TPRO-PCI-U/TSAT-PCI-U
SYNCHRONIZABLE TIMECODE GENERATOR with UNIVERSAL PCI BUS INTERFACE

LabView Driver

Application Programmer's Guide

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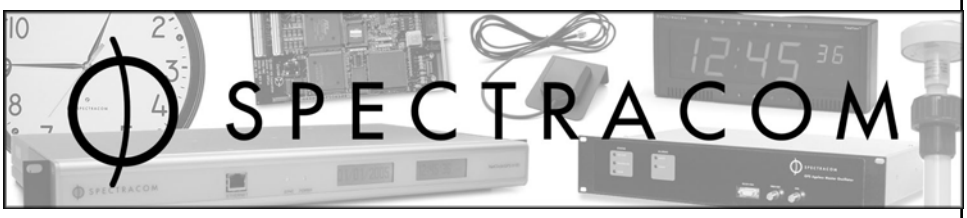

www.spectracomcorp.com
Part Number 1159-5006-0050
Manual Revision B
24 April 2009

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1 Overview

The LabView Driver for the Spectracom TPRO/TSAT PCI-U boards provides the interface for multiple users to access the board. The TPRO-PCI-U is a precision clock that automatically synchronizes to standardized time code signals or (for TSAT-PCI-U configuration) to the GPS satellite system and can be read from the host computer.

Inputs to the TPRO-PCI-U are modulated time code (or GPS receiver signals for TSAT-PCI-U), host commands, and time tags.

Outputs are modulated IRIG-B time code, programmable start/stop time, and a programmable "heartbeat" pulse rate.

The board also can generate interrupts on the PCI bus (if enabled). Interrupt sources include the heartbeat, time tag, FIFO data available, and/or at the programmable start time.

The clock will automatically synchronize to specified time code signals. A status bit advises the host of synchronization status. In the absence of Timecode input or GPS the board will start counting at 000 days, 00 hours, 00 minutes, 00 seconds at power-on. The clock time can also be set by user command.

2 Command Messages and Error Codes

2.1 The Command Message Catalog

A detailed description of the command messages follows. The description of each message is augmented with definitions of relevant data types and symbolic constants.

2.1.1 TPRO_Open

Field Name	Data Type	Description
Handle	INT*4	Pointer to handle. Defaults is 0.
Device Name	CHAR*10	Device name – trpopci0
Options	UINT*2	Pointer to options

Return:

Field Name	Description
Handle	Valid handle to TPRO –PCI card
Options	
Error Code	Refer appendix

2.1.2 TPRO_Close

Field Name	Data Type	Description
Handle	INT*4	TPRO- PCI handle.

Return:

Field Name	Description
Error Code	Refer appendix

2.1.3 TPRO_GetAltitude

Field Name	Data Type	Description
Handle	INT*4	TPRO- PCI handle.
Meters	IEEE*4	Pointer to Meters

Return:

Field Name	Description
Handle	Valid handle to TPRO –PCI card
Meters	
Error Code	Refer appendix

2.1.4 TPRO-GetDate

Field Name	Data Type	Description
Handle	INT*4	TPRO- PCI handle.
Year	UINT*2	Pointer to Year
Month	UCHAR*1	Pointer to Month
Day	UCHAR*1	Pointer to Day

Return:

Field Name	Description
Handle	Valid handle to TPRO –PCI card
Year	
Month	
Day	
Error Code	Refer appendix

2.1.5 TPRO_GetDriver

Field Name	Data Type	Description
Handle	INT*4	TPRO- PCI handle.
Driver	CHAR*x	Driver Name
END OF MSG		

Return:

Field Name	Description
Handle	Valid handle to TPRO –PCI card
Error Code	Refer appendix

2.1.6 TPRO_GETFIRMWARE

Field Name	Data Type	Description
Handle	INT*4	TPRO- PCI handle.
Firmware	CHAR*x	Firmware Name

Return:

Field Name	Description
Handle	Valid handle to TPRO –PCI card
Error Code	Refer appendix

2.1.7 TPRO_GETFPGA

Field Name	Data Type	Description
Handle	INT*4	TPRO- PCI handle.
FPGA	CHAR*x	FPGA Name

Return:

Field Name	Description
Handle	Valid handle to TPRO –PCI card
Error Code	Refer appendix

2.1.8 TPRO_GETLATITUDE

Field Name	Data Type	Description
Handle	INT*4	TPRO- PCI handle.
Degrees	UINT*2	Pointer to Degrees
Minutes	IEEE*4	Pointer to Minutes.

Return:

Field Name	Description
Handle	Valid handle to TPRO –PCI card
Degrees	
Minutes	
Error Code	Refer appendix

2.1.9 TPRO_GETLONGITUDE

Field Name	Data Type	Description
Handle	INT*4	TPRO- PCI handle.
Degrees	UINT*2	Pointer to Degrees
Minutes	IEEE*4	Pointer to Minutes

Return:

Field Name	Description
Handle	Valid handle to TPRO –PCI card
Degrees	
Minutes	
Error Code	Refer appendix

2.1.10 TPRO_GETSATINFO

Field Name	Data Type	Description
Handle	INT*4	TPRO- PCI handle.
SatsTracked	UCHAR*1	Pointer to SatsTracked
SatsView	UCHAR*1	Pointer to SatsView

Return:

Field Name	Description
Handle	Valid handle to TPRO –PCI card
SatsTracked	
SatsView	
Error Code	Refer appendix

2.1.11 TPRO_GETTIME

Field Name	Data Type	Description
Handle	INT*4	TPRO- PCI handle.
Seconds	IEEE*8	Pointer to Seconds
Minutes	UCHAR*1	Pointer to Minutes
Hours	UCHAR*1	Pointer to Hours
Days	UCHAR*1	Pointer to Days

Return:

Field Name	Description
Handle	Valid handle to TPRO –PCI card
Seconds	
Minutes	
Hours	
Days	
Error Code	Refer appendix

2.1.12 TPRO_RESETFIRMWARE

Field Name	Data Type	Description
Handle	INT*4	TPRO- PCI handle.

