

RTX2300

Frequency Counter Module

Interface Specification

RTX	Technical Documentation Rtx2300 Frequency Counter Module	Interface Specification		
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1 History

Date	Initials	Rev.	Description
25/08/2010	MHP	1.0	Initial version
21/09/2012	MHP	1.1	Added GetManufacturerInfo
2/10/2012	MHP	1.2	Removed Get/SetPersonality
7/1 2013	MHP	1.3	Result resolution changed

2 References

- Rtx2300 Configuration.doc
- Rtx2300 Software Design.doc
- Rtx2300 System Interface Specification

3 Terms and abbreviations

Term	Description
Task	A self-contained major software component in the RTX standard software environment
FreqCnt module	The frequency counter module.
Master	The software and or system controlling the Rtx2300 module, typically an application running on a PC.
Target	The RTX2300 module including the board containing the circuitry and the software running it.
Firmware	The software running in the target.
Request	A command sent to the Rtx2300 module, e.g. measure voltage.
Confirm	The result of the request, returned by Rtx2300 module.

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4 Introduction

This document describes the SW interface between master PC running the Rtx2300 module driver software and the Rtx2300 module. An overview of the system is shown in Figure 1.

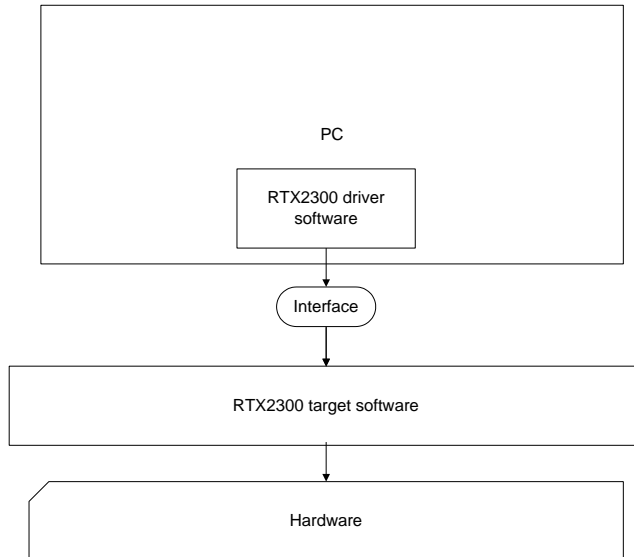


Figure 1

4.1 Interface

This is the interface described in this document.

4.2 RTX2300 module driver software

This is the PC software that controls the Rtx2300 module by using the interface described in this document.

4.3 Rtx2300 module target software

This is the software running inside the module.

5 Generic types

The Rtx2300 interfaces use RTX Telecom standard platform independent types. These types must be defined in accordance with the platform used.

Type name	Typical definition	Description
rsuint8	typedef unsigned char rsuint8;	unsigned 8 bit
rsint8	typedef signed char rsint8;	signed 8 bit
rsuint16	typedef unsigned short rsuint16;	unsigned 16 bit
rsint16	typedef signed short rsint16;	signed 16 bit
rsuint32	typedef unsigned long rsuint32;	unsigned 32 bit
rsint32	typedef signed long rsint32;	signed 32 bit
rsbitfield	typedef unsigned char rsbitfield;	bitfield designator

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6 Interface

The Rtx2300 interface is mail based. Please read the *Rtx2300 Interface Specification* for a detailed description of mails and primitives.

7 Interface description

The following lists the primitives and mailtypes used to communicate with the module.

7.1 Connection mode

Description:	Set the connection mode		
Primitive:	FREQCNT_SET_CONNECTION_MODE_REQ		
Parameters:			
Type	Name	Description	
Rtx2300InstanceNoType	InstNo	The instance number.	
FreqCntConnectionModeType	Mode	The required connection mode	


Description:	The connection mode has been set		
Primitive:	FREQCNT_SET_CONNECTION_MODE_CFM = 0x7201		
Parameters:			
Type	Name	Description	
Rtx2300InstanceNoType	InstNo	The instance number.	
Rtx2300ErrorType	ErrorCode	RTX2300_ERR_NO_ERROR RTX2300_ERR_BUSY: the module is busy. RTX2300_ERR_RANGE: illegal parameter(s) found	

Description:	Get the connection mode		
Primitive:	FREQCNT_GET_CONNECTION_MODE_REQ = 0x7202		
Parameters:			
Type	Name	Description	
Rtx2300InstanceNoType	InstNo	The instance number.	

