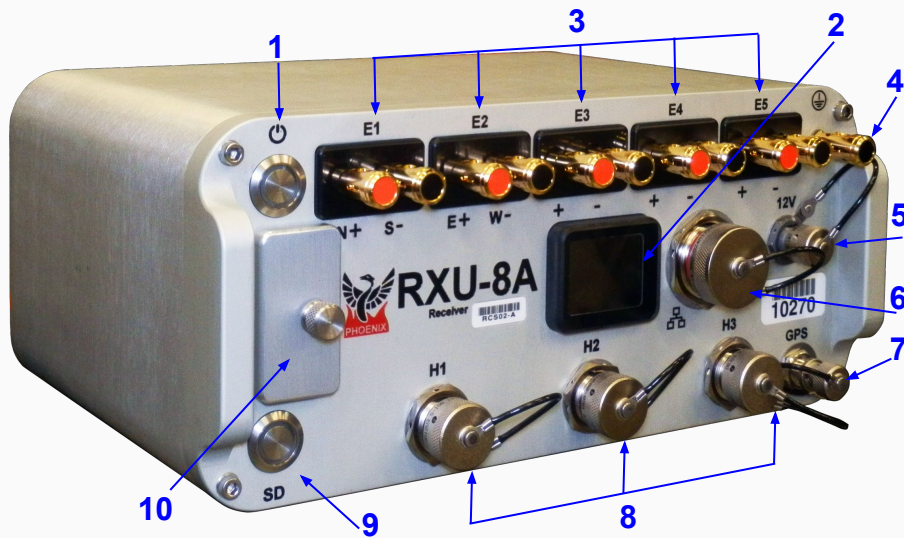


# RXU-8A

## Quick Start Guide for MT



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## Components

1	Power/Record button and indicator
2	Display
3	E1 (Ex) electrode connectors E2 (Ey) electrode connectors E3 electrode connectors E4 electrode connectors E5 electrode connectors
4	Ground electrode connector
5	12VDC power input
6	LAN connector
7	GPS antenna connector
8	H1 (Hx) magnetic sensor connector H2 (Hy) magnetic sensor connector H3 (Hz) magnetic sensor connector
9	SD card button and indicator
10	SD card slot and cover

# RXU-8A

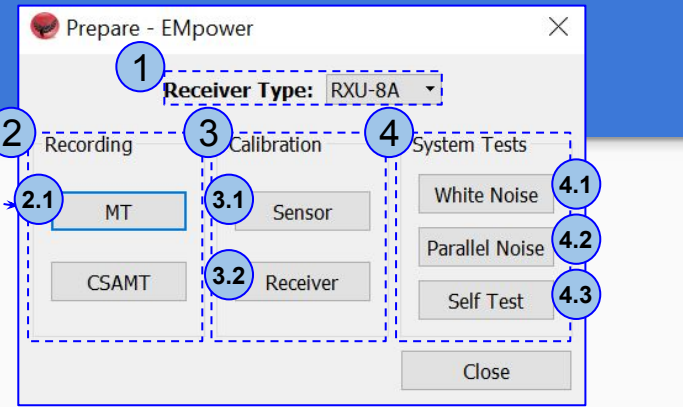
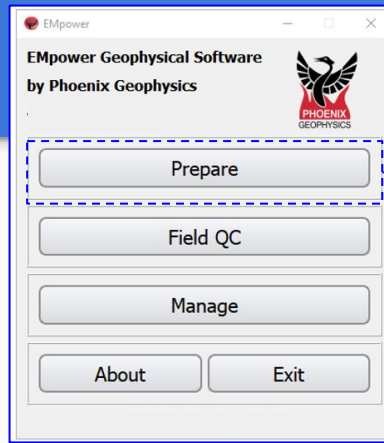


Designed with flexibility in mind, the RXU-8A can be used as a regular MT receiver, where the extra electric channels can be used to acquire a redundant recording on the same site or to acquire an adjacent site.

Excellent choice for controlled source acquisitions that require a large density of electric channels. The RXU-8A can also work for special applications where extra electric inputs might be needed.

