

Kolectric Research

MC8022+ Covermeter



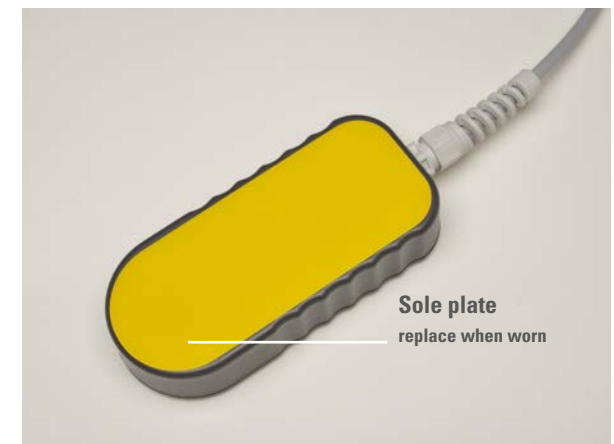
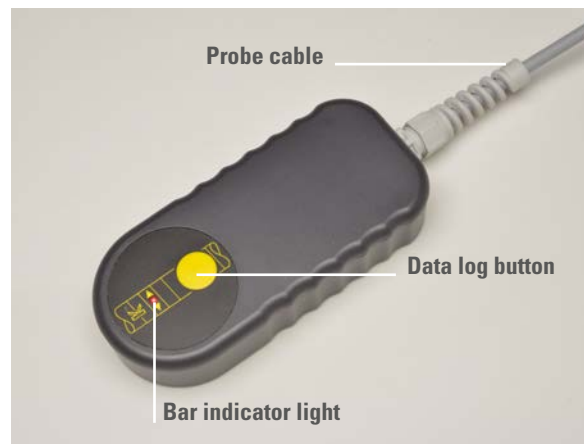
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GETTING STARTED

Controls and Display

Switch the MC8022+ on by pressing and holding the red button until the display shows the instrument name and serial number. The display quickly changes to show the normal controls and cover reading.



Press the red button briefly to change the displayed control page. These pages are shown in turn:

Cover depth	Normal display for measuring cover depth
Bar size	Automatic bar size measurement
Data log	Review logged data
Settings	Configure measurement, logging, audio and time & date

Page labels and menu items are shown in this manual like this

Cover depth

The three yellow buttons have different functions depending on which control page is being used. The active function is shown on the display just above each button. In this manual button labels are shown like this **(SELECT)**.

When changing **Settings**, the left (▲) and right (▼) yellow buttons move up and down through the list of settings, the middle yellow button is pressed to select a menu item **(SELECT)** or change a setting (➡) and the red button is used to move back to the previous menu.

Switch the instrument off by pressing the red button for about two seconds until the screen shows the **Settings** display. The first option in the list, **Switch off**, is highlighted. Press **(SELECT)** to turn the instrument off. The instrument can be switched off in any mode and will switch off automatically after a period of time if there have been no key presses.

To change the time before shutdown press the red button to display **Settings**, then select **Measurement**.



Setting "Never" prevents automatic shutdown which can be useful for some complex measurements.

Backlight

The display is designed to be visible in normal daylight conditions. For use in darker environments, turn on the backlight.

The display backlight can be turned off to save power or improve visibility depending on local lighting conditions. The display contrast can be adjusted to give the best visibility at different viewing angles.

Charging the battery

MC8022+ contains a rechargeable battery that provides about 20 hours of typical operation. When operating, the battery indicator at the left hand side of the **Cover depth** display shows approximately how much charge is in the battery. The battery meter will appear empty when there is less than 30 minutes operation left.

The instrument should be fully charged before first use in the field. If you know the MC8022+ will not be used for a few months, connect the charger for 1-2 hours before storing the instrument, and then fully recharge the battery before it is used again.



To recharge the battery, switch the instrument off and connect the supplied charger to the left hand connector on the instrument. Charging the battery to 95% of capacity takes about 2 hours. Leave the charger connected for at least 3 hours for a full recharge.

Only use the supplied battery charger. Using any other type of charger may result in reduced battery performance or damage to the equipment. Damage caused by using an unsuitable charger is not covered by warranty. If the charger is damaged, obtain a genuine spare part from Kolectric Research or your local agent. Always replace the connector sealing cap after charging to prevent ingress of dust and moisture.

Setting the date and time

MC8022+ has an internal clock which is used to timestamp logged data. The time, date and display format (12 hr or 24:00 hr, d/m/y or m/d/y) can be set from **Date and Time**.

Display the **Settings** by pressing the red button three times.

Press the right-hand yellow button (▼) to move down the menu until **Date and Time** is highlighted. Press the middle yellow button **(SELECT)** to adjust the Date and Time.



