Instruction **Manual**

LPR Corrosion Transmitter & Alarm Relay
Models: DP-OPT-LOGR-CS-CU
DP-OPT-LOGR-CS
DP-OPT-LOGR-CU

- **Retrofit to (or supplied with) DIGICHEM® Plus+ Controllers**

Supplied by:

Convergent Water Controls Pty Ltd
2/4 Huntley St
Alexandria NSW 2015
Tel: (02) 9698 3131
Fax: (02) 9698 3210
www.cwc.com.au
info@cwc.com.au

Manufacturer: Convergent Water Controls Pty Ltd, Sydney Australia.

Note: On-going product development at Convergent Water Controls may lead to changes in the specifications of this product.

Warranty: This product is guaranteed for a period of 12 months from installation date or 18 months from Invoice date (whichever occurs first). The warranty applies to manufacturing or component defects which may cause the unit to malfunction under specified conditions. The guarantee does not cover damage due to abuse, tampering or improper installation.

Disclaimer: Convergent Water Controls will not be held liable for any consequential damage or loss arising resulting from product malfunction.

Table of Contents

1. Introduction

The DP-OPT-LOGR LPR Corrosion Transmitter & Alarm Relay can be wired to any CWC DIGICHEM-Plus+ controller, already fitted with an analogue input card (DP-OPT-CARD-IP-mA-2) and 3G modem (DP-OPT-CARD-3G) card, to remotely monitor corrosion rates of Carbon Steel (DP-OPT-LOGR-CS-CU and DP-OPT-LOGR-CS) and Copper (DP-OPT-LOGR-CS-CU and DP-OPT-LOGR-CU).

The DP-OPT- LOGR corrosion monitor range includes:

- **DP-OPT-LOGR-CS-CU**
  2 x LogR LPR Corrosion Transmitters & Alarm relays mounted in Weatherproof plastic enclosure with Power supplies & mains lead/plug. Includes 2 Corrosion Probes with Carbon Steel & Copper electrodes. Excludes CR-2CP-1VTU-PVC rack & DP-OPT-CARD-IP-mA-2 card for DP+.
- **DP-OPT-LOGR-CS**
  1 x LogR LPR Corrosion Transmitter & Alarm Relay mounted in Weatherproof plastic enclosure with Power supply & mains lead/plug. Includes 1 Corrosion Probe with Carbon Steel electrodes. Excludes CR-2CP-1VTU-PVC rack & DP-OPT-CARD-IP-mA-2 card for DP+
- **DP-OPT-LOGR-CU**
  1 x LogR LPR Corrosion Transmitter & Alarm Relay mounted in Weatherproof plastic enclosure with Power supply & mains lead/plug. Includes 1 Corrosion Probe with Copper electrodes. Excludes CR-2CP-1VTU-PVC rack & DP-OPT-CARD-IP-mA-2 card for DP+.

1.1 Features

- Easy retrofit to controllers installed in the field.
- Accepts up to 2 Corrosion Probes (DP-OPT-LOGR-CS-CU Model Only)
- Allows monitoring of Carbon Steel and Copper Corrosion rates
- Notification of Corrosion Alarm Raised and Alarm Cancelled
- Alarm Notification via SMS and/or e-mail

NOTE: DP-OPT-CARD-3G and DP-OPT-CARD-IP-mA cards required for the remote monitoring functions and alarms to work.

2. Installation & Wiring

The DP-OPT-LOGR corrosion monitors provide a single closed contact alarm for abnormal corrosion rates. The corrosion monitor is an ordering option and can be retro-fitted to the DIGICHEM Plus+ controller.

The DP-OPT-LOGR corrosion monitor provides a 4-20mA output signal to allow near real time monitoring and logging of trends to be plotted on the www.digichemplus.com user interface when wired to a DIGICHEM-Plus+ Cooling tower controller. However please note that in order to receive corrosion rate alarms via SMS and/or e-mail, and for the scaled 4-20mA graphs to be plotted on the user interface, your DIGICHEM-Plus+ Cooling tower controller must have already been fitted with an analogue input card (DP-OPT-CARD-IP-mA-2) and 3G modem (DP-OPT-CARD-3G) card.

