

# TXM-22

## Geophysical Transmitter

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# A new idea for a versatile transmitter for EM application

Geophysical transmitters available on the market feed a current into a grounded dipole or into a loop.

If different dipoles need to be used as it is required for Tensor CSAMT it is necessary to reconnect the transmitter and to redo the transmission in order to obtain the other polarity.

The new Metronix transmitter uses a 3 electrode arrangement which does not require a reconnection of electrodes and which can switch the polarity within less than a millisecond controlled by software only.

# Tensor CSMT vs. Scalar CSMT

## Tensor CSMT

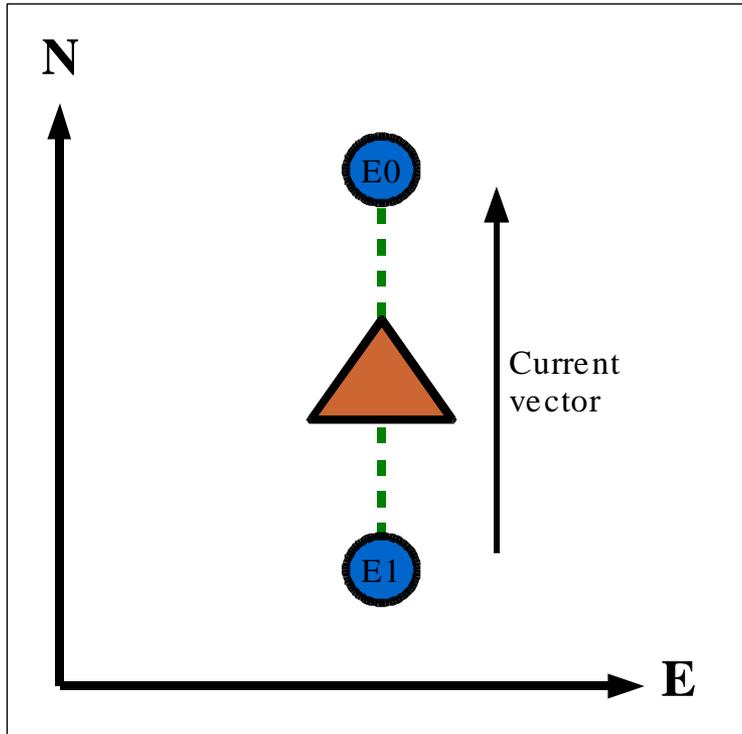
- + Better resolution of geological structures
- + Allows 2D and 3D modelling & inversion
- - Longer measurement times

## Scalar CSMT

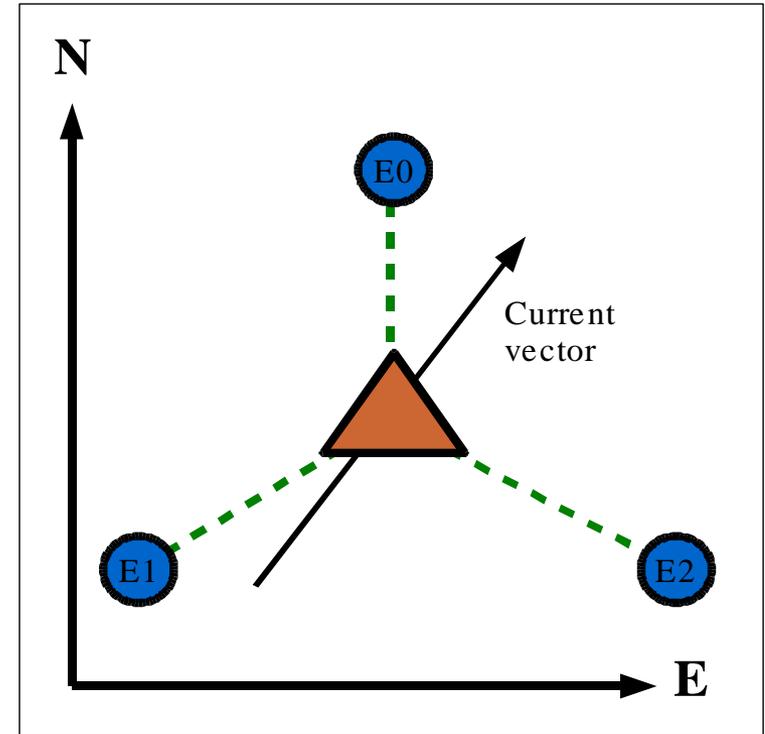
- - Only resolves structures crossing the profile
- - Possibility to miss geological structures in unknown terrain
- - 1D modelling only
- o Shorter measurement times

- Controlled Source Audio Magnetotellurics
- Tensor CSAMT; CSMT
- Long Offset Transient Electromagnetics
- Current Source can be grounded dipole or a horizontal loop configuration
- Rotating Electromagnetic fields