Use the yellow buttons (▲) and (▼) to move up and down the menu and (➡) to change the selected setting.



When finished, press the red button to return to **Settings**.

Setting the measurement units

Cover depth and bar size can be displayed in millimetres or inches to suit local requirements.

A third option is provided to display cover depth in arbitrary units (0-1000). This scale is used with custom depth tables.

To change measurement units, go to **Settings** and then select **Measurement**. Scroll to **Cover units** and press the middle yellow button to change the setting.



MAINTENANCE

Maintenance

MC8022+ should be kept clean using a damp cloth. Do not immerse in water. Do not use solvent or abrasive cleaners.

The bottom of the probe is protected by a replaceable yellow plastic plate. This will wear as the probe is run over concrete. It should be peeled off and replaced periodically to protect the main probe housing. Self adhesive replacements are included in each MC8022+ kit and spares are available direct from Kolectric Research.

Certification

The MC8022+ Covermeter should be tested for compliant performance periodically; the recommended interval is 12 months. Complete units should be packed appropriately and returned to Kolectric Research for testing and certification.

There are no user serviceable components inside the equipment and opening the equipment voids any warranty.

MEASURING COVER

Use the following process to measure cover:

1. Connect and Calibrate the probe
2. Set the measurement range
3. Set the bar size
4. Locate the bar
5. Read the cover depth

Connect and Calibrate the probe

Calibration must be performed every time you switch the instrument on.

To remind you, the **Cover depth** display will show 0 mm (0.00 in) until calibration is performed.



Connect the probe cable to the connector on the right hand side of the MC8022+. Align the white index marks on the connectors, push the plug onto the instrument connector, then turn the locking ring in the direction of the green arrow. Press the red button to switch on the MC8022+.

Calibrate the instrument by holding the probe in the air at least 1m away from metal objects and magnetic fields, such as keys, rings or coins, fluorescent lights, mobile phones or computer screens.



Press and release the left hand yellow button (**CAL**). The instrument will beep when the button is pressed and beep again when calibration is complete. The display changes to show a value around 160 mm (Lo) or 220 mm (Hi) depending on the range and bar size selected.

“Cover depth at limit” is shown to indicate that the reading is outside the specified measurement limits of the instrument.



Move the probe towards a metallic object and note that the cover depth display gradually changes to a lower value.

These simple checks confirm that the instrument is functioning and ready for use. If required, a sample rebar of known diameter can be used for a more complete confirmation of operation.

To get the best possible results, calibration should also be performed periodically if you are making large numbers of measurements and especially before making measurements of deep cover.

Set the measurement range

The MC8022+ has two measurement ranges – High and Low. Change range by pressing the right hand yellow button (**Range**). An indicator on the right-hand side of the screen shows **Hi** or **Lo**.

The High range is more sensitive so it can measure greater cover depths. When locating a bar or measuring cover, you should normally use the High range to avoid missing deep bars. However, when trying to find the orientation of bars that are closely spaced, try the Low range because it is less affected by nearby bars.

Bar size	Maximum cover	
	Hi range	Lo range
6 mm	110 mm	70 mm
40 mm	185 mm	90 mm

Set the bar size

Cover measurement is only accurate if the bar size is known reasonably precisely.

If you know the bar size, press the middle yellow button (**BAR**) to set the value shown on the **Cover depth** page. Pressing (**BAR**) selects the next available bar size. In the picture, the bar size has been set to 16 mm.



To locate a bar and estimate its size automatically, see “Automatic bar sizing” below; this will set the current bar size to the measured value.

Quick bar location

To quickly find the approximate position of a bar, look at the top of the probe whilst slowly sweeping the probe over the search area.

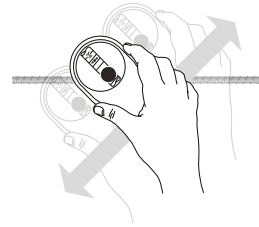
The red bar indicator light flashes briefly when the signal detected from a bar is near its peak and this can be used as a quick guide to bar location.



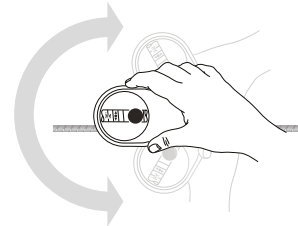
For more precise location follow the procedure below.

Precise bar location and cover measurement

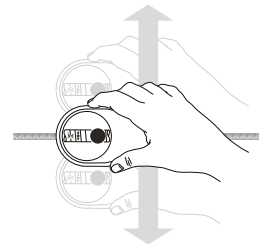
Hold the yellow face of the probe flat against the concrete surface. Move the probe over the surface whilst watching the cover depth display. The probe is positioned roughly over a bar when the cover depth reading is at its lowest.