Furthermore, the scaling will need to be configured on the www.digichemplus.com User Interface.

The DP-OPT-LOGR corrosion monitor should be mounted on a sturdy, flat (Vertical) mounting surface such as a wall or steel frame, preferably out of direct contact with the elements using the cabinet mounting feet provided.

Once mounted, the corrosion monitoring probes should be installed into the flow to be monitored and oriented so that the monitored flow is towards the probe tips. An ideal method to plumb these sensors into an existing system is by incorporating our CR-2CP-1VTU-PVC corrosion coupon rack. This 3/4" PVC manifold includes 2x 3/4" BSPF ports to allow the installation of up to 2 corrosion monitor probes and also includes a ball valve on inlet to allow isolation of the rack during probe installation and maintenance.

Finally, your DP-OPT-LOGR corrosion monitor can be wired into your DIGICHEM-Plus+ Cooling tower controller (Can also be wired into a PLC, BMS or Data logger with 2x 4-20mA Analogue inputs and 2x dry contact inputs). Please see section 2.2 for more details regarding this wiring.

> **Warning:** All wiring should be performed by a suitably qualified person with the controller and corrosion monitor unplugged from mains power, failure to do so could result in permanent damage, injury or death.

2.2 Wiring of DP-OPT-LOGR to DP+ Input cards

2.2.1 Wiring of DP-OPT-LOGR to Input card

Wiring of the DP-OPT-LOGR corrosion monitor should be performed by a suitably qualified person and the DIGICHEM-Plus+ controller should be unplugged from your mains supply prior to any wiring being undertaken.

The signal cable from the corrosion monitor should be fed into the DIGICHEM-Plus+ controller through an appropriate 20mm gland on the bottom of the DIGICHEM-Plus+ controller and the gland tightened to secure the cable.

The signal cable should now be wired to the Input card terminals following the wiring directions below. All wires can be identified by wire numbers printed on the insulator of each wire.

Alarm Contacts Wiring

Wire one wire from each Alarm contact wire to its corresponding terminal as per the input listing below:

Alarm 1 (CS)	: Terminal 19 & Common 18
Alarm 2 (CU)	: Terminal 17 & Common 15 (or 18)

Alarm contacts are dry contact type so polarity will not matter however it is good practice to wire your black or light blue wire to the common terminals for easy identification.

4-20mA Signal Wiring

Wire one wire from each 4-20mA Signal wire to its corresponding terminal as per the input listing below:

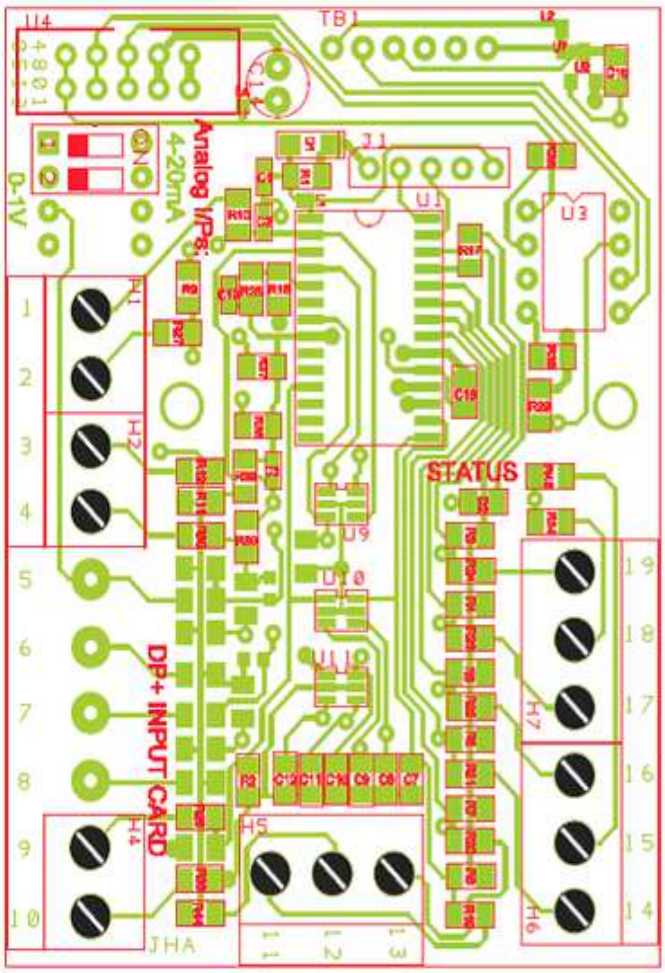
4-20mA Signal 1 (CS)	: Terminal 1 (Positive) & Terminal 2 (Negative)
4-20mA Signal 2 (CU)	: Terminal 3 (Positive) & Terminal 4 (Negative)

