

Version 1.16.2 – November 2022

Abstract

This application note describes the hardware changes and improvements of the Revision 2.3 of the syn1588® PCIe NIC to the previous version of the device. As well as the respective updates in the user interface.

Introduction

Compatibility

The Revision 2.3 of the syn1588® PCIe NIC is functionally fully compatible with its predecessor Revision 2.1. It will require the latest version 1.16 (or newer) of the syn1588® Software Suite.

Why a new hardware revision?

Since more than two years, the entire electronic industry has been suffering from a severe component shortage resulting in excessively high lead times, affecting semiconductors, discrete components and mechanical parts alike. To make matters worse, several manufacturers have discontinued a number of key components. More often than not they did not even offer last time buy options for existing customers. In order to provide the syn1588® PCIe NIC to our customers Oregano Systems had to adapt to this crisis quickly. We replaced components which were not available, while at the same time further improving the procurement as well as the manufacturing process itself.

Hardware Changes

New power supply

Since Intel obsoleted the whole Enpirion power device family without offering a last time buy options we had introduce new power supply devices. While this step naturally affects the whole design of the syn1588® PCIe NIC it does not affect the functionality of the card in the least.

New PCI Manufacturer and Device ID

Starting with Revision 2.3 of the syn1588® PCIe NIC we are using the PCI Manufacturer ID of our parent company "Meinberg Funkuhren". By changing the PCI configuration we ensure that older existing PCI drivers will not accept this card, using the new driver software is thus structurally enforced.

Revision 2.3 of the syn1588® PCIe NIC will require a new driver (version 2.16 or newer) which will also fully support the previous Revision 2.1 cards.

SFP network interface

The Revision 2.3 of the syn1588[®] PCIe NIC offers a unified SFP type network interface. The available ordering options of the syn1588[®] PCIe NIC allows customer to choose between fiber short range, fiber long range and standard copper SFP transceiver modules. Please check the Application Note AN002 for further details.

Jitter Cleaner PLL

Again motivated by the poor availability and excessive lead time we replaced the on-board Jitter Cleaner PLL for the Revision 2.3 of our syn1588[®] PCIe NIC. Instead of the SiLabs PLL device we used in the past, now we are relying on the SiTime PLL device SiT95147. As part of this change the complete clock distribution architecture of the card had been optimized. As a consequence, the overall clock synchronization performance could be improved significantly.

Software

syn1588[®] Software Suite


The syn1588[®] Software Suite version 1.16 or newer is required for the Revision 2.3 of the syn1588[®] PCIe NIC. This version offers full backward compatibility to the existing Revision 2.1 of our syn1588[®] PCIe NIC.

In a first step, operating system support will be limited to Linux. The Windows driver suite is currently in the final stages of beta testing and will be released very shortly. Please check the OS support document of the syn1588[®] Software Suite for all details.

User-defined PLL functions

By changing the on-board PLL device all user-defined PLL software functions (e.g. the “frequency” command in the syn1588 and ptpmmm utilities or the fSync utility when using the ExtClk option) needed to be adapted accordingly. With the base release 1.16 of the syn1588[®] software suite the external jitter cleaner PLL will not be user programmable. This support will be added either with an update of the release 1.16 or with the next release 1.17. The ExtClk option using an external 10 MHz clock is available by default without using the fSync utility; simply connect the appropriate external clock to connector X8.

It is ensured by the syn1588[®] software suite that both the old Revision 2.1 and the new Revision 2.3 of our syn1588[®] PCIe NIC are configured correctly.

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