



Helios
Kernel 0.4.0

Helios Developer's Guide

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1 Data Structure Index

1.1 Data Structures

Here are the data structures with brief descriptions:

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2 File Index

2.1 File List

Here is a list of all documented files with brief descriptions:

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3 Data Structure Documentation

3.1 MemoryRegionStats_s Struct Reference

Data structure for memory region statistics.

Data Fields

- Word_t [largestFreeEntryInBytes](#)
- Word_t [smallestFreeEntryInBytes](#)
- Word_t [numberOfFreeBlocks](#)
- Word_t [availableSpaceInBytes](#)
- Word_t [successfulAllocations](#)
- Word_t [successfulFrees](#)
- Word_t [minimumEverFreeBytesRemaining](#)

3.1.1 Detailed Description

The MemoryRegionStats_t data structure is used by [xMemGetHeapStats\(\)](#) and [xMemGetKernelStats\(\)](#) to obtain statistics about either memory region.

See also

[xMemoryRegionStats](#)
[xMemGetHeapStats\(\)](#)
[xMemGetKernelStats\(\)](#)
[xMemFree\(\)](#)

3.1.2 Field Documentation

3.1.2.1 availableSpaceInBytes `Word_t MemoryRegionStats_s::availableSpaceInBytes`

The amount of free memory in bytes (i.e., `numberOfFreeBlocks * CONFIG_MEMORY_REGION_BLOCK_SIZE`).

3.1.2.2 largestFreeEntryInBytes `Word_t MemoryRegionStats_s::largestFreeEntryInBytes`

The largest free entry in bytes.

3.1.2.3 minimumEverFreeBytesRemaining `Word_t MemoryRegionStats_s::minimumEverFreeBytesRemaining`

Lowest water level since system initialization of free bytes of memory.

3.1.2.4 numberOfFreeBlocks `Word_t MemoryRegionStats_s::numberOfFreeBlocks`

The number of free blocks. See `CONFIG_MEMORY_REGION_BLOCK_SIZE` for block size in bytes.

3.1.2.5 smallestFreeEntryInBytes `Word_t MemoryRegionStats_s::smallestFreeEntryInBytes`

The smallest free entry in bytes.

3.1.2.6 successfulAllocations `Word_t MemoryRegionStats_s::successfulAllocations`

Number of successful memory allocations.

3.1.2.7 successfulFrees `Word_t MemoryRegionStats_s::successfulFrees`

Number of successful memory "frees".

The documentation for this struct was generated from the following file:

- [HeliOS.h](#)

3.2 QueueMessage_s Struct Reference

Data structure for a queue message.

Data Fields

- Base_t [messageBytes](#)
- Byte_t [messageValue](#) [[CONFIG_MESSAGE_VALUE_BYTES](#)]

3.2.1 Detailed Description

The QueueMessage_t stucture is used to store a queue message and is returned by [xQueueReceive\(\)](#) and [xQueuePeek\(\)](#).

See also

[xQueueMessage](#)
[xQueueReceive\(\)](#)
[xQueuePeek\(\)](#)
[CONFIG_MESSAGE_VALUE_BYTES](#)
[xMemFree\(\)](#)

3.2.2 Field Documentation

3.2.2.1 **messageBytes** Base_t QueueMessage_s::messageBytes

The number of bytes contained in the message value which cannot exceed CONFIG_MESSAGE_VALUE_BYTES.

3.2.2.2 **messageValue** Byte_t QueueMessage_s::messageValue[CONFIG_MESSAGE_VALUE_BYTES]

The queue message value.

The documentation for this struct was generated from the following file:

- [HeliOS.h](#)

3.3 SystemInfo_s Struct Reference

Data structure for information about the HeliOS system.

Data Fields

- `Byte_t` [productName](#) [OS_PRODUCT_NAME_SIZE]
- `Base_t` [majorVersion](#)
- `Base_t` [minorVersion](#)
- `Base_t` [patchVersion](#)
- `Base_t` [numberOfTasks](#)

3.3.1 Detailed Description

The `SystemInfo_t` data structure is used to store information about the HeliOS system and is returned by [xSystemGetSystemInfo\(\)](#).

See also

[xSystemInfo](#)
[xSystemGetSystemInfo\(\)](#)
`OS_PRODUCT_NAME_SIZE`
[xMemFree\(\)](#)

3.3.2 Field Documentation

3.3.2.1 **majorVersion** `Base_t SystemInfo_s::majorVersion`

The SemVer major version number of HeliOS.

3.3.2.2 **minorVersion** `Base_t SystemInfo_s::minorVersion`

The SemVer minor version number of HeliOS.

3.3.2.3 **numberOfTasks** `Base_t SystemInfo_s::numberOfTasks`

The number of tasks regardless of their state.

3.3.2.4 **patchVersion** `Base_t SystemInfo_s::patchVersion`

The SemVer patch version number of HeliOS.

3.3.2.5 **productName** `Byte_t SystemInfo_s::productName[OS_PRODUCT_NAME_SIZE]`

The product name of the operating system (always "HeliOS").

The documentation for this struct was generated from the following file:

- [HeliOS.h](#)

3.4 TaskInfo_s Struct Reference

Data structure for information about a task.

Data Fields

- `Base_t id`
- `Byte_t name [CONFIG_TASK_NAME_BYTES]`
- `TaskState_t state`
- `Ticks_t lastRunTime`
- `Ticks_t totalRunTime`

3.4.1 Detailed Description

The `TaskInfo_t` structure is similar to `xTaskRuntimeStats_t` in that it contains runtime statistics for a task. However, `TaskInfo_t` also contains additional details about a task such as its name and state. The `TaskInfo_t` structure is returned by `xTaskGetTaskInfo()` and `xTaskGetAllTaskInfo()`. If only runtime statistics are needed, then `TaskRuntimeStats_t` should be used because of its smaller memory footprint.

See also

[xTaskInfo](#)
[xTaskGetTaskInfo\(\)](#)
[xTaskGetAllTaskInfo\(\)](#)
[CONFIG_TASK_NAME_BYTES](#)
[xMemFree\(\)](#)

3.4.2 Field Documentation

3.4.2.1 `id` `Base_t TaskInfo_s::id`

The ID of the task.

3.4.2.2 `lastRunTime` `Ticks_t TaskInfo_s::lastRunTime`

The duration in ticks of the task's last runtime.

3.4.2.3 `name` `Byte_t TaskInfo_s::name[CONFIG_TASK_NAME_BYTES]`

The name of the task which must be exactly `CONFIG_TASK_NAME_BYTES` bytes in length. Shorter task names must be padded.

3.4.2.4 `state` `TaskState_t TaskInfo_s::state`

The state the task is in which is one of four states specified in the `TaskState_t` enumerated data type.

3.4.2.5 totalRunTime `Ticks_t TaskInfo_s::totalRunTime`

The duration in ticks of the task's total runtime.

The documentation for this struct was generated from the following file:

- [HeliOS.h](#)

3.5 TaskNotification_s Struct Reference

Data structure for a direct to task notification.

Data Fields

- `Base_t notificationBytes`
- `Byte_t notificationValue [CONFIG_NOTIFICATION_VALUE_BYTES]`

3.5.1 Detailed Description

The TaskNotification_t data structure is used by [xTaskNotifyGive\(\)](#) and [xTaskNotifyTake\(\)](#) to send and receive direct to task notifications. Direct to task notifications are part of the event-driven multitasking model. A direct to task notification may be received by event-driven and co-operative tasks alike. However, the benefit of direct to task notifications may only be realized by tasks scheduled as event-driven. In order to wait for a direct to task notification, the task must be in a "waiting" state which is set by [xTaskWait\(\)](#).

See also

[xTaskNotification](#)
[xMemFree\(\)](#)
[xTaskNotifyGive\(\)](#)
[xTaskNotifyTake\(\)](#)
[xTaskWait\(\)](#)

3.5.2 Field Documentation

3.5.2.1 notificationBytes `Base_t TaskNotification_s::notificationBytes`

The length in bytes of the notification value which cannot exceed CONFIG_NOTIFICATION_VALUE_BYTES.

3.5.2.2 notificationValue `Byte_t TaskNotification_s::notificationValue [CONFIG_NOTIFICATION_VALUE_BYTES]`

The notification value whose length is specified by the notification bytes member.

The documentation for this struct was generated from the following file:

- [HeliOS.h](#)

3.6 TaskRunTimeStats_s Struct Reference

Data structure for task runtime statistics.

Data Fields

- Base_t [id](#)
- Ticks_t [lastRunTime](#)
- Ticks_t [totalRunTime](#)

3.6.1 Detailed Description

The TaskRunTimeStats_t data structure is used by [xTaskGetTaskRunTimeStats\(\)](#) and [xTaskGetAllRuntimeStats\(\)](#) to obtain runtime statistics about a task.

See also

[xTaskRunTimeStats](#)
[xTaskGetTaskRunTimeStats\(\)](#)
[xTaskGetAllRunTimeStats\(\)](#)
[xMemFree\(\)](#)

3.6.2 Field Documentation

3.6.2.1 `id` Base_t TaskRunTimeStats_s::id

The ID of the task.

3.6.2.2 `lastRunTime` Ticks_t TaskRunTimeStats_s::lastRunTime

The duration in ticks of the task's last runtime.

3.6.2.3 `totalRunTime` Ticks_t TaskRunTimeStats_s::totalRunTime

The duration in ticks of the task's total runtime.

The documentation for this struct was generated from the following file:

- [HeliOS.h](#)

4 File Documentation

4.1 config.h File Reference

Kernel header file for user definable settings.

Macros

- `#define CONFIG_MESSAGE_VALUE_BYTES 0x8u /* 8 */`
Define to enable the Arduino API C++ interface.
- `#define CONFIG_NOTIFICATION_VALUE_BYTES 0x8u /* 8 */`
Define the size in bytes of the direct to task notification value.
- `#define CONFIG_TASK_NAME_BYTES 0x8u /* 8 */`
Define the size in bytes of the ASCII task name.
- `#define CONFIG_MEMORY_REGION_SIZE_IN_BLOCKS 0x18u /* 24 */`
Define the number of memory blocks available in all memory regions.
- `#define CONFIG_MEMORY_REGION_BLOCK_SIZE 0x20u /* 32 */`
Define the memory block size in bytes for all memory regions.
- `#define CONFIG_QUEUE_MINIMUM_LIMIT 0x5u /* 5 */`
Define the minimum value for a message queue limit.
- `#define CONFIG_STREAM_BUFFER_BYTES 0x20u /* 32 */`
Define the length of the stream buffer.
- `#define CONFIG_TASK_WD_TIMER_ENABLE`
Enable task watchdog timers.
- `#define CONFIG_DEVICE_NAME_BYTES 0x8u /* 8 */`
Define the length of a device driver name.

4.1.1 Detailed Description

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4.1.2 Macro Definition Documentation

4.1.2.1 CONFIG_DEVICE_NAME_BYTES `#define CONFIG_DEVICE_NAME_BYTES 0x8u /* 8 */`

Setting `CONFIG_DEVICE_NAME_BYTES` will define the length of a device driver name. The name of device drivers should be exactly this length. There really isn't a reason to change this and doing so may break existing device drivers. The default length is 8 bytes.

4.1.2.2 CONFIG_MEMORY_REGION_BLOCK_SIZE `#define CONFIG_MEMORY_REGION_BLOCK_SIZE 0x20u /* 32 */`

Setting `CONFIG_MEMORY_REGION_BLOCK_SIZE` allows the end-user to define the size of a memory region block in bytes. The memory region block size should be set to achieve the best possible utilization of the available memory. The `CONFIG_MEMORY_REGION_BLOCK_SIZE` setting effects both the heap and kernel memory regions. The default value is 32 bytes. The literal must be appended with a "u" to maintain MISRA C:2012 compliance.

See also

[xMemAlloc\(\)](#)

[xMemFree\(\)](#)

[CONFIG_MEMORY_REGION_SIZE_IN_BLOCKS](#)

4.1.2.3 CONFIG_MEMORY_REGION_SIZE_IN_BLOCKS `#define CONFIG_MEMORY_REGION_SIZE_IN_BLOCKS 0x18u /* 24 */`

The heap memory region is used by tasks. Whereas the kernel memory region is used solely by the kernel for kernel objects. The `CONFIG_MEMORY_REGION_SIZE_IN_BLOCKS` setting allows the end-user to define the size, in blocks, of all memory regions thus effecting both the heap and kernel memory regions. The size of a memory block is defined by the `CONFIG_MEMORY_REGION_BLOCK_SIZE` setting. The size of all memory regions needs to be adjusted to fit the memory requirements of the end-user's application. By default the `CONFIG_MEMORY_REGION_SIZE_IN_BLOCKS` is defined on a per platform and/or tool-chain basis therefor it is not defined here by default. The literal must be appended with a "u" to maintain MISRA C:2012 compliance.

4.1.2.4 CONFIG_MESSAGE_VALUE_BYTES `#define CONFIG_MESSAGE_VALUE_BYTES 0x8u /* 8 */`

Because HeliOS kernel is written in C, the Arduino API cannot be called directly from the kernel. For example, assertions are unable to be written to the serial bus in applications using the Arduino platform/tool-chain. The `CONFIG_ENABLE_ARDUINO_CPP_INTERFACE` builds the included `arduino.cpp` file to allow the kernel to call the Arduino API through wrapper functions such as `ArduinoAssert()`. The `arduino.cpp` file can be found in the `/extras` directory. It must be copied into the `/src` directory to be built.

Note

On some MCU's like the 8-bit AVR's, it is necessary to undefine the `DISABLE_INTERRUPTS()` macro because interrupts must be enabled to write to the serial bus.

Define to enable system assertions.

The `CONFIG_ENABLE_SYSTEM_ASSERT` setting allows the end-user to enable system assertions in HeliOS. Once enabled, the end-user must define `CONFIG_SYSTEM_ASSERT_BEHAVIOR` for there to be an effect. By default the `CONFIG_ENABLE_SYSTEM_ASSERT` setting is not defined.

See also

`CONFIG_SYSTEM_ASSERT_BEHAVIOR`

Define the system assertion behavior.

The `CONFIG_SYSTEM_ASSERT_BEHAVIOR` setting allows the end-user to specify the behavior (code) of the assertion which is called when `CONFIG_ENABLE_SYSTEM_ASSERT` is defined. Typically some sort of output is generated over a serial or other interface. By default the `CONFIG_SYSTEM_ASSERT_BEHAVIOR` is not defined.

Note

In order to use the **ArduinoAssert()** functionality, the `CONFIG_ENABLE_ARDUINO_CPP_INTERFACE` setting must be enabled.

See also

`CONFIG_ENABLE_SYSTEM_ASSERT`

`CONFIG_ENABLE_ARDUINO_CPP_INTERFACE`

```
#define CONFIG_SYSTEM_ASSERT_BEHAVIOR(f, l) __ArduinoAssert__( f , l )
```

Define the size in bytes of the message queue message value.

Setting the `CONFIG_MESSAGE_VALUE_BYTES` allows the end-user to define the size of the message queue message value. The larger the size of the message value, the greater impact there will be on system performance. The default size is 8 bytes. The literal must be appended with "u" to maintain MISRA C:2012 compliance.

See also

[xQueueMessage](#)

4.1.2.5 CONFIG_NOTIFICATION_VALUE_BYTES `#define CONFIG_NOTIFICATION_VALUE_BYTES 0x8u /* 8 */`

Setting the `CONFIG_NOTIFICATION_VALUE_BYTES` allows the end-user to define the size of the direct to task notification value. The larger the size of the notification value, the greater impact there will be on system performance. The default size is 8 bytes. The literal must be appended with "u" to maintain MISRA C:2012 compliance.

See also

[xTaskNotification](#)

4.1.2.6 CONFIG_QUEUE_MINIMUM_LIMIT `#define CONFIG_QUEUE_MINIMUM_LIMIT 0x5u /* 5 */`

Setting the CONFIG_QUEUE_MINIMUM_LIMIT allows the end-user to define the MINIMUM length limit a message queue can be created with [xQueueCreate\(\)](#). When a message queue length equals its limit, the message queue will be considered full and return true when [xQueuelsQueueFull\(\)](#) is called. A full queue will also not accept messages from [xQueueSend\(\)](#). The default value is 5. The literal must be appended with "u" to maintain MISRA C:2012 compliance.

See also

[xQueuelsQueueFull\(\)](#)
[xQueueSend\(\)](#)
[xQueueCreate\(\)](#)

4.1.2.7 CONFIG_STREAM_BUFFER_BYTES `#define CONFIG_STREAM_BUFFER_BYTES 0x20u /* 32 */`

Setting CONFIG_STREAM_BUFFER_BYTES will define the length of stream buffers created by [xStreamCreate\(\)](#). When the length of the stream buffer reaches this value, it is considered full and can no longer be written to by calling [xStreamSend\(\)](#). The default value is 32. The literal must be appended with "u" to maintain MISRA C:2012 compliance.