4-20mA Signal wiring is polarity sensitive and **must** be wired in with **White wires to positive** terminals and **Black wires to Negative** terminals.

When the DIGICHEM-Plus+ Cooling tower controller is powered up, the LED on the Input card should pulse slowly to display normal operation.

For further information regarding the DIGICHEM-Plus+ analogue input card (DP-OPT-CARD-IP-mA-2), please refer to the CWC website - www.cwc.com.au.

2.2.2 Wiring Diagram of DP-OPT-LOGR to Input card



1 - AN Signal 1 (CS) White 3
2 - AN COM 1 (CS) Black 3
3 - AN Signal 2 (Cu) White 4
4 - AN COM 2 (Cu) Black 4
5 - N/A
6 - N/A
7 - N/A
8 - N/A
9 - N/A
10 - N/A
11 - N/A
12 - N/A
13 - N/A
14 - N/A
15 - Alarm COM (Cu) Black 2
16 - N/A
17 - Alarm 2 (Cu) White 2
18 - Alarm COM (CS) Black 1
19 - Alarm 1 (CS) White 1

WIRING DIAGRAM of Input CARD

Please see the diagram above and follow the instructions in section 2.2.1 above.

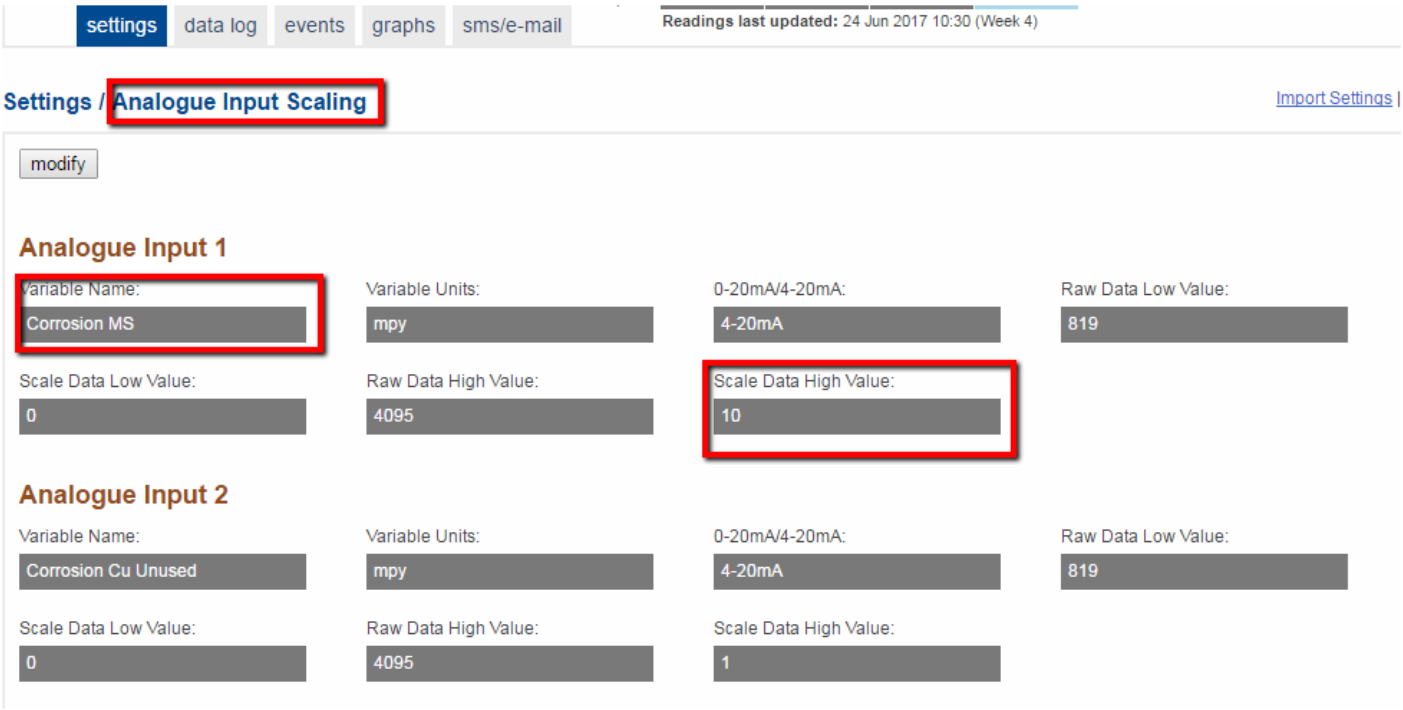
3. Configuration

Refer to the Instruction Manual for the logR Corrosion Transmitter and follow these steps:

1. MODE 1 - Set the Type of Sensor, such as Steel.