This manual is intended for MT operations. The RXU-8A can also be used for CSAMT recordings. For more information on CSAMT consult the [\*CSAMT Operation manual\*](#) (DAA31).

# Creating a Configuration File



Open **EMpower** and click the **Prepare** button

## 1. Select the **Receiver Type**

## 2. **Recording**

### 2.1. **MT - Configuration Creator**

Use the Calibration and System Test options needed

## 3. **Calibration**

### 3.1. **Sensor Calibration**

### 3.2. **Receiver Calibration**

*\*No additional configuration needed*

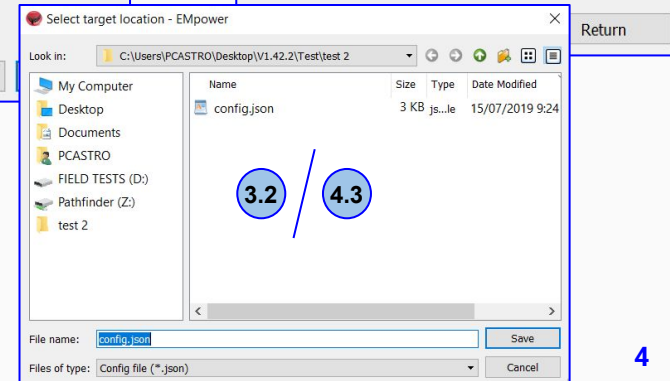
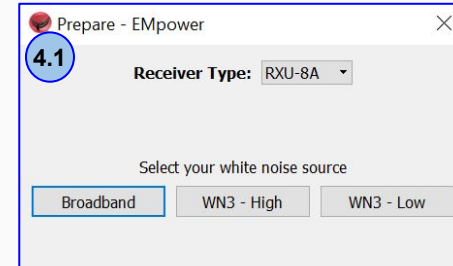
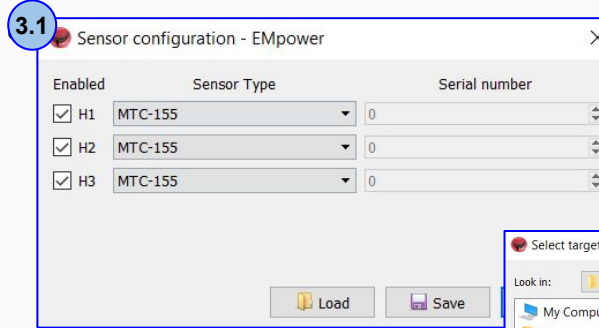
## 4. **System tests**

### 4.1. **White Noise**

### 4.2. **Parallel Noise - Configuration Creator**

### 4.3. **Self Test**

*\*No additional configuration needed*



# Creating a Configuration file - MT acquisition

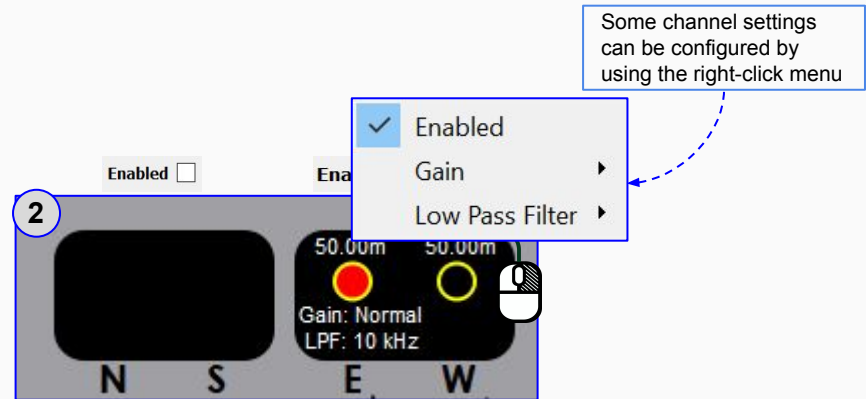
1. Check that the **Receiver type** is **RXU-8A**
2. Select the **Schedule**
  - 2.1. **Manual** or **Automatic Start**
  - 2.2. Or for a specific schedule use, **Single Shot**, **Daily** or **Weekly** and click **Add Schedule** to define the time and date
3. **Ethernet port** (consult the [Remote Networking manuals](#))
4. **Channels Settings**
5. Define the Receiver Settings
  - **Sampling Mode**
  - **Sampling Rate**
6. **Configuration Layout**

