

TXM-22

Geophysical Transmitter

Ulrich Matzander
Metronx GmbH
Braunschweig, Germany

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

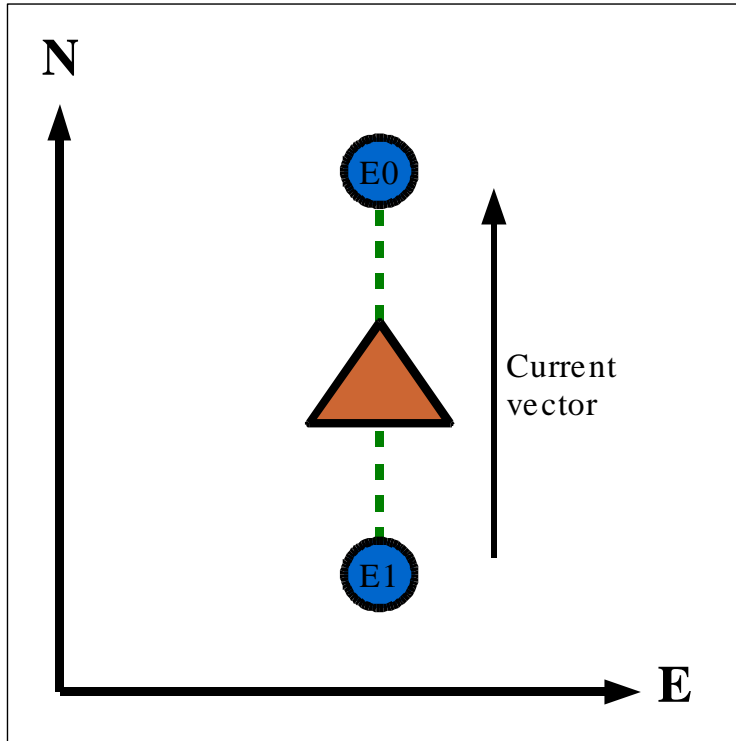
- + Better resolution of geological structures
- + Allows 2D and 3D modelling & inversion
- - Longer measurement times

Scalar CSMT

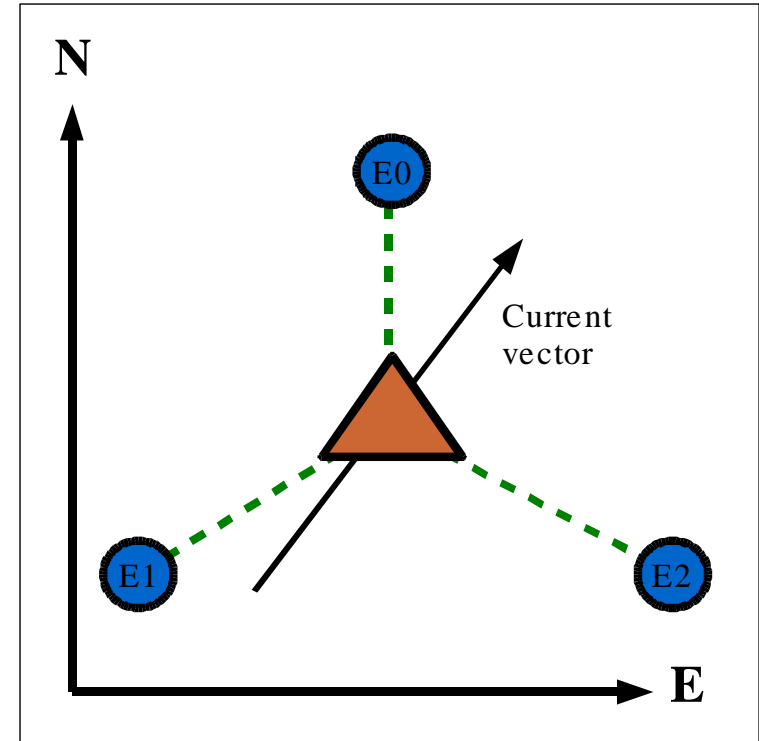
- - Only resolves structures crossing the profile
- - Possibility to miss geological structures in unknown terrain
- - 1D modelling only
- o Shorter measurement times