Return:

Field Name	Description
Handle	Valid handle to TPRO –PCI card
Error Code	Refer appendix

2.1.13 TPRO_SETHEARTBEAT

Field Name	Data Type	Description
Handle	INT*4	TPRO- PCI handle.
Signal Type	UCHAR*1	Signal type value
Output Type	UCHAR*1	Output type value
ClockFreq	UCHAR*1	ClockFreq value
Frequency	IEEE*8	Frequency value

Return:

Field Name	Description
Handle	Valid handle to TPRO –PCI card
Error Code	Refer appendix

2.1.14 TPRO_SETMATCHTIME

Field Name	Data Type	Description
Handle	INT*4	TPRO- PCI handle.
Match Type	UCHAR*1	Match Type value
Seconds	IEEE*8	Seconds value
Minutes	UCHAR*1	Minutes value

Return:

Field Name	Description
Handle	Valid handle to TPRO –PCI card
Error Code	Refer appendix

2.1.15 TPRO_SETOSCILLATOR

Field Name	Data Type	Description
Handle	INT*4	TPRO- PCI handle.
Frequency	UCHAR*1	Pointer to Frequency

Return:

Field Name	Description
Handle	Valid handle to TPRO –PCI card
Frequency	
Error Code	Refer appendix

2.1.16 TPRO_SETPROPDELAYCORR

Field Name	Data Type	Description
Handle	INT*4	TPRO- PCI handle.
Us	INT*4	Pointer to Us

Return:

Field Name	Description
Handle	Valid handle to TPRO –PCI card
Us	
Error Code	Refer appendix

2.1.17 TPRO_SETTIME

Field Name	Data Type	Description
Handle	INT*4	TPRO- PCI handle.
Seconds	UCHAR*1	Seconds value
Minutes	UCHAR*1	Minutes Value
Hours	UCHAR*1	Hours Value
Days	UINT*2	Days Value

Return:

Field Name	Description
Handle	Valid handle to TPRO –PCI card
Error Code	Refer appendix

2.1.18 TPRO_SETYEAR

Field Name	Data Type	Description
Handle	INT*4	TPRO- PCI handle.
Year	UINT*2	Year value

Return:

Field Name	Description
Handle	Valid handle to TPRO –PCI card
Error Code	Refer appendix

2.1.19 TPRO_SIMEVENT

Field Name	Data Type	Description
Handle	INT*4	TPRO- PCI handle.

Return:

Field Name	Description
Handle	Valid handle to TPRO –PCI card
Error Code	Refer appendix

2.1.20 TPRO_SYNCHCONTROL

Field Name	Data Type	Description
Handle	INT*4	TPRO- PCI handle.
Enbp	UCHAR*1	Pointer to Enbp

Return:

Field Name	Description
Handle	Valid handle to TPRO –PCI card
Enbp	
Error Code	Refer appendix

2.1.21 TPRO_SYNCHSTATUS

Field Name	Data Type	Description
Handle	INT*4	TPRO- PCI handle.
Status	UCHAR*1	Pointer to Status

Return:

Field Name	Description
Handle	Valid handle to TPRO –PCI card
Status	
Error Code	Refer appendix

2.1.22 TPRO_WAITEVENT

Field Name	Data Type	Description
Handle	INT*4	TPRO- PCI handle.
Seconds	IEEE*8	Pointer to Seconds
Minutes	UCHAR*1	Pointer to Minutes
Hours	UCHAR*1	Pointer to Hours
Days	UINT*2	Pointer to Days
Year	UINT*2	Pointer to Year
Month	UCHAR*1	Pointer to Month
Day	UCHAR*1	Pointer to Day
Ticks	UINT*4	Ticks value

Return:

Field Name	Description
Handle	Valid handle to TPRO –PCI card
Seconds	
Minutes	
Hours	
Days	
Year	
Month	
Day	
Error Code	Refer appendix

2.1.23 TPRO_WAITHEARTBEAT

Field Name	Data Type	Description
Handle	INT*4	TPRO- PCI handle.
Ticks	UINT*4	Ticks value

Return:

Field Name	Description
Handle	Valid handle to TPRO –PCI card
Error Code	Refer appendix

2.1.24 TPRO_WAITMATCH

Field Name	Data Type	Description
Handle	INT*4	TPRO- PCI handle.
Ticks	UINT*4	Ticks value

Return:

Field Name	Description
Handle	Valid handle to TPRO –PCI card
Error Code	Refer appendix

2.2 Error Codes

Error Code	Error Description
1	Error creating handle to device
2	Error creating device object
3	Error closing device handle
4	Tpro device was not opened
5	Function is not available for board type
6	Invalid frequency
7	Invalid year parameter
8	Invalid day parameter
9	Invalid hour parameter
10	Invalid minute parameter
11	Invalid seconds parameter
12	Invalid delay factor
13	Device timed out
14	Error communicating with driver

REVISION HISTORY

Revision Level	*ECN Number*	*Description*
A	**2187**	First draft of Spectracom documentation for this product.
B	**2332**	Minor corrections.

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