

EMpower Data Management



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Recording Library

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Creating / Opening a Project

1. Start **EMpower**

2. Click **Manage**

3. Open or Create a New Project

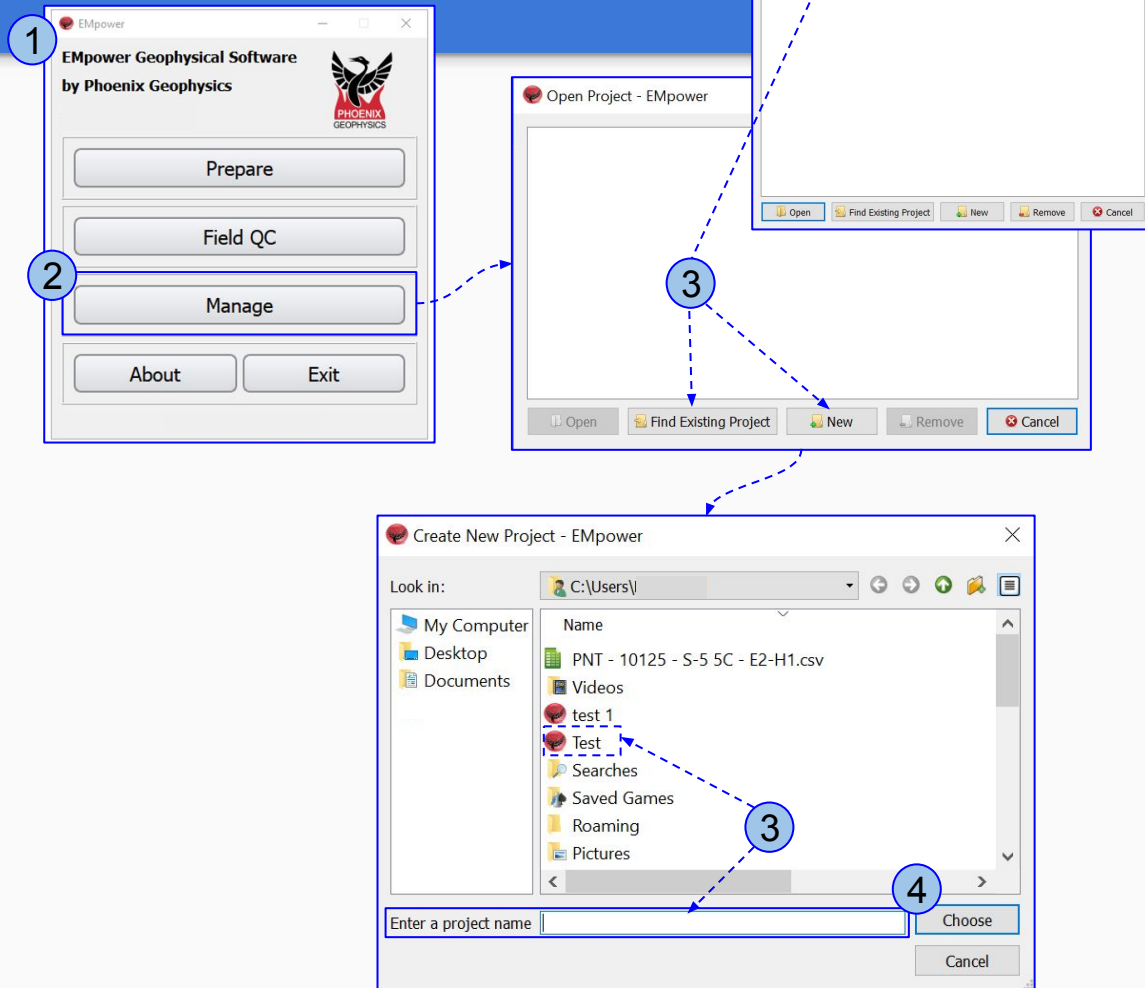
To Open an Existing Project

- Click **Find Existing Project** or select from the list (*previously used*)
- Select the Project

To create a New Project

- Click **New**
- Type the Project Name

4. Click **Choose**



Importing Data / Drag and Drop

Importing Data

1. Select **Import Recordings** from **File** menu

- Select the recording and click **Choose**

Drag and drop

2. Select the **recording folder** in the **File Explorer** window

3. Drag and drop the **Recording data** to the Timeline or Map

4. Wait until charging is completed

The composite image illustrates the data import process in EMPower. It features four numbered steps: 1. Selecting 'Import Recordings' from the File menu. 2. Selecting the recording folder in the File Explorer window. 3. Dragging and dropping the recording data to the Timeline or Map. 4. Waiting until charging is completed. The images show the EMPower File menu, a file selection dialog, a File Explorer window, and the EMPower map interface.



To add a recording from the **SD Card**

- Insert **SD card** in the computer SD Card slot or use an external USB memory card reader

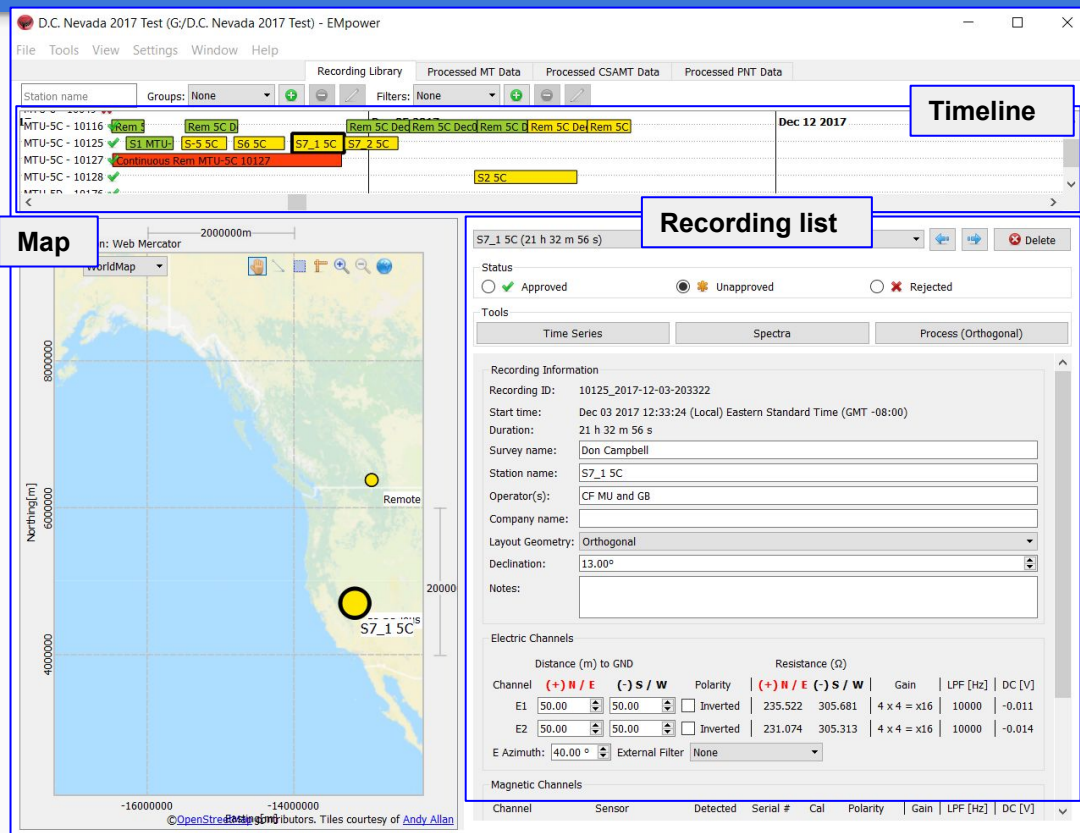
Visual Representation of Sites

- Imported recordings are shown in three synchronized views

- Timeline
- Map
- Recording information

- Visual tracking

Green	Approved
Yellow	Unapproved
Red	Rejected



Selecting a recording in any of the views will automatically update the recording information in the other views

Verifying/Editing Recording Information

The layout and recording information can be consulted and edited using the recording list

1. Review the Recording Information

- Edit the enabled fields, if required

⚠ If a warning is found, consult the [DAA24 System Troubleshooting manual](#)

2. Review the following information:

- Declination
- Dipole length
- The **Azimuth** at which the E and H sensors were laid out
- Use the External filter selector to indicate if an accessory was used during the recording. For details about each specific accessory, consult the manual of such accessory.
- The correct **Calibration** sensor will show a green mark

3. Review the information on **View Recording Details** (see next page)

4. To add more information (such as pictures, documents etc.) click the **Attachments** button

5. Export (see page 10)

The screenshot shows a software interface for recording information. It includes a status bar at the top with radio buttons for 'Approved', 'Unapproved', and 'Rejected'. Below this are tabs for 'Time Series', 'Spectra', and 'Process (Orthogonal)'. The main section is titled 'Recording Information' and contains fields for 'Recording ID', 'Start time', 'Duration', 'Survey name', 'Operator(s)', 'Company name', 'Layout Geometry', 'Declination', and 'Notes'. A dashed blue box labeled '1' encloses the 'Recording Information' section. Below this is the 'Electric Channels' section, which includes a table with columns for 'Channel', 'Distance (m) to GND', 'Resistance (Ω)', 'Polarity', 'Gain', 'LPF [Hz]', and 'DC [V]'. A dropdown menu for 'External Filter' is open, showing options like 'None', 'XPLFH 180-500', 'XPLFH 500-1300', and 'External filter ALP02-'. A dashed blue box labeled '2' encloses the 'Electric Channels' section. Below this is the 'Magnetic Channels' section, which includes a table with columns for 'Channel', 'Sensor', 'Detected', 'Serial #', 'Cal', 'Polarity', 'Gain', 'LPF [Hz]', and 'DC [V]'. A dashed blue box labeled '3' encloses the 'Magnetic Channels' section. At the bottom, there are three buttons: 'View Recording Details', 'Attachments (0)', and 'Export'. A dashed blue box labeled '4' encloses the 'Attachments (0)' button. A dashed blue box labeled '5' encloses the 'Export' button.

Status: ☐ Approved ☒ Unapproved ☐ Rejected

Tools: Time Series Spectra Process (Orthogonal)

Recording Information

Recording ID: 10501_2022-06-27-160923
Start time: Jun 27 2022 09:09:23 (Local) Eastern Daylight Time (GPS -07:00)
Duration: 33 m 57 s
Survey name: Nevada June 2022
Operator(s): EE/DF/JT
Company name: Phoenix Geophysics
Layout Geometry: Scalar CSAMT
Declination: 0.00°
Notes:

Electric Channels

Channel	(+) N / E	(-) S / W	Polarity	(+) N / E	(-) S / W	Gain	LPF [Hz]	DC [V]
E1	50.00	34.50	☐ Inverted	4824.383	3345.035	4 x 1 = x4	10000	-0.022
E2	50.00	49.00	☐ Inverted	2684.518	3053.859	4 x 1 = x4	10000	-0.019

E Azimuth: 0.00 ° External Filter: None

Magnetic Channels

Channel	Sensor	Detected	Serial #	Cal	Polarity	Gain	LPF [Hz]	DC [V]
H1	MTC-155	MTC-155	53729	☒	☐ Inverted	x4	10000	-0.011
H2	MTC-155	MTC-155	53739	☒	☐ Inverted	x4	10000	-0.03
H3		N/A		☒	☐ Inverted	N/A	N/A	N/A

H1-H3 Azimuth: 0.00 °

View Recording Details Attachments (0) Export

Recording Details

Ensure the following levels are within acceptable limits

1. Battery Voltage

2. Internal Temperature

3. Number of Satellites

3.1. Max Satellites Seen shows the highest number of satellites tracked for each constellation since power on and until the end of the corresponding recording.

3.2. The **Satellites Over Time** plot shows the number of satellites being tracked throughout the recording process, one point per minute.

4. Saturated Frames

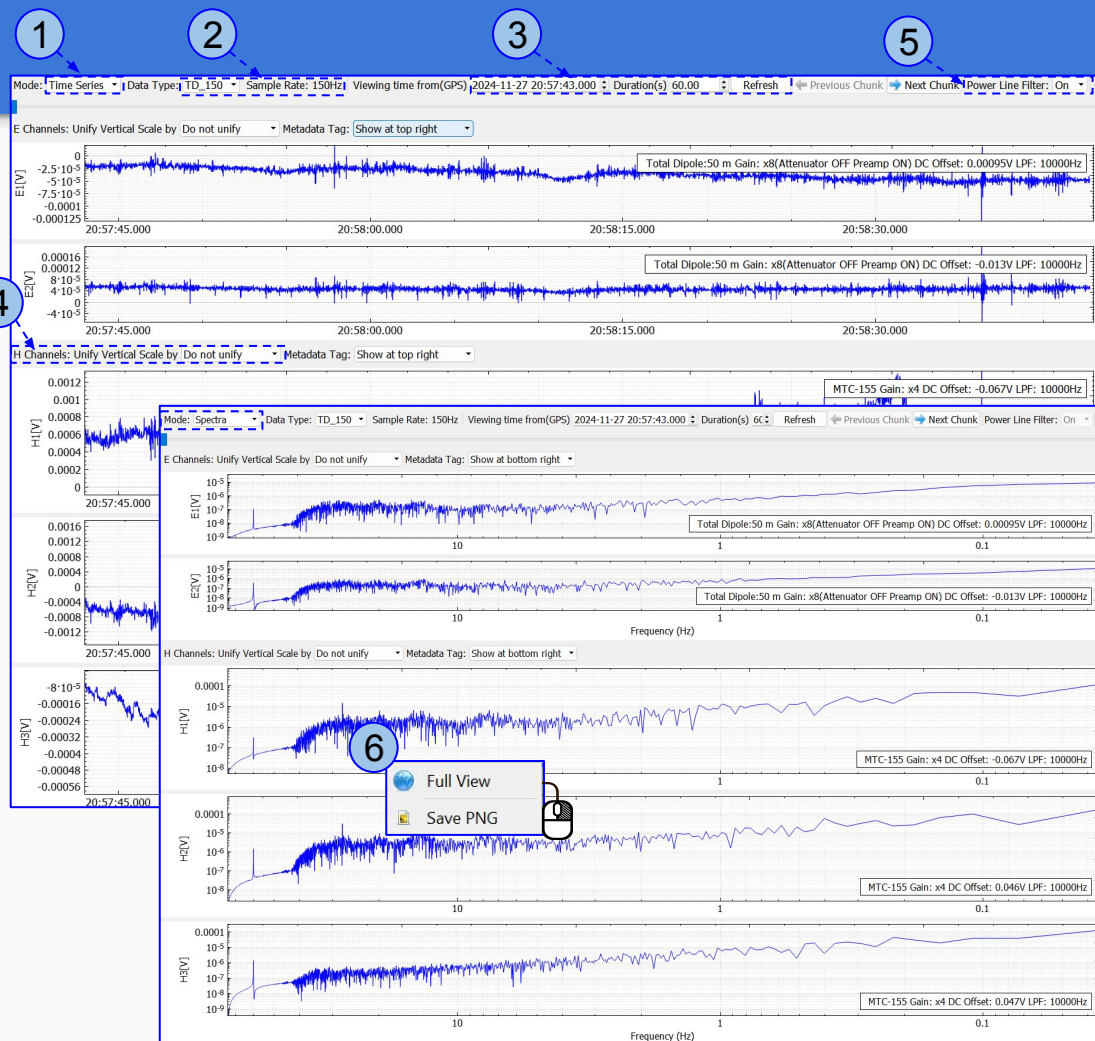
- If saturation is not close to ~0%, review the channel configuration, the gain might be too high, or there could be artificial noise at the site

