries, including Automotive, Commercial & Heavy Duty Vehicles, Motorcycles, Marine, Industrial and many more. We understand the unique challenges and requirements of each sector and tailor our products to meet your specific needs.

VEHICLE NETWORK INTERFACES

Unlock seamless access to your ECUs and electronic network architectures with our comprehensive range of interfaces. Record raw bus traffic, monitor physical signals, and calibrate or update ECU software with ease. Our interfaces are the foundation for effective simulation, data logging, and prototyping. By investing in the very latest network technologies, Intrepid has the tools and expertise to support you.

DATA LOGGING AND CLOUD ANALYSIS

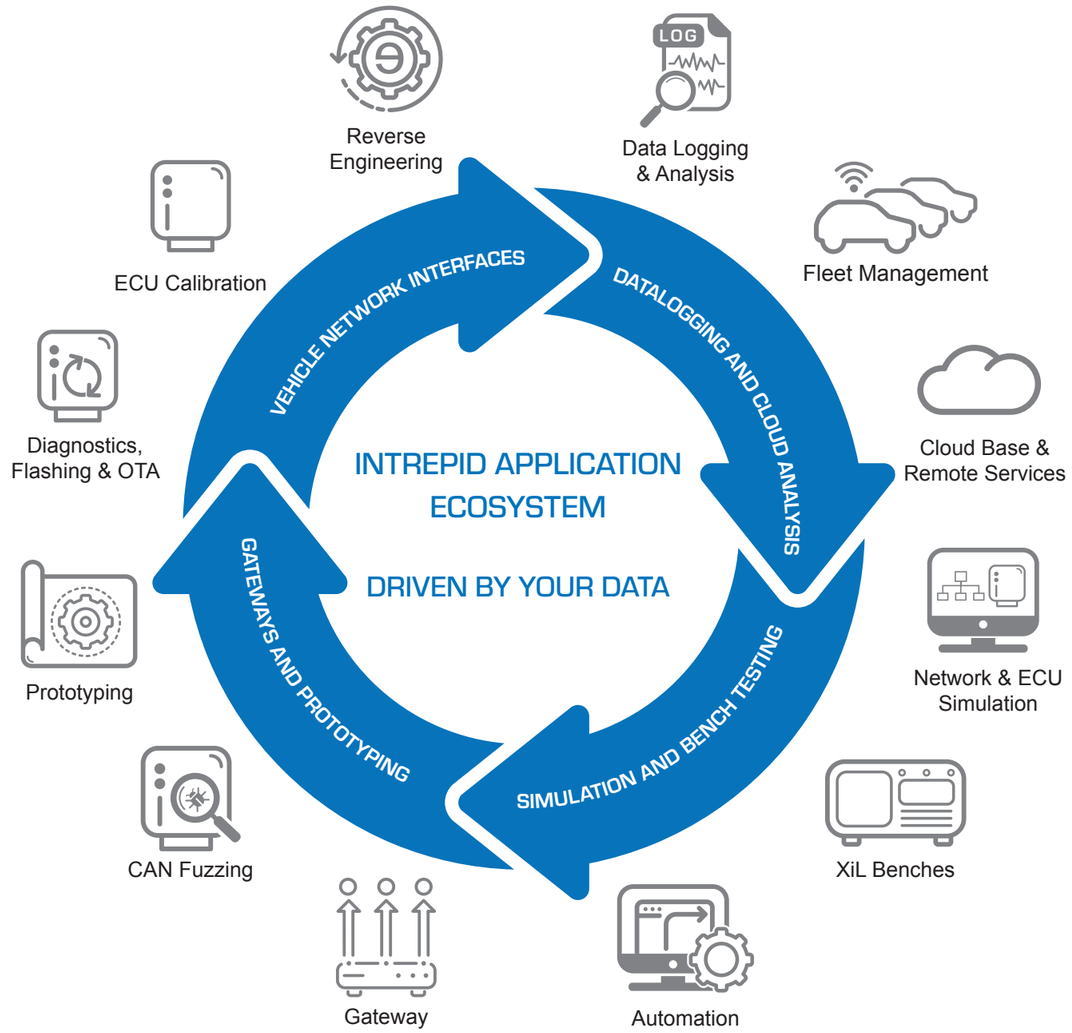
Elevate your Data logging capabilities across diverse applications. Our cloud system for asset and data management offers unlimited access to the data from your fleet and delivers valuable insights into your devices under test. The knowledge gained from your data can be used to validate and improve your simulation and bench tests providing opportunities for continuous improvement.