2. MODE 6 - Set the High Corrosion Alarm limit, such as 5mpy. This means the alarm will be triggered if the Corrosion Rate exceeds 5mpy.
3. MODE 7 - Set he mA to the desired mpy range you require, such as 10 mpy for Carbon Steel (CS). This means the 4-20mA output of the logR spans 0-10mpy.

Log onto www.digichemplus.com, select your unit from the SITES menu and perform the following:

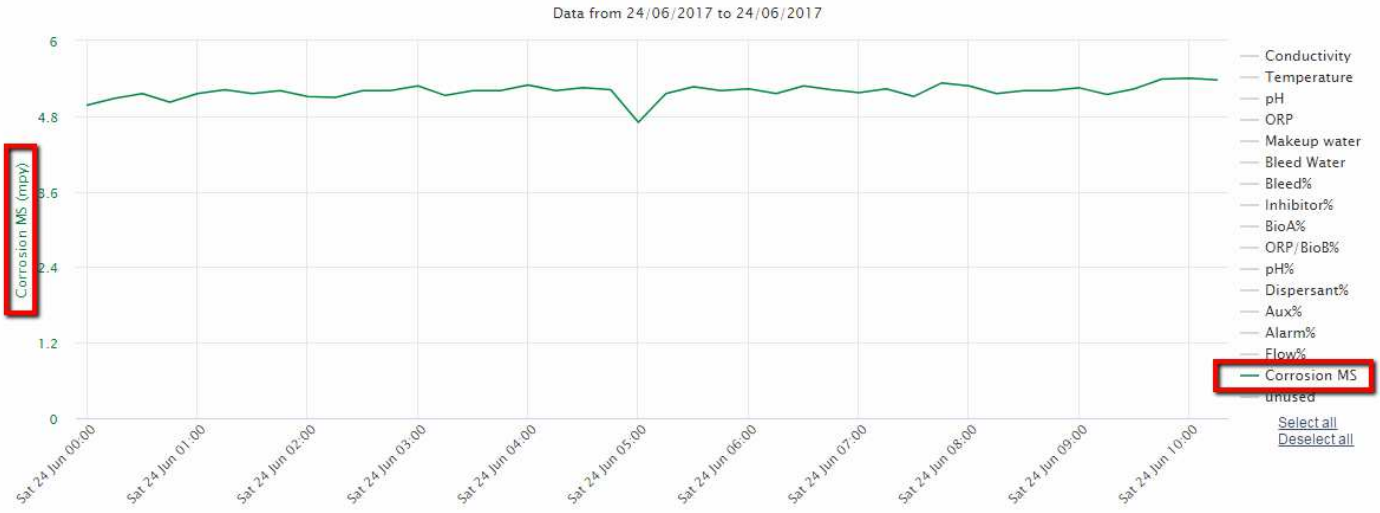
1. Hover your mouse on the SETTINGS menu and select ANALOGUE INPUT SCALING.
2. Change the VARIABLE NAME to the Metal type you are monitoring, e.g. "Corrosion MS" for Corrosion Mild Steel.
3. Change the SCALE HIGH DATA VALUE for the "mpy range" set under MODE 7 in the logR.
4. The other values do not need to be changed. However, here is a brief explanation of what they are:
5. The Raw Data coming in from the DIGICHEM Plus+ controller is a 12 bit number, so spans 0-4095 (i.e. 4096 (or 2^{12}) possible values). Hence, 0-20mA = 0-4195, 4mA = 819 and 20mA = 4095.
6. In the TEST INPUTS/OUTPUTS menu of the DIGICHEM Plus+ controller, you can view the Raw Data value in real time.