- 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

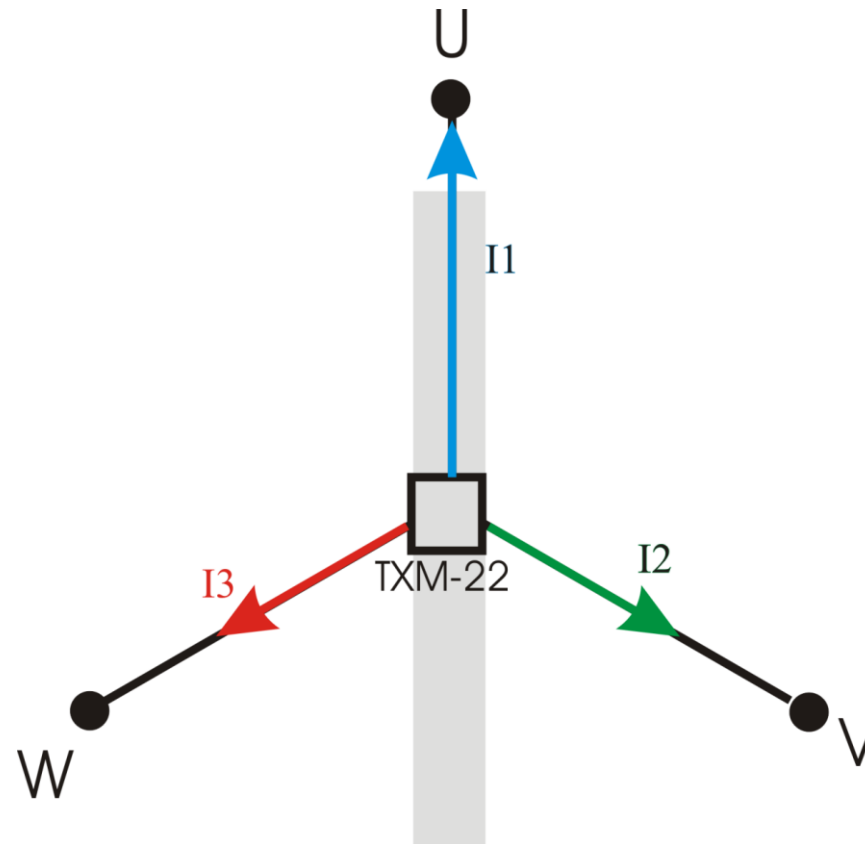


Standard CSAMT Transmitter

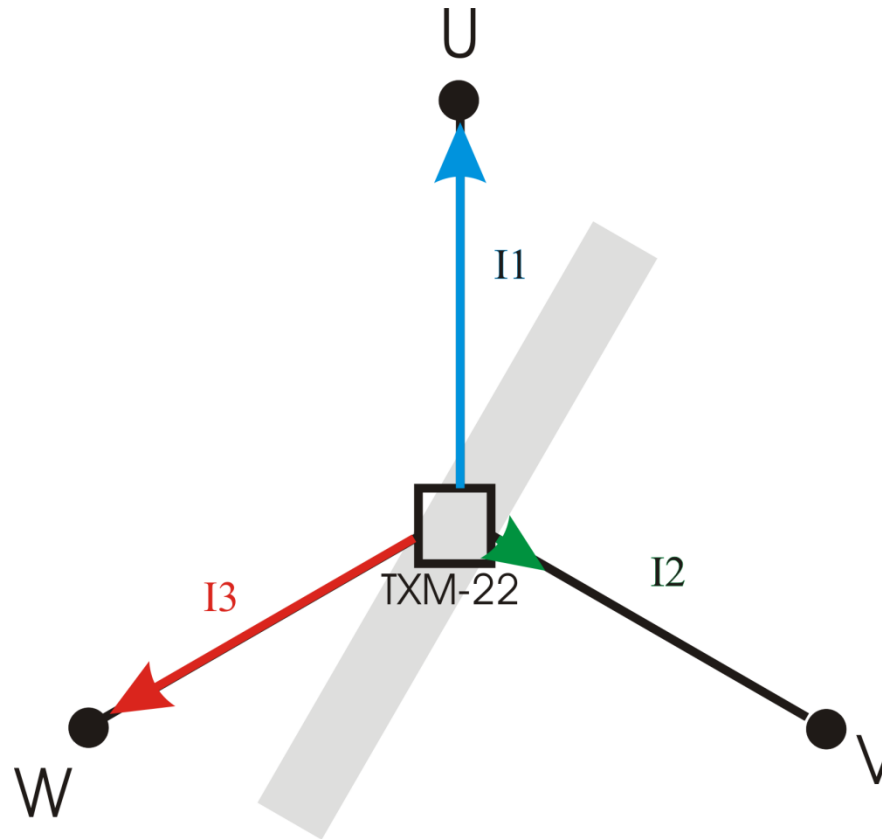


TXM-22 Tensor CSAMT Transmitter

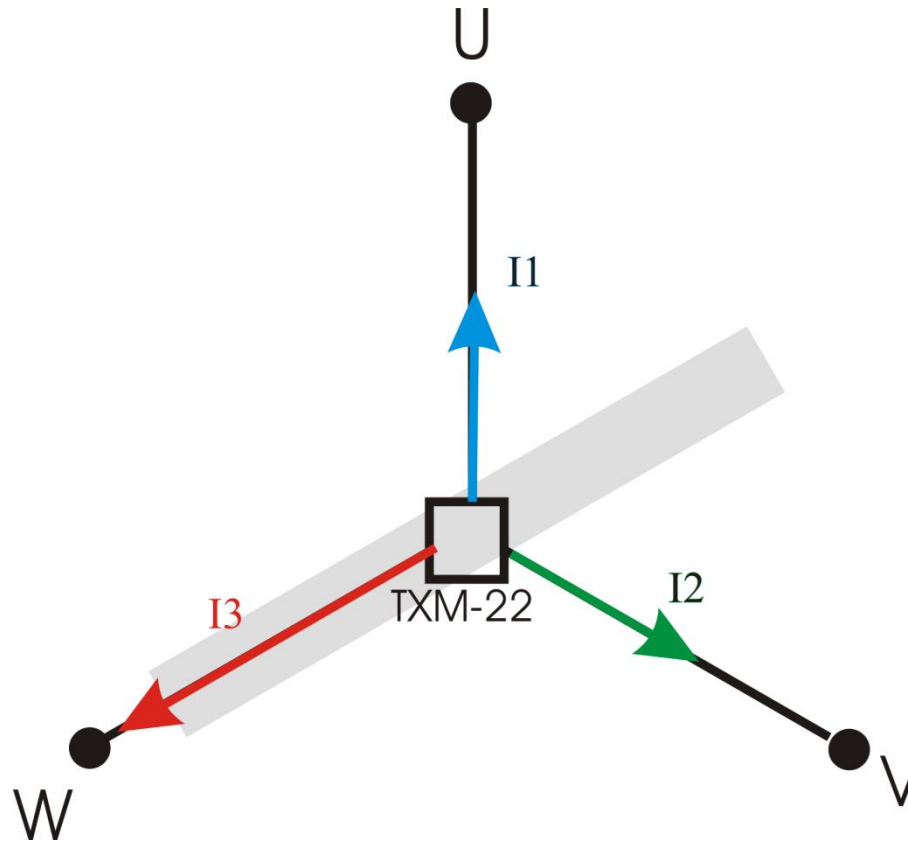
Rotating Current Dipole 0°



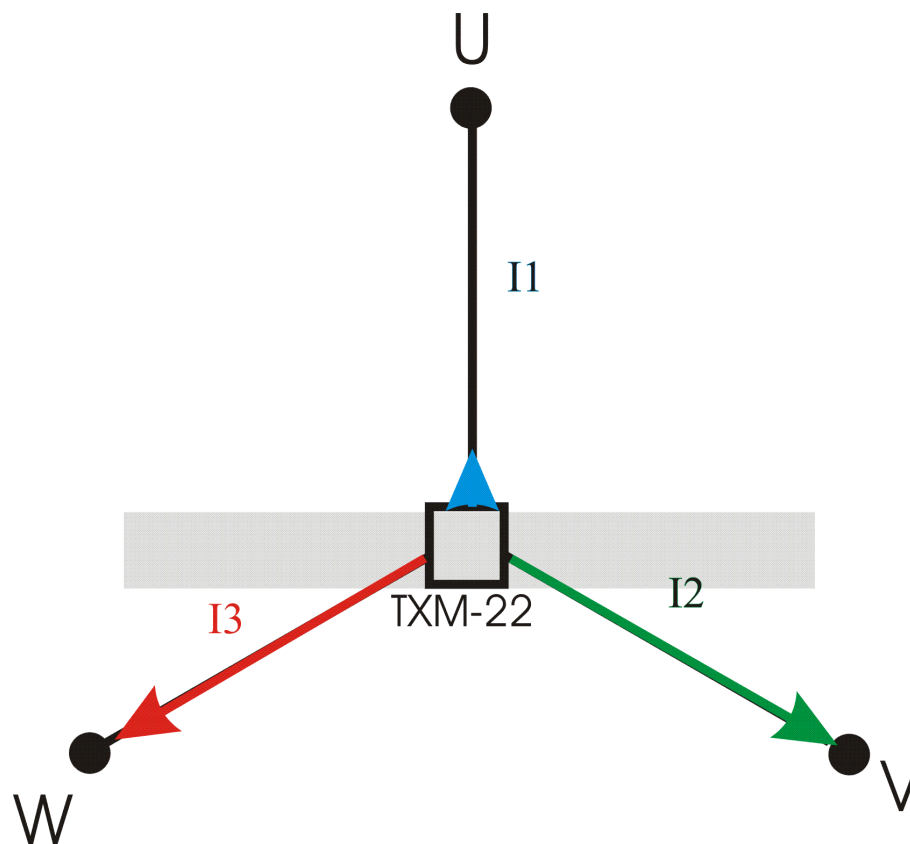
Rotating Current Dipole 30°