5. Time Series Level



Recording Details and QC

1. The **Time Series** and **Spectra** shows the data available for QC
2. **Data Type** allow to switch between different data sampling rates (96K / 24K / 150 Hz)
3. Specify the desired date, time, and duration range for the plot
 - Select or enter the date and/or time
 - Define the **Duration(s)** segment to display, then click **Refresh** to update the plot
4. The **Unify Vertical Scale by**, allows to visualize by Channel scale
5. **Power Line Filter** (Refer to DAA14 Manual, Slide 4 for additional details.)
6. **Exporting**
 - Right-click on the plot
 - Save PNG



Multi-Selection tools

1. Use the **Line Selection** tool for specific sites



Hold down the left-click and draw the line over the sites on the map

2. Use the **Rubberband** for large ranges

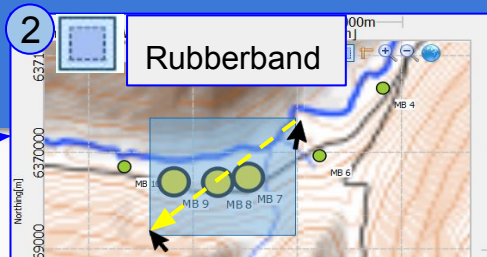


Hold down the left-click and drag over the sites on the map (*ensure to cover entirely all the sites needed*)

3. After selecting more than one recording in the Recording Library, the list of those recordings will appear on the right of the map

4. Use the selection to

- Add recordings to a group
- Multi-Rec Edit
- Export Time Series
- Delete recordings



The screenshot shows the software interface with the 'Recording Library' tab selected. The 'Station name' field is empty, and the 'Groups' dropdown is set to 'None'. The 'Filters' dropdown is also set to 'None'. The 'Sep 20 2016' date is displayed. The map shows a selection of sites, with a yellow line selection box and a blue rubberband selection box. A dashed arrow points from the 'Line Selection' label in the main screenshot to the yellow line selection box. A dashed arrow points from the 'Rubberband' label in the main screenshot to the blue rubberband selection box. A dashed arrow points from the '3' label in the main screenshot to the list of selected recordings on the right. A dashed arrow points from the '4' label in the main screenshot to the 'Add to group' button in the context menu.

Recording Type	Station Name	Survey Name	Start Date	Status
MT	S-5 5C	Don Campbell	2017-12-01	Unapproved
MT	S6 5C	Don Campbell	2017-12-02	Unapproved
MT	S7_1 5C	Don Campbell	2017-12-03	Unapproved
MT	S7_2 5C	Don Campbell	2017-12-04	Unapproved

The context menu shows the following options:

- Add to group
- Export Selected
- Test
- Add to new group

The bottom of the interface shows the following buttons:

- Export (4)
- Multi-Rec Edit (4)
- Delete (4)

Export Recording

Select the Recording(s) from the Timeline, Recording Library or Map

**To export multiple recordings, see [Groups and filters](#)*

1. Use **Export Recordings**

- Right-click over the timeline or map
- **Export** button

2. Choose the Exporting Format

3. The recording(s) not supporting by JSON format will be marked in red

File Tools View Settings Window Help

Create New Project Ctrl+N
Open Existing Project Ctrl+O
Recent Projects...
Import Recordings Ctrl+I
Import Calibration Files Ctrl+L
Import Processed Data Ctrl+R
Export Recordings Ctrl+E
Export MT Processed Sites
Export CSAMT Processed Sites
Close Current Project Ctrl+W
Exit Alt+F4

Recording Library Processed MT Data Processed CSAMT Data Processed PNT Data

Filters: None

Dec 05 2017

Rem SC D Rem SC D Rem SC D Rem SC D Rem SC D Rem SC D Rem SC D Rem SC D

MTU 56 SC 57.1 SC 57.2 SC

Add to group
Export Recording

WorldMap

Add to group
Export Selected

Remote

Export Recordings - EMapower

Target Recordings

10426_2021-05-19-204847 - Txd (15 m 47 s)

Exporting Format

☒ Text format time series (JSON)
☐ Select time span for the recording (for 1 recording only)
☐ Recording metadata report (CSV)
☐ Recording geographic information (KML)

* This recording cannot be exported to the selected format

Save Cancel

Status

☒ Approved ☐ Unapproved

Tools

Time Series

Recording ID: 1001_2022-06-27-171742

Start time: Jun 25 2022 16:18:30 (Local) Eastern Day

Duration: 15 h 10 m 4 s

Survey name: Nevada June 2022

Station name: MT - MTC-155

Operator(s): EE/DF/JT

Company name: Phoenix Geophysics

Layout Geometry: Orthogonal

Declination: 0.00°

Notes: 2 other recordings at the station

Exporting Format

☐ Text format time series (JSON)
☐ Select time span for the recording (for 1 recording only)
☒ Recording metadata report (CSV)
☐ Recording geographic information (KML)

Save Cancel

Electric Channels

Distance (m) to GND

Channel (+) N / E (-) S / W Polarity (+) N / E (-) S / W Gain LPF [Hz] DC [V]

E1 20.00 20.00 ☐ Inverted 2827.515 1583.146 8 x 1 = x8 10000 -0.011

E2 20.00 20.00 ☐ Inverted 3394.245 2759.743 8 x 1 = x8 10000 -0.0017

E Azimuth: 0.00 ° External Filter: None

Magnetic Channels

Channel Sensor Detected Serial # Cal Polarity Gain LPF [Hz] DC [V]

H1 MTC-155 MTC-155 53094 ☒ Inverted x4 10000 0.0015

H2 MTC-155 MTC-155 57330 ☒ Inverted x4 10000 -0.025

H3 N/A ☒ Inverted N/A N/A N/A

H1-H3 Azimuth: 0.00 °

View Recording Details Attachments (0) Export



Processing Data

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Processing MT Data

From the Recording Library tab:

1. Choose a recording to process
2. Review the Layout Geometry
3. Run the Process Site Creation Wizard, selecting:

- Electric Components
- Magnetic Components
- Reference Channels
- Processing Timeframe
- Processing Parameters

**These steps will be explained in the Following pages*

Verify that there is not a warning icon on the left of the channels or next to the Recording ID

The screenshot displays the MT Data Processing software interface. At the top, the 'Recording Library' tab is active, showing a list of recordings. Below this, a map view shows the location of the recording site, 'S7_1 5C', marked with a yellow dot. The 'Process Site Creation Wizard' is open on the right, showing the 'Layout Geometry' section. The wizard includes fields for Recording ID, Start time, Duration, Survey name, Station name, Operator(s), Company name, Layout Geometry, Declination, and Notes. The 'Electric Channels' section shows a table of channels with columns for Channel, Distance (m) to GND, Resistance (Ω), Gain, LPF [Hz], and DC [V]. The 'Magnetic Channels' section shows a table of channels with columns for Channel, Sensor, Detected, Serial #, Cal, Polarity, Gain, LPF [Hz], and DC [V].

Recording Library

Station name	Groups	Filters
MTU-8 - 10049	None	None
MTU-SC - 10116		
MTU-SC - 10125		
MTU-SC - 10127		
MTU-SC - 10128		
MTU-SD - 10176		
MTU-SC - 10241		

Map View

Projection: Web Mercator
Scale: 1000000m
Location: S7_1 5C (Remote)

Process Site Creation Wizard

Layout Geometry

Recording ID: 10125_2017-12-03-203322
Start time: Dec 03 2017 12:33:24 (Local) Eastern Standard Time (GMT -08:00)
Duration: 21 h 32 m 56 s
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	(+) N / E	(-) S / W	Polarity	(+) N / E	(-) S / W	Gain	LPF [Hz]	DC [V]
E1	50.00	50.00	☐ Inverted	235.522	305.681	4 x 4 = x16	10000	-0.011
E2	50.00	50.00	☐ 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 #	Cal	Polarity	Gain	LPF [Hz]	DC [V]
H1	MTC-155	☒	53917	☒	Inverted	x4	10000	0.074
H2	MTC-155	☒	53918	☒	Inverted	x4	10000	0.032
H3	MTC-155	☒	53195	☒	Inverted	x4	10000	-0.078

H1-H3 Azimuth: 40.00 °

View Recording Details Attachments (1) Export

Process Site Creation wizard

Electric components

1. Select the recording with the desired electric lines from the Map, Timeline or Drop-down list
2. **Review / Edit** the E-Channel details
 - 2.1. Use the **Select Manually** button to change the Channel Selection (Ex/Ey)
 - 2.2. To change or add details use the **Edit** button
3. The **Navigation Bar** will display the components of the processed site being created
4. Click Next to continue

Process Site Creation - S7_2 5C - EMpower

17 Nov 14 2017 Nov 21 2017 Nov 28 2017 Dec 05 2017

MTU-5C - 10116
MTU-5C - 10125
MTU-5C - 10127

Projection: Web Mercator

WorldMap

1000000m

7000000
6000000
5000000
4000000

San Francisco San Jose Sacramento Portland Eugene Seattle Vancouver Edmonton Lethbridge Calgary Remote Winnipeg

S7_2 5C

100000

10000

1000

100

~11000000

Courtesy of: © OpenTopoMap(CC-BY-SA)

Channel Selection - EMpower

Ex Ey

E1 ☐ ☐ E1
E2 ☐ ☐ E2

OK Cancel

Select a recording to use for the electric components

S7_2 5C - 10125 - Dec 04 10:14:38 - Dec 05 08:14:20

E-Channel details

E-Channel Selection

Ex = E1
Ey = E2

2.1 Select Manually

Ex Ey

Dipole length: 100 m Dipole length: 100 m
North resistance: 334 Ω East resistance: 379 Ω
South resistance: 349 Ω West resistance: 350 Ω
Ex Calibration Serial: N/A Ey Calibration Serial: N/A

2.2 Edit

E-Channel details

Ex Ey

Ex Calibration Serial: 0 Ey Calibration Serial: 0

Save Cancel

Electric Components: S7_2 5C - 10125 - Dec 04 10:14:38 - Dec 05 08:14:20

Magnetic Components: --

Reference Channels (H): --

Processing Timeframe: --

Next

Navigation Bar

1 2 3 4

Legend

- The recording is good to process
- The recording does not have an available calibration file
- The recording does not have two mandatory electric channels

When a recording is selected, the letter P (Primary) will appear next to the channel name

Process Site Creation wizard

Magnetic Channels

If the desired magnetic channels are in the same recording

1. Keep the option **Use magnetic channels from the same recording as electric channels** selected
2. Use **Select Manually** to modify as needed and click **Next**

If need to borrow the magnetic channel data from a different recording

3. Select **Use magnetic channels from a different recording**
 - o Select a valid recording/magnetic sensors from the Map / Timeline or using the Drop-down and click **Next**

Recordings with different Sampling Mode and/or Sampling Rate will not appear on the dropdown list "Use magnetic channels from a different recording".

4. Use **Select Manually**

5. Click **Next**

The image displays two screenshots of the 'Process Site Creation - S-5 SC - EMpower' wizard, specifically the 'Magnetic Channels' step. The top screenshot shows the 'Use magnetic channels from the same recording as electric channels' option selected. A blue dashed line with a circle '1' points to the map area, and a circle '2' points to the 'Select Manually' button. The bottom screenshot shows the 'Use magnetic channels from a different recording' option selected. A blue dashed line with a circle '3' points to the map area, and a circle '4' points to the 'Select Manually' button. A circle '5' points to the 'Next' button. The map area in both screenshots shows a site labeled 'P.M' and a site labeled 'M'. The wizard interface includes a list of recordings, a map, and a 'Magnetic Selection - EMpower' dialog box.

