

# RTMaps

## Real-Time Multisensor applications

Synchronizing and processing data streams  
has never been faster and easier!



Embedded Success

**dSPACE**

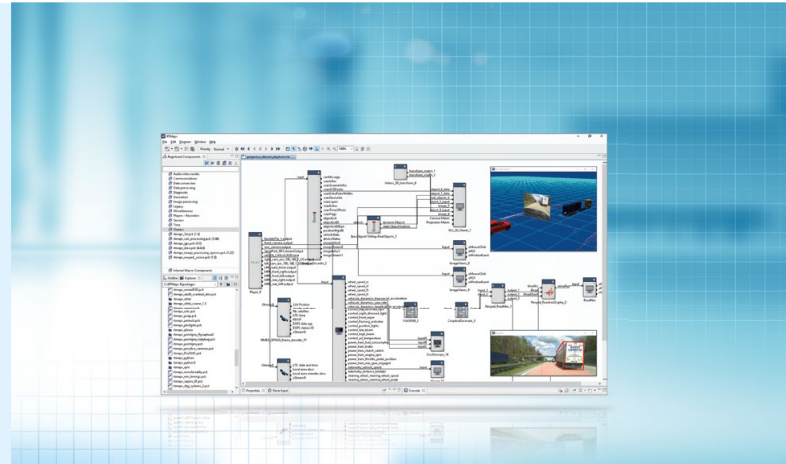
# RTMaps

Development environment for multisensor applications (ADAS, robotics, ...)



## Highlights

- Recording, synchronization and playback of data from numerous sensors and communication buses
- Prototyping, testing and benchmarking of perception and data fusion algorithms
- Available for different operating systems and x86- and ARM-based hardware architectures



## Application Areas

**Multisensor applications** play an essential role in many areas such as advanced driver assistance systems, autonomous driving, multimodal human-machine interfaces, robotics and aerospace.

Developing these kinds of applications in the lab or in the vehicle typically requires **capturing, synchronizing and processing data in real time** from various sensors such as cameras, laser scanners, radars or GNSS receivers and interfacing with communication networks, such as CAN, LIN or Ethernet. During the test and development phase, it is also essential to be able to **record, visualize and play back time-correlated data**. RTMaps (Real-Time Multisensor applications) from Intempora ([www.intempora.com](http://www.intempora.com)) is designed specifically for these use cases. It provides a modular development and **run-time environment for x86- and ARM-based platforms** supporting operating systems such as Microsoft Windows® and Linux.

## Key Benefits

With RTMaps, data is acquired asynchronously and each data sample is captured along with its time stamp at its own genuine pace. This ensures that **all data is time-correlated**. RTMap's unparalleled performance on multicore CPUs enables users to get the most out of their computing architectures and easily set up applications that handle multiple, high-bandwidth data streams, including real-time processing and data fusion. **Sensor data can be recorded and played back synchronously for offline development and testing under reproducible conditions.**

RTMaps provides comprehensive component libraries for automotive sensors, buses and perception algorithms and it supports any type and quantity of sensors and actuators. Algorithms can be developed easily by means of block diagrams or by integrating own code using dedicated software development kits for C++ and Python. It is even possible to **process data on multiple distributed platforms** while preserving time coherency and synchronization of heterogeneous data streams.

## Integration in the dSPACE Tool Chain

RTMaps is **tightly integrated** in the dSPACE tool chain. For this, dSPACE provides an interface blockset designed specifically for **bidirectional, low-latency communication** between RTMaps and dSPACE's PC-based simulation platform VEOS® or dSPACE real-time systems.

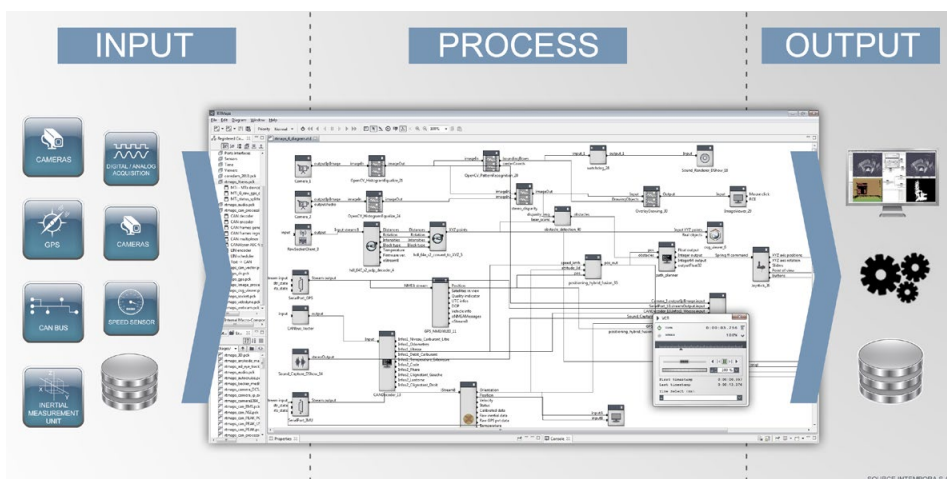
In addition, dSPACE ControlDesk® Next Generation can be connected to RTMaps via the ASAM XIL API, which lets users monitor and parameterize components that are implemented and processed in RTMaps.