Description:	The connection mode has been read		
Primitive:	FREQCNT_GET_CONNECTION_MODE_CFM = 0x7203		
Parameters:			
Type	Name	Description	
Rtx2300InstanceNoType	InstNo	The instance number.	
Rtx2300ErrorType	ErrorCode	RTX2300_ERR_NO_ERROR RTX2300_ERR_BUSY: the module is busy. RTX2300_ERR_RANGE: illegal parameter(s) found	
FreqCntConnectionModeType	Mode	The required connection mode	

7.2 Impedance

Description:	Set the input impedance		
Primitive:	FREQCNT_SET_IMPEDANCE_REQ = 0x7204		
Parameters:			
Type	Name	Description	
Rtx2300InstanceNoType	InstNo	The instance number.	
rsbool	LowImp	0: high impedance (default) 1: low impedance (50 Ohms)	

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Description:	The input impedance has been set	
Primitive:	FREQCNT_SET_IMPEDANCE_CFM = 0x7205	
Parameters:		
Type	Name	Description
Rtx2300InstanceNoType	InstNo	The instance number.
Rtx2300ErrorType	ErrorCode	RTX2300_ERR_NO_ERROR RTX2300_ERR_BUSY: the module is busy.

Description:	Get the input impedance	
Primitive:	FREQCNT_GET_IMPEDANCE_REQ = 0x7206	
Parameters:		
Type	Name	Description
Rtx2300InstanceNoType	InstNo	The instance number.

Description:	The input impedance has been set	
Primitive:	FREQCNT_GET_IMPEDANCE_CFM = 0x7207	
Parameters:		
Type	Name	Description
Rtx2300InstanceNoType	InstNo	The instance number.
Rtx2300ErrorType	ErrorCode	RTX2300_ERR_NO_ERROR RTX2300_ERR_BUSY: the module is busy.
rsbool	LowImp	0: high impedance (default) 1: low impedance (50 Ohms)


7.3 DC coupling

Description:	Set the input DC coupling	
Primitive:	FREQCNT_SET_DC_COUPLING_REQ = 0x7208	
Parameters:		
Type	Name	Description
Rtx2300InstanceNoType	InstNo	The instance number.
rsbool	DcCoupled	0: AC coupled (default) 1: DC coupled

Description:	The input DC coupling has been set	
Primitive:	FREQCNT_SET_DC_COUPLING_CFM = 0x7209	
Parameters:		
Type	Name	Description
Rtx2300InstanceNoType	InstNo	The instance number.
Rtx2300ErrorType	ErrorCode	RTX2300_ERR_NO_ERROR RTX2300_ERR_BUSY: the module is busy.

Description:	Get the input DC coupling	
Primitive:	FREQCNT_GET_DC_COUPLING_REQ = 0x720A	
Parameters:		
Type	Name	Description
Rtx2300InstanceNoType	InstNo	The instance number.

Description:	The input DC coupling has been set	
Primitive:	FREQCNT_GET_DC_COUPLING_CFM = 0x720B	
Parameters:		
Type	Name	Description
Rtx2300InstanceNoType	InstNo	The instance number.
Rtx2300ErrorType	ErrorCode	RTX2300_ERR_NO_ERROR RTX2300_ERR_BUSY: the module is busy.
rsbool	DcCoupled	0: AC coupled 1: DC coupled

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7.4 Gate time

Description:	Set the gate time. This is the time the counter actually counts the input frequency. Higher gate time results in higher accuracy but longer measurement time. The default is FREQCNT_GATE_TIME_100MS.		
Primitive:	FREQCNT_SET_GATE_TIME_REQ = 0x7230		
Parameters:			
Type	Name	Description	
Rtx2300InstanceNoType	InstNo	The instance number.	
FreqCntGateTimeType	GateTime	The time spent counting	

Description:	The gate time has been set		
Primitive:	FREQCNT_SET_GATE_TIME_CFM = 0x7231		
Parameters:			
Type	Name	Description	
Rtx2300InstanceNoType	InstNo	The instance number.	
Rtx2300ErrorType	ErrorCode	RTX2300_ERR_NO_ERROR RTX2300_ERR_BUSY: the module is busy.	