SIMULATION AND BENCH TESTING

We offer state-of-the-art simulation tools, combining user-friendly function blocks with customisable C-Code and Python interfaces for tailored control. Our solutions seamlessly integrate with your SIL, HIL, and VIL test environments, providing a robust, adaptable approach to elevate testing capabilities and streamline development processes.

GATEWAYS AND PROTOTYPING

Fast-track your prototyping process with our intuitive tools, designed to test early-stage concepts efficiently and cost-effectively. Our gateway builder simplifies network data manipulation across various technologies through a user-friendly drag-and-drop interface. Leverage the synergy between our logging tools and simulations to test and refine your prototypes, ensuring a seamless transition from concept to reality.



OUR INNOVATION FOR YOUR APPLICATION

Intrepid's hardware and software tools have been designed and developed in conjunction with many of our existing customers' and industry experts. This has enabled us to create a class leading product ecosystem to meet our customers' testing applications and stringent requirements.

INDUSTRIES

- Passenger Vehicles
- Commercial Vehicles
- Off-Highway
- Marine
- Motorcycles
- Aerospace & Defence
- Rail
- Agriculture
- Industrial

APPLICATIONS

- Data Logging & Analysis
- Network Simulation
- Gateway
- Validation
- XiL Benches
- Vehicle Engineering
- ADAS Testing
- Software-Defined Vehicles
- Automotive Testing
- E-mobility
- Cloud Base & Remote Services
- Diagnostics, Flashing & OTA

DRIVEN BY YOUR DATA

With the ever increasing complexity of today's modern vehicles and architectures, we have designed high-end customisable solutions to meet the needs of our customers to maximise value, efficiency, time saving and multi-application flexibility.

- Reverse Engineering
- Automation
- Data Analysis Tool Suite
- Scripting
- Graphical Panels
- CAN Fuzzing
- Real Time Clock - Timestamping
- Synchronised Video
- Function Blocks
- Messages Editor
- Core Mini Stand Alone Support
- Database Import & Export
- Analytical Dashboard & Reporting
- Open Source API
- Diagnostic Jobs

NETWORKING PROBLEMS...OUR SOLUTIONS

By working closely with, and participating in the industry standard committees, Intrepid develops the necessary hardware and software solutions for your physical and protocol networking requirements.

NETWORKS	PROTOCOLS
100 / 1000BASE-T1	**SOME/IP**
10BASE-T1S	**AUTOSAR**
MultiGBASE-T1	**SoAD**
wBMS	**XCP**
SerDes	**SecOC**
FPD-Link / GMSL / I2C	**DoIP**
CAN / CAN FD	**OBD**
FlexRay	**UDS**
LIN	**J2534 / RP1210**
A2B	**J1939**

VEHICLE NETWORK INTERFACES

UNLOCKING THE POTENTIAL OF MODERN VEHICLES

Intrepid Vehicle Network Interfaces are at the forefront of technology, offering unparalleled access and control over diverse ECU and electronic network architectures. Our interfaces are engineered to support a wide range of network types, including Automotive Ethernet, CAN (FD), LIN, and FlexRay, ensuring compatibility across various systems and applications.

Intrepid tools are designed for seamless integration with these networks, providing comprehensive support for engineers engaged in network testing. Whether it's efficient communication, precise monitoring, or effective diagnostics, our interfaces are designed to enhance system performance, reliability and validation. Explore the advanced features that make our interfaces a pivotal component in the realms of data logging, simulation, and prototyping.

