EAPI User Guide

Revision History

Revision	Date	Author	Changes
1_0	18th November 2015	MM	First release
1_1	15th January 2016	MM	Add COMe-A41-CT6 support
1_2	23th February 2017	MM	Add COMe-A98-CT6, COMe-B09-BT6, SBC-A44-pITX , SBC-A80-pITX support
1_3	5th September 2017	MM	Add Q7-B03 support
1_4	2nd March 2018	MM	Add 'Reset Causes' functions for COMe-A98-CT6 Add COMe-A75-CT6, COMe-A72-CT6, COMe-C08-BT6 support Change backlight range fron 0-100 to 0-255 Remove WEC7 support
1_5	17th April 2018	MM	Add SBC-B68-eNUC support
1_6	1st June 2018	MM	Add ETX-A61 support
1_7	6th November 2018	MM	Change files location, add UDOO support
1_8	7th November 2019	MM	Add SM-B69, UDOO Bolt, COMe-C24-CT6, COMe-C55-CT6, SBC-C41-pITX, SBC-C90 support
1_9	7th April 2020	MM	Bug fix for GPIOs functions for COMe-A98-CT6, COMe-B09-BT6, COMe-B75-BT6, COMe-B72-BT6, COMe-C08-BT6. Add COMe-C89-BT6, COMe-C91-BT6 support. Remove COMe-948-BT6, COMe-953-BT6 support, COMe-A41-BT6 support, SBC-949-pITX, Q7-881, Q7-963, Q7-978, SBC-992-pITX
1_10	25th August 2020	MM	Add 'EDID' functions for Q7-B03, COMe-C24-CT6, COMe-C24-CT6, SBC-C41-pITX. Introduce PWM management for Internal FAN Add Win7_64 project for digital signature issue (SHA2) with W7

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1. Introduction

The EAPI library should be applicable to the following SECO modules:

Q7 Modules:

- Q7-974
- Q7-A36
- uQ7-A76-J
- Q7-B03

In addition to these, EAPI library supports the following SECO modules:

- COMe-A98-CT6
- COMe-B09-BT6
- COMe-B75-CT6
- COMe-B72-CT6
- COMe-C08-BT6
- COMe-C89-BT6
- COMe-C91-BT6
- COMe-C24-CT6
- COMe-C55-CT6
- SBC-A44-pITX
- SBC-A80-pITX
- SBC-B68-eNUC
- SBC-C41-pITX
- SBC-C90
- SM-B69
- UDOO
- UDOO Bolt
- ETX-A61

The exported functions follow the Qseven(R) Specifications v.1.20, furthermore, EAPI library provide other functions for specific board features that EAPI standard does not contemplate.

2. Files description

The package contains files described below:

EAPI_User_Guide.pdf	This document
COM_EAPI_R1_0.pdf	Q7 standard library documentation (http://www.picmg.org/pdf/COM_EAPI_R1_0.pdf)
BIN\linux_32\libEAPI.a	EAPI SECO library for **Linux** (x86 devices)
BIN\linux_32\EAPI_Test	EAPI SECO sample console application for **Linux** (x86 devices)
BIN\linux_64\libEAPI.a	EAPI SECO library for **Linux** (x64 devices)
BIN\linux_64\EAPI_Test	EAPI SECO sample console application for **Linux** (x64 devices)
BIN\Win_32\Eapi.dll	EAPI SECO Dll for **Microsoft 32 bit** OS *(see supported OS in SECO website for each board)*
BIN\Win_32\Eapi.lib	EAPI SECO library for **Microsoft 32 bit** OS *(see supported OS in SECO website for each board)*
BIN\Win_32\EAPI.exe	EAPI SECO library application for **Microsoft 32 bit** OS *(see supported OS in SECO website for each board)*
BIN\Win_32\EAPI_Test.exe	EAPI SECO sample console application for **Microsoft 32 bit** OS *(see supported OS in SECO website for each board)*

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BIN\Win_64\Eapi.dll	EAPI SECO library for **Microsoft 64 bit** OS *(see supported OS in SECO website for each board)*
BIN\Win_64\Eapi.lib	EAPI SECO library for **Microsoft 64 bit** OS *(see supported OS in SECO website for each board)*
BIN\Win_64\EAPI.exe	EAPI SECO sample application for **Microsoft 64 bit** OS *(see supported OS in SECO website for each board)*
BIN\Win_64\EAPI_Test.exe	EAPI SECO sample console application for **Microsoft 64 bit** OS *(see supported OS in SECO website for each board)*
BIN\Win7_64\Eapi.dll	EAPI SECO library for **Windows 7 64 bit** *(see supported OS in SECO website for each board)*
BIN\Win7_64\Eapi.lib	EAPI SECO library for **Windows 7 64 bit** OS *(see supported OS in SECO website for each board)*
BIN\Win7_64\EAPI.exe	EAPI SECO sample application for **Windows 7 64 bit** OS *(see supported OS in SECO website for each board)*
BIN\Win7_64\EAPI_Test.exe	EAPI SECO sample console application for **Windows 7 64 bit** OS *(see supported OS in SECO website for each board)*
Project\EAPI_Test\EAPI_Test.cpp	EAPI SECO sample console application source code for **Linux** and **Windows** OS
Project\EAPI_Test\EAPI_Test.vcproj	EAPI SECO VS2008 project for **Microsoft** OS sample console application
Project\EAPI_Test\Makefile	EAPI SECO makefile for **Linux** sample console application
Project\EAPI_WIN*	EAPI SECO source code and project for **Microsoft** sample application
Project\include*	EAPI SECO header for Qseven standard functions