Description:	Get the gate time.		
Primitive:	FREQCNT_GET_GATE_TIME_REQ = 0x7232		
Parameters:			
Type	Name	Description	
Rtx2300InstanceNoType	InstNo	The instance number.	

Description:	The gate time has been read		
Primitive:	FREQCNT_GET_GATE_TIME_CFM = 0x7233		
Parameters:			
Type	Name	Description	
Rtx2300InstanceNoType	InstNo	The instance number.	
Rtx2300ErrorType	ErrorCode	RTX2300_ERR_NO_ERROR RTX2300_ERR_BUSY: the module is busy.	
FreqCntGateTimeType	GateTime	The current gate time	

7.5 Trigger

Description:	Set the trigger level. This is the level the input signal must exceed for the count to register it. Trigger level are only active when input are DC coupled. Trigger level are midlevel when in AC coupled mode.		
Primitive:	FREQCNT_SET_TRIGGER_LEVEL_REQ = 0x7234		
Parameters:			
Type	Name	Description	
Rtx2300InstanceNoType	InstNo	The instance number.	
Rtx2300VoltageType	TrigLvl	The trigger level in mV	
rsbool	PosEdge	1: trigger on negative edge of input signal 1: trigger on positive edge of input signal (default)	
rsbool	Auto	0: the TrigLvl parameter is used to control trigger level 1: the trigger level is adjusted automatically.	

Description:	The trigger level has been set		
Primitive:	FREQCNT_SET_TRIGGER_LEVEL_CFM = 0x7235		
Parameters:			
Type	Name	Description	
Rtx2300InstanceNoType	InstNo	The instance number.	

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Rtx2300ErrorType	ErrorCode	RTX2300_ERR_NO_ERROR RTX2300_ERR_BUSY: the module is busy.
rsbool	Triggered	0:the level is out of range so the trigger does not activate 1: the trigger is activated Please note: a proper input signal is required for this information to be correct! This information is not valid in AutoTrig mode.

Description:	Get the trigger level.	
Primitive:	FREQCNT_GET_TRIGGER_LEVEL_REQ = 0x7236	
Parameters:		
Type	Name	Description
Rtx2300InstanceNoType	InstNo	The instance number.

Description:	The trigger level has been read	
Primitive:	FREQCNT_GET_TRIGGER_LEVEL_CFM = 0x7237	
Parameters:		
Type	Name	Description
Rtx2300InstanceNoType	InstNo	The instance number.
Rtx2300ErrorType	ErrorCode	RTX2300_ERR_NO_ERROR RTX2300_ERR_BUSY: the module is busy.
Rtx2300VoltageType	TrigLvl	The trigger level in mV. In normal mode this is the level specified by the user. In autotrig mode this is the current level set by the system.
rsbool	Triggered	0:the level is out of range so the trigger does not activate 1: the trigger is activated Please note: a proper input signal is required for this information to be correct!
rsbool	PosEdge	0: trigger on negative edge of input signal 1: trigger on positive edge of input signal
rsbool	Auto	0:the TrigLvl parameter is used to control trigger level 1: the trigger level is adjusted automatically.

7.6 Measurements


Description:	Get the current frequency measurement. Start a measurement and return the result.	
Primitive:	FREQCNT_GET_FREQUENCY_REQ = 0x7240	
Parameters:		
Type	Name	Description
Rtx2300InstanceNoType	InstNo	The instance number.
FreqCntMeasureModeType	Mode	The mode to use

Description:	The frequency has been measured	
Primitive:	FREQCNT_GET_FREQUENCY_CFM = 0x7241	
Parameters:		
Type	Name	Description
Rtx2300InstanceNoType	InstNo	The instance number.
Rtx2300ErrorType	ErrorCode	RTX2300_ERR_NO_ERROR RTX2300_ERR_BUSY: the module is busy. RTX2300_ERR_RANGE: unknown mode
Rtx2300FrequencyType	Result_Int	The integer part of the result. If the <i>Mode</i> parameter is anything but <i>normal</i> this field contains 0.
Rtx2300FrequencyType	Result_Frac	The fractional part of the result, specified as ppm, i.e. the number of 1/1000000 Hz . If the <i>Mode</i> parameter is anything but <i>normal</i> this field contains 0.
Rtx2300FrequencyType	HwCntRef	For internal use
Rtx2300FrequencyType	HwCntFreq	For internal use

7.7 Indications

The following indications may be sent from the module to the master at any time after initialization.