Process Site Creation - S-5 SC - EMpower

Select a recording to use for the magnetic components

☐ Use magnetic channels from the same recording as electric channels
☒ Use magnetic channels from a different recording

Channels

Hx = H1 MTC-155 53917
Hy = H2 MTC-155 53918
Hz = H3 MTC-155 53194

Source recording of Hz: 10125-2017-12-01-230711

Magnetics Selection - EMpower

Hx: Hy: Hz:

☒ Use H1-H3 band azimuth: 0 °
☐ Use custom azimuth

Hx and Hy are mandatory channels

Electric Components: S-5 SC - 10125 - Dec 01 15:07:12 - Dec 02 09:34:58
Magnetic Components: S-5 SC - 10125 - Dec 01 15:07:12 - Dec 02 09:34:58 (Primary component station)

Process Site Creation - S-5 SC - EMpower

Select a recording to use for the magnetic components

☐ Use magnetic channels from the same recording as electric channels
☒ Use magnetic channels from a different recording

Rem SC Dec01 - 10116 - Dec 01 16:32:46 - Dec 02 14:10:10

Channels

Hx = H1 MTC-155 53909
Hy = H2 MTC-155 53910
Hz = H3 MTC-155 53194

Source recording of Hz: 10125-2017-12-01-230711

Magnetics Selection - EMpower

Hx: Hy: Hz:

☒ Use H1-H3 band azimuth: 0 °
☐ Use custom azimuth

Hx and Hy are mandatory channels

Electric Components: S-5 SC - 10125 - Dec 01 15:07:12 - Dec 02 09:34:58
Magnetic Components: Rem SC Dec01 - 10116 - Dec 01 16:32:46 - Dec 02 14:10:10
Reference Channels (H) --
Processing Timeframe: --

Previous Next

Process Site Creation wizard Reference Channels

Same recording

1. To use reference channels from the same recording as the electric/magnetic channels
 - Select either the Magnetic Channels or Electric Channels
 - Click **Next**

Remote reference

2. To use Reference channels from a concurrent recording select **“Use reference channels from concurrent a recording”**
 - A concurrent recording with valid magnetic or electric channels will appear as non-gray in the Map / Timeline and in the drop-down list

Recordings with different Sampling Mode and/or Sampling Rate will not appear on the dropdown list "Use reference channels from concurrent a recording".

- ### 3. Use **Select Manually** as needed
- Click **Next**

Select a recording to use for the reference components

☒ Use reference channels from the same recording as the electric/magnetic channels

☒ Magnetic ☐ Electric

* Magnetic channels will be taken from recording (10125 - S2 5C)

The screenshot displays the OpenTopoMap web application interface. On the left, a map view shows a location in the UK with a yellow dot labeled 'S2 5C' and a blue dashed circle. The recording selection panel on the right shows a list of recordings for 'S2 5C' and 'S3 5C'. The channel selection dialog box shows the selection of 'Magnetic' channels for 'S2 5C' and 'S3 5C'.

Recording Selection Panel:

- Select a recording to use for the reference components**
 - ☐ Use reference channels from the same recording as the electric/magnetic channels
 - ☒ Use reference channels from a concurrent recording
- Channel Selection**
 - Rx = H1 MTC-155 53917
 - Ry = H2 MTC-155 53918

Channel Selection Dialog Box:

- Magnetics Selection - EMpower**
 - Rx: Ry:
 - ☒ Use H1-H3 band azimuth: 40 °
 - ☐ Use custom azimuth
 - ☐ Rx and Ry are mandatory channels
 -

Map View:

- Projection: Web Mercator
- WorldMap
- S2 5C
- S3 5C
- S2 5A
- S3 5A

Processing Timeframe:

- Electric Components: S2 5C - 10128 - 23:49:26 - 18:00:50
- Magnetic Components: Rem 5C Dec06 - 10116 - 00:53:52 - 21:37:00
- Reference Channels (H): S4 5C - 10125 - 19:15:28 - 17:11:30
- Processing Timeframe: --

Navigation:

-
-

When a channel (**H** magnetic or **E** electric) is selected from a concurrent site the letters **R(H)** or **R(E)** appears next to the Reference site name

Processing Timeframe / Parameters

1. The **Select Processing Timeframe**, allows to select the time segment of the recording that will be processed
 - Use the **Start - End fields** or move the blue indicators in the **Duration** selectors to select the desired Start and End times of the Processing Timeframe.
 - Click Next
2. In the **Processing Parameters** window to reduce the effect of power line noise
 - Select the frequency of the **Electric power grid filter** that corresponds to the frequency carried by the power lines in the region
3. Type the **Process site name**
4. Robust Templates (*see next page*)

1 Select Processing Timeframe

Processing timeframe

Time zone

☐ GPS ☒ Site time zone: America/Edmonton (GPS-06:00)

Start: 2017-08-27 10:53:11 End: 2017-08-28 10:34:29

Sunrise: 06:54 Sunset: 20:40
Duration: 23 h 41 m 18 s

2 Processing Parameters

3 ☒ Electric power grid filter

☐ 50 Hz ☒ 60 Hz ☐ None

Process site name

P=MB 1 R= (Local H)

4 ☒ Robust Templates

☒ Process with robust templates enabled

Multiple Coherence [0.1] (Default)

Mask name: Multiple Coherence

Robust algorithm: Multiple Coherence ⓘ

Attack: 0.10 ⓘ

Cross powers to reject: 10% ⓘ

Set Default + -

Robust Template / Processing Queue

4. Enable Robust Templates by checking **Process with robust templates enabled**

4.1. Select the **Robust Mask**

- Change the parameters as needed

4.2. Use the **Set Default** button to change the default Mask for the current processing site(s)

4.3. Add or delete Robust Mask Template(s)

**All changes will be applied to the current processing task only and subsequent processing will default to the Robust Template configured in the Project Settings.*

5. Click the **Process** button

6. The **Processing Queue** shows the processing of the site(s) selected

All the processing with **Robust Templates** enabled will automatically generate a workbench named "Robust" in the Crosspower Editor

Processing Parameters

Electric power grid filter

☐ 50 Hz ☒ 60 Hz ☐ None

Process site name

P=MB 1 R= (Local H)

Robust Templates

☒ Process with robust templates enabled

Multiple Coherence [0.1] (Default)

Mask name: Multiple Coherence

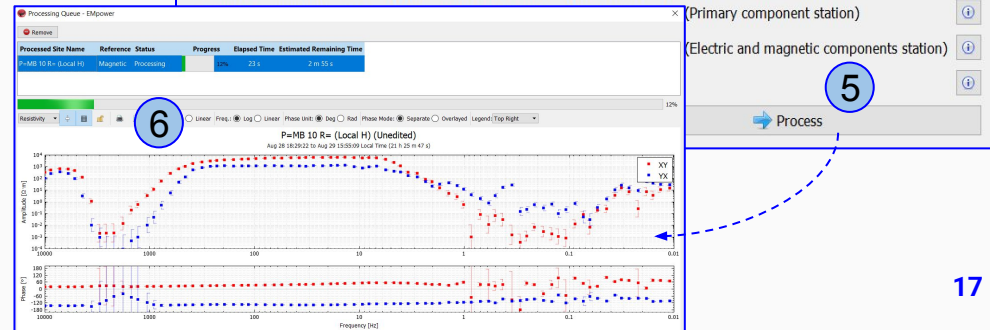
Robust algorithm: Multiple Coherence

Attack: 0.10

Cross powers to reject: 10%

Set Default

Electric Components: MB 1 - 10128 - Aug 24 18:37:11 - Aug 25 10:15:20



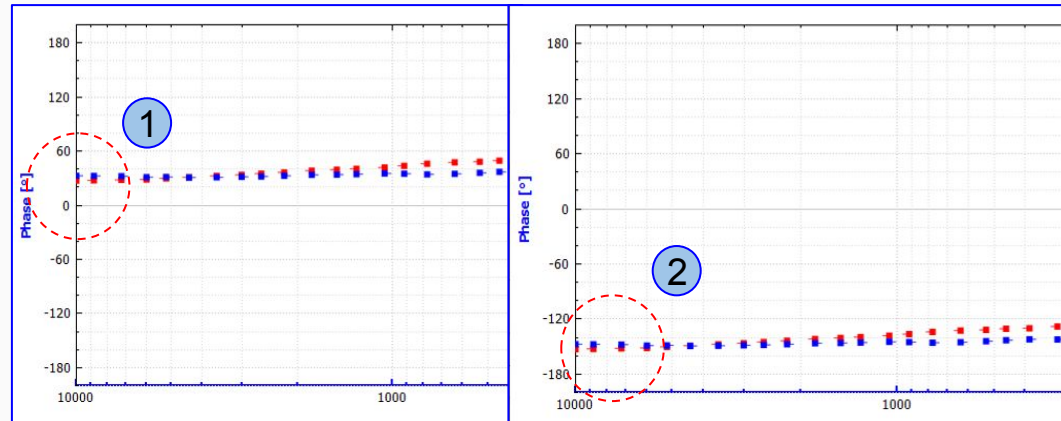
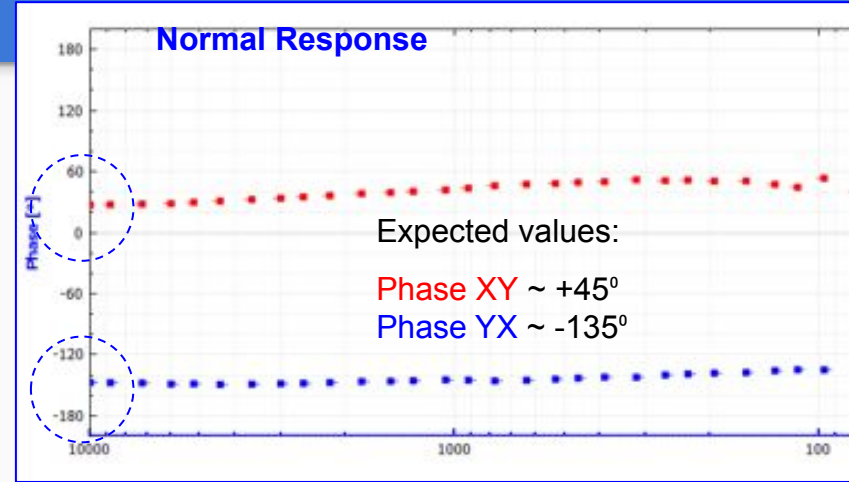
How to identify a reverse polarity

After processing the data, the phase plot will display an overlapping response, which is an indicator of a reverse polarity.

Identify the channel responsible for reverse polarity:

1. The first plot shows that **H1 or E2** channels are the source of the reverse polarity
2. If channel **H2 or E1** are the source, the plot will display a different phase position

Once we identify the problematic channel, we can proceed with the corrections. (see next page)



Note that in the majority of the cases, a reverse polarity can be easily fixed in EMpower.

Magnetic Channels Corrections

EMpower provides a solution to fix a reverse polarity by adjusting some parameters to compensate for layout errors.

- H1(Hx) Polarity Inverted:** occurs when the sensor's connector is oriented to the North
 - Check the Inverted checkbox
- H2(Hy) Polarity Inverted:** occurs when the sensor's connector is oriented to the East
 - Check the Inverted checkbox
- H Connections interchanged**
 - Identify the sensors that were plugged into the wrong connector on the receiver. Then, while selecting the Magnetic Components in the Site processing wizard, click on **Select Manually** and choose the appropriate connection mapping from the dropdown lists.

Magnetic Channels

Channel	Sensor	Detected	Serial #	Cal	Polarity	Gain	LPF [Hz]	DC [V]
H1	MTC-155	MTC-155	53291	✓	☒ Inverted	x4	10000	0
H2	MTC-155	MTC-155	2666	✓	☐ Inverted	x1	10000	0

Magnetic Channels

Channel	Sensor	Detected	Serial #	Cal	Polarity	Gain	LPF [Hz]	DC [V]
H1	MTC-155	MTC-155	53291	✓	☐ Inverted	x4	10000	0
H2	MTC-155	MTC-155	2666	✓	☒ Inverted	x1	10000	0

3 Channels

Hx = H1 MTC-155 53917
Hy = H2 MTC-155 53918
Hz = H3 MTC-155 53194

Source recording of Hz: 10125_2022-02-01-230711 Select Manually

Magnetics Selection - EMpower

Hx: Hy: Hz:

☒ Use H1-H3 band azimuth: 40 °
☐ Use custom azimuth

⚠ Hx and Hy are mandatory channels

Ok



Note:

For (3) repeat the channel mapping procedure every time data needs to be processed with these channels

Electric Channels Corrections

EMpower is able to correct possible mistakes in the field layout (polarity or connection)

1. Polarity Inverted on E1

- Occurs when the **North** electrode is connected to the **South** connector, and the **South** electrode connected to the **North** connector.

2. Polarity Inverted on E2

- Occurs when the **East** electrode is connected to the **West** connector, and the **West** electrode connected to the **East** connector.

3. Connections Interchanged on NS and EW

- Occurs when the **North** electrode is connected to the **East** connector, and the **South** electrode is connected to the **West** connector, or vice versa.

In the Electric components section of the Site processing wizard, click **Select Manually** and apply the appropriate correction.

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	☒ Inverted	505.807	1251.798	4 x 1 = x4	10000	0.017
E2	50.00	50.00	☐ Inverted	427.056	418.831	4 x 1 = x4	10000	-0.03

E Azimuth: 0.00 ° External Filter: None

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	☐ Inverted	505.807	1251.798	4 x 1 = x4	10000	0.017
E2	50.00	50.00	☒ Inverted	427.056	418.831	4 x 1 = x4	10000	-0.03

E Azimuth: 0.00 ° External Filter: None

Select a recording to use for the electric components

S-5 SC - 10125 - Dec 01 15:07:12 - Dec 02 09:34:55

E-Channel details

E-Channel Selection

☒ Ex = E1
☐ Ey = E2

[Select Manually](#)

Ex		Ey	
Dipole length:	100 m	Dipole length:	100 m
North resistance:	232 Ω	East resistance:	136 Ω
South resistance:	141 Ω	West resistance:	175 Ω
Ex Calibration Serial:	N/A	Ey Calibration Serial:	N/A

[Edit](#)

Channel Selection - ...