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3. EAPI supported Functions

EAPI Functions	Q7-974	Q7-A36	uQ7-A76-J	Q7-B03	COMe-A98-CT6	COMe-B09-BT6	COMe-B75-CT6	COMe-B72-CT6	COMe-C08-BT6	COMe-C91-CT6	COMe-C89-CT6	COMe-C24-CT6	COMe-C55-CT6	SBC-A44-pITX	SBC-A80-pITX	SBC-B68-eNUC	SBC-C41-pITX	SBC-C90	SM-B69	UDOO	UDOO Bolt	ETX-A61
EApiBoardGetName																						
EAPI_ID_BOARD_MANUFACTURER_STR	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
EAPI_ID_BOARD_NAME_STR	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
EAPI_ID_BOARD_REVISION_STR	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EAPI_ID_BOARD_SERIAL_STR	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
EAPI_ID_BOARD_BIOS_REVISION_STR	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
EAPI_ID_BOARD_HW_REVISION_STR	-	-	-	-	√	√	√	√	√	√	√	√	√	√	-	√	√	√	√	√	√	√
EAPI_ID_BOARD_PLATFORM_TYPE_STR	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
EAPI_ID_GET_EAPI_SPEC_VERSION	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
EAPI_ID_BOARD_BOOT_COUNTER_VAL	-	-	-	√	√	√	√	√	√	√	√	√	√	√	-	√	√	√	√	-	√	-
EAPI_ID_BOARD_RUNNING_TIME_METER_VAL	-	-	-	-	√	√	√	√	√	√	√	√	√	-	-	-	√	-	√		-	-
EAPI_ID_BOARD_PNPID_VAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EAPI_ID_BOARD_PLATFORM_REV_VAL	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
EAPI_ID_BOARD_DRIVER_VERSION_VAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EAPI_ID_BOARD_LIB_VERSION_VAL	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
EApiBoardGetValue																						
EAPI_ID_HWMON_CPU_TEMP	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
EAPI_ID_HWMON_CHIPSET_TEMP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EAPI_ID_HWMON_SYSTEM_TEMP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EAPI_ID_HWMON_RAM_TEMP	-	-	-	-	√	√	√	√	√	√	√	-	√	-	-	-	-	-	-	-	-	-
EAPI_ID_HWMON_VOLTAGE_VCORE	-	-	-	-	√	√	√	√	√	√	√	√	√	-	-	-	√	√	√	-	√	-
EAPI_ID_HWMON_VOLTAGE_2V5	-	-	-	-	√	√	√	√	√	√	√	-	√	-	-	-	-	√	-	-	√	-
EAPI_ID_HWMON_VOLTAGE_3V3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EAPI_ID_HWMON_VOLTAGE_VBAT	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EAPI_ID_HWMON_VOLTAGE_5V	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EAPI_ID_HWMON_VOLTAGE_5VSB	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EAPI_ID_HWMON_VOLTAGE_12V	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EAPI_ID_HWMON_FAN_CPU	√	√	√	-	√	√	√	√	√	√	√	√	√	√	√	√	√	√	-	√	√	√
EAPI_ID_HWMON_FAN_SYSTEM	√	√	√	√	√	√	√	√	√	√	√	√	√	-	-	-	-	√	-	-	√	-
EApiVgaGetBacklightEnable	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EApiVgaSetBacklightEnable	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EApiVgaGetBacklightBrightness	√[7]	√[7]	√[7]	√	√	√	√	√	√	√	√	√	√	√	√	√	√	-	√	-	-	-
EApiVgaSetBacklightBrightness	√[7]	√[7]	√[7]	√	√	√	√	√	√	√	√	√	√	√	√	√	√	-	√	-	-	-
EApiWDogGetCap	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
EApiWDogStart	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
EApiWDogTrigger	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
EApiWDogStop	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
EApiI2CGetBusCap *(I2C_EXTERNAL)*	√[2]	√[2]	√[2]	-	√	√	√	√	√	√	√	√	√	-	√[4]	-	-	√	-	√[5]	√	-
EApiI2CWriteReadRaw *(I2C_EXTERNAL)*	√[2]	√[2]	√[2]	-	√	√	√	√	√	√	√	√	√	-	√[4]	-	-	√	-	√[5]	√	-

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EApiI2CReadTransfer *(I2C_EXTERNAL)*	√2	√2	√2	-	√	√	√	√	√	√	√	√	√	-	√4	-	-	√	-	√5	√	-
EApiI2CWriteTransfer *(I2C_EXTERNAL)*	√2	√2	√2	-	√	√	√	√	√	√	√	√	√	-	√4	-	-	√	-	√5	√	-
EApiI2CProbeDevice *(I2C_EXTERNAL)*	√2	√2	√2	-	√	√	√	√	√	√	√	√	√	-	√4	-	-	√	-	√5	√	-
EApiI2CGetBusCap *(I2C_LVDS_1)*	-	-	-	-	-	-	-	-	-	-	-	√	√	√	√4	-	-	-	-	√5	√	-
EApiI2CWriteReadRaw *(I2C_LVDS_1)*	-	-	-	-	-	-	-	-	-	-	-	√	√	√	√4	-	-	-	-	√5	√	-
EApiI2CReadTransfer *(I2C_LVDS_1)*	-	-	-	-	-	-	-	-	-	-	-	√	√	√	√4	-	-	-	-	√5	√	-
EApiI2CWriteTransfer *(I2C_LVDS_1)*	-	-	-	-	-	-	-	-	-	-	-	√	√	√	√4	-	-	-	-	√5	√	-
EApiI2CProbeDevice *(I2C_LVDS_1)*	-	-	-	-	-	-	-	-	-	-	-	√	√	√	√4	-	-	-	-	√10	√	-
EApiGPIOGetDirectionCaps	√1	√1	√1	-	√	√	√	√	√	√	√	√	√	√3	√4	-	√	√	√	-	√	-
EApiGPIOGetDirection	√1	√1	√1	-	√	√	√	√	√	√	√	√	√	√3	√4	-	√	√	√	-	√	-
EApiGPIOSetDirection	√1	√1	√1	-	-	-	-	-	-	-	-	-	-	√3	√4	-	√	√	√	-	√	-
EApiGPIOGetLevel	√1	√1	√1	-	√	√	√	√	√	√	√	√	√	√3	√4	-	√	√	√	-	√	-
EApiGPIOSetLevel	√1	√1	√1	-	√	√	√	√	√	√	√	√	√	√3	√4	-	√	√	√	-	√	-
EApiStorageCap	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
EApiStorageAreaRead	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
EApiStorageAreaWrite	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√

