Sonardyne has developed the Subsea Monitoring, Analysis and Reporting Transponder (SMART) to cover a range of advanced subsea asset monitoring applications. Part of Sonardyne’s Sixth Generation (6G®) product range, SMART builds on a rich heritage of acoustic positioning and communication systems.

SMART brings together low power electronics, long duration data logging, subsea data processing and acoustic telemetry into a single, easily deployed instrument. SMART has the flexibility to interface with a wide range of internal and external sensors and other data sources, utilising standard or bespoke data analysis algorithms to provide the key data that operators need, when they want it.

Applications – Limited only by imagination
The advanced capability offered by SMART enables it to be used as either a primary or backup monitoring system for a variety of tasks such as monitoring of subsea structures, well-heads and risers. The system can also be configured for mooring line monitoring and pipeline monitoring, both for commissioning and longer term. In fact, with its ability to interface to most data sources, SMART can be used just about anywhere you need access to information on the performance or condition of subsea assets.

Flexible data acquisition
SMART includes digital and analogue inputs which can be configured to connect to multiple data sources. Internal sensors are available for motion measurement including; accelerometers, angular rate sensors and inclinometers, along with standard and high precision pressure and temperature sensors. External sensors that can be interfaced include; pressure sensors, strain gauges and Acoustic Doppler Current Profilers. For more bespoke applications, custom interfaces can be created to link to instruments from corrosion monitors to vibration measurement tools.

SMART at a glance
- Digital and analogue interfaces to internal and external sensors and instruments
- Data logging with secure storage
- Subsea data processing and analysis for identifying critical data
- Advanced acoustic telemetry
- Ethernet connection for high speed download – on deck or via BlueComm
- Standard and bespoke software options
- Highly configurable for all environmental conditions and operating water depths
Data logging and processing
A low power data logger is a key ingredient of SMART, enabling data received from external and internal sources to be securely archived. Where SMART goes beyond existing products, is in its ability to process raw data subsea to provide value added functions.

The Advanced Data Acquisition and Processing System (ADAPS), which is the heart of SMART, has a highly capable processor which can run sophisticated user specified algorithms, as well as simple data analyses such as Min/Max/ Mean statistics and thresholding for alarms and critical event reporting. By reducing high bandwidth sensor data to small, critical packets, SMART enhances users’ knowledge of the subsea world. By efficiently managing power consumption, long deployment times can be achieved from the internal battery pack.

In addition, where surface analysis of the telemetered data requires a more thorough review of sensor parameters, SMART enables acoustic recovery of raw data from specified time ranges. Alternatively, SMART can be coupled via an Ethernet connection to BlueComm (Sonardyne’s high bandwidth through-water optical communication link), enabling larger quantities of data to be ‘harvested’ from an ROV or AUV. All logged data can be downloaded from safe storage via Ethernet when the unit is recovered.

Advanced acoustic telemetry
SMART shares its acoustic telemetry module and transducer technology with the award winning Compat 6. Operating in the Medium Frequency (MF) band, there are options for omni-directional and directional transducers with high output powers for use in deep water and in challenging acoustic environments. Utilising Sonardyne Wideband 2 advanced spread spectrum coding, SMART can transmit acoustic data at rates up to 9,000 bps to Sonardyne’s existing range of topside transceivers.

Wideband 2 offers mitigation from multipath in shallow water and amongst steel structures in deep water. In the most challenging applications, SMART can be used with additional relay transponders to ensure that there is always a clear acoustic path to surface equipment for reliable transmission of critical data.

Standard or customised software – Meeting users’ needs
The software to run SMART is fully configurable and can run either on a Sonardyne ruggedised PC interfaced directly with the chosen topside transceiver, or on a third party computer connected via a Sonardyne Surface Interface Unit (SIU). Users can choose to run standard software which provides acoustic link configuration, diagnostics and a command interface to the SMART, with data passed on to third party software. This option is attractive if analysis and display software is already available for the application, or where the SMART is providing a wireless backup to a cabled system. Alternatively, Sonardyne’s software development team can build on the standard platform to provide users with software that meets their requirements for managing and displaying data, with the level of automation being specified by the customer.

Flexible options – Tailored to fit
The essence of SMART is flexibility and configurability. The ability to connect to different sensors and data sources is an integral part of the SMART product line. However, options do not stop there. Being based on the established Compat 6 form factor, SMART is available in a range of materials from Aluminium through Aluminium Bronze to Super Duplex Stainless Steel for the highest corrosion resistance. Other options include longer ‘maxi’ housings for increased battery capacity, connector types and, if required, additional functions including acoustic positioning can be added to the monitoring system. SMART offers users the most flexible subsea data analysis and acoustic communications facility in the marketplace.