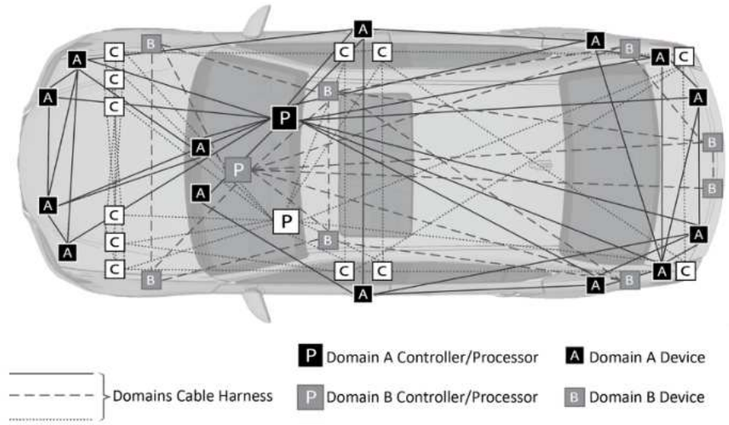
IN THE REALM OF AUTOMOTIVE ENGINEERING

The development, testing, and validation of vehicle network systems are crucial components in the era of Software-Defined Vehicles (SDVs). At Intrepid, we offer a comprehensive range of sophisticated vehicle network interfaces that cater to every stage of this intricate process, fully equipped with database support and advanced API integrations.

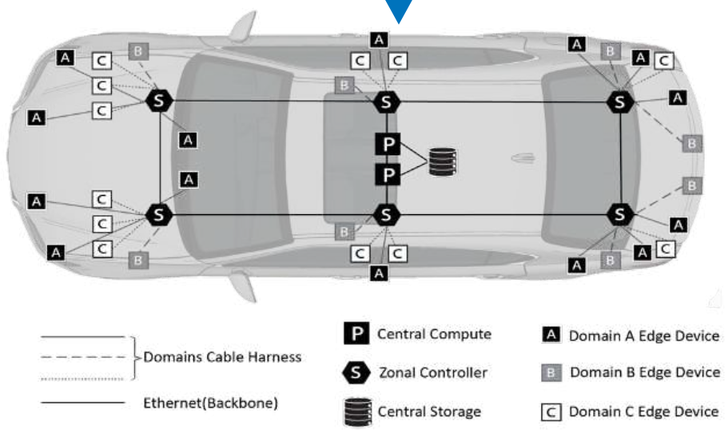
SUPPORTING DOMAIN-BASED AND ZONAL ARCHITECTURES

In navigating the transition from domain-based to zonal architectures in automotive networks, our tools are meticulously designed to support, develop, and test both aspects, ensuring seamless integration and enhanced performance in modern vehicle systems.

DOMAIN



ZONAL



Find out more

OPTIMISING VEHICLE DEVELOPMENT WITH INTREPID'S HARDWARE SOLUTIONS

EARLY NETWORK DEVELOPMENT AND TESTING:

Our interfaces are specifically designed to facilitate seamless early-stage development and testing of vehicle networks, supporting essential transport layers such as UDS and XCP/CCP. They provide real-time data capture and analysis capabilities, essential for refining network architectures and ensuring robust performance from the outset, aligning with the dynamic demands of SDVs.

INTEGRATION DURING VEHICLE DEVELOPMENT:

As vehicles transition from concept to reality, our hardware plays a pivotal role in the integration of various systems. These interfaces allow for comprehensive data exchange and system coordination, crucial for developing robust and efficient vehicle networks. With our open source APIs or industry standard J2534 and RP1210 support, our solutions ensure seamless interfacing with existing software frameworks, enhancing database support and validation processes.

PROTOTYPING SOLUTIONS:

Intrepid's interfaces excel in the prototyping phase by enabling early engagement with vehicle networks, a crucial advantage when supplier software is pending. Our tools facilitate rapid prototyping, allowing developers to simulate and interact with network components, accelerating the development cycle. This proactive approach ensures seamless integration and testing, significantly advancing the pace of SDV prototyping.

ADVANCED SIMULATION CAPABILITIES:

Our solutions are not just about physical testing; it offers advanced simulation functionalities as well. This allows development teams to create and test virtual models of vehicle networks, providing a cost-effective and efficient way to predict real-world performance, identify areas for improvement, and conduct thorough validation tests.

TESTING AND VALIDATION OF VEHICLES:

As vehicles approach the final stages of development, rigorous testing and validation become imperative. Our vehicle network interfaces are instrumental in facilitating thorough testing by enabling accurate data logging, monitoring, and analysis. This ensures that every aspect of the vehicle network meets the highest standards of quality and performance, in line with the stringent requirements of SDVs and the evolving automotive landscape.