EXTRA STANDARD FEATURES

EApiBoardGetValue																						
EAPI_ID_HWMON_RAM_TEMP	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
EAPI_ID_GET_SWITCH_STATUS	-	-	-	-	-	-	√	√	√	√	√	-	-	-	-	-	-	-	-	-	-	-

EApiFanEnable	√	√	√	√	√	√	√	√	√	√	√	√	√	-	-	-	-	-	-	-	√	-
EApiFanDisable	√	√	√	√	√	√	√	√	√	√	√	√	√	-	-	-	-	-	-	-	√	-
EApiFanPWMGetCycle	√	√	√	√	√	√	√	√	√	√	√	√	√	-	-	-	-	-	-	-	√	-
EApiFanPWMSetCycle	√	√	√	√	√	√	√	√	√	√	√	√	√	-	-	-	-	-	-	-	√	-
EApiFanPWMGetDutyCycle	√	√	√	√	√	√	√	√	√	√	√	√	√	-	-	-	-	-	-	-	√	-
EApiFanPWMSetDutyCycle	√	√	√	√	√	√	√	√	√	√	√	√	√	-	-	-	-	-	-	-	√	-

EApiWDog_SetConfigAndStart	√	√	√	√	√	√	√	√	√	√	√	√	√	-	-	√	√	√	√	√	√	√

EApiGPIOSetCarrier	√	√	√	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

EApiGetResetCauses	-	-	-	-	√	√	√	√	√	√	√	√	√	-	-	-	√	√	√	-	√	-
EApiClearResetCauses	-	-	-	-	√	√	√	√	√	√	√	√	√	-	-	-	√	√	√	-	√	-

EApiSPIGetBusCap	√	√	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	√	-
EApiSPIWriteReadRaw	√	√	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	√	-

EApiEDIDRead	-	-	-	√	-	-	-	-	-	-	-	√	-	-	-	-	√	-	√	-	-	-
EApiEDIDWrite	-	-	-	√	-	-	-	-	-	-	-	√	-	-	-	-	√	-	√	-	-	-

Notes:

√1 GPIO supported only on carrier with GPIO extender, but not with SECOCQ7-3.5 carrier board under Windows 8.1 (32/64bit)

√2 Not supported under Windows 8.1 (32/64bit). With Linux (Ubuntu 15.04) 32/64bit, need to start I2C driver with ***modprobe i2c-dev*** command

√3 Supported only under Linux (Ubuntu 16.04) 32/64bit, WEC7, Windows 7 (with LPSS on PCI mode). For Windows 8, 8.1, 10, use SW package downloadable from SECO web site. Under Linux (Ubuntu 16.04) 32/64bit, are supported also GPIO08 (TS_INT#) and GPIO09 (TS_RST#)

4 Supported only under Linux (Ubuntu 16.04) 32/64bit. For Windows 8, 8.1, 10, use SW package downloadable from SECO web site. Under Linux (Ubuntu 16.04) 32/64bit, are supported also GPIO08 (TS_INT#) and GPIO09 (TS_RST#)

√5 Supported only under Linux 32/64bit.

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4. Notes and known issues

Notes:

EAPI library requires to have ***administrator privileges*** under all operating system,.

Under Linux OS, using EApiBoardGetValue function calling EAPI_ID_HWMON_CPU_TEMP (where supported), you need to install **'msr-tools'** package for your distribution.

Under Linux OS, using I2C functions, with Bay Trail boards, you need to install **'i2c-tools'** package for your distribution.

Known issues:

EAPI storage read operation (**EapiStorageAreaRead** function) on COMe-A98-CT6, COMe-B09-BT6, COMe-B75-CT6, COMe-B72-CT6, COMe-C08-BT6, COMe-C89-BT6 and COMe-C91-BT6 boards, must be wait at least **100ms** after write operation (**EapiStorageAreaWrite** function)

RPM value, using 3-WIRE FAN, is reliable only with PWM at 100%.

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5. Extra standard features

5.1 Information Functions

The EApi library introduces two adding parameters to **EapiBoardGetValue** function descibed in section 4.2 on **PICMG_EAPI_R1.0.pdf.**

EApiStatus_t

EAPI_CALLTYPE

EapiBoardGetValue(__IN uint32_t Id,

__OUT uint32_t *pValue);

Description:

Information about the hardware platform in value format.

