INFOCO CU

Control Unit for INFOCO Tx or Rx

A compact, multi-function controller with user-friendly software that easily interfaces to the INFOCO Tx or Rx module

Key Features & Benefits

Electronics

- Selectable inputs: optical (through FC/APC or FC/UPC connector) or electrical analog (through BNC connector)

- Two analog outputs (*x*- and *y*-channel control signals) with amplitude range ±70 V and frequency bandwidth 0–10 kHz

- Advanced stochastic parallel gradient descent (SPGD[+]) control algorithm embedded on ARM7TDMI® 32-bit processor with controllable iteration rate up to 10,000 iterations per second with high-voltage output

- Full remote control through 10/100Base-TX Ethernet Interface

- Hardware & software flexibility for various applications

- Open architecture allowing for firmware upgrade of INFOCO CU modules

- Power requirements: AC 100–240 V, < 15 W, 50/60 Hz

Software

- Graphical interface for end-user operation

- Input signal time-history display

- Manual setting of the output voltages, provides controllable fiber tip displacement for the INFOCO Tx or Rx module

- Controllable *x* and *y* scanning of output voltages, provides the output beam steering for the INFOCO Tx and focal spot imaging for the INFOCO Rx

- Computation and generation of control signals optimizing input signal (maximizing or minimizing) in a feedback control system architecture

- Computer requirements: PC (Windows XP or later) or Mac

- Network requirements: Ethernet TCP/IP connection between a computer and the INFOCO CU

With the Optonicus' intelligent fiber-optics collimator receiver & free-space fiber coupler (INFOCO Rx), the INFOCO control unit (CU) provides focal spot profiling and centroid sensing, adaptive free-space coupling of input light into a fiber with optimization and assessment of the coupling efficiency, fast measurements of the input optical wave arrival angles and focal spot sharpness.

With the Optonicus' intelligent fiber-optics collimator transmitter (INFOCO Tx), the INFOCO CU provides fine and rapid laser beam pointing and steering, compensation of mechanical and/or acoustical jitter and adaptive mitigation of random wavefront tip and tilt aberrations of the outgoing optical beam.
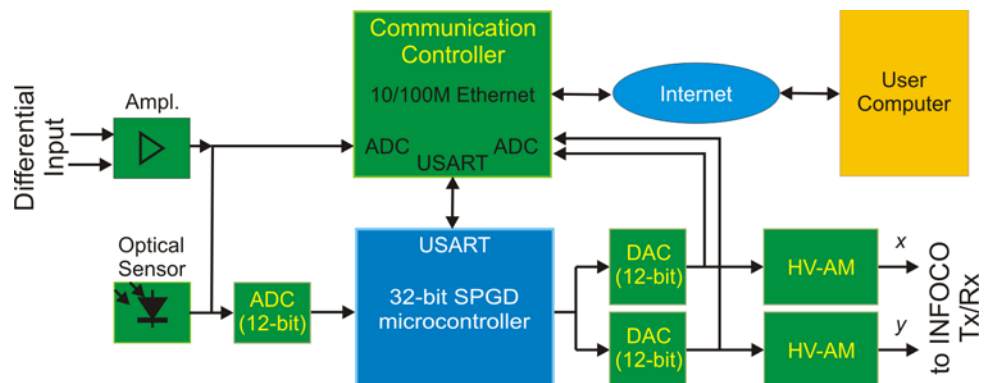
The INFOCO CU is an intelligent controller based on the latest microprocessor technology. The INFOCO CU receives either an optical or electrical input signal that is sent into a 12-bit analog-to-digital converter (ADC) and further to the 32-bit microcontroller running the proprietary advanced stochastic parallel gradient descent (SPGD[+]) control algorithm.

The main SPGD[+] controller computes in parallel two digital outputs that are sent to 12-bit digital-to-analog converters (DAC), supplying *x* and *y* analog signals to either the high-voltage amplifiers (HV-AM) or the low-voltage amplifiers (LV-AM). The output signals of the low-voltage amplifiers with amplitude range ±2.5 V or the output signals of the high-voltage amplifiers with amplitude range ±70 V provide controls that are supplied to the INFOCO Tx or Rx. In addition, a communication controller provides the interface through a local area network (LAN) between the user's computer and the INFOCO CU, sending and receiving commands and system data.