



PMAC Inspection offer a complete Offshore CP Inspection service to ensure the integrity of pipelines and structures. This service is based on proven technology with further developed hardware and software to meet industry and legislative requirements and experienced engineers.

Ensuring the integrity of oil and gas pipelines and structures requires specialist monitoring with sophisticated hardware and software. This is an area where PMAC have invested heavily, offering the industry proprietary technology with enhanced data acquisition and management software to meet these demands. The PMAC Acquisition software, used in conjunction with PMAC's processing software and CP experience, offers a choice of data reporting and interpretation methods, to meet the specific requirements of the client.

Regulatory authorities require constant evaluation/auditing of CP systems to ensure structural integrity. CP Surveys allow a system's ability to resist/avoid corrosion to be monitored, and any corrosion issues to be remedied before the onset of major failure. PMAC also manage an extensive database of historical data which can be used to monitor CP trends to identify areas on interest throughout the design life of CP systems. Based on the use of the Twin Cells (TC) probe technique, the system gives real time data measurement for both subsea pipelines and structures. Continuous CP and field gradient (FG) readings can be logged simultaneously, so PMAC are able to determine the anode current output and calculate the remaining life of installed anode systems. The PMAC Subsea Digitiser utilises the latest technology adding increased reliability. With selectable multiple outputs of RS232 and RS485, and configurable baud rates, the bottle meets most operational requirements. The electronic housing and choice of power supply options allow the electronics bottle to be mounted on all ROVs, or even on deck (topside) if necessary.

The system is controlled by a proprietary Software system allowing the user to measure, store and report in an integrated package. Advanced connectivity options allow gathered data to be freely passed from the PMAC Systems PC to any other onboard system, such as the survey package or video overlay.

The reporting package uses innovative methods to reduce processing times and hence reduce reporting delivery times, making onboard data processing a real alternative to onshore reporting.

In addition to the TC system PMAC also offers Trailing Wire surveys for instances where pipelines are buried or lack contact points and Single Cell contact only surveys and equipment.

Data is measured by the subsea digitizer at a rate of approx. 2Hz i.e 2 samples per second. As a default it is recorded at the same rate as it is generated but may be adjusted to log at rates of between 100ms to 5000ms if so desired. System electronics are calibrated to record at a resolution of;
Contact and Proximity CP - 1mV, Contact and Proximity FG - 1µV/cm

Twin (TC) Cell Probe

Compact and robust design incorporating two half-cells to monitor continuous cathodic potential and field gradient values. Replaceable inconel tip for contact readings. Wetcon connector for connection to subsea digitiser or ROV.

Cathodic Potential (CP) (vs. Ag/AgCl, or Zn reference cells), Electrical Field Gradient (EFG or FG in uV/cm), Anode current (mA or Amp) measurements calculated.

UK Office: PMAC House, Greenhole Park, Greenhole Place, Aberdeen, UK AB23 8EU
Tel: +44 (0)1224 703032
Fax: +44 (0)1224 821660
Email: contact@pmacinspection.com

Singapore Office: 35 Changi South Avenue 2, Sunny Industrial Building, Singapore 486134
Tel: +65 6214 3990
Email: asia.pacific@pmacinspection.com



Subsea Digitiser

Multiple output options, based on RS232 and RS485 technologies. Configurable Baud rates, measurement frequency and filtering. 24V DC or 110V AC power requirement at less than 0.5A.

Acquisition / Processing Software (APS)

Windows based with extensive Graphic User Interface. Innovative processing package reduces processing and report delivery times. Advanced connectivity options to other onboard systems such as the survey package or video overlay. The system is controlled by a proprietary software package (APS-1) that allows the engineer to collect data, store data, report the data and pass the data to multiple onboard systems. The reporting software (APS-2) uses innovative technology that allows the timely production of reports, and makes onboard reporting a viable alternative.



Technical Specifications

Probe:

Material: Polyacetal

Weight in Air: 1.7kg approx

Weight in water: 0.5kg approx

Connections: Wetcon 3pin male

Dimensions: 540 mm long, 60 mm diameter



Subsea Digitiser:

Material: Outer Housing 6061 Anodised Aluminium

Dimensions: 140mm diameter by 220mm long

Weight in Air: 3kg approx

Weight in Water: 1.3 kg approx

Connections: Wetcon Female bulkheads; 2 pin, 3 pin and 10pin

Depth Rating: 1500msw or 3000msw

Interface Options: RS232 or RS485 –variable baud rate 1200 to 115000 (topside converter box provided)

Power Supply: 24Vdc or 110Vac



Seabed Resistivity & Seawater Conductivity

In order to correct for IR drops caused by the seabed mud where a pipeline is buried regular measurements of the seabed resistivity are required. The System used is a true seabed resistivity measurement as opposed to other systems that measure the seawater conductivity at surface of the seabed.

PMAC have a unit that will measure:

The resistivity (approx. 0.25 to 200+Ohm-m) of seabed sediments along a pipeline route.

The temperature of those same seabed sediments (approx -10 to +25 Celsius)

The system can be used to take single location readings at a single depth in the sediment and is designed to be used several times per day (along a pipeline length) and be deployed from a work class ROV using the vehicles manipulator. Typically readings are taken at the start and end of dives or at agreed intervals/locations along the pipeline. The data is used in conjunction with seawater conductivity readings to correct the CP data during processing.

PMAC are also able to Provide Seawater Conductivity and Temperature probes with continuous logging if this data is not available from other sources.

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