Parameter:

Id

__IN Selects the Get Value Sub function Id.

Id	Description	Units/Format
EAPI_ID_HWMON_RAM_TEMP	RAM Temperature	0.1 Kelvins
EAPI_ID_GET_SWITCH_STATUS	Get Boot Switch status	0 for BOOT 1 for NORMAL

pValue

__OUT Pointer to a buffer that receives the value's data.

Return Status Code:

Condition	Return Value
EAPI_STATUS_NOT_INITIALIZED	Library Uninitialized
EAPI_STATUS_INVALID_PARAMETER	pValue==NULL
EAPI_STATUS_UNSUPPORTED	unknown Id
....	For other Status Codes see **PICMG_EAPI_R1.0.pdf** 2.3 on pag16
EAPI_STATUS_SUCCESS	Success

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5.2 Fan Control Functions

The EApi library allows you to configure and control Fan speed.

EAPI library integrates the following functions:

- EApiPWMEnable
- EApiPWMDisable
- EApiPWMPWMGetCycle
- EApiPWMSetCycle
- EApiPWMGetDutyCycle
- EApiPWMSetDutyCycle

The following Fan functions are deprecated:

- EApiFanEnable
- EApiFanDisable
- EApiFanPWMGetCycle
- EApiFanPWMSetCycle
- EApiFanPWMGetDutyCycle
- EApiFanPWMSetDutyCycle

5.2.1 EApiPWMEnable()

EApiStatus_t

EAPI_CALLTYPE

EApiPWMEnable(__IN uint8_t PWM_ID,

__IN uint32_t Cycle,

__IN uint8_t DutyCycle);

Description:

Enable Fan PWM

Parameter:

PWM_ID

Selected FAN:

0 for Internal FAN

1 for External FAN

Cycle

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Frequency value expressed in Hz (0-65535 Hz)

Duty Cycle

Duty Cycle percent value (between 0 and 100)

Return Status Code:

Condition	Return Value
EAPI_STATUS_INVALID_PARAMETER	DutyCycle > 100 or Cycle > MAX_CYCLE_STEPS
EAPI_STATUS_UNSUPPORTED	Unsupported Function
EAPI_STATUS_SUCCESS	Success

5.2.2 EApiPWMDisable()

EApiStatus_t

EAPI_CALLTYPE

EApiPWMDisable(__IN uint8_t PWM_ID);

Description:

Disable Fan PWM

Parameter:

PWM_ID

Selected FAN:

0 for Internal FAN

1 for External FAN

Return Status Code:

Condition	Return Value
EAPI_STATUS_UNSUPPORTED	Unsupported Function
EAPI_STATUS_SUCCESS	Success

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5.2.3 EApiPWMGetCycle()

EApiStatus_t

EAPI_CALLTYPE

EApiPWMGetCycle(__IN uint8_t PWM_ID,

__OUT uint32_t * Value);

Description:

Return current PWM cycle value

Parameter:

PWM_ID

Selected FAN:

0 for Internal FAN

1 for External FAN

Value

Pointer to a buffer that receives the current PWM frequency value expressed in Hz (0-65535 Hz)

Return Status Code:

Condition	**Return Value**
EAPI_STATUS_UNSUPPORTED	Unsupported Function
EAPI_STATUS_SUCCESS	Success

5.2.4 EApiPWMSetCycle()

EApiStatus_t

EAPI_CALLTYPE

EApiPWMSetCycle(__IN uint8_t PWM_ID,

__IN uint32_t Value);

Description:

Set the PWM cycle value

Parameter:

PWM_ID

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Selected FAN:

0 for Internal FAN

1 for External FAN

Value

PWM frequency value to set, expressed in Hz (0-65535 Hz)

Return Status Code:

Condition	Return Value
EAPI_STATUS_INVALID_PARAMETER	Cycle > MAX_CYCLE_STEPS
EAPI_STATUS_UNSUPPORTED	Unsupported Function
EAPI_STATUS_SUCCESS	Success

5.2.5 EApiPWMGetDutyCycle()

EApiStatus_t

EAPI_CALLTYPE

EApiPWMGetDutyCycle(__IN uint8_t PWM_ID,

__OUT uint32_t * Value);

Description:

Return current PWM duty cycle value

Parameter:

PWM_ID

Selected FAN:

0 for Internal FAN

1 for External FAN

Value

Pointer to a buffer that receives the current PWM duty cycle value

Return Status Code:

Condition	Return Value
EAPI_STATUS_UNSUPPORTED	Unsupported Function
EAPI_STATUS_SUCCESS	Success

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5.2.6 EApiPWMSetDutyCycle()

EApiStatus_t

EAPI_CALLTYPE

EApiPWMSetDutyCycle(__IN uint8_t PWM_ID,

__OUT uint32_t * Value);

Description:

Set the PWM duty cycle value

Parameter:

PWM_ID

Selected FAN:

0 for Internal FAN

1 for External FAN

Value

PWM duty cycle percent value to set (between 0 and 100)

Return Status Code:

Condition	**Return Value**
EAPI_STATUS_INVALID_PARAMETER	DutyCycle > 100
EAPI_STATUS_UNSUPPORTED	Unsupported Function
EAPI_STATUS_SUCCESS	Success

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5.3 Watch Dog Control Functions

5.3.1 EApiWDog_SetConfigAndStart()

EAPI_LIB_DEF
EApiStatus_t
EAPI_CALLTYPE
EApiWDog_SetConfigAndStart(__IN uint32_t delay_Timeout_msec,
__IN uint32_t event_Timeout_msec,
__IN uint32_t reset_Timeout_msec,
__IN uint32_t mode_Event,
__IN uint8_t mode_Timeout_unit,
__IN uint8_t mode_Delay_unit,
__IN uint8_t mode_Trigger_Type);

Description:

Configure and start Watch Dog setting additional parameter for Watch Dog not provided by EAPI standard definition.