Ex: ☐ E1 ☒ E2
Ey: ☐ E1 ☒ E2

[OK](#) [Cancel](#)

S-5 SC - 10125 - Dec 01 15:07:12 - Dec 02 09:34:55



Note:

For (3) repeat the channel mapping procedure every time data needs to be processed with these channels



Advanced Search

Toolbar (Sites list)	22
Groups	23
Filters	24

Toolbar (Sites list)

Recording library

1. Quick search by **Site name**
2. **Groups** (Slide 23)
3. **Filters** (Slide 24)

Processed MT Data

4. **Select All** the Sites
5. Quick search by **Site name**
6. **Groups** (Slide 23)
7. **Filters** (Slide 24)
8. **Export Selected**

The image illustrates the workflow for recording and processing MT data in EMpower, with numbered callouts (1-8) linking the steps in the list to specific UI elements.

Recording Library Toolbar:

- 1. Station name search field
- 2. Groups dropdown menu
- 3. Filters dropdown menu

Station group editor - EMpower:

- 4. Select All checkbox
- 5. Site name search field
- 6. Groups dropdown menu
- 7. Filters dropdown menu

Advanced Filter Options - EMpower:

- 8. Filter name search field

Processed data group editor - EMpower:

- 6. Groups dropdown menu

Advanced Filters - EMpower:

- 7. Filters dropdown menu

Process Site Exporter - EMpower:

- 8. Export Selected button

Groups

1. Create new group

2. Type the **Group Name**

2.1. Select the sites from the right list using the blue arrow

3. Add sites using the Multi-Selection tools or by following the next steps

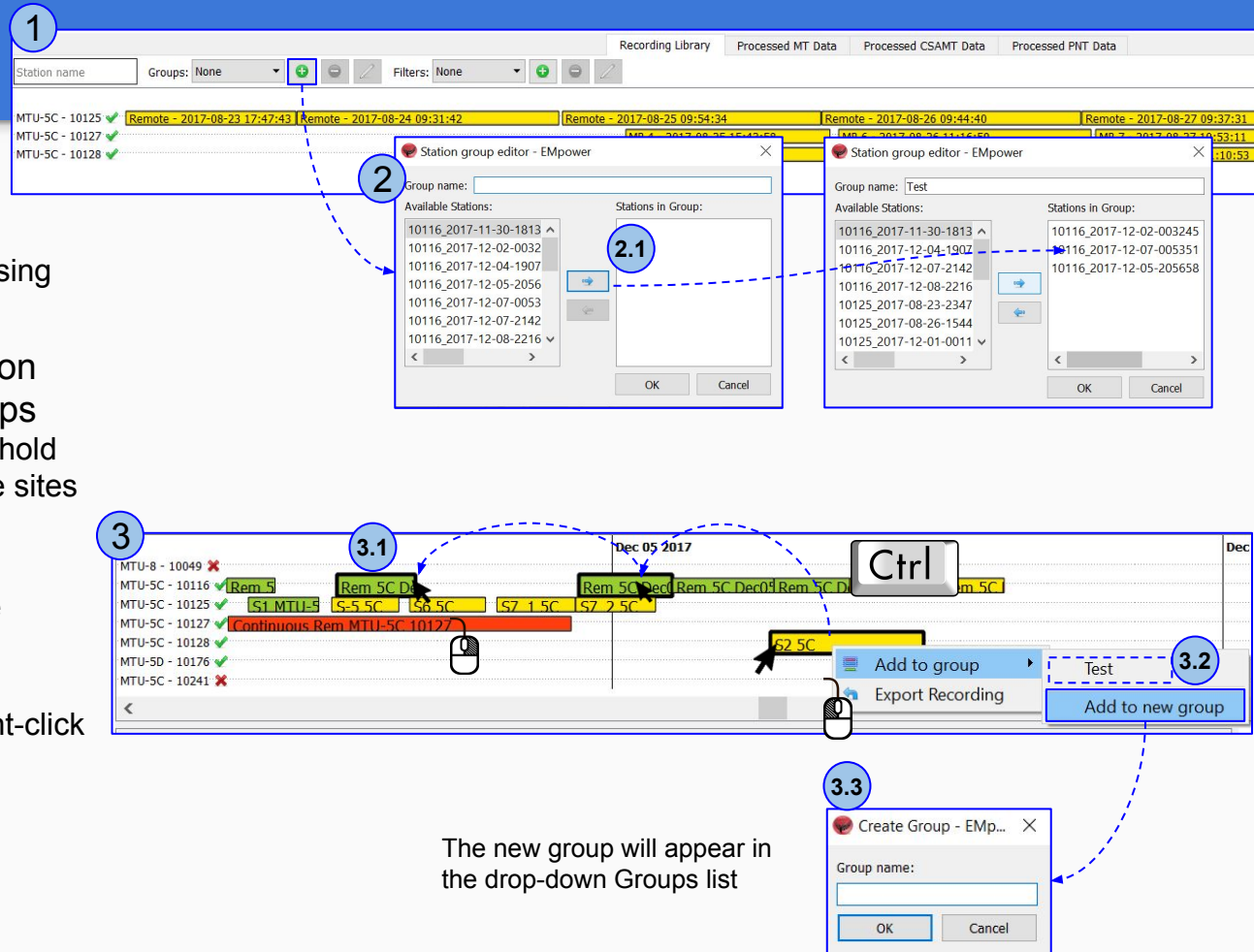
3.1. Use left-click to select the site and hold down the **Ctrl** key to select multiple sites (release the buttons)

3.2. Select **Add to group** from the Right-click menu and select the existing group

or

3.3. Select **Add to group** from the Right-click menu and **Add to new group**

4. Create new group



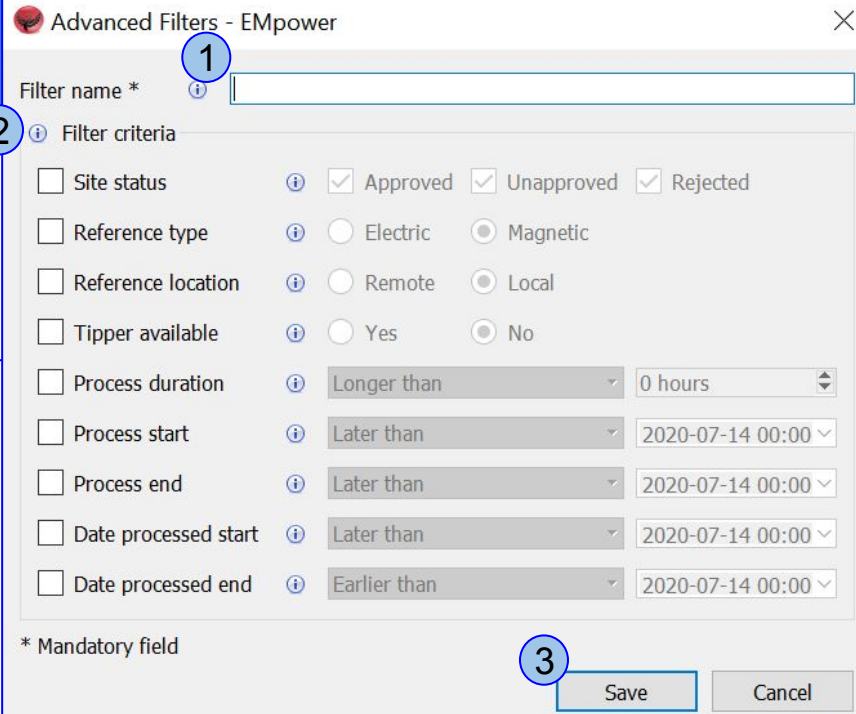
The screenshot illustrates the steps for creating a new group in the EMpower software. The main interface shows a list of stations with a right-click menu open, showing options like 'Add to group', 'Export Recording', and 'Add to new group'. A 'Station group editor - EMpower' dialog box is open, showing 'Available Stations' and 'Stations In Group' lists. A 'Station group editor - EMpower' dialog box is also open, showing 'Available Stations' and 'Stations In Group' lists. A 'Create Group - EMp...' dialog box is open, showing 'Group name:' and 'OK'/'Cancel' buttons. The 'Ctrl' key icon is shown, indicating the multi-selection process.

The new group will appear in the drop-down Groups list

Filters (Processed MT Data)

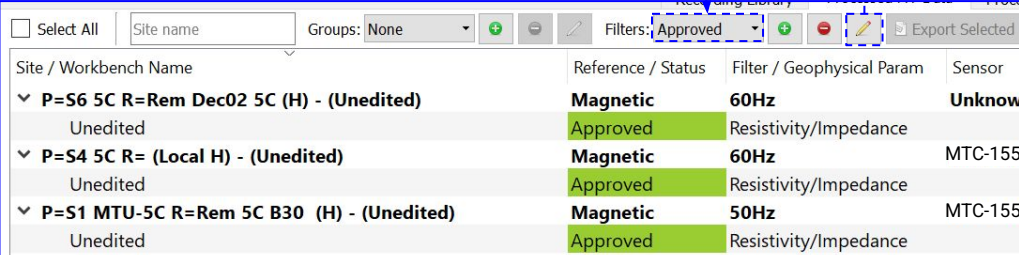
The Advanced Filter can work with individual sites or with Groups

1. Name the **Filter** (*mandatory field)
2. Select the **Filter criteria**
3. Save the **Filter**
4. The new **Filter** will be added to the drop down list
5. Use the Edit  button to add or change **Filter criteria**



The dialog box 'Advanced Filters - EMpower' contains the following elements:

- 1** Filter name *: A text input field.
- 2** Filter criteria: A section with multiple criteria, each with a checkbox and options:
 - Site status: ☐ Site status, with radio buttons for ☒ Approved, ☒ Unapproved, and ☒ Rejected.
 - Reference type: ☐ Reference type, with radio buttons for ☐ Electric and ☒ Magnetic.
 - Reference location: ☐ Reference location, with radio buttons for ☐ Remote and ☒ Local.
 - Tipper available: ☐ Tipper available, with radio buttons for ☐ Yes and ☒ No.
 - Process duration: ☐ Process duration, with a dropdown 'Longer than' and a text field '0 hours'.
 - Process start: ☐ Process start, with a dropdown 'Later than' and a date field '2020-07-14 00:00'.
 - Process end: ☐ Process end, with a dropdown 'Later than' and a date field '2020-07-14 00:00'.
 - Date processed start: ☐ Date processed start, with a dropdown 'Later than' and a date field '2020-07-14 00:00'.
 - Date processed end: ☐ Date processed end, with a dropdown 'Earlier than' and a date field '2020-07-14 00:00'.
- 3** * Mandatory field: A label at the bottom.
- Buttons: 'Save' and 'Cancel' at the bottom right.



The main application window shows a table of filters. The 'Filters' dropdown is set to 'Approved'. The table has columns: Site / Workbench Name, Reference / Status, Filter / Geophysical Param, and Sensor.

Site / Workbench Name	Reference / Status	Filter / Geophysical Param	Sensor
▼ P=S6 5C R=Rem Dec02 5C (H) - (Unedited)	Magnetic	60Hz	Unknown
Unedited	Approved	Resistivity/Impedance	
▼ P=S4 5C R= (Local H) - (Unedited)	Magnetic	60Hz	MTC-155
Unedited	Approved	Resistivity/Impedance	
▼ P=S1 MTU-5C R=Rem 5C B30 (H) - (Unedited)	Magnetic	50Hz	MTC-155
Unedited	Approved	Resistivity/Impedance	

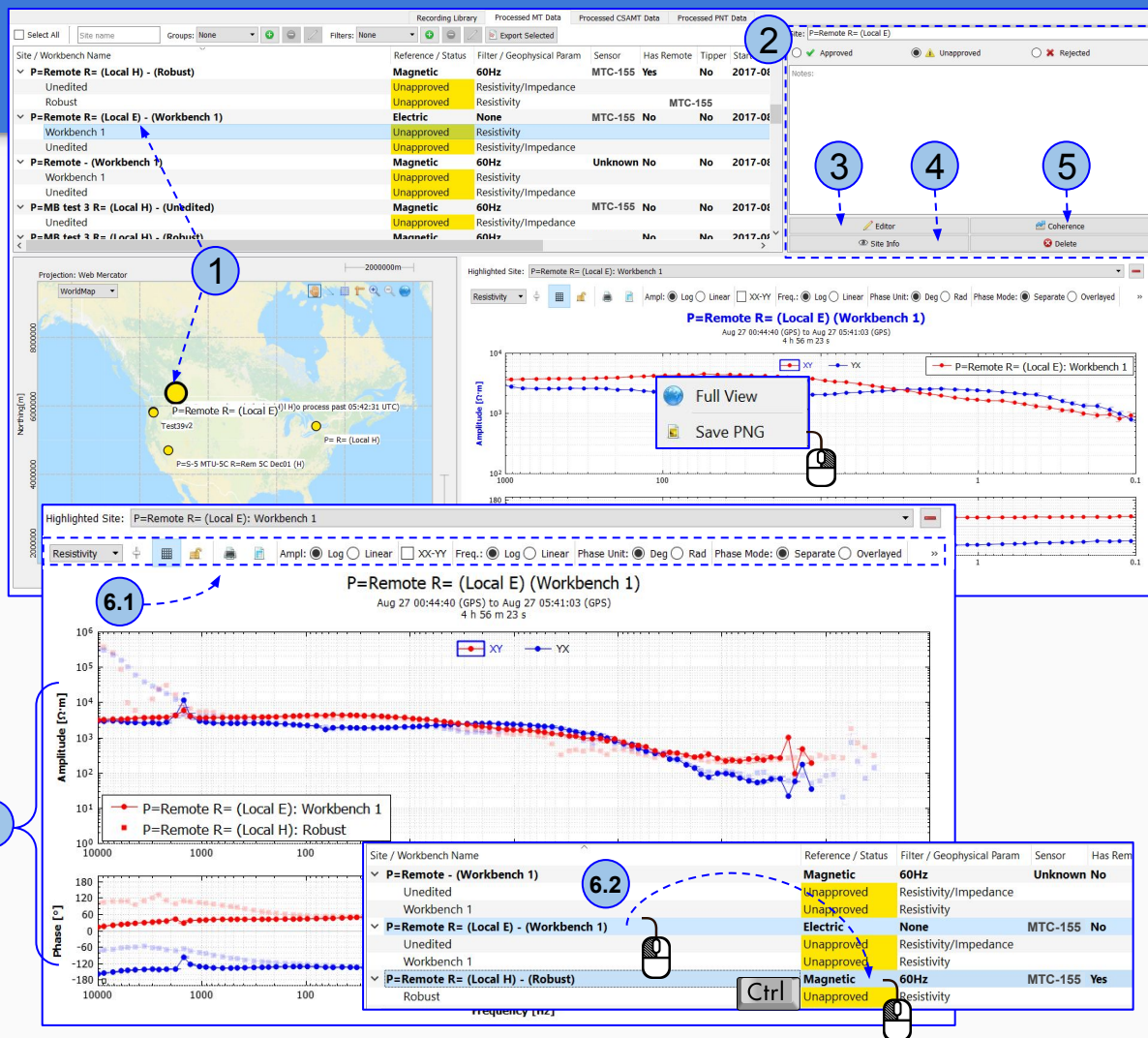


Processed MT Data

Visualizing Processed Data	26
Plotting diagonal elements	27
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Working with multi-sites	29
Site Info - Coherence	30
Process Site Exporter	31

