

# Advanced Electrochemical Techniques: Current and Potential Logging

**cormon**

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The CPL technique measures the changes in potential and current associated with corrosion on the surface of the sensor. This passive, intrusive technique allows general and localised corrosion to be detected in real-time in a wide variety of environments.

CPL is notable for its **speed of response** - allowing corrective action through control of process variables and inhibition to be taken in real time.

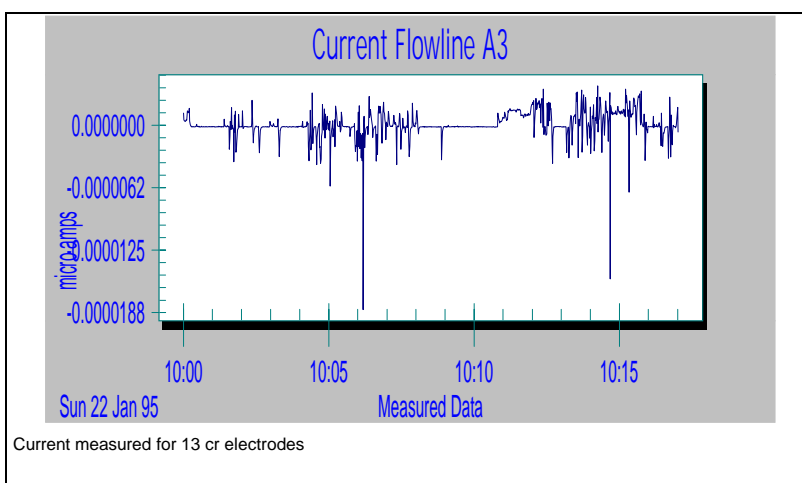
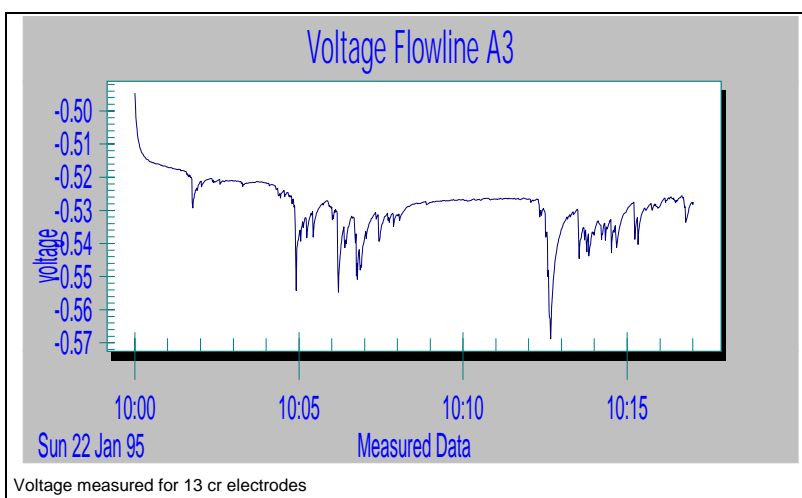
**Localised attack**, largely invisible to other on-line monitoring methods, may be detected. This makes the technique ideal for Duplex, Super Duplex and other exotics, as well as carbon steel systems where the principal attack mechanism is localised.

The **passive measurement** gives a result independent of the distortions that may be created in making 'driven' measurements. The measurement is less dependant on solution resistance and may therefore be used in some hydrocarbon production systems where other electrochemical methods would not be effective.

## Instrumentation

CPL measurement modules consist of 4 channel units which may be combined into multi-channel instruments complete with power supply and connections.

The measurements on each channel are made between three electrodes. Current is measured between two electrodes of nominally the same material as the pipe or vessel. Potential is measured against a third identical electrode or against a standard reference electrode.



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## Data Capture

Data is captured using an Amulet software package running on a PC platform under Windows 95 or NT4.

Data is collected every second for the current and potential from all sensors simultaneously. The data is processed in the software and the summary values and calculated parameters stored.

Data rates can be slowed down in the software where rapid data collection is not required and the system can be configured to save all of the data that is collected if storage facilities allow.

## Sensors

Intrusive probes for use with the CPL technique are available in a wide range of access configurations including AC series 2" high pressure and RC series 1" retractable. Special materials are available. Flush probes are generally recommended for CPL applications

## Housing

For permanent installations the instrumentation is housed in 19" rack mount units (4 or 8 channels per rack). The equipment may also be ordered as part of a system in a fully configured cabinet, complete with computer system, to meet any specification.

Sensor inputs and RS232 communication connections are terminated at the rear of each rack unit via gold plated multi-pin connectors.

## Intrinsic Safety

The instrument is designed for safe area mounting, and may be connected to sensors in a hazardous area via suitably certified zener isolating barriers. Cable length is restricted to 100 meters in screened pairs of standard data cable. 2 pairs (4 cores) are required per channel.

## Specifications

### Measurements

Channels	Modules of 4,
Current	0.1nA to 1mA
Potential	1 $\mu$ V to 12V
Temp coefficient	0.02 $\mu$ V/ $^{\circ}$ C
Input Impedance	10 Gohm
Isolation between inputs	500V

### Interface

Switching	Solid state 3 pole
Power supply	110/240V AC 60/50Hz
A-D converter	16 bit
Power consumption	80W

### Cabinet

Height 3U 162 mm, width 530 mm, depth 500 mm  
Weight 13 Kg as 4 channel 19" rack

### Accessories (to order)

Probe cable & connectors  
IS barriers  
RS232 interface cable  
Mains power supply lead

### Minimum Computer Specification

Windows 95, P100, 16 Mbyte RAM, 1Gbyte HD  
Windows NT, P200, 32 Mbyte RAM, 1Gbyte HD

### Software Requirements

Amulet software for data acquisition, analysis and reporting. Windows 95 or NT4

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