The screenshot shows the EMpower configuration software interface. The main window is titled 'Configuration Creator - EMpower'. The 'Schedule' menu is open, showing options: Manual (Ctrl+Alt+1), Automatic Start (Ctrl+Alt+2), Single Shot (Ctrl+Alt+3), Daily (Ctrl+Alt+4), Weekly (Ctrl+Alt+5), and Add Schedule (Ctrl+A). The 'Magnetic channel settings' section is expanded, showing 'Enabled' checked, 'Sensor Type' set to MTC-155, 'Gain' set to Normal, 'Low Pass Filter' set to 10 kHz, and 'Sensor S/N' set to 0. The 'Receiver Settings' section shows 'Sampling Mode' set to 'Sparse high frequency sampling' and 'Sampling Rate' set to '24kps High'. The 'Configuration layout' section shows 'Layout Geometry' set to 'Orthogonal'. The 'RXU-8A Geophysical Receiver' hardware is shown with a 'Live Tool' button and three 'MTC-155' sensors. A text box at the bottom of the configuration window states: 'This section is used for inputting the parameters and instrument details that will be used for the recording'. A red warning icon is present in the bottom left corner of the overall image.

To use the magnetic sensor data from a different recording or use a remote reference, all recordings **must** have a matching Sampling Mode and Sampling Rates. Otherwise, EMpower will not allow to process data using borrowed channels or remote reference

# Creating a Configuration File - Electric Channel Settings

1. Select the **Electric** channel
2. **Enable or Disable** channel(s)
  - Disable channels that you do not plan to use during the recording. This will save space on the SD card.
3. Select the desired **Gain** and **Low Pass Filter**
  - For most applications, Normal Gain and 10 kHz LPF are best
4. Type **distances to the electrodes** of this channel if known
  - if not, they will need to be corrected later before data processing



# Creating a Configuration File - Magnetic Channel Settings

## 1. Select a **Magnetic** channel

## 2. **Enable or Disable** channel(s)

- Disable channels that you do not plan to use during the recording. This will save space on the SD card.

## 3. Select the correct **Sensor Type**

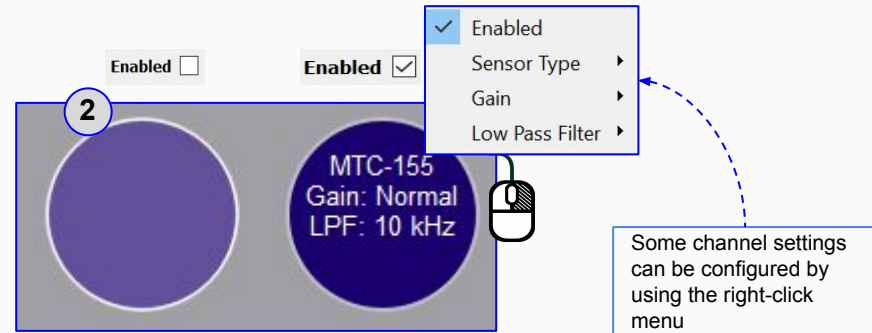
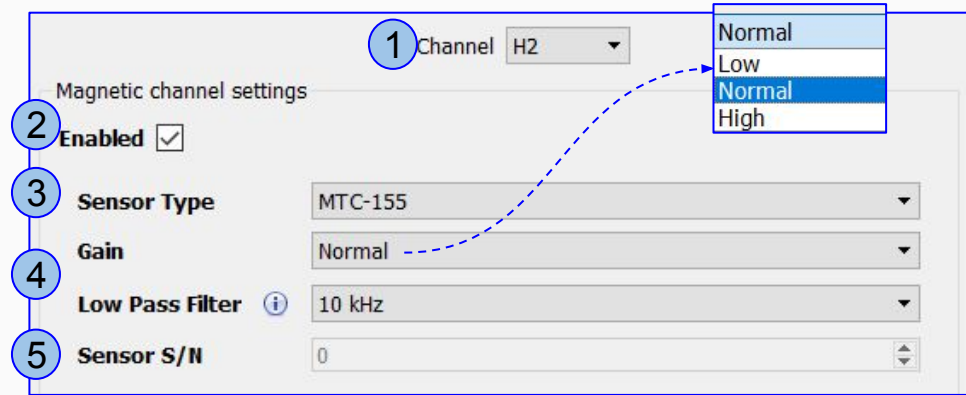
- If the sensor type is incorrect in the configuration file, the receiver will display a warning message. However, the recording will not be interrupted

