



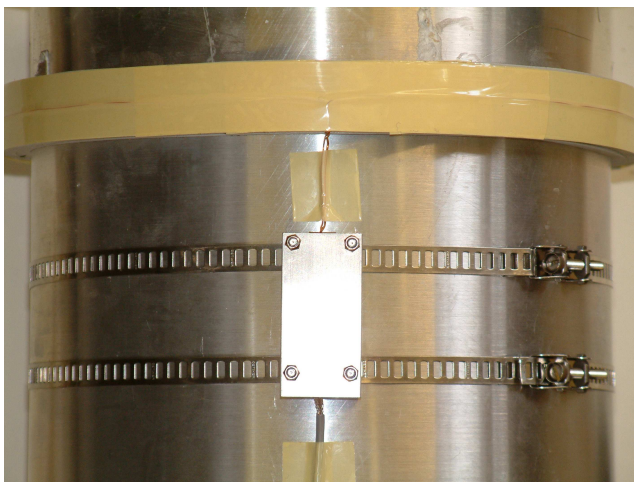
ASTECH ELECTRONICS LTD PRODUCT DATA ROTARY TELEMETRY SYSTEMS FOR SHIPS TRIALS

Power measurements during ships trials calls for equipment which is easily installed and will accurately transfer strain gauge propeller shaft torque measurements and rotational speed data to a remote readout. With almost 40 years of experience in rotary instrumentation Astech Electronics understand what is required and provide suitable system packages using components drawn from a standard product range. Multi-channel systems are also available where measurement of thrust or shaft bending in addition to torque is called for.

The Astech system consists of 3 main parts – firstly shaft mounted items consisting of a torque transmitter, steel strapping to clamp the transmitter to the shaft and a single turn loop attached around the shaft periphery. The loop functions as the rotating part of an inductive coupling interface which provides non-contacting signal transfer from, and inductive power transfer to, the transmitter.

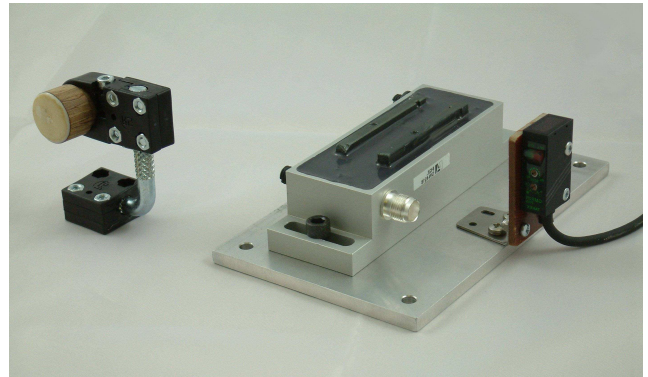


SHAFT MOUNTING ITEMS – TRANSMITTER + STRAPPING & ANTENNA MATERIALS KIT CAK



TORQUE TRANSMITTER ATTACHED TO 230mm DIAMETER SHAFT TOGETHER WITH COMBINED INDUCTIVE POWER PICKUP & DATA SIGNAL TRANSMISSION LOOP

The second part of the system comprises of the stationary shaft adjacent items - the torque signal pickup head or combined pickup and inductive power head and the infra-red RPM pickup unit. A co-axial cable of up to 50 metres length connects the inductive pickup/head to the remotely located demodulating/decoding and readout unit, with a second cable connecting the RPM pickup.

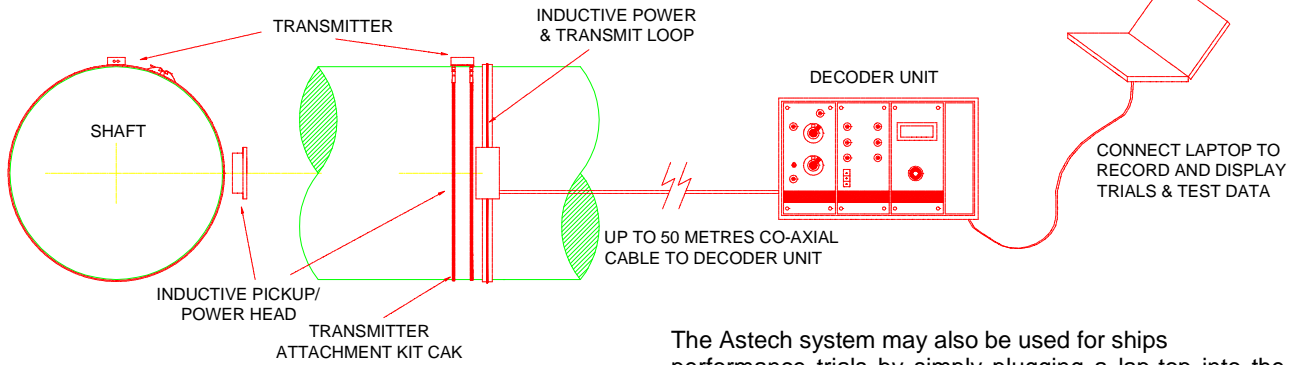


TORQUE SIGNAL INDUCTIVE PICKUP IH1 (FOR BATTERY POWERED TRANSMITTERS) & COMBINED PICKUP/ INDUCTIVE POWER HEAD IH2/L WITH TACHOMETER PICKUP ON BASE

Final portion of the system is the remotely located demodulating/decoding and readout equipment and this consists of a caseframe housing 3 modules – a demodulating module, a power computation module and a digital display module. Analogue voltage and process current outputs are provided for torque, RPM and power, in addition to the digital display. A further output is the transmitter supply voltage - useful for checking the transmitter battery or inductive power supply voltage.