Description:	Reset indication. The module has finished its reset handling and is now ready to accept requests.
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Primitive:	FREQCNT_RESET_IND = 0x7250	
Parameters:		
Type	Name	Description
Rtx2300InstanceNoType	InstNo	The instance number.

Description:	The frequency has been measured	
Primitive:	FREQCNT_FREQUENCY_RESULT_IND = 0x7251	
Parameters:		
Type	Name	Description
Rtx2300InstanceNoType	InstNo	The instance number.
Rtx2300ErrorType	ErrorCode	RTX2300_ERR_NO_ERROR RTX2300_ERR_BUSY: the module is busy.
Rtx2300FrequencyType	Result_Int	The integer part of the result.
Rtx2300FrequencyType	Result_Frac	The fractional part of the result, specified as ppm, i.e. the number of 1/1000000000 Hz .
Rtx2300FrequencyType	HwCntRef	For internal use
Rtx2300FrequencyType	HwCntFreq	For internal use

7.8 General housekeeping

7.8.1 Initializing the system

Description:	Initialize the module	
Primitive:	FREQCNT_INIT_REQ = 0x7218	
Parameters:		
Type	Name	Description
Rtx2300InstanceNoType	InstNo	The instance number.


Description:	The initialization has finished	
Primitive:	FREQCNT_INIT_CFM = 0x7219	
Parameters:		
Type	Name	Description
Rtx2300InstanceNoType	InstNo	The instance number.
Rtx2300ErrorType	ErrorCode	RTX2300_ERR_NO_ERROR

7.8.2 Getting the Manufacturer Information

The Manufacturer Information is a set of information that describes the system. The information is stored during manufacturing and cannot be changed.

Description:	Get the Manufacturer Information	
Primitive:	FREQCNT_GET_MANUFACTURER_INFO_REQ = 0x7264	
Parameters:		
Type	Name	Description
Rtx2300InstanceNoType	InstNo	The instance number.

Description:		
Primitive:	FREQCNT_GET_MANUFACTURER_INFO_CFM = 0x7265	
Parameters:		
Type	Name	Description
Rtx2300InstanceNoType	InstNo	The instance number.
Rtx2300ErrorType	ErrorCode	RTX2300_ERR_NO_ERROR
FreqCntManufacturerInfoType	Info	The Manufacturer Information.

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7.8.3 User data handling

These requests allow the client to access the user area of the on-board EEPROM. The area consists of 100 bytes and may be used by the customer for any purpose.

If the flag `FREQCNT_GLOBAL_ACCESS_FLAG` is OR'ed to the address, it is considered an absolute EEPROM address, capable of reaching the entire EEPROM. This is only possible in *Manufacturer mode*.

Description:	Write user data to non-volatile storage. Required access rights: <i>Admin</i> .	
Primitive:	<code>FREQCNT_WRITE_USERDATA_REQ = 0x7270</code>	
Parameters:		
Type	Name	Description
Rtx2300InstanceNoType	InstNo	The instance number.
rsuint16	Addr	The user data address
rsuint8	ByteCount	The number of bytes to write, max 16 bytes
FreqCntUserDataTypes	Data	The data to write


Description:	The data has been written	
Primitive:	<code>FREQCNT_WRITE_USERDATA_CFM = 0x7271</code>	
Parameters:		
Type	Name	Description
Rtx2300InstanceNoType	InstNo	The instance number.
Rtx2300ErrorType	ErrorCode	RTX2300_ERR_NO_ERROR RTX2300_ERR_AUTHENTICATION: the user does not have the required privilege to do this. RTX2300_ERR_RANGE: attempt to access outside the user area, or more than 16 bytes specified.

