

# CELLCORDER™

## CRT-400 Cell Resistance Tester



### Quick Start Instructions Operating Instructions

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590-2093-501A / SL-29408 / 4200-049 R3

## Powering On the Cellcorder

1. Press and release the green **Power Key**.

**Power**



2. The firmware version number appears.

```
System Initializing
* o o o o
Flash Vers.##.#####
Boot Vers.##.#####
```

3. If readings are in temporary storage, messages appear.
4. To save readings, insert the USB flash drive and press **Yes/F1**. Whether you select **Yes** or **No/F2**, readings stay in memory.

```
Readings are in
temporary storage.
Save readings to
the USB device?
YES NO HELP
```

5. To clear readings from the memory, press **Yes/F1**. Do this if you are starting a new set of readings.

```
Do you want to erase
the readings from
temporary storage?
YES NO
```

6. To keep readings in memory, press **No/F2**. Do this if you are not finished taking readings or want to examine the readings.

7. The **Main Menu** appears.

```

CELLCORDER
CRT-400

TEST VIEW LOAD CRT
MODE RESULTS DATA SETUP
```

**Note:** It is highly recommended that the calibration constants are saved to the USB flash drive.

## Powering Off the Cellcorder

1. Press and hold the green **Power Key**.

Power



```
System is now
shutting down
3
```

```
System is now
shutting down
2
```

```
System is now
shutting down
1
```

```
Release
Power Button
```

2. Powering off doesn't automatically delete voltage or resistance readings from memory.
3. If readings are in memory, you are prompted to save them.

```
Readings are in
temporary storage.
Save readings to
the USB device?
YES NO HELP
```

```
Do you want to erase
the readings from
temporary storage?
YES NO
```

## Taking Voltage Readings

1. Connect the voltage probes to the Cellcorder and select **Test Mode/F1**.

```
CELLCORDER
CRT-400
TEST VIEW LOAD CRT
MODE RESULTS DATA SETUP
```

2. From the Test Mode menu, select **F1-Voltage**.

```
Test Mode
F1 - Voltage
F2 - Resistance
F3 - S.G./Temp.
VOLT RES SG/TEMP BACK
```

3. If "**Resume Test**" appears, put the probes on the cell.

```
CELL 001
13.50 Volts
(RESUME TESTING)
DVM DONE
```

## Warning

Don't measure voltages greater than 20V DC.

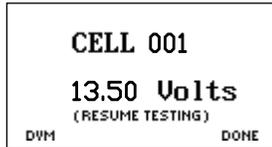
4. If "**Stored in Memory**" appears, retest the cell or change the cell number by typing a number and pressing **Enter**.

```
CELL 001
13.50 Volts
(STORED IN MEMORY)
DVM RETEST DONE
```

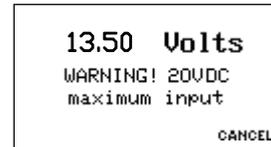
5. When the unit beeps, remove the probes. The cell number advances automatically to the next cell.

## The Cellcorder is also a Digital Voltmeter (DVM)

1. In the voltage mode, select **DVM** by pressing the **F1** button.

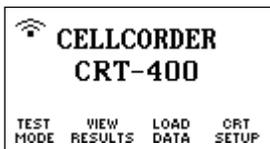


2. The screen displays the measured voltages.
3. Readings are not saved in **DVM** mode.

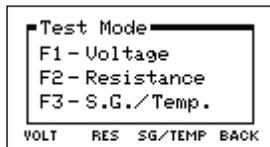


## Taking Resistance Readings

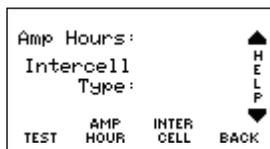
1. Connect the resistance test leads to the Cellcorder and select **Test Mode/F1**.



2. From the **Test** menu, select **F2-Resistance**.



3. Select the **Amp Hour rate/F2** of the cell being tested. Specify the number of **Intercell connections/F3** per cell.