# Standard Transmitter vs. TXM-22

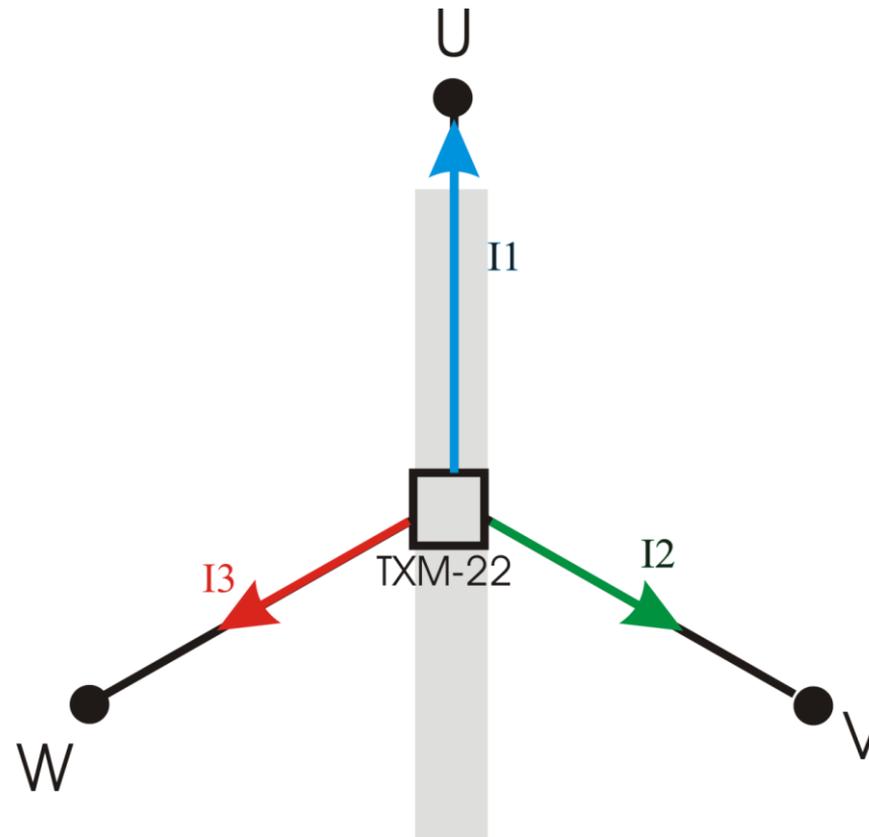


Standard CSAMT Transmitter

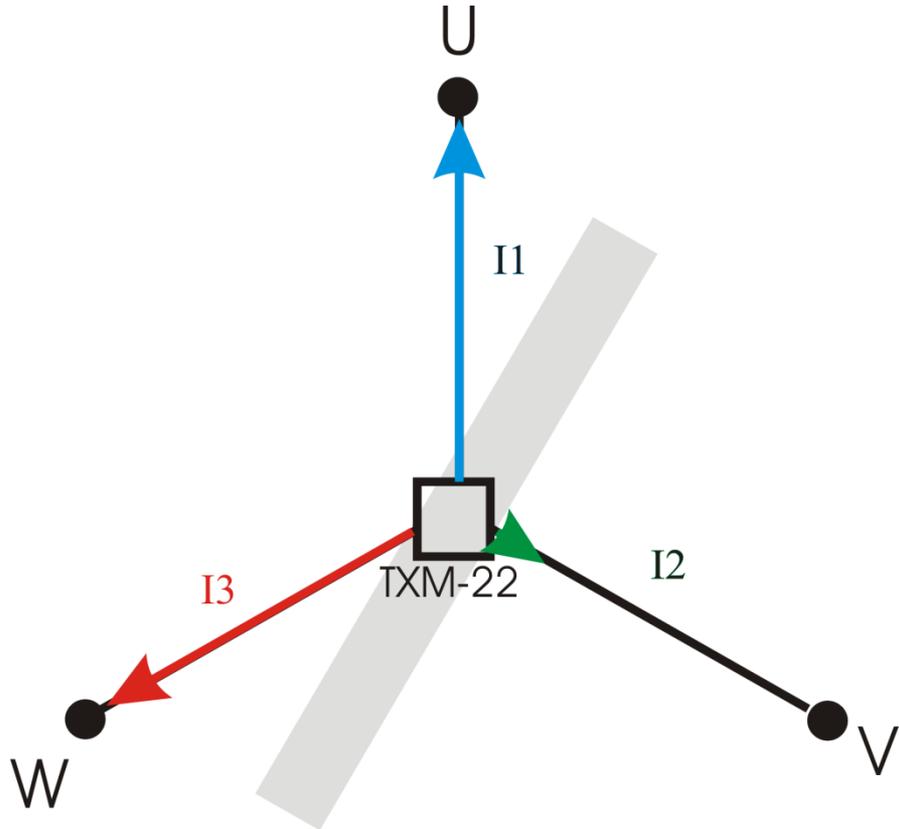


TXM-22 Tensor CSAMT Transmitter

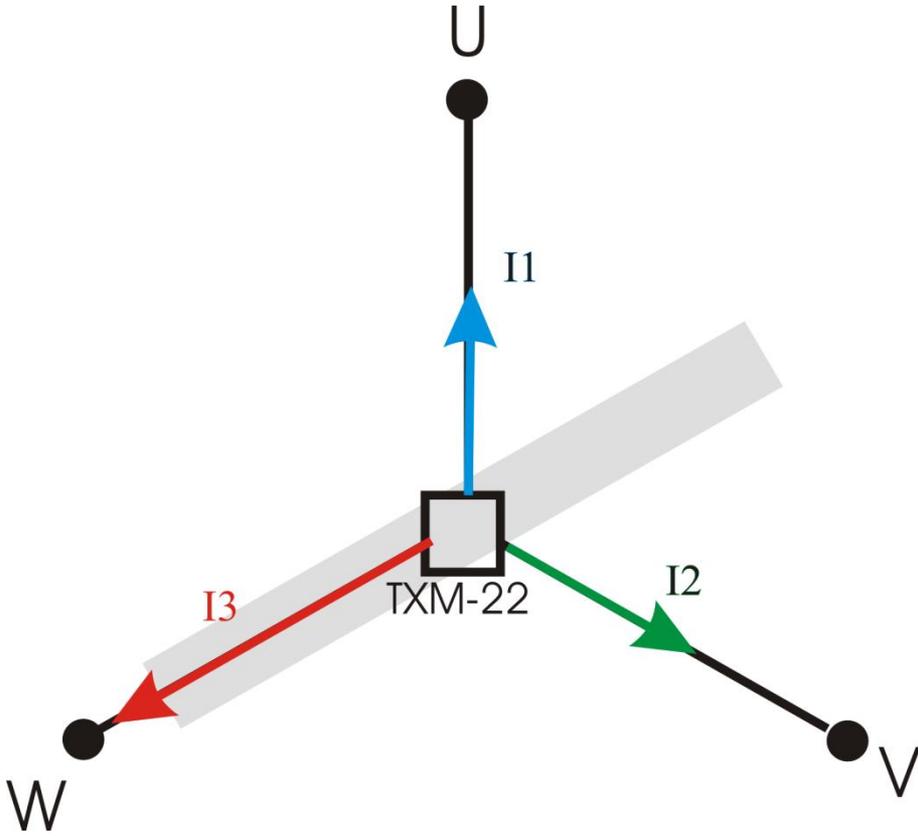
# Rotating Current Dipole 0°



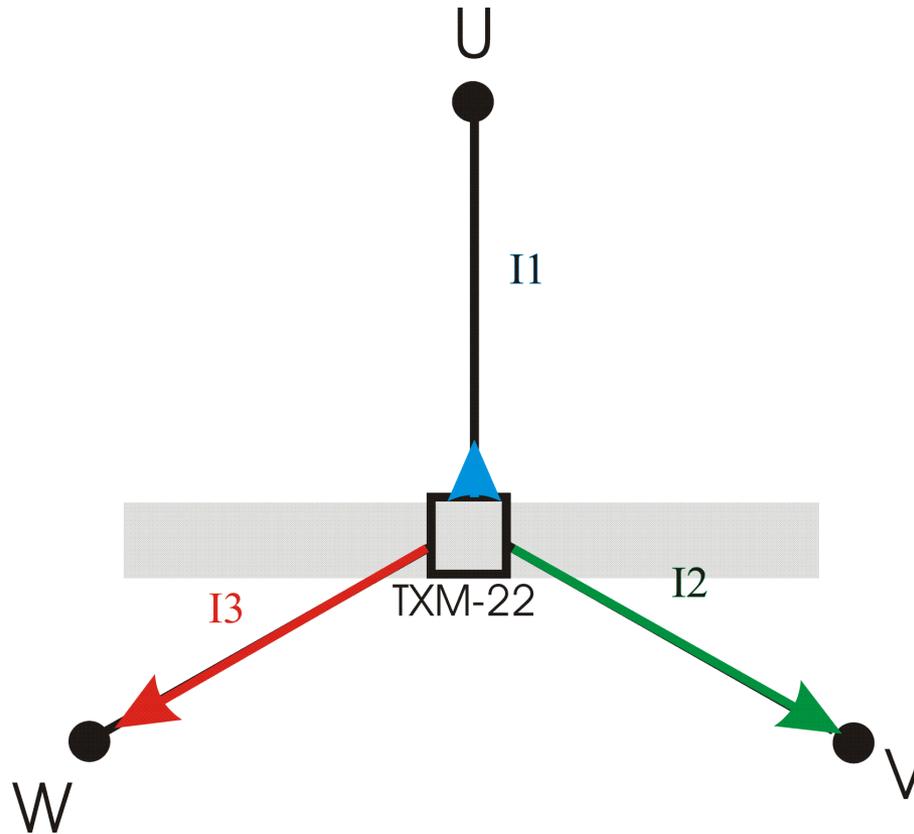
# Rotating Current Dipole 30°



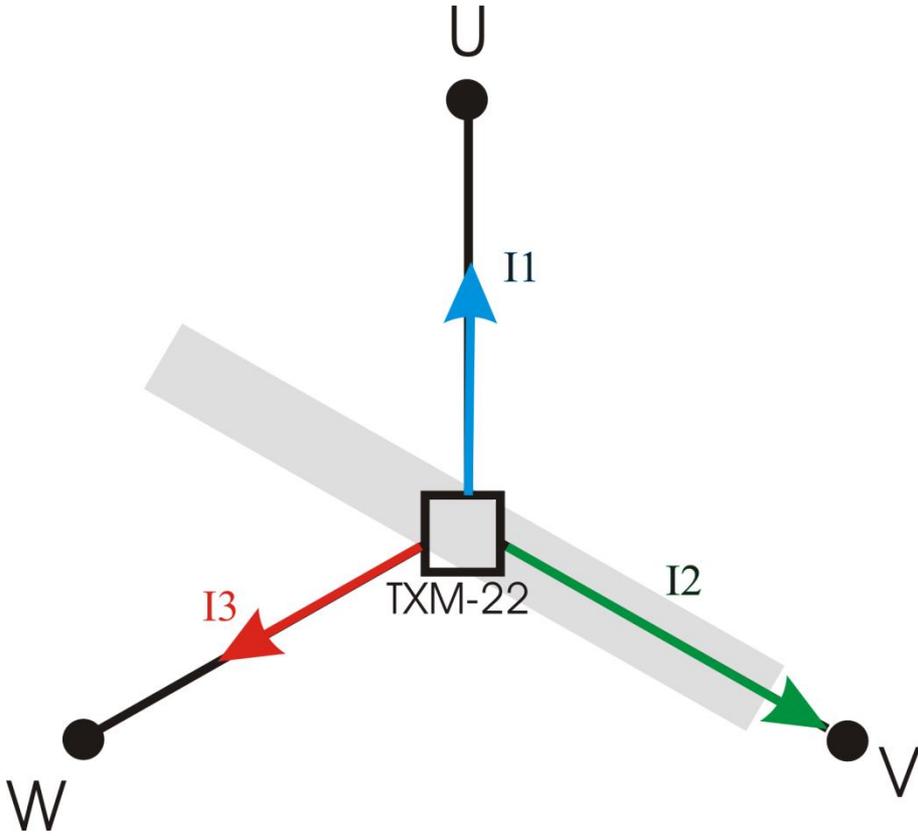
# Rotating Dipole 60°



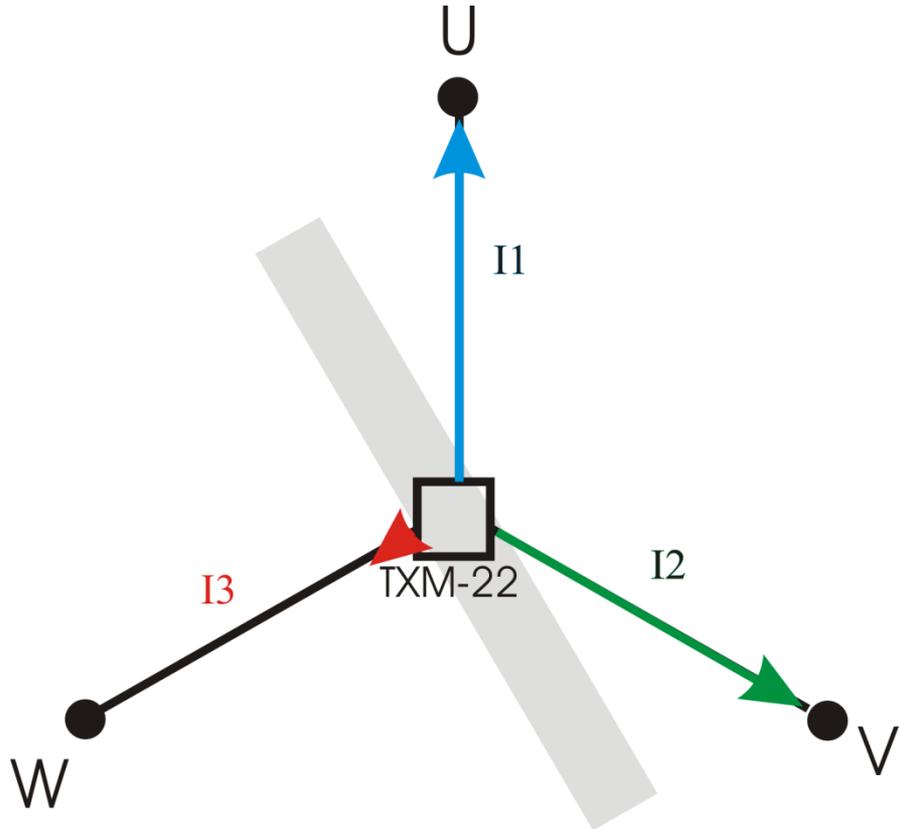
# Rotating Current Dipole 90°



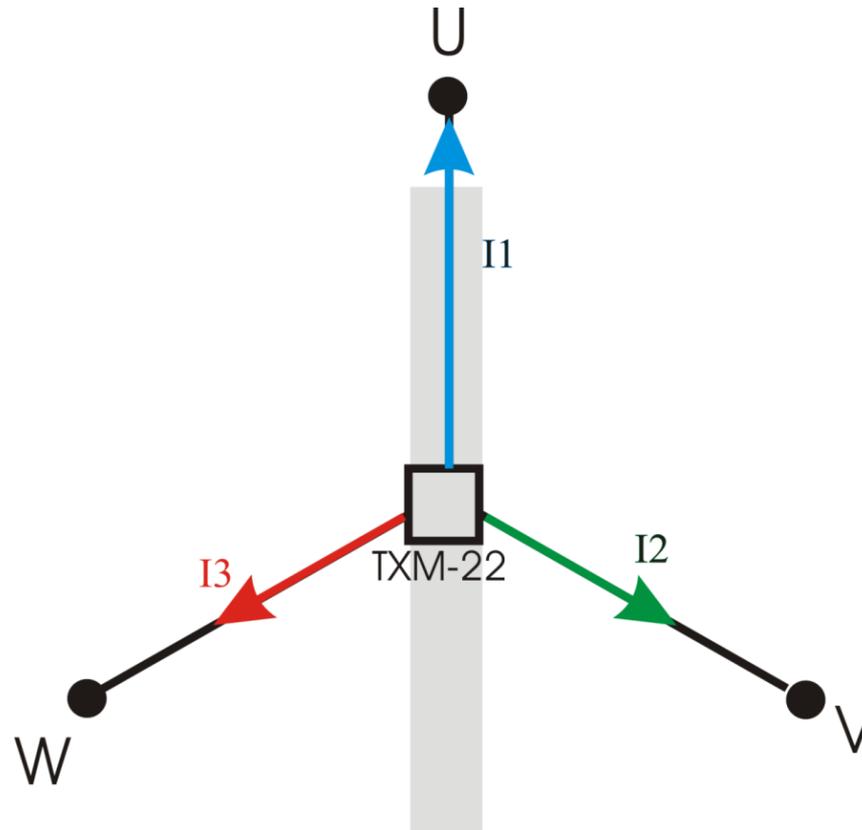
# Rotating Current Dipole 120°



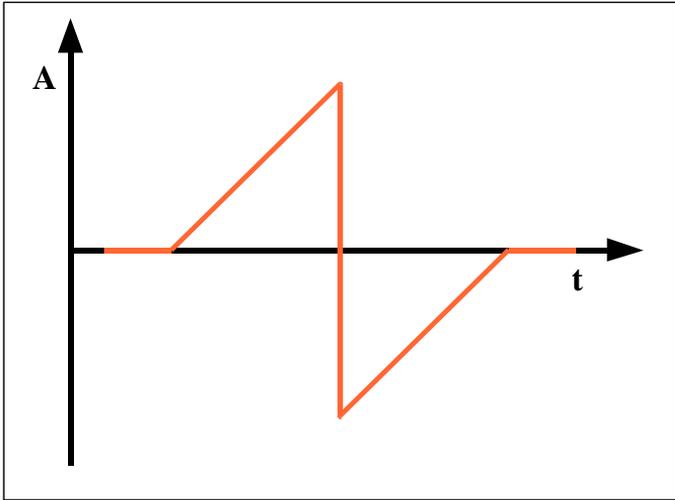
