OS Awareness Manual uiPLUS

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Version 18-Nov-2020

History

28-Aug-18 The title of the manual was changed from “RTOS Debugger for *<x>*” to “OS Awareness Manual *<x>*”.

Overview

The OS Awareness for µiPLUS contains special extensions to the TRACE32 Debugger. This manual describes the additional features, such as additional commands and statistic evaluations.

Brief Overview of Documents for New Users

Architecture-independent information:

- **“Debugger Basics - Training”** (training_debugger.pdf): Get familiar with the basic features of a TRACE32 debugger.
- **“T32Start”** (app_t32start.pdf): T32Start assists you in starting TRACE32 PowerView instances for different configurations of the debugger. T32Start is only available for Windows.
- **“General Commands”** (general_ref_*<x>*.pdf): Alphabetic list of debug commands.

Architecture-specific information:

- **“Processor Architecture Manuals”**: These manuals describe commands that are specific for the processor architecture supported by your debug cable. To access the manual for your processor architecture, proceed as follows:
  - Choose **Help** menu > **Processor Architecture Manual**.
- **“OS Awareness Manuals”** (rtos_*<os>*.pdf): TRACE32 PowerView can be extended for operating system-aware debugging. The appropriate OS Awareness manual informs you how to enable the OS-aware debugging.

Supported Versions

Currently µiPLUS is supported for the following versions:

- ARM processors.

Configuration

µiPLUS is a µITRON interface layer upon Nucleus PLUS. The OS Awareness for µiPLUS is part of the OS Awareness for Nucleus PLUS. Thus, configure the OS Awareness for Nucleus PLUS and you will automatically get all µiPLUS features as well. See "**OS Awareness Manual Nucleus PLUS**".

The **TASK.CONFIG** command loads an extension definition file called "nucleus.t32" (directory "~~/demo/<*processor*>/kernel/nucleus"). It contains all necessary µiPLUS extensions.

Automatic configuration tries to locate the µiPLUS internals automatically. For this purpose all symbol tables must be loaded and accessible at any time the OS Awareness is used.

If you want to have dual port access for the display functions (display "On The Fly"), you have to map emulation or shadow memory to the address space of all used system tables.

For automatic configuration it is necessary that all system internal symbols are loaded and accessible at any time, the OS Awareness is used. Use the automatic configuration of the OS Awareness for Nucleus PLUS:

Format:	**TASK.CONFIG nucleus**

Hooks & Internals of µiPLUS

The OS Awareness for µiPLUS uses kernel symbols and kernel structures to find the relevant information. Be sure that the µiPLUS library is built with symbol information.

Additionally symbols and structures of the Nucleus PLUS kernel are used.

Features

The OS Awareness for µiPLUS supports the following features.

Display of Kernel Resources

The extension defines new commands to display various kernel resources. Information on the following µiPLUS components can be displayed:

TASK.UITSK	Tasks
TASK.UIMBX	Mailboxes
TASK.UIDTQ	Data queues
TASK.UISEM	Semaphores
TASK.UIFLG	Event flags
TASK.UIMPF	Fixed sized memory pools
TASK.UIMPL	Variable sized memory pools

For a description of the commands, refer to chapter "**µiPLUS Commands**".

When working with emulation memory or shadow memory, these resources can be displayed "On The Fly", i.e. while the target application is running, without any intrusion to the application. If using this dual port memory feature, be sure that emulation memory is mapped to all places, where µiPLUS holds its tables.

When working only with target memory, the information will only be displayed if the target application is stopped.

Task Runtime Statistics

The time spent in a task can be evaluated statistically and displayed graphically.

This is provided by the standard Nucleus PLUS awareness.

Task State Analysis

The time different tasks are in a certain state (running, ready, suspended or waiting) can be evaluated statistically or displayed graphically.

This is provided by the standard Nucleus PLUS awareness.

Function Runtime Statistics

All function related statistic and time chart evaluations can be used with task specific information.

This is provided by the standard Nucleus PLUS awareness.

Task Stack Coverage

This is provided by the standard Nucleus PLUS awareness.

µiPLUS specific Menu

The menu file “nucleus.men” contains a menu with µiPLUS specific menu items. Load this menu with the **MENU.ReProgram** command. It is necessary to load the application symbols *before* executing the **MENU.ReProgram** command; otherwise this command will not find the µiPLUS symbols and will not create the **µiPLUS** menu.

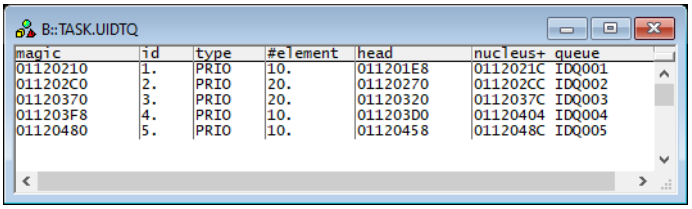
You will find a new menu called **µiPLUS**.

- The **Display** menu items launch the kernel resource display windows.

TASK.UIDTQ Display data queues

Format: **TASK.UIDTQ** *<data_queue>*

Displays a table with the µiPLUS data queues. Specifying a queue magic number or ID will show you the queue pointers, queue message contents and the waiting tasks of that queue.

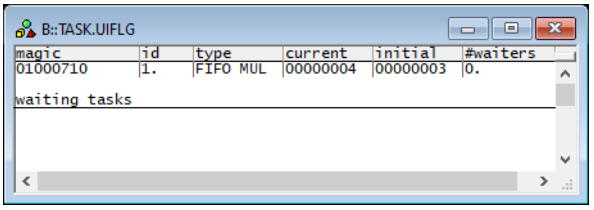


Double-click on “magic” to get more information about a specific data queue.