4.1.2.8 CONFIG_TASK_NAME_BYTES `#define CONFIG_TASK_NAME_BYTES 0x8u /* 8 */`

Setting the CONFIG_TASK_NAME_BYTES allows the end-user to define the size of the ASCII task name. The larger the size of the task name, the greater impact there will be on system performance. The default size is 8 bytes. The literal must be appended with "u" to maintain MISRA C:2012 compliance.

See also

[xTaskInfo](#)

4.1.2.9 CONFIG_TASK_WD_TIMER_ENABLE `#define CONFIG_TASK_WD_TIMER_ENABLE`

Defining CONFIG_TASK_WD_TIMER_ENABLE will enable the task watchdog timer feature. The default is enabled.

4.2 HeliOS.h File Reference

Header file for end-user application code.

Data Structures

- struct [TaskNotification_s](#)
Data structure for a direct to task notification.
- struct [TaskRunTimeStats_s](#)
Data structure for task runtime statistics.
- struct [MemoryRegionStats_s](#)
Data structure for memory region statistics.
- struct [TaskInfo_s](#)
Data structure for information about a task.
- struct [QueueMessage_s](#)
Data structure for a queue message.
- struct [SystemInfo_s](#)
Data structure for information about the HeliOS system.

Typedefs

- typedef enum [TaskState_e](#) [TaskState_t](#)
Enumerated type for task states.
- typedef [TaskState_t](#) [xTaskState](#)
Enumerated type for task states.
- typedef enum [SchedulerState_e](#) [SchedulerState_t](#)
Enumerated type for scheduler state.
- typedef [SchedulerState_t](#) [xSchedulerState](#)
Enumerated type for scheduler state.
- typedef enum [Return_e](#) [Return_t](#)
Enumerated type for syscall return type.
- typedef [Return_t](#) [xReturn](#)
Enumerated type for syscall return type.
- typedef VOID_TYPE **TaskParm_t**
- typedef TaskParm_t * **xTaskParm**
- typedef UINT8_TYPE **Base_t**
- typedef Base_t **xBase**
- typedef UINT8_TYPE **Byte_t**
- typedef Byte_t **xByte**
- typedef VOID_TYPE **Addr_t**
- typedef Addr_t * **xAddr**
- typedef SIZE_TYPE **Size_t**
- typedef Size_t **xSize**
- typedef UINT16_TYPE **HalfWord_t**
- typedef HalfWord_t **xHalfWord**
- typedef UINT32_TYPE **Word_t**
- typedef Word_t **xWord**
- typedef UINT32_TYPE **Ticks_t**
- typedef Ticks_t **xTicks**
- typedef VOID_TYPE **Task_t**
- typedef Task_t * **xTask**
- typedef VOID_TYPE **Timer_t**
- typedef Timer_t * **xTimer**
- typedef VOID_TYPE **Queue_t**
- typedef Queue_t * **xQueue**
- typedef VOID_TYPE **StreamBuffer_t**

- typedef StreamBuffer_t * **xStreamBuffer**
- typedef struct TaskNotification_s TaskNotification_t
Data structure for a direct to task notification.
- typedef TaskNotification_t * xTaskNotification
Data structure for a direct to task notification.
- typedef struct TaskRunTimeStats_s TaskRunTimeStats_t
Data structure for task runtime statistics.
- typedef TaskRunTimeStats_t * xTaskRunTimeStats
Data structure for task runtime statistics.
- typedef struct MemoryRegionStats_s MemoryRegionStats_t
Data structure for memory region statistics.
- typedef MemoryRegionStats_t * xMemoryRegionStats
Data structure for memory region statistics.
- typedef struct TaskInfo_s TaskInfo_t
Data structure for information about a task.
- typedef TaskInfo_t xTaskInfo
Data structure for information about a task.
- typedef struct QueueMessage_s QueueMessage_t
Data structure for a queue message.
- typedef QueueMessage_t * xQueueMessage
Data structure for a queue message.
- typedef struct SystemInfo_s SystemInfo_t
Data structure for information about the HeliOS system.
- typedef SystemInfo_t * xSystemInfo
Data structure for information about the HeliOS system.

Enumerations

- enum TaskState_e { TaskStateSuspended , TaskStateRunning , TaskStateWaiting }
Enumerated type for task states.
- enum SchedulerState_e { SchedulerStateSuspended , SchedulerStateRunning }
Enumerated type for scheduler state.
- enum Return_e { ReturnOK , ReturnError }
Enumerated type for syscall return type.

Functions

- xReturn xDeviceRegisterDevice (xReturn(*device_self_register_>())
Syscall to register a device driver with the kernel.
- xReturn xDeviceIsAvailable (const xHalfWord uid_, xBase *res_)
Syscall to query the device driver about the availability of a device.
- xReturn xDeviceSimpleWrite (const xHalfWord uid_, xWord *data_)
Syscall to write a word of data to the device.
- xReturn xDeviceWrite (const xHalfWord uid_, xSize *size_, xAddr data_)
Syscall to write multiple bytes of data to a device.
- xReturn xDeviceSimpleRead (const xHalfWord uid_, xWord *data_)
Syscall to read a word of data from the device.
- xReturn xDeviceRead (const xHalfWord uid_, xSize *size_, xAddr *data_)
Syscall to read multiple bytes from a device.
- xReturn xDeviceInitDevice (const xHalfWord uid_)

- Syscall to initialize a device.*
- [xReturn xDeviceConfigDevice](#) (const xHalfWord uid_, xSize *size_, xAddr config_)
- Syscall to configure a device.*
- [xReturn xMemAlloc](#) (volatile xAddr *addr_, const xSize size_)
- Syscall to request memory from the heap.*
- [xReturn xMemFree](#) (const volatile xAddr addr_)
- Syscall to free heap memory allocated by [xMemAlloc\(\)](#)*
- [xReturn xMemGetUsed](#) (xSize *size_)
- Syscall to obtain the amount of in-use heap memory.*
- [xReturn xMemGetSize](#) (const volatile xAddr addr_, xSize *size_)
- Syscall to obtain the amount of heap memory allocated at a specific address.*
- [xReturn xMemGetHeapStats](#) (xMemoryRegionStats *stats_)
- Syscall to get memory statistics on the heap memory region.*
- [xReturn xMemGetKernelStats](#) (xMemoryRegionStats *stats_)
- Syscall to get memory statistics on the kernel memory region.*
- [xReturn xQueueCreate](#) (xQueue *queue_, const xBase limit_)
- Syscall to create a message queue.*
- [xReturn xQueueDelete](#) (xQueue queue_)
- Syscall to delete a message queue.*
- [xReturn xQueueGetLength](#) (const xQueue queue_, xBase *res_)
- Syscall to get the length of a message queue.*
- [xReturn xQueueIsQueueEmpty](#) (const xQueue queue_, xBase *res_)
- Syscall to inquire as to whether a message queue is empty.*
- [xReturn xQueueIsQueueFull](#) (const xQueue queue_, xBase *res_)
- Syscall to inquire as to whether a message queue is full.*
- [xReturn xQueueMessagesWaiting](#) (const xQueue queue_, xBase *res_)
- Syscall to inquire as to whether a message queue has one or more messages waiting.*
- [xReturn xQueueSend](#) (xQueue queue_, const xBase bytes_, const xByte *value_)
- Syscall to send a message to a message queue.*
- [xReturn xQueuePeek](#) (const xQueue queue_, xQueueMessage *message_)
- Syscall to retrieve a message from a message queue without dropping the message.*
- [xReturn xQueueDropMessage](#) (xQueue queue_)
- Syscall to drop a message from a message queue without retrieving the message.*
- [xReturn xQueueReceive](#) (xQueue queue_, xQueueMessage *message_)
- Syscall to retrieve and drop the next message from a message queue.*
- [xReturn xQueueLockQueue](#) (xQueue queue_)
- Syscall to lock a message queue.*
- [xReturn xQueueUnLockQueue](#) (xQueue queue_)
- Syscall to unlock a message queue.*
- [xReturn xStreamCreate](#) (xStreamBuffer *stream_)
- Syscall to create a stream buffer.*
- [xReturn xStreamDelete](#) (const xStreamBuffer stream_)
- Syscall to delete a stream buffer.*
- [xReturn xStreamSend](#) (xStreamBuffer stream_, const xByte byte_)
- Syscall to send a byte to a stream buffer.*
- [xReturn xStreamReceive](#) (const xStreamBuffer stream_, xHalfWord *bytes_, xByte **data_)
- Syscall to retrieve all waiting bytes from a stream buffer.*
- [xReturn xStreamBytesAvailable](#) (const xStreamBuffer stream_, xHalfWord *bytes_)
- Syscall to inquire about the number of bytes waiting in a stream buffer.*
- [xReturn xStreamReset](#) (const xStreamBuffer stream_)
- Syscall to reset a stream buffer.*

- **xReturn xStreamIsEmpty** (const xStreamBuffer stream_, xBase *res_)
Syscall to inquire as to whether a stream buffer is empty.
- **xReturn xStreamIsFull** (const xStreamBuffer stream_, xBase *res_)
Syscall to inquire as to whether a stream buffer is full.
- **xReturn xSystemAssert** (const char *file_, const int line_)
Syscall to raise a system assert.
- **xReturn xSystemInit** (void)
Syscall to bootstrap HeliOS.
- **xReturn xSystemHalt** (void)
Syscall to halt HeliOS.
- **xReturn xSystemGetSystemInfo** (xSystemInfo *info_)
Syscall to inquire about the system.
- **xReturn xTaskCreate** (xTask *task_, const xByte *name_, void(*callback_)(xTask task_, xTaskParm parm_), xTaskParm taskParameter_)
Syscall to create a new task.
- **xReturn xTaskDelete** (const xTask task_)
Syscall to delete a task.
- **xReturn xTaskGetHandleByName** (xTask *task_, const xByte *name_)
Syscall to get the task handle by name.
- **xReturn xTaskGetHandleById** (xTask *task_, const xBase id_)
Syscall to get the task handle by task id.
- **xReturn xTaskGetAllRunTimeStats** (xTaskRunTimeStats *stats_, xBase *tasks_)
Syscall to get obtain the runtime statistics of all tasks.
- **xReturn xTaskGetTaskRunTimeStats** (const xTask task_, xTaskRunTimeStats *stats_)
Syscall to get the runtime statistics for a single task.
- **xReturn xTaskGetNumberOfTasks** (xBase *tasks_)
Syscall to get the number of tasks.
- **xReturn xTaskGetTaskInfo** (const xTask task_, xTaskInfo *info_)
Syscall to get info about a task.
- **xReturn xTaskGetAllTaskInfo** (xTaskInfo *info_, xBase *tasks_)
Syscall to get info about all tasks.
- **xReturn xTaskGetTaskState** (const xTask task_, xTaskState *state_)
Syscall to get the state of a task.
- **xReturn xTaskGetName** (const xTask task_, xByte **name_)
Syscall to get the name of a task.
- **xReturn xTaskGetId** (const xTask task_, xBase *id_)
Syscall to get the task id of a task.
- **xReturn xTaskNotifyStateClear** (xTask task_)
Syscall to clear a waiting direct-to-task notification.
- **xReturn xTaskNotificationIsWaiting** (const xTask task_, xBase *res_)
Syscall to inquire as to whether a direct-to-task notification is waiting.
- **xReturn xTaskNotifyGive** (xTask task_, const xBase bytes_, const xByte *value_)
Syscall to give (i.e., send) a task a direct-to-task notification.
- **xReturn xTaskNotifyTake** (xTask task_, xTaskNotification *notification_)
Syscall to take (i.e. receive) a waiting direct-to-task notification.
- **xReturn xTaskResume** (xTask task_)
Syscall to place a task in the "running" state.
- **xReturn xTaskSuspend** (xTask task_)
Syscall to place a task in the "suspended" state.
- **xReturn xTaskWait** (xTask task_)
Syscall to place a task in the "waiting" state.

- [xReturn xTaskChangePeriod](#) (xTask task_, const xTicks period_)
Syscall to change the interval period of a task timer.
- [xReturn xTaskChangeWDPeriod](#) (xTask task_, const xTicks period_)
Syscall to change the task watchdog timer period.
- [xReturn xTaskGetPeriod](#) (const xTask task_, xTicks *period_)
Syscall to obtain the task timer period.
- [xReturn xTaskResetTimer](#) (xTask task_)
Syscall to set the task timer elapsed time to zero.
- [xReturn xTaskStartScheduler](#) (void)
Syscall to start the HeliOS scheduler.
- [xReturn xTaskResumeAll](#) (void)
Syscall to set the scheduler state to running.
- [xReturn xTaskSuspendAll](#) (void)
Syscall to set the scheduler state to suspended.
- [xReturn xTaskGetSchedulerState](#) (xSchedulerState *state_)
Syscall to get the scheduler state.
- [xReturn xTaskGetWDPeriod](#) (const xTask task_, xTicks *period_)
Syscall to get the task watchdog timer period.
- [xReturn xTimerCreate](#) (xTimer *timer_, const xTicks period_)
Syscall to create an application timer.
- [xReturn xTimerDelete](#) (const xTimer timer_)
Syscall to delete an application timer.
- [xReturn xTimerChangePeriod](#) (xTimer timer_, const xTicks period_)
Syscall to change the period on an application timer.
- [xReturn xTimerGetPeriod](#) (const xTimer timer_, xTicks *period_)
Syscall to get the current period for an application timer.
- [xReturn xTimerIsTimerActive](#) (const xTimer timer_, xBase *res_)
Syscall to inquire as to whether an application timer is active.
- [xReturn xTimerHasTimerExpired](#) (const xTimer timer_, xBase *res_)
Syscall to inquire as to whether an application timer has expired.
- [xReturn xTimerReset](#) (xTimer timer_)
Syscall to reset an application timer.
- [xReturn xTimerStart](#) (xTimer timer_)
Syscall to place an application timer in the running state.
- [xReturn xTimerStop](#) (xTimer timer_)
Syscall to place an application timer in the suspended state.

4.2.1 Detailed Description

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4.2.2 Typedef Documentation

4.2.2.1 MemoryRegionStats_t `typedef struct MemoryRegionStats_s MemoryRegionStats_t`

The MemoryRegionStats_t data structure is used by [xMemGetHeapStats\(\)](#) and [xMemGetKernelStats\(\)](#) to obtain statistics about either memory region.

See also

- [xMemoryRegionStats](#)
- [xMemGetHeapStats\(\)](#)
- [xMemGetKernelStats\(\)](#)
- [xMemFree\(\)](#)

4.2.2.2 QueueMessage_t `typedef struct QueueMessage_s QueueMessage_t`

The QueueMessage_t structure is used to store a queue message and is returned by [xQueueReceive\(\)](#) and [xQueuePeek\(\)](#).

See also

- [xQueueMessage](#)
- [xQueueReceive\(\)](#)
- [xQueuePeek\(\)](#)
- [CONFIG_MESSAGE_VALUE_BYTES](#)
- [xMemFree\(\)](#)

4.2.2.3 Return_t `typedef enum Return_e Return_t`

All HeliOS syscalls return the `Return_t` type which can either be `ReturnOK` or `ReturnError`. The C macros `OK()` and `ERROR()` can be used as a more concise way of checking the return value of a syscall (e.g., `if(OK(xMemGetUsed(&size))) {}` or `if(ERROR(xMemGetUsed(&size))) {}`).

See also

`OK()`
`ERROR()`
[xReturn](#)

4.2.2.4 SchedulerState_t `typedef enum SchedulerState_e SchedulerState_t`

The scheduler can be in one of three possible states as defined by the `SchedulerState_t` enumerated data type. The state the scheduler is in is changed by calling `xTaskSuspendAll()` and `xTaskResumeAll()`. The state the scheduler is in can be obtained by calling `xTaskGetSchedulerState()`.

See also

[xSchedulerState](#)
[xTaskSuspendAll\(\)](#)
[xTaskResumeAll\(\)](#)
[xTaskGetSchedulerState\(\)](#)
[xTaskStartScheduler\(\)](#)

4.2.2.5 SystemInfo_t `typedef struct SystemInfo_s SystemInfo_t`

The `SystemInfo_t` data structure is used to store information about the HeliOS system and is returned by `xSystemGetSystemInfo()`.

See also

[xSystemInfo](#)
[xSystemGetSystemInfo\(\)](#)
`OS_PRODUCT_NAME_SIZE`
[xMemFree\(\)](#)

4.2.2.6 TaskInfo_t `typedef struct TaskInfo_s TaskInfo_t`

The TaskInfo_t structure is similar to xTaskRuntimeStats_t in that it contains runtime statistics for a task. However, TaskInfo_t also contains additional details about a task such as its name and state. The TaskInfo_t structure is returned by xTaskGetTaskInfo() and xTaskGetAllTaskInfo(). If only runtime statistics are needed, then TaskRunTimeStats_t should be used because of its smaller memory footprint.