DATA LOGGING AND CLOUD ANALYSIS

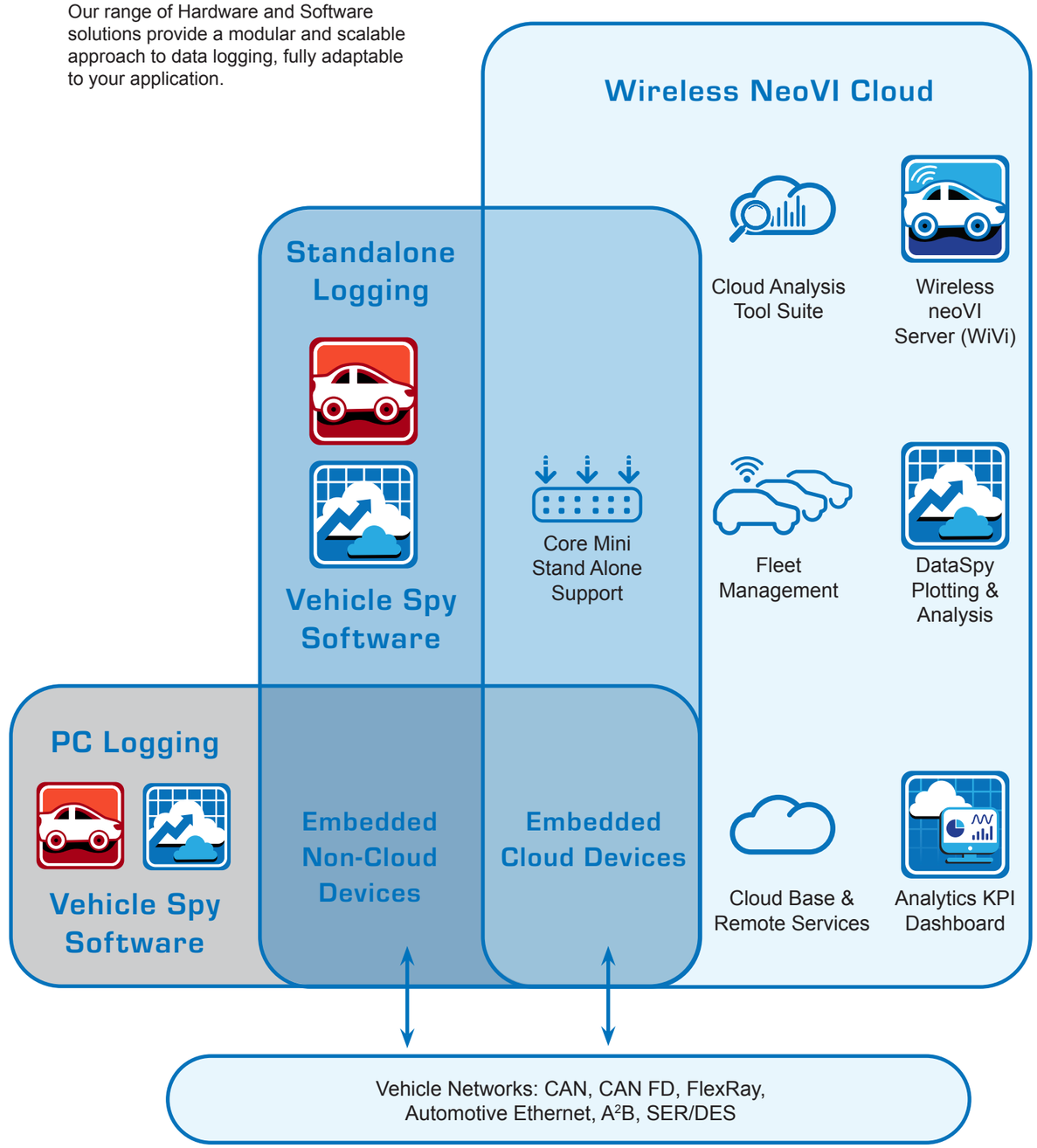
INNOVATIVE VEHICLE NETWORK DATA LOGGING, CUTTING-EDGE CLOUD INTEGRATION

Vehicle network data logging involves capturing and storing data from a vehicle's internal networks, such as CAN and Automotive Ethernet to monitor system performance, diagnose issues, enabling improvements in efficiency and quality. This data is crucial for understanding vehicle systems and software behaviour during vehicle development validation phases.

