For subsea trees

The SSI series of LVDT (linear variable differential transformer) linear position sensors from Macro Sensors comply now with the CiA 443 CANopen profile for use on subsea trees.

(Photo: Macro Sensors)

THE COMPANY NOW OFFERS ITS SSI SERIES with the CiA 443 CANopen communication interface mandated for use on subsea trees (a.k.a. christmas trees) used in offshore oil drilling. The term “christmas tree” refers to the assembly of valves, sensors, and controllers and other equipment placed over a wellhead, which, in formation, resembles a decorated tree. Its function is to prevent oil or gas release from an oil well, while controlling flow rates to maintain steady production levels.

Valves on the christmas tree are used to open and close oil pipes as they bring oil from the sea bed. The function of Macro Sensors Submersible LVDT is to provide feedback on valves in monitoring and controlling their status as part of a subsea control module. Failure to completely close a valve could result in an environmental disaster. Located on the ocean floor in depths up to several hundred meters, the LVDT sensor and other prescribed “Level 2” components installed on the “christmas tree” are connected to offshore platforms by means of CAN networks. In the past, sensors and other equipment were connected by EIA 485 serial links that proved unreliable.

To improve operability and standardize communications between devices among different manufacturers on subsea trees, the SIIS (Subsea Instrument Interface Standardization group) and CiA (CAN in Automation) Association jointly developed a communication interface – the CiA 443 CANopen profile. The CANopen network links SIIS level-2 devices to a subsea control system, which communicates via CiA 443.

In addition to complying with the CiA 443 CANopen regulation, Macro Sensors encases its SSI series in Inconel 625 to withstand deepsea environments with pressures up to 5000 psi. Due to a higher content of nickel, chromium, and molybdenum, the Inconel offers protection against corrosion. According to the company, the Inconel enhances the reliability of the LVDT assembly, ensuring that it can meet service life requirements of at least 20 years, even if fully exposed to seawater. Reliability is critically important due to the cost of replacing subsea hardware.