Description:	Read data from the NVS	
Primitive:	<code>FREQCNT_READ_USERDATA_REQ = 0x7272</code>	
Parameters:		
Type	Name	Description
Rtx2300InstanceNoType	InstNo	The instance number.
rsuint16	Addr	The user data address
rsuint8	ByteCount	The number of bytes to read, max 16 bytes

Description:	The data has been read	
Primitive:	<code>FREQCNT_READ_USERDATA_CFM = 0x7273</code>	
Parameters:		
Type	Name	Description
Rtx2300InstanceNoType	InstNo	The instance number.
Rtx2300ErrorType	ErrorCode	RTX2300_ERR_NO_ERROR RTX2300_ERR_RANGE: attempt to access outside the user area, or more than 16 bytes specified.
rsuint8	ByteCount	The number of bytes read
FreqCntUserDataTypes	Data	The data to write

7.8.4 Requesting system status

Description:	Get the current status of the module.	
Primitive:	<code>FREQCNT_GET_STATUS_REQ = 0x7222</code>	
Parameters:		
Type	Name	Description
Rtx2300InstanceNoType	InstNo	The instance number.

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Description:	Return the current status		
Primitive:	FREQCNT_GET_STATUS_CFM = 0x7223		
Parameters:			
Type	Name	Description	
Rtx2300InstanceNoType	InstNo	The instance number.	
Rtx2300ErrorType	ErrorCode	RTX2300_ERR_NO_ERROR	
FreqCntStatusType	Status	The module status	

7.8.5 Requesting firmware version

Description:	Get version info for installed firmware. The info consists of a firmware defined NULL terminated string, and a 16 bit version number.		
Primitive:	FREQCNT_GET_VERSION_REQ = 0x7224		
Parameters:			
Type	Name	Description	
Rtx2300InstanceNoType	InstNo	The instance number.	

Description:	Return the version info		
Primitive:	FREQCNT_GET_VERSION_CFM = 0x7225		
Parameters:			
Type	Name	Description	
Rtx2300InstanceNoType	InstNo	The instance number.	
Rtx2300ErrorType	ErrorCode	RTX2300_ERR_NO_ERROR RTX2300_ERR_UNSUPPORTED: firmware not found.	
Rtx2300VersionInfoType	VersionInfo	The version info.	


7.8.6 Requesting firmware information

Description:	Get additional firmware info.		
Primitive:	FREQCNT_GET_FIRMWARE_INFO_REQ = 0x7226		
Parameters:			
Type	Name	Description	
Rtx2300InstanceNoType	InstNo	The instance number.	

Description:	Return the firmware info		
Primitive:	FREQCNT_GET_FIRMWARE_INFO_CFM = 0x7227		
Parameters:			
Type	Name	Description	
Rtx2300InstanceNoType	InstNo	The instance number.	
Rtx2300ErrorType	ErrorCode	RTX2300_ERR_NO_ERROR	
Rtx2300DateType	LinkDate	The link date	
Rtx2300VersionLabelType	VersionLabel	This field contains the version label as a zero terminated string.	

7.8.7 Setting access mode

Description:	Set the access mode. Some requests needs a privileged access mode to execute. Please note that 2 failed attempts to set the access mode are accepted. If the third attempt fails the system enters an internal loop and must be restarted.		
Primitive:	FREQCNT_SET_ACCESS_MODE_REQ = 0x7280		
Parameters:			
Type	Name	Description	
Rtx2300InstanceNoType	InstNo	The instance number.	

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Rtx2300AccessModeType	AccessMode	The required access mode
Rtx2300PasswordType	Password	The password required to enable the mode. No password is required to enable user mode, use 0.

Description:	Access mode has been enabled	
Primitive:	FREQCNT_SET_ACCESS_MODE_CFM = 0x7281	
Parameters:		
Type	Name	Description
Rtx2300InstanceNoType	InstNo	The instance number.
Rtx2300ErrorType	ErrorCode	RTX2300_ERR_NO_ERROR RTX2300_ERR_AUTHENTICATION: wrong password RTX2300_ERR_RANGE: unknown mode

Description:	Get the access mode	
Primitive:	FREQCNT_GET_ACCESS_MODE_REQ = 0x7282	
Parameters:		
Type	Name	Description
Rtx2300InstanceNoType	InstNo	The instance number.