4. Select **Test/F1**.

CELL - ###	Uc( )	
##.### Uc	Ric1)-----	$\mu\Omega$
Rc	Ric2)-----	$\mu\Omega$
##### $\mu\Omega$	Ric3)-----	$\mu\Omega$
	Ric4)-----	$\mu\Omega$
		DONE

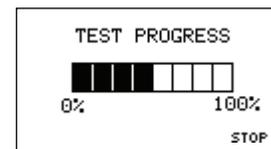
(mem) Voltage Readings Stored in Memory  
(act) Actual Voltage Reading

Up to 4 Intercell Readings

### No VFloat Readings Exist. Now What?

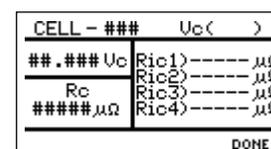
If "No VFloat readings exist. Are you sure you want to continue?" appears. Choose **No/F2**, read voltage, then resume resistance testing. Reading voltage before resistance results in more accurate voltage readings because skewing is not a factor. If you choose **Yes/F1**, voltage and resistance are read concurrently. Concurrent readings are subject to the skewing effect.

5. Connect the leads to the cell. See lower-left for some examples; refer to the CRT-400 User's Guide for more details. Press the orange **Test** button. The display shows test progress.



6. When the unit beeps, remove the probes. When leads are moved, the cell number advances automatically to the next cell.

7. When finished testing, press the **Done/F4** button.



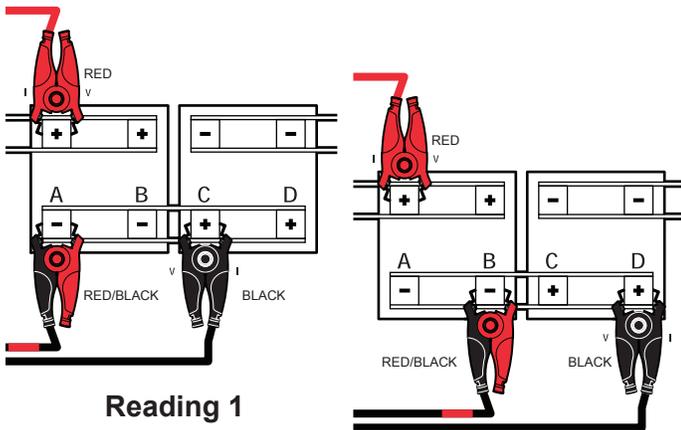
## Connecting the Resistance Leads

These figures show connections for dual post cells.

- Take two readings.

Read with the intercell leads connected from terminal posts A to C.

Then read with the intercell leads connected from terminal posts B to D.



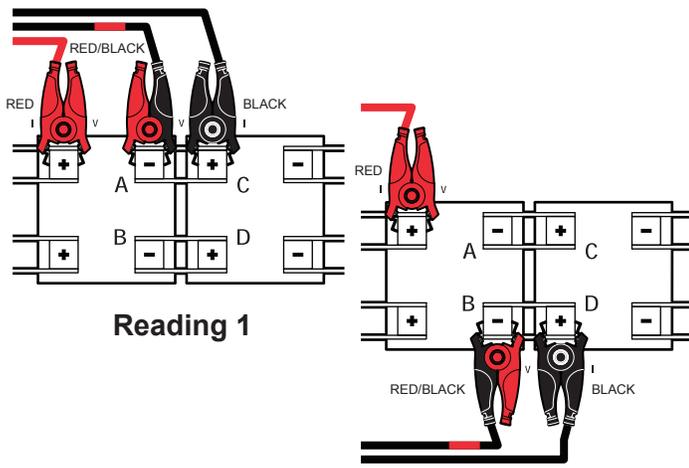
Reading 1

Reading 2

- Take two readings.

Read with the intercell leads connected from terminal posts A to C.

Then read with the intercell leads connected from terminal posts B to D.