As the volume of vehicle data expands, the complexity and resource demands of its collection and processing intensify. Intrepid's remote data logging and cloud-based solutions alleviate these challenges by eliminating the need for physical presence during data acquisition and the repetitive task of manually offloading, exporting, and processing data from test units. Our sophisticated cloud-based analysis tools are designed to streamline your data processing workflow, enhancing the efficiency of deriving valuable insights and supporting informed decision-making.

SCALABLE SOLUTIONS

Our range of Hardware and Software solutions provide a modular and scalable approach to data logging, fully adaptable to your application.



Find out more

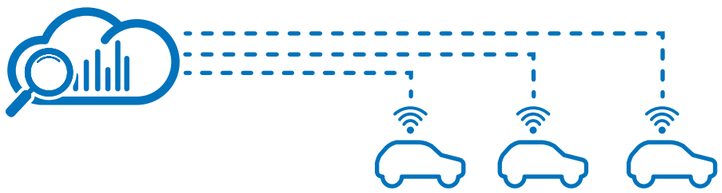
OPTIMISING VEHICLE DEVELOPMENT CLOUD TOOLS FOR DATA MANAGEMENT AND COLLABORATIVE INNOVATION

1 VERSATILE PC AND EMBEDDED DATA LOGGING SOLUTIONS

- Flexible data capture and analysis directly on your PC
- Embedded configuration with onboard storage
- Full resolution network data
- Diagnostic and calibration data

2 CLOUD CONNECTIVITY WITH DATA EXPORT AND ANALYSIS

- Enhance fleet and device management
- Global remote monitoring automated data offload
- Efficient and secure data handling
- Automatic industry-standard exports and data handling for accelerated workflow



3 CLOUD BASED DATA VISUALISATION

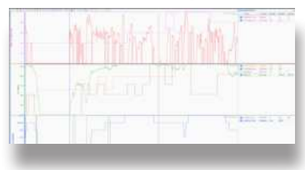
- Visualise time series data in dashboards to monitor key metrics and programme KPIs
- Our platform supports a wide range of analytical needs, tailored to your team's requirements
- Enhanced efficiency and depth of your data analysis

Analytics

4 COMPREHENSIVE DATA MINING AND ANALYSIS TOOLS (DATA SPY/IPA)

- Visualise signal data including calculated channels, GPS data alignment, and collaborative plotting tools
- Powerful data-based search capability
- Utilise Python for advanced data mining and reporting

Data Spy



5 3RD PARTY INTEGRATIONS AND DATA TRANSFER

- Support for custom solution integrations
- Automated transfer into customer data lakes
- Partnerships and collaboration

6 OVER-THE-AIR UPDATES

- Data transfer and configuration updates
- Device firmware and software upgrades
- Vehicle software and calibration flashing

Fleet Management

Diagnostics, Flashing & OTA

GATEWAYS AND PROTOTYPING

WHY GATEWAY NETWORKS?

Gateways are essential in modern network architectures. They enable data transfer between ECUs or networks with different physical layers, such as Automotive Ethernet and CAN FD. Developing and testing early gateway prototypes can be expensive and time consuming, requiring significant effort both from the OEM and software supplier. What if you could create a prototype gateway without the need of any code, using your existing databases? The power of Vehicle Spy messages editor and gateway builder makes it possible with just a few clicks.

VEHICLE SPY GATEWAY BUILDER FOR ALL ENGINEERS

Intrepid Gateway Builder provides a fast, robust and higley flexible utility allowing you to bridge data bidirectionally between different networks, including CAN, CAN FD, LIN or Automotive Ethernet. Configuring gateways couldn't be easier with the drag-and-drop functionality of Vehicle Spy Gateway Builder.

INPUT

OUTPUT

GATEWAY CONTROL

The advent of the Intrepid Gateway Builder signifies a monumental shift in how automotive networks are developed and managed. With this tool, the barriers to efficient and effective gateway configuration are significantly lowered, enabling a broader range of engineers to contribute to advancements in automotive technology. By simplifying the process and making it more accessible, we're not only speeding up development times but also fostering innovation within the industry.

KEY HIGHLIGHTS:

EFFORTLESS PROTOTYPING

Designed for engineers at all levels, create gateway prototypes effortlessly using existing databases, without any need for coding.