See also

[xTaskInfo](#)
[xTaskGetTaskInfo\(\)](#)
[xTaskGetAllTaskInfo\(\)](#)
[CONFIG_TASK_NAME_BYTES](#)
[xMemFree\(\)](#)

4.2.2.7 TaskNotification_t `typedef struct TaskNotification_s TaskNotification_t`

The TaskNotification_t data structure is used by xTaskNotifyGive() and xTaskNotifyTake() to send and receive direct to task notifications. Direct to task notifications are part of the event-driven multitasking model. A direct to task notification may be received by event-driven and co-operative tasks alike. However, the benefit of direct to task notifications may only be realized by tasks scheduled as event-driven. In order to wait for a direct to task notification, the task must be in a "waiting" state which is set by xTaskWait().

See also

[xTaskNotification](#)
[xMemFree\(\)](#)
[xTaskNotifyGive\(\)](#)
[xTaskNotifyTake\(\)](#)
[xTaskWait\(\)](#)

4.2.2.8 TaskRunTimeStats_t `typedef struct TaskRunTimeStats_s TaskRunTimeStats_t`

The TaskRunTimeStats_t data structure is used by xTaskGetTaskRunTimeStats() and xTaskGetAllRuntimeStats() to obtain runtime statistics about a task.

See also

[xTaskRunTimeStats](#)
[xTaskGetTaskRunTimeStats\(\)](#)
[xTaskGetAllRunTimeStats\(\)](#)
[xMemFree\(\)](#)

4.2.2.9 TaskState_t `typedef enum TaskState_e TaskState_t`

A task can be in one of four possible states as defined by the TaskState_t enumerated data type. The state a task is in is changed by calling `xTaskResume()`, `xTaskSuspend()` or `xTaskWait()`. The HeliOS scheduler will only schedule, for execution, tasks in either the TaskStateRunning or TaskStateWaiting state.

See also

[xTaskState](#)
[xTaskResume\(\)](#)
[xTaskSuspend\(\)](#)
[xTaskWait\(\)](#)
[xTaskGetTaskState\(\)](#)

4.2.2.10 xReturn `typedef Return_t xReturn`

See also

[Return_t](#)

4.2.2.11 xSchedulerState `typedef SchedulerState_t xSchedulerState`

See also

[SchedulerState_t](#)

4.2.2.12 xTaskNotification `typedef TaskNotification_t* xTaskNotification`

See also

[TaskNotification_t](#)

4.2.2.13 xTaskState `typedef TaskState_t xTaskState`

See also

[TaskState_t](#)

4.2.3 Enumeration Type Documentation

4.2.3.1 **Return_e** enum [Return_e](#)

All HeliOS syscalls return the `Return_t` type which can either be `ReturnOK` or `ReturnError`. The C macros `OK()` and `ERROR()` can be used as a more concise way of checking the return value of a syscall (e.g., `if(OK(xMemGetUsed(&size))) {}` or `if(ERROR(xMemGetUsed(&size))) {}`).

See also

`OK()`

`ERROR()`

[xReturn](#)

Enumerator

ReturnOK	Return value if the syscall was successful.
ReturnError	Return value if the syscall failed.

4.2.3.2 SchedulerState_e enum SchedulerState_e

The scheduler can be in one of three possible states as defined by the SchedulerState_t enumerated data type. The state the scheduler is in is changed by calling [xTaskSuspendAll\(\)](#) and [xTaskResumeAll\(\)](#). The state the scheduler is in can be obtained by calling [xTaskGetSchedulerState\(\)](#).

See also

[xSchedulerState](#)
[xTaskSuspendAll\(\)](#)
[xTaskResumeAll\(\)](#)
[xTaskGetSchedulerState\(\)](#)
[xTaskStartScheduler\(\)](#)

Enumerator

SchedulerStateSuspended	State the scheduler is in after calling xTaskSuspendAll() . TaskStartScheduler() will stop scheduling tasks for execution and relinquish control when xTaskSuspendAll() is called.
SchedulerStateRunning	State the scheduler is in after calling xTaskResumeAll() . xTaskStartScheduler() will continue to schedule tasks for execution until xTaskSuspendAll() is called.

4.2.3.3 TaskState_e enum TaskState_e

A task can be in one of four possible states as defined by the TaskState_t enumerated data type. The state a task is in is changed by calling [xTaskResume\(\)](#), [xTaskSuspend\(\)](#) or [xTaskWait\(\)](#). The HeliOS scheduler will only schedule, for execution, tasks in either the TaskStateRunning or TaskStateWaiting state.

See also

[xTaskState](#)
[xTaskResume\(\)](#)
[xTaskSuspend\(\)](#)
[xTaskWait\(\)](#)
[xTaskGetTaskState\(\)](#)

Enumerator

TaskStateSuspended	State a task is in after it is created OR after calling xTaskSuspend() . Tasks in the TaskStateSuspended state will not be scheduled for execution by the scheduler.
TaskStateRunning	State a task is in after calling xTaskResume() . Tasks in the TaskStateRunning state will be scheduled for execution by the scheduler.
TaskStateWaiting	State a task is in after calling xTaskWait() . Tasks in the TaskStateWaiting state will be scheduled for execution by the scheduler only when a task event has occurred.

4.2.4 Function Documentation

4.2.4.1 xDeviceConfigDevice() [xReturn](#) xDeviceConfigDevice (

```

    const xHalfWord uid_,
    xSize * size_,
    xAddr config_ )

```

The [xDeviceConfigDevice\(\)](#) will call the device driver's DEVICENAME_config() function to configure the device. The syscall is bi-directional (i.e., it will write configuration data to the device and read the same from the device before returning). The purpose of the bi-directional functionality is to allow the device's configuration to be set and queried using one syscall. The structure of the configuration data is left to the device driver's author. What is required is that the configuration data memory is allocated using [xMemAlloc\(\)](#) and that the "size_" parameter is set to the size (i.e., amount) of the configuration data (e.g., sizeof(MyDeviceDriverConfig)) in bytes.

See also

[xReturn](#)
[xMemAlloc\(\)](#)
[xMemFree\(\)](#)

Parameters

<i>uid_</i>	The unique identifier ("UID") of the device driver to be operated on.
<i>size_↔</i> —	The size (i.e., amount) of configuration data to be written and read to and from the device, in bytes.
<i>config_↔</i> —	The configuration data. The configuration data must have been allocated by xMemAlloc() .

Returns

On success, the syscall returns ReturnOK. On failure, the syscall returns ReturnError. A failure is any condition in which the syscall was unable to achieve its intended objective. For example, if [xTaskGetId\(\)](#) was unable to locate the task by the task object (i.e., xTask) passed to the syscall, because either the object was null or invalid (e.g., a deleted task), [xTaskGetId\(\)](#) would return ReturnError. All HeliOS syscalls return the xReturn (a.k.a., Return_t) type which can either be ReturnOK or ReturnError. The C macros OK() and ERROR() can be used as a more concise way of checking the return value of a syscall (e.g., if(OK(xMemGetUsed(&size))) {} or if(ERROR(xMemGetUsed(&size))) {}).

4.2.4.2 xDeviceInitDevice() `xReturn` xDeviceInitDevice (
 const xHalfWord uid_)

The `xDeviceInitDevice()` syscall will call the device driver's `DRIVERNAME_init()` function to bootstrap the device. For example, setting memory mapped registers to starting values or setting the device driver's state and mode. This syscall is optional and is dependent on the specifics of the device driver's implementation by its author.

See also

[xReturn](#)

Parameters

<code>uid_↔</code> —	The unique identifier ("UID") of the device driver to be operated on.
-------------------------	---

Returns

On success, the syscall returns `ReturnOK`. On failure, the syscall returns `ReturnError`. A failure is any condition in which the syscall was unable to achieve its intended objective. For example, if `xTaskGetId()` was unable to locate the task by the task object (i.e., `xTask`) passed to the syscall, because either the object was null or invalid (e.g., a deleted task), `xTaskGetId()` would return `ReturnError`. All HeliOS syscalls return the `xReturn` (a.k.a., `Return_t`) type which can either be `ReturnOK` or `ReturnError`. The C macros `OK()` and `ERROR()` can be used as a more concise way of checking the return value of a syscall (e.g., `if(OK(xMemGetUsed(&size))) {}` or `if(ERROR(xMemGetUsed(&size))) {}`).

4.2.4.3 xDeviceIsAvailable() `xReturn` xDeviceIsAvailable (
 const xHalfWord uid_,
 xBase * res_)

The `xDeviceIsAvailable()` syscall queries the device driver about the availability of a device. Generally "available" means the that the device is available for read and/or write operations though the meaning is implementation specific and left up to the device driver's author.

See also

[xReturn](#)

Parameters

<code>uid_↔</code> —	The unique identifier ("UID") of the device driver to be operated on.
<code>res_↔</code> —	The result of the inquiry; here, taken to mean the availability of the device.

Returns

On success, the syscall returns `ReturnOK`. On failure, the syscall returns `ReturnError`. A failure is any condition in which the syscall was unable to achieve its intended objective. For example, if `xTaskGetId()` was unable to locate the task by the task object (i.e., `xTask`) passed to the syscall, because either the object was null or

invalid (e.g., a deleted task), `xTaskGetId()` would return `ReturnError`. All HeliOS syscalls return the `xReturn` (a.k.a., `Return_t`) type which can either be `ReturnOK` or `ReturnError`. The C macros `OK()` and `ERROR()` can be used as a more concise way of checking the return value of a syscall (e.g., `if(OK(xMemGetUsed(&size))) {}` or `if(ERROR(xMemGetUsed(&size))) {}`).

4.2.4.4 xDeviceRead() `xReturn` `xDeviceRead` (

```

    const xHalfWord uid_,
    xSize * size_,
    xAddr * data_ )

```

The `xDeviceRead()` syscall will read multiple bytes of data from a device into a data buffer. The data buffer must be freed by `xMemFree()`. Whether the data is read from the device is dependent on the device driver mode, state and implementation of these features by the device driver's author.

See also

`xReturn`
`xMemFree()`

Parameters

<code>uid</code> ↔ —	The unique identifier ("UID") of the device driver to be operated on.
<code>size</code> ↔ —	The number of bytes read from the device and contained in the data buffer.
<code>data</code> ↔ —	The data buffer containing the data read from the device which must be freed by <code>xMemFree()</code> .

Returns

On success, the syscall returns `ReturnOK`. On failure, the syscall returns `ReturnError`. A failure is any condition in which the syscall was unable to achieve its intended objective. For example, if `xTaskGetId()` was unable to locate the task by the task object (i.e., `xTask`) passed to the syscall, because either the object was null or invalid (e.g., a deleted task), `xTaskGetId()` would return `ReturnError`. All HeliOS syscalls return the `xReturn` (a.k.a., `Return_t`) type which can either be `ReturnOK` or `ReturnError`. The C macros `OK()` and `ERROR()` can be used as a more concise way of checking the return value of a syscall (e.g., `if(OK(xMemGetUsed(&size))) {}` or `if(ERROR(xMemGetUsed(&size))) {}`).

4.2.4.5 xDeviceRegisterDevice() `xReturn` `xDeviceRegisterDevice` (

```

    xReturn (*) () device_self_register_ )

```

The `xDeviceRegisterDevice()` syscall is a component of the HeliOS device driver model which registers a device driver with the HeliOS kernel. This syscall must be made before a device driver can be called by `xDeviceRead()`, `xDeviceWrite()`, etc. Once a device is registered, it cannot be un-registered - it can only be placed in a suspended state which is done by calling `xDeviceConfigDevice()`. However, as with most aspects of the HeliOS device driver model, it is important to note that the implementation of and support for device state and mode is up to the device driver's author.

Note

A device driver's unique identifier ("UID") must be a globally unique identifier. No two device drivers in the same application can share the same UID. This is best achieved by ensuring the device driver author selects a UID for his device driver that is not in use by other device drivers. A device driver template and device drivers can be found in /drivers.

See also

[CONFIG_DEVICE_NAME_BYTES](#)

[xReturn](#)

Parameters

<i>device_self_↔ register_</i>	The device driver's self registration function, DRIVERNAME_self_register().
------------------------------------	---

Returns

On success, the syscall returns ReturnOK. On failure, the syscall returns ReturnError. A failure is any condition in which the syscall was unable to achieve its intended objective. For example, if [xTaskGetId\(\)](#) was unable to locate the task by the task object (i.e., xTask) passed to the syscall, because either the object was null or invalid (e.g., a deleted task), [xTaskGetId\(\)](#) would return ReturnError. All HeliOS syscalls return the xReturn (a.k.a., Return_t) type which can either be ReturnOK or ReturnError. The C macros OK() and ERROR() can be used as a more concise way of checking the return value of a syscall (e.g., if(OK(xMemGetUsed(&size))) {} or if(ERROR(xMemGetUsed(&size))) {}).

4.2.4.6 xDeviceSimpleRead() [xReturn](#) xDeviceSimpleRead (
 const xHalfWord uid_,
 xWord * data_)

The [xDeviceSimpleRead\(\)](#) syscall will read a word of data from a device. The word of data must be freed by [xMemFree\(\)](#). Whether the data is read from the device is dependent on the device driver mode, state and implementation of these features by the device driver's author.

See also

[xReturn](#)

[xMemFree\(\)](#)

Parameters

<i>uid_↔</i>	The unique identifier ("UID") of the device driver to be operated on.
<i>data_↔</i>	The word of data read from the device which must be freed by xMemFree() .

Returns

On success, the syscall returns ReturnOK. On failure, the syscall returns ReturnError. A failure is any condition in which the syscall was unable to achieve its intended objective. For example, if [xTaskGetId\(\)](#) was unable to locate the task by the task object (i.e., xTask) passed to the syscall, because either the object was null or invalid (e.g., a deleted task), [xTaskGetId\(\)](#) would return ReturnError. All HeliOS syscalls return the xReturn (a.k.a., Return_t) type which can either be ReturnOK or ReturnError. The C macros OK() and ERROR() can be used as a more concise way of checking the return value of a syscall (e.g., if(OK(xMemGetUsed(&size))) {} or if(ERROR(xMemGetUsed(&size))) {}).

4.2.4.7 xDeviceSimpleWrite() [xReturn](#) xDeviceSimpleWrite (
 const xHalfWord uid_,
 xWord * data_)

The [xDeviceSimpleWrite\(\)](#) syscall will write a word (i.e., xWord) of data to a device. The word of data must have been allocated by [xMemAlloc\(\)](#). Whether the data is written to the device is dependent on the device driver mode, state and implementation of these features by the device driver's author.

See also

[xReturn](#)
[xMemAlloc\(\)](#)
[xMemFree\(\)](#)

Parameters

<i>uid</i> ↔ —	The unique identifier ("UID") of the device driver to be operated on.
<i>data</i> ↔ —	A word of data to be written to the device. The word of data must have been allocated by xMemAlloc() .

Returns

On success, the syscall returns ReturnOK. On failure, the syscall returns ReturnError. A failure is any condition in which the syscall was unable to achieve its intended objective. For example, if [xTaskGetId\(\)](#) was unable to locate the task by the task object (i.e., xTask) passed to the syscall, because either the object was null or invalid (e.g., a deleted task), [xTaskGetId\(\)](#) would return ReturnError. All HeliOS syscalls return the xReturn (a.k.a., Return_t) type which can either be ReturnOK or ReturnError. The C macros OK() and ERROR() can be used as a more concise way of checking the return value of a syscall (e.g., if(OK(xMemGetUsed(&size))) {} or if(ERROR(xMemGetUsed(&size))) {}).

4.2.4.8 xDeviceWrite() [xReturn](#) xDeviceWrite (
 const xHalfWord uid_,
 xSize * size_,
 xAddr data_)

The [xDeviceWrite\(\)](#) syscall will write multiple bytes of data contained in a data buffer to a device. The data buffer must have been allocated by [xMemAlloc\(\)](#). Whether the data is written to the device is dependent on the device driver mode, state and implementation of these features by the device driver's author.

See also

[xReturn](#)
[xMemAlloc\(\)](#)
[xMemFree\(\)](#)

Parameters

<i>uid</i> ↔ —	The unique identifier ("UID") of the device driver to be operated on.
<i>size</i> ↔ —	The size of the data buffer, in bytes.
<i>data</i> ↔ —	The data buffer containing the data to be written to the device. The data buffer must have been allocated by xMemAlloc() .

Returns

On success, the syscall returns ReturnOK. On failure, the syscall returns ReturnError. A failure is any condition in which the syscall was unable to achieve its intended objective. For example, if [xTaskGetId\(\)](#) was unable to locate the task by the task object (i.e., xTask) passed to the syscall, because either the object was null or invalid (e.g., a deleted task), [xTaskGetId\(\)](#) would return ReturnError. All HeliOS syscalls return the xReturn (a.k.a., Return_t) type which can either be ReturnOK or ReturnError. The C macros OK() and ERROR() can be used as a more concise way of checking the return value of a syscall (e.g., if(OK(xMemGetUsed(&size))) {} or if(ERROR(xMemGetUsed(&size))) {}).