Visualizing Processed Data

1. Select the **Processed Site** from the Workbench list or Map
2. Edit the Processed Site (Name, Status and Notes)
3. The **Edit Cross Powers** feature removes outlying cross powers from the calculation of resistivity, phase, and other geophysical parameters
4. Site Info
5. Coherence
6. The **Plot** shows the Amplitude and Phase of the selected Processed Site
 - 6.1. Use the **Plot toolbar** to access additional plot features
 - 6.2. Add Processed Site(s) by selecting the site in the Workbench list

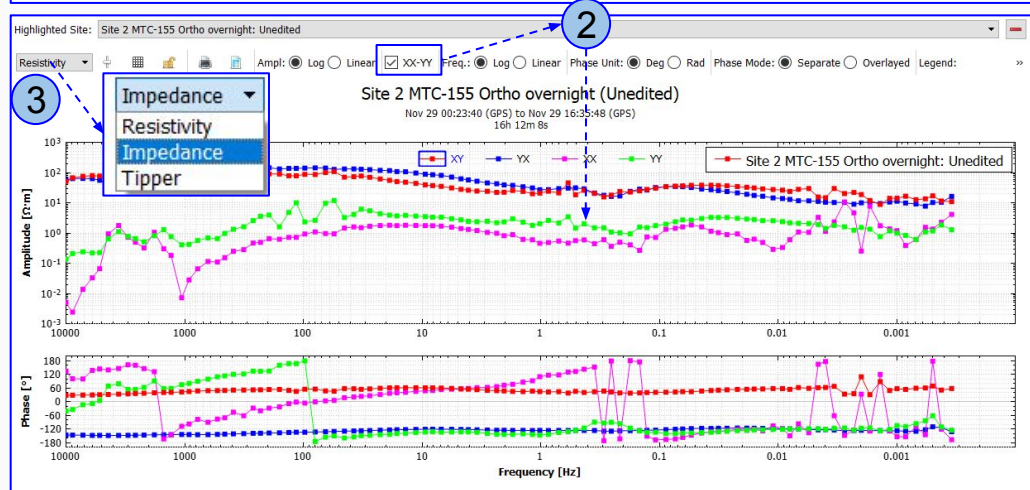
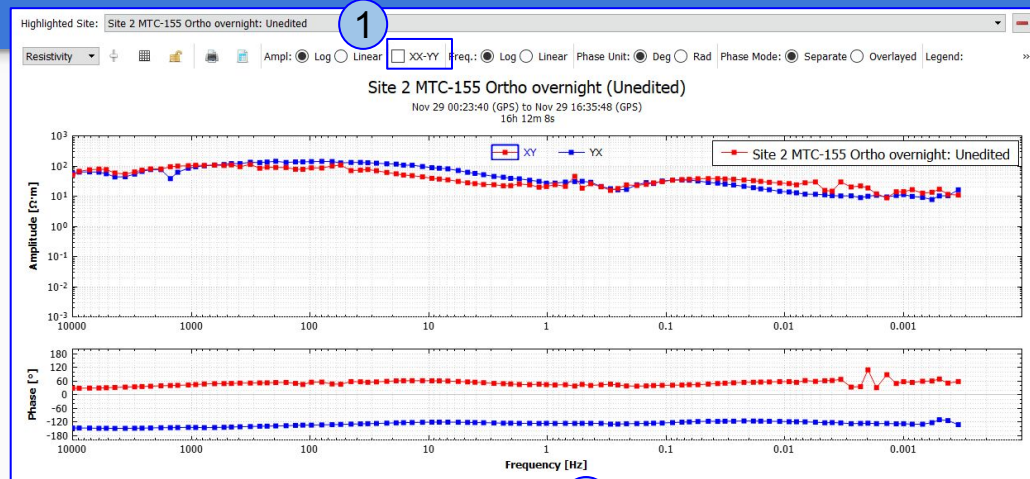


Plotting diagonal elements

EMpower has the capability to see the off-diagonal **Impedance/Resistivity** elements of the MT tensor in the plot. The **XX-YY** elements are essential components for several dimensionality tools (*Shift skew, Ellipticity, Polar diagrams, etc.*)

In the Processed Data tab, after select the **Processed Site**

1. Select the **XX-YY** to show the diagonal elements in the plot
2. The **Plot** will show two additional lines of the MT tensor for the site
3. The tool works with geo-modes **Resistivity** and **Impedance**



Processed Site Selection

Select:

1. **Select all** the processed sites
2. Select a group of processed sites
 - 2.1. Left-click on the first site on the list, press and hold the **Shift** key and left-click on the last site

Or

- 2.2. Hold the Left-click on the site and drag up/down to select items

3. To select specific processed sites

- 3.1. Left-click on the first site on the list and hold the **Ctrl** key until the last processed site is selected

*To select site(s) from the map see [Multi-Selection Tools](#)

Export:

4. Click the **Export Selected** button
 - 4.1. Complete the information as needed and click the **Save** button

The screenshot displays the 'Workbench list' window with several annotations and steps:

- Step 1:** A box labeled '1' points to the 'Select All' checkbox.
- Step 2.1:** A box labeled '2.1' points to a 'Shift' key icon, indicating the key to hold for selecting a range of sites.
- Step 2.2:** A box labeled '2.2' points to a mouse cursor clicking on a site in the list.
- Step 3.1:** A box labeled '3.1' points to a 'Ctrl' key icon, indicating the key to hold for selecting specific sites.
- Step 4:** A box labeled '4' points to the 'Export Selected' button in the top right corner.
- Step 4.1:** A box labeled '4.1' points to the 'Save' button in the 'Process Site Exporter - EMapower' dialog box.

The 'Workbench list' table shows the following data:

Site / Workbench Name	Reference / Status	Filter / Geophysical Param	Sensor	Has Remc
Test	Magnetic	60Hz	MTC-150	Yes
Unapproved	Resistivity/Impedance			
Unapproved	Resistivity			
test 4505 2 - (Workbench 1)	Electric	None		
Workbench 1	Unapproved	Resistivity		
Unapproved	Resistivity/Impedance			
test 4505 - (Unedited)	Electric	None	MTC-155	No
Unedited	Unapproved	Resistivity/Impedance		
P=Victoria Park R= (Local H) - (Workbench 2)	Magnetic	None	MTC-155	No

The 'Process Site Exporter - EMapower' dialog box shows the following settings:

- Target Sites:** P=Remote R= (Local E) - Workbench 1, P=Remote R= (Local H) - Unedited, P=Remote R= (Local H) - Robust
- Exporting Format:** MT Exchange File (selected), EDI (selected), PLT
- INFO layout:** Compact
- File By:** Export 54.1
- Report Document:** ODF (selected), PDF
- Sections to include:** Title Page, Calibration Metadata, Map, Plot Images (all checked)

Working with multi-sites

EMpower has the functionality to work with multiple sites. Select the sites as needed (see *previous page*)

1. The highlighted site will be in the foreground

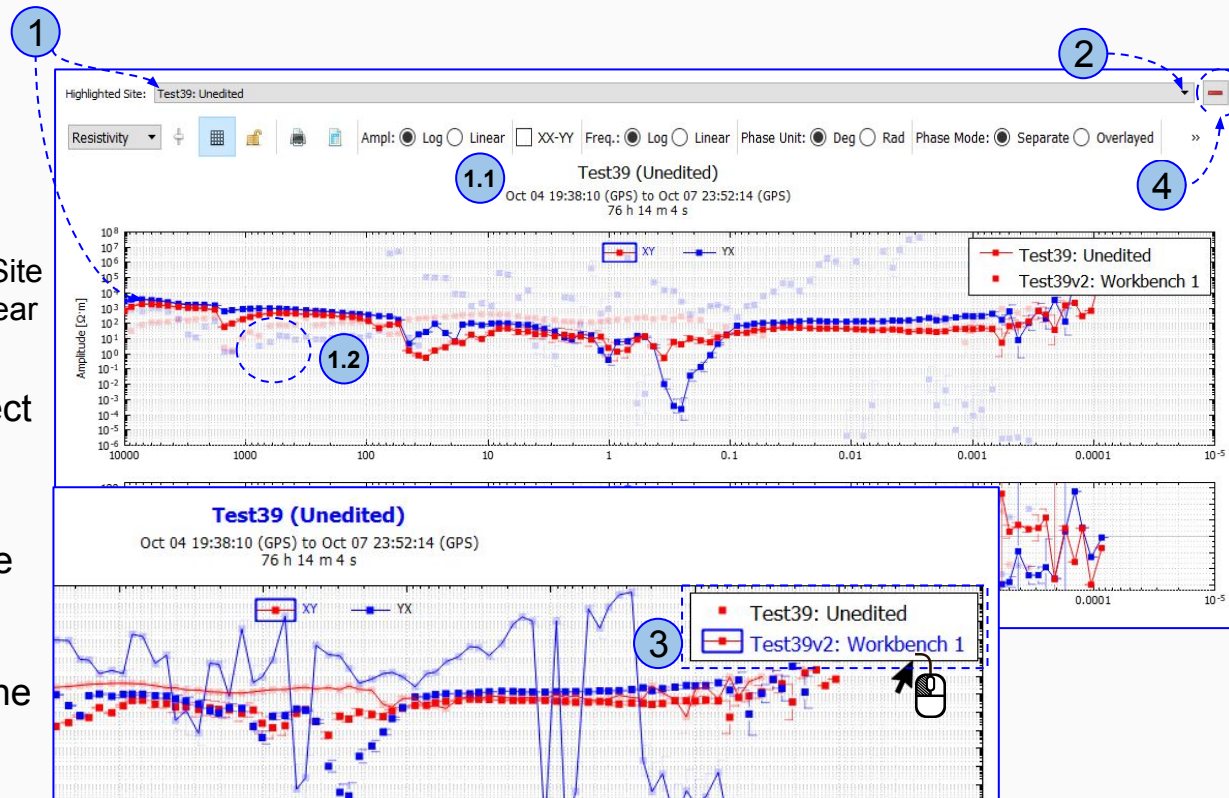
1.1. The plot title will show the Highlighted Site

1.2. Other selected sites in the plot will appear in attenuated colour

2. To change the Highlighted Site, select the Highlighted Site from the drop down menu

3. To switch between curves, select the site on the plot legend

4. To remove a site from the plot use the button 



Site Info - Coherence

1. General Processing Metadata information

2. Channels details

- Electrics
- Magnetics
- Remote Reference (E)

3. Recording Information

4. Coherence

1 Metadata Viewer: P=S6 5C R=Rem Dec02 5C (H) - EMpower

Processing Metadata

Site ID: {68d7ac2f-b935-489d-895b-961d3f1d0026}
Site Name: P=S6 5C R=Rem Dec02 5C (H)
Survey Name: Don Campbell
Company Name:
Power Grid: 60Hz
Process Type: Orthogonal
Version: Not Available
Site Status: **approved**

Tipper Source: From Local Magnetics
Reference Type: Magnetic
Reference Location: Remote
Process Date: Not available
Start Time: Sat Dec 2 22:26:22 2017 GMT
Stop Time: Sun Dec 3 17:20:02 2017 GMT
Duration: 18 h 53 m 40 s
Frequency Range: 0.00005 Hz to 12500 Hz

Processing Notes

2

Electrics Magnetics Remote Reference (E)

	Tag	Polarity Inverted	Gain	LPF	DC	Saturated Frames	Dropped Frames	Pot RResistance(+)	Pot Resistance(-)	Dipole Leng
Ex	Not Available	No	0 x 0 = x0	Not Available	Not Available	0	0	0 Ω	0 Ω	0 m
Ey	Not Available	No	0 x 0 = x0	Not Available	Not Available	0	0	0 Ω	0 Ω	0 m

3

Recording Information

Recording ID: 10125_2017-12-02-203505
Station Name: S6 5C
Survey Name: Don Campbell
Operator(s): CF MU and GB
Start Time: Dec 02 2017 12:35:05
Stop time: Dec 03 2017 09:20:02
Duration: 20 h 44 m 57 s
Electric Filter: None
Latitude: 38.8469 °
Longitude: -118.308 °
Altitude: 1250.1 m
Elevation: 0.00
Magnetic Declination: 13.000000

Receiver Information

Rx Type: UNKNOWN
Rx ID: 10125
Rx Firmware:
Rx Cal: Not Available

Recording Notes

4

Coherence viewer - EMpower

Channel 1: Ex Channel 2: Hy

Coherence

Frequency [Hz]

Close

Site: P=S1 MTU-SC R=Rem SC B30 (H)

☒ Approved ☐ Unapproved ☐ Rejected

Notes:

Edit Cross Powers Coherence Site Info Delete

Process Site Exporter

1. Select Site(s) - Processed MT Data
 - Modify Groups/Filters as needed
 - Check the desired processed sites or use Check all the processed sites to export (See [Advanced Search](#))
2. Use the **Export Selected** option to open the Process Site Exporter
3. Select one of the **Exporting Format**
4. **Report Document** give the option to create a customized report, by selecting the sections that will be included