Description:	The current access mode	
Primitive:	FREQCNT_GET_ACCESS_MODE_CFM = 0x7283	
Parameters:		
Type	Name	Description
Rtx2300InstanceNoType	InstNo	The instance number.
Rtx2300ErrorType	ErrorCode	RTX2300_ERR_NO_ERROR RTX2300_ERR_AUTHENTICATION: wrong password
Rtx2300AccessModeType	AccessMode	The current access mode

7.8.8 Getting/setting serial number

Description:	Set serial number information. The serial number information is not used by the firmware. The primary serial number is a number that uniquely identifies this particular RTX2300 system. The secondary serial number may be used for any purpose. It requires <i>Manufacturer</i> access rights to change the primary serial number, while the secondary serial number requires <i>Admin</i> access rights.	
Primitive:	FREQCNT_SET_SERIALNO_REQ = 0x7284	
Parameters:		
Type	Name	Description
Rtx2300InstanceNoType	InstNo	The instance number.
rsbool	SetPrimary	True: set the primary serial number False: set the secondary serial number
Rtx2300SerialNumberType	SerialNo	The serial number.

Description:	The serial number has been set	
Primitive:	FREQCNT_SET_SERIALNO_CFM = 0x7285	
Parameters:		
Type	Name	Description
Rtx2300InstanceNoType	InstNo	The instance number.
Rtx2300ErrorType	ErrorCode	RTX2300_ERR_NO_ERROR RTX2300_ERR_AUTHENTICATION: the user does not have the required privilege to do this.

Description:	Get the serial number	
Primitive:	FREQCNT_GET_SERIALNO_REQ = 0x7286	
Parameters:		

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Type	Name	Description
Rtx2300InstanceNoType	InstNo	The instance number.

Description:		
Primitive:	FREQCNT_GET_SERIALNO_CFM = 0x7287	
Parameters:		
Type	Name	Description
Rtx2300InstanceNoType	InstNo	The instance number.
Rtx2300ErrorType	ErrorCode	RTX2300_ERR_NO_ERROR
Rtx2300SerialNumberType	PrimSerialNo	The primary serial number.
Rtx2300SerialNumberType	SecSerialNo	The secondary serial number.

7.8.9 Preset settings to default values

Description:	Preset some or all system settings in Non Volatile Storage to their default values, according to the specified mode. Required access rights: <i>Manufacturer</i> .	
Primitive:	FREQCNT_SET_NVS_DEFAULT_REQ = 0x7288	
Parameters:		
Type	Name	Description
Rtx2300InstanceNoType	InstNo	The instance number.
Rtx2300NvsDefaultModeType	Mode	The mode to use when presetting the settings.

Description:	The settings has been set	
Primitive:	FREQCNT_SET_NVS_DEFAULT_CFM = 0x7289	
Parameters:		
Type	Name	Description
Rtx2300InstanceNoType	InstNo	The instance number.
Rtx2300ErrorType	ErrorCode	RTX2300_ERR_NO_ERROR RTX2300_ERR_AUTHENTICATION: the user does not have the required privedge to do this.


7.8.10 Getting the current temperature

Description	Request current temperature from the device	
Primitive:	FREQCNT_GET_TEMPERATURE_REQ = 0x7290	
Parameters:		
Type	Name	Description
Rtx2300InstanceNoType	InstNo	The instance number.

Description	The temperature info has been returned from the device	
Primitive:	FREQCNT_GET_TEMPERATURE_CFM = 0x7291	
Parameters:		
Type	Name	Description
Rtx2300InstanceNoType	InstNo	The instance number.
Rtx2300ErrorType	ErrorCode	RTX2300_ERR_NO_ERROR
Rtx2300TemperatureType	Temperature	The current temperature in degrees Celsius. Accuray is +/- 10 degrees.

7.8.11 Getting internal debug info

Description	Request debug info
Primitive:	FREQCNT_GET_INFO_REQ = 0x7292
Parameters:	

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Type	Name	Description
Rtx2300InstanceNoType	InstNo	The instance number.
rsuint8	InfoType	The type of info to get

Description:	The info has been returned from the device	
Primitive:	FREQCNT_GET_INFO_CFM = 0x7293	
Parameters:		
Type	Name	Description
Rtx2300InstanceNoType	InstNo	The instance number.
Rtx2300ErrorType	ErrorCode	RTX2300_ERR_NO_ERROR
rsuint8	InfoType	The type of info
rsuint16	Info0	
rsuint16	Info1	
rsuint16	Info2	
float	Info3	

7.9 Calibration


7.9.1 System clock

Description:	Calibrate the system clock. The calibration value is calculated internally from the internal reference clock and stored in non-volatile memory. Please note that it is only possible to actually measure the system clock when the CKOUT fuse has been programmed, in which case the clock is output on the PBO pin. This is, however, not required. Calibrating the system clock is done during production by RTX Telecom only. Required access rights: <i>Manufacturer.</i>	
Primitive:	FREQCNT_SET_SYSCLK_REQ = 0x7294	
Parameters:		
Type	Name	Description
Rtx2300InstanceNoType	InstNo	The instance number.

