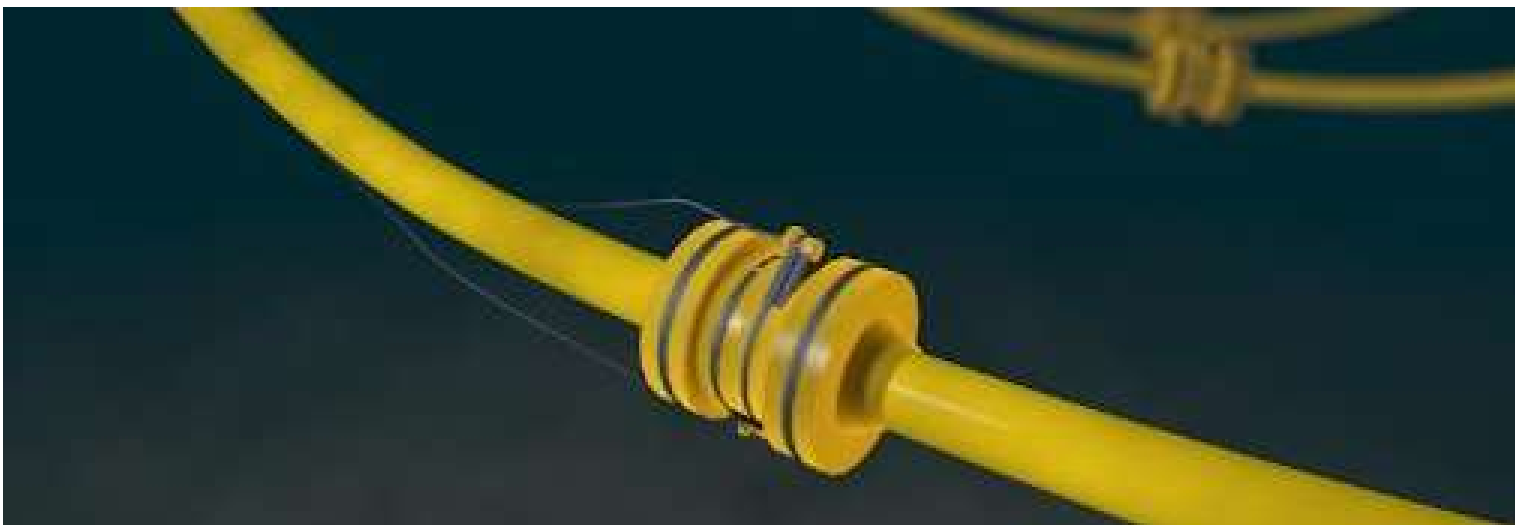


Pressure & Temperature Monitoring System (P&TMS)

Technical Specifications

Purpose	
Objectives	<ul style="list-style-type: none"> Measures rigid pipelines internal fluid pressure and temperature
Technology	<ul style="list-style-type: none"> Nonintrusive Deformation of the pipe external circumference
Sensor Unit	
Monitoring Specifications (typical)	
Rigid pipe temperature range	<ul style="list-style-type: none"> Typical: -40°C to 120°C Please contact Cybernetix for any other temperature range
Rigid pipe pressure range	<ul style="list-style-type: none"> Typical: 0bar to 345bar
Accuracy	<ul style="list-style-type: none"> Pressure measurement = 2% full scale Temperature measurement = 0,5°C
Response time	<ul style="list-style-type: none"> Quasi-instantaneous (transmission time)
Calibration	<ul style="list-style-type: none"> Temperature calibration for compensation of thermal effect after sensor installation
Environmental Specifications	
Water depth	<ul style="list-style-type: none"> 3000m maximum
Hardware Characteristics	
Pipeline dimension	<ul style="list-style-type: none"> 4-inch to 16-inch outer diameter
Main elements	<ul style="list-style-type: none"> Sensors Thermal protection foam Crossover boxes Flying leads to data acquisition unit
Number of sensors per unit	<ul style="list-style-type: none"> 2 sensors (nominal & redundant) for pressure measurement 2 sensors (nominal & redundant) for temperature measurement Possibility to add other sensors on request
Dimension	<ul style="list-style-type: none"> Length = 980mm (including thermal protection) OD = OD riser + 180 mm (including thermal protection) OD = OD riser + 330 mm (including thermal protection and crossover boxes)
Installation	<ul style="list-style-type: none"> Onshore, on coated pipe, under insulation foam
Materials	<ul style="list-style-type: none"> Stainless steel (sensors, sensor clamps, crossover boxes, fixing elements) Polyurethane foam (thermal protection) Plastics (fixing elements)
Reliability	
Design life	<ul style="list-style-type: none"> 30 years
Redundancy	<ul style="list-style-type: none"> Nominal and redundant systems fully separated



Data Acquisition Unit

Hardware Characteristics

Location	<ul style="list-style-type: none"> • Subsea, closed to the sensor unit
Integrated equipment	<ul style="list-style-type: none"> • Sensor conditioning modules and controllers • Junction boxes, with ROV connectors
Power equipment	<ul style="list-style-type: none"> • 24VDC / 0,4 A maximum
Data transmission to monitoring unit	<ul style="list-style-type: none"> • By umbilical or acoustic modem or stand alone solution

Data specifications (typical)

Data acquisition frequency	<ul style="list-style-type: none"> • 1 measure per second
Data storage	<ul style="list-style-type: none"> • Capacity according to client requirements

Reliability

Maintenance	<ul style="list-style-type: none"> • ROV-serviceable units
Redundancy	<ul style="list-style-type: none"> • 2 separate electronics units (nominal and redundant)

Monitoring Unit

Data Processing Specifications (typical)

Location	<ul style="list-style-type: none"> • Topside
Software	<ul style="list-style-type: none"> • Cybernetix Cyxense Surveillor®
Data transmission to client system	<ul style="list-style-type: none"> • Possible via OPC UA or SQL request
Data transmission to shore	<ul style="list-style-type: none"> • Depending on client requirements