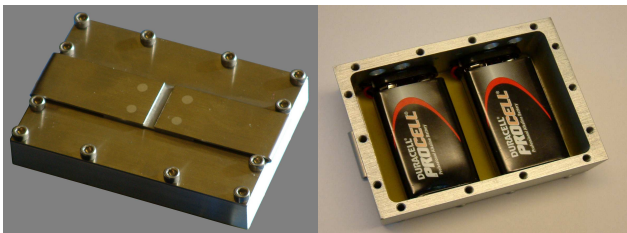
READOUT CASEFRAME CONTAINING DEMODULATOR/DECODER POWER COMPUTATION AND DIGITAL DISPLAY MODULES



The Astech system may also be used for ships performance trials by simply plugging a lap-top into the system. Logging and display/report software is available from Astech Electronics.

Optional Battery Power Supply for Transmitter

For short terms trials – typically up to 72 hours, a battery supply unit (part BU16) is available for the transmitter. Unlike the inductive power method, which needs a small air-gap to transfer power, the battery powered system can operate with an air-gap of up to 200mm.



BATTERY UNIT BU16

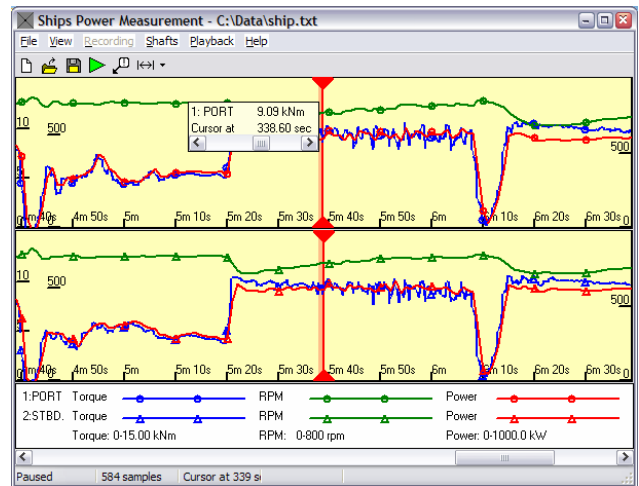
The BU16 battery unit is attached to the shaft by means of a slotted baseplate which fits onto the CAK kit steel strapping.

After installation, no access to the shaft mounted parts is required. Zero /offset and scaling adjustments may be carried out at the readout unit. For systems using inductively powered transmitters a number of remote control function are available, including remote calibration.

Important features and advantages of Astech Rotary Telemetry Systems:

- Simple to install on any shaft size
- Non-critical positioning of hardware
- High (16 bit) accuracy
- Reliable pcm digital data transmission
- Torque, RPM, Power outputs in V, I and Digital
- Transmitter powered by inductive or battery
- Transmitter temperature & supply volts transmitted
- Multi-channel system versions available
- Remote control of transmitter functions including:
 - ⊗ unlimited zero offset adjustment
 - ⊗ unlimited input sensitivity (span) adjustment
 - ⊗ remote analogue and digital calibration signals
 - ⊗ gauge wiring integrity continuously monitored

The remote control functions utilise the inductive power coupling and can therefore only be used on inductively powered transmitters



TYPICAL SHIPS TRIAL GRAPHICAL DISPLAY

Main Specifications

Input:	Full Bridge Strain Gauges 350-2000Ω
Input Sensitivity:	Recommended Maximum ±1mV (If provided with shaft dimensions material and torque range Astech can supply pre-scaled systems)
Input Zero Stability:	±0.001% full scale/°C
Torque Resolution:	15 bits plus sign = ±0.003%
RPM Resolution:	±0.1%
Outputs:	±5V, 4-20mA, USB, RS485, RS232
Digital Display:	3½ Decade 15mm LED
Digital Display Outputs Selection:	1) TORQUE 2) RPM 3) POWER 4) TRANSMITTER SUPPLY VOLTS 5) TRANSMITTER TEMPERATURE
Maximum Radial Airgap:	20mm (inductive transmitter supply) 200mm (battery transmitter supply)
Analogue O/P Bandwidth:	DC -200Hz
Shaft Diameter:	Maximum Approximately 1 metre
Shaft Axial Length Requirement:	60mm



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