Description:	The system clock has been set	
Primitive:	FREQCNT_SET_SYSCLK_CFM = 0x7295	
Parameters:		
Type	Name	Description
Rtx2300InstanceNoType	InstNo	The instance number.
Rtx2300ErrorType	ErrorCode	RTX2300_ERR_NO_ERROR RTX2300_ERR_AUTHENTICATION: the user does not have the required privilege to do this.

Description:	Get the system clock setting.	
Primitive:	FREQCNT_GET_SYSCLK_REQ = 0x7296	
Parameters:		
Type	Name	Description
Rtx2300InstanceNoType	InstNo	The instance number.

Description:	The system clock has been read	
Primitive:	FREQCNT_GET_SYSCLK_CFM = 0x7297	
Parameters:		
Type	Name	Description
Rtx2300InstanceNoType	InstNo	The instance number.
Rtx2300ErrorType	ErrorCode	RTX2300_ERR_NO_ERROR
rsuint8	Value	The system clock calibration value

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7.9.2 Internal reference clock

Description:	Calibrate internal reference clock. This is a calibration value for the 12bit DAC that adjusts the internal 10 MHz reference oscillator. The DAC value is stored internally in non-volatile memory. Required access rights: <i>Manufacturer</i> .	
Primitive:	FREQCNT_SET_REFERENCE_OFFSET_REQ = 0x7298	
Parameters:		
Type	Name	Description
Rtx2300InstanceNoType	InstNo	The instance number.
rsuint16	Offset	The reference offset.

Description:	The offset has been set	
Primitive:	FREQCNT_SET_REFERENCE_OFFSET_CFM = 0x7299	
Parameters:		
Type	Name	Description
Rtx2300InstanceNoType	InstNo	The instance number.
Rtx2300ErrorType	ErrorCode	RTX2300_ERR_NO_ERROR RTX2300_ERR_BUSY: the module is busy. RTX2300_ERR_AUTHENTICATION: the user does not have the required privilege to do this.

Description:	Get the internal reference offset.	
Primitive:	FREQCNT_GET_REFERENCE_OFFSET_REQ = 0x729A	
Parameters:		
Type	Name	Description
Rtx2300InstanceNoType	InstNo	The instance number.


Description:	The offset has been read	
Primitive:	FREQCNT_GET_REFERENCE_OFFSET_CFM = 0x729B	
Parameters:		
Type	Name	Description
Rtx2300InstanceNoType	InstNo	The instance number.
Rtx2300ErrorType	ErrorCode	RTX2300_ERR_NO_ERROR RTX2300_ERR_BUSY: the module is busy.
rsuint16	Offset	The reference offset.

8 Types

8.1 Rtx2300 System Types

The following types are standard Rtx2300 types, see *Rtx2300 System Interface Specification* for a detailed description of these types.

- Rtx2300ErrorType
- Rtx2300VersionInfoType
- Rtx2300VersionInfoStrType
- Rtx2300DateType
- Rtx2300FrequencyType
- Rtx2300AccessModeType
- Rtx2300PasswordType

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- Rtx2300FwuErrorType

8.2 FreqCntStatusType


Description:	This type is used to return module status information to the PC.	
C-syntax:		
<code>typedef union FreqCntStatusType</code>		
<code>{</code>		
<code> struct</code>		
<code> {</code>		
<code> rsbitfield InitDone : 1;</code>	The module has been initialized and is ready to accept commands.	
<code> rsbitfield SafeMode : 1;</code>	The firmware is in safemode	
<code> rsbitfield Reserved1 : 6;</code>		
<code> rsbitfield Reserved2 : 8;</code>		
<code> } Bits;</code>		
<code> rsuint16 Data;</code>		
<code>} FreqCntStatusType;</code>		

