

Últimos artículos publicados

Journal: Sensors and Actuators A: Physical,

Paper: Lateral polishing of bends in plastic optical fibres applied to a multipoint liquid-level measurement sensor

AUTHORS: M. Lomer, J. Arrue, C. Jauregui, P. Aiestaran, J. Zubia and J.M. LÃ³pez-Higuera

Abstract:

A new liquid-level sensor with a multipoint layout is presented, which is based on power loss arising in laterally-polished bent sections prepared along a plastic optical fibre. The polishing is applied to the fibre surface on top of several U-shaped bends until part of the core is also removed. The resultant bare flat area on the core is an elliptic surface in direct contact with the medium surrounding the fibre. Any variation in the optical and geometric parameters characterising our multimode fibre is analysed, since it will cause changes in the propagation of light along the polished bends. Experimental results included in the paper correspond to the prototype for our sensor, which consists of eight sensing probes placed sequentially along the fibre, in combination with an optoelectronic unit working as a liquid-level transducer. The results show that it is possible to measure several parameters simultaneously and at a low cost.

Journal: Measurement Science & Technology

Paper: Quasi-distributed level sensor based on bent side-polished plastic optical fibre cable

AUTHORS: M. Lomer, , A. Quintela, M. LÃ³pez-Amo, J. Zubia, and J.M. LÃ³pez-Higuera

Abstract:

A level and flexible quasi-distributed liquid sensor based on the changes in the light transmittance in a plastic optical fibre (POF) cable is proposed. The measurement points are constituted by small areas created by side-polishing on a curved fibre and the removal of a portion of the core. These points are distributed on each full-turn of a spire of fibre built on a cylindrical tube vertically positioned in a tank. The changes between the refractive indices of air and liquid generate a signal power proportional to the position and level of the liquid. The sensor system has been successfully demonstrated in the laboratory, and experimental results of two prototypes with 15 and 18 measurement points and with bend radius of 5mm and 8mm are presented.