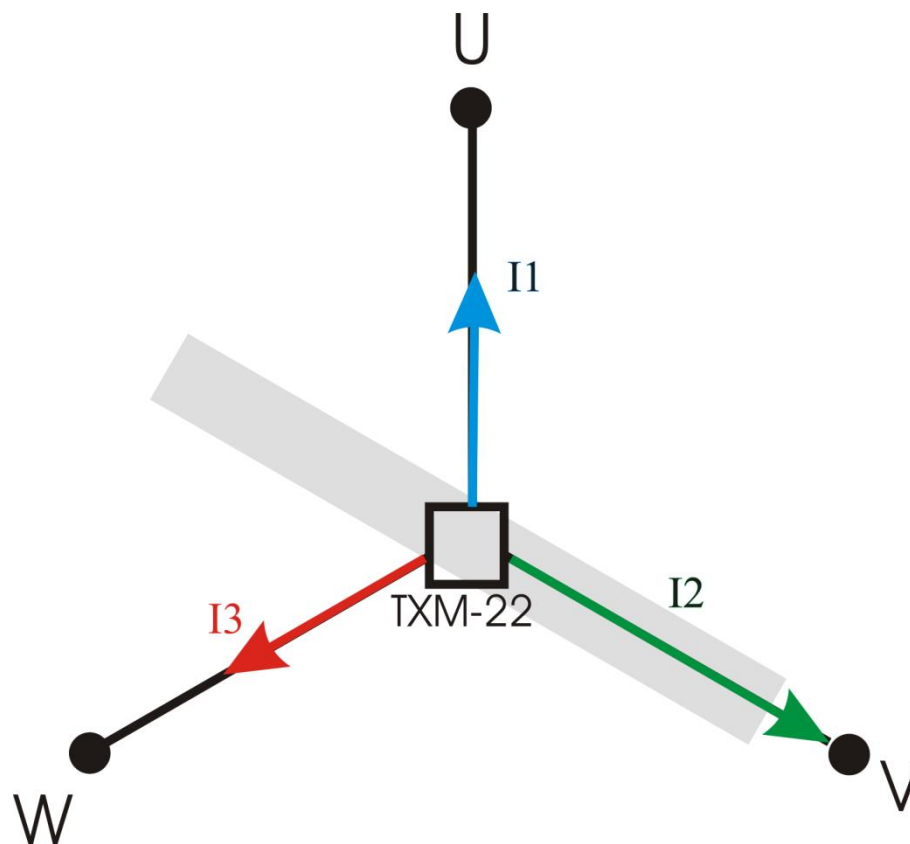
Rotating Dipole 60°



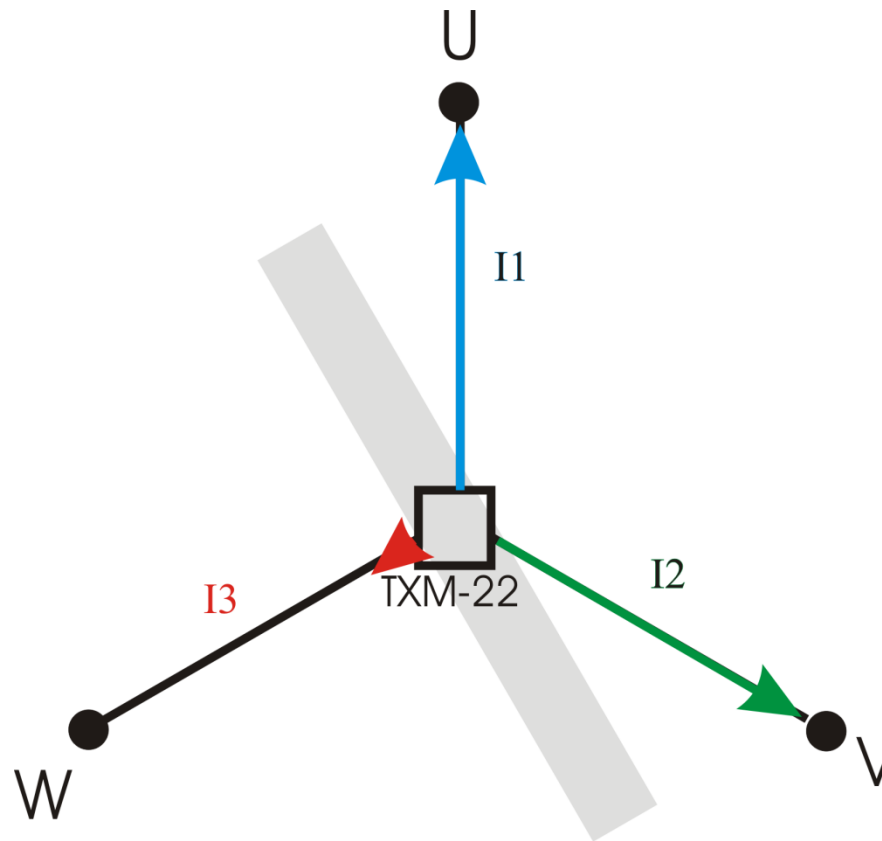
Rotating Current Dipole 90°



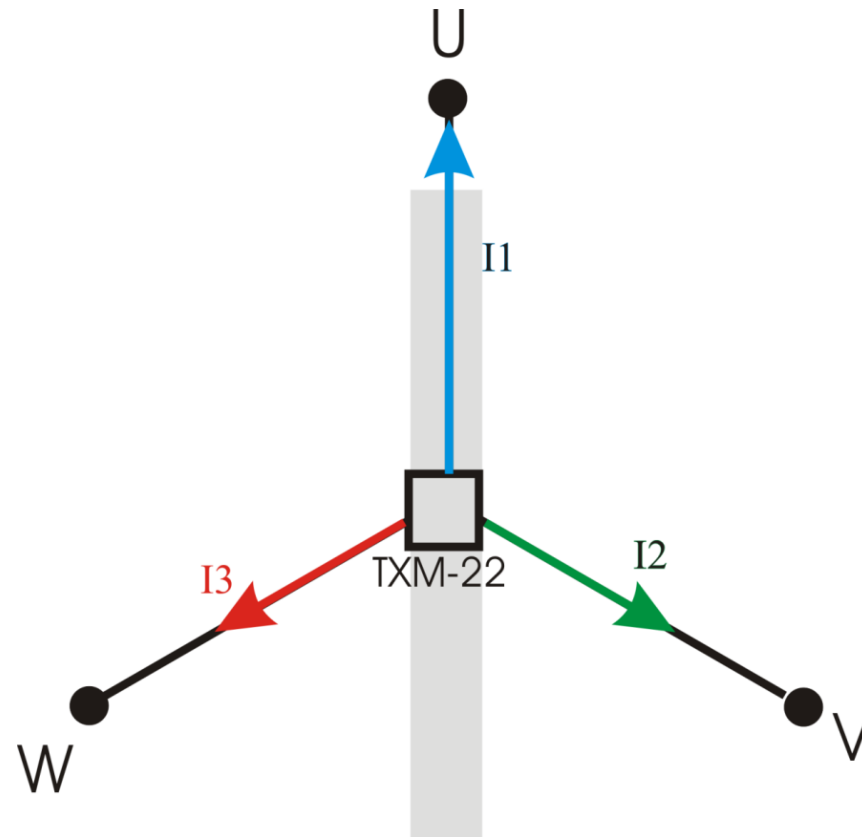
Rotating Current Dipole 120°



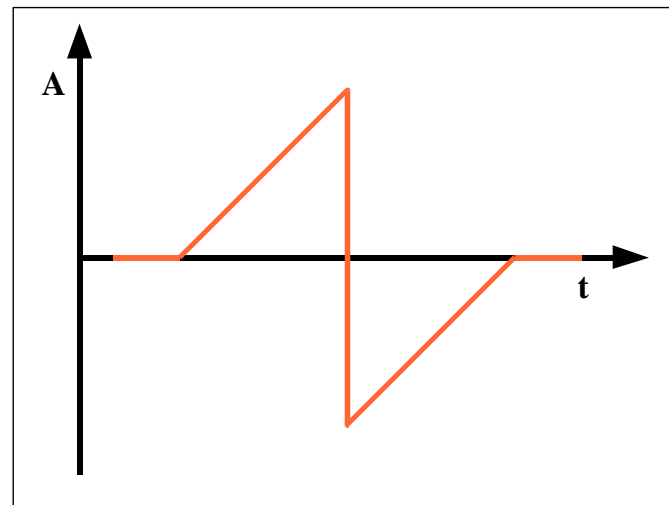
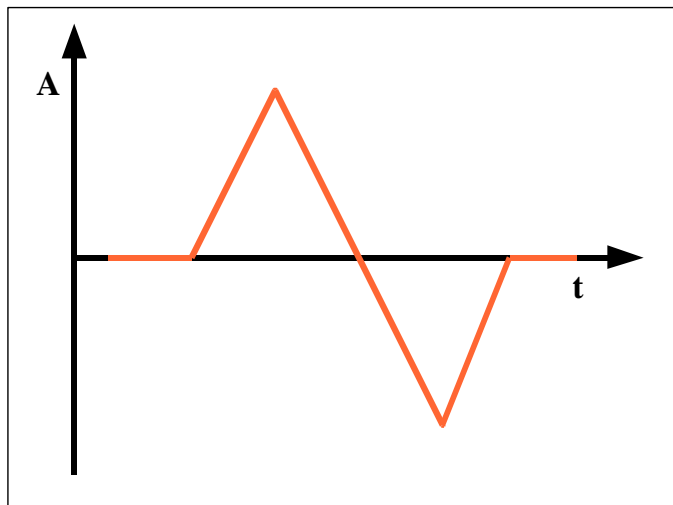
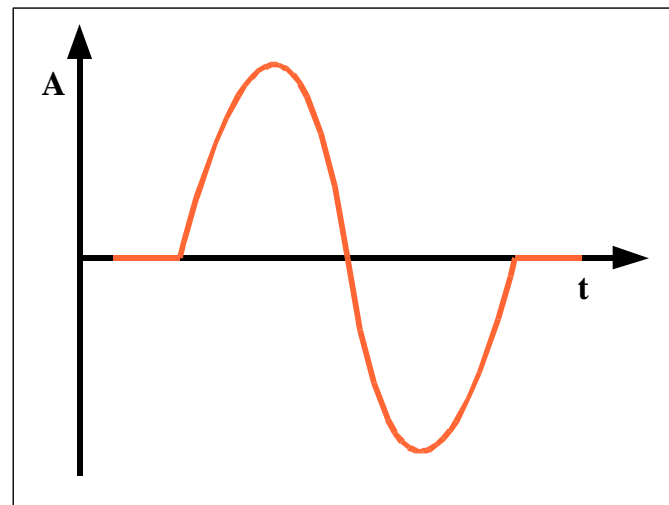