TASK.UIFLG Display event flags

Format: **TASK.UIFLG** *<event_flag>*

Displays a table with the µiPLUS event flags. Specifying an event flag magic number or ID will show you the waiting tasks of that event flag.

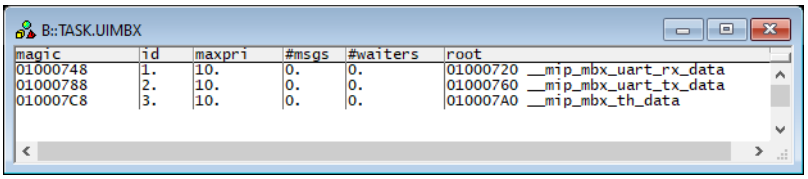


Double-click on “magic” to get more information about a specific event flag.

TASK.UIMBX Display mailboxes

Format: **TASK.UIMBX** *<mailbox>*

Displays a table with the µiPLUS mailboxes. Specifying a mailbox magic number or ID will show you the message content and the waiting tasks of that mailbox.

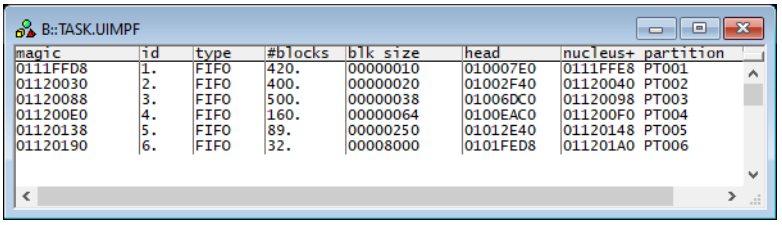


Double-click on “magic” to get more information about a specific mailbox.

TASK.UIMPF Display fixed memory pools

Format: **TASK.UIMPF**

Displays a table with the µiPLUS fixed sized memory pools.



Double-click on the address of the Nucleus+ partition to get more information about a specific pool.

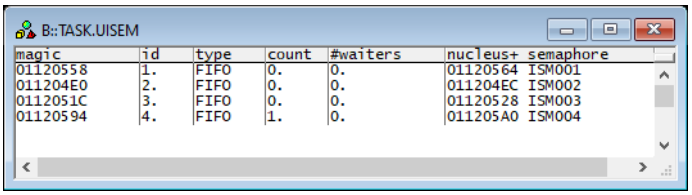
TASK.UIMPL Display variable memory pools

Format: **TASK.UIMPL**

Displays a table with the µiPLUS variable sized memory pools. Double click on the address of the Nucleus+ memory pool to get more information about a specific pool.

Format: **TASK.UISEM** *<sema>*

Displays a table with the µiPLUS semaphores. Specifying a semaphore magic number or ID will show you the waiting tasks of that semaphore.

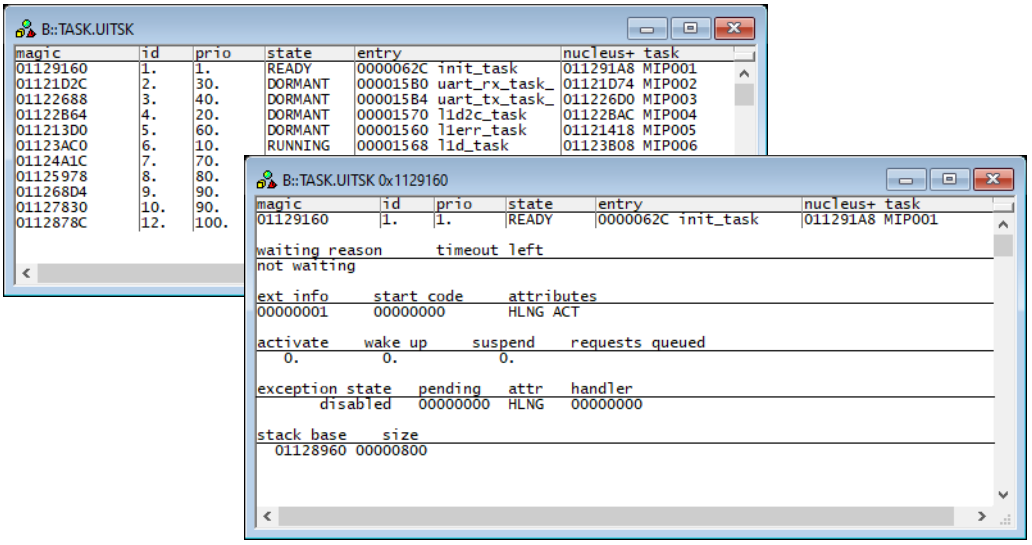


Double click on “magic” to get more information about a specific semaphore.

Format: **TASK.UITSK** *<task>*

Displays the task table of µiPLUS or detailed information about one specific task.

Without any arguments, a table with all created tasks will be shown.
Specify a task ID or magic number to display detailed information on that task.



“magic” is a unique ID, used by the OS Awareness to identify a specific task (address of the CTSK).

The fields “magic”, “entry”, “nucleus+ task”, “stackbase” and “handler” are mouse sensitive, double clicking on them opens appropriate windows. Right-clicking a value in the **magic** column will show a local menu.

µiPLUS PRACTICE Functions

Currently there are no special PRACTICE functions for µiPLUS.

Frequently-Asked Questions

No information available