DRAG-AND-DROP CONFIGURATION

Easily configure gateways with a user-friendly interface.

SUPPORTS MULTIPLE NETWORKS

Compatible with CAN, CAN FD, LIN, and Automotive Ethernet, offering wide applicability.

COST AND TIME EFFICIENT

Reduces the development cycle, cutting down both time and costs associated with traditional methods.

Find out more

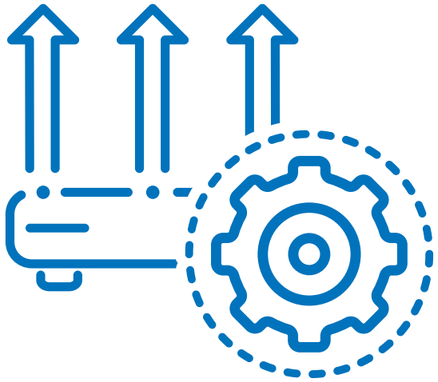
KEY FUNCTIONS & FEATURES OF GATEWAY BUILDER

DATA ROUTING

Data routing through our gateway tools enables ***seamless interconnectivity***, permitting ECU data to be distributed across multiple, varied physical networks such as CAN to Automotive Ethernet. This feature is pivotal in ***prototype vehicle integration***, effortlessly linking different network types, streamlining communication among diverse ECUs.

FILTER MESSAGES

The gateway builder offers the capability to selectively filter messages, allowing you to ***block specific data*** from being transferred across the network. This feature is invaluable for testing vehicle software and diagnostic systems under conditions where certain data is absent, providing insights into ***system resilience*** and response.



MODIFY DATA

Our gateway tools enable ***signal modification and mapping*** across different network types and software levels, adapting signal locations and engineering units for seamless integration. Additionally, our configurable gateway excels in ***Fault Injection*** testing, enhancing network analysis and diagnostics.

COMPUTE AND LOGIC

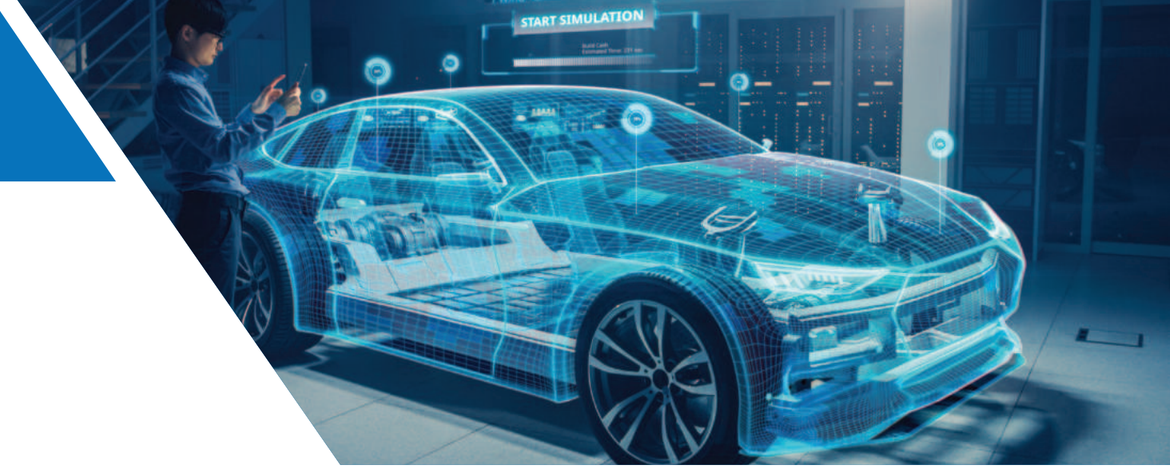
Our software has a wide range of mathematical and logical operations, managing gateway functionality and enhancing signal processing, including checksum calculations and the addition of new messages.

EMBEDDED

After completing development, your prototype gateway can be smoothly integrated and run within our hardware tool chain, ensuring ***efficient and timely*** data handling across CAN, CAN FD, LIN, and Automotive Ethernet networks. This deployment caters to the demanding needs of diverse physical layers, providing ***reliable and prompt*** data processing.

