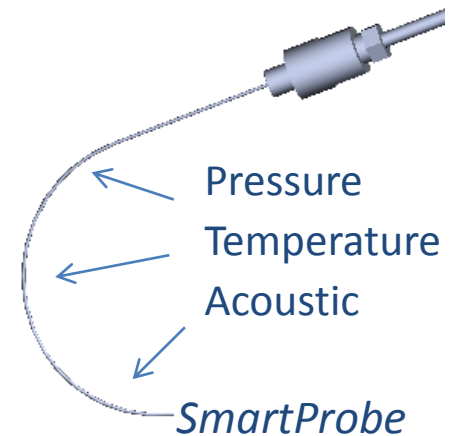


- Field Installable SmartProbe for measuring pressure, temperature and acoustic flow / equipment emissions without intrusion into process flow
- Operating conditions up to 15kpsi/400°F for Sour Gas Service
- Installable in SmartProbe compatible instrument headers, flanges, and mechanical pipe connections
- Significant value potential:
 - Measurement of process parameters across networks
 - Indication of rate, flow regime and fluid phases
 - Detection of leaks at or near joints
 - Operation of nearby pipeline equipment (valves, pumps etc) assured
 - Tamper detection at valves



"Smart" Pipe Connector



*"Smart" Ring
Flange Adaptor*

- Conceptual alternative to SmartProbe for surface measurement of insulated pipes
 - Measurement probe for measuring pipe or equipment contact temperature and acoustic flow/equipment emissions
 - Field Installable without violating pressure integrity or creating thermal chimneys or cold-spots
- Envisaged System Components
 - SmartEar Sensors
 - SmartScope with Fibres SmartSoft and SmartEar Thermal Logging Configuration
 - SmartSonic with SmartSoft and SmartEar Noise Data Logging Configuration
- Concept design only, system not yet developed