4.2.4.9 xMemAlloc() [xReturn](#) xMemAlloc (

```

volatile xAddr * addr_,
const xSize size_ )

```

The [xMemAlloc\(\)](#) syscall allocates heap memory for user's application. The amount of available heap memory is dependent on the CONFIG_MEMORY_REGION_SIZE_IN_BLOCKS and CONFIG_MEMORY_REGION_BLOCK_SIZE settings. Similar to libc calloc(), [xMemAlloc\(\)](#) clears (i.e., zeros out) the allocated memory it allocates. Because the address of the newly allocated heap memory is handed back through the "addr_" argument, the argument must be cast to "volatile xAddr *" to avoid compiler warnings.

See also

[xReturn](#)
[CONFIG_MEMORY_REGION_SIZE_IN_BLOCKS](#)
[CONFIG_MEMORY_REGION_BLOCK_SIZE](#)
[xMemFree\(\)](#)

Parameters

<i>addr</i> ↔ —	The address of the allocated memory. For example, if heap memory for a structure called mystruct (MyStruct *) needs to be allocated, the call to xMemAlloc() would be written as follows if(OK(xMemAlloc((volatile xAddr *) &mystruct, sizeof(MyStruct)))) {}.
<i>size</i> ↔ —	The amount of heap memory, in bytes, being requested.

Returns

On success, the syscall returns ReturnOK. On failure, the syscall returns ReturnError. A failure is any condition in which the syscall was unable to achieve its intended objective. For example, if [xTaskGetId\(\)](#) was unable to locate the task by the task object (i.e., xTask) passed to the syscall, because either the object was null or invalid (e.g., a deleted task), [xTaskGetId\(\)](#) would return ReturnError. All HeliOS syscalls return the xReturn (a.k.a., Return_t) type which can either be ReturnOK or ReturnError. The C macros OK() and ERROR() can be used as a more concise way of checking the return value of a syscall (e.g., if(OK(xMemGetUsed(&size))) {} or if(ERROR(xMemGetUsed(&size))) {}).

4.2.4.10 xMemFree() [xReturn](#) xMemFree (
 const volatile xAddr addr_)

The [xMemFree\(\)](#) syscall frees (i.e., de-allocates) heap memory allocated by [xMemAlloc\(\)](#). [xMemFree\(\)](#) is also used to free heap memory allocated by syscalls including [xTaskGetAllRunTimeStats\(\)](#).

See also

[xReturn](#)
[xMemAlloc\(\)](#)

Parameters

<i>addr</i> ↔ _	The address of the allocated memory to be freed.
--------------------	--

Returns

On success, the syscall returns ReturnOK. On failure, the syscall returns ReturnError. A failure is any condition in which the syscall was unable to achieve its intended objective. For example, if [xTaskGetId\(\)](#) was unable to locate the task by the task object (i.e., xTask) passed to the syscall, because either the object was null or invalid (e.g., a deleted task), [xTaskGetId\(\)](#) would return ReturnError. All HeliOS syscalls return the xReturn (a.k.a., Return_t) type which can either be ReturnOK or ReturnError. The C macros OK() and ERROR() can be used as a more concise way of checking the return value of a syscall (e.g., if(OK(xMemGetUsed(&size))) {} or if(ERROR(xMemGetUsed(&size))) {}).

4.2.4.11 xMemGetHeapStats() [xReturn](#) xMemGetHeapStats (
 xMemoryRegionStats * stats_)

The [xMemGetHeapStats\(\)](#) syscall is used to obtain detailed statistics about the heap memory region which can be used by the application to monitor memory utilization.

See also

[xReturn](#)
[xMemoryRegionStats](#)
[xMemFree\(\)](#)

Parameters

<code>stats</code> ↔	The memory region statistics. The memory region statistics must be freed by xMemFree() .
—	

Returns

On success, the syscall returns ReturnOK. On failure, the syscall returns ReturnError. A failure is any condition in which the syscall was unable to achieve its intended objective. For example, if [xTaskGetId\(\)](#) was unable to locate the task by the task object (i.e., xTask) passed to the syscall, because either the object was null or invalid (e.g., a deleted task), [xTaskGetId\(\)](#) would return ReturnError. All HeliOS syscalls return the xReturn (a.k.a., Return_t) type which can either be ReturnOK or ReturnError. The C macros OK() and ERROR() can be used as a more concise way of checking the return value of a syscall (e.g., if(OK(xMemGetUsed(&size))) {} or if(ERROR(xMemGetUsed(&size))) {}).

4.2.4.12 xMemGetKernelStats() [xReturn](#) xMemGetKernelStats (
 [xMemoryRegionStats](#) * stats_)

The [xMemGetKernelStats\(\)](#) syscall is used to obtain detailed statistics about the kernel memory region which can be used by the application to monitor memory utilization.

See also

[xReturn](#)
[xMemoryRegionStats](#)
[xMemFree\(\)](#)

Parameters

<code>stats</code> ↔	The memory region statistics. The memory region statistics must be freed by xMemFree() .
—	

Returns

On success, the syscall returns ReturnOK. On failure, the syscall returns ReturnError. A failure is any condition in which the syscall was unable to achieve its intended objective. For example, if [xTaskGetId\(\)](#) was unable to locate the task by the task object (i.e., xTask) passed to the syscall, because either the object was null or invalid (e.g., a deleted task), [xTaskGetId\(\)](#) would return ReturnError. All HeliOS syscalls return the xReturn (a.k.a., Return_t) type which can either be ReturnOK or ReturnError. The C macros OK() and ERROR() can be used as a more concise way of checking the return value of a syscall (e.g., if(OK(xMemGetUsed(&size))) {} or if(ERROR(xMemGetUsed(&size))) {}).

4.2.4.13 xMemGetSize() [xReturn](#) xMemGetSize (
 const volatile xAddr addr_,
 xSize * size_)

The [xMemGetSize\(\)](#) syscall can be used to obtain the amount, in bytes, of heap memory allocated at a specific address. The address must be the address obtained from [xMemAlloc\(\)](#).

See also

[xReturn](#)

Parameters

<i>addr</i> ↔ —	The address of the heap memory for which the size (i.e., amount) allocated, in bytes, is being sought.
<i>size</i> ↔ —	The size (i.e., amount), in bytes, of heap memory allocated to the address.

Returns

On success, the syscall returns ReturnOK. On failure, the syscall returns ReturnError. A failure is any condition in which the syscall was unable to achieve its intended objective. For example, if [xTaskGetId\(\)](#) was unable to locate the task by the task object (i.e., xTask) passed to the syscall, because either the object was null or invalid (e.g., a deleted task), [xTaskGetId\(\)](#) would return ReturnError. All HeliOS syscalls return the xReturn (a.k.a., Return_t) type which can either be ReturnOK or ReturnError. The C macros OK() and ERROR() can be used as a more concise way of checking the return value of a syscall (e.g., if(OK(xMemGetUsed(&size))) {} or if(ERROR(xMemGetUsed(&size))) {}).

4.2.4.14 xMemGetUsed() [xReturn](#) xMemGetUsed (xSize * size_)

The [xMemGetUsed\(\)](#) syscall will update the "size_" argument with the amount, in bytes, of in-use heap memory. If more memory statistics are needed, [xMemGetHeapStats\(\)](#) provides a more complete picture of the heap memory region.

See also

[xReturn](#)

[xMemGetHeapStats\(\)](#)

Parameters

<i>size</i> ↔ —	The size (i.e., amount), in bytes, of in-use heap memory.
--------------------	---

Returns

On success, the syscall returns ReturnOK. On failure, the syscall returns ReturnError. A failure is any condition in which the syscall was unable to achieve its intended objective. For example, if [xTaskGetId\(\)](#) was unable to locate the task by the task object (i.e., xTask) passed to the syscall, because either the object was null or invalid (e.g., a deleted task), [xTaskGetId\(\)](#) would return ReturnError. All HeliOS syscalls return the xReturn (a.k.a., Return_t) type which can either be ReturnOK or ReturnError. The C macros OK() and ERROR() can be used as a more concise way of checking the return value of a syscall (e.g., if(OK(xMemGetUsed(&size))) {} or if(ERROR(xMemGetUsed(&size))) {}).

4.2.4.15 xQueueCreate() `xReturn` xQueueCreate (
 xQueue * queue_,
 const xBase limit_)

The [xQueueCreate\(\)](#) syscall will create a new message queue for inter-task communication.

See also

[xReturn](#)
[xQueue](#)
[CONFIG_QUEUE_MINIMUM_LIMIT](#)
[xQueueDelete\(\)](#)

Parameters

<i>queue</i> ↔ —	The message queue to be operated on.
<i>limit_</i>	The message limit for the queue. When this value is reached, the message queue is considered to be full. The minimum message limit is configured using the CONFIG_QUEUE_MINIMUM_LIMIT (default is 5) setting.

Returns

On success, the syscall returns ReturnOK. On failure, the syscall returns ReturnError. A failure is any condition in which the syscall was unable to achieve its intended objective. For example, if [xTaskGetId\(\)](#) was unable to locate the task by the task object (i.e., xTask) passed to the syscall, because either the object was null or invalid (e.g., a deleted task), [xTaskGetId\(\)](#) would return ReturnError. All HeliOS syscalls return the xReturn (a.k.a., Return_t) type which can either be ReturnOK or ReturnError. The C macros OK() and ERROR() can be used as a more concise way of checking the return value of a syscall (e.g., if(OK(xMemGetUsed(&size))) {} or if(ERROR(xMemGetUsed(&size))) {}).

4.2.4.16 xQueueDelete() `xReturn` xQueueDelete (
 xQueue queue_)

The [xQueueDelete\(\)](#) syscall will delete a message queue used for inter-task communication.

See also

[xReturn](#)
[xQueue](#)
[xQueueCreate\(\)](#)

Parameters

<i>queue</i> ↔ —	The message queue to be operated on.
---------------------	--------------------------------------

Returns

On success, the syscall returns ReturnOK. On failure, the syscall returns ReturnError. A failure is any condition in which the syscall was unable to achieve its intended objective. For example, if `xTaskGetId()` was unable to locate the task by the task object (i.e., `xTask`) passed to the syscall, because either the object was null or invalid (e.g., a deleted task), `xTaskGetId()` would return ReturnError. All HeliOS syscalls return the `xReturn` (a.k.a., `Return_t`) type which can either be ReturnOK or ReturnError. The C macros `OK()` and `ERROR()` can be used as a more concise way of checking the return value of a syscall (e.g., `if(OK(xMemGetUsed(&size))) {}` or `if(ERROR(xMemGetUsed(&size))) {}`).

4.2.4.17 xQueueDropMessage() `xReturn` `xQueueDropMessage` (
`xQueue queue_`)

The `xQueueDropMessage()` syscall is used to drop the next message from a message queue without retrieving the message.

See also

`xReturn`

`xQueue`

Parameters

<code>queue_↔</code>	The message queue to be operated on.
<code>_</code>	

Returns

On success, the syscall returns ReturnOK. On failure, the syscall returns ReturnError. A failure is any condition in which the syscall was unable to achieve its intended objective. For example, if `xTaskGetId()` was unable to locate the task by the task object (i.e., `xTask`) passed to the syscall, because either the object was null or invalid (e.g., a deleted task), `xTaskGetId()` would return ReturnError. All HeliOS syscalls return the `xReturn` (a.k.a., `Return_t`) type which can either be ReturnOK or ReturnError. The C macros `OK()` and `ERROR()` can be used as a more concise way of checking the return value of a syscall (e.g., `if(OK(xMemGetUsed(&size))) {}` or `if(ERROR(xMemGetUsed(&size))) {}`).

4.2.4.18 xQueueGetLength() `xReturn` `xQueueGetLength` (
`const xQueue queue_`,
`xBase * res_`)

The `xQueueGetLength()` syscall is used to inquire about the length (i.e., the number of messages) of a message queue.

See also

`xReturn`

`xQueue`

Parameters

<i>queue</i> ↔ —	The message queue to be operated on.
<i>res_</i>	The result of the inquiry; taken here to mean the number of messages a message queue contains.

Returns

On success, the syscall returns ReturnOK. On failure, the syscall returns ReturnError. A failure is any condition in which the syscall was unable to achieve its intended objective. For example, if [xTaskGetId\(\)](#) was unable to locate the task by the task object (i.e., xTask) passed to the syscall, because either the object was null or invalid (e.g., a deleted task), [xTaskGetId\(\)](#) would return ReturnError. All HeliOS syscalls return the xReturn (a.k.a., Return_t) type which can either be ReturnOK or ReturnError. The C macros OK() and ERROR() can be used as a more concise way of checking the return value of a syscall (e.g., if(OK(xMemGetUsed(&size))) {} or if(ERROR(xMemGetUsed(&size))) {}).

4.2.4.19 xQueueIsQueueEmpty() [xReturn](#) xQueueIsQueueEmpty (
 const xQueue *queue_*,
 xBase * *res_*)

The [xQueueIsQueueEmpty\(\)](#) syscall is used to inquire as to whether a message queue is empty. A message queue is considered empty if the length (i.e., number of messages) of a queue is zero.

See also

[xReturn](#)

[xQueue](#)

Parameters

<i>queue</i> ↔ —	The message queue to be operated on.
<i>res_</i>	The result of the inquiry; taken here to mean "true" if the queue is empty, "false" if it contains one or more messages.

Returns

On success, the syscall returns ReturnOK. On failure, the syscall returns ReturnError. A failure is any condition in which the syscall was unable to achieve its intended objective. For example, if [xTaskGetId\(\)](#) was unable to locate the task by the task object (i.e., xTask) passed to the syscall, because either the object was null or invalid (e.g., a deleted task), [xTaskGetId\(\)](#) would return ReturnError. All HeliOS syscalls return the xReturn (a.k.a., Return_t) type which can either be ReturnOK or ReturnError. The C macros OK() and ERROR() can be used as a more concise way of checking the return value of a syscall (e.g., if(OK(xMemGetUsed(&size))) {} or if(ERROR(xMemGetUsed(&size))) {}).

4.2.4.20 xQueuelQueueFull() `xReturn` xQueueIsQueueFull (

```

    const xQueue queue_,
    xBase * res_ )

```

The `xQueuelQueueFull()` syscall is used to inquire as to whether a message queue is full. A message queue is considered full if the length (i.e., number of messages) of a queue has reached its message limit which is configured using the `CONFIG_QUEUE_MINIMUM_LIMIT` (default is 5) setting.

See also

[xReturn](#)

[xQueue](#)

[CONFIG_QUEUE_MINIMUM_LIMIT](#)

Parameters

<i>queue_↔</i> —	The message queue to be operated on.
<i>res_</i>	The result of the inquiry; taken here to mean "true" if the queue is full, "false" if it contains less than "limit" messages.

Returns

On success, the syscall returns `ReturnOK`. On failure, the syscall returns `ReturnError`. A failure is any condition in which the syscall was unable to achieve its intended objective. For example, if `xTaskGetId()` was unable to locate the task by the task object (i.e., `xTask`) passed to the syscall, because either the object was null or invalid (e.g., a deleted task), `xTaskGetId()` would return `ReturnError`. All HeliOS syscalls return the `xReturn` (a.k.a., `Return_t`) type which can either be `ReturnOK` or `ReturnError`. The C macros `OK()` and `ERROR()` can be used as a more concise way of checking the return value of a syscall (e.g., `if(OK(xMemGetUsed(&size))) {}` or `if(ERROR(xMemGetUsed(&size))) {}`).

4.2.4.21 xQueueLockQueue() `xReturn` xQueueLockQueue (

```

    xQueue queue_ )

```

The `xQueueLockQueue()` syscall is used to lock a message queue. Locking a message queue prevents tasks from sending messages to the queue but does not prevent tasks from peeking, receiving or dropping messages from a message queue.

See also

[xReturn](#)

[xQueue](#)

[xQueueUnLockQueue\(\)](#)

Parameters

<i>queue_↔</i> —	The message queue to be operated on.
---------------------	--------------------------------------

Returns

On success, the syscall returns ReturnOK. On failure, the syscall returns ReturnError. A failure is any condition in which the syscall was unable to achieve its intended objective. For example, if [xTaskGetId\(\)](#) was unable to locate the task by the task object (i.e., xTask) passed to the syscall, because either the object was null or invalid (e.g., a deleted task), [xTaskGetId\(\)](#) would return ReturnError. All HeliOS syscalls return the xReturn (a.k.a., Return_t) type which can either be ReturnOK or ReturnError. The C macros OK() and ERROR() can be used as a more concise way of checking the return value of a syscall (e.g., if(OK(xMemGetUsed(&size))) {} or if(ERROR(xMemGetUsed(&size))) {}).

4.2.4.22 xQueueMessagesWaiting() [xReturn](#) xQueueMessagesWaiting (
 const xQueue queue_,
 xBase * res_)

The [xQueueMessagesWaiting\(\)](#) syscall is used to inquire as to whether a message queue has one or more messages waiting.