Keeping the probe over the same spot, rotate it around its centre. When the lowest cover reading is seen, the probe body has been aligned with the direction of the bar.



Now the bar orientation is known, slowly sweep the probe, keeping it parallel to the bar. The lowest cover reading will now correspond to the centre line.



Once you have found a bar and aligned the probe to it, you can read the cover depth from the display.

If you want to log this cover reading, press the yellow button on the probe. This will record the cover depth, bar size, time and date and can be viewed on the MC8022+ or downloaded to a PC later if required. (See Data logging, below)

For maximum precision follow the same procedure but instead of watching for minimum cover, look for maximum signal strength reading.

Signal strength is shown below the main cover depth readout, in smaller numbers – 1854 in the picture.



The signal strength reading is at its greatest when the probe is aligned with the centre line of a bar. When this position and alignment is found, read the cover as before.

In some situations an alternate method is useful to map out the orientation of bars. First sweep the probe in a straight line until you find a bar (bar indicator light / lowest cover / maximum signal). Mark this position. Now perform a second sweep in the same direction but some distance from the first and again mark the bar position. A line drawn between these marks gives the orientation of the bars. Keeping the probe parallel to the bar orientation, perform a third sweep to find the centre of the bar. The location of parallel bars can now be marked by extending the sweep either side of the first bar.

Audio cover mode

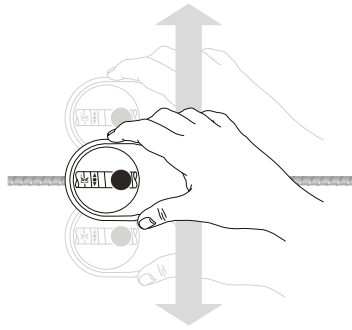
MC8022+ has an audible indication of detection strength which helps to locate bars without having to watch the display. To use Audio cover indication, go to **Settings**, select **Audio** and set **Mode** to “Cover”. You can also adjust the volume from this menu.



Now when you sweep the probe over the search area, you will hear a tone that increases in pitch as you get closer to a bar and reaches its highest pitch when the probe is aligned with the bar.

Set the audio **Mode** to “Off” to stop the tone.

AUTOMATIC BAR RESIZING



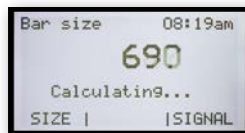
The MC8022+ can be used to automatically calculate the size of covered rebar.

First, align the probe with the centre line of the bar to be measured using the bar search process above.

Keeping the probe in the same position, press the red button to select the **Bar size** page. Initially this will show the detected signal level. You can adjust the position of the probe so that the reading is at its highest indicating the best alignment of the probe with the bar.

Whilst keeping the probe completely still in this position, press the left yellow button (**SIZE**) to calculate the bar size.

When the process is complete, the display shows the bar size. The instrument will indicate if the target bar is too near or too far to complete the calculation. If the bar is too near, a plastic spacer can be used to hold the probe away from the bar.



Press the right yellow button (**SIGNAL**) to show the detected level again to repeat the process.



Press the mode button to change back to cover depth mode and note that the bar size shown in the top right of the display has been updated automatically, ready for cover depth measurements.

LOW COVER SCANNING

The MC8022+ can be used to quickly check a large area for sufficient cover. You can set the minimum acceptable cover and the MC8022+ will sound an audible alarm if an area of lower cover is detected.

To use Low Cover Scanning, configure the MC8022+ as follows:

Press the red mode button to show the **Settings** page, then select **Audio**. Press the middle yellow button (➡) to change the audio **Mode** to "Low cover".

Adjust the volume according to the environment.



Move to the **Low Cover** setting and use the middle yellow button (➡) to select the required cover depth, pressing and holding the button to rapidly step through the available cover range.

Press the red button twice to return to the **Cover depth** display.

Sweep the probe over the area to be checked. An alarm is heard if a bar is detected with low cover.

Turn off Low Cover mode from the **Audio** menu when the search is complete.

CUSTOM COVER TABLES

The MC8022+ can be used to assess cover over non-standard bar, pipes or other inclusions in pre-fabricated structures. This process requires preparation of a custom depth table and setting the measurement units to an arbitrary scale of 0-1000. Contact your Kolectric reseller for advice on using custom cover tables.

MC8022+ can log cover readings as you make them so that you can review them later or download them to a PC.

Prepare for Data logging

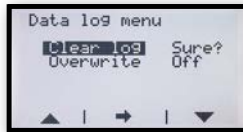
Before starting a new set of measurements, prepare as follows.

Turn the MC8022+ on. Check the time displayed on the **Cover depth** page and make adjustments, if necessary, using the **Data and Time** menu in **Settings**.

The MC8022+ can store 2000 readings. It is good practice to regularly review or download the data you need and then clear the memory on the MC8022+.