## 4. Select the desired **Gain** and **LPF**

- For most broadband applications with MTC-100 series sensors, Normal Gain and 10 kHz LPF are best

## 5. Type the **Serial Number** of the sensor if required

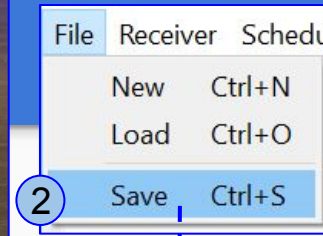
- There is no need to type serial number for sensors MTC-155/MTC-185, since it will be automatically detected by the receiver.
- For older sensors, type the serial number of each sensor. If you don't know this information in advance, keep field notes to add this information later, after the recording is imported into EMapower



# Saving a MT Configuration File

## 1. Insert the SD Card

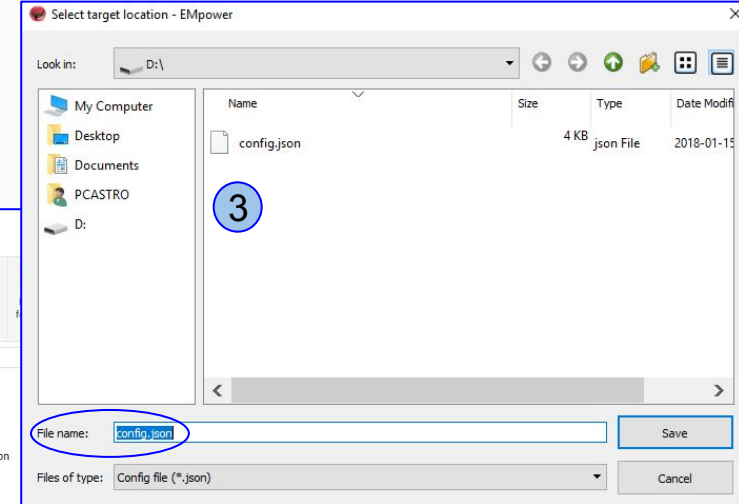
- The computer must be equipped with an SD card slot or use a USB card reader



## 2. Click the **File** menu

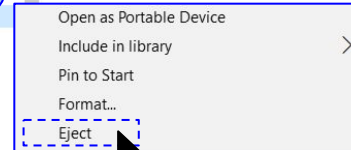
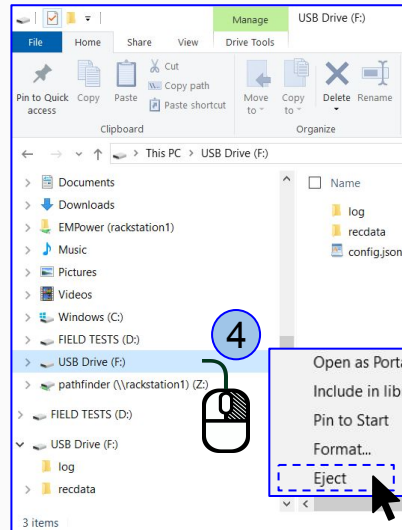
- **Save or Ctrl+S**
- **Select the SD card**
- **EMpower** will automatically create the file "**config.json**"

## 3. Save the configuration file (**config.json**) in the root folder of the **SD card**



## 4. Open the file explorer

- Right click **SD card** drive
- **Select Eject** option
- **Pull out the SD Card**








