

# RTI Connex DDS Micro



First Connectivity Software Designed for Architecting Resource-Constrained IIoT Systems



Connex<sup>®</sup> DDS Micro distributed Industrial Internet of Things (IIoT) systems meet stringent Size, Weight and Power (SWaP) requirements well beyond the reach of traditional messaging frameworks. Connex DDS Micro is a small-footprint connectivity framework for IIoT systems where size and efficiency matter. It is standards-compliant and fully interoperable with other Connex DDS products.

## Highlights:

Small memory footprint

User-configurable feature set through build options

Support for low power CPUs

Scalability from embedded 16-bit microcontrollers to multi-core 64-bit CPUs

Bundled source code

Ability to run on Linux (x86), Windows, FreeRTOS (ARM), VxWorks (PowerPC) and devices without OS (ARM)

Portability to other embedded or real-time operating systems

Completely decentralized and easy-to-embed architecture with no message brokers or daemon processes

Standards compliance: based on DDS programming interface and RTPS wire interoperability protocol

Embedded systems and devices are – in cars, production-line environments and medical equipment – and they increasingly connect to a network or even the Internet. With the emergent IIoT, system developers are faced with the challenge of distributing the increasing variety and volume of data produced by these systems and devices. It is critical that the data can be acted upon in real-time for enhanced automation, analytics and business intelligence.

Connex DDS Micro provides a small-footprint modular messaging solution for resource-limited devices that have minimal memory, flash or CPU power, or even no operating system at all.

By abstracting out low-level networking and communication details and providing a flexible integration framework, Connex DDS Micro minimizes the amount of device or application specific code that needs to be created.

Built on the Connex databus - a data-centric framework for distributing and managing real-time data in the IIoT - Connex DDS Micro provides a high-level and standards-compliant alternative to in-house development. It significantly reduces the development costs as well as system communications risks.

## Comprehensive Messaging Solution

### Peer-to-peer communication

Connex DDS Micro uses an innovative, completely decentralized architecture. 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. As a result, Connex DDS Micro delivers the consistent low-latency, high throughput and scalability required for big data in motion.

### Plug-and-play communication

Devices and applications are automatically discovered and connected at run-time. No system administration or directory service is required, allowing use in autonomous, dynamic and ad hoc intelligent systems.

### 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 DDS Micro 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.

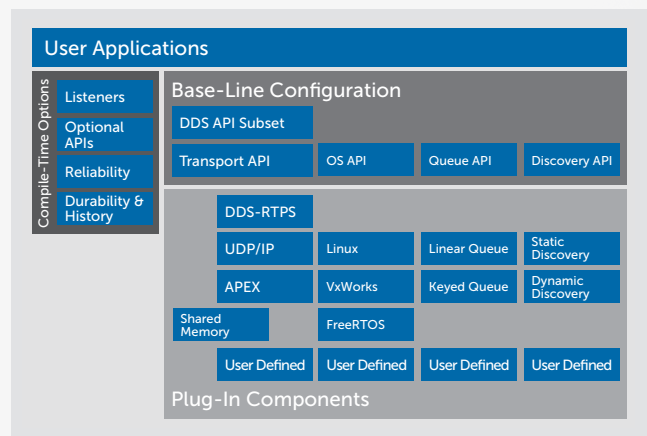
### Highly portable

Bundled source code enables developers to port Connex DDS Micro to new operating systems, compilers or

processor architectures. It 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.

### Modular and user-configurable architecture

A small kernel provides the baseline capabilities for publish/subscribe messaging. By rebuilding the kernel from source code, additional features such as asynchronous notification, reliable communication and filtering can be compiled in, allowing application-specific trade offs between available features and footprint. A modular user-configurable architecture enables developers to trade off available features and footprint.



## Complementary Products

Connex DDS Micro is fully interoperable with Connex DDS 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 Industrial Internet of Things (IIoT) connectivity company. The RTI Connex<sup>®</sup> databus is a software framework that shares information in real time, making applications work together as one, integrated system. It connects across field, fog and cloud. Its reliability, security, performance and scalability are proven in the most demanding industrial systems. Deployed systems include medical devices and imaging; wind, hydro and solar power; autonomous planes, trains and cars; traffic control; Oil and Gas; robotics, ships and defense.

RTI lives at the intersection of functional artificial intelligence and pervasive networking<sup>SM</sup>.

RTI is the largest vendor of products based on the Object Management Group (OMG) Data Distribution Service<sup>™</sup> (DDS) standard. RTI is privately held and headquartered in Sunnyvale, Calif.



Your systems. Working as one.

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