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# Press Release

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## CONNECTORLESS TECHNOLOGY ENABLES DATA TO BE TRANSFERRED ACROSS BARRIERS IN HAZARDOUS ENVIRONMENTS.

C-Tech Innovation, the Chester based Innovation and research organisation, has a new concept for transmitting both power and data across a barrier – such as a pressure vessel wall - without the need for an electrical connection.

Electrical connectors for most industries are a well known, common and inexpensive entity. However, for others – for example oil & gas, chemical and process industries – specific technical requirements and safety issues can mean that a connector can cost tens of thousands of pounds and require a sizeable engineering design and build project. A well known example of this is undersea connectors for oil, gas and exploration markets where operating requirements might mean that a connector has to withstand huge differential pressures of up to 10,000 psi without leakage. Furthermore they may have to operate over multiple interfaces, and survive repeated disconnections/reconnections with high reliability.

Similarly onerous technical requirements can also be found in the process, chemical and nuclear industries where containment of hazardous substances must be guaranteed and barriers must be maintained.

To date, the most common technical solution has been to engineer high performance electrical connectors using pressure equalization techniques, glass to metal seals, exotic materials etc. Traditional inductive couplers, where a first set of windings couples across a

barrier to a second set of windings, have not been used due to the very high electrical losses that thick (usually metal) vessel walls create between the windings.

C-Tech's connectorless concept uses an innovative arrangement of mechanical, electrical and electronic elements and is aimed at relatively low power (<100W) and low baud rate transmissions (<100) for instrumentation purposes. Examples of target applications include powering (from outside) and receiving data about the temperature, pressure, flow or level instrumentation inside a pressure vessel.

The system works using primary and secondary windings arranged on the inside and outside diameter of a blind pipe. The construction of the pipe enables its wall to be thin in comparison to the vessel wall. Furthermore since the pipe is a much smaller diameter than the vessel, its thinner wall thickness enables it to withstand equivalent pressures to the vessel and offer similar containment properties. The pipe can either protrude into or out from a vessel and can be mechanically attached via a standard flange or welded into position. The first (exterior) set of windings is energized with an AC signal, and since the pipe wall is relatively thin, the first set of windings couples to the second set so that electrical energy is carried across the barrier, to provide power to the measurement device located inside the vessel. This in turn provides data which is transmitted back outside the vessel to be measured.

The theme can be varied by either modulating the frequency or amplitude of the signals to carry data using simple signal encoding/decoding electronics.

The benefits are that electrical connections can be made inexpensively and reliably whilst still offering good levels of pressure or environmental containment.

**Note:** C-Tech Innovation (www.ctechinnovation.com) is an internationally renowned, independent research and technology development company with 40 years experience in

providing research and development services to companies, universities and government bodies.

Activities range from research to commercialisation of innovative new products and multi-disciplinary consultancy. Based near Chester in North West England, the company's world-wide customer base ranges from small start-up companies to large multi-nationals.

C-Tech Innovation's facilities and experienced staff provide a complete, flexible service to customers. Fully equipped laboratories and workshops enable experimental and prototype equipment to be designed, constructed and fully proven in complete confidence.

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