Table 1: Site / Workbench Name

Site / Workbench Name	Reference / Status	Filter / Geophysical Param	Sensor
Test	Approved	Resistivity	
P=Remote R= (Local H) - (Robust)	Magnetic	60Hz	MTC-155 Y
Unedited	Unapproved	Resistivity/Impedance	
	Unapproved	Resistivity	
	Electric	None	MTC-155 N
	Unapproved	Resistivity	
	Unapproved	Resistivity/Impedance	

Table 2: Process Site Exporter - EMapower

Target Sites
P=Remote R= (Local E) - Workbench 1
P=Remote R= (Local H) - Unedited
P=Remote R= (Local H) - Robust

Exporting Format

- ☐ Site metadata (CSV)
- ☐ Site geographic information (KML)
- ☐ Archived file (phzip)
- ☒ MT Exchange File
 - ☒ EDI ☐ PLT
 - INFO layout:
 - File By:
- ☐ Report Document
 - ☒ ODF ☐ PDF

Sections to include

☒ Title Page	☒ Calibration Metadata
☒ Map	☒ Plot Images

Export MT Processed Sites

File	Tools	View	Settings	Window	Hel
Create New Project	Ctrl+N				
Open Existing Project	Ctrl+O				
Recent Projects...					
Import Recordings	Ctrl+I				
Import Calibration Files	Ctrl+L				
Import Processed Data	Ctrl+R				
Export Recordings	Ctrl+E				
Export MT Processed Sites					
Export CSAMT Processed Sites					
Close Current Project	Ctrl+W				
Exit	Alt+F4				

Report Document

Sections to include

☒ Title Page	☒ Calibration Metadata
☒ Map	☒ Plot Images



Processed data editing

Crosspower Editor

Editing Cross Powers	33
Robust Mask	34
Project Settings - Robust Templates	35
Polar Editor	36
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Editing Cross Powers

Edit Cross Powers, is a tool to create multiple edition masks without changing the original (Unedited) data. Masks can be used to clean noisy sites

1. To create a new **Workbench**

- Click the icon 
- Type the **Workbench name**
- Complete the information as needed
- Click the **Create** button

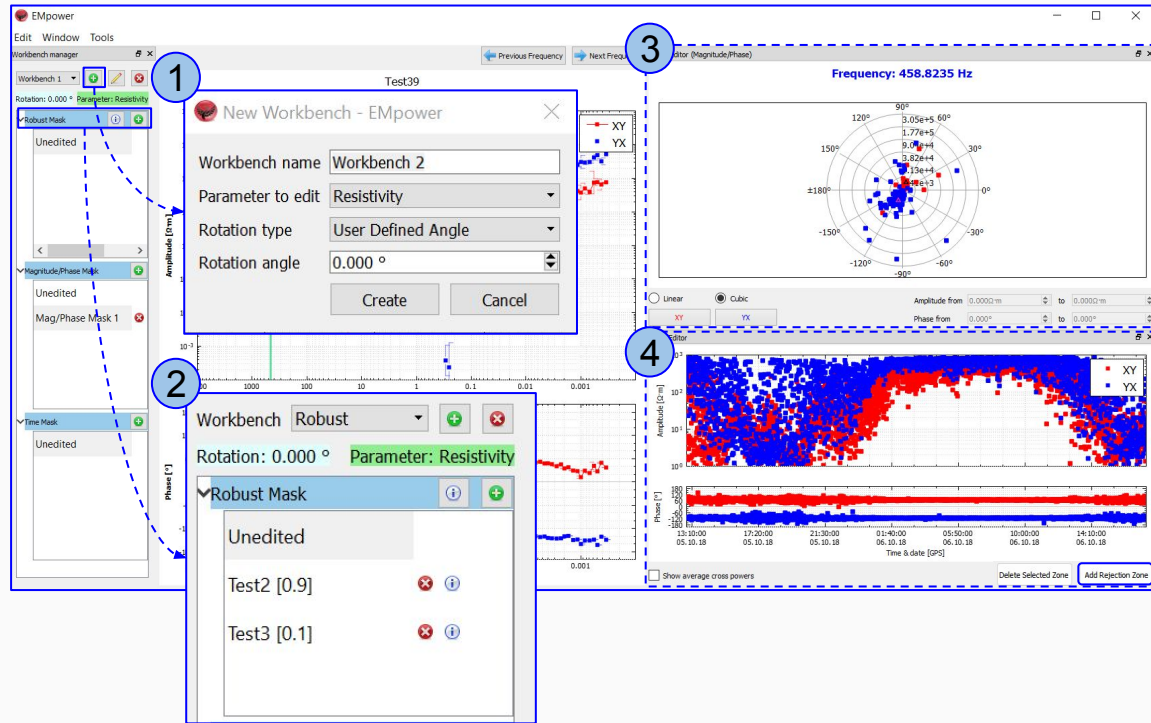
2. When the site is processed using a Robust Template, the Workbench list will include Robust and the Robust mask will display the Robust Templates created on the Project setting (page 8)

3. Polar Editor

- Create a **Polar Editor Mask**(page 36)

4. Time Editor

- Create a **Time Editor Mask**(page 37)



Robust Mask

The Robust Mask algorithm fixes the most common problems

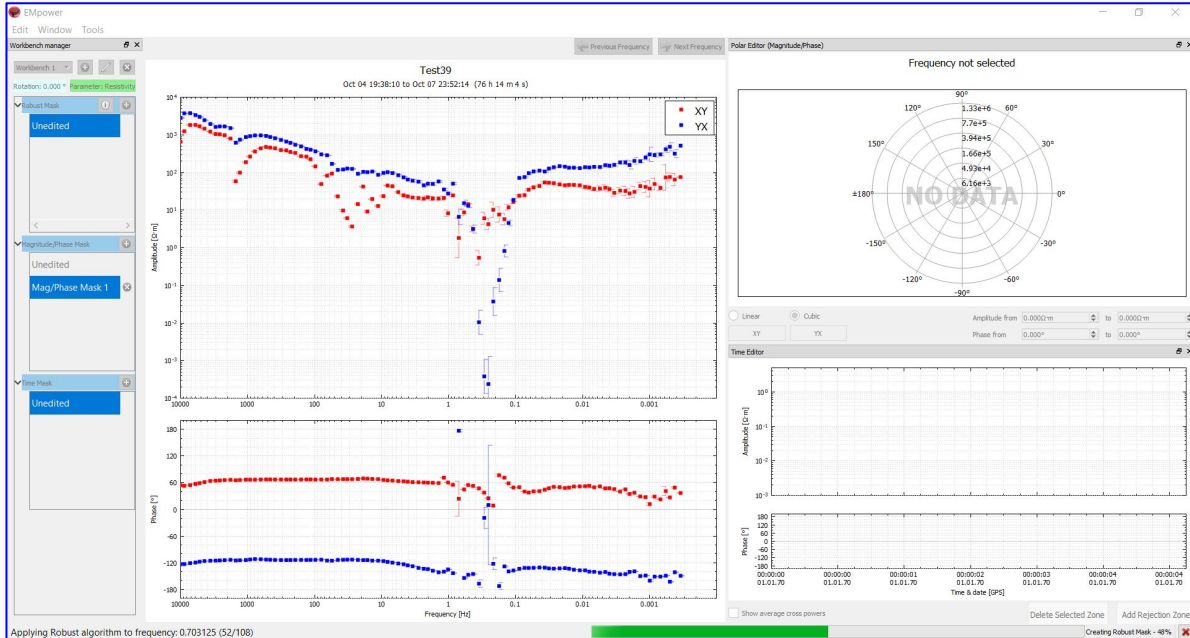
1. Create a Robust Mask

- Type the **Mask Name**

2. Use the different options to obtain the desired information

- Select the **Robust** algorithm
- Define the **Attack**
- Select the percent of **Cross powers** to reject

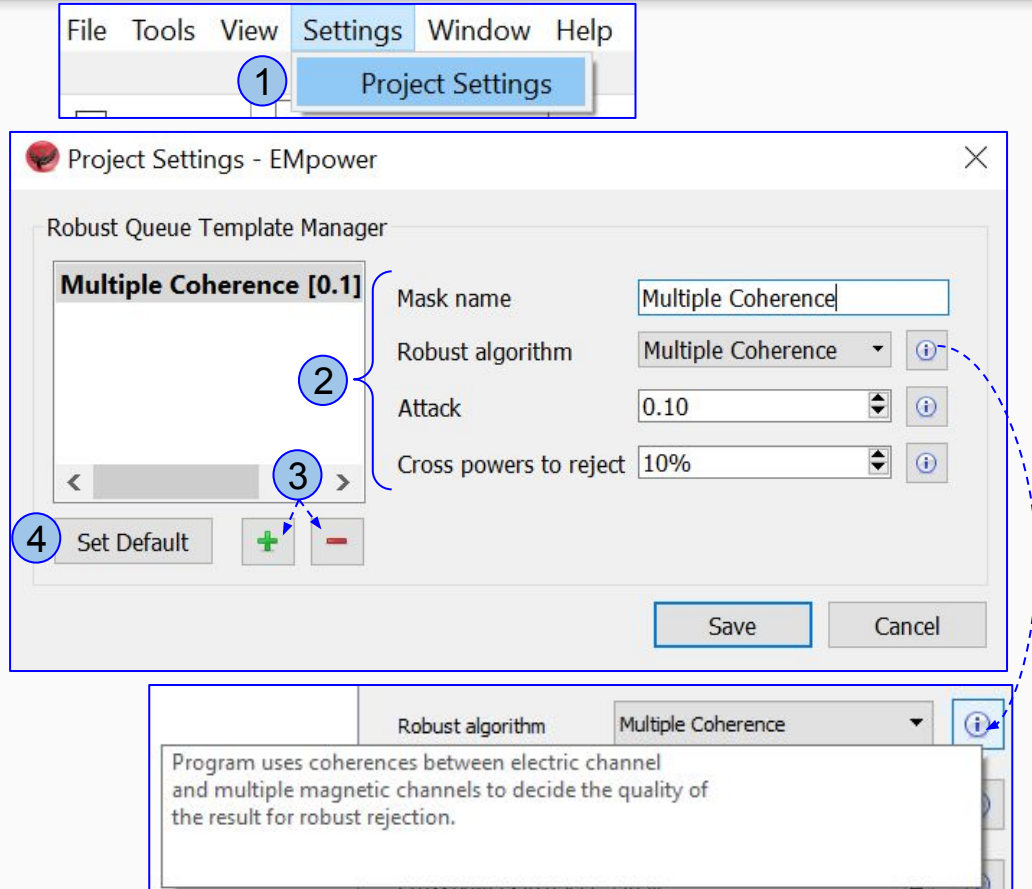
3. Wait until the process is completed



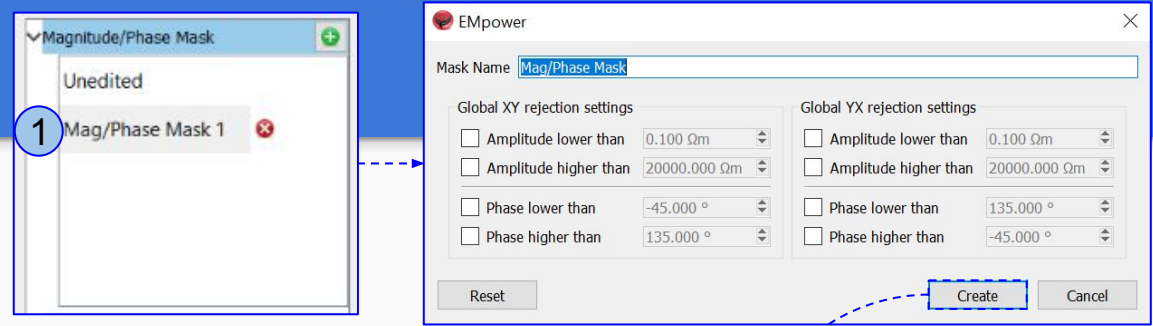
3

Project Settings - Robust Templates

1. Select **Project Settings** from Setting menu
2. Define the parameters for the **Robust Mask Template**
 - This *template only applies to the current project*
3. Add, Modify or Delete a Robust Mask
4. **Set Default**
 - The "default" in settings will be the robust mask selected after processing for any processing in the project



Polar Editor

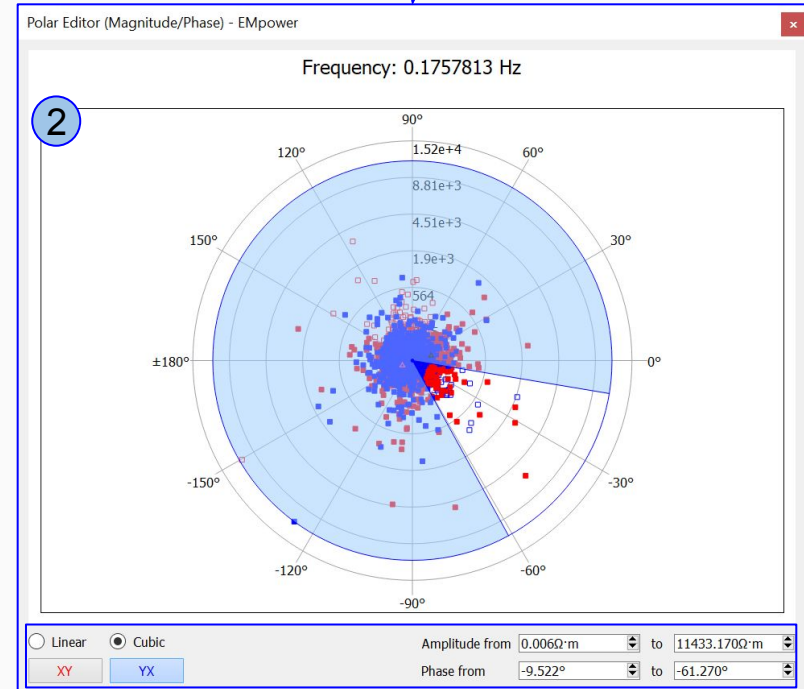


1. Create a New Magnitude/ Phase Editor Polar Masks

- Type the **Mask Name**
- Edit the **Global XY rejection settings** as needed
- Click the **Create** button

