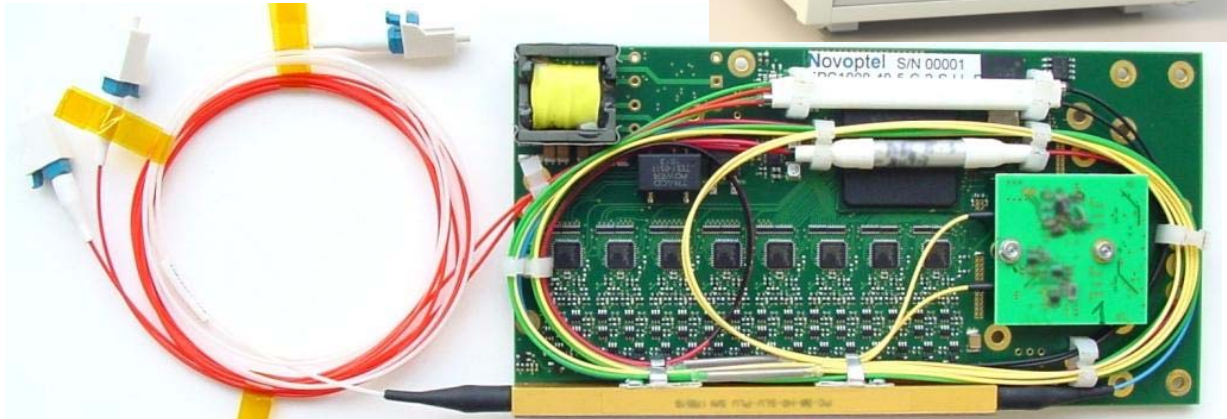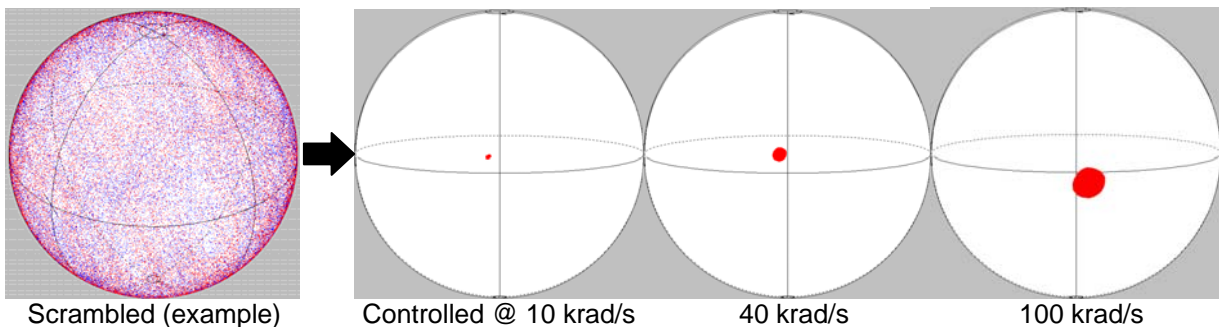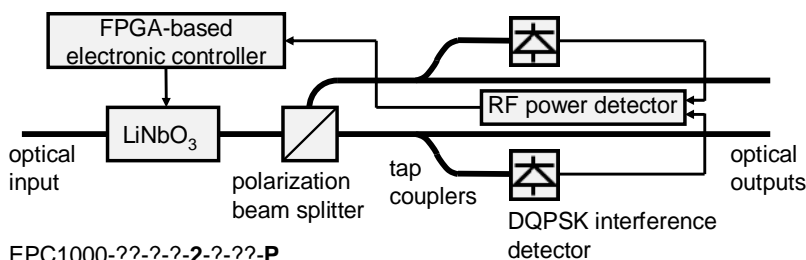# Novoptel

www.novoptel.com

EPC1000 Polarization Controller/Demultiplexer

- **Guaranteed endless tracking (control) speed: 40**, **60** or **100 krad/s** on Poincaré sphere
- To our knowledge, **Novoptel's endless polarization tracking speed is at least 100 times as high as that of competitor products.** If you are aware of something better then please inform us so that we can correct this statement.
- Extremly reliable: More than **350 Gigarad** were tracked in several extended tests.

Scrambled (example)   Controlled @ 10 krad/s   40 krad/s   100 krad/s

- **Single (CW)** or **dual (DQPSK, QAM; also: DPSK, duobinary, ASK) polarization tracking**
- Wavelength range: **C band**, **extensible to L band**; also possible: S band, 1310 nm, ...
- Temperature range: **-10°C to +70°C**; extension is possible.
- Power consumption: About **5 W** from single **+5 V** source. Compatible with the needs of 40 Gb/s, 100 GbE, 2x100 GbE, 4x100 GbE and other transponders. Can be further reduced.
- Interfaces for external controller or computer: **Software commands (SPI)**, **digital hardware lines**.
- Functionality: **Channel swapping** (to exchange demultiplexed polarization channels, may for example be activated by a framer/mapper), **reset**, **control** (on/off), modification of important parameters (**control gain** and **speed**, **dither amplitude**, **delay time** of supplied error signal)
- **In-field upgradable firmware** and **remote access** possibility for diagnosis and troubleshooting
- **Desktop units (with USB and GUI)**, **plug-in module cards**, **IP cores. Various configurations.**
- Options: User-supplied error signal, **arbitrary and endlessly variable output polarization**, ...
- EPX1000 = cost-saving desktop unit with combined functionalities of EPC1000 and 10 Mrad/s polarization scrambler/transformer EPS1000
- Contact us for data sheet or special needs.
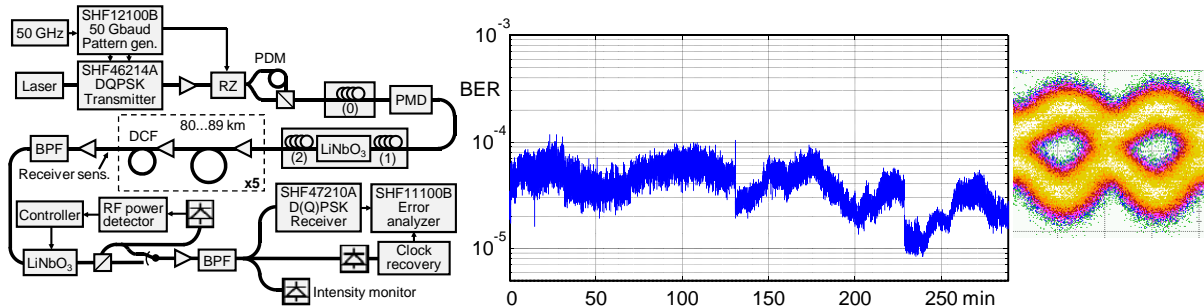