See also

[xReturn](#)

[xQueue](#)

Parameters

<i>queue_</i>	The message queue to be operated on.
<i>res_</i>	The result of the inquiry; taken here to mean "true" if there is one or more messages waiting.

Returns

On success, the syscall returns ReturnOK. On failure, the syscall returns ReturnError. A failure is any condition in which the syscall was unable to achieve its intended objective. For example, if [xTaskGetId\(\)](#) was unable to locate the task by the task object (i.e., xTask) passed to the syscall, because either the object was null or invalid (e.g., a deleted task), [xTaskGetId\(\)](#) would return ReturnError. All HeliOS syscalls return the xReturn (a.k.a., Return_t) type which can either be ReturnOK or ReturnError. The C macros OK() and ERROR() can be used as a more concise way of checking the return value of a syscall (e.g., if(OK(xMemGetUsed(&size))) {} or if(ERROR(xMemGetUsed(&size))) {}).

4.2.4.23 xQueuePeek() [xReturn](#) xQueuePeek (
 const xQueue queue_,
 xQueueMessage * message_)

The [xQueuePeek\(\)](#) syscall is used to retrieve the next message from a message queue without dropping the message (i.e., peek at the message).

See also

[xReturn](#)

[xQueue](#)

[xQueueMessage](#)

[xMemFree\(\)](#)

Parameters

<i>queue_</i>	The message queue to be operated on.
<i>message_</i> ←	The message retrieved from the message queue. The message must be freed by xMemFree() .

Returns

On success, the syscall returns ReturnOK. On failure, the syscall returns ReturnError. A failure is any condition in which the syscall was unable to achieve its intended objective. For example, if [xTaskGetId\(\)](#) was unable to locate the task by the task object (i.e., xTask) passed to the syscall, because either the object was null or invalid (e.g., a deleted task), [xTaskGetId\(\)](#) would return ReturnError. All HeliOS syscalls return the xReturn (a.k.a., Return_t) type which can either be ReturnOK or ReturnError. The C macros OK() and ERROR() can be used as a more concise way of checking the return value of a syscall (e.g., if(OK(xMemGetUsed(&size))) {} or if(ERROR(xMemGetUsed(&size))) {}).

4.2.4.24 xQueueReceive() [xReturn](#) xQueueReceive (
 [xQueue](#) queue_,
 [xQueueMessage](#) * message_)

The [xQueueReceive\(\)](#) syscall has the effect of calling [xQueuePeek\(\)](#) followed by [xQueueDropMessage\(\)](#). The syscall will receive the next message from the message queue if there is a waiting message.

See also

[xReturn](#)
[xQueue](#)
[xQueueMessage](#)
[xMemFree\(\)](#)

Parameters

<i>queue_</i>	The message queue to be operated on.
<i>message_</i> ←	The message retrieved from the message queue. The message must be freed by xMemFree() .

Returns

On success, the syscall returns ReturnOK. On failure, the syscall returns ReturnError. A failure is any condition in which the syscall was unable to achieve its intended objective. For example, if [xTaskGetId\(\)](#) was unable to locate the task by the task object (i.e., xTask) passed to the syscall, because either the object was null or invalid (e.g., a deleted task), [xTaskGetId\(\)](#) would return ReturnError. All HeliOS syscalls return the xReturn (a.k.a., Return_t) type which can either be ReturnOK or ReturnError. The C macros OK() and ERROR() can be used as a more concise way of checking the return value of a syscall (e.g., if(OK(xMemGetUsed(&size))) {} or if(ERROR(xMemGetUsed(&size))) {}).

4.2.4.25 xQueueSend() [xReturn](#) xQueueSend (
 xQueue queue_,
 const xBase bytes_,
 const xByte * value_)

The [xQueueSend\(\)](#) syscall is used to send a message to a message queue. The message value is an array of bytes (i.e., xByte) and cannot exceed CONFIG_MESSAGE_VALUE_BYTES (default is 8) bytes in size.

See also

[xReturn](#)
[xQueue](#)
[xByte](#)
[CONFIG_MESSAGE_VALUE_BYTES](#)

Parameters

<i>queue_↔</i> —	The message queue to be operated on.
<i>bytes_↔</i> —	The size, in bytes, of the message to send to the message queue. The size of the message cannot exceed the CONFIG_MESSAGE_VALUE_BYTES (default is 8) setting.
<i>value_↔</i> —	The message to be sent to the queue.

Returns

On success, the syscall returns ReturnOK. On failure, the syscall returns ReturnError. A failure is any condition in which the syscall was unable to achieve its intended objective. For example, if [xTaskGetId\(\)](#) was unable to locate the task by the task object (i.e., xTask) passed to the syscall, because either the object was null or invalid (e.g., a deleted task), [xTaskGetId\(\)](#) would return ReturnError. All HeliOS syscalls return the xReturn (a.k.a., Return_t) type which can either be ReturnOK or ReturnError. The C macros OK() and ERROR() can be used as a more concise way of checking the return value of a syscall (e.g., if(OK(xMemGetUsed(&size))) {} or if(ERROR(xMemGetUsed(&size))) {}).

4.2.4.26 xQueueUnLockQueue() [xReturn](#) xQueueUnLockQueue (
 xQueue queue_)

The [xQueueUnLockQueue\(\)](#) syscall is used to unlock a message queue that was previously locked by [xQueueLockQueue\(\)](#). Once a message queue is unlocked, tasks may resume sending messages to the message queue.

See also

[xReturn](#)
[xQueue](#)
[xQueueLockQueue\(\)](#)

Parameters

<i>queue</i> ↔ —	The message queue to be operated on.
---------------------	--------------------------------------

Returns

On success, the syscall returns ReturnOK. On failure, the syscall returns ReturnError. A failure is any condition in which the syscall was unable to achieve its intended objective. For example, if [xTaskGetId\(\)](#) was unable to locate the task by the task object (i.e., xTask) passed to the syscall, because either the object was null or invalid (e.g., a deleted task), [xTaskGetId\(\)](#) would return ReturnError. All HeliOS syscalls return the xReturn (a.k.a., Return_t) type which can either be ReturnOK or ReturnError. The C macros OK() and ERROR() can be used as a more concise way of checking the return value of a syscall (e.g., if(OK(xMemGetUsed(&size))) {} or if(ERROR(xMemGetUsed(&size))) {}).

4.2.4.27 xStreamBytesAvailable() [xReturn](#) xStreamBytesAvailable (
const xStreamBuffer *stream_*,
xHalfWord * *bytes_*)

The [xStreamBytesAvailable\(\)](#) syscall is used to obtain the number of waiting (i.e., available) bytes in a stream buffer.

See also

[xReturn](#)
[xStreamBuffer](#)

Parameters

<i>stream</i> ↔ —	The stream buffer to be operated on.
<i>bytes</i> ↔ —	The number of available bytes in the stream buffer.

Returns

On success, the syscall returns ReturnOK. On failure, the syscall returns ReturnError. A failure is any condition in which the syscall was unable to achieve its intended objective. For example, if [xTaskGetId\(\)](#) was unable to locate the task by the task object (i.e., xTask) passed to the syscall, because either the object was null or invalid (e.g., a deleted task), [xTaskGetId\(\)](#) would return ReturnError. All HeliOS syscalls return the xReturn (a.k.a., Return_t) type which can either be ReturnOK or ReturnError. The C macros OK() and ERROR() can be used as a more concise way of checking the return value of a syscall (e.g., if(OK(xMemGetUsed(&size))) {} or if(ERROR(xMemGetUsed(&size))) {}).

4.2.4.28 xStreamCreate() [xReturn](#) xStreamCreate (
xStreamBuffer * *stream_*)

The [xStreamCreate\(\)](#) syscall is used to create a stream buffer which is used for inter-task communications. A stream buffer is similar to a message queue, however, it operates only on one byte at a time.

See also

[xReturn](#)
[xStreamBuffer](#)
[xStreamDelete\(\)](#)

Parameters

<i>stream</i> ↔	The stream buffer to be operated on.
—	

Returns

On success, the syscall returns ReturnOK. On failure, the syscall returns ReturnError. A failure is any condition in which the syscall was unable to achieve its intended objective. For example, if [xTaskGetId\(\)](#) was unable to locate the task by the task object (i.e., xTask) passed to the syscall, because either the object was null or invalid (e.g., a deleted task), [xTaskGetId\(\)](#) would return ReturnError. All HeliOS syscalls return the xReturn (a.k.a., Return_t) type which can either be ReturnOK or ReturnError. The C macros OK() and ERROR() can be used as a more concise way of checking the return value of a syscall (e.g., if(OK(xMemGetUsed(&size))) {} or if(ERROR(xMemGetUsed(&size))) {}).

4.2.4.29 xStreamDelete() [xReturn](#) xStreamDelete (

const xStreamBuffer *stream_*)

The [xStreamDelete\(\)](#) syscall is used to delete a stream buffer created by [xStreamCreate\(\)](#).

See also

[xReturn](#)
[xStreamBuffer](#)
[xStreamCreate\(\)](#)

Parameters

<i>stream</i> ↔	The stream buffer to be operated on.
—	

Returns

On success, the syscall returns ReturnOK. On failure, the syscall returns ReturnError. A failure is any condition in which the syscall was unable to achieve its intended objective. For example, if [xTaskGetId\(\)](#) was unable to locate the task by the task object (i.e., xTask) passed to the syscall, because either the object was null or invalid (e.g., a deleted task), [xTaskGetId\(\)](#) would return ReturnError. All HeliOS syscalls return the xReturn (a.k.a., Return_t) type which can either be ReturnOK or ReturnError. The C macros OK() and ERROR() can be used as a more concise way of checking the return value of a syscall (e.g., if(OK(xMemGetUsed(&size))) {} or if(ERROR(xMemGetUsed(&size))) {}).

4.2.4.30 xStreamIsEmpty() [xReturn](#) xStreamIsEmpty (
 const xStreamBuffer stream_,
 xBase * res_)

The [xStreamIsEmpty\(\)](#) syscall is used to inquire as to whether a stream buffer is empty. An empty stream buffer has zero waiting (i.e., available) bytes.

See also

[xReturn](#)

xStreamBuffer

Parameters

<i>stream_↔</i>	The stream buffer to be operated on.
<i>res_</i>	The result of the inquiry; taken here to mean "true" if the length (i.e., number of waiting bytes) is zero.

Returns

On success, the syscall returns ReturnOK. On failure, the syscall returns ReturnError. A failure is any condition in which the syscall was unable to achieve its intended objective. For example, if [xTaskGetId\(\)](#) was unable to locate the task by the task object (i.e., xTask) passed to the syscall, because either the object was null or invalid (e.g., a deleted task), [xTaskGetId\(\)](#) would return ReturnError. All HeliOS syscalls return the xReturn (a.k.a., Return_t) type which can either be ReturnOK or ReturnError. The C macros OK() and ERROR() can be used as a more concise way of checking the return value of a syscall (e.g., if(OK(xMemGetUsed(&size))) {} or if(ERROR(xMemGetUsed(&size))) {}).

4.2.4.31 xStreamIsFull() [xReturn](#) xStreamIsFull (
 const xStreamBuffer stream_,
 xBase * res_)

The [xStreamIsFull\(\)](#) syscall is used to inquire as to whether a stream buffer is full. An full stream buffer has CONFIG_STREAM_BUFFER_BYTES (default is 32) bytes waiting.

See also

[xReturn](#)

xStreamBuffer

[CONFIG_STREAM_BUFFER_BYTES](#)

Parameters

<i>stream_↔</i>	The stream buffer to be operated on.
<i>res_</i>	The result of the inquiry; taken here to mean "true" if the length (i.e., number of waiting bytes) is CONFIG_STREAM_BUFFER_BYTES bytes.

Returns

On success, the syscall returns ReturnOK. On failure, the syscall returns ReturnError. A failure is any condition in which the syscall was unable to achieve its intended objective. For example, if [xTaskGetId\(\)](#) was unable to locate the task by the task object (i.e., xTask) passed to the syscall, because either the object was null or invalid (e.g., a deleted task), [xTaskGetId\(\)](#) would return ReturnError. All HeliOS syscalls return the xReturn (a.k.a., Return_t) type which can either be ReturnOK or ReturnError. The C macros OK() and ERROR() can be used as a more concise way of checking the return value of a syscall (e.g., if(OK(xMemGetUsed(&size))) {} or if(ERROR(xMemGetUsed(&size))) {}).

4.2.4.32 xStreamReceive() [xReturn](#) xStreamReceive (
 const xStreamBuffer stream_,
 xHalfWord * bytes_,
 xByte ** data_)

The [xStreamReceive\(\)](#) syscall is used to retrieve all waiting bytes from a stream buffer.

See also

[xReturn](#)
[xByte](#)
[xStreamBuffer](#)
[xMemFree\(\)](#)

Parameters

<i>stream_</i> ↔ —	The stream buffer to be operated on.
<i>bytes_</i> ↔ —	The number of bytes retrieved from the stream buffer.
<i>data_</i>	The bytes retrieved from the stream buffer. The data must be freed by xMemFree() .

Returns

On success, the syscall returns ReturnOK. On failure, the syscall returns ReturnError. A failure is any condition in which the syscall was unable to achieve its intended objective. For example, if [xTaskGetId\(\)](#) was unable to locate the task by the task object (i.e., xTask) passed to the syscall, because either the object was null or invalid (e.g., a deleted task), [xTaskGetId\(\)](#) would return ReturnError. All HeliOS syscalls return the xReturn (a.k.a., Return_t) type which can either be ReturnOK or ReturnError. The C macros OK() and ERROR() can be used as a more concise way of checking the return value of a syscall (e.g., if(OK(xMemGetUsed(&size))) {} or if(ERROR(xMemGetUsed(&size))) {}).

4.2.4.33 xStreamReset() [xReturn](#) xStreamReset (
 const xStreamBuffer stream_)

The [xStreamReset\(\)](#) syscall is used to reset a stream buffer. Resetting a stream buffer has the effect of clearing the stream buffer such that [xStreamBytesAvailable\(\)](#) would return zero bytes available.

See also

[xReturn](#)

[xStreamBuffer](#)

Parameters

<i>stream</i> ↔	The stream buffer to be operated on.
—	

Returns

On success, the syscall returns ReturnOK. On failure, the syscall returns ReturnError. A failure is any condition in which the syscall was unable to achieve its intended objective. For example, if [xTaskGetId\(\)](#) was unable to locate the task by the task object (i.e., xTask) passed to the syscall, because either the object was null or invalid (e.g., a deleted task), [xTaskGetId\(\)](#) would return ReturnError. All HeliOS syscalls return the xReturn (a.k.a., Return_t) type which can either be ReturnOK or ReturnError. The C macros OK() and ERROR() can be used as a more concise way of checking the return value of a syscall (e.g., if(OK(xMemGetUsed(&size))) {} or if(ERROR(xMemGetUsed(&size))) {}).

4.2.4.34 xStreamSend() [xReturn](#) xStreamSend (
 xStreamBuffer *stream*_,
 const xByte *byte*_)

The [xStreamSend\(\)](#) syscall is used to send one byte to a stream buffer.

See also

[xReturn](#)

[xByte](#)

[xStreamBuffer](#)

Parameters

<i>stream</i> ↔	The stream buffer to be operated on.
—	
<i>byte</i> _	The byte to send to the stream buffer.

Returns

On success, the syscall returns ReturnOK. On failure, the syscall returns ReturnError. A failure is any condition in which the syscall was unable to achieve its intended objective. For example, if [xTaskGetId\(\)](#) was unable to locate the task by the task object (i.e., xTask) passed to the syscall, because either the object was null or invalid (e.g., a deleted task), [xTaskGetId\(\)](#) would return ReturnError. All HeliOS syscalls return the xReturn (a.k.a., Return_t) type which can either be ReturnOK or ReturnError. The C macros OK() and ERROR() can be used as a more concise way of checking the return value of a syscall (e.g., if(OK(xMemGetUsed(&size))) {} or if(ERROR(xMemGetUsed(&size))) {}).

4.2.4.35 xSystemAssert() [xReturn](#) xSystemAssert (
 const char * *file_*,
 const int *line_*)

The [xSystemAssert\(\)](#) syscall is used to raise a system assert. In order for [xSystemAssert\(\)](#) to have an effect the configuration setting CONFIG_SYSTEM_ASSERT_BEHAVIOR must be defined. That said, it is recommended that the ASSERT C macro be used in place of [xSystemAssert\(\)](#). In order for the ASSERT C macro to have any effect, the configuration setting CONFIG_ENABLE_SYSTEM_ASSERT must be defined.

See also

[xReturn](#)
 CONFIG_SYSTEM_ASSERT_BEHAVIOR
 CONFIG_ENABLE_SYSTEM_ASSERT
 ASSERT

Parameters

<i>file_</i> ↔ —	The C file where the assert occurred. This will be set by the ASSERT C macro.
<i>line_</i> ↔ —	The C file line where the assert occurred. This will be set by the ASSERT C macro.