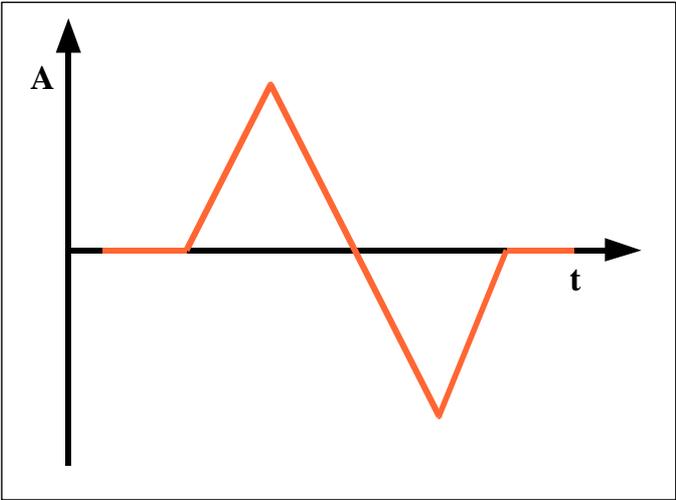
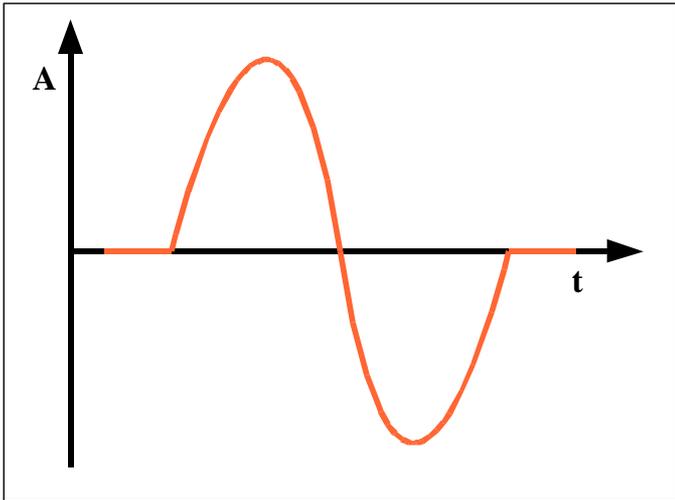
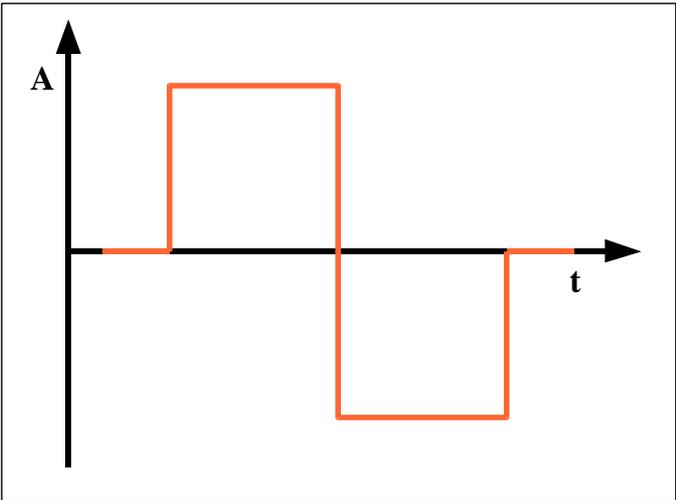
# Rotating Current Dipole 150°



# Rotating Current Dipole 180°

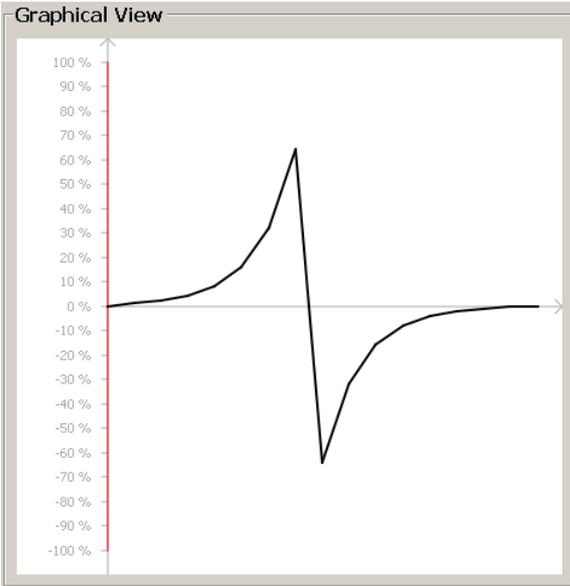


# Different Default Waveforms



# User Definable Waveforms

	Value
1	0
2	1
3	2
4	4
5	8
6	16
7	32
8	64
9	-64
10	-32
11	-16
12	-8
13	-4
14	-2
15	-1
16	0



# Core Unit of TXM-22

Besides manufacturing of geophysical instruments Metronix has a long tradition in development and production of servo drives.