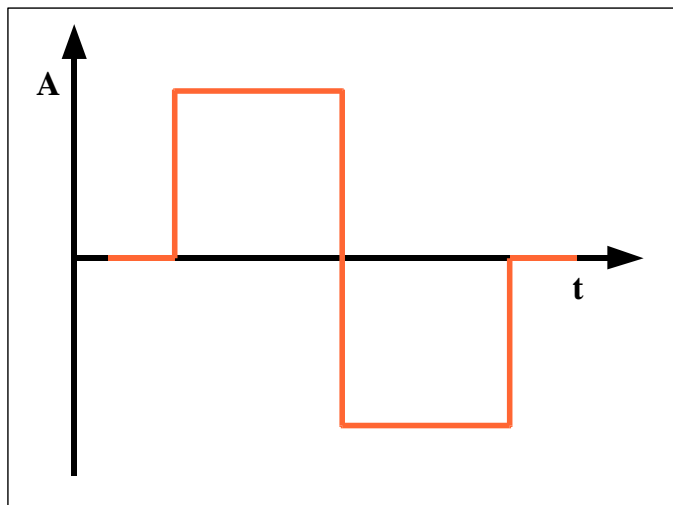
Rotating Current Dipole 150°



Rotating Current Dipole 180°

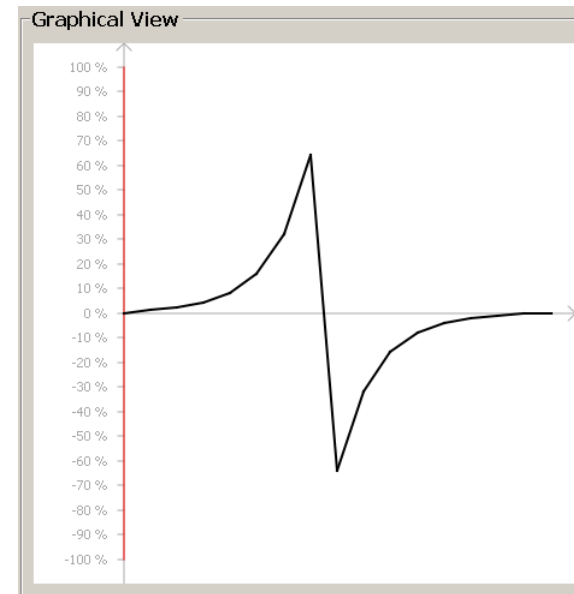
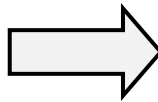


Different Default Waveforms



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 synchro 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

