OPERATING MANUAL

CMC20A

Current Meter Counter

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1. SPECIFICATIONS

Housing:	Weatherproof anodised aluminium case with nylon webbing adjustable neck strap.
Display:	4 Digit liquid crystal display rated to 80°C.
Accuracy:	± 0.1 seconds (Timed from first contact closure) ± 1 pulse
Timer:	Quartz crystal accuracy, better than 1 in 20,000.
Preset Facility:	Time intervals of 10, 20, 30, 40, 50, 80, 100, 200 and infinity seconds.
Integrate Mode:	INT. This mode is used for taking discharge measurements by the integration method, for use with ground-feeler weights or for manual operation of counter.
Contact Debounce:	The current meter pulse is debounced in software. The debounce time is user selectable. (1, 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 25, 30, 35, 40, 45mS) This is useful for a meter with a cat whisker contact wire.
Buzzer:	Instantaneous beep for each current meter pulse except in the integrate mode. In the integrate mode, the buzzer gives a continuous beep while the current meter reed switch is closed.
Power Supply:	9V DC - 6 AA Alkaline batteries. The actual battery voltage is displayed for 2 second each time the unit is switched on. Low voltage is also indicated by all decimal points showing on the display at 5.8 volts.

2. INTRODUCTION

The CMC20A is an enhanced version of the familiar CMC20, being a self-contained instrument featuring microprocessor control circuitry, a quartz timebase and a liquid crystal display. The counter is powered by 6 x AA size alkaline cells which ensure cheap and easy replacement.

Low battery voltage below approximately 5.8 volts is indicated on the display by the showing of all decimal points.

An internal buzzer sounds at each contact closure during the timing period to indicate correct operation.

The display on the CMC20A gives continuous indication of the pulse count during the course of the reading period - and indicates with a resolution of 1 to a maximum of 9999 counts.

3. SPECIFIC FEATURES

This simple counter displays the accumulated pulse count for a range of preset time periods. In addition the “integrate” range is included for use when integrating depth measurements are made with a ground-feeler weight. in the “integrate” mode the buzzer sounds continuously while the contacts are closed and counting continues until interrupted manually by the “Stop” switch. The use of a supplementary timer is necessary in this mode.

The enhanced features of the CMC20A include :

- Actual battery voltage displayed on power up.
- User selectable contact debounce time.
- More accurate timing – the timer is started on the first contact closure + this closure does not increment the counter.

4. PANEL LAYOUT

5. CONTROLS

5.1 Start

Resets the display and prepares for the preset time interval. (The colon on the display indicates that start has been pressed)

Note : Timing commences on the first detected contact closure. The count will not increment on the first closure, only subsequent closures. This ensures that timing is accurate.

5.2 Stop

Stops further counting - and allows the counter to be reset and restarted by the Start switch.

5.3 Rotary Switch

Selects a range of preset time periods and the integrate mode for use with ground-feeler weights.

5.4 Display

Displays counted pulses during normal operation.

On power up the display indicates the battery voltage. (eg " 8:9 " represents 8.9 volts)

5.5 Setting Contact Debounce Time

To display or change the contact debounce time :

- Press and hold the “Start” button as the unit is switched on. The left 2 flashing digits indicate the contact debounce time in mS. The right 2 steady digits indicate the pulse count.
- Press the “Start” button to increase the contact debounce time.
- Press the “Stop” button to decrease the contact debounce time.
- In this mode the buzzer and counter is enabled, so an indication of the current meter performance can be gauged as the debounce time is altered.
- When satisfied with the setting, rotate the Rotary switch one click in any direction. This will save the selected debounce time for all future use. Note that this is saved even when the unit is switched off, or batteries are removed.

5.6 Displaying the CMC20A Firmware Revision

To display the Firmware Revision :

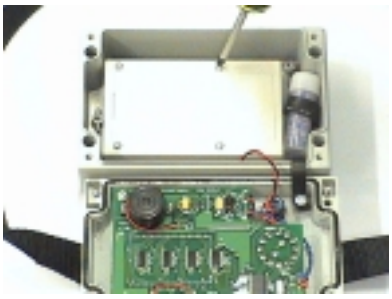
- Press and hold the “Stop” button as the unit is switched on. The display will show the Firmware Revision for 2 seconds. (eg “ 1:00” indicates Revision 1.00)

6. ANNUAL SERVICING

6.1 Changing the Batteries

To change the batteries, first undo the 4 screws in the corners of the front cover.

Carefully hinge the front cover forward, revealing the electronics and battery compartment.



Undo the 4 screws on the lid of the battery compartment and remove the cover.

Replace all 6 AA alkaline batteries and re-assemble the current meter counter.

6.2 Regenerating the Silica Gel

The silica gel capsule can be seen in the above photos, on the right hand side of the battery compartment.

Regenerate the silica gel by heating the contents of the capsule at 100oC for one (1) hour [until blue].

7. FAULT FINDING

Symptom	Possible Cause	Action
No count or audible signal while meter propeller is turning.	Faulty leads or connections at terminal.	Check leads for continuity. Check condition of plugs.
All decimal points showing on display.	Low battery voltage.	Check voltage – low level is 5.8volts. (When unit is switched on, the battery voltage is displayed for 2 secs.)
As meter gets faster, the count stops.	The contact debounce time is set too long.	Reduce the contact debounce time.