A high power Metronix Intelligent Servo Drive is the core Unit of the TXM-22 geophysical transmitter.

On standard it is used as an intelligent servo for synchronous motors.

Now, a new field of application is the usage as geophysical transmitter



# TXM-22 Power Unit



# Technical Data of TXM-22

Input Voltage	50-60Hz, 3-phase 400V
Max. output voltage	+/- 560V
Max. output current long term	40A
max. Output power	22kW
Frequency range	0.001Hz up to 8192Hz
Output signal	Squarewave (up to 8192Hz) or any user selectable arbitrary wave forms such as sinewave, Sawtooth, PRBS
Output current	Adjustable by user
Temperatue range	Up to 40° ambient temperature without degrading
Controller	TXB-07 Control Box connected by cable, synchronized by GPS, incl. W-LAN functionality



40A OUTPUT

OUTPUT ACTIVE



# TXM-22

POWER GOOD



24V GOOD



READY



ERROR



TO CONTROL UNIT



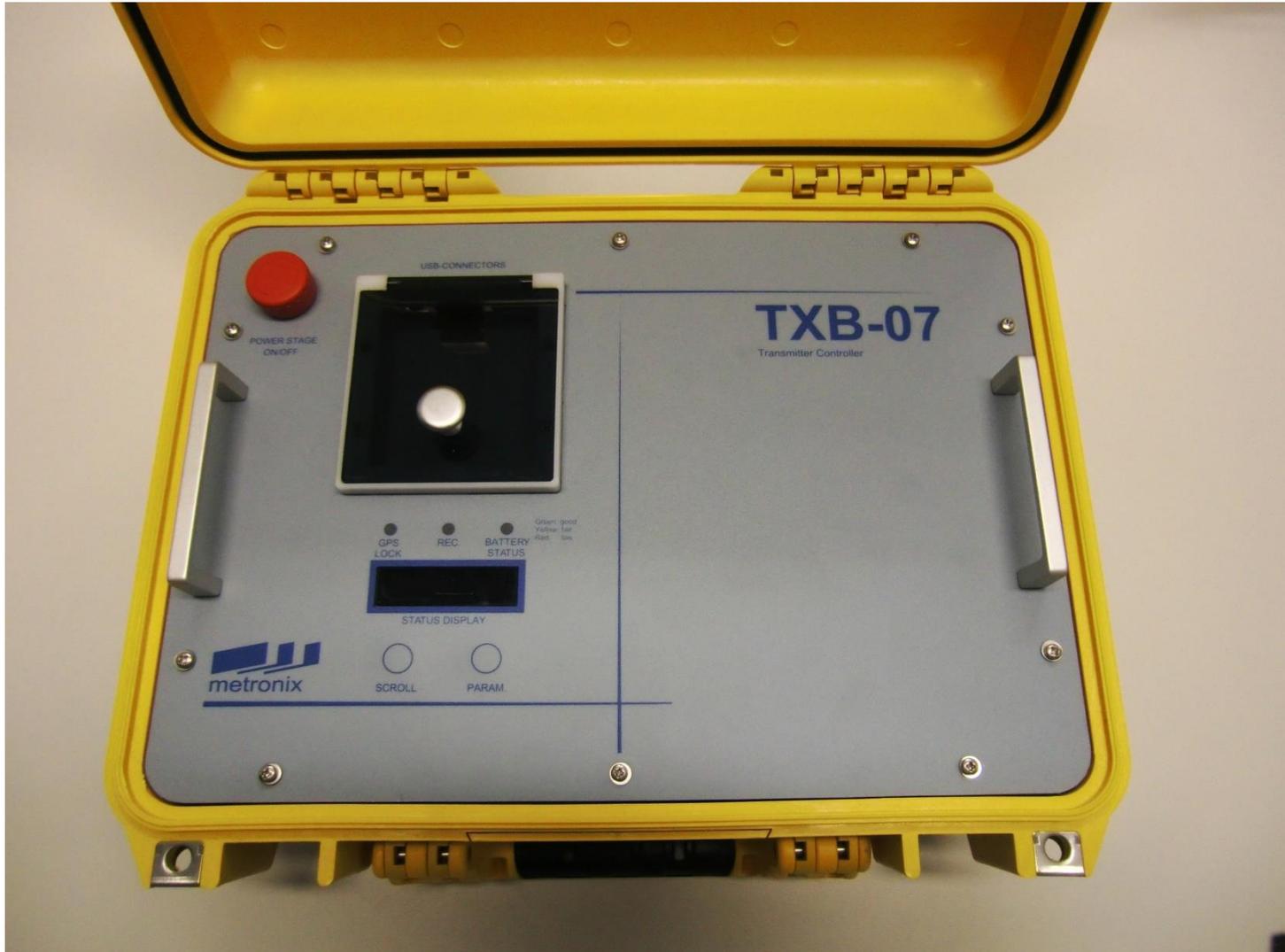
EMERGENCY POWER-OFF



CURRENT MEASUREMENT



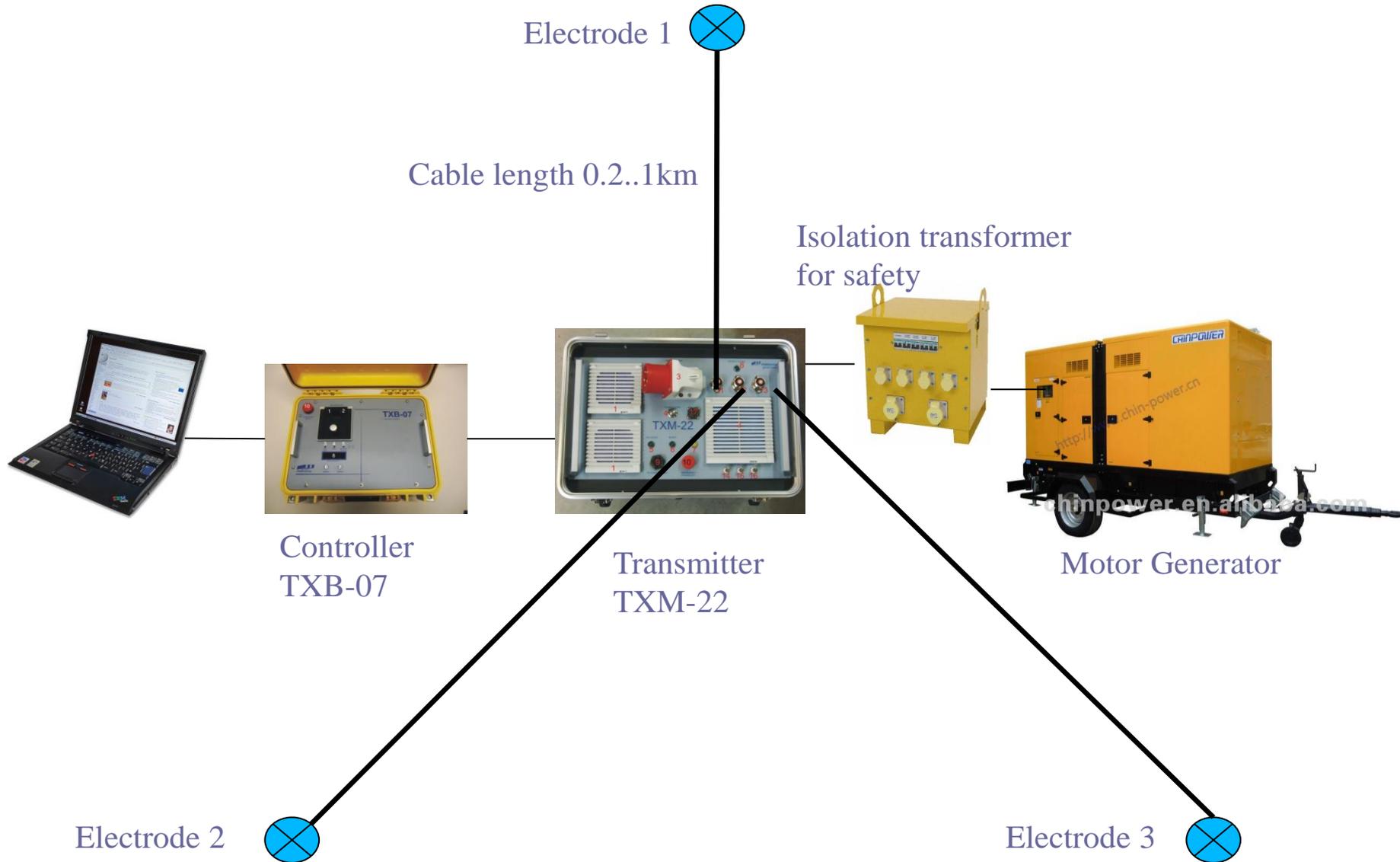
# TXB-07 Controller Unit

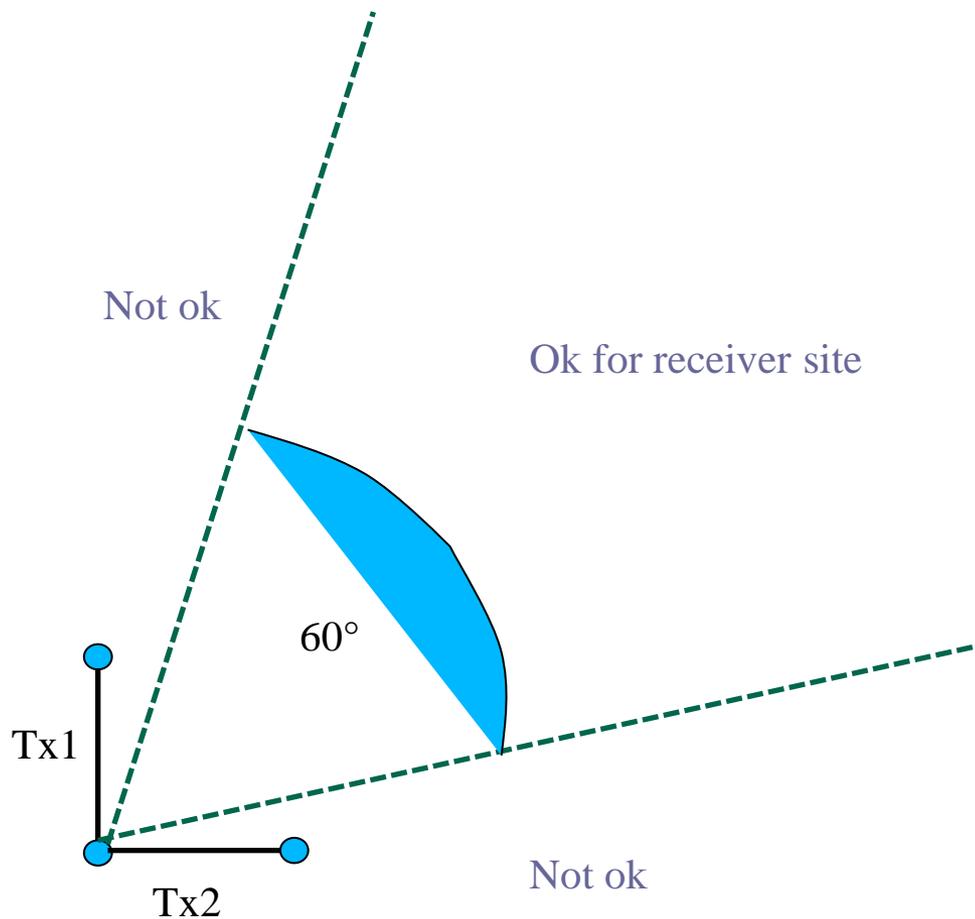


# Technical Data of TXB-07

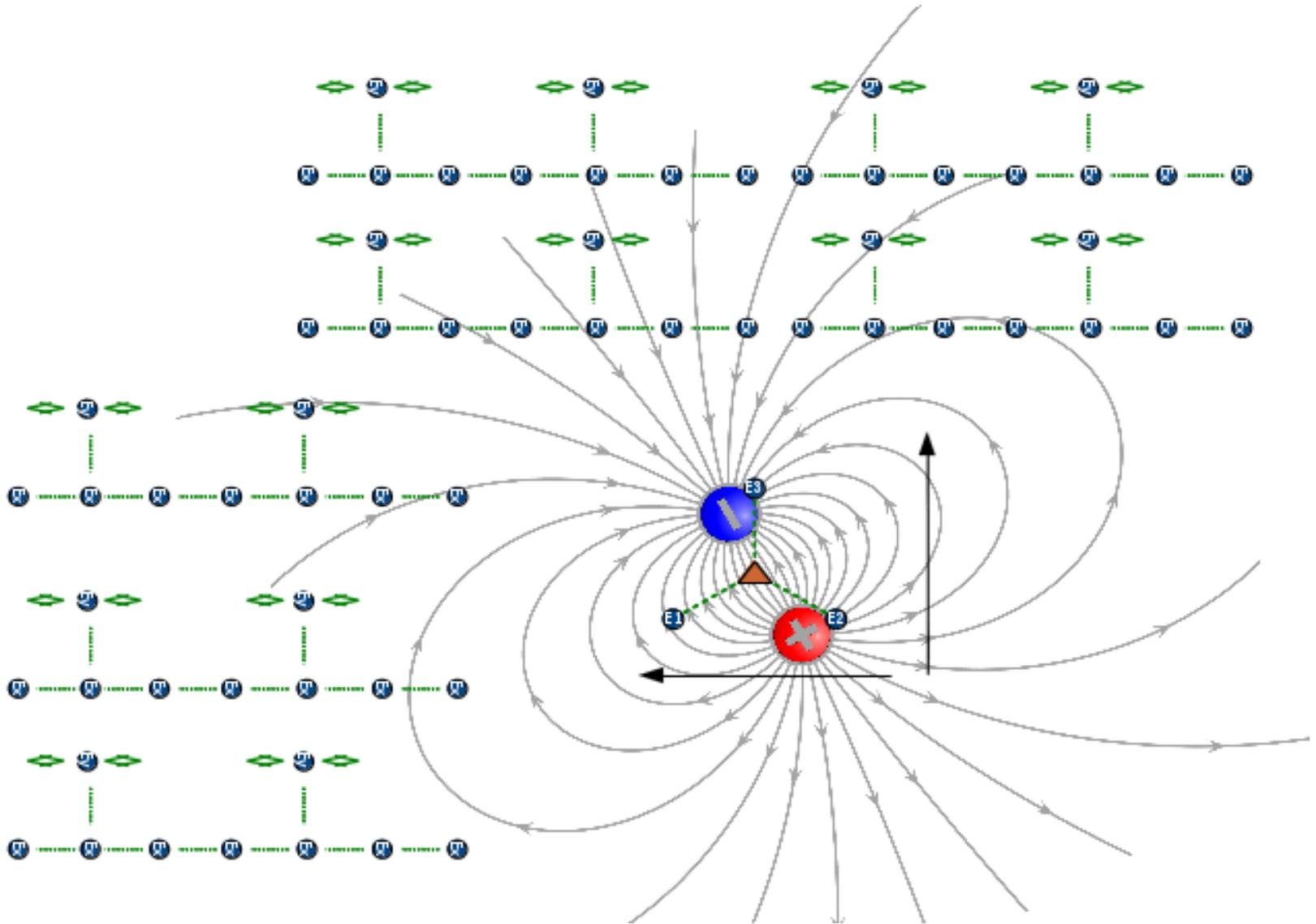
Input Voltage	12V coming from TXM-22 or external battery
Synchronization	GPS controlled synchronization
Channels	3 channels for recording of each phase current
Control	By external computer or by pre-programmed time schedule
Temperature range	-30°C to 60°C
Weight	7 kg incl. accessories