Returns

On success, the syscall returns ReturnOK. On failure, the syscall returns ReturnError. A failure is any condition in which the syscall was unable to achieve its intended objective. For example, if [xTaskGetId\(\)](#) was unable to locate the task by the task object (i.e., xTask) passed to the syscall, because either the object was null or invalid (e.g., a deleted task), [xTaskGetId\(\)](#) would return ReturnError. All HeliOS syscalls return the xReturn (a.k.a., Return_t) type which can either be ReturnOK or ReturnError. The C macros OK() and ERROR() can be used as a more concise way of checking the return value of a syscall (e.g., if(OK(xMemGetUsed(&size))) {} or if(ERROR(xMemGetUsed(&size))) {}).

4.2.4.36 xSystemGetSystemInfo() [xReturn](#) xSystemGetSystemInfo (
 xSystemInfo * *info_*)

The [xSystemGetSystemInfo\(\)](#) syscall is used to inquire about the system. The information about the system that may be obtained is the product (i.e., OS) name, version and number of tasks.

See also

[xReturn](#)
[xSystemInfo](#)
[xMemFree\(\)](#)

Parameters

<i>info_</i> ↔ —	The system information. The system information must be freed by xMemFree() .
---------------------	--

Returns

On success, the syscall returns ReturnOK. On failure, the syscall returns ReturnError. A failure is any condition in which the syscall was unable to achieve its intended objective. For example, if [xTaskGetId\(\)](#) was unable to locate the task by the task object (i.e., xTask) passed to the syscall, because either the object was null or invalid (e.g., a deleted task), [xTaskGetId\(\)](#) would return ReturnError. All HeliOS syscalls return the xReturn (a.k.a., Return_t) type which can either be ReturnOK or ReturnError. The C macros OK() and ERROR() can be used as a more concise way of checking the return value of a syscall (e.g., if(OK(xMemGetUsed(&size))) {} or if(ERROR(xMemGetUsed(&size))) {}).

4.2.4.37 [xSystemHalt\(\)](#) [xReturn](#) xSystemHalt (void)

The [xSystemHalt\(\)](#) syscall is used to halt HeliOS. Once called, [xSystemHalt\(\)](#) will disable all interrupts and stops the execution of further statements. The system will have to be reset to recover.

See also

[xReturn](#)

Returns

On success, the syscall returns ReturnOK. On failure, the syscall returns ReturnError. A failure is any condition in which the syscall was unable to achieve its intended objective. For example, if [xTaskGetId\(\)](#) was unable to locate the task by the task object (i.e., xTask) passed to the syscall, because either the object was null or invalid (e.g., a deleted task), [xTaskGetId\(\)](#) would return ReturnError. All HeliOS syscalls return the xReturn (a.k.a., Return_t) type which can either be ReturnOK or ReturnError. The C macros OK() and ERROR() can be used as a more concise way of checking the return value of a syscall (e.g., if(OK(xMemGetUsed(&size))) {} or if(ERROR(xMemGetUsed(&size))) {}).

4.2.4.38 [xSystemInit\(\)](#) [xReturn](#) xSystemInit (void)

The [xSystemInit\(\)](#) syscall is used to bootstrap HeliOS and must be the first syscall made in the user's application. The [xSystemInit\(\)](#) syscall initializes memory and calls initialization functions through the port layer.

See also

[xReturn](#)

Returns

On success, the syscall returns ReturnOK. On failure, the syscall returns ReturnError. A failure is any condition in which the syscall was unable to achieve its intended objective. For example, if [xTaskGetId\(\)](#) was unable to locate the task by the task object (i.e., xTask) passed to the syscall, because either the object was null or invalid (e.g., a deleted task), [xTaskGetId\(\)](#) would return ReturnError. All HeliOS syscalls return the xReturn (a.k.a., Return_t) type which can either be ReturnOK or ReturnError. The C macros OK() and ERROR() can be used as a more concise way of checking the return value of a syscall (e.g., if(OK(xMemGetUsed(&size))) {} or if(ERROR(xMemGetUsed(&size))) {}).

4.2.4.39 xTaskChangePeriod() [xReturn](#) xTaskChangePeriod (
 xTask *task_*,
 const xTicks *period_*)

The [xTaskChangePeriod\(\)](#) is used to change the interval period of a task timer. The period is measured in ticks. While architecture and/or platform dependent, a tick is often one millisecond. In order for the task timer to have an effect, the task must be in the "waiting" state which can be set using [xTaskWait\(\)](#).

See also

[xReturn](#)
[xTask](#)
[xTicks](#)
[xTaskWait\(\)](#)

Parameters

<i>task_</i> ↔ —	The task to be operated on.
<i>period_</i> ↔ —	The interval period in ticks.

Returns

On success, the syscall returns ReturnOK. On failure, the syscall returns ReturnError. A failure is any condition in which the syscall was unable to achieve its intended objective. For example, if [xTaskGetId\(\)](#) was unable to locate the task by the task object (i.e., xTask) passed to the syscall, because either the object was null or invalid (e.g., a deleted task), [xTaskGetId\(\)](#) would return ReturnError. All HeliOS syscalls return the xReturn (a.k.a., Return_t) type which can either be ReturnOK or ReturnError. The C macros OK() and ERROR() can be used as a more concise way of checking the return value of a syscall (e.g., if(OK(xMemGetUsed(&size))) {} or if(ERROR(xMemGetUsed(&size))) {}).

4.2.4.40 xTaskChangeWDPeriod() [xReturn](#) xTaskChangeWDPeriod (
 xTask *task_*,
 const xTicks *period_*)

The [xTaskChangeWDPeriod\(\)](#) syscall is used to change the task watchdog timer period. This has no effect unless CONFIG_TASK_WD_TIMER_ENABLE is defined and the watchdog timer period is greater than zero. The task watchdog timer will place a task in a suspended state if a task's runtime exceeds the watchdog timer period. The task watchdog timer period is set on a per task basis.

See also

[xReturn](#)
[xTask](#)
[xTicks](#)
[CONFIG_TASK_WD_TIMER_ENABLE](#)

Parameters

<i>task</i> ↔ —	The task to be operated on.
<i>period</i> ↔ —	The task watchdog timer period measured in ticks. Ticks is platform and/or architecture dependent. However, most platforms and/or architectures have a one millisecond tick duration.

Returns

On success, the syscall returns ReturnOK. On failure, the syscall returns ReturnError. A failure is any condition in which the syscall was unable to achieve its intended objective. For example, if [xTaskGetId\(\)](#) was unable to locate the task by the task object (i.e., xTask) passed to the syscall, because either the object was null or invalid (e.g., a deleted task), [xTaskGetId\(\)](#) would return ReturnError. All HeliOS syscalls return the xReturn (a.k.a., Return_t) type which can either be ReturnOK or ReturnError. The C macros OK() and ERROR() can be used as a more concise way of checking the return value of a syscall (e.g., if(OK(xMemGetUsed(&size))) {} or if(ERROR(xMemGetUsed(&size))) {}).

4.2.4.41 xTaskCreate() [xReturn](#) xTaskCreate (

```

    xTask * task_,
    const xByte * name_,
    void(*) (xTask task_, xTaskParm parm_) callback_,
    xTaskParm taskParameter_ )

```

The [xTaskCreate\(\)](#) syscall is used to create a new task. Neither the [xTaskCreate\(\)](#) or [xTaskDelete\(\)](#) syscalls can be called from within a task (i.e., while the scheduler is running).

See also

[xReturn](#)

[xTaskDelete\(\)](#)

[xTask](#)

[xTaskParm](#)

[CONFIG_TASK_NAME_BYTES](#)

Parameters

<i>task_</i>	The task to be operated on.
<i>name_</i>	The name of the task which must be exactly CONFIG_TASK_NAME_BYTES (default is 8) bytes in length. Shorter task names must be padded.
<i>callback_</i>	The task's main (i.e., entry point) function.
<i>task_</i> ↔ <i>Parameter_</i>	A parameter which is accessible from the task's main function. If a task parameter is not needed, this parameter may be set to null.

Returns

On success, the syscall returns ReturnOK. On failure, the syscall returns ReturnError. A failure is any condition in which the syscall was unable to achieve its intended objective. For example, if [xTaskGetId\(\)](#) was unable to locate the task by the task object (i.e., xTask) passed to the syscall, because either the object was null or invalid (e.g., a deleted task), [xTaskGetId\(\)](#) would return ReturnError. All HeliOS syscalls return the xReturn

(a.k.a., `Return_t`) type which can either be `ReturnOK` or `ReturnError`. The C macros `OK()` and `ERROR()` can be used as a more concise way of checking the return value of a syscall (e.g., `if(OK(xMemGetUsed(&size))) {}` or `if(ERROR(xMemGetUsed(&size))) {}`).

4.2.4.42 `xTaskDelete()` `xReturn` `xTaskDelete` (
 `const xTask task_`)

The `xTaskDelete()` syscall is used to delete an existing task. Neither the `xTaskCreate()` or `xTaskDelete()` syscalls can be called from within a task (i.e., while the scheduler is running).

See also

[xReturn](#)

[xTask](#)

Parameters

<code>task_↔</code>	The task to be operated on.
—	

Returns

On success, the syscall returns `ReturnOK`. On failure, the syscall returns `ReturnError`. A failure is any condition in which the syscall was unable to achieve its intended objective. For example, if `xTaskGetId()` was unable to locate the task by the task object (i.e., `xTask`) passed to the syscall, because either the object was null or invalid (e.g., a deleted task), `xTaskGetId()` would return `ReturnError`. All HeliOS syscalls return the `xReturn` (a.k.a., `Return_t`) type which can either be `ReturnOK` or `ReturnError`. The C macros `OK()` and `ERROR()` can be used as a more concise way of checking the return value of a syscall (e.g., `if(OK(xMemGetUsed(&size))) {}` or `if(ERROR(xMemGetUsed(&size))) {}`).

4.2.4.43 `xTaskGetAllRunTimeStats()` `xReturn` `xTaskGetAllRunTimeStats` (
 `xTaskRunTimeStats * stats_`,
 `xBase * tasks_`)

The `xTaskGetAllRunTimeStats()` syscall is used to obtain the runtime statistics of all tasks.

See also

[xReturn](#)

[xTask](#)

[xTaskRunTimeStats](#)

[xMemFree\(\)](#)

Parameters

<i>stats</i> ↔ —	The runtime statistics. The runtime statics must be freed by xMemFree() .
<i>tasks</i> ↔ —	The number of tasks in the runtime statistics.

Returns

On success, the syscall returns ReturnOK. On failure, the syscall returns ReturnError. A failure is any condition in which the syscall was unable to achieve its intended objective. For example, if [xTaskGetId\(\)](#) was unable to locate the task by the task object (i.e., xTask) passed to the syscall, because either the object was null or invalid (e.g., a deleted task), [xTaskGetId\(\)](#) would return ReturnError. All HeliOS syscalls return the xReturn (a.k.a., Return_t) type which can either be ReturnOK or ReturnError. The C macros OK() and ERROR() can be used as a more concise way of checking the return value of a syscall (e.g., if(OK(xMemGetUsed(&size))) {} or if(ERROR(xMemGetUsed(&size))) {}).

4.2.4.44 xTaskGetAllTaskInfo() [xReturn](#) xTaskGetAllTaskInfo (
[xTaskInfo](#) * *info_*,
 xBase * *tasks_*)

The [xTaskGetAllTaskInfo\(\)](#) syscall is used to get info about all tasks. [xTaskGetAllTaskInfo\(\)](#) is similar to [xTaskGetAllRunTimeStats\(\)](#) with one difference, [xTaskGetAllTaskInfo\(\)](#) provides the state and name of the task along with the task's runtime statistics.

See also

[xReturn](#)
[xTaskInfo](#)
[xMemFree\(\)](#)

Parameters

<i>info</i> ↔ —	Information about the tasks. The task information must be freed by xMemFree() .
<i>tasks</i> ↔ —	The number of tasks.

Returns

On success, the syscall returns ReturnOK. On failure, the syscall returns ReturnError. A failure is any condition in which the syscall was unable to achieve its intended objective. For example, if [xTaskGetId\(\)](#) was unable to locate the task by the task object (i.e., xTask) passed to the syscall, because either the object was null or invalid (e.g., a deleted task), [xTaskGetId\(\)](#) would return ReturnError. All HeliOS syscalls return the xReturn (a.k.a., Return_t) type which can either be ReturnOK or ReturnError. The C macros OK() and ERROR() can be used as a more concise way of checking the return value of a syscall (e.g., if(OK(xMemGetUsed(&size))) {} or if(ERROR(xMemGetUsed(&size))) {}).

4.2.4.45 xTaskGetHandleById() [xReturn](#) xTaskGetHandleById (
 xTask * *task_*,
 const xBase *id_*)

The [xTaskGetHandleById\(\)](#) syscall will get the task handle using the task id.

See also

[xReturn](#)

[xTask](#)

Parameters

<i>task_</i> ↔ —	The task to be operated on.
<i>id_</i> —	The task id.

Returns

On success, the syscall returns ReturnOK. On failure, the syscall returns ReturnError. A failure is any condition in which the syscall was unable to achieve its intended objective. For example, if [xTaskGetId\(\)](#) was unable to locate the task by the task object (i.e., xTask) passed to the syscall, because either the object was null or invalid (e.g., a deleted task), [xTaskGetId\(\)](#) would return ReturnError. All HeliOS syscalls return the xReturn (a.k.a., Return_t) type which can either be ReturnOK or ReturnError. The C macros OK() and ERROR() can be used as a more concise way of checking the return value of a syscall (e.g., if(OK(xMemGetUsed(&size))) {} or if(ERROR(xMemGetUsed(&size))) {}).

4.2.4.46 xTaskGetHandleByName() [xReturn](#) xTaskGetHandleByName (
 xTask * *task_*,
 const xByte * *name_*)

The [xTaskGetHandleByName\(\)](#) syscall will get the task handle using the task name.

See also

[xReturn](#)

[xTask](#)

[CONFIG_TASK_NAME_BYTES](#)

Parameters

<i>task_</i> ↔ —	The task to be operated on.
<i>name_</i> ↔ —	The name of the task which must be exactly CONFIG_TASK_NAME_BYTES (default is 8) bytes in length. Shorter task names must be padded.

Returns

On success, the syscall returns ReturnOK. On failure, the syscall returns ReturnError. A failure is any condition in which the syscall was unable to achieve its intended objective. For example, if `xTaskGetId()` was unable to locate the task by the task object (i.e., `xTask`) passed to the syscall, because either the object was null or invalid (e.g., a deleted task), `xTaskGetId()` would return ReturnError. All HeliOS syscalls return the `xReturn` (a.k.a., `Return_t`) type which can either be ReturnOK or ReturnError. The C macros `OK()` and `ERROR()` can be used as a more concise way of checking the return value of a syscall (e.g., `if(OK(xMemGetUsed(&size))) {}` or `if(ERROR(xMemGetUsed(&size))) {}`).

4.2.4.47 xTaskGetId() `xReturn` `xTaskGetId` (
 const `xTask` `task_`,
 `xBase` * `id_`)

The `xTaskGetId()` syscall is used to obtain the id of a task.

See also

`xReturn`

`xTask`

Parameters

<code>task_↔</code>	The task to be operated on.
<code>id_</code>	The id of the task.

Returns

On success, the syscall returns ReturnOK. On failure, the syscall returns ReturnError. A failure is any condition in which the syscall was unable to achieve its intended objective. For example, if `xTaskGetId()` was unable to locate the task by the task object (i.e., `xTask`) passed to the syscall, because either the object was null or invalid (e.g., a deleted task), `xTaskGetId()` would return ReturnError. All HeliOS syscalls return the `xReturn` (a.k.a., `Return_t`) type which can either be ReturnOK or ReturnError. The C macros `OK()` and `ERROR()` can be used as a more concise way of checking the return value of a syscall (e.g., `if(OK(xMemGetUsed(&size))) {}` or `if(ERROR(xMemGetUsed(&size))) {}`).

4.2.4.48 xTaskGetName() `xReturn` `xTaskGetName` (
 const `xTask` `task_`,
 `xByte` ** `name_`)

The `xTaskGetName()` syscall is used to get the ASCII name of a task. The size of the task name is `CONFIG_↔ TASK_NAME_BYTES` (default is 8) bytes in length.

See also

`xReturn`

`xTask`

`xMemFree()`

Parameters

<i>task</i> ↔ —	The task to be operated on.
<i>name</i> ↔ —	The task name which must be precisely CONFIG_TASK_NAME_BYTES (default is 8) bytes in length. The task name must be freed by xMemFree() .