If you have set a High Corrosion Alarm value in MODE 6 of the logR, then it is important to save a Message so that when the alarm is raised, you receive a meaningful message. Whilst logged onto www.digichemplus.com, please follow these steps:

1. Hover your mouse on the SETTINGS menu and select DIGITAL INPUT MESSAGES.
2. Edit the "Tank 1 Message" and save, e.g. "Corrosion MS > 5 mpy", or "Corrosion MS > 70 mpy". This value set here, e.g. 5 mpy should match the High Alarm value programmed in MODE 6 in the logR.
3. Tank 2 can be saved as the 2nd Channel Message.
4. There are also Tank 3, through to Tank 6 messages, which can be used for low level chemical tank signals if low level tank switches are connected to these inputs.

Whilst still logged onto www.digichemplus.com, when you click on the GRAPHS menu, the graph will be displayed and "Analogue Input 1" will automatically be labelled as to what you set it to, e.g. "Corrosion MS" and the Y-axis of the graph will be scaled accordingly. See example of graph below.



4. Specifications

Corrosion Rate Measure & Display:	• 0.01 to 50.0 mpy for steel. • Updates every 150 seconds. • LogR CE compliant under 89/336/EEC. • Electrode metallurgy user selectable.
Conductivity:	• 50 to 9999 uS • Autoranging. • 1uS resolution. • Corrects corrosion rate for water resistivity.
Display:	• 2x8 LCD Display
Data Logging:	• 1Year @ 5 minute intervals. • Log auto-uploaded via USB thumb drive in .CSV format. • Battery backed clock time & date stamps.

Outputs:	• Volt Free Alarm Contact.
	  o Closed = Corrosion Rate Alarm Activated
	  o Open = Corrosion Rate Normal
	• 4-20mA
	  o User selectable 4-20mA range from 2 to 100mpy.
	  o Adjustable loop Span & Zero.
	  o Resolution nominally 1 part in 4000.

Power Supply:	• Standard 3 Pin 10A Mains Plug

LPR Sensor (Linear Polarization Resistance):	• Non-metallic sensor 50C @ 8 bar max.
	• Immersed components ABT, nylon & epoxy.
	• Digital, DC isolated 3 wire sensor.
	• Sensor supplied with:
	  o 3m (10ft) of 3 x AWG 22 PVC jacketed cable.
	  o ¾" SCH 80 threaded PVC 'T' fitting with ¾" non-metallic sensor entry fitting.
	  o 1¼"L x 3/16'D electrode set, installed.
	• Accepts standardized LPR electrodes
	  o Threaded #4-40 UNC
	  o 1010 Carbon Steel
	  o CDA 110 Copper
	  o CDA 443 Admiralty

5. Optional Accessories

Part Number	Description
CR-2CP-1VTU-PVC	PVC Rack 3/4" for 2 optional LogR 3/4" Corrosion Probes, 3/4" BSPF ports, Flow direction opposite to Corrosion Coupon Rack. Incl 1 True union ball valve on inlet (Suited to installation with DP+ system that already has 1x ball valve on its manifold inlet)
DP-OPT-CARD-IP-mA-2	DIGICHEM Plus+ Option: Input card to monitor 6 tank levels with optional low level tank switches, plus two 4-20mA signals from two 3rd party instruments such as Corrosion Transmitters (Requires DIGICHEM Plus+ firmware version 0.92 or later)
DP-OPT-CARD-3G	DIGICHEM Plus+ Option: 3G Modem card to enable full remote connectivity via the Internet. Incorporates Pentaband UMTS (WCDMA/FDD) 800, 850, 900, 1900 and 2100 MHz modem module. EXCLUDES ANNUAL CONNECTION/ACCESS CHARGE.