

# SYNCRO



## Universal Platform for Locking Applications

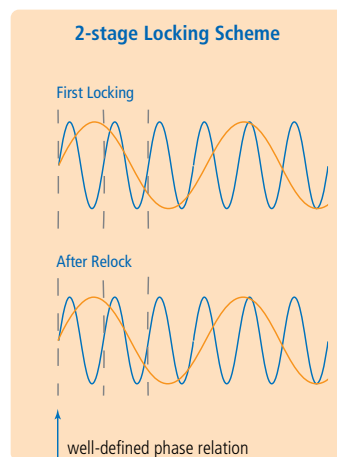
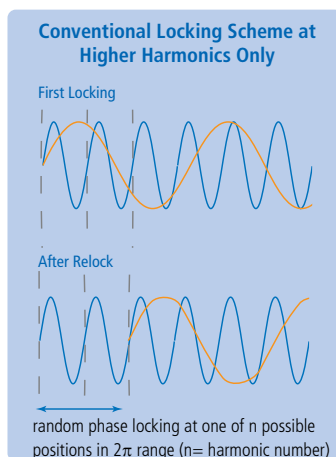


The modular design of the new locking electronics allows us to configure the phase lock loop for various locking tasks. Developed to serve in our optical frequency comb systems for repetition rate and offset frequency stabilization, it can be used to phase lock various external devices, such as lasers, cavities or fiber-links, in today's most demanding experiments.

### FEATURES

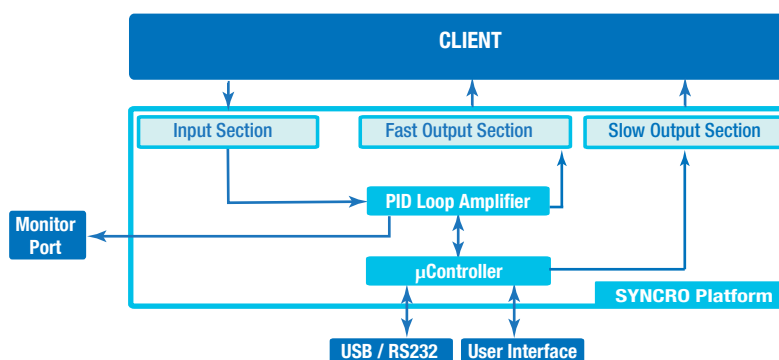
- Full Automation
- Proportional Bandwidth >1.0 MHz (-3 dB) (Typ. 1.3 MHz; Effective Bandwidth Depends on other Components in the Complete Control Loop)
- User-Friendly Operation
- Front Panel Touch Screen or Remote Control with PC (RS232 or USB)
- Track Function: Slow Integrator Ensures Stable Long Term Operation By Coarse Adjustment of Operating Parameters to Compensate Drifts Due to Change of Ambient Conditions

### 2-STAGE LOCKING SCHEME



The phase relation is defined through the fundamental lock. Locking is done at higher harmonics for superior phase sensitivity.

### GENERIC SYSTEM SCHEME



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### RRE-SYNCRO

phase locks the repetition rate of a pulsed laser to a radio frequency reference, derived from a radio frequency clock. Alternatively, the SYNCRO-RRE can be configured for locking to an optical reference clock: a beat signal detection unit between the laser and the optical reference provides the input signal, and a preamplifier and a digital phase detector is used in the input section of the electronics.

### LLE-SYNCRO

phase locks the frequency of a CW laser to a stabilized mode of an optical frequency comb system. Depending on the type of the CW laser, the fast and slow output sections of the electronics can be configured to provide the right control signal requested by the CW laser, e.g. piezo drive for the fast and temperature control for the slow feedback.

### XPS800-E

is the complete electronics part of the XPS800 Femtosecond Phase Stabilization Unit for the stabilization of the phase relation between carrier and envelope of the pulses emitted from a femtosecond laser. Besides the SYNCRO-based locking electronics, the package includes detectors, RF-Spectrum analyzer and oscilloscope, and AOM and driver. The stabilization is based on the frequency comb technology.

### FLS

for distribution of stable optical timing signals, stabilizes the length of the fiber-optic link. The Fiber-Link Stabilization unit comes complete with an attosecond precision phase detector, actuators and locking electronics.