TXM-22

metronix
geophysics

OUTPUT ACTIVE

E1

E2

E3

POWER GOOD

24V GOOD

READY

ERROR

TO CONTROL UNIT

EMERGENCY
POWER-OFF

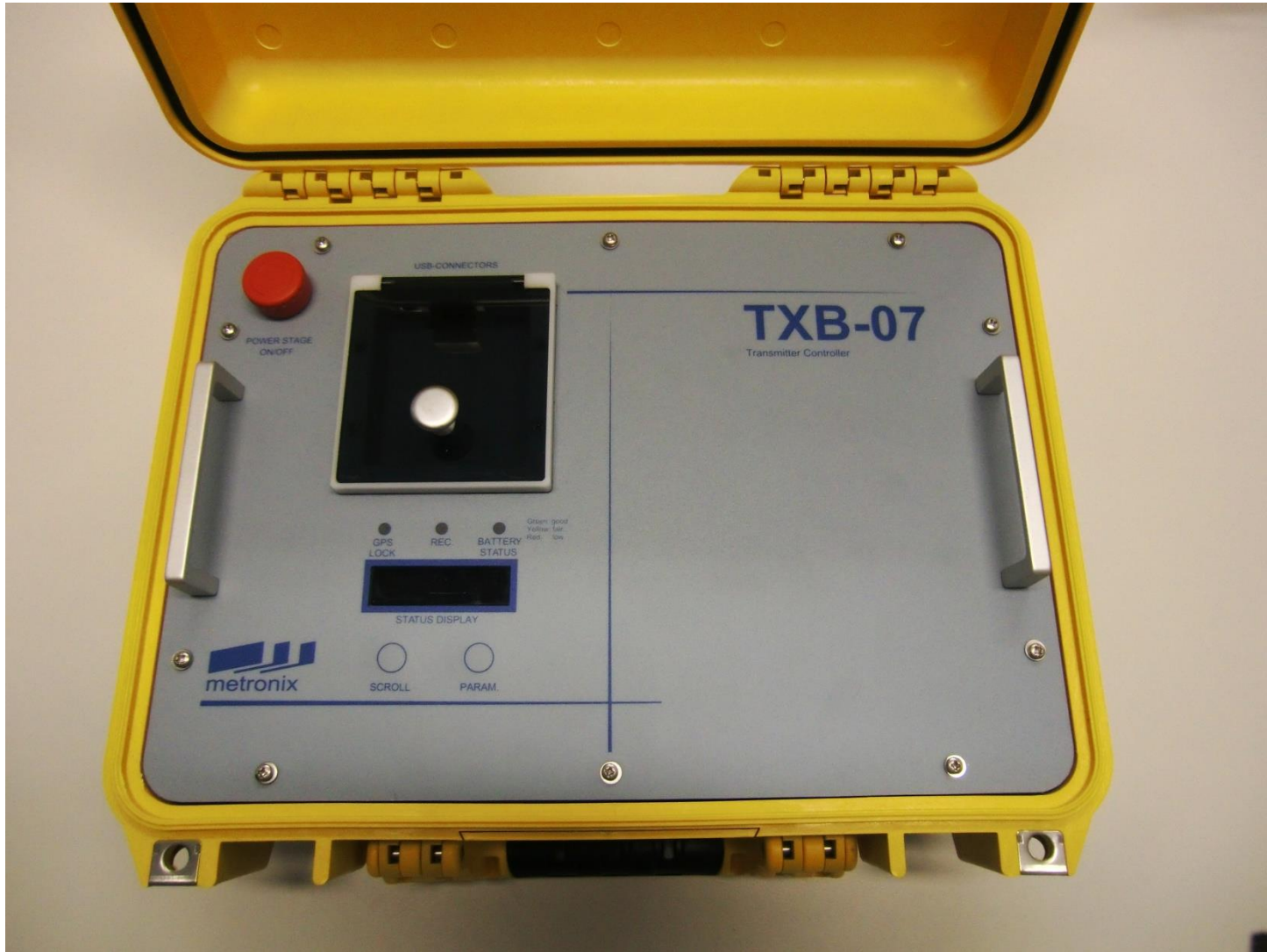
CURRENT MEASUREMENT

E1

E2

E3

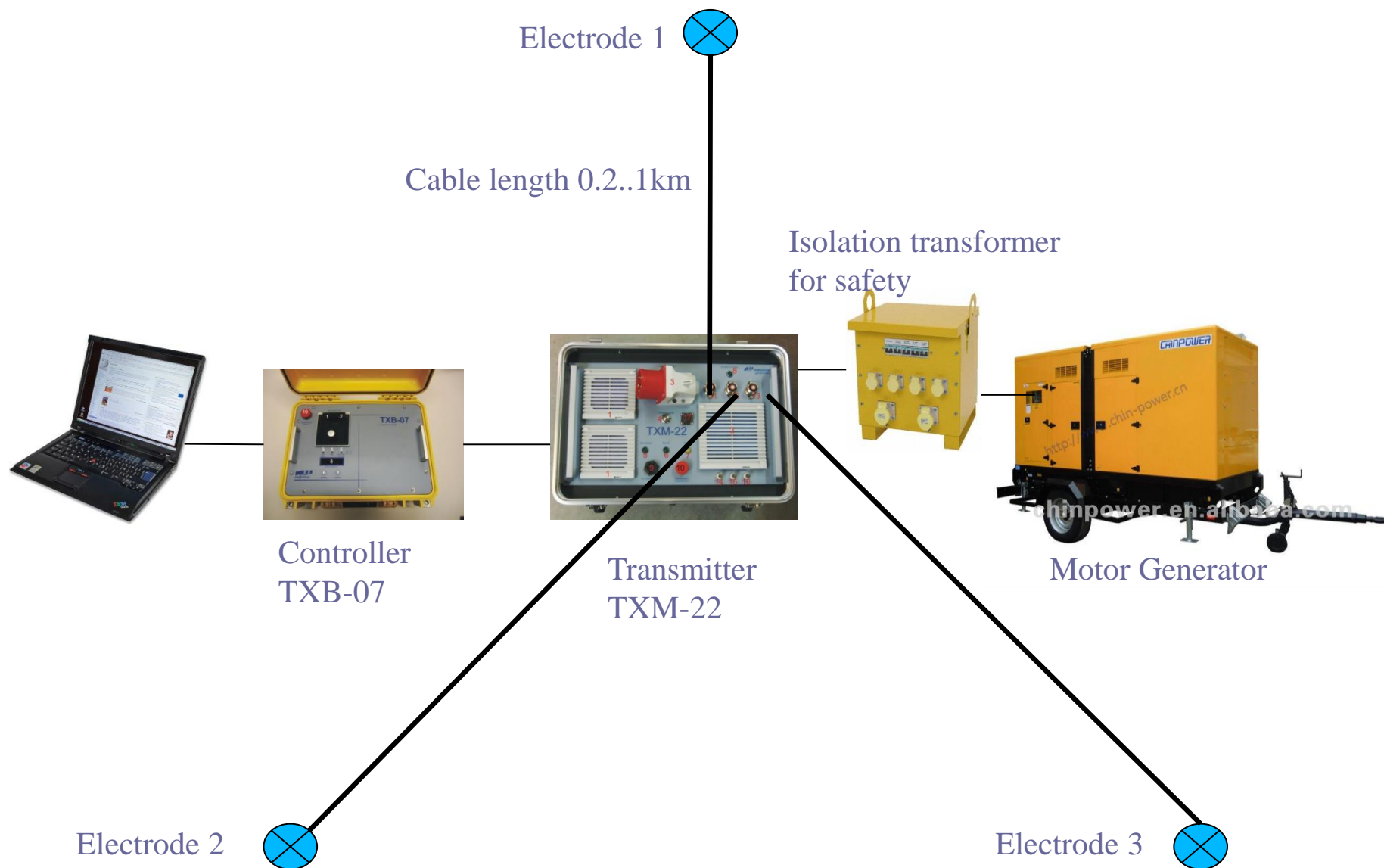
TXB-07 Controller Unit



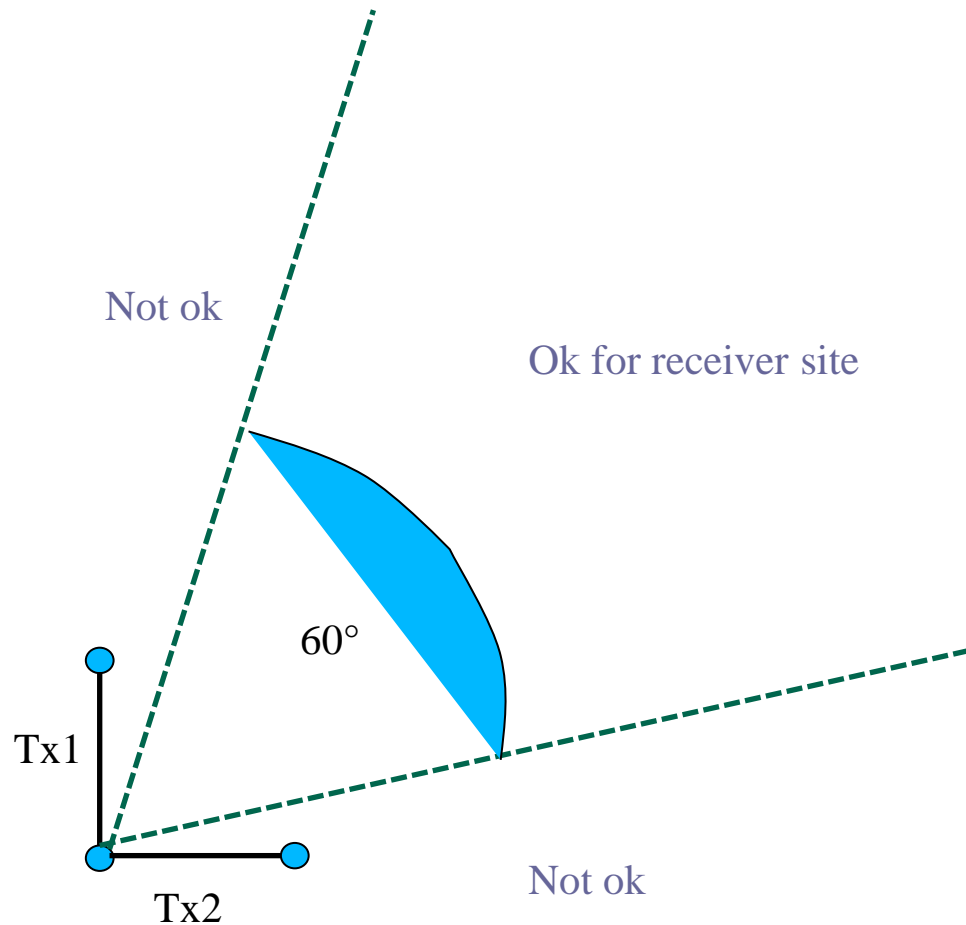
Technical Data of TXB-07