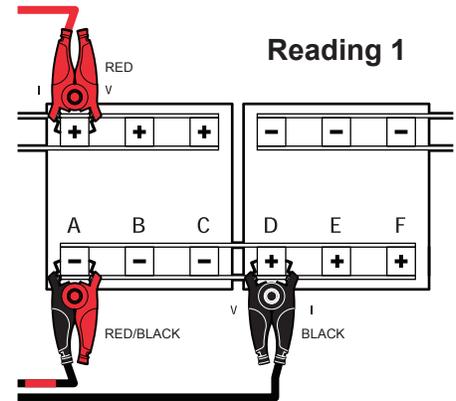
Reading 1

Reading 2

These figures show connections for triple post cells.

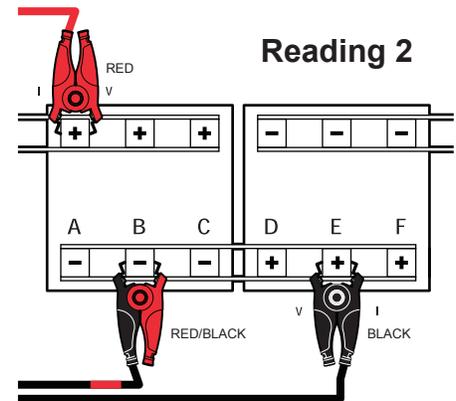
- Take three readings.

Read with the intercell leads connected from terminal posts A to D.



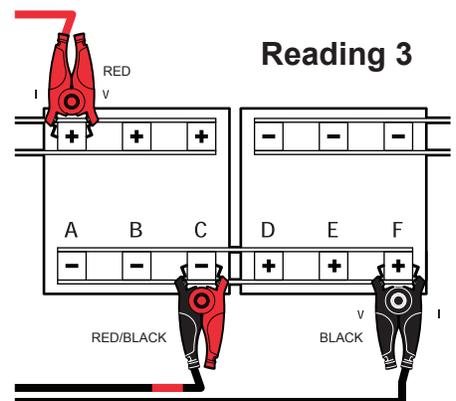
Reading 1

- Then read with the intercell leads connected from terminal posts B to E.



Reading 2

- Then read with the intercell leads connected from terminal posts C to F.

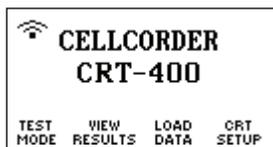


Reading 3

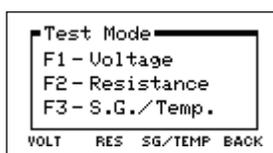
## Transferring Specific Gravity and Temperature Readings

1. On the CRT-400, select a cell data file to transfer **Specific Gravity** and **Temperature** readings into. This can be readings that already exist in memory or you can open a previously saved set of readings from the USB flash drive.

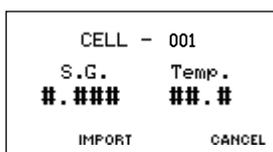
2. From the **Main Menu**, select **Test Mode/F1**.



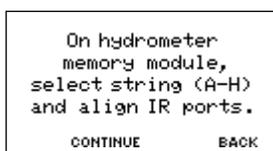
3. From the **Test Mode** menu, select **F3-S.G./Temp.**