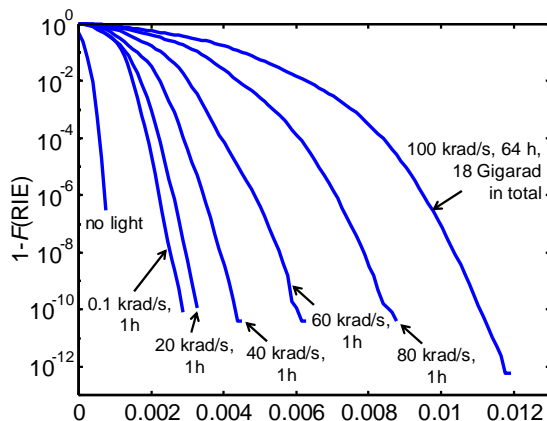EPC1000-??-?-?-**2**-?-??-**P**

Configuration example:

EPC1000 with interference detection for **demultiplexing of polarization-multiplexed DQPSK or QAM signals**. Everything is mounted on controller card (see above).

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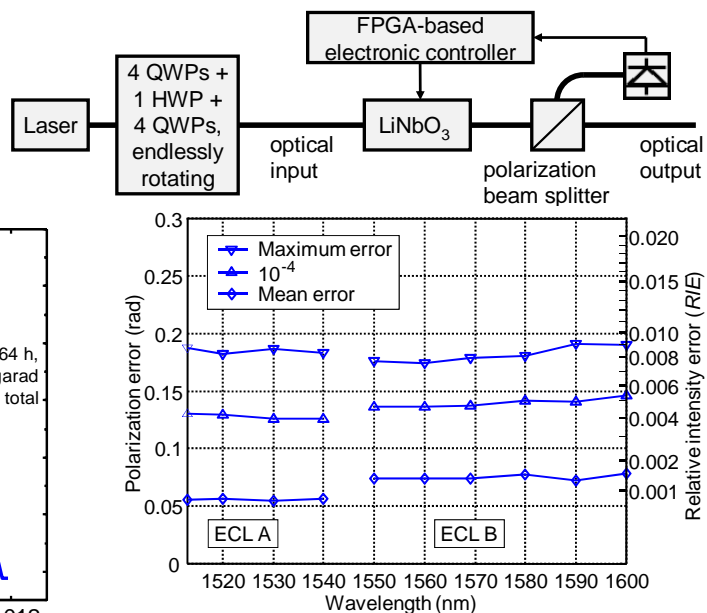04.03.2014

Results obtained with Novoptel EPC1000

World's highest symbol rate in polarization-agile realtime transmission with 4 bit/symbol: 200 Gb/s, 50 Gsymbols/s, 430 km polarization-multiplexed DQPSK transmission with 40 krad/s polarization tracking (IEEE PTL 22(2010)9, pp. 613-615)

World's fastest endless optical polarization control: 100 krad/s on Poincaré sphere tracked over 64 h (Electron. Lett., Vol. 47, No. 14, 2011, pp. 813-814)

Complementary distribution function $1-F(RIE)$ of relative intensity error (RIE) for 1 hour at 0.1, 20, 40, 60, 80 krad/s, and for 64 hours at 100 krad/s scrambling speed (18 Gigarad in total). The zero point ($RIE = 0$) is determined without light.

Relative intensity error (RIE) and polarization errors which are surpassed only with the given probability, as a function of wavelength for 30-minute measurements at 50 krad/s scrambling speed.

About Novoptel GmbH

Novoptel GmbH in Paderborn, Germany, was incorporated by Prof. Dr.-Ing. Reinhold Noé and Dr.-Ing. Benjamin Koch in 2010 as a spin-off of the University of Paderborn, with the aim of developing and delivering **nov**el **opt**ics and **el**ectronics for **tel**ecommunication. Leveraging 2+ decades of pioneer experience in optical polarization control as well as knowledge about the needs of the telecom industry, the two founders and the team have brought this technology to an unprecedented maturity and have developed desktop units, modules and intellectual property cores for ultrafast optical endless polarization control. These control a LiNbO$_3$ integrated electrooptic polarization transformer.

- Novoptel has developed products, counts on growth from own resources and will not promise anything it can not hold.
- We have steped onto the marketplace only after the technical challenges and problems were solved. This has taken years; it is even correct to say 20+ years. But we believe that it is verifiable technical performance, proven reliabilty, and experience, combined with a competitive cost structure, which will succeed, not claims, publicity or headcount.
- Enthusiastic customer feedback shows that we are on the right track. Yet we are always willing to learn.

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