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

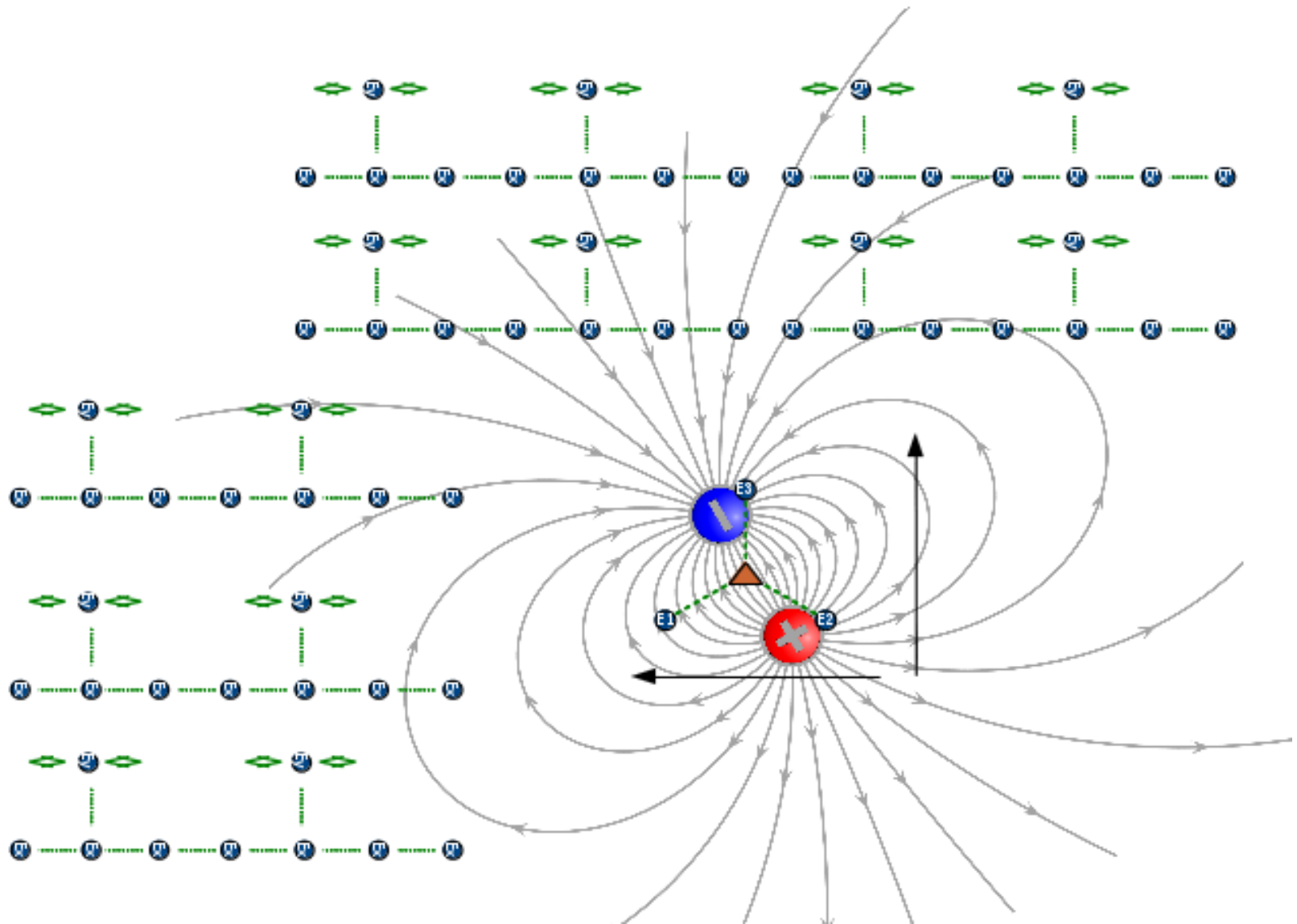
Transmitter Setup in the Field



Tensor CSAMT with standard transmitter



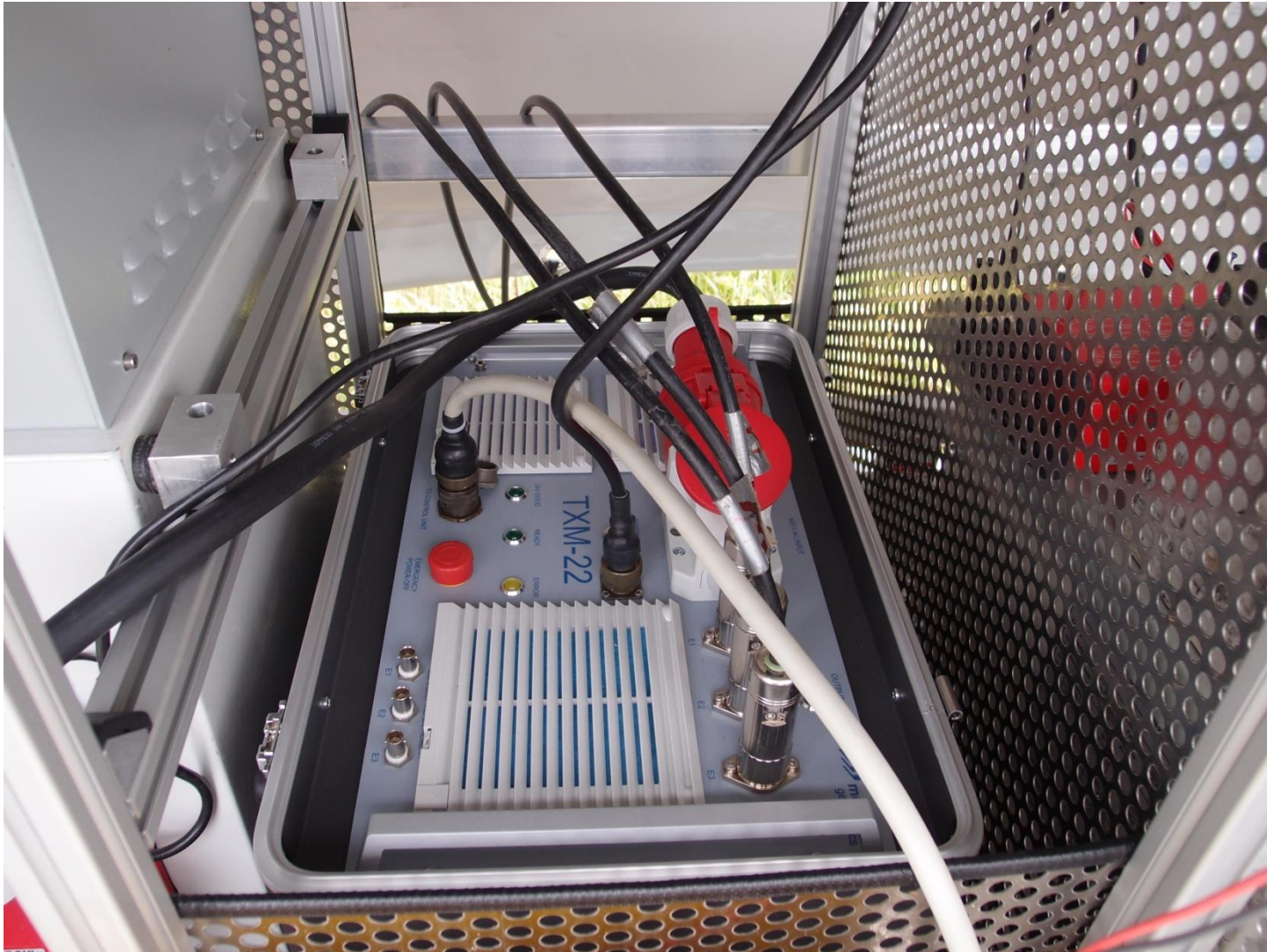
Multiple receiver array can be covered with one transmitter position



TXM-22 in Operation



TXM-22 mounted on Trailer




Isolation Transformer mounted on Trailer




