



## Concerto™ RCC-NT

### Rate of Corrosion in Concrete – Concerto RCC

The Concerto RCC networked permanent data logging system is used to provide corrosion measurements and monitoring data for critical concrete structures in locations where portable units cannot be used practically and remote communications are available.

The Concerto RCC-NT system operates with the M-series and C-series PROCES probes. Other systems and probe types are available upon request. Concerto RCC monitoring pods are deployed on the structure as a permanent installation. The units are controlled from a central control point and data is recorded at predefined intervals (from once per hour to once per day) and stored locally on a flashcard for collection when required (quarterly to annually) and/or automatically transferred to a web based server for remote access.

### Introduction

The Concerto RCC-NT system is used to provide corrosion monitoring data for large / complex civil structures. The functionality is the same as the Concerto RCC-DL system.

In the past Concerto RCC-NT units have been deployed on bridges and in tunnels, but can be adapted for any structure type (including ports & harbours, high rise buildings, industrial complexes, etc).

### Description

The Concerto RCC-NT comprises a number of permanent corrosion rate meters, connected together and controlled by a local network control unit. When connected to Concerto PROCES probes the Concerto RCC-NT provides the following standard set of measurements.

1. Corrosion Potential (Ecorr) of the working electrode and/or the main reinforcement with respect to the probe reference element
2. Corrosion Rate (Icorr) of the working electrode and/or the main reinforcement using the Linear Polarisation Resistance (LPR) method
3. Concrete resistivity
4. Concrete temperature
5. Concrete humidity

The LPR polarisation voltage and time are configured in firmware and can be tailored to specific applications. Resistivity is measured using a single frequency square wave, the amplitude and frequency is also configurable in firmware.

The system has been designed to allow for incorporation of other measurements on user request. These may include:

- Macro-cell effects
- Coupling current between the probe test electrode and main reinforcement (for use with cathodic protection systems)
- Potential between auxiliary electrode and the probe test electrode and/or main reinforcement





Concerto™ RCC-NT Control Unit

## Concerto™ RCC-NT

### Remote Supply Network

The remote supply network is made up of four nodes daisy chained together. The network cable supplies power and communications from a local Network Control Unit based in the instrumentation room or other secure location of the installation.

For systems that have power restrictions the individual nodes can be put into a sleep mode and turned on only when a measurement is required. This system is very adaptable and in some applications 40+ nodes can be placed on one chain.

As well as connecting to the PROCES range of rate of corrosion probes the Concerto RCC-NT can also incorporate 3rd party monitoring units (e.g. movement sensors, inclinometers, accelerometers, crack width gauges, etc) to provide a comprehensive structural integrity monitoring system.

The physical location of the individual monitoring pods is dependent on the local environment and access availability.

The current networked system fully conforms to the EU EMC directive but is not intrinsically safe.

### Overall System Control

The local control unit provides; dc power, local network communication and control of the individual monitoring units, local data storage and remote communications. control unit provides; dc power, local network communication and control of the individual monitoring units, local data storage and remote communications.

The control unit may be configured to operate in a remote condition, with communications via a modem (posting data automatically or on demand) or may be incorporated into a plant / facility network for direct communication and control.

### Enclosures

Various options are available for enclosures for the standard Concerto RCC-NT instrumentation. Factors to be taken into account in selecting enclosures for the individual monitoring units and the local control unit are:

- Exposure conditions (indoor or outdoor, if outdoor minimum protection requirements; IP65, IP68 or hermetically sealed).
- Location of units with respect to structure (fixed to wall, post, or ceiling, instrument pit, control room, etc.)
- Cable routing (instrumentation cable from probe-to-units and network cable from unit-to-unit).

CAPCIS is able to advise on enclosure requirements and provide suitable systems on a case-by-case basis.

#### Manchester office

CAPCIS House 1 Echo Street  
Manchester M1 7DP  
United Kingdom

Tel +44 (0)161 933 4000  
Fax +44 (0)161 933 4001

#### Oxford office

Unit 6 Hanborough Business Park  
Long Hanborough Oxford  
OX29 8LH United Kingdom

Tel +44 (0)1993 882 445  
Fax +44 (0)1993 882 559

#### Aberdeen office

78 Carden Place Aberdeen  
AB10 1UL  
United Kingdom

Tel +44 (0)1224 612 400  
Fax +44 (0)1224 612 401