# RXU-8A

## Connection - Single site MT

Start by connecting:

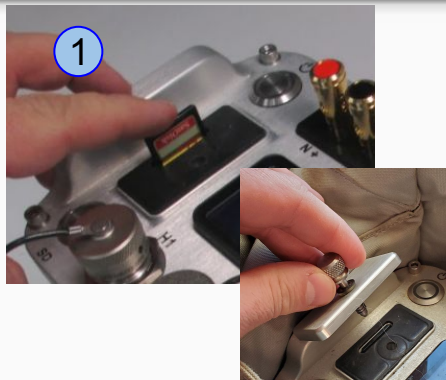
1. Ground electrode
2. Electrodes to channel **E1**(Ex) (N+, S-) and channel **E2**(Ey) (E+, W-)
  - Channels E3, E4, E5 are normally not required in a conventional Single site MT survey
3. Magnetic sensors to channels **H1**(Hx), **H2**(Hy) and **H3**(Hz)
4. GPS antenna
5. 12V DC Power Source
6. Network connector

 In the field, it is often most efficient to connect the components to the receiver following the order on the right

# SD Card - Recording Data



## Recording

1. Insert the **SD card** and close the cap
2. To turn on the receiver, press the **Power** button briefly, wait until both **LEDs** are solid blue
  - 2.1. LED pattern for **Automatic Start** recording
3. If the schedule type was configured as **Manual**, press the **Power** button briefly and release to start recording



*\*For any problems with the SD Card, check the [DAA24 System Troubleshooting manual](#)*

### Indicators

 *Rapid, equal pulses*  
 *Solid color / Off*

The receiver auto-detects serial and model for magnetic sensors of the new generation (MTC-155/185). The information about the sensor is updated on the receiver screen only at power on and right after each recording starts.

- 2 Briefly press and release the power button

	Starting	Acquiring GPS	Ready
Power	 		
SD			

### 2.1 Automatic Start

*The recording starts automatically according to the schedule*

	Recording
Power	 
SD	 

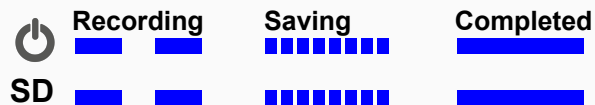
- 3 Briefly press and release the power button

	Ready	Channels Detection	Recording
Power		 	 
SD			 

# Stopping a recording

1. Press the **Power** button briefly and release to stop recording
  - Wait until both LEDs are steady blue
2. Turn off the receiver by pressing the **Power** button for a few seconds, until the **LEDs** will flash red
  - Wait until both **LEDs** turn off
3. Eject the **SD card**
  - Press the **SD card** and release, pull the **SD card**