SDV PROTOTYPE VALIDATION

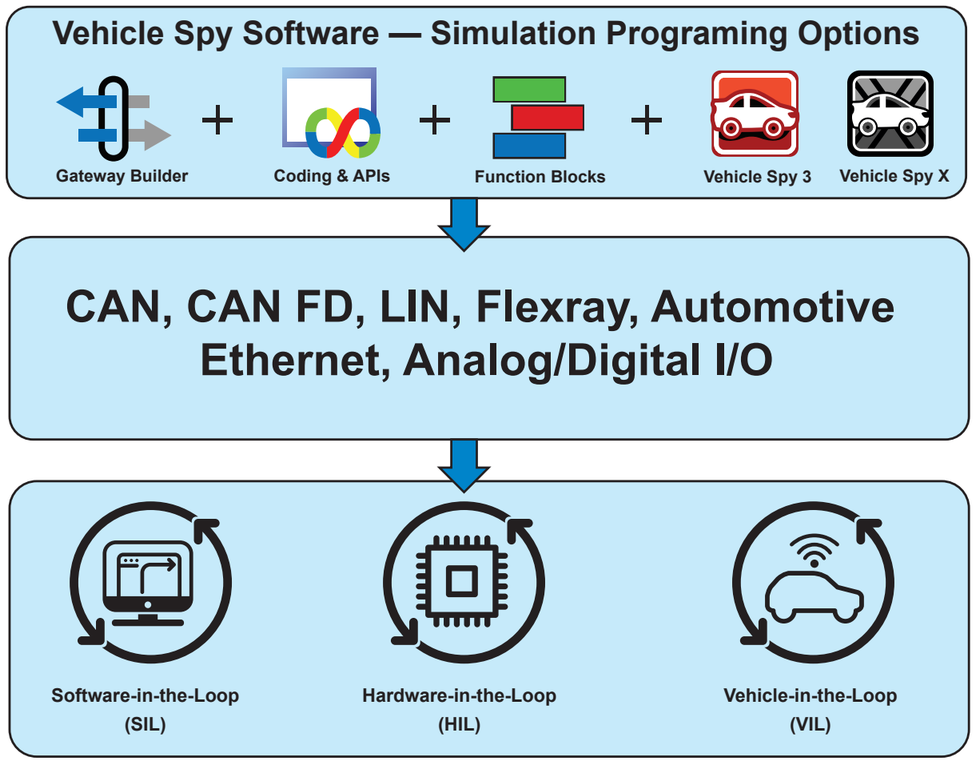
Our gateway builder tool enhances the ***validation process*** of Software-Defined Vehicles (SDV), by enabling efficient management of ***network interactions*** and ***ECU communications***. Its versatility in handling complex data scenarios is crucial for thorough testing of SDV prototypes, ensuring they meet the high standards of modern vehicle technology. Accelerate your development process with our rapid prototyping tools, designed for the agile world of SDVs.



SIMULATION AND BENCH TESTING

THE NEED FOR NETWORK, ECU, & RESTBUS SIMULATION

Intrepid Control Systems offers top tier XIL and bench testing solutions, focusing on network simulation. Our comprehensive suite empowers engineers to conduct sophisticated Software-in-the-Loop (SIL), Hardware-in-the-Loop (HIL), and Vehicle-in-the-Loop (VIL) tests, ensuring accuracy and reliability in network communications. These tools are essential for simulating and evaluating complex vehicle networks, providing a seamless environment for rapid development, extensive diagnostics and performance assessments.



ADVANCED SIMULATION CAPABILITIES

Our tools are designed to mirror the complexity of modern vehicle networks, providing engineers with a robust environment for the rapid prototyping, thorough diagnostics, and comprehensive performance analysis essential for cutting-edge automotive development.

FLEXIBLE DEVELOPMENT ENVIRONMENT

With support for Python and C-Code, easy to use visual function blocks and the ability to import CAPL scripts, Intrepid offers unmatched flexibility. This allows for intricate simulation scenarios, custom network traffic generation, and detailed ECU signal playback, fostering innovative solutions to network behavior and response challenges.

INTERACTIVE DATA VISUALISATION

Vehicle Spy sets a new standard with its dynamic graphical panels, offering engineers an immersive experience in data visualisation. This interactive platform facilitates direct engagement with simulation parameters, empowering users to adjust, control, and refine automotive systems with precision.