Returns

On success, the syscall returns ReturnOK. On failure, the syscall returns ReturnError. A failure is any condition in which the syscall was unable to achieve its intended objective. For example, if [xTaskGetId\(\)](#) was unable to locate the task by the task object (i.e., xTask) passed to the syscall, because either the object was null or invalid (e.g., a deleted task), [xTaskGetId\(\)](#) would return ReturnError. All HeliOS syscalls return the xReturn (a.k.a., Return_t) type which can either be ReturnOK or ReturnError. The C macros OK() and ERROR() can be used as a more concise way of checking the return value of a syscall (e.g., if(OK(xMemGetUsed(&size))) {} or if(ERROR(xMemGetUsed(&size))) {}).

4.2.4.49 xTaskGetNumberOfTasks() [xReturn](#) xTaskGetNumberOfTasks (
 xBase * *tasks_*)

The [xTaskGetNumberOfTasks\(\)](#) syscall is used to obtain the number of tasks regardless of their state (i.e., suspended, running or waiting).

See also

[xReturn](#)

Parameters

<i>tasks</i> ↔ —	The number of tasks.
---------------------	----------------------

Returns

On success, the syscall returns ReturnOK. On failure, the syscall returns ReturnError. A failure is any condition in which the syscall was unable to achieve its intended objective. For example, if [xTaskGetId\(\)](#) was unable to locate the task by the task object (i.e., xTask) passed to the syscall, because either the object was null or invalid (e.g., a deleted task), [xTaskGetId\(\)](#) would return ReturnError. All HeliOS syscalls return the xReturn (a.k.a., Return_t) type which can either be ReturnOK or ReturnError. The C macros OK() and ERROR() can be used as a more concise way of checking the return value of a syscall (e.g., if(OK(xMemGetUsed(&size))) {} or if(ERROR(xMemGetUsed(&size))) {}).

4.2.4.50 xTaskGetPeriod() [xReturn](#) xTaskGetPeriod (
 const xTask *task_*,
 xTicks * *period_*)

The [xTaskGetPeriod\(\)](#) syscall is used to obtain the current task timer period.

See also

[xReturn](#)
[xTask](#)
[xTicks](#)

Parameters

<i>task</i> ↔ —	The task to be operated on.
<i>period</i> ↔ —	The task timer period in ticks. Ticks is platform and/or architecture dependent. However, most platforms and/or architect

Returns

On success, the syscall returns ReturnOK. On failure, the syscall returns ReturnError. A failure is any condition in which the syscall was unable to achieve its intended objective. For example, if [xTaskGetId\(\)](#) was unable to locate the task by the task object (i.e., xTask) passed to the syscall, because either the object was null or invalid (e.g., a deleted task), [xTaskGetId\(\)](#) would return ReturnError. All HeliOS syscalls return the xReturn (a.k.a., Return_t) type which can either be ReturnOK or ReturnError. The C macros OK() and ERROR() can be used as a more concise way of checking the return value of a syscall (e.g., if(OK(xMemGetUsed(&size))) {} or if(ERROR(xMemGetUsed(&size))) {}).

4.2.4.51 xTaskGetSchedulerState() [xReturn](#) xTaskGetSchedulerState ([xSchedulerState](#) * state_)

The [xTaskGetSchedulerState\(\)](#) is used to get the state of the scheduler.

See also

[xReturn](#)
[xSchedulerState](#)

Parameters

<i>state</i> ↔ —	The state of the scheduler.
---------------------	-----------------------------

Returns

On success, the syscall returns ReturnOK. On failure, the syscall returns ReturnError. A failure is any condition in which the syscall was unable to achieve its intended objective. For example, if [xTaskGetId\(\)](#) was unable to locate the task by the task object (i.e., xTask) passed to the syscall, because either the object was null or invalid (e.g., a deleted task), [xTaskGetId\(\)](#) would return ReturnError. All HeliOS syscalls return the xReturn (a.k.a., Return_t) type which can either be ReturnOK or ReturnError. The C macros OK() and ERROR() can be used as a more concise way of checking the return value of a syscall (e.g., if(OK(xMemGetUsed(&size))) {} or if(ERROR(xMemGetUsed(&size))) {}).

4.2.4.52 xTaskGetTaskInfo() [xReturn](#) xTaskGetTaskInfo (
 const xTask task_,
 xTaskInfo * info_)

The [xTaskGetTaskInfo\(\)](#) syscall is used to get info about a single task. [xTaskGetTaskInfo\(\)](#) is similar to [xTaskGetTaskRunTimeStats\(\)](#) with one difference, [xTaskGetTaskInfo\(\)](#) provides the state and name of the task along with the task's runtime statistics.

See also

[xReturn](#)
[xMemFree\(\)](#)
[xTask](#)
[xTaskInfo](#)

Parameters

<i>task</i> ↔ —	The task to be operated on.
<i>info</i> ↔ —	Information about the task. The task information must be freed by xMemFree() .

Returns

On success, the syscall returns ReturnOK. On failure, the syscall returns ReturnError. A failure is any condition in which the syscall was unable to achieve its intended objective. For example, if [xTaskGetId\(\)](#) was unable to locate the task by the task object (i.e., xTask) passed to the syscall, because either the object was null or invalid (e.g., a deleted task), [xTaskGetId\(\)](#) would return ReturnError. All HeliOS syscalls return the xReturn (a.k.a., Return_t) type which can either be ReturnOK or ReturnError. The C macros OK() and ERROR() can be used as a more concise way of checking the return value of a syscall (e.g., if(OK(xMemGetUsed(&size))) {} or if(ERROR(xMemGetUsed(&size))) {}).

4.2.4.53 xTaskGetTaskRunTimeStats() [xReturn](#) xTaskGetTaskRunTimeStats (
 const xTask task_,
 xTaskRunTimeStats * stats_)

The [xTaskGetTaskRunTimeStats\(\)](#) syscall is used to get the runtime statistics for a single task.

See also

[xReturn](#)
[xTask](#)
[xTaskRunTimeStats](#)
[xMemFree\(\)](#)

Parameters

<i>task</i> ↔ —	The task to be operated on.
<i>stats</i> ↔ —	The runtime statistics. The runtime statistics must be freed by xMemFree() .

Returns

On success, the syscall returns ReturnOK. On failure, the syscall returns ReturnError. A failure is any condition in which the syscall was unable to achieve its intended objective. For example, if [xTaskGetId\(\)](#) was unable to locate the task by the task object (i.e., xTask) passed to the syscall, because either the object was null or invalid (e.g., a deleted task), [xTaskGetId\(\)](#) would return ReturnError. All HeliOS syscalls return the xReturn (a.k.a., Return_t) type which can either be ReturnOK or ReturnError. The C macros OK() and ERROR() can be used as a more concise way of checking the return value of a syscall (e.g., if(OK(xMemGetUsed(&size))) {} or if(ERROR(xMemGetUsed(&size))) {}).

4.2.4.54 xTaskGetTaskState() [xReturn](#) xTaskGetTaskState (
 const xTask task_,
 xTaskState * state_)

The [xTaskGetTaskState\(\)](#) syscall is used to obtain the state of a task (i.e., suspended, running or waiting).

See also

[xReturn](#)

[xTask](#)

[xTaskState](#)

Parameters

<i>task</i> ↔ —	The task to be operated on.
<i>state</i> ↔ —	The state of the task.

Returns

On success, the syscall returns ReturnOK. On failure, the syscall returns ReturnError. A failure is any condition in which the syscall was unable to achieve its intended objective. For example, if [xTaskGetId\(\)](#) was unable to locate the task by the task object (i.e., xTask) passed to the syscall, because either the object was null or invalid (e.g., a deleted task), [xTaskGetId\(\)](#) would return ReturnError. All HeliOS syscalls return the xReturn (a.k.a., Return_t) type which can either be ReturnOK or ReturnError. The C macros OK() and ERROR() can be used as a more concise way of checking the return value of a syscall (e.g., if(OK(xMemGetUsed(&size))) {} or if(ERROR(xMemGetUsed(&size))) {}).

4.2.4.55 xTaskGetWDPeriod() [xReturn](#) xTaskGetWDPeriod (
 const xTask task_,
 xTicks * period_)

The [xTaskGetWDPeriod\(\)](#) syscall is used to obtain the task watchdog timer period.

See also

[xReturn](#)[xTask](#)[xTicks](#)[CONFIG_TASK_WD_TIMER_ENABLE](#)

Parameters

<i>task</i> ↔ —	The task to be operated on.
<i>period</i> ↔ —	The task watchdog timer period, measured in ticks. Ticks are platform and/or architecture dependent. However, on must platforms and/or architectures the tick represents one millisecond.

Returns

On success, the syscall returns ReturnOK. On failure, the syscall returns ReturnError. A failure is any condition in which the syscall was unable to achieve its intended objective. For example, if [xTaskGetId\(\)](#) was unable to locate the task by the task object (i.e., xTask) passed to the syscall, because either the object was null or invalid (e.g., a deleted task), [xTaskGetId\(\)](#) would return ReturnError. All HeliOS syscalls return the xReturn (a.k.a., Return_t) type which can either be ReturnOK or ReturnError. The C macros OK() and ERROR() can be used as a more concise way of checking the return value of a syscall (e.g., if(OK(xMemGetUsed(&size))) {} or if(ERROR(xMemGetUsed(&size))) {}).

4.2.4.56 xTaskNotificationIsWaiting() [xReturn](#) xTaskNotificationIsWaiting (
 const xTask task_,
 xBase * res_)

The [xTaskNotificationIsWaiting\(\)](#) syscall is used to inquire as to whether a direct-to-task notification is waiting for the given task.

See also

[xReturn](#)

[xTask](#)

Parameters

<i>task</i> ↔ —	Task to be operated on.
<i>res</i> ↔ —	The result of the inquiry; taken here to mean "true" if there is a waiting direct-to-task notification. Otherwise "false", if there is not a waiting direct-to-notification.

Returns

On success, the syscall returns ReturnOK. On failure, the syscall returns ReturnError. A failure is any condition in which the syscall was unable to achieve its intended objective. For example, if [xTaskGetId\(\)](#) was unable to locate the task by the task object (i.e., xTask) passed to the syscall, because either the object was null or invalid (e.g., a deleted task), [xTaskGetId\(\)](#) would return ReturnError. All HeliOS syscalls return the xReturn (a.k.a., Return_t) type which can either be ReturnOK or ReturnError. The C macros OK() and ERROR() can be used as a more concise way of checking the return value of a syscall (e.g., if(OK(xMemGetUsed(&size))) {} or if(ERROR(xMemGetUsed(&size))) {}).

4.2.4.57 xTaskNotifyGive() `xReturn` xTaskNotifyGive (
 xTask *task_*,
 const xBase *bytes_*,
 const xByte * *value_*)

The `xTaskNotifyGive()` syscall is used to give (i.e., send) a direct-to-task notification to the given task.

See also

`xReturn`

`xTask`

`CONFIG_NOTIFICATION_VALUE_BYTES`

Parameters

<i>task_</i> ↔ —	The task to be operated on.
<i>bytes_</i> ↔ —	The number of bytes contained in the notification value. The number of bytes in the notification value cannot exceed <code>CONFIG_NOTIFICATION_VALUE_BYTES</code> (default is 8) bytes.
<i>value_</i> ↔ —	The notification value which is a byte array whose length is defined by " <i>bytes_</i> ".

Returns

On success, the syscall returns `ReturnOK`. On failure, the syscall returns `ReturnError`. A failure is any condition in which the syscall was unable to achieve its intended objective. For example, if `xTaskGetId()` was unable to locate the task by the task object (i.e., `xTask`) passed to the syscall, because either the object was null or invalid (e.g., a deleted task), `xTaskGetId()` would return `ReturnError`. All HeliOS syscalls return the `xReturn` (a.k.a., `Return_t`) type which can either be `ReturnOK` or `ReturnError`. The C macros `OK()` and `ERROR()` can be used as a more concise way of checking the return value of a syscall (e.g., `if(OK(xMemGetUsed(&size))) {}` or `if(ERROR(xMemGetUsed(&size))) {}`).

4.2.4.58 xTaskNotifyStateClear() `xReturn` xTaskNotifyStateClear (
 xTask *task_*)

The `xTaskNotifyStateClear()` syscall is used to clear a waiting direct-to-task notification for the given task.

See also

`xReturn`

`xTask`

Parameters

<i>task_</i> ↔ —	The task to be operated on.
---------------------	-----------------------------

Returns

On success, the syscall returns ReturnOK. On failure, the syscall returns ReturnError. A failure is any condition in which the syscall was unable to achieve its intended objective. For example, if `xTaskGetId()` was unable to locate the task by the task object (i.e., `xTask`) passed to the syscall, because either the object was null or invalid (e.g., a deleted task), `xTaskGetId()` would return ReturnError. All HeliOS syscalls return the `xReturn` (a.k.a., `Return_t`) type which can either be ReturnOK or ReturnError. The C macros `OK()` and `ERROR()` can be used as a more concise way of checking the return value of a syscall (e.g., `if(OK(xMemGetUsed(&size))) {}` or `if(ERROR(xMemGetUsed(&size))) {}`).

4.2.4.59 xTaskNotifyTake() `xReturn` `xTaskNotifyTake` (
`xTask` `task_`,
`xTaskNotification` * `notification_`)

The `xTaskNotifyTake()` syscall is used to take (i.e., receive) a waiting direct-to-task notification.

See also

`xReturn`

`xTask`

`CONFIG_NOTIFICATION_VALUE_BYTES`

`xTaskNotification`

Parameters

<code>task_</code>	The task to be operated on.
<code>notification_</code>	The direct-to-task notification.

Returns

On success, the syscall returns ReturnOK. On failure, the syscall returns ReturnError. A failure is any condition in which the syscall was unable to achieve its intended objective. For example, if `xTaskGetId()` was unable to locate the task by the task object (i.e., `xTask`) passed to the syscall, because either the object was null or invalid (e.g., a deleted task), `xTaskGetId()` would return ReturnError. All HeliOS syscalls return the `xReturn` (a.k.a., `Return_t`) type which can either be ReturnOK or ReturnError. The C macros `OK()` and `ERROR()` can be used as a more concise way of checking the return value of a syscall (e.g., `if(OK(xMemGetUsed(&size))) {}` or `if(ERROR(xMemGetUsed(&size))) {}`).

4.2.4.60 xTaskResetTimer() `xReturn` `xTaskResetTimer` (
`xTask` `task_`)

The `xTaskResetTimer()` syscall is used to reset the task timer. In effect, this sets the elapsed time, measured in ticks, back to zero.

See also

`xReturn`

`xTask`

`xTicks`

Parameters

<i>task</i> ↔	The task to be operated on.
—	

Returns

On success, the syscall returns ReturnOK. On failure, the syscall returns ReturnError. A failure is any condition in which the syscall was unable to achieve its intended objective. For example, if [xTaskGetId\(\)](#) was unable to locate the task by the task object (i.e., xTask) passed to the syscall, because either the object was null or invalid (e.g., a deleted task), [xTaskGetId\(\)](#) would return ReturnError. All HeliOS syscalls return the xReturn (a.k.a., Return_t) type which can either be ReturnOK or ReturnError. The C macros OK() and ERROR() can be used as a more concise way of checking the return value of a syscall (e.g., if(OK(xMemGetUsed(&size))) {} or if(ERROR(xMemGetUsed(&size))) {}).

4.2.4.61 xTaskResume() [xReturn](#) xTaskResume (
 xTask task_)

The [xTaskResume\(\)](#) syscall will place a task in the "running" state. A task in this state will run continuously until suspended and is scheduled to run cooperatively by the HeliOS scheduler.

See also

[xReturn](#)
[xTask](#)
[xTaskResume\(\)](#)
[xTaskSuspend\(\)](#)
[xTaskWait\(\)](#)

Parameters

<i>task</i> ↔	The task to be operated on.
—	

Returns

On success, the syscall returns ReturnOK. On failure, the syscall returns ReturnError. A failure is any condition in which the syscall was unable to achieve its intended objective. For example, if [xTaskGetId\(\)](#) was unable to locate the task by the task object (i.e., xTask) passed to the syscall, because either the object was null or invalid (e.g., a deleted task), [xTaskGetId\(\)](#) would return ReturnError. All HeliOS syscalls return the xReturn (a.k.a., Return_t) type which can either be ReturnOK or ReturnError. The C macros OK() and ERROR() can be used as a more concise way of checking the return value of a syscall (e.g., if(OK(xMemGetUsed(&size))) {} or if(ERROR(xMemGetUsed(&size))) {}).

4.2.4.62 xTaskResumeAll() [xReturn](#) xTaskResumeAll (
 void)

The `xTaskResumeAll()` syscall is used to set the scheduler state to running. `xTaskStartScheduler()` must still be called to pass control to the scheduler. If the scheduler state is not running, then `xTaskStartScheduler()` will simply return to the caller when called.

