Instruction **Manual**

- **4-20mA Output Card**
- **AF09-XP2, AF09A-XP2, AF09B-XP2**
- **Retrofit to (or supplied with) CWC Controller Models: DIGICHEM®-XP2, PH-XP2 or ORP-XP**

Supplied by:

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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. 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.

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1. INTRODUCTION

The AF09 Series 4-20mA output cards can be fitted to any CWC DIGICHEM, ORP-XP2 or PH-XP2-Series controller to remotely monitor the variable being controlled. The 4-20mA output of the card can be connected directly to Building Management Systems (BMS), data logger, chart recorder or any device that requires a 4-20mA (or 1-5Vdc) input for monitoring. The card works immediately after installation when powered up.

1.1 Features

- Easy retrofit to controllers installed in the field.
- Isolated 4-20mA proportional to µS/TDS, ORP or pH
- AF09-XP2 is for DIGICHEM Controllers
- AF09A-XP2 is for the ORP-XP2 Controller
- AF09B-XP2 is for the PH-XP2 Controller

All the AF09 cards are identical, but have different part numbers in order to differentiate between which controller they will belong to.

For example, in a system, where you require both pH and Conductivity measurement, but you only require a 4-20mA output for the pH controller, and not for Conductivity, then you only need to order the AF09B-XP2 card, which will be fitted to the pH controller.

2. INSTALLATION & WIRING

The XP2 Series controllers fitted with the AF09 4-20mA output card provides an optically isolated 4-20mA signal for direct interface to a data logger, chart recorder or any device that requires a 4-20mA (or 1-5Vdc) input for monitoring. The card works immediately after installation when powered up.

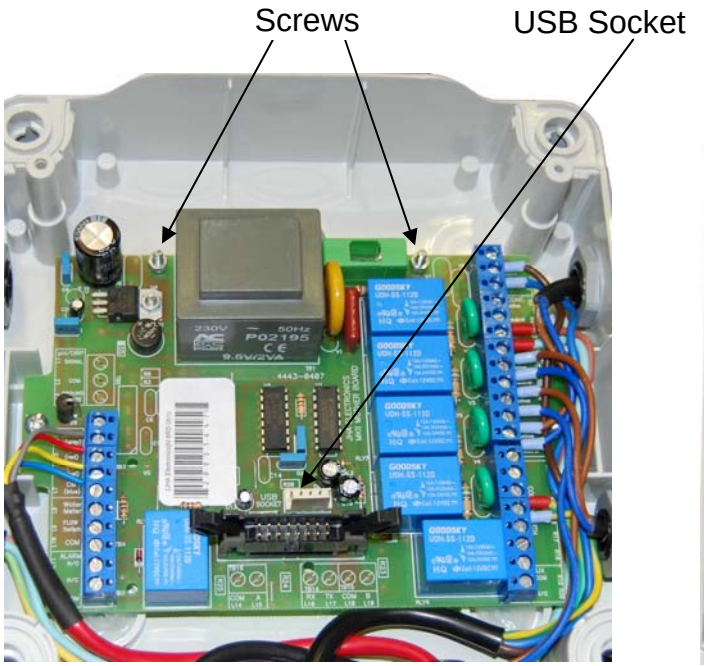
A 250 ohm resistor across the output can convert the 4-20mA signal to 1-5Vdc signal should this be required. This card is an ordering option and can be retro-fitted to the DIGICHEM-XP2, PH-XP2, ORP-XP2 controller. It can also be supplied factory fitted.

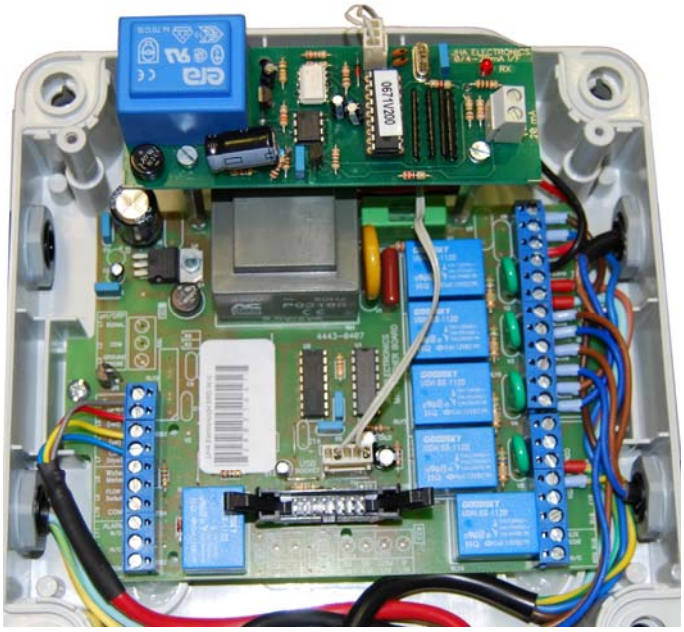
The XP2 Series **AF09, AF09A, and AF09B** card optional kit consists of the following:

1. 4-20mA output card
2. Interconnecting communications cable (2-way).
3. 2 x 40mm metal spacers (F/F).
4. 2 x screws & washers

After installation and wiring, the card is recognised by the controller if the LED on the card pulses after power up.