8.3 FreqCntConnectionModeType

Description:	Defines the possible ways of connecting the frequency counter	
C-syntax:		
<code>typedef enum</code>		
<code>{</code>		
<code> FREQCNT_CONMODE_INTREF,</code>	Standard mode: the input signal is connected to the internal connector, the reference signal is obtained from the internal reference, and the reference signal is not routed out for external use.	
<code> FREQCNT_CONMODE_INTREFOUT,</code>	Standard mode with reference signal output : the input signal is connected to the internal connector, the reference signal is obtained from the internal reference, and the reference signal is routed to the external connector..	
<code> FREQCNT_CONMODE_EXTREF,</code>	External reference mode: the input signal is connected to the internal connector, the reference signal is obtained from the external connector.	
<code> FREQCNT_CONMODE_BYPASS,</code>	Bypass mode: the internal connector is connected to the external connector. Please note that the counter is not operational in this mode!	
<code> FREQCNT_CONMODE_COUNT</code>		
<code>} RENUM8 (FreqCntConnectionModeType);</code>		

8.4 FreqCntMeasureModeType

Description:	Defines the possible ways of measuring frequencies	
C-syntax:		
<code>typedef enum</code>		
<code>{</code>		
<code> FREQCNT_MEASUREMODE_NORMAL,</code>	Standard mode: a single measurement is made and the result is returned in the confirmation when the measurement has finished.	
<code> FREQCNT_MEASUREMODE_NOWAIT,</code>	The confirmation is returned immediately without a result. Then a single measurement is made and the result is returned in an FREQCNT_FREQUENCY_RESULT_IND indication.	
<code> FREQCNT_MEASUREMODE_FREERUN,</code>	The confirmation is returned immediately without a result. Then a measurement is made and the result is returned in an FREQCNT_FREQUENCY_RESULT_IND indication. When a measurement has finished a new one is started immediately.	
<code> FREQCNT_MEASUREMODE_FREERUN_STOP,</code>	End the FREERUN mode.	
<code> FREQCNT_MEASUREMODE_COUNT</code>		
<code>} RENUM8 (FreqCntMeasureModeType);</code>		

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8.5 FreqCntGatetype

Description:	Defines the possible gate times of the frequency counter	
C-syntax:		
<pre>typedef enum {</pre>		
FREQCNT_GATETIME_10MS,		Gate time = 10 ms.
FREQCNT_GATETIME_20MS,		Gate time = 20 ms.
FREQCNT_GATETIME_50MS,		Gate time = 50 ms.
FREQCNT_GATETIME_100MS,		Gate time = 100 ms.
FREQCNT_GATETIME_200MS,		Gate time = 200 ms.
FREQCNT_GATETIME_500MS,		Gate time = 500 ms.
FREQCNT_GATETIME_1S,		Gate time = 1000 ms.
FREQCNT_GATETIME_2S,		Gate time = 2000 ms.
FREQCNT_GATETIME_5S,		Gate time = 5000 ms.
FREQCNT_GATETIME_10S,		Gate time = 10000 ms.
FREQCNT_GATETIME_20S,		Gate time = 20000 ms.
FREQCNT_GATETIME_50S,		Gate time = 50000 ms.
FREQCNT_GATETIME_INFINITE,		Gate time is continuously open, i.e. counter mode. The counter may be read at any time. Setting this gate time also clears the counter.
FREQCNT_GATETIME_COUNT		
} RSENUM8 (FreqCntGateTimeType);		

8.6 FreqCntUserDataType


Description:	This type contains data transmitted to or from the EEPROM	
C-syntax:		
<pre>typedef struct FreqCntUserDataType { rsuint8 Data[16]; } FreqCntUserDataType;</pre>		

8.7 User data constants

Description:	User data size	
C-syntax:		
#define FREQCNT_USERDATA_SIZE 100		The number of bytes in the user data area
Description:	User data access flag	
C-syntax:		
#define FREQCNT_GLOBAL_DATA_FLAG 0x8000		For internal use only

8.8 FreqCntManufacturerInfoType

Description:	Frequency counter manufacturer information type	
C-syntax:		
<pre>typedef struct FreqCntManufacturerInfoType {</pre>		
Rtx2300DateType ProdDate;		The date of production
Rtx2300SerialNumberType MainboardSerial;		The mainboard serial number, 0 if not applicable
Rtx2300VersionNoType HwVersion;		The hardware version
Rtx2300VersionNoType TestVersion;		The test version
} FreqCntManufacturerInfoType;		

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