

## **Operational Description**

The Aantel PAT700 on-line TOC analyzer Onboard Automated Standards Introduction System (OASIS™) employs Radio Frequency Identification (RFID) technology, a registered radio frequency device. The RFID system in the PAT700 operates over a very short distance to eliminate any interference with other wireless communications.

The term RFID describes a system that transmits data wirelessly, using radio waves, over a very short distance. An RFID system is comprised of a “tag” and a “reader/writer”. In the PAT700 analyzer, the tag is attached to the standards bottles used in calibrations (conductivity and TOC), validations, and system suitability tests. The RFID tag consists of a microchip attached to a radio antenna mounted on a substrate. The RFID tag is attached to the bottom of the standards bottle. The microchip contains data about the standard contained in the bottle. The PAT700 OASIS system contains four RFID reader/writers permanently mounted inside the analyzer that align with the bottle RFID tags when the bottles are fully loaded in the analyzer. The reader/writer retrieves the data stored on the RFID tags located on the bottom of the standards bottles. The RFID reader/writers have antennas that emit radio waves and receive signals back from the tags on the standards bottles. The information provided from the tag includes the identity of the standard, the standard’s concentration, date of expiration and other pertinent data.

The reader/writer takes the data received from the tag and passes the information in digital form to the PAT700 processor. The RFID system in the PAT700 can read and write to the RFID tags attached to the standards bottle. The writing feature allows the PAT700 to write data to the bottles showing that the bottle has been used and provides for writing of data for the exclusive excursion sampling feature.

The RFID system in the PAT700 does not require any user intervention to operate. The system operates automatically when bottle tests are performed. The system automatically turns on and off to read and write data only when necessary. When enabled, the radio frequency modulation emitted from the antennas is fixed at 13.56 Mhz. There are no user serviceable parts associated with the RFID system. The RFID reader/writer board assembly should only be serviced by a Hach Ultra certified service representative. Since the RFID labels on the standards bottles contain the data necessary for each standard, the labels must not be removed from the bottle. Without the label, the RFID reader/writer has no data to read and will not operate as intended.

The PAT700 utilizes RFID technology as an integral part of its system. This RFID system allows the ability to read and write information to four individual bottles containing calibrated reagent fluids. These bottles also contain transponders directly mounted to their bottom surfaces. To complete the RFID system, Diamond contains an RFID circuit board with four 1- inch diameter antennas. When enabled, the radio frequency modulation emitted from these antennas is fixed at 13.56MHz.