# Transmitter Setup in the Field





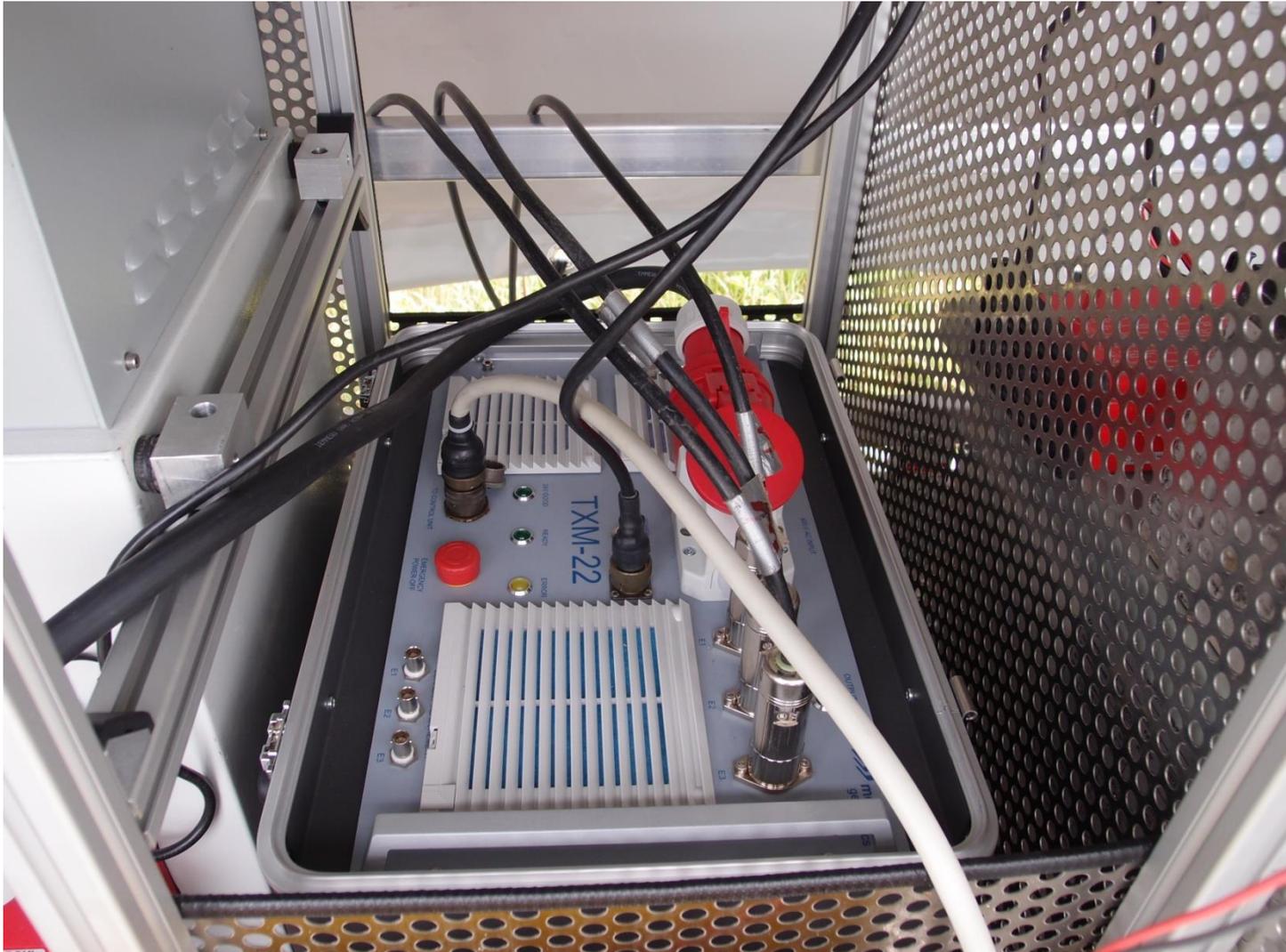
# Multiple receiver array can be covered with one transmitter position



# TXM-22 in Operation



# TXM-22 mounted on Trailer



# Isolation Transformer mounted on Trailer



# TXM-22 User Interface (Main Screen)

Metronix TXM22 - Start Job

Device Jobs Site System Editors Window Help

Control

Start/Stop Time

	Hour	Minute	Second	Date
Start	10	06	41	2011-01-07
Stop	10	36	41	2011-01-07

Select Waveform

MTX_FREE_1	7.8125E-3 Hz	P2: 30 °
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Cyclic Job

Granularity 1 seconds

Submit Start Now

Goto  Stop All Jobs  Stop Current Job

Submitted job ID 48

Status

Power Stage Output Idle

Joblist Active

System Status

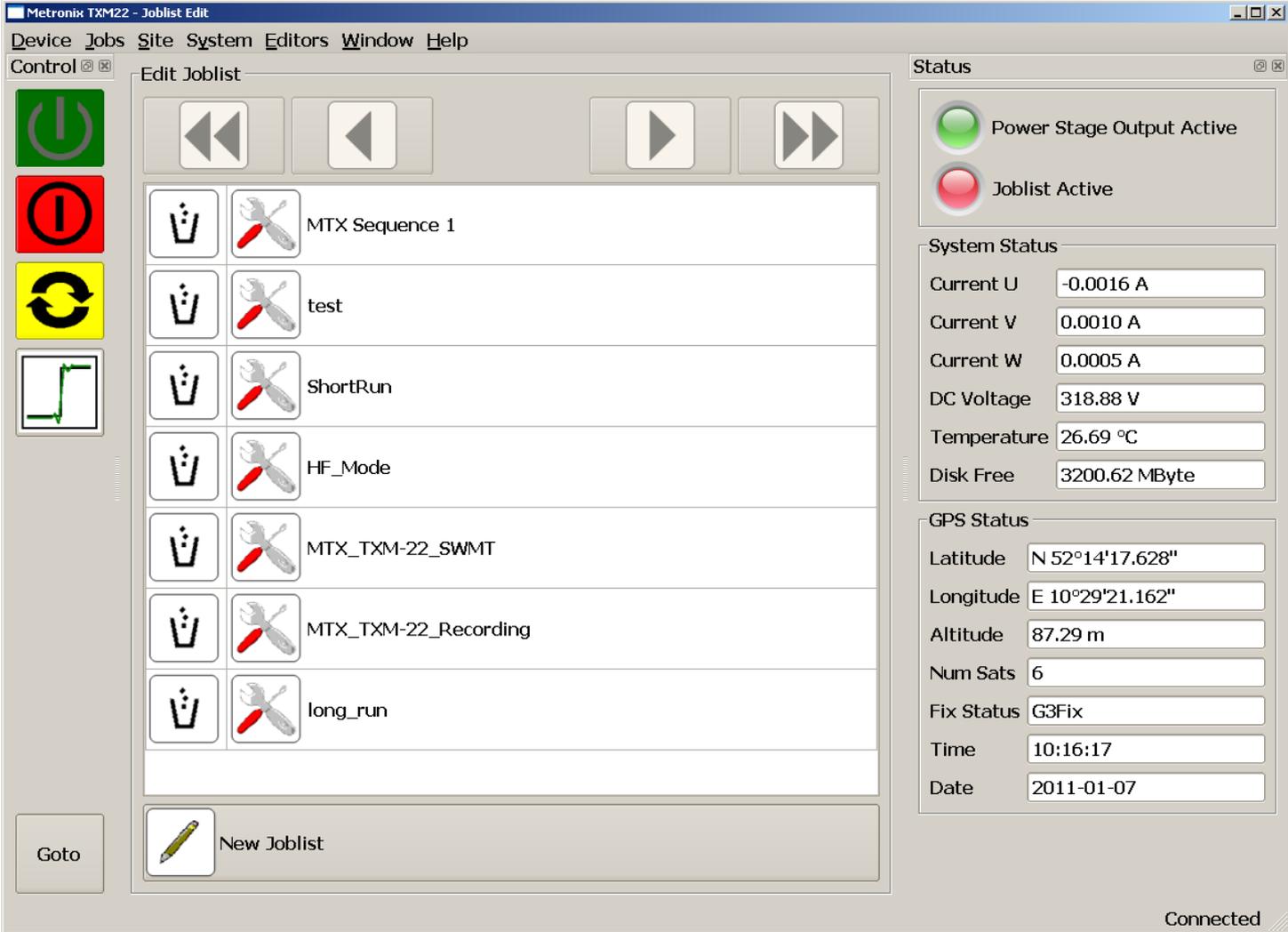
Current U	0.0005 A
Current V	0.0093 A
Current W	-0.0098 A
DC Voltage	319.46 V
Temperature	25.38 °C
Disk Free	3200.66 MByte

GPS Status

Latitude	N 52°14'17.682"
Longitude	E 10°29'21.174"
Altitude	81.24 m
Num Sats	7
Fix Status	G3Fix
Time	10:10:03
Date	2011-01-07