Parameter:

delay_Timeout_msec

Initial delay for the watchdog timer in milliseconds. The first trigger must happen within (*delay* + EventTimeout) milliseconds, of calling ***EApiWDog_SetConfigAndStart***

event_Timeout_msec

Watchdog timeout interval in milliseconds to trigger an event.

reset_Timeout_msec

Watchdog timeout interval in milliseconds to trigger a reset.

mode_Event

Set EAPI_WTD_MODE_SIGNAL to signalation on WDOUT / WDT signal:

Q7-974, Q7-A36, uQ7-A76-J, Q7-B03 on WDOUT signal on pin 72 on Q7 connector

COMe-A98-CT6, COMe-B09-BT6, COMe-B75-CT6, COMe-B72-CT6, COMe-C08-BT6, COMe-C89-BT6, COMe-C91-BT6, COMe-C24-CT6, COMe-C55-CT6: on WDT signal on pin B27 on ComEx connector

SM-B69: on WDT signal on pin S145 on Smarc connector

UDOO, UDOO BOLT, ETX-A61, SBC-A44-pITX, SBC-C41-pITX, SBC-C90: not supported

Set EAPI_WTD_MODE_PWRBTN_1SEC to Power button after 1 second

Set EAPI_WTD_MODE_PWRBTN_4SEC to Power button after 4 second

Set EAPI_WTD_MODE_SYSTEM_RESET to Reset

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mode_Timeout_unit

Set EAPI_WTD_MODE_IN_MSEC to consider **reset_Timeout_msec** express in millisecond.

Set EAPI_WTD_MODE_TIMEOUT_IN_MINUTES to consider **reset_Timeout_msec** express in second.

mode_Delay_unit

Set EAPI_WTD_MODE_IN_MSEC to consider **delay_Timeout_msec** express in second.

Set EAPI_WTD_MODE_DELAY_IN_MINUTES to consider **delay_Timeout_msec** express in second.

mode_Trigger_Type

Set EAPI_WTD_MODE_ENABLE_SW_TRIGGER to enable software trigger

Set EAPI_WTD_MODE_ENABLE_HW_TRIGGER to enable hardware trigger

Q7-974, Q7-A36, uQ7-A76-J and Q7-B03 on WDTRIG# signal on pin 70 of Q7 connector

Return Status Code:

Condition	**Return Value**
EAPI_STATUS_UNSUPPORTED	Unsupported Function
EAPI_STATUS_SUCCESS	Success

Note that Watchdog Modes are mutually exclusive.

The Watchdog has been specified as a single stage Watchdog that resets the system when timed out.

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5.4 GPIO Control Functions

The EApi library allows you to work with GPIO exender present on SECO carrier boards and also to configure the serial port present on SECO picoITX carrier board (SECOCQ7-pITX-Xboard) as RS232 or RS485 or RS422.

5.4.1 EApiGPIOSetCarrier()

EApiStatus_t

EAPI_CALLTYPE

EApiGPIOSetCarrier(__IN uint8_t Carrier_ID);

Description:

Working with SECO Pico ITX carrier board as SECOCQ7-pITX-Xboard, is necessary to call once this function before using GPIO functions in order to set EAPI library to work with this carrier board

Parameter:

Carrier_ID

Set CARRIER_NONE to work without carrier board GPIO extender

Set CARRIER_M901 to work with **SECOCQ7-pITX-Xboard** carrier board GPIO extender

Set CARRIER_0A42 to work with **SECOCQ7-3.5** carrier board GPIO extender

Return Status Code:

Condition	**Return Value**
EAPI_STATUS_UNSUPPORTED	Unsupported Function
EAPI_STATUS_SUCCESS	Success

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5.5 Reset Causes Functions

The EApi library allows you with ***'EApiGetResetCauses'*** and ***'EApiClearResetCauses'*** functions to get and clear reset causes. There are three reset causes supported:

- Reset button pressed (RESET_CAUSE_RESET)
- WDT timeout expired (RESET_CAUSE_WDT)
- Power failure (RESET_CAUSE_PWFAIL)
- EC reset (RESET_CAUSE_SWRESET) (only after BIOS programming)

5.5.1 EApiGetResetCauses()

EApiStatus_t

EAPI_CALLTYPE

EApiGetResetCauses(__IN uint32_t * ResetCauses);

Description:

Get reset causes value

Parameter:

ResetCauses

Pointer to a buffer that receives the reset causes mask.

RESET_CAUSE_RESET = (1 << 0) for reset button pressed

RESET_CAUSE_WDT = (1 << 1) for WDT timeout expired

RESET_CAUSE_PWFAIL = (1 << 2) for power failure

RESET_CAUSE_ SWRESET = (1 << 3) for EC reset

Return Status Code:

Condition	**Return Value**
EAPI_STATUS_UNSUPPORTED	Unsupported Function
EAPI_STATUS_SUCCESS	Success

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5.5.2 EApiClearResetCauses()

EApiStatus_t

EAPI_CALLTYPE

EApiClearResetCauses(__OUT uint32_t ResetCauses);

Description:

Clear the selected reset causes.

Parameter:

ResetCauses

Reset causes mask to clear.

RESET_CAUSE_RESET = (1 << 0) for reset button pressed

RESET_CAUSE_WDT = (1 << 1) for WDT timeout expired

RESET_CAUSE_PWFAIL = (1 << 2) for power failure

RESET_CAUSE_ SWRESET = (1 << 3) for EC reset

Return Status Code:

Condition	**Return Value**
EAPI_STATUS_UNSUPPORTED	Unsupported Function
EAPI_STATUS_SUCCESS	Success

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5.6 SPI Functions

5.6.1 EApiSPIGetBusCap()

EApiStatus_t

EAPI_CALLTYPE

EApiSPIGetBusCap(uint32_t *pMaxBlkLen);

Description:

Returns the capabilities of the selected SPI bus.