PROTOCOL PROFICIENCY

Our comprehensive support for essential transport and application layer protocols, including AUTOSAR, ISO-TP, and J1939, extends the depth of our simulation and bench testing capabilities. This ensures an accurate emulation of vehicle networks, which is vital for exhaustive diagnostics and effective system validation.

Find out more

INTRODUCING OUR SOFTWARE SOLUTIONS

If you are looking to perform diagnostics, simulation, data acquisition, automated testing, memory edit/calibration, or bus monitoring, Intrepid has the software solution for you.

Vehicle Spy 3
Designed for vehicle network monitoring, diagnostics and simulations, Vehicle Spy 3 supports CAN, LIN, and Automotive Ethernet, offering a rich visual interface and C-code scripting for engineers focused on intuitive data analysis and scenario testing.

Vehicle Spy X
As a script-focused complement to Vehicle Spy 3, Vehicle Spy X introduces Python scripting in a streamlined interface, suitable for various operating systems. This flexibility makes it ideal for users seeking advanced programmability for diagnostics, analysis, and simulation, facilitating complex project execution and workflow integration.

Data Spy
A plotting analysis tool that operates both in the cloud and on PC platforms, offering a versatile solution for analysing vehicle network data. Designed for detailed data visualisation, it enables engineers to plot, analyse, and interpret complex datasets with ease.

Wireless neoVI Cloud
A cloud-based solution for efficient data logger fleet management, enabling remote download, control, and monitoring with an intuitive interface. It simplifies operations for Intrepid data loggers, offering automatic data handling, live viewing, and fleet oversight through a user-friendly web interface.

Wireless neoVI Analytics
A powerful analytics platform designed to process, analyse, and visualise large time series datasets collected from vehicle networks. This tool leverages advanced data processing techniques to offer meaningful insights, helping engineers to quickly identify development KPIs trends, anomalies, and performance metrics.

Find out more

THE POWER OF PARTNERING

It's important to pick the right partners. That's why we partner with key providers in the automotive and silicon industries to keep you informed and create products and solutions for you.

KEYSIGHT TECHNOLOGIES
aws
RA CONSULTING
ANALOG DEVICES AHEAD OF WHAT'S POSSIBLE™
MARVELL
MICROCHIP
TEXAS INSTRUMENTS
arm
NXP
teorest group
hitex
NeoMore
Grupo Álava
LYNX
VETES Mühendislik
HARMAN A SAMSUNG COMPANY
HORIBA MIRA
Raspberry Pi

INTREPID PRODUCT SOLUTIONS

INTERFACING SOLUTIONS
CAN, LIN, FlexRay Automotive Ethernet tools
single to multi networks

MULTIFUNCTION I/O - INSTRUMENTATION
Thermocouples, Analog I/O, Digital I/O

STANDALONE DATA LOGGING SOLUTIONS
Compact and flexible multi-network solutions offering cloud connectivity

VEHICLE NETWORK INTERFACES

SIMULATION & BENCH TESTING

DATA LOGGING & CLOUD ANALYSIS

GATEWAYS & PROTOTYPING

Find out more

AUTOMOTIVE ETHERNET
Media convertors, Ethernet Switches, Active Taps

EMBEDDED SIMULATION GATEWAY TOOLS
Cost effective solution for deploying pre developed scripts across R&D fleets and prototypes

ACCESSORIES
Simple but powerful tools to control and automate vehicle and network testing

* Images are not to scale

UK OFFICE

Intrepid Control Systems Ltd proudly operates from MIRA Technology Park, one of the UK's premier OEM R&D testing facilities. Our regional offices are committed to offering unparalleled customer service, thanks to our experienced team who provide comprehensive local support. We collaborate with an extensive portfolio of clients, including esteemed brands such as Jaguar Land Rover, Ford, Polestar, and Nissan. Additionally, Intrepid UK oversees operations within Ireland, Benelux, and Turkey, ensuring a broad and effective regional outreach.

INTREPID UK services and facilities include:

- Regional, Account & Application Managers
- Onsite Repair Services
- Dedicated Technical Support
- Workshop for Application Support & Testing
- Training Classes
- Product Demo & Application Display Area
- Research & Development
- Consulting & Services

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Contact Our Sales Team

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ENGINEERING INTEGRITY SOCIETY

WORLDWIDE REACH

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