

REAL-TIME APPLICATIONS WITH WINDOWS AND RTX

- Precise and robust solutions
- Symmetric multiprocessing
- One operating system for both classical and real-time tasks



www.addi-data.com

ACQUISITION/REGULATION IN REAL TIME

Why realize a real-time application with Windows/RTX?

Real-time systems allow time-critical measurement, control and automation tasks. This means a real-time system executes a task within a predefined time. Real-time systems are especially required for automatic rework processes: the products are to be reworked where an error was detected during a previous measurement. If the control system reacts too slowly, the product is not reworked at the correct place.

Windows is not a deterministic operating system. Nevertheless, a lot of users also wish to use the trusted platform for measurement and automation tasks. Equipped with the RTX real-time extension, Windows is able to execute time-critical tasks as well as classical tasks. RTX does not intervene in the Windows basis.

Symmetric Multiprocessing (SMP)

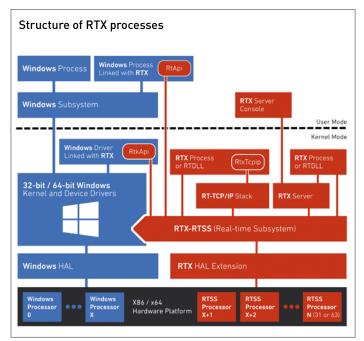
The multi core architecture x86 of Windows allows to assign several processors to RTX in order to realize several real-time applications with one PC. This architecture, also called SMP (Symmetric Multiprocessing), gives direct access to a memory space shared by all cores and thus allows an optimal use of the real-time functions. To reduce debug time and to solve difficulties caused by the interaction between the cores, RTX offers so-phisticated and efficient analysis features. This way, you can fully benefit from the advantages of symmetric multiprocessing.

RTX in practice

RTX and Windows coexist in one single PC. The RTX core allows a direct and exact control of the interrupts, the memory and the I/O in real time; this ensures that tasks are completed within the desired time. Thanks to the broad band communication of the PC and the synchronisation, RTX can easily control the data exchange with Windows in real time.

Application fields:

- Aviation
- PC-based measurement and control (Windows)
- Simulation in real time
- CNC motion and axis control
- Hardware for the medical sector
- etc.



Application example

Task

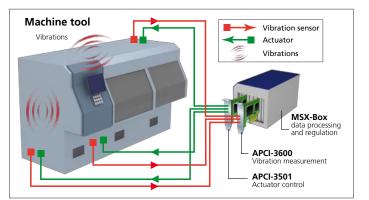
Real-time system for measuring vibration values and control of the actuators for vibration damping

Challenge

- Vibrations caused by the machine during the production process
- Small system with hard real-time
- Independent application processing

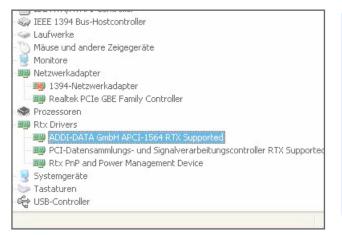
Solution

- MSX-Box with APCI-3600 vibration measurement board for measurement of the vibration values
- Analog output board APCI-3501 for the output of analog values to the actuators for control of the vibration damping (piezoelectric crystals)
- Parametering / visualisation through website is possible



FAST INSTALLATION

Step 1



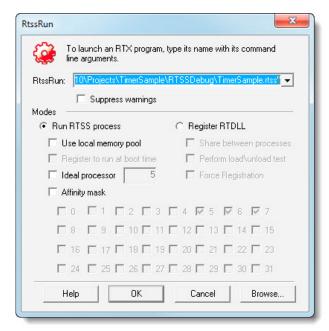
Make sure that the RTX driver of the ADDI-DATA board is installed in the device manager.

Step 2

| Task Name | Processor | Mask | ID |
|-------------|-----------|------------|----------|
| PCIe1564.rt | 00000001 | (1) | 1 |
| PCIe1564.rt | 00000001 | (1) | 2 |
| | | | |
| | Help | Start Task | End Task |

To activate the real-time process, click on the RTSS driver (specific for each board) or use the RTSS task manager to select the board that you want to use.

Step 3



If you are using RtssRun, you have the option to configure your application before the start. You can choose between RTSS and RTDLL.

Step 4

| ************* |
|---|
| Timer sample |
| ***************** |
| is sample demonstrates how to configure, start and get the value of |
| timer |
| ******************* |
| CIe1564 GetNumberOfBoards OK |
| Cle1564 OpenBoardViaIndex OK |
| CIe1564_SetBoardIntRoutine OK |
| CIe1564_InitAndStartTimer OK |
| erValue = 4 timerStatus = 0, softwareTriggerStatus = 0 |
| erValue = 3 timerStatus = 0, softwareTriggerStatus = 0 |
| erValue = 2 timerStatus = 0, softwareTriggerStatus = 0 |
| erValue = 1 timerStatus = 0, softwareTriggerStatus = 0 |
| ner interrupt! |
| errupt mask: 0x2 |
| erValue = 4 timerStatus = 0, softwareTriggerStatus = 0 |
| erValue = 3 timerStatus = 0, softwareTriggerStatus = 0 |
| erValue = 2 timerStatus = 0, softwareTriggerStatus = 0 |
| erValue = 1 timerStatus = 0, softwareTriggerStatus = 0 |
| ner interrupt! |
| errupt mask: 0x2 |

You can use the RTX samples delivered with our boards to configure your application, they include the source code on which your programming is based.

SUPPORTED PRODUCTS

ADDI-DATA offers a wide range of PC boards coming with RTX drivers and drivers for Windows 8 / 7 / Vista / XP. The boards are specially designed for real-time use in the harsh industrial environment and thus come with numerous protective circuits.



PCI Express boards

Counter



PCI boards

- Digital
- Counter
- Analog
- Serial Interface



CompactPCI boards

- Digital
- Counter
- Analog
- Serial Interface

We also develop drivers on request. Just ask us : +49 7229 1847-0.



In preparation RTX drivers for the new CompactPCI Serial boards



Bespoke solutions

The best solution is often a customized one. As a manufacturer, we are able to adapt our solutions as closely as possible to your requirements.

We are pleased to advise you on finding the best solution for your applications and to perform the necessary adaptations for you. Just ask us!



Advice needed?

Just call us by phone +49 7229 1847-120 or send us an e-mail: info@addi-data.com.

Windows is a registered trademark of Microsoft Corporation RTX is a registered trademark of IntervalZero.

ADDI-DATA GmbH Airpark Business Center • Airport Boulevard B210 77836 Rheinmuenster • Germany Phone: +49 7229 1847-0 • Fax: +49 7229 1847-222 info@addi-data.com • www.addi-data.com