Parameter:

pMaxBlkLen

Size in bytes, Pointer to a buffer that receives the maximum transfer block length for the SPI interface. Please note care must be taken when using in combination with EapiSPIWriteReadRaw as the maximum data payload length is then pMaxBlkLen-(write overhead).

Return Status Code:

Condition	**Return Value**
EAPI_STATUS_NOT_INITIALIZED	Library Uninitialized
EAPI_STATUS_INVALID_PARAMETER	pMaxBlkLen==NULL
EAPI_STATUS_UNSUPPORTED	Unsupported Function
...	See 2.3 Status Codes on page 16 of COM_EAPI_R1_0.pdf
EAPI_STATUS_SUCCESS	Success

5.6.2 EApiSPIWriteReadRaw()

EApiStatus_t

EAPI_CALLTYPE

EapiSPIWriteReadRaw(uint16_t config,

unsigned char CS,

void *pWBuffer ,

uint32_t WriteBCnt,

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void *pRBuffer ,
uint32_t ReadBCnt);

Description:

Universal function for read and write operations to the SPI bus.

Parameter:

config

Configuration parameter:

UDOO Bolt this value must be **3** to use SPI bus on pin 1 (MISO), pin3 (MOSI), pin 4 (CLK) on CN25 connector

CS

Chip Select:

UDOO Bolt this value must be **3** to drive SPI CS on pin 2 on CN25 connector

pWBuffer

Pointer to a buffer containing the data to be transferred. This parameter can be NULL if the data is not required.

WriteBCnt

Size, in bytes, of the information pointed to by the pWBuffer parameter. If pWBuffer is NULL this must be zero.

pRBuffer

Pointer to a buffer that receives the read data. This parameter can be NULL if the data is not required.

ReadBCnt

Size, in bytes, to be read to pRBuffer. If pRBuffer is NULL this must be zero.

Return Status Code:

Condition	Return Value
EAPI_STATUS_NOT_INITIALIZED	Library Uninitialized
EAPI_STATUS_INVALID_PARAMETER	(WriteBCnt>1)&&(pWBuffer==NULL)
EAPI_STATUS_INVALID_PARAMETER	(ReadBCnt>1)&&(pRBuffer==NULL)
EAPI_STATUS_INVALID_PARAMETER	((WriteBCnt==0)&&(ReadBCnt==0))
EAPI_STATUS_INVALID_BLOCK_LENGTH	WriteBCnt>pMaxBlkLen
EAPI_STATUS_INVALID_BLOCK_LENGTH	ReadBCnt>pMaxBlkLen
EAPI_STATUS_UNSUPPORTED	Unsupported Function

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...	See 2.3 Status Codes on page 16 of COM_EAPI_R1_0.pdf
EAPI_STATUS_SUCCESS	Success

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5.7 EDID Functions

The EApi library allows you with '***EApiEDIDRead***' and ' ***EApiEDIDWrite*** ' functions to read and write EDID informations onto internal EEPROM to use the as custom EDID (for more details refer to board manual www.seco.com).

5.7.1 EApiEDIDRead()

EApiStatus_t
EAPI_CALLTYPE
EApiEDIDRead (void *pBuffer,
uint32_t BufLen);

Description:

Read EDID values from internal EEPROM (21 bytes).

Parameter:

pBuffer

Pointer to a buffer that receives the read data.

BufLen

Data buffer size in bytes. It must be at least 21 bytes.

Return Status Code:

Condition	**Return Value**
EAPI_STATUS_NOT_INITIALIZED	Library Uninitialized
EAPI_STATUS_MORE_DATA	BufLen < 21 bytes
EAPI_STATUS_UNSUPPORTED	Unsupported Function
...	See 2.3 Status Codes on page 16 of COM_EAPI_R1_0.pdf
EAPI_STATUS_SUCCESS	Success

5.7.2 EApiEDIDWrite()

EApiStatus_t
EAPI_CALLTYPE
EApiEDIDWrite (void *pBuffer,

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uint32_t BufLen);

Description:

Write EDID values to internal EEPROM (21 bytes).

Parameter:

pBuffer

Pointer to a buffer that contains the writing data.

BufLen

Data buffer size in bytes. It must be at least 21 bytes.

Return Status Code:

Condition	**Return Value**
EAPI_STATUS_NOT_INITIALIZED	Library Uninitialized
EAPI_STATUS_MORE_DATA	BufLen < 21 bytes
EAPI_STATUS_UNSUPPORTED	Unsupported Function
...	See 2.3 Status Codes on page 16 of COM_EAPI_R1_0.pdf
EAPI_STATUS_SUCCESS	Success

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Appendix A - Functions pinout

I2C's functions drive I2C_Clock and I2C_Data on the following pins:

Q7-974	*I2C_CLK on Pin 66 and I2C_DAT on Pin 67 on Q7 connector (Use **EAPI_ID_I2C_EXTERNAL** ID for calling I2C functions)*
Q7-A36	*I2C_CLK on Pin 66 and I2C_DAT on Pin 67 on Q7 connector (Use **EAPI_ID_I2C_EXTERNAL** ID for calling I2C functions)*
uQ7-A76-J	*I2C_CLK on Pin 66 and I2C_DAT on Pin 67 on Q7 connector (Use **EAPI_ID_I2C_EXTERNAL** ID for calling I2C functions)*
Q7-B03	*Not supported*
SBC-A44-pITX	*I2C_CLK on Pin 46 and I2C_DAT Pin 48 on LVDS connector (CN16) (Use **EAPI_ID_I2C_LVDS_1**ID for calling I2C functions)*
SBC-A80-pITX	*I2C_CLK on Pin 6 and I2C_DAT Pin 8 on CN10 connector (Use **EAPI_ID_I2C_EXTERNAL** ID for calling I2C functions)* *I2C_CLK on Pin 60 and I2C_DAT Pin 58 on CN16 connector (Use **EAPI_ID_I2C_LVDS_1**ID for calling I2C functions)*
SBC-B68-eNUC	*Not supported*
SBC-C41-pITX	*Not supported*
SBC-C90	*I2C_CLK on Pin 3 and I2C_DAT Pin 5 on CN35 connector (Use **EAPI_ID_I2C_EXTERNAL** ID for calling I2C functions)* *I2C_CLK on Pin 4 and I2C_DAT Pin 6 on CN35 connector (Use **EAPI_ID_I2C_LVDS_1**ID for calling I2C functions)*
UDOO	*I2C_CLK on Pin 2 and I2C_DAT Pin 4 on CN14 connector (Use **EAPI_ID_I2C_EXTERNAL** ID for calling I2C functions)* *I2C_CLK on Pin 10 and I2C_DAT Pin 12 on CN14 connector (Use **EAPI_ID_I2C_LVDS_1**ID for calling I2C functions)*
UDOO Bolt	*I2C_CLK on Pin 8 and I2C_DAT Pin 10 on CN25 connector (Use **EAPI_ID_I2C_EXTERNAL** ID for calling I2C functions)* *I2C_CLK on Pin 7 and I2C_DAT Pin 9 on CN25 connector (Use **EAPI_ID_I2C_LVDS_1**ID for calling I2C functions)*
COMe-A98-CT6	*I2C_CLK on Pin B33 and I2C_DAT Pin B34 on ComE connector (Use **EAPI_ID_I2C_EXTERNAL** ID for calling I2C functions)*
COMe-B09-BT6	*I2C_CLK on Pin B33 and I2C_DAT Pin B34 on ComE connector (Use **EAPI_ID_I2C_EXTERNAL** ID for calling I2C functions)*
COMe-B75-CT6	*I2C_CLK on Pin B33 and I2C_DAT Pin B34 on ComE connector (Use **EAPI_ID_I2C_EXTERNAL** ID for calling I2C functions)*
COMe-B72-CT6	*I2C_CLK on Pin B33 and I2C_DAT Pin B34 on ComE connector (Use **EAPI_ID_I2C_EXTERNAL** ID for calling I2C functions)*
COMe-C08-BT6	*I2C_CLK on Pin B33 and I2C_DAT Pin B34 on ComE connector (Use **EAPI_ID_I2C_EXTERNAL** ID for calling I2C functions)*
COMe-C89-BT6	*I2C_CLK on Pin B33 and I2C_DAT Pin B34 on ComE connector (Use **EAPI_ID_I2C_EXTERNAL** ID for calling I2C functions)*
COMe-C91-BT6	*I2C_CLK on Pin B33 and I2C_DAT Pin B34 on ComE connector (Use **EAPI_ID_I2C_EXTERNAL** ID for calling I2C functions)*
COMe-C24-CT6	*I2C_CLK on Pin B33 and I2C_DAT Pin B34 on ComE connector (Use **EAPI_ID_I2C_EXTERNAL** ID for calling I2C functions)*
COMe-C55-CT6	*I2C_CLK on Pin B33 and I2C_DAT Pin B34 on ComE connector (Use **EAPI_ID_I2C_EXTERNAL** ID for calling I2C functions)*
SM-B69	*Not supported*
ETX-A61	*Not supported*

SPI's functions drive SPI_MISO, SPI_MOSI, SPI_CS, SPI_CLK on the following pins:

UDOO Bolt	*SPI_MISO on Pin 1 on CN25 connector* *SPI_MOSI on Pin 3 on CN25 connector* *SPI_CS on Pin 2 on CN25 connector* *SPI_CLK on Pin 4 on CN25 connector*

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GPIO's functions drive GPIO on the following pins:

Q7-974	*Pin 2-10 on CN10 connector on SECOCQ7-pITX/Xboard carrier board all configurable as Input or Output*
Q7-A36	*Pin 2-10 on CN10 connector on SECOCQ7-pITX/Xboard carrier board all configurable as Input or Output*
uQ7-A76-J	*Pin 2-10 on CN10 connector on SECOCQ7-pITX/Xboard carrier board all configurable as Input or Output*
Q7-B03	*Not supported*
SBC-A44-pITX	*Pin 3-4-5-6-7-8-9-10 on CN23 connector and pin 45-47 on LVDS connector (CN16)*
SBC-A80-pITX	*Pin 2-3-4-5-6-7-8-9 on CN32 connector and pin 4-5 on CN 10 connector*
SBC-B68-eNUC	*Not supported*
SBC-C41-pITX	*Pin 3-4-5-6-7-8-9-10 on CN16 connector*
SBC-C90	*Pin 3-4-5-6-7-8-9-10 on CN28 connector*
UDOO	*Not supported*
UDOO Bolt	*Pin 13-14-15-16-17-18-19-20-21-22-23-24-25-26-27-28 on CN25 connector*
COMe-A98-CT6	*Pin A54-A63-A67-A85 as Input and A93-B54-B57-B63 as Output on ComEx connector*
COMe-B09-BT6	*Pin A54-A63-A67-A85 as Input and A93-B54-B57-B63 as Output on ComEx connector*
COMe-B75-CT6	*Pin A54-A63-A67-A85 as Input and A93-B54-B57-B63 as Output on ComEx connector*
COMe-B72-CT6	*Pin A54-A63-A67-A85 as Input and A93-B54-B57-B63 as Output on ComEx connector*
COMe-C08-BT6	*Pin A54-A63-A67-A85 as Input and A93-B54-B57-B63 as Output on ComEx connector*
COMe-C89-BT6	*Pin A54-A63-A67-A85 as Input and A93-B54-B57-B63 as Output on ComEx connector*
COMe-C91-BT6	*Pin A54-A63-A67-A85 as Input and A93-B54-B57-B63 as Output on ComEx connector*
COMe-C24-CT6	*Pin A54-A63-A67-A85 as Input and A93-B54-B57-B63 as Output on ComEx connector*
COMe-C55-CT6	*Pin A54-A63-A67-A85 as Input and A93-B54-B57-B63 as Output on ComEx connector*
SM-B69	*Pin P108-P109-P110-P111-P112-P113-P114-P115-P116-P117-P118-P119 on Smarc connector*
ETX-A61	*Not supported*