## Functionality Overview

Functionality	Description
General	<ul style="list-style-type: none"> <li>Developing, testing, validation and benchmarking of processing algorithms and data fusion algorithms</li> <li>2-D &amp; 3-D visualization</li> <li>Data time-stamping, latency measurement, downstream resynchronization</li> <li>Datalogging and real-time data playback for offline development and validation</li> <li>Graphical programming by means of block diagrams and easy integration of C++, Python and Simulink code</li> <li>Optimized, multithread run-time engine and dedicated real-time capabilities</li> <li>Data processing and data synchronization on multiple distributed platforms</li> <li>RTMaps Studio for graphical development with large module libraries</li> <li>RTMaps Runtime Engine for embedded deployment and customized HMLs</li> </ul>
Supported sensors, communication buses and protocols	<ul style="list-style-type: none"> <li>Cameras (GigE Vision, USB 2.0, USB 3.0, FireWire, analog, Camera Link, HDR, ... from Point Grey, IDS, Basler, AVT, NIT, ...)</li> <li>Stereo-vision heads</li> <li>Laser scanners (IBEO, Velodyne, SICK, Hokuyo, Quanergy)</li> <li>Radars (Delphi, Autocruise, Continental, ...)</li> <li>Time-of-flight sensors (LeddarTech)</li> <li>CAN, LIN (PEAK, Vector, NI, .dbc files decoder)</li> <li>GPS, IMUs (SBG Systems, OXTS, Xsens, VectorNav, IXSEA, Phidgets, ...)</li> <li>Communication (TCP &amp; UDP, ASAM XCP over Ethernet, DDS, ASAM XIL API, ...)</li> <li>Analog/digital I/O (NI DAQ, Data Translation, Phidgets, Audio, ...)</li> <li>Eye trackers (Pertech, faceLAB, SmartEye, SMI, The Eye Tribe, ...) and biometrics (BIOPAC, Becker Meditec, ...)</li> <li>Motion capturing (Kinect, Xtion, Vicon, ...)</li> </ul>
Supported operating systems and platforms	<ul style="list-style-type: none"> <li>Windows®, Linux, Embedded Linux</li> <li>x86, x86_64, ARMv7</li> </ul>
Targeted applications	<ul style="list-style-type: none"> <li>Advanced driving assistance systems</li> <li>Autonomous vehicles</li> <li>Mobile robotics</li> <li>Data recorders</li> <li>Advanced multimodal HMLs</li> </ul>

## Order Information

Product	Order Number
Intempora RTMaps Developer Version	RTMAPS_DEV
Intempora RTMaps Run-Time Version	RTMAPS_RTV



RTMaps – a modular, multithread frame-work for real-time, multisensor applications.

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#### Germany

dSPACE GmbH  
Rathenaustraße 26  
33102 Paderborn  
Tel.: +49 5251 1638-0  
Fax: +49 5251 16198-0  
info@dspace.de

#### United Kingdom

dSPACE Ltd.  
Unit B7 · Beech House  
Melbourn Science Park  
Melbourn  
Hertfordshire · SG8 6HB  
Tel.: +44 1763 269 020  
Fax: +44 1763 269 021  
info@dspace.co.uk

#### France

dSPACE SARL  
7 Parc Burospace  
Route de Gisy  
91573 Bièvres Cedex  
Tel.: +33 169 355 060  
Fax: +33 169 355 061  
info@dspace.fr

#### China

dSPACE Mechatronic Control  
Technology (Shanghai) Co., Ltd.  
Unit 1101-1105, 11F/L  
Middle Xizang Rd. 18  
Harbour Ring Plaza  
200001 Shanghai  
Tel.: +86 21 6391 7666  
Fax: +86 21 6391 7445  
infochina@dspace.com

#### Japan

dSPACE Japan K.K.  
10F Gotenyama Trust Tower  
4-7-35 Kitashinagawa  
Shinagawa-ku  
Tokyo 140-0001  
Tel.: +81 3 5798 5460  
Fax: +81 3 5798 5464  
info@dspace.jp

#### USA and Canada

dSPACE Inc.  
50131 Pontiac Trail  
Wixom · MI 48393-2020  
Tel.: +1 248 295 4700  
Fax: +1 248 295 2950  
info@dspaceinc.com