2. Use the different tools to obtain the desired information

- Linear / Cubic
- XY / YX
- Amplitude range
- Phase range



Time Editor

1. Create a New Time Editor Mask

1.1. The Mask Name can be edited by right-clicking on it

2. To add a new rejection area

2.1. Click the **Add Rejection Zone** button

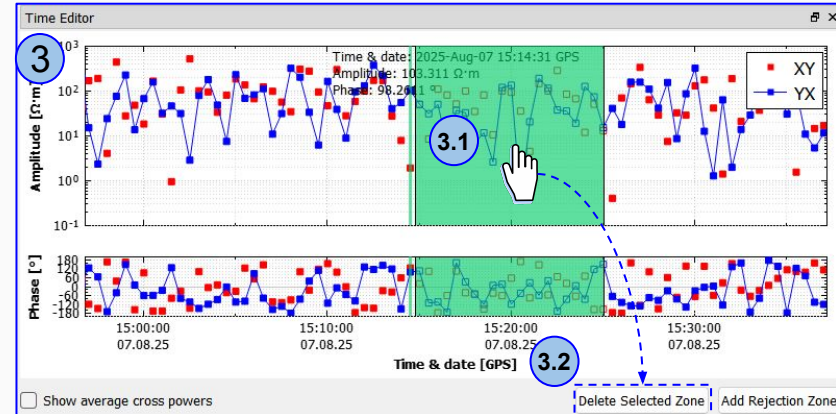
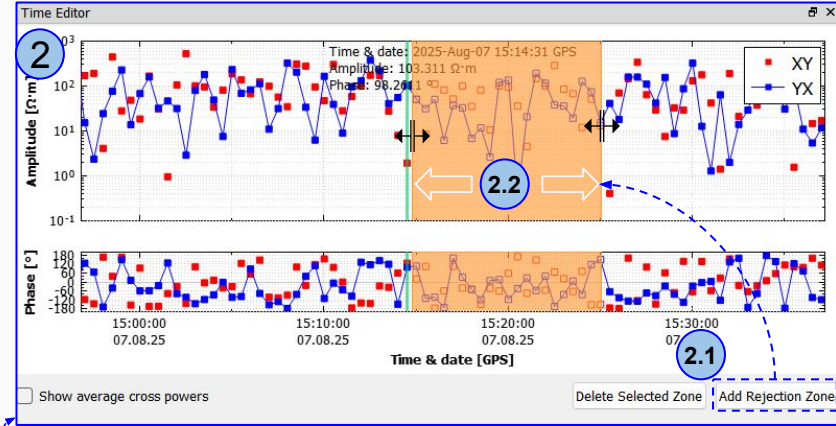
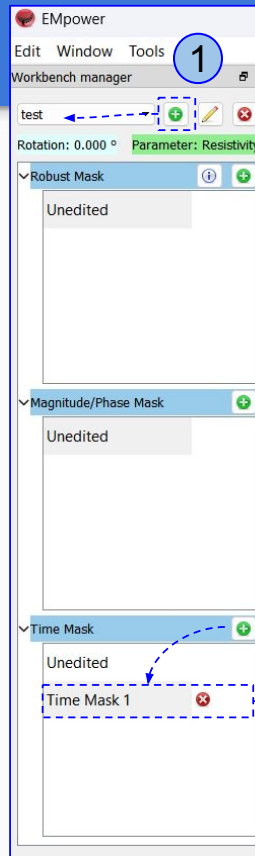
2.2. Left-click and hold, and start dragging to the left or right to select the area of crosspower rejection

3. To remove an existing rejection area:

3.1. Select the area to be deleted

3.2. Click the **Delete Selected Zone** button

** The crosspowers rejected in the polar editor will be shown in the time editor and vice versa.*





Processed PNT Data

Processed PNT Data	39
Multi-Site PNT	40

Processed PNT Data

This tab shows processed Parallel Noise data

1. Area to Select the Site of interest and view its metadata

2. Area to edit information of the selected Processed **Site**

- Site Name
- Mark the site as Approved, Unapproved or Rejected
- Relevant Notes for the processing

3. Selectors to choose the **Channels** to be analysed and displayed

4. Tools



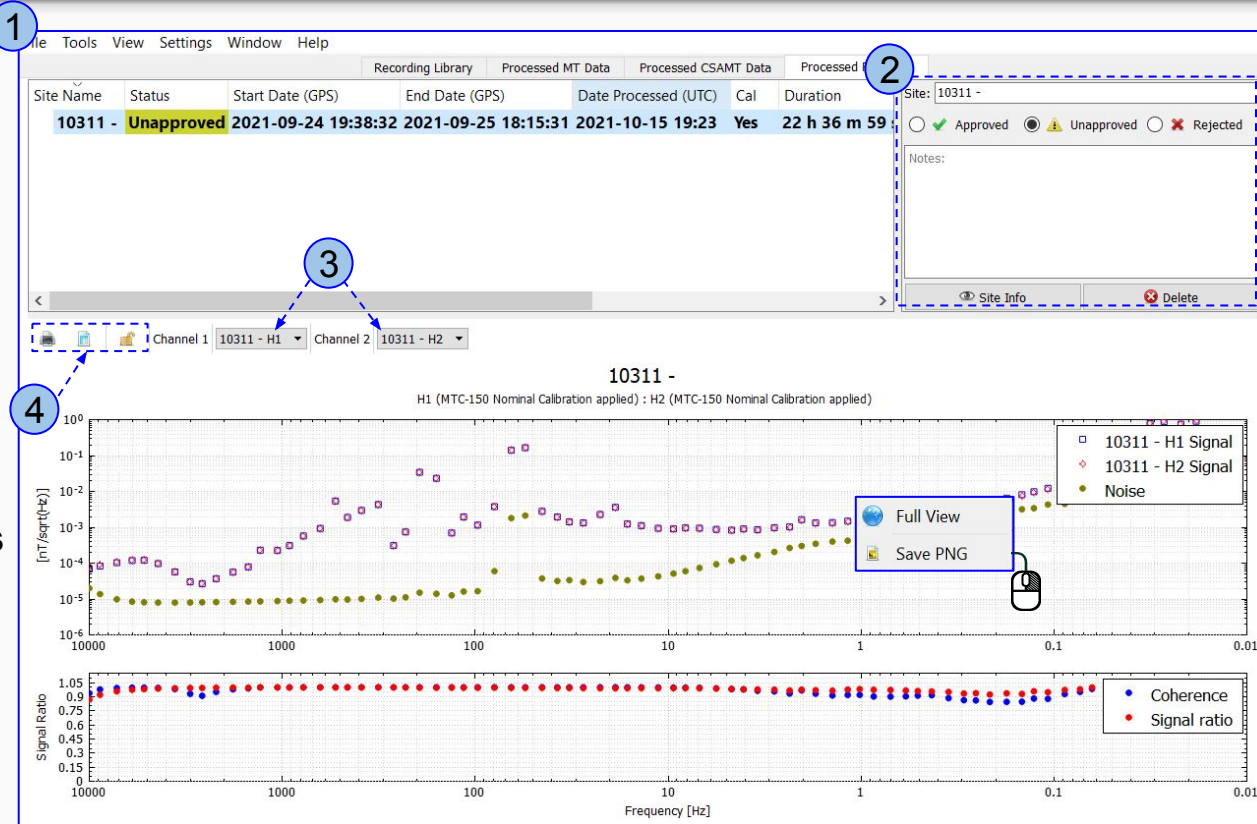
Print the plot



Export the values in CSV format



Lock / Unlock plot scale



Multi-Site PNT

1. Use the **Multi-Site PNT (Ctrl+T)** tool to process Parallel Noise data using specific channels from different recordings

2. Select the recording(s)

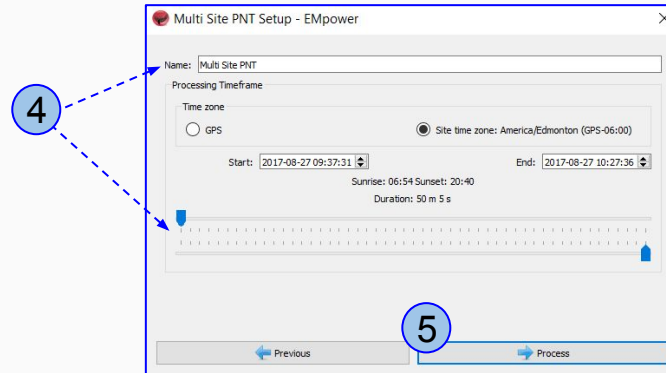
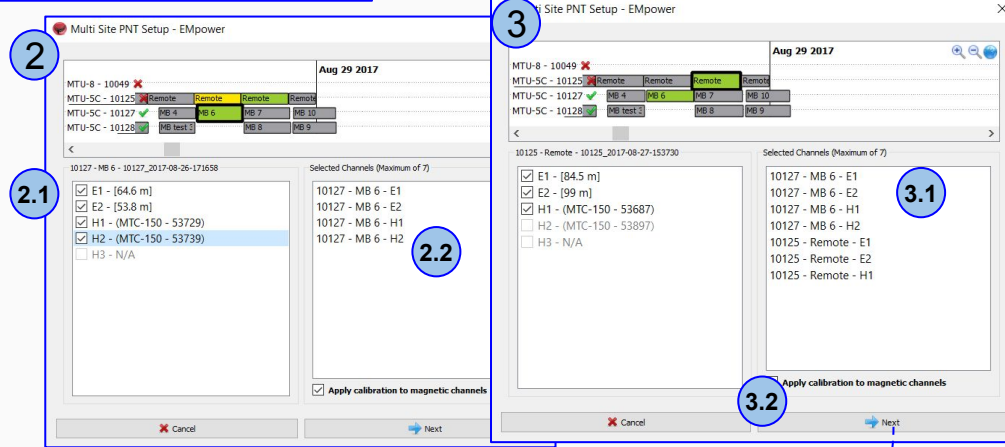
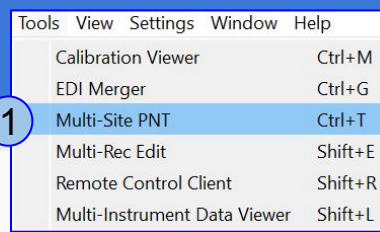
- 2.1. Select the first Recording and define the channels
- 2.2. Select for another recording(s) the channels that will be used (no more than 7)

3. **Apply calibration to magnetic channels**

- 3.1. When the selected sensor does not have associated calibration available in the project **EMpower** will apply a generic calibration
- 3.2. Click **Next**

4. Define the Name and Duration, the time available depends on the overlapped time between all the recordings selected

5. To begin processing click the **Process** button





Tools

EDI Merger <Create>	42
EDI Merger <Edit and Save>	43
Multi-Rec Edit	44
Multi-Instrument Data Viewer	45

EDI Merger <Create>

1. **EDI Merger (Ctrl+G)** tool is used to combine two EDI files into one.
2. Select the EDI files by using the **Browse for EDI** button
3. Choose one of the Geophysical Mode
4. The **Merged Results** plot shows the highlighted area on the EDI plots

The screenshot displays the EDI Merger - EPower software interface. The main window shows two plots: Amplitude [Ω·m] and Phase [°] versus Frequency [Hz]. The Amplitude plot has a logarithmic y-axis from 10⁻³ to 10⁰. The Phase plot has a linear y-axis from -180 to 180. The Frequency axis is logarithmic from 10,000 to 0.01 Hz. A menu is open, showing the 'EDI Merger' option (Ctrl+G). A file selection dialog is open, showing the file 'P_MB_4_R_Remote_H_Workbench_1.edi' selected. The 'Browse for EDI' button is highlighted. The 'Merged Result' plot shows the combined data from both files. The 'Resistivity' mode is selected in the dropdown menu.