EApiBoardGetValue function for EAPI_ID_HWMON_FAN_CPU monitor following pin:

Q7-974	*Pin 3 on CN2 connector*
Q7-A36	*Pin 3 on CN2 connector*
uQ7-A76-J	*Pin 3 on CN2 connector*
Q7-B03	*Not supported*
SBC-A44-pITX	*Pin 3 on CN6 connector*
SBC-A80-pITX	*Pin 3 on CN20 connector*
SBC-B68-eNUC	*Pin 3 on CN5 connector and pin 3 on CN6 connector*
SBC-C41-pITX	*Pin 3 on CN8 connector*
SBC-C90	*Pin 3 on CN34 connector*

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UDOO	*Pin 3 on CN22 connector*
UDOO Bolt	*Pin 3 on CN7 connector*
COMe-A98-CT6	*Pin 3 on CN4 connector*
COMe-B09-BT6	*Pin 3 on CN4 connector*
COMe-B75-CT6	*Pin 3 on CN4 connector*
COMe-B72-CT6	*Pin 3 on CN4 connector*
COMe-C08-BT6	*Pin 3 on CN4 connector*
COMe-C89-BT6	*Pin 3 on CN4 connector*
COMe-C91-BT6	*Pin 3 on CN4 connector*
COMe-C24-CT6	*Pin 3 on CN4 connector and pin 3 on CN7 connector*
COMe-C55CT6	*Pin 3 on CN4 connector and pin 3 on CN8 connector*
SM-B69	*No internal fan present*
ETX-A61	*Pin 3 on CN1 connector*

EApiBoardGetValue function for EAPI_ID_HWMON_FAN_SYSTEM monitor following pin:

Q7-974	*FAN_TACHION Pin 195 on Q7 connector*
Q7-A36	*FAN_TACHION Pin 195 on Q7 connector*
uQ7-A76-J	*FAN_TACHION Pin 195 on Q7 connector*
Q7-B03	*FAN_TACHION Pin 195 on Q7 connector*
SBC-A44-pITX	*No external fan present*
SBC-A80-pITX	*No external fan present*
SBC-B68-eNUC	*No external fan present*
SBC-C41-pITX	*No external fan present*
SBC-C90	*No external fan present*
UDOO	*No external fan present*
UDOO Bolt	*Pin 12 on Cn25 connector*
COMe-A98-CT6	*Pin B102 on ComEx connector*
COMe-B09-BT6	*Pin B102 on ComEx connector*
COMe-B75-CT6	*Pin B102 on ComEx connector*
COMe-B72-CT6	*Pin B102 on ComEx connector*
COMe-C08-BT6	*Pin B102 on ComEx connector*
COMe-C89-BT6	*Pin B102 on ComEx connector*
COMe-C91-BT6	*Pin B102 on ComEx connector*
COMe-C24-CT6	*Pin B102 on ComEx connector*
COMe-C55-CT6	*Pin B102 on ComEx connector*

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SM-B69	*Pin P114 on Smarc connector*
ETX-A61	*No external fan present*

EAPI Fan control functions drive following pin:

Q7-974	*FAN_PWMOUT Pin 196 on Q7 connector*
Q7-A36	*FAN_PWMOUT Pin 196 on Q7 connector*
uQ7-A76-J	*FAN_PWMOUT Pin 196 on Q7 connector*
Q7-B03	*FAN_PWMOUT Pin 196 on Q7 connector*
SBC-A44-pITX	*No external fan present*
SBC-A80-pITX	*No external fan present*
SBC-B68-eNUC	*No external fan present*
SBC-C41-pITX	*No external fan present*
SBC-C90	*No external fan present*
UDOO	*No external fan present*
UDOO Bolt	*Pin 11 on Cn25 connector*
COMe-A98-CT6	*Pin B101 on ComEx connector*
COMe-B09-BT6	*Pin B101 on ComEx connector*
COMe-B75-CT6	*Pin B101 on ComEx connector*
COMe-B72-CT6	*Pin B101 on ComEx connector*
COMe-C08-BT6	*Pin B101 on ComEx connector*
COMe-C89-BT6	*Pin B101 on ComEx connector*
COMe-C91-BT6	*Pin B101 on ComEx connector*
COMe-C24-CT6	*Pin B101 on ComEx connector*
COMe-C55-CT6	*Pin B101 on ComEx connector*
SM-B69	*Not supported*
ETX-A61	*No external fan present*

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