

DATASHEET

# RTI Connex Cert

CONNECTIVITY PLATFORM FOR SAFETY-CRITICAL SYSTEMS

## HIGHLIGHTS

Ability to meet stringent safety certification standards

Commercial DO-178C DAL A certification evidence

Optimized footprint designed to meet size, weight and power requirements

Standards-based loose coupling between portable components to minimize integration, maintenance and upgrade costs

Support for a wide variety of safety RTOSs and processors

Connex<sup>®</sup> Cert significantly reduces the time and cost of developing distributed safety-critical systems. It streamlines certification efforts by providing an off-the-shelf Certification Package and saving potentially tens of thousands of lines of custom code. In addition, because it supports the DDS standard, applications are easier to develop, integrate, evolve and maintain than those using bespoke solutions.

## OVERVIEW

Intelligent systems in mission-critical environments are held to extremely high standards. Whether these applications are in cars, planes, medical equipment or the battlefield, they rely on real-time data exchange to support real-time control and automated insight. With its small code size and fully deterministic behavior, Connex Cert offers the portability and reliability demanded by these systems. It also works in devices with minimal memory, flash, CPU power or even no operating system. By abstracting out low-level networking and communication details and providing a flexible integration framework, Connex Cert reduces development time and cost by minimizing the amount of device or application specific code that has to be created.

It also benefits both military and commercial drones, also known as Unmanned Air Vehicles (UAVs). Traditionally, UAVs have only been allowed to fly within line-of-sight with an observer, either on the ground or in a chase plane. They have also been prohibited from operating in the civilian National Airspace System (NAS). These restrictions limit their utility and make

them expensive to operate. In order to unleash the potential of UAVs by increasing their operating range and integrating them into NAS, they will need to comply with civilian standards such as DO-178C. With proven DO-178C safety certification evidence up to the most stringent Design Assurance Level (DAL), DAL A, Connex Cert makes it easier and more cost-effective to do so.

## COMPREHENSIVE MESSAGING SOLUTION

### Peer-to-peer communication

Connex Cert uses an innovative, completely decentralized architecture that delivers consistent low-latency, high throughput and scalability. Applications directly exchange data in a true peer-to-peer manner — no servers, message brokers or daemon processes act as bottlenecks or single points of failure.

### Real-time Quality of Service (QoS)

Applications have comprehensive control over and visibility into real-time behavior, including timing, deadlines, resource utilization and system state. QoS can be specified per-topic and per-subscriber.

**Optimized publish/subscribe**

Data can be reliably multicast to multiple applications and devices for extremely efficient streaming data distribution. With multicast, messages can be routed and filtered by the network switch instead of by the middleware or application software.

**Wire efficiency**

The Real-Time Publish-Subscribe (RTPS) protocol is extremely wire efficient. Data is sent in a compact binary representation. Most metadata is only exchanged once, at discovery time.

**OPTIMIZED FOR SMALL-FOOTPRINT APPLICATIONS****Low memory requirement**

Connex Cert is a library that links with your application. The library size is optimized for small footprint applications and memory allocation is kept to a minimum.

**Highly portable**

Bundled source code enables developers to port Connex Cert to new operating systems, compilers or processor architectures. Connex Cert has no built-in dependency on operating system services. Applications can be implemented on platforms with minimal operating system capabilities or no operating system at all. Processor support ranges from 16-bit microcontrollers with 32-bit integer support to multicore Intel and PowerPC CPUs. Leading enterprise operating systems, including Linux and Windows, are supported as well to ease application development and testing.

**DESIGNED FOR SAFETY-CRITICAL APPLICATIONS****Safety certification**

Connex Cert has proven DO-178C DAL A certification evidence to support systems undergoing certification to RTCA DO-178B/C (EUROCAE ED-12B/C). RTI provides services to support certification efforts by developing the necessary certification artifacts, including software development, verification, and configuration management plans and software requirements, design and code standards. Certification evidence is licensed separately.

**Small code size**

With minimized lines of source code, Connex Cert provides a cost-effective foundation for rigorous certifications.

**Deterministic behavior**

The code is developed using process guidelines that ensure deterministic behavior. All memory allocation is done at startup and no memory is freed at run-time.

**ADDITIONAL RTI PRODUCTS**

Connex Cert is fully interoperable with Connex<sup>®</sup> Professional, the world's most popular implementation of the DDS standard, which is augmented with many powerful tools and run-time services.

**ABOUT RTI**

Real-Time Innovations (RTI) is the largest software framework company for autonomous systems. RTI Connex<sup>®</sup> is the world's leading architecture for developing intelligent distributed systems. Uniquely, Connex shares data directly, connecting AI algorithms to real-time networks of devices to build autonomous systems.

RTI is the best in the world at ensuring our customers' success in deploying production systems. With over 1,800 designs, RTI software runs over 250 autonomous vehicle programs, controls the largest power plants in North America, coordinates combat management on U.S. Navy ships, drives a new generation of medical robotics, enables flying cars, and provides 24/7 intelligence for hospital and emergency medicine. RTI runs a smarter world.

RTI is the leading vendor of products compliant with the Object Management Group<sup>®</sup> (OMG<sup>®</sup>) Data Distribution Service<sup>™</sup> (DDS) standard. RTI is privately held and headquartered in Sunnyvale, California with regional offices in Colorado, Spain and Singapore.

Download a free 30-day trial of the latest, fully-functional Connex software today: [www.rti.com/downloads](http://www.rti.com/downloads).

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