- 1 Briefly press and release the power button



- 2 Keep pressing the power button 3 sec and release

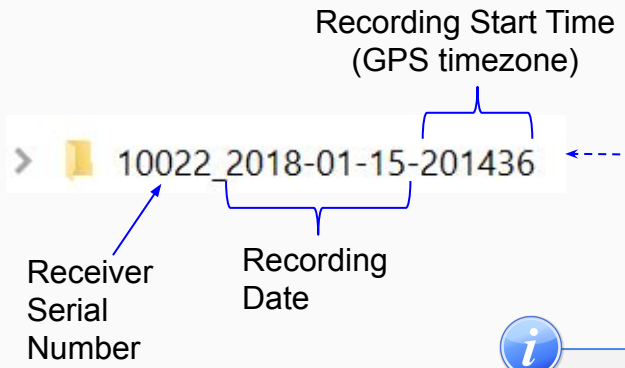
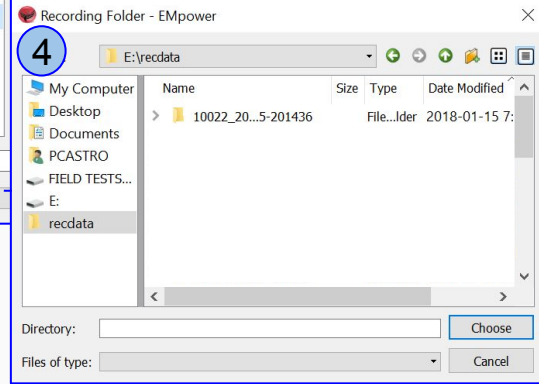
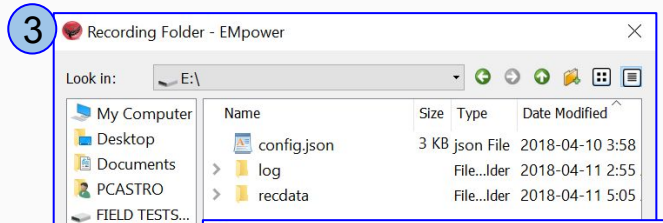
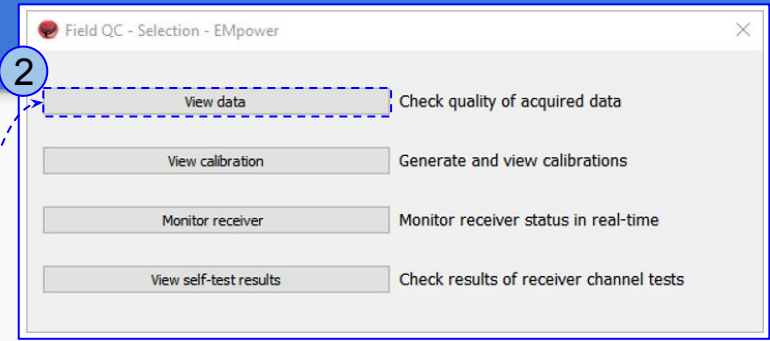
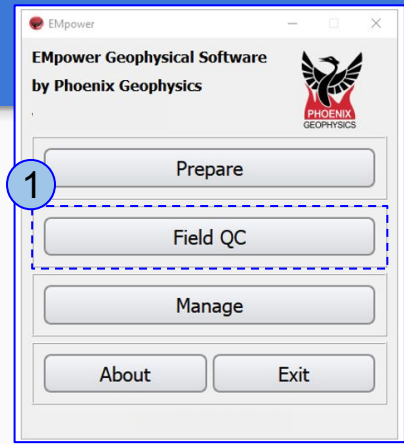



## Indicators

-  *Rapid, equal pulses*
-  *Solid color / Off*

# Importing - Field QC

1. Click the **Field QC** button
2. Select **View data**
3. Select the **SD card**
  - The recording creates two folders, log and recdata
4. Open the **recdata** folder
  - Select the recording file
  - Click **Choose**



 To manage data the "Manage" section can be consulted.

## Review and Process the recording information

1. Review the Electrode **Resistance** values and make the necessary corrections

- Electrode **Distance (m) to GND**
- **Polarity**
- **E-Azimuth**
- **External Filter**

2. Ensure that the magnetic sensors were detected and make the necessary corrections

- **Serial #**
- **Polarity**
- **H1-H3 Azimuth**

3. View Recording Details (see page 16)

4. After reviewing the information, **Process** the data (see next page)



*The warning icon indicates that something might be wrong with the recording, review the recording information and make necessary changes if needed. Hover mouse pointer over the warning icon for more information.*

Field QC - EMpower

S7\_1 5C (21h 32m 56s)

Status:  Approved  Unapproved  Rejected

Tools: Time Series Spectra Process (Orthogonal)

Recording Information

Recording ID: 10125\_2017-12-03-203322

Start time: Dec 03 2017 12:33:24 (Local) Eastern Standard Time (GPS -08:00)

Duration: 21h 32m 56s

Survey name: Don Campbell

Station name: S7\_1 5C

Operator(s): CF MU and GB

Company name:

Layout Geometry: Orthogonal

Declination: 13.00°

Notes:

Electric Channels

Channel	Distance (m) to GND		Polarity	Resistance (Ω)		Gain	LPF [Hz]	DC [V]
	(+) N / E	(-) S / W		(+) N / E	(-) S / W			
E1	50.00	50.00	<input type="checkbox"/> Inverted	235.522	305.681	4 x 4 = x16	10000	-0.011
E2	50.00	50.00	<input type="checkbox"/> Inverted	231.074	305.313	4 x 4 = x16	10000	-0.014

E Azimuth: 40.00 ° External Filter: None

Magnetic Channels

Channel	Sensor	Detected	Serial #	Polarity	Gain	LPF [Hz]	DC [V]
H1	MTC-80H	Not Present		<input type="checkbox"/> Inverted	x4	10000	0.074
H2	MTC-155	MTC-155	53918	<input type="checkbox"/> Inverted	x4	10000	0.032
H3	MTC-155	MTC-155	53195	<input type="checkbox"/> Inverted	x4	10000	-0.078

H1-H3 Azimuth: 40.00 °

View Recording Details

# Processing MT Data

## 1. Click the **Process** button

- Verify that the channels and references selected are the desired ones

## 2. Define the segment of time series to be processed

- Select the Start and End date/time
- Or by using the arrows to define the time period

## 3. Enable the electric power grid filter that corresponds to the frequency carried by the power lines in the survey region (50Hz, 60Hz or None)

## 4. Click the **Process** button

## 5. A live display of the resistivity curve will appear after a few seconds

*\*This resistivity curve is not saved. It is purely for QC purposes*

The image displays five screenshots of the EMpower software interface, illustrating the steps for processing MT data:

- Field QC - EMpower**: Shows the 'Process (Orthogonal)' button highlighted with a blue dashed box and a circled '1'.
- 10065 Site 2 Serial 10065 - EMpower**: Shows the 'Magnetic Channels' section with Hx, Hy, and Hz selected. The 'Processing timeframe' section shows a time series graph with start and end times. A blue dashed box and circled '2' highlight the time series selection area.
- Magnetics Selection - EMpower**: Shows a warning message: 'Hx and Hy are mandatory channels'. A blue dashed box and circled '3' highlight the warning.
- Channel Selection - ...**: Shows the 'Channel Selection' dialog box with radio buttons for Ex and Ey channels. A blue dashed box and circled '4' highlight the 'Process' button in the background.
- Processing Quarter - EMpower**: Shows a live display of the resistivity curve. A blue dashed box and circled '5' highlight the resistivity curve plot.

# Viewing Recording Details

Review that the following levels are within valid limits for quality control:

- 1. Battery Voltage
- 2. Internal Temperature
- 3. Number of Satellites
- 4. Saturated Frames

- If saturation is not close to ~0%, review the channel configuration (see pages 4 - 6), the channel gain might be too high and/or there is artificial noise on your site

- 5. Time Series Levels for each channel

The screenshot shows the EMpower recording details interface. It includes recording information, instrument details, and various data visualizations. Five callouts are present:

- 1. Battery Voltage:** A line graph showing voltage (V) over time, starting at approximately 12.8V and decreasing to about 12.4V.
- 2. Internal Temperature:** A line graph showing temperature (°C) over time, fluctuating between approximately 17.4°C and 20.4°C.
- 3. Number of Satellites:** A bar chart showing the number of satellites over time, ranging from 6 to 15.
- 4. Saturated Frames - E1:** A bar chart showing the number of saturated frames over time, with most values at 0 and some spikes up to 3.
- 5. Time Series Level - E1:** A scatter plot showing signal (V) over time, with maximum values (red dots) around 1.8V, average values (green line) around 0.2V, and minimum values (blue dots) around -1.2V.

Tag	Board S/N	Model	Firmware	Sat	Signal Ranges	
1	E1	201070	BCM01-I	1001c	~0 % - View	View Levels
2	E2	201071	BCM01-I	1001c	~0 % - View	View Levels
3	H1			0 %	View Levels	
4	H2			0 %	View Levels	



*Please check out the [FAQs](#)*

*<https://phoenixgeophysics.freshdesk.com/>*

*Or email us at: [support@phoenix-geophysics.com](mailto:support@phoenix-geophysics.com)*