See also

[xReturn](#)
[xTaskStartScheduler\(\)](#)
[xTaskResumeAll\(\)](#)
[xTaskSuspendAll\(\)](#)

Returns

On success, the syscall returns `ReturnOK`. On failure, the syscall returns `ReturnError`. A failure is any condition in which the syscall was unable to achieve its intended objective. For example, if `xTaskGetId()` was unable to locate the task by the task object (i.e., `xTask`) passed to the syscall, because either the object was null or invalid (e.g., a deleted task), `xTaskGetId()` would return `ReturnError`. All HeliOS syscalls return the `xReturn` (a.k.a., `Return_t`) type which can either be `ReturnOK` or `ReturnError`. The C macros `OK()` and `ERROR()` can be used as a more concise way of checking the return value of a syscall (e.g., `if(OK(xMemGetUsed(&size))) {}` or `if(ERROR(xMemGetUsed(&size))) {}`).

4.2.4.63 `xTaskStartScheduler()` `xReturn` `xTaskStartScheduler` (`void`)

The `xTaskStartScheduler()` syscall is used to start the HeliOS task scheduler. On this syscall is made, control is handed over to HeliOS. In order to suspend the scheduler and return to the caller, the `xTaskSuspendAll()` syscall will need to be made. Once a call to `xTaskSuspendAll()` is made, `xTaskResumeAll()` must be called before calling `xTaskStartScheduler()` again. If `xTaskStartScheduler()` is called while the scheduler is in a suspended state, `xTaskStartScheduler()` will immediately return.

See also

[xReturn](#)
[xTaskResumeAll\(\)](#)
[xTaskSuspendAll\(\)](#)

Returns

On success, the syscall returns `ReturnOK`. On failure, the syscall returns `ReturnError`. A failure is any condition in which the syscall was unable to achieve its intended objective. For example, if `xTaskGetId()` was unable to locate the task by the task object (i.e., `xTask`) passed to the syscall, because either the object was null or invalid (e.g., a deleted task), `xTaskGetId()` would return `ReturnError`. All HeliOS syscalls return the `xReturn` (a.k.a., `Return_t`) type which can either be `ReturnOK` or `ReturnError`. The C macros `OK()` and `ERROR()` can be used as a more concise way of checking the return value of a syscall (e.g., `if(OK(xMemGetUsed(&size))) {}` or `if(ERROR(xMemGetUsed(&size))) {}`).

4.2.4.64 xTaskSuspend() [xReturn](#) xTaskSuspend (
 xTask task_)

The [xTaskSuspend\(\)](#) syscall will place a task in the "suspended" state. A task in this state is not scheduled to run by the HeliOS scheduler and will not run.

See also

[xReturn](#)
[xTask](#)
[xTaskResume\(\)](#)
[xTaskSuspend\(\)](#)
[xTaskWait\(\)](#)

Parameters

<i>task_</i> ↔	The task to be operated on.
—	

Returns

On success, the syscall returns ReturnOK. On failure, the syscall returns ReturnError. A failure is any condition in which the syscall was unable to achieve its intended objective. For example, if [xTaskGetId\(\)](#) was unable to locate the task by the task object (i.e., xTask) passed to the syscall, because either the object was null or invalid (e.g., a deleted task), [xTaskGetId\(\)](#) would return ReturnError. All HeliOS syscalls return the xReturn (a.k.a., Return_t) type which can either be ReturnOK or ReturnError. The C macros OK() and ERROR() can be used as a more concise way of checking the return value of a syscall (e.g., if(OK(xMemGetUsed(&size))) {} or if(ERROR(xMemGetUsed(&size))) {}).

4.2.4.65 xTaskSuspendAll() [xReturn](#) xTaskSuspendAll (
 void)

The [xTaskSuspendAll\(\)](#) syscall is used to set the scheduler state to suspended. If called from a running task, the HeliOS scheduler will quit and return control back to the caller. To set the scheduler state to running, [xTaskResumeAll\(\)](#) must be called followed by a call to [xTaskStartScheduler\(\)](#).

See also

[xReturn](#)
[xTaskStartScheduler\(\)](#)
[xTaskResumeAll\(\)](#)
[xTaskSuspendAll\(\)](#)

Returns

On success, the syscall returns ReturnOK. On failure, the syscall returns ReturnError. A failure is any condition in which the syscall was unable to achieve its intended objective. For example, if [xTaskGetId\(\)](#) was unable to locate the task by the task object (i.e., xTask) passed to the syscall, because either the object was null or invalid (e.g., a deleted task), [xTaskGetId\(\)](#) would return ReturnError. All HeliOS syscalls return the xReturn (a.k.a., Return_t) type which can either be ReturnOK or ReturnError. The C macros OK() and ERROR() can be used as a more concise way of checking the return value of a syscall (e.g., if(OK(xMemGetUsed(&size))) {} or if(ERROR(xMemGetUsed(&size))) {}).

4.2.4.66 xTaskWait() `xReturn` xTaskWait (
 xTask *task_*)

The `xTaskWait()` syscall will place a task in the "waiting" state. A task in this state is not scheduled to run by the HeliOS scheduler *UNTIL* an event occurs. When an event occurs, the HeliOS will schedule the task to run until the even has passed (e.g., the task either "takes" or "clears a direct-to-task notification"). Tasks in the "waiting" state are tasks that are using event-driven multitasking. HeliOS supports two types of events: task timers and direct-to-task notifications.

See also

`xReturn`
`xTask`
`xTaskResume()`
`xTaskSuspend()`
`xTaskWait()`

Parameters

<i>task_</i> ↔	The task to be operated on.
—	

Returns

On success, the syscall returns `ReturnOK`. On failure, the syscall returns `ReturnError`. A failure is any condition in which the syscall was unable to achieve its intended objective. For example, if `xTaskGetId()` was unable to locate the task by the task object (i.e., `xTask`) passed to the syscall, because either the object was null or invalid (e.g., a deleted task), `xTaskGetId()` would return `ReturnError`. All HeliOS syscalls return the `xReturn` (a.k.a., `Return_t`) type which can either be `ReturnOK` or `ReturnError`. The C macros `OK()` and `ERROR()` can be used as a more concise way of checking the return value of a syscall (e.g., `if(OK(xMemGetUsed(&size))) {}` or `if(ERROR(xMemGetUsed(&size))) {}`).

4.2.4.67 xTimerChangePeriod() `xReturn` xTimerChangePeriod (
 xTimer *timer_*,
 const xTicks *period_*)

The `xTimerChangePeriod()` syscall is used to change the time period on an application timer. Once the period has elapsed, the application timer is considered expired.

See also

`xReturn`
`xTimer`
`xTicks`

Parameters

<i>timer_</i> ↔	The application timer to be operated on.
—	
<i>period_</i> ↔	The application timer period, measured in ticks.
—	

Returns

On success, the syscall returns ReturnOK. On failure, the syscall returns ReturnError. A failure is any condition in which the syscall was unable to achieve its intended objective. For example, if [xTaskGetId\(\)](#) was unable to locate the task by the task object (i.e., xTask) passed to the syscall, because either the object was null or invalid (e.g., a deleted task), [xTaskGetId\(\)](#) would return ReturnError. All HeliOS syscalls return the xReturn (a.k.a., Return_t) type which can either be ReturnOK or ReturnError. The C macros OK() and ERROR() can be used as a more concise way of checking the return value of a syscall (e.g., if(OK(xMemGetUsed(&size))) {} or if(ERROR(xMemGetUsed(&size))) {}).

4.2.4.68 xTimerCreate() [xReturn](#) xTimerCreate (
 xTimer * timer_,
 const xTicks period_)

The [xTimerCreate\(\)](#) syscall is used to create a new application timer. Application timers are not the same as task timers. Application timers are not part of HeliOS's event-driven multitasking. Application timers are just that, timers for use by the user's application for general purpose timekeeping. Application timers can be started, stopped, reset and have time period, measured in ticks, that elapses.

See also

[xReturn](#)
[xTimer](#)
[xTicks](#)
[xTimerDelete\(\)](#)

Parameters

<i>timer</i> ↔ —	The application timer to be operated on.
<i>period</i> ↔ —	The application timer period, measured in ticks.

Returns

On success, the syscall returns ReturnOK. On failure, the syscall returns ReturnError. A failure is any condition in which the syscall was unable to achieve its intended objective. For example, if [xTaskGetId\(\)](#) was unable to locate the task by the task object (i.e., xTask) passed to the syscall, because either the object was null or invalid (e.g., a deleted task), [xTaskGetId\(\)](#) would return ReturnError. All HeliOS syscalls return the xReturn (a.k.a., Return_t) type which can either be ReturnOK or ReturnError. The C macros OK() and ERROR() can be used as a more concise way of checking the return value of a syscall (e.g., if(OK(xMemGetUsed(&size))) {} or if(ERROR(xMemGetUsed(&size))) {}).

4.2.4.69 xTimerDelete() [xReturn](#) xTimerDelete (
 const xTimer timer_)

The [xTimerDelete\(\)](#) syscall is used to delete an application timer created with [xTimerCreate\(\)](#).

See also

[xReturn](#)
[xTimer](#)
[xTicks](#)
[xTimerCreate\(\)](#)

Parameters

<i>timer</i> ↔	The application timer to be operated on.
—	

Returns

On success, the syscall returns ReturnOK. On failure, the syscall returns ReturnError. A failure is any condition in which the syscall was unable to achieve its intended objective. For example, if [xTaskGetId\(\)](#) was unable to locate the task by the task object (i.e., xTask) passed to the syscall, because either the object was null or invalid (e.g., a deleted task), [xTaskGetId\(\)](#) would return ReturnError. All HeliOS syscalls return the xReturn (a.k.a., Return_t) type which can either be ReturnOK or ReturnError. The C macros OK() and ERROR() can be used as a more concise way of checking the return value of a syscall (e.g., if(OK(xMemGetUsed(&size))) {} or if(ERROR(xMemGetUsed(&size))) {}).

4.2.4.70 xTimerGetPeriod() [xReturn](#) xTimerGetPeriod (

```

    const xTimer timer_,
    xTicks * period_ )

```

The [xTimerGetPeriod\(\)](#) syscall is used to obtain the current period for an application timer.

See also

[xReturn](#)
[xTimer](#)
[xTicks](#)

Parameters

<i>timer</i> ↔	The application timer to be operate don.
—	
<i>period</i> ↔	The application timer period, measured in ticks.
—	

Returns

On success, the syscall returns ReturnOK. On failure, the syscall returns ReturnError. A failure is any condition in which the syscall was unable to achieve its intended objective. For example, if [xTaskGetId\(\)](#) was unable to locate the task by the task object (i.e., xTask) passed to the syscall, because either the object was null or invalid (e.g., a deleted task), [xTaskGetId\(\)](#) would return ReturnError. All HeliOS syscalls return the xReturn (a.k.a., Return_t) type which can either be ReturnOK or ReturnError. The C macros OK() and ERROR() can be used as a more concise way of checking the return value of a syscall (e.g., if(OK(xMemGetUsed(&size))) {} or if(ERROR(xMemGetUsed(&size))) {}).

4.2.4.71 xTimerHasTimerExpired() `xReturn xTimerHasTimerExpired (`
`const xTimer timer_,`
`xBase * res_)`

The `xTimerHasTimerExpired()` syscall is used to inquire as to whether an application timer has expired. If the application timer has expired, it must be reset with `xTimerReset()`. If a timer is not active (i.e., started), it cannot expire even if the timer period has elapsed.

See also

[xReturn](#)
[xTimer](#)
[xTimerReset\(\)](#)

Parameters

<i>timer</i> ↔ —	The application timer to be operated on.
<i>res</i> ↔ —	The result of the inquiry; taken here to mean "true" if the application timer has elapsed (i.e., expired). "False" if the application timer has not expired

Returns

On success, the syscall returns ReturnOK. On failure, the syscall returns ReturnError. A failure is any condition in which the syscall was unable to achieve its intended objective. For example, if `xTaskGetId()` was unable to locate the task by the task object (i.e., `xTask`) passed to the syscall, because either the object was null or invalid (e.g., a deleted task), `xTaskGetId()` would return ReturnError. All HeliOS syscalls return the `xReturn` (a.k.a., `Return_t`) type which can either be ReturnOK or ReturnError. The C macros OK() and ERROR() can be used as a more concise way of checking the return value of a syscall (e.g., `if(OK(xMemGetUsed(&size))) {}` or `if(ERROR(xMemGetUsed(&size))) {}`).

4.2.4.72 xTimerIsTimerActive() `xReturn xTimerIsTimerActive (`
`const xTimer timer_,`
`xBase * res_)`

The `xTimerIsTimerActive()` syscall is used to inquire as to whether an application timer is active. An application timer is considered to be active if the application timer has been started by `xTimerStart()`.

See also

[xReturn](#)
[xTimer](#)
[xTimerStart\(\)](#)
[xTimerStop\(\)](#)

Parameters

<i>timer</i> ↔ —	The application timer to be operated on.
<i>res</i> ↔ —	The result of the inquiry; taken here to mean "true" if the application timer is running. "False" if the application timer is not running.

Returns

On success, the syscall returns ReturnOK. On failure, the syscall returns ReturnError. A failure is any condition in which the syscall was unable to achieve its intended objective. For example, if [xTaskGetId\(\)](#) was unable to locate the task by the task object (i.e., xTask) passed to the syscall, because either the object was null or invalid (e.g., a deleted task), [xTaskGetId\(\)](#) would return ReturnError. All HeliOS syscalls return the xReturn (a.k.a., Return_t) type which can either be ReturnOK or ReturnError. The C macros OK() and ERROR() can be used as a more concise way of checking the return value of a syscall (e.g., if(OK(xMemGetUsed(&size))) {} or if(ERROR(xMemGetUsed(&size))) {}).

4.2.4.73 xTimerReset() `xReturn xTimerReset (xTimer timer_)`

The [xTimerReset\(\)](#) syscall is used to reset an application timer. Resetting has the effect of setting the application timer's elapsed time to zero.

See also

[xReturn](#)
[xTimer](#)
[xTimerReset\(\)](#)
[xTimerStart\(\)](#)
[xTimerStop\(\)](#)

Parameters

<i>timer</i> ↔ —	The application timer to be operated on.
---------------------	--

Returns

On success, the syscall returns ReturnOK. On failure, the syscall returns ReturnError. A failure is any condition in which the syscall was unable to achieve its intended objective. For example, if [xTaskGetId\(\)](#) was unable to locate the task by the task object (i.e., xTask) passed to the syscall, because either the object was null or invalid (e.g., a deleted task), [xTaskGetId\(\)](#) would return ReturnError. All HeliOS syscalls return the xReturn (a.k.a., Return_t) type which can either be ReturnOK or ReturnError. The C macros OK() and ERROR() can be used as a more concise way of checking the return value of a syscall (e.g., if(OK(xMemGetUsed(&size))) {} or if(ERROR(xMemGetUsed(&size))) {}).

4.2.4.74 xTimerStart() `xReturn` xTimerStart (
 xTimer timer_)

The `xTimerStart()` syscall is used to place an application timer in the running state.

See also

`xReturn`
`xTimer`
`xTimerReset()`
`xTimerStart()`
`xTimerStop()`

Parameters

<i>timer</i> ↔	The application timer to be operated on.
—	

Returns

On success, the syscall returns `ReturnOK`. On failure, the syscall returns `ReturnError`. A failure is any condition in which the syscall was unable to achieve its intended objective. For example, if `xTaskGetId()` was unable to locate the task by the task object (i.e., `xTask`) passed to the syscall, because either the object was null or invalid (e.g., a deleted task), `xTaskGetId()` would return `ReturnError`. All HeliOS syscalls return the `xReturn` (a.k.a., `Return_t`) type which can either be `ReturnOK` or `ReturnError`. The C macros `OK()` and `ERROR()` can be used as a more concise way of checking the return value of a syscall (e.g., `if(OK(xMemGetUsed(&size))) {}` or `if(ERROR(xMemGetUsed(&size))) {}`).

4.2.4.75 xTimerStop() `xReturn` xTimerStop (
 xTimer timer_)

The `xTimerStop()` syscall is used to place an application timer in the suspended state.

See also

`xReturn`
`xTimer`
`xTimerReset()`
`xTimerStart()`
`xTimerStop()`

Parameters

<i>timer</i> ↔	The application timer to be operated on.
—	

Returns

On success, the syscall returns `ReturnOK`. On failure, the syscall returns `ReturnError`. A failure is any condition in which the syscall was unable to achieve its intended objective. For example, if `xTaskGetId()` was unable to locate the task by the task object (i.e., `xTask`) passed to the syscall, because either the object was null or invalid (e.g., a deleted task), `xTaskGetId()` would return `ReturnError`. All HeliOS syscalls return the `xReturn` (a.k.a., `Return_t`) type which can either be `ReturnOK` or `ReturnError`. The C macros `OK()` and `ERROR()` can be used as a more concise way of checking the return value of a syscall (e.g., `if(OK(xMemGetUsed(&size))) {}` or `if(ERROR(xMemGetUsed(&size))) {}`).

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