Connected

# User Interface (Edit Joblist)



Metronix TXM22 - Joblist Edit

Device Jobs Site System Editors Window Help

Control Edit Joblist

Power Stage Output Active

Joblist Active

System Status

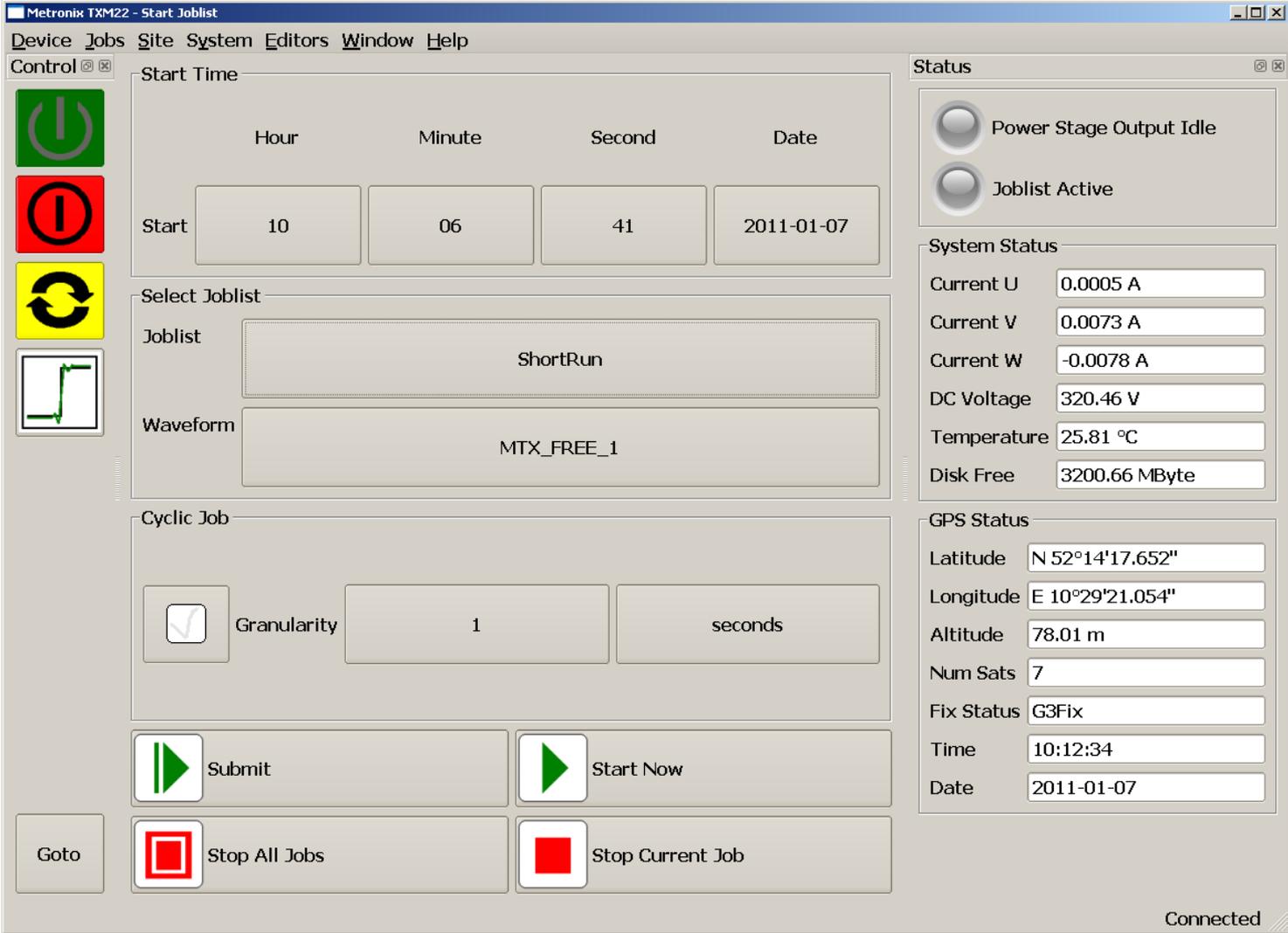
Current U	-0.0016 A
Current V	0.0010 A
Current W	0.0005 A
DC Voltage	318.88 V
Temperature	26.69 °C
Disk Free	3200.62 MByte

GPS Status

Latitude	N 52°14'17.628"
Longitude	E 10°29'21.162"
Altitude	87.29 m
Num Sats	6
Fix Status	G3Fix
Time	10:16:17
Date	2011-01-07

Connected

# User Interface (Start Job List)



The screenshot shows the 'Metronix TXM22 - Start Joblist' application window. It features a menu bar with 'Device', 'Jobs', 'Site', 'System', 'Editors', 'Window', and 'Help'. A 'Control' panel on the left contains icons for power, stop, refresh, and waveform. The main area is divided into several sections: 'Start Time' with fields for Hour (10), Minute (06), Second (41), and Date (2011-01-07); 'Select Joblist' with a 'Joblist' field containing 'ShortRun' and a 'Waveform' field containing 'MTX\_FREE\_1'; 'Cyclic Job' with a checked 'Granularity' field set to '1 seconds'; and a bottom row of buttons: 'Submit', 'Start Now', 'Goto', 'Stop All Jobs', and 'Stop Current Job'. On the right, a 'Status' panel shows 'Power Stage Output Idle' and 'Joblist Active'. Below it, 'System Status' displays various metrics: Current U (0.0005 A), Current V (0.0073 A), Current W (-0.0078 A), DC Voltage (320.46 V), Temperature (25.81 °C), and Disk Free (3200.66 MByte). 'GPS Status' shows Latitude (N 52°14'17.652"), Longitude (E 10°29'21.054"), Altitude (78.01 m), Num Sats (7), Fix Status (G3Fix), Time (10:12:34), and Date (2011-01-07). The bottom right corner indicates 'Connected'.

# User Interface (Waveform Editor)

**Edit Waveform** [?] [X]

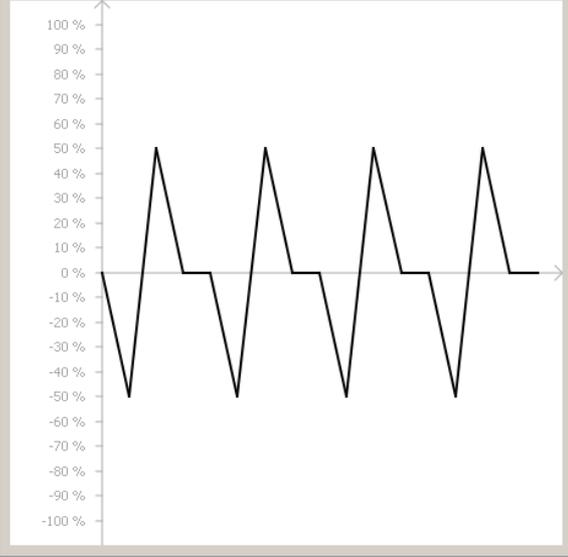
**General Parameters**

Name:

Max. Amplitude:

Number of Samples:

**Graphical View**

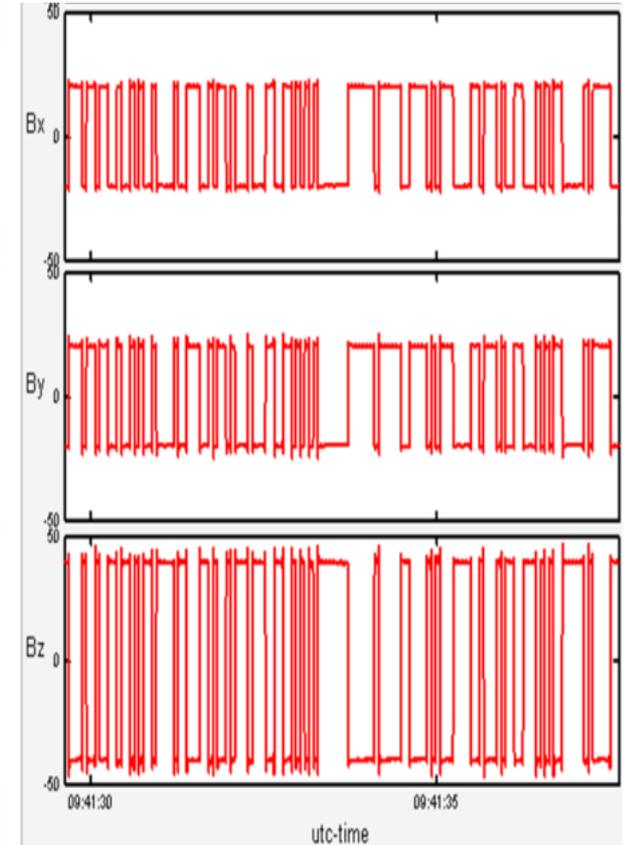
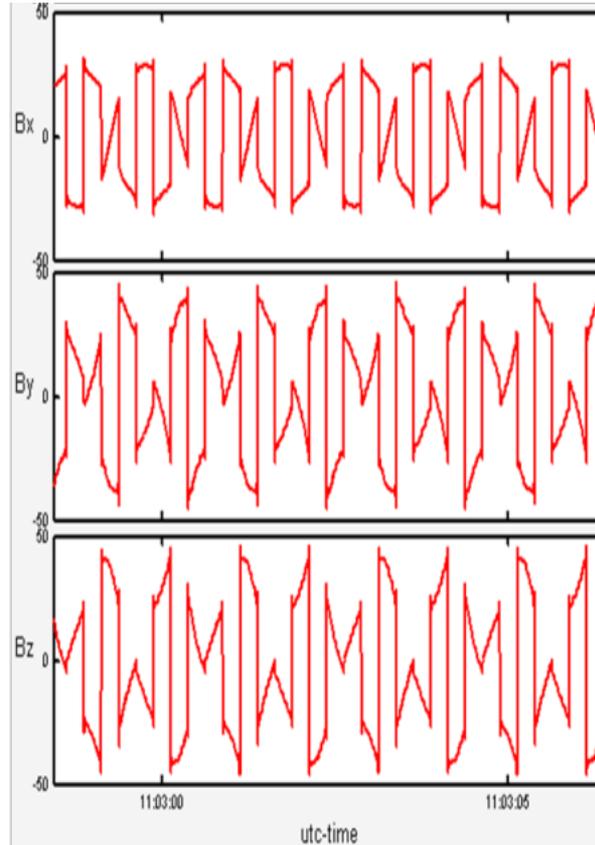
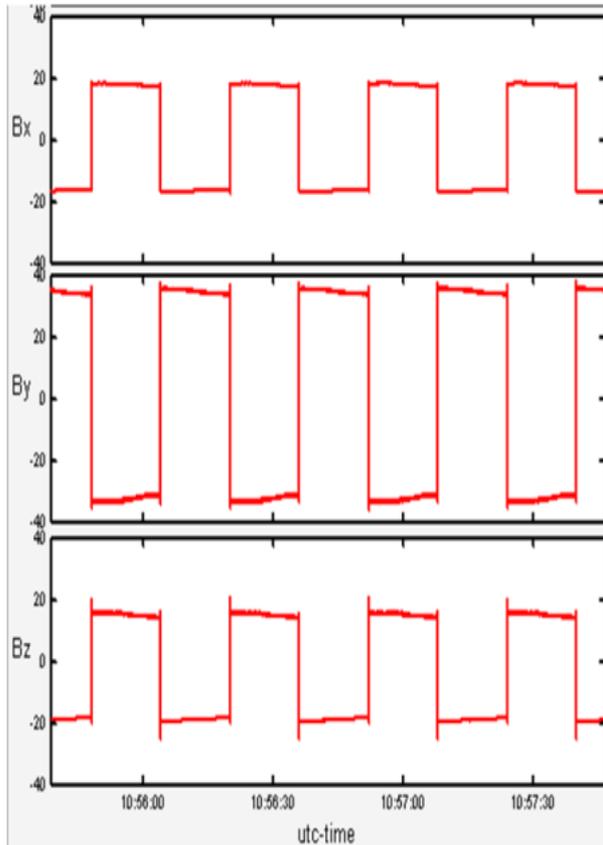