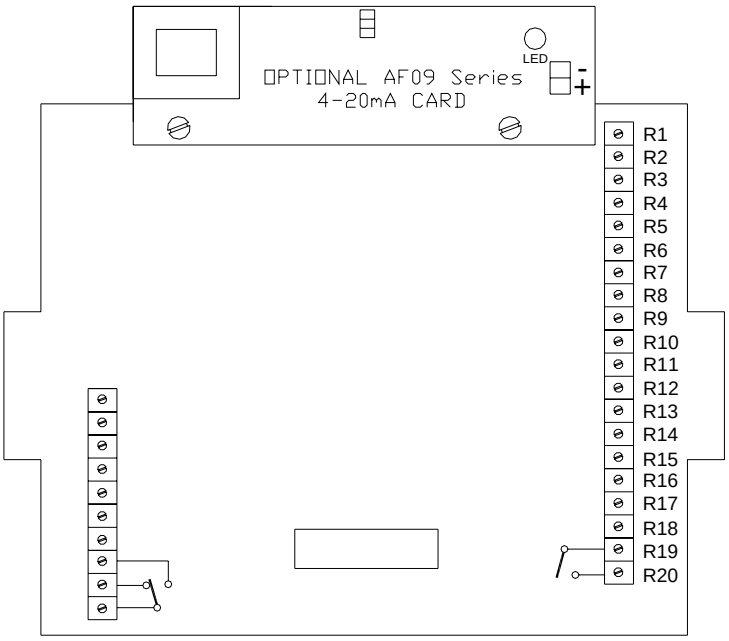
2.1 Installing the AF09 Card





CIRCUIT WITHOUT THE 4-20mA CARD **CIRCUIT WITH 4-20mA CARD**

NOTE: The above are DIGICHEM-XP2 Controller circuit mother boards. The PH-XP2 and ORP-XP2 will be slightly different, but will still have the same layout (i.e. screws, USB Socket & Terminal numbers).



+: 4-20mA Signal
-: Signal Ground

Max 4-20mA O/P impedance: 500 Ω

R3: Output card Active 240VAC
R4: Output card Neutral

Wiring Diagram of AF09-XP2 Output Card

2.2 Wiring Instructions for the AF09 Card

NOTE: Wiring should be performed by a licensed electrician.

1. Make sure that the power is switched off and the controller is unplugged from mains power.
2. Remove cover of enclosure.
3. Locate the two screws (male threads) as indicated in the LHS photograph on the previous page.
4. Plug the new interconnecting cable from the BMS card into the USB socket on the motherboard.
5. Screw the 2 metal spacers onto the 2 male threads on the motherboard.
6. Use the two screws provided and fasten the card to the 2 metal spacers.
7. Connect the RED wire of the interface card to terminal R3.
8. Connect the BLACK wire of the interface card to terminal R4.
9. Connect the 4-20mA terminals on the output card as required.
10. Replace cover of enclosure, ensuring that the seal is in place and no wires are trapped between the lid and the base.
11. Plug into mains and switch on.

NOTE: Please see the table below for the 4-20mA spans for the various controllers.

Controller:	4-20mA Output Zero-Span
DIGICHEM-XP2	0 – 5000 µS/TDS
PH-XP2	0 – 14 pH
ORP-XP2	0 – 1000 mV

If you are not receiving 4-20mA as required, follow the fault finding guide below.

3. FAULT FINDING GUIDE

If you are not receiving 4-20mA from your controller, please follow the steps below:

1. **To avoid electrical shock do not touch anything inside the controller, as there is live voltage!**
2. **These checks should be performed by a licensed electrician.**
3. Open the enclosure and see the table on the following page:

Fault:	Fix:
Red LED is not pulsing on the right hand side of the output card	• Switch off controller • Check wiring of output card into terminals R3 & R4 of the base board. • Switch on controller. • Check 240Vac is at these terminals. • Check ribbon connector is attached correctly from the output card to the base board
Red LED is pulsing, but no 4-20mA signal	• Switch off controller • Disconnect 4-20mA wires from terminals on output card • Switch on controller • Measure 4-20mA directly into the terminals on the output card. • If correct, check 3rd party mA input device. • If not, contact your supplier

4. SPECIFICATIONS

Power Supply:	220 – 240 VAC (50 – 60Hz)
Input:	Internal from DIGICHEM-XP2, PH-XP2 or ORP-XP2 controllers
Standard Output:	Isolated 4-20mA output or 1-5Vdc with 250 ohm resistor across output terminals
4-20mA Output	Maximum impedance: 500 Ω
LED Indication:	Pulsing indicates correct operation
Controller Enclosure rating:	IP55 (ie. Completely weatherproof), if mounted inside Controller Enclosure
EMC compatibility	C-tick approved
Operating Temperature:	0 - 50°C