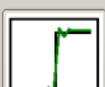


TXM-22 User Interface (Main Screen)

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

Connected

Status

☐ Power Stage Output Idle
☐ Joblist Active

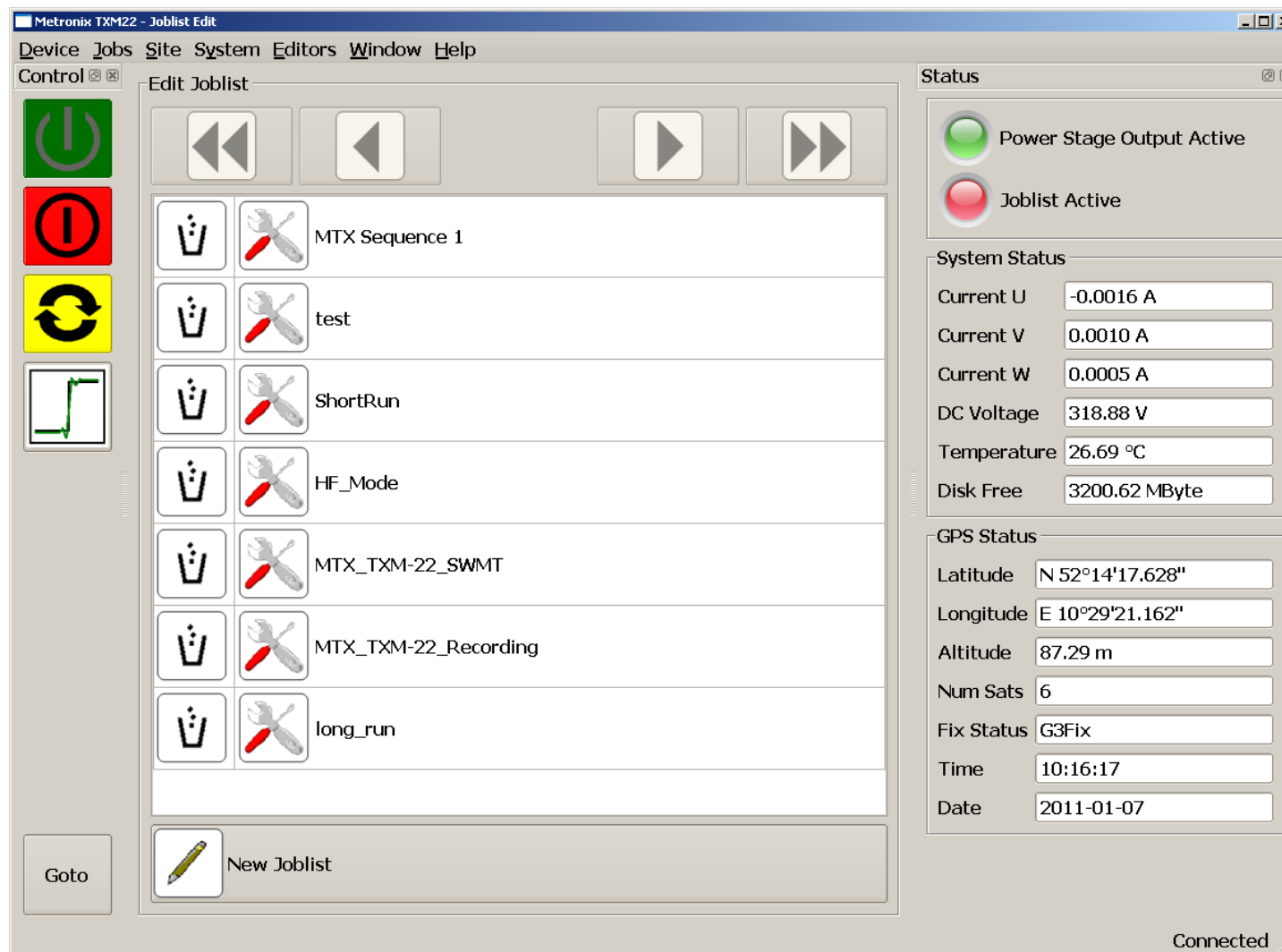
System Status

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





User Interface (Edit Joblist)