**Sample Points**

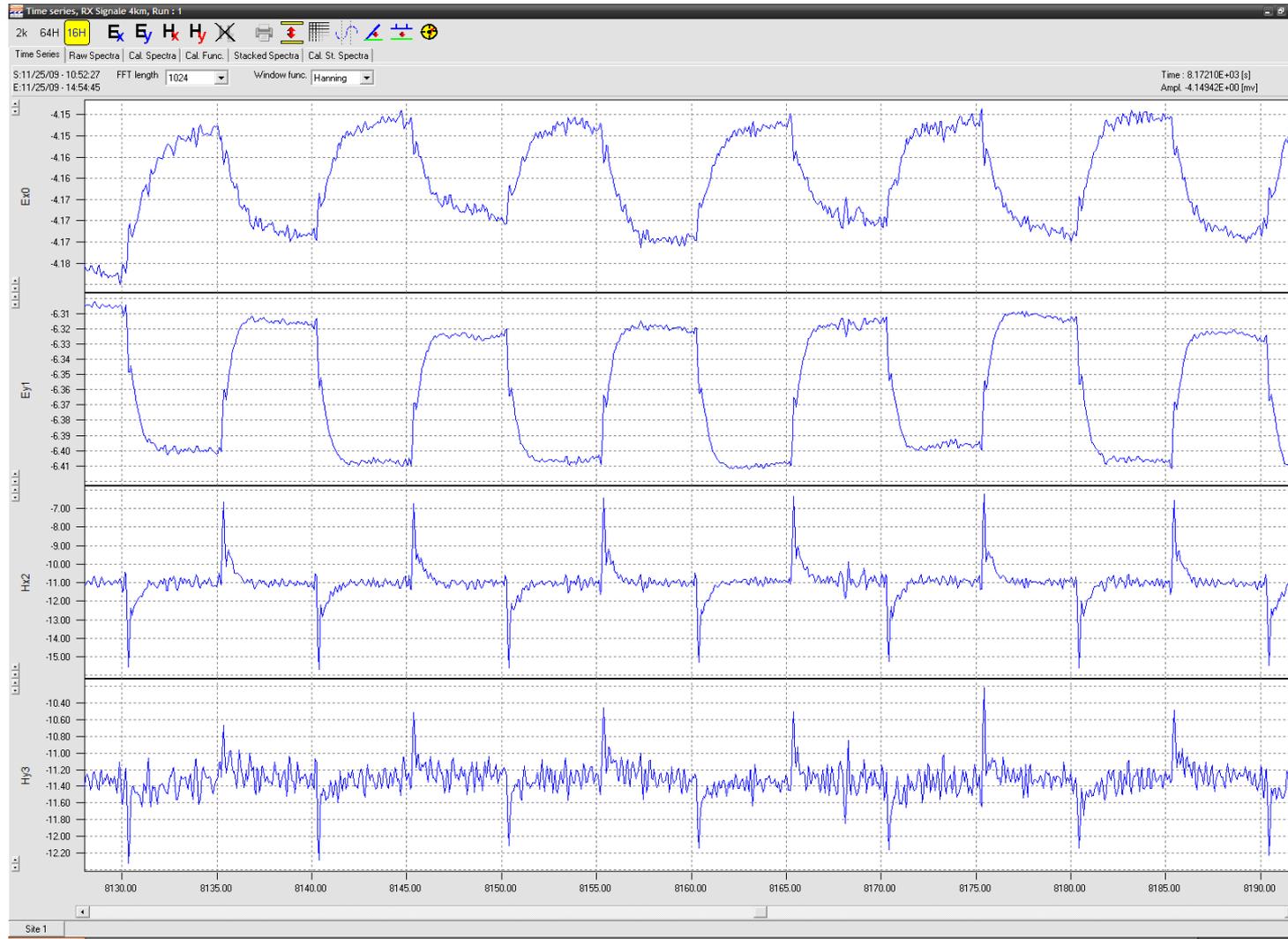
◀ ▶

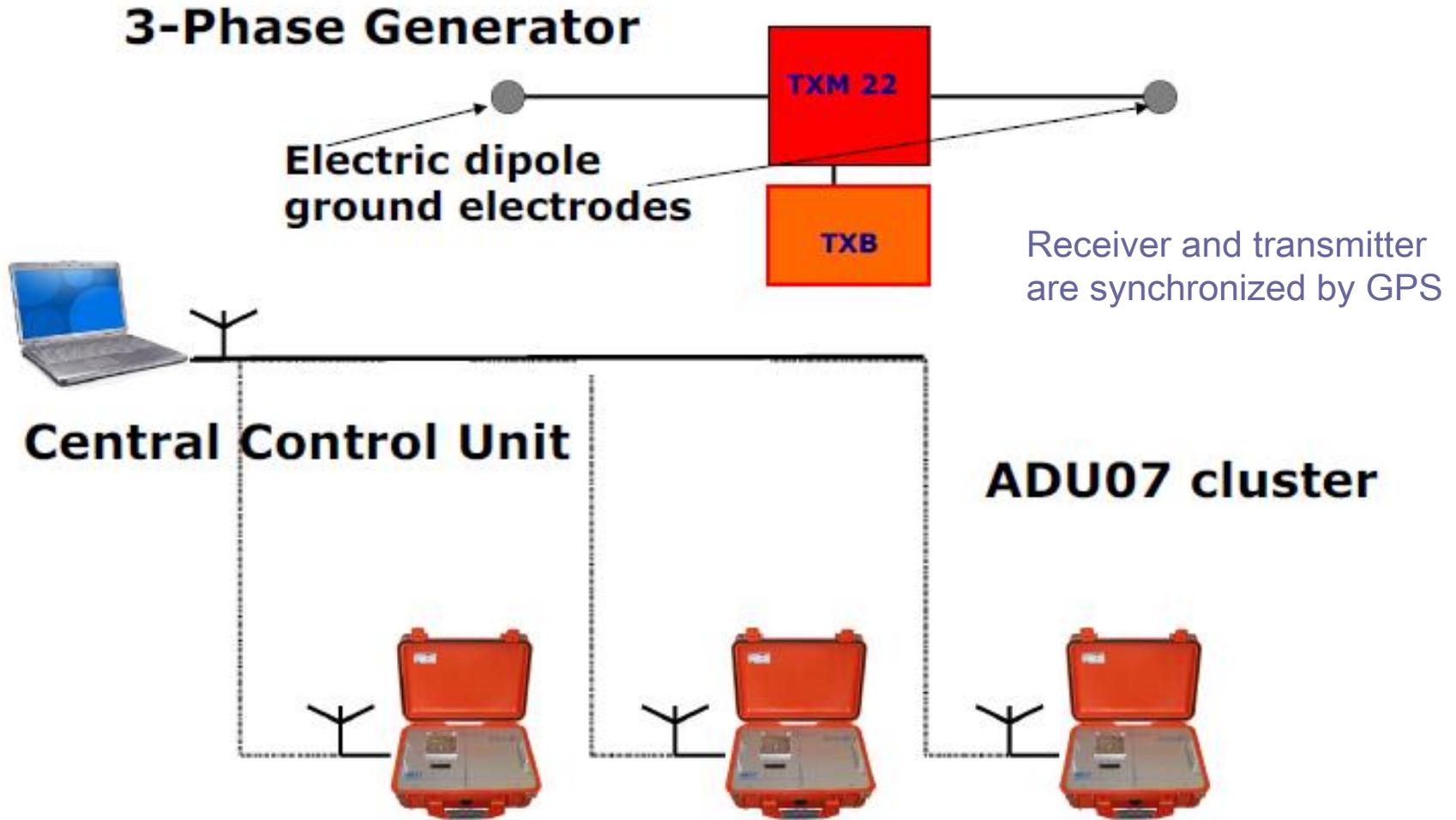
	Value
1	0
2	-50
3	50
4	0
5	0
6	-50
7	50
8	0
9	0
10	-50
11	50
12	0
13	0
14	-50
15	50
16	0

# Different Tx-Signals



# Raw Time Series of Tx signal in 5km Dist.





# Receiver Units ADU-07e