4. From the **SG/Temp** screen, select **Import** by pressing **F2**.

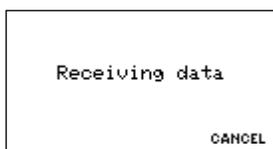


5. On the **Data Module**, select a channel (**A-H**) of data to transfer.

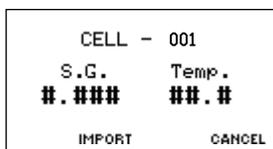


6. Align the **Data Module** and **CRT-400 IR port**.

7. On the CRT-400 press **F2** for **Continue**.



8. When transfer is done, the **S.G./Temp.** value from Cell 1 appears.



9. Select **Import/F2** to save the file to the USB flash drive.

## Saving the Readings

### Saving New Data Readings to the USB Flash Drive

1. Make sure the Cellcorder has been charged properly.
2. The USB flash drive may be placed into the left side USB port on the Cellcorder before or after the Cellcorder is powered on.
3. Follow the prompts on the Cellcorder's LCD accordingly.
4. When prompted to save readings to USB flash drive, select **Yes/F1**.
5. Follow the prompts and enter the file name and select **Save/F2**.
6. If the file already exists, a **Warning** displays, asking for overwrite confirmation. Press **F1** to overwrite the file or **F2** to enter a new file name.
7. The USB flash drive has now stored the new data.

**Note:** Do not remove the USB flash drive while accessing data, writing to a file, reading information, etc.

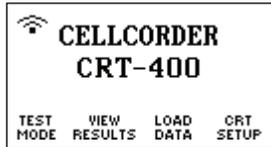
### Warning

Never leave the USB flash drive plugged into the Cellcorder when performing tests or while the Cellcorder is connected to a battery for testing.

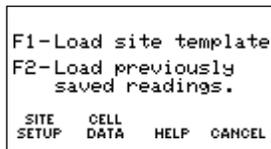
Readings cleared from Cellcorder temporary storage cannot be retrieved unless they have been saved to the USB flash drive or PC.

### Loading Data Readings from the USB Flash Drive

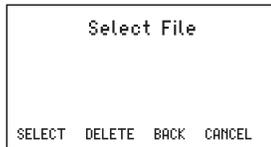
1. Insert a USB flash drive with readings into the Cellcorder. From the Main Menu, select **F3-Load Data**.



2. Select **F2-Cell Data**.



3. **Select-F2** the file from the list provided.



### Recommended Steps to Save CAL-K

The **CAL-K** are calibration constants that are utilized for calibration correction during calibration. In the event these constants are lost, they can be restored easily.

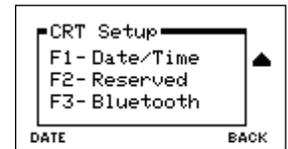
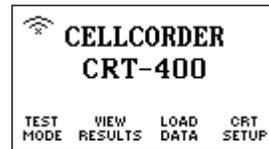
It is highly recommended that the calibration constants are saved to the USB flash drive.

To save the constants:

1. Make sure the CRT is powered on.
2. Select **Shift**, then the number **7** from the keypad.
3. Enter the password '**1234**' and press **Enter**.
4. Select **Calibration** by pressing the number **1** on the keypad.
5. Choose **CAL-K** by selecting **F2**.
6. Select **F2** once again to confirm the **Backup**.
7. Enter a File Name and select **F2** to so **Save**.

### Using the *Bluetooth*® Headset

1. Make sure the CRT and the *Bluetooth* wireless headset are charged properly.
2. Power the *Bluetooth* headset on.
3. Power the CRT on. The CRT automatically attempts to connect to the last stored wireless device when powered on.
4. To connect manually to a stored headset, select **CRT Setup/F4** and use the down arrow key to go to **F3-Bluetooth**, press **F3**.

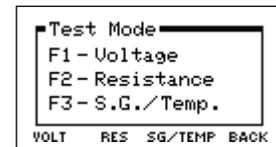


5. The last stored device will display, press **F2** to connect.
6. When connecting to a new headset:
  - a. Press **F1-New**.
  - b. Now press **F1-Headset**.
  - c. Place the *Bluetooth* device in discovery mode.
  - d. Press **F2** to **Continue**.
  - e. When *Bluetooth* devices are found, a list is populated.



Use the arrow keys to select the desired *Bluetooth* device and press **F1**.

7. Once the *Bluetooth* headset and the CRT are connected, press **F1-Test Mode**.
8. Choose the desired test by pressing either **F1, F2, or F3**.



9. Place the *Bluetooth* headset on your ear for test status information.

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