User Interface (Start Job List)

Metronix TXM22 - Start Joblist

Device Jobs Site System Editors Window Help

Control    

Start Time

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



Select Joblist



Joblist: ShortRun

Waveform: MTX_FREE_1

Cyclic Job

☒ Granularity: 1 seconds

 Submit  Start Now

 Stop All Jobs  Stop Current Job

Goto

Status

☐ Power Stage Output Idle
☐ Joblist Active

System Status

Current U: 0.0005 A
Current V: 0.0073 A
Current W: -0.0078 A
DC Voltage: 320.46 V
Temperature: 25.81 °C
Disk Free: 3200.66 MByte

GPS Status

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
Date: 2011-01-07

Connected

User Interface (Waveform Editor)

Edit Waveform [?] [X]

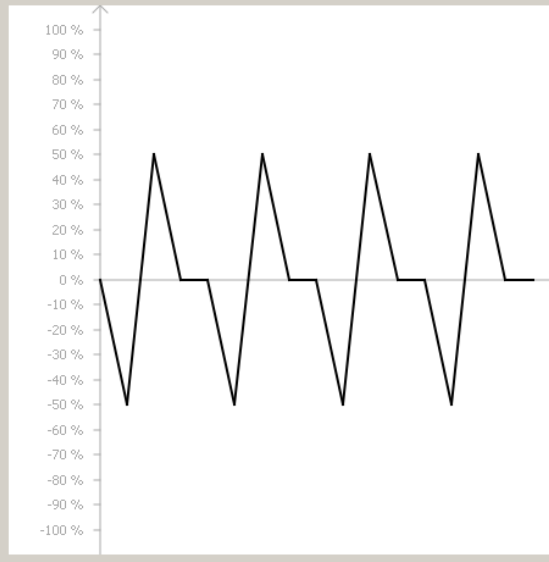
General Parameters

Name:

Max. Amplitude:

Number of Samples:

Graphical View

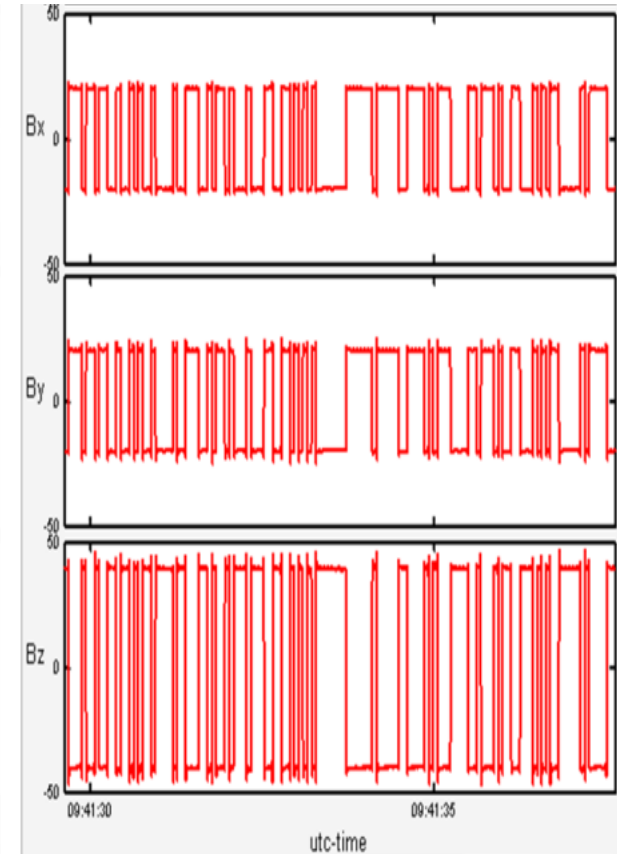
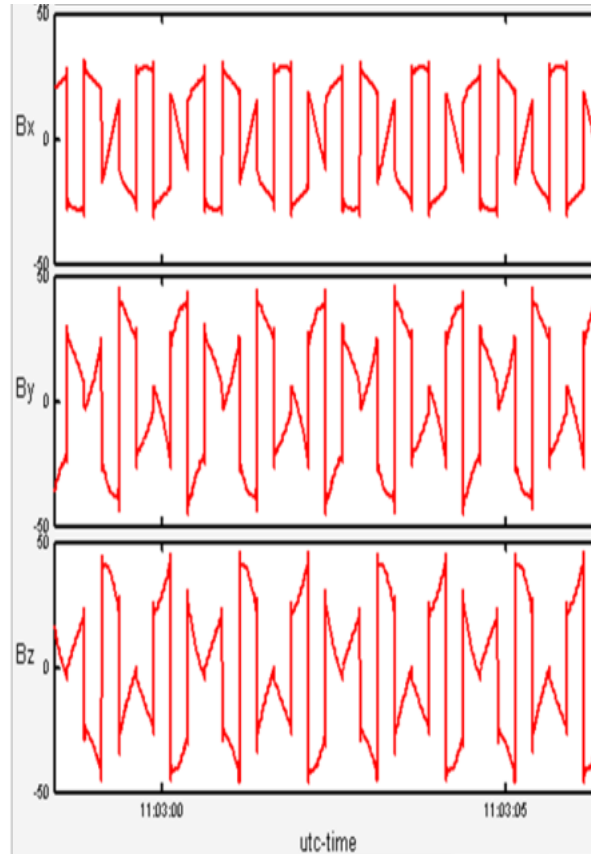
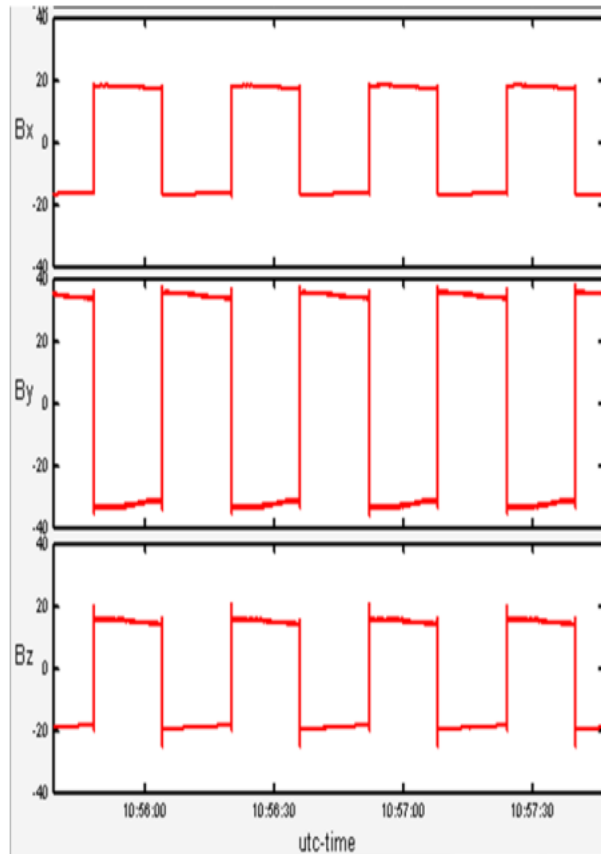


Sample Points