Tools View Settings Window Help

Tool	Shortcut
Calibration Viewer	Ctrl+M
EDI Merger	Ctrl+G
Multi-Site PNT	Ctrl+T
Multi-Rec Edit	Shift+E
Remote Control Client	Shift+R
Multi-Instrument Data Viewer	Shift+L

EDI Merger - EPower

Amplitude [Ω·m]

Phase [°]

Frequency [Hz]

Browse for EDI

Look in: C:\Users\PCASTRO\Desktop

Name	Size	Type	Date
Desktop			
Documents			
PCASTRO			
FIELD TESTS (G:)			
P_MB_4_R_Remote_H_Workbench_1.edi	7...B	e...e	26/03
P_Remote_R_Local_E_Workbench_1.edi	6...B	e...e	26/03
Google Drive		Fi...	26/03
V1.50		Fi...	24/03
New Folder2		Fi...	23/03
v1.31.0.1		Fi...	27/02
RemoteControlClient_Win		Fi...	19/02
V1.48		Fi...	11/02

File name: P_MB_4_R_Remote_H_Workbench_1.edi

Files of type: EDI File (*.edi)

Open Cancel

Amplitude [Ω·m]

Phase [°]

Frequency [Hz]

Browse for EDI

Resistivity

Remove Frequency Restore Frequency Save Close

Resistivity

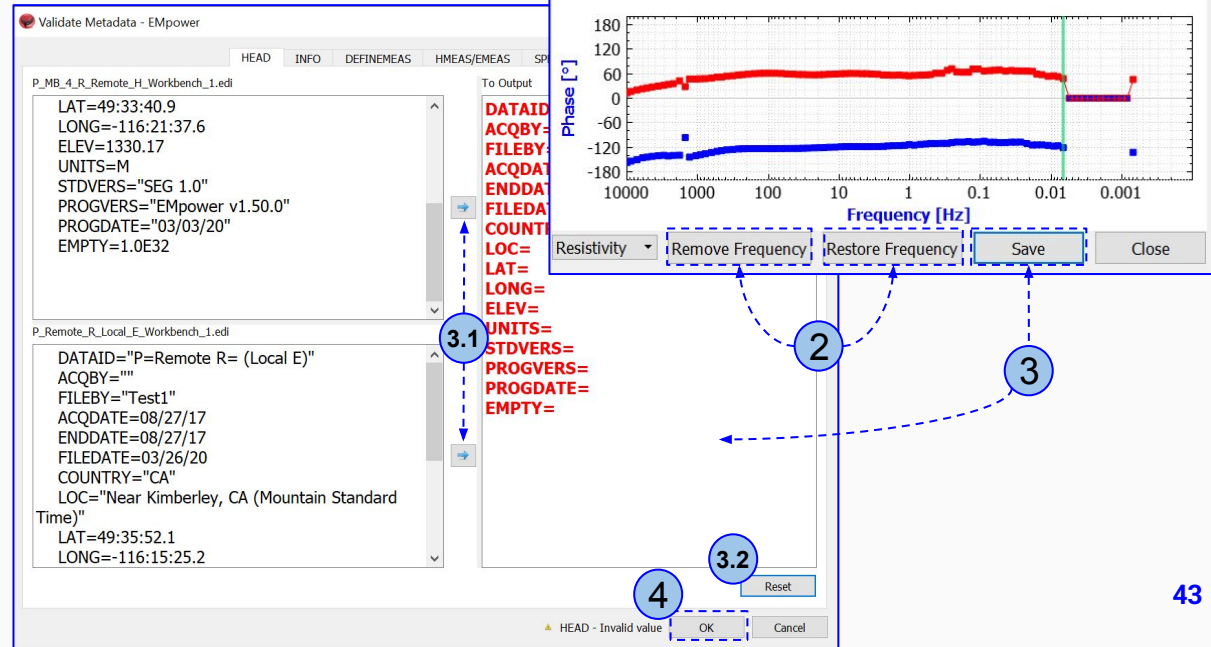
Resistivity

Impedance

Tipper

EDI Merger <Edit and Save>

1. To exclude a frequency, select it by using the Left-Click, *(review the information on the top plot)* and click **Remove Frequency** or use the Delete key
2. To recover the frequency, select the frequency and click **Restore Frequency**
3. Click **Save** button and fill out the metadata of the merged EDI in each tab
 - 3.1. Use the blue arrows to select the information from respective EDI file. This information can be manually edited in the merger EDI file.
 - 3.2. To clear the selection use the **Reset** button
4. Once the all the Metadata has been filled click **OK** button to save the merged EDI



Multi-Rec Edit

The **Multi-Rec Edit** tool is used to update multiple recordings and channels simultaneously.

1. Select **Multi-Rec Edit**

1.1. The tool can be launched from the Recording Library when multiple recordings are selected from the map or timeline, the list will appear on the right of the map.(see page 9)

2. Choose the Groups and/or Filters as needed

3. Choose between recording Information or Channels that will be modified.

3.1. Select All Rows or select the necessary rows (see pages 23-24)

3.2. Click the **Edit Selected Rows**

3.3. Made the necessary adjustments

4. Click Save button

The screenshot shows the EMpower software interface. A menu is open with the following options: Calibration Viewer (Ctrl+M), EDI Merger (Ctrl+G), Multi-Site PNT (Ctrl+T), **Multi-Rec Edit** (Shift+E), Remote Control Client (Shift+R), and Multi-Instrument Data Viewer (Shift+L). The 'Multi-Rec Edit' option is highlighted with a blue circle and the number 1. On the right, a table lists recordings with columns: Recording Type, Station Name, Survey Name, Start Date, and Status. The table contains 14 rows of data. A blue dashed box highlights the 'Multi-Rec Edit (14)' button at the bottom right of the table, with a blue circle and the number 1.1. Below the table, there are buttons for 'Export (14)', 'Multi-Rec Edit (14)', and 'Delete (14)'. The 'Multi-Rec Edit (14)' button is highlighted with a blue dashed box and a blue circle with the number 1.1.

The screenshot shows the 'Multi Rec Editor - EMpower' window. It has a 'Recording filter' dropdown set to 'MT'. Below it, there are buttons for 'Select All Rows' and 'Edit Selected Rows'. A blue dashed box highlights the 'Edit Selected Rows' button, with a blue circle and the number 3.1. To the right, there is a 'Batch Editing - EMpower' window titled 'Recording Information'. It has a 'Status' dropdown set to 'None' and a 'Filters' dropdown set to 'None'. A blue dashed box highlights the 'Status' dropdown, with a blue circle and the number 2. Below the dropdowns, there are checkboxes for 'Status', 'Survey Name', 'Operator(s)', 'Company', and 'Declination'. A blue dashed box highlights the 'Status' checkbox, with a blue circle and the number 3.2. The 'Batch Editing - EMpower' window also has a table with columns: Station Name, Survey Name, and Color. The table contains 4 rows of data. A blue dashed box highlights the 'Status' checkbox, with a blue circle and the number 3.2.

The screenshot shows the 'Batch Editing - EMpower' window for 'Electric Channels' and 'Magnetic Channels'. The 'Electric Channels' window has checkboxes for 'Distance (m) to ground (+)', 'Distance (m) to ground (-)', 'Polarity', 'Inverted', and 'Azimuth'. The 'Magnetic Channels' window has checkboxes for 'Sensor Type', 'Sensor Serial', 'Polarity', and 'Azimuth'. A blue dashed box highlights the 'Status' checkbox in the 'Batch Editing - EMpower' window, with a blue circle and the number 4. Below the 'Batch Editing - EMpower' window, there is a 'Batch Editing - EMpower' window titled 'Electric Channels'. It has a 'Status' dropdown set to 'None' and a 'Filters' dropdown set to 'None'. A blue dashed box highlights the 'Status' dropdown, with a blue circle and the number 2. Below the dropdowns, there are checkboxes for 'Status', 'Survey Name', 'Operator(s)', 'Company', and 'Declination'. A blue dashed box highlights the 'Status' checkbox, with a blue circle and the number 3.2. The 'Batch Editing - EMpower' window also has a table with columns: Station Name, Survey Name, and Color. The table contains 4 rows of data. A blue dashed box highlights the 'Status' checkbox, with a blue circle and the number 3.2.



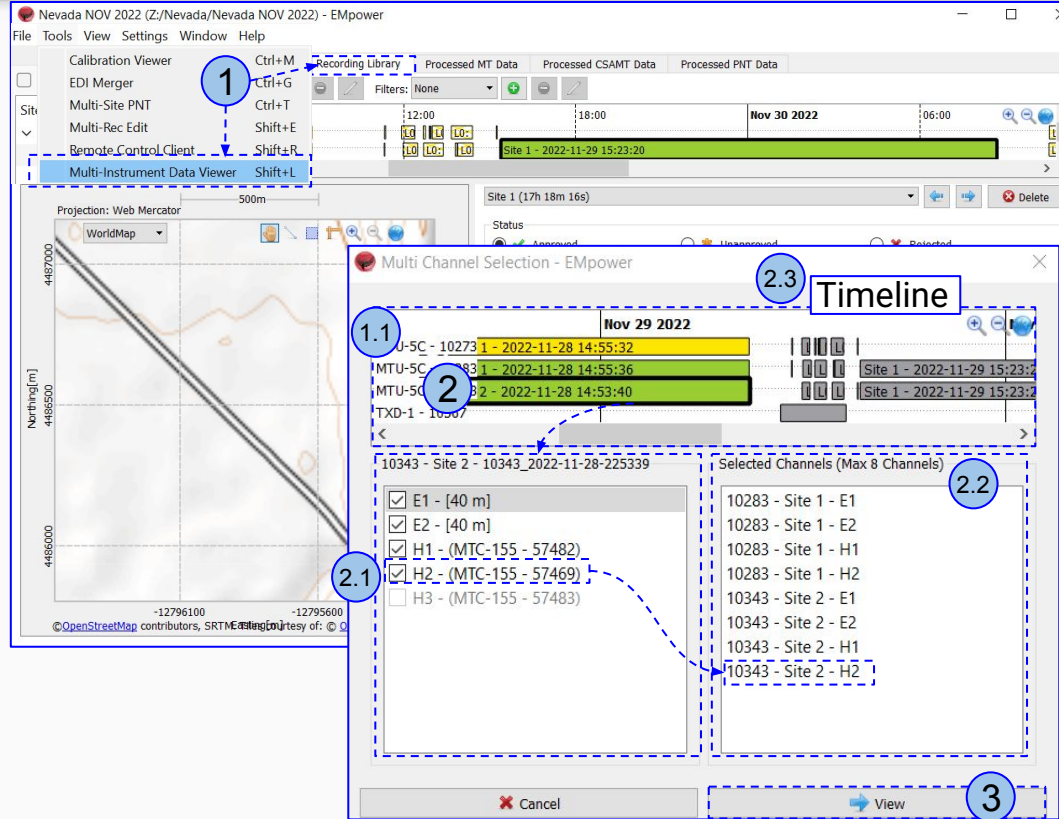
Rows with "----" consist of either disabled channels or not applicable channels of receiver type.

Multi-Instrument Data Viewer

The **Multi-Instrument Data Viewer** tool was designed to visualize multiple channels from different data recordings simultaneously (8 channels maximum).

1. From the Recording Library Tool menu, select **Multi-Instrument Data Viewer**

- 1.1. The Multi Channel Selection window will display the recordings in the project
2. To compare two or more receivers, the recordings must be using the same type (MT/CSAMT) and the same decimation scheme
 - 2.1. The channels used by the selected receiver will be on the left list, use the check-box to select the channel.
 - 2.2. The selected channels will be displayed in the list on the right (Receiver Number - Name - Channel).
 - 2.3. After selecting the first receiver, the list of the recordings on the timeline will show the available recordings
3. Click View button

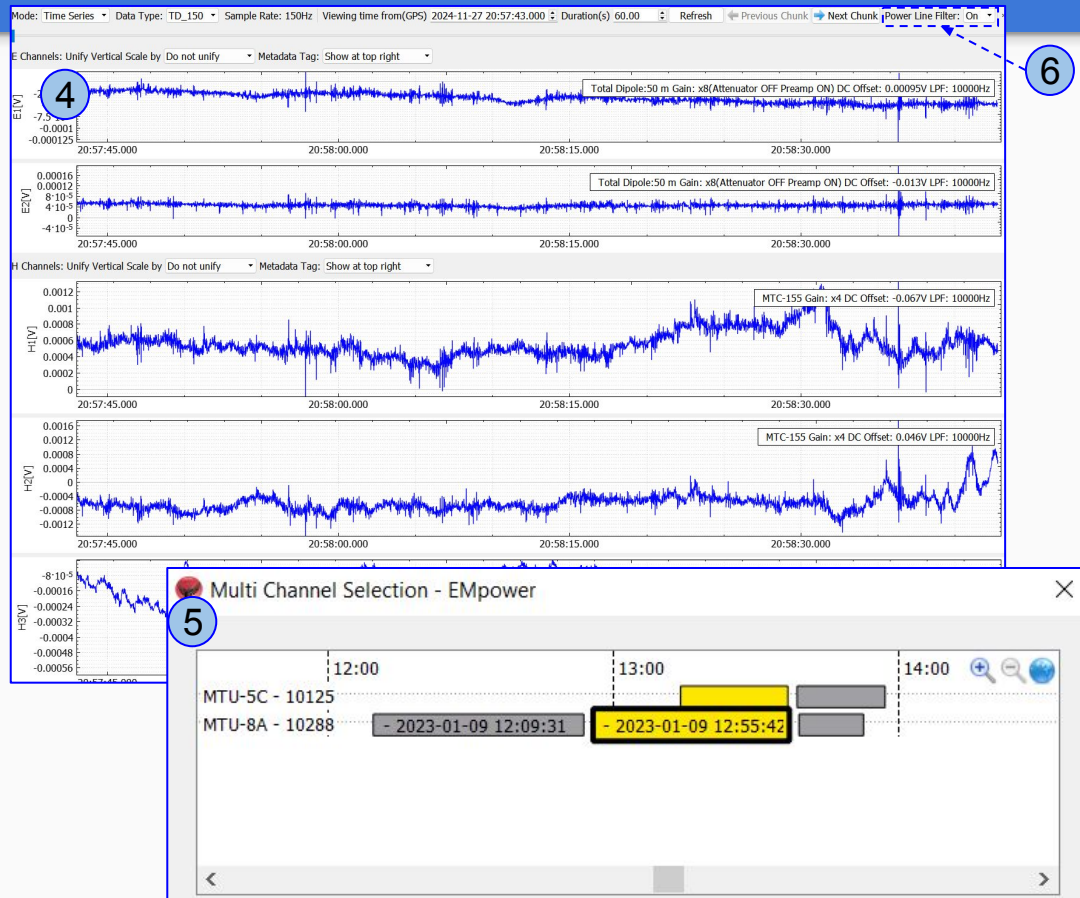


Multi - Instrument Time Series Viewer

4. The **Multi Instrument Time Series Viewer** will display the selected channels
5. When two time series recordings overlap the data, EMpower will start at the final time a recording started and ends at the time the earliest recording ends
6. **Power Line Filter** (Refer to DAA14 Manual, Slide 4 for additional details.)

Example

When the site is operating with multiple receivers at the same time, but the expected results sometimes are not congruent. This tool allows to compare the specific channels with another similar recording and detect the problem, sometimes caused by animals or environmental sources.



Software Recommendations

- Do not copy data to your computer, instead create a project where you want the data, and import the data into the project from the card
- Use parallel tasks
 - Import data in parallel
 - Process several sites in parallel
- When editing, prefer starting with robust and only clear details manually after





Please check out the [FAQs](https://phoenixgeophysics.freshdesk.com/)

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

Or email us at: support@phoenix-geophysics.com