First, check that you have reviewed or downloaded any previous logged data that might be needed.

Go to the **Settings** and select **Data log**.



Select **Clear log** – the display will show “Sure?”. Select **Clear log** a second time and all stored readings will be deleted. Press the red button to exit without clearing the log.

The **Overwrite** option can be used so that the MC8022+ always stores the latest readings and automatically deletes older readings as new ones are logged. Switch this option on to overwrite old data. When **Overwrite** is switched off, the MC8022+ will stop logging when the memory is full, protecting previous readings.

Logging Cover readings

When measuring cover, press the yellow button on the probe to log the current cover depth. The instrument beeps to confirm that the data has been recorded and the display briefly shows “Log” below the bar size.



Reviewing Cover readings

To review logged data on the MC8022+, press the red button to display the **Data log** page.



The display shows the latest recorded reading. To see older readings press the right-hand yellow button (▼); to see newer readings use the left-hand yellow button (▲).

Downloading

The optional MC8022+ download kit includes a USB cable and software to transfer logged data to a PC. Follow the instructions in the next section to install it on your PC.

To copy logged cover readings to a PC, first unplug the probe cable and connect the download cable to the right-hand connector on the MC8022+. Plug the other end of the download cable into your PC's USB port.

Run the download software using the shortcut “Kolectric MC802x download”.

Click the Download button. The logged data appears in the download software window.

To save the data to your PC, click “Save File” and choose a suitable filename. By default, this will save all the downloaded data. To save a specific range of data, enter the first and last required record numbers before clicking Save File.

When all the data required has been downloaded and saved, clear the Covermeter's memory by clicking “Clear Log”. This removes all logged data from the MC8022+.

You can also set the MC8022+ time and date from the download software.

The MC8022+ Download Kit includes software to copy logged cover readings onto a PC using a USB cable. If your MC8022+ kit was not purchased with the download cable and software, it can be purchased directly from Kolectric Research.

Kolectric download software is designed for Windows 10 or Windows 7. You may need administrator rights to successfully install the software. Ask your IT advisor if in doubt.

Install the software BEFORE connecting the download cable.

Insert the USB memory stick into your PC. Open the root folder for the USB disk and run 'setup.exe'.

Follow the on-screen instructions.

When the installation is complete, plug the download cable into the right-hand connector on the MC8022+ (disconnect the probe cable first). Connect the other end of the cable to a USB port on your PC. Switch the MC8022+ on.

The software creates a new program shortcut: “Kolectric Research | Kolectric MC802x download”

Run this to start the software.

SPECIFICATION

Cover Measurement

Cover depth indicated is from the bar surface. Performance meets or exceeds the requirements of BS1881 part 204:1988 when instrument has been tested and certified compliant by Kolectric Research and is operated according to this user manual.

Bar Size	Cover Range	Cover depth	Accuracy
6 mm bar	5 mm – 108 mm	up to 60 mm cover	±1 mm
40 mm bar	22 mm – 185 mm	up to 120 mm	±2 mm
		up to 160 mm	±3 mm
		over 160 mm	±4 mm

Automatic Bar Sizing

Accuracy	± 0.5 mm – ± 1.5 mm
Resolution	0.1 mm
Minimum Cover	8 – 22 mm depending on bar size
Maximum Cover	80 mm (40 mm bars); 60 mm (6 mm bars)

Bar Resolution

Bar resolution is dependent on bar size and cover. Typical examples of resolution performance are shown:

Bar Size	Cover	Minimum Spacing
16 mm	60 mm	70 mm
16 mm	100 mm	110 mm
25 mm	130 mm	150 mm

Operating Parameters

Operating Weight	800g (instrument+probe+cable)
Operating Temp	-10°C – +50°C
Battery Operation	20 hrs typical
Full Charge	3 hrs typical
Battery Charger	110 – 240V AC
Ingress Protection	IP65

REPAIR AND DISPOSAL

Repair

There are no user-serviceable components inside the equipment. Opening the equipment voids any warranty.

If you damage your MC8022+ or it malfunctions during the warranty period, please contact your reseller or Kolectric Research directly to arrange for assessment and repair.

Recycling

MC8022+ contains sophisticated electronics which include valuable materials which can be recovered by an appropriate waste electrical and electronic equipment (WEEE) recycling process. The equipment is marked with the crossed-out wheeled bin symbol to remind you to recycle the equipment separately from household waste.

Battery

MC8022+ contains a lithium-ion battery pack. This is designed to last the lifetime of the instrument and must only be replaced, or removed for disposal, by Kolectric Research, a qualified service agent or an authorized WEEE recycling centre. Damaging the battery may result in catastrophic failure, fire and serious personal injury.

Further details are available directly from Kolectric Research.

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