



Technical Document - Confidential

GSM PROTOCOL STACK

G23

CLK-CLOCK

DRIVER INTERFACE

Document Number:	8415.004.99.003
Version:	0.4
Status:	Draft
Approval Authority:	
Creation Date:	1998-Sep-11
Last changed:	2015-Mar-08 by XGUTTEFE
File Name:	8415_004.doc

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Change History

Date	Changed by	Approved by	Version	Status	Notes
1998-Sep-11	LM et al.		0.1		1
1999-Mar-24	MS et al.		0.2		
2000-Feb-01	OSE et al.		0.3		
2003-May-13	XINTEGRA		0.4	Draft	

Notes:

1. Initial version
2. New document template/English check
3. New Template

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- [ISO 9000:2000] International Organization for Standardization. Quality management systems - Fundamentals and vocabulary. December 2000

1.1 References

- [C_8415.0026] 8415.026.99.012; March 19, 1999
Generic Driver Interface – Functional Specification; Condat

2 Introduction

G23 is a software package implementing Layers 2 and 3 of the ETSI-defined GSM air interface signaling protocol, and as such represents the part of a GSM mobile station's protocol software which is both, platform and manufacturer independent. Therefore, G23 can be viewed as a building block providing standardized functionality through generic interfaces for easy integration.

The G23 suite of products consists of the following items:

- Layers 2 and 3 for speech & short message services,
- Layers 2 and 3 for fax & data services,
- Application Control Interface,
- Slim MMI [02.30] and
- Test and integration support tools.

This document describes the functional interface of the G23 real-time clock device driver. This driver is used to control and access a real-time clock. One real-time clock is supported by this driver.

The driver can be configured to signal an alarm. This is done by setting an OS signal or calling the specific user configurable call-back function.

3 Interface description of the CLK driver

3.1 Data types

Name	Description
CLK_AlarmCB_Type	Alarm call-back function type
time_t	Represents time values

3.1.1 clk_AlarmCB_Type

Definition:

```
typedef void (*clk_AlarmCB_Type) (void) ;
```

Description:

This type defines a call-back function. This function is called when the specified time set as an alarm has been reached. For more details, refer to the description of the alarm call-back function in the chapter describing the exported functions.

3.1.2 time_t

Definition:

```
typedef long time_t;
```

Description:

This type is used time_t to store the time in seconds since midnight (00:00:00), January 1, 1970, coordinated universal time (UTC).

3.2 Constants

Name	Description
CLK_OK	Return value indicating successful completion of a function
CLK_INITIALIZED	Driver is already initialized
CLK_INVALID_PARAMETERS	Parameters are out of range or not allowed
CLK_NOTCONFIGURED	No alarm set
CLK_SIGTYPE_ALARM	Indicate an alarm

3.3 Functions

Name	Description
clk_Init	Initialization of CLK
clk_Exit	Termination of CLK
clk_SetTime	Set a new time
clk_GetTime	Query the current time
clk_SetAlarm	Set the time an alarm should be indicated
clk_GetAlarm	Retrieve the settings of an alarm
clk_Signal	Define a signal used to indicate an alarm
clk_SetCallBack	Define call-back functions called on alarm events

3.3.1 clk_Init – Driver initialization

Definition:

```
drv_Return_Type clk_Init  
(  
    void  
);
```

Parameters:

Name	Description
-	-

Return values:

Name	Description
CLK_OK	Initialization successful
CLK_INITIALIZED	Driver already initialized

Description

This function is used to initialize the real-time clock device driver, i.e. CLK initializes its internal data. After initialization, the driver is ready to be accessed.

3.3.2 clk_Exit – De-initialization of the driver

Definition:

```
void clk_Exit  
(  
    void  
);
```

Parameters:

Name	Description
-	-

Return values:

Name	Description
-	-

Description

This function is used to indicate to CLK that the CLK driver and its functionality are no longer needed.

3.3.3 clk_SetTime – Setup the real-time clock

Definition:

```
void clk_SetTime  
(  
    time_t          in_Time  
    int             in_Msec  
);
```

Parameters:

Name	Description
in_Time	Time to be set (in seconds since midnight (00:00:00), January 1, 1970, coordinated universal time (UTC))
in_Msec	Fraction of a second in milliseconds

Return values:

Name	Description
-	-

Description

This function is used to set a new time for the real-time clock.

3.3.4 clk_GetTime – Retrieve the system time

Definition:

```
drv_Return_Type clk_GetTime  
(  
    time_t*          in_TimePtr  
    int*             in_MsecPtr  
);
```

Parameters:

Name	Description
in_TimePtr	Pointer to the buffer used to store the system time (time in seconds since midnight (00:00:00), January 1, 1970, coordinated universal time (UTC))
in_MsecPtr	Pointer to the buffer used to store the fraction of a second in milliseconds

Return values:

Name	Description
-	-

Description

This function is used to retrieve the system time.

3.3.5 clk_SetAlarm – Setup an alarm event

Definition:

```
drv_Return_Type clk_SetAlarm
(
    time_t          in_Time
    int             in_Msec
);
```

Parameters:

Name	Description
in_Time	Defines the time an alarm should occur (in seconds since midnight (00:00:00), January 1, 1970, coordinated universal time (UTC))
in_Msec	Fraction of a second in milliseconds

Return values:

Name	Description
CLK_OK	Alarm set
CLK_INVALID_PARAMETERS	The given time is older than the current time. Alarm will not be set.

Description

This function is used to set an alarm. The driver signals an alarm to its parent by initiating an event or calling a the parent's call-back function. Use the function clk_Signal in order to be notified by a signal, or the clk_SetCallback to be notified by a call-back function. If neither a signal nor a call-back is defined, the alarm will have no effect.

3.3.6 clk_GetAlarm – Retrieve an alarm event

Definition:

```
drv_Return_Type clk_GetAlarm  
(  
    time_t*          out_TimePtr  
    int*             out_MsecPtr  
);
```

Parameters:

Name	Description
in_TimePtr	Pointer to the buffer used to store the system time (time in seconds since midnight (00:00:00), January 1, 1970, coordinated universal time (UTC))
in_MsecPtr	Pointer to the buffer used to store the fraction of a second in milliseconds

Return values:

Name	Description
CLK_OK	Alarm set
CLK_NOTCONFIGURED	No alarm set

Description

This function is used to retrieve a previously set time of an alarm. If no alarm has been set, the function returns CLK_NOTCONFIGURED.

3.3.7 clk_Signal – Setup a signal

Definition:

```
drv_Return_Type clk_Signal
(
    T_VSI_CALLER      in_ProcessHandle
    int               in_Type
    drv_Signal_Type   in_Signal
);
```

Parameters:

Name	Description
in_ProcessHandle	Handle of calling process (type is defined in the corresponding document)
in_SigType	Type of event that is to be signaled
in_Signal	Value used when indicating the signal to the process.

Return values:

Name	Description
CLK_OK	Function completed successfully
CLK_UNKNOWN	The device is unknown
CLK_ACCESS_DENIED	Driver in use by another process
CLK_INVALID_PARAMETERS	One or more parameters are out of range

Description

This function is used to define a signal indicated to the process defined by the parameter in_ProcessHandle when the specific event given in the parameter in_SigType occurs. Valid values for the parameter in_SigType are defined in the following table. This functionality exists until this function is called for the same device and the same signal value with the event type DRV_SIGTYPE_CANCEL.

Signal	Value
DRV_SIGTYPE_CANCEL	0
CLK_SIGTYPE_ALARM	DRV_SIGTYPE_U SER

3.3.8 clk_SetCallback – Set a call-back function

Definition:

```

drv_Return_Type clk_SetCallbacks
(
    T_VSI_CALLER      in_ProcessHandle
    clk_AlarmCB_Type  in_AlarmCallbackPtr,
);
    
```

Parameters:

Name	Description
in_ProcessHandle	Handle of calling process (type is defined in the corresponding document)
in_AlarmCallbackPtr	This parameter points to the function that is called when an alarm has occurred. This parameter can be NULL if the user does not wish to be informed about status changes.

Return values:

Name	Description
CLK_OK	Function completed successfully
CLK_ACCESS_DENIED	Driver is being used by another process

Description

This function is used to set the call-back function the driver calls when an alarm has occurred. This function can be called at any time after initialization. To remove a call-back, call this function setting the parameter for the corresponding call-back to NULL.

3.3.9 clk_AlarmCB – Alarm call-back function

Definition:

```
void clk_AlarmCB  
(  
    void  
);
```

Parameters:

Name	Description
-	-

Return values:

Name	Description
-	-

Description

CLK calls this function when an alarm has occurred. An alarm time must be set by calling the function clk_SetAlarm. Use the driver function clk_SetCallBack to activate the call-back mechanism.

Appendices

A. Acronyms

DS-WCDMA Direct Sequence/Spread Wideband Code Division Multiple Access

B. Glossary

International Mobile Telecommunication 2000 (IMT-2000/ITU-2000) Formerly referred to as FPLMTS (Future Public Land-Mobile Telephone System), this is the ITU's specification/family of standards for 3G. This initiative provides a global infrastructure through both satellite and terrestrial systems, for fixed and mobile phone users. The family of standards is a framework comprising a mix/blend of systems providing global roaming. <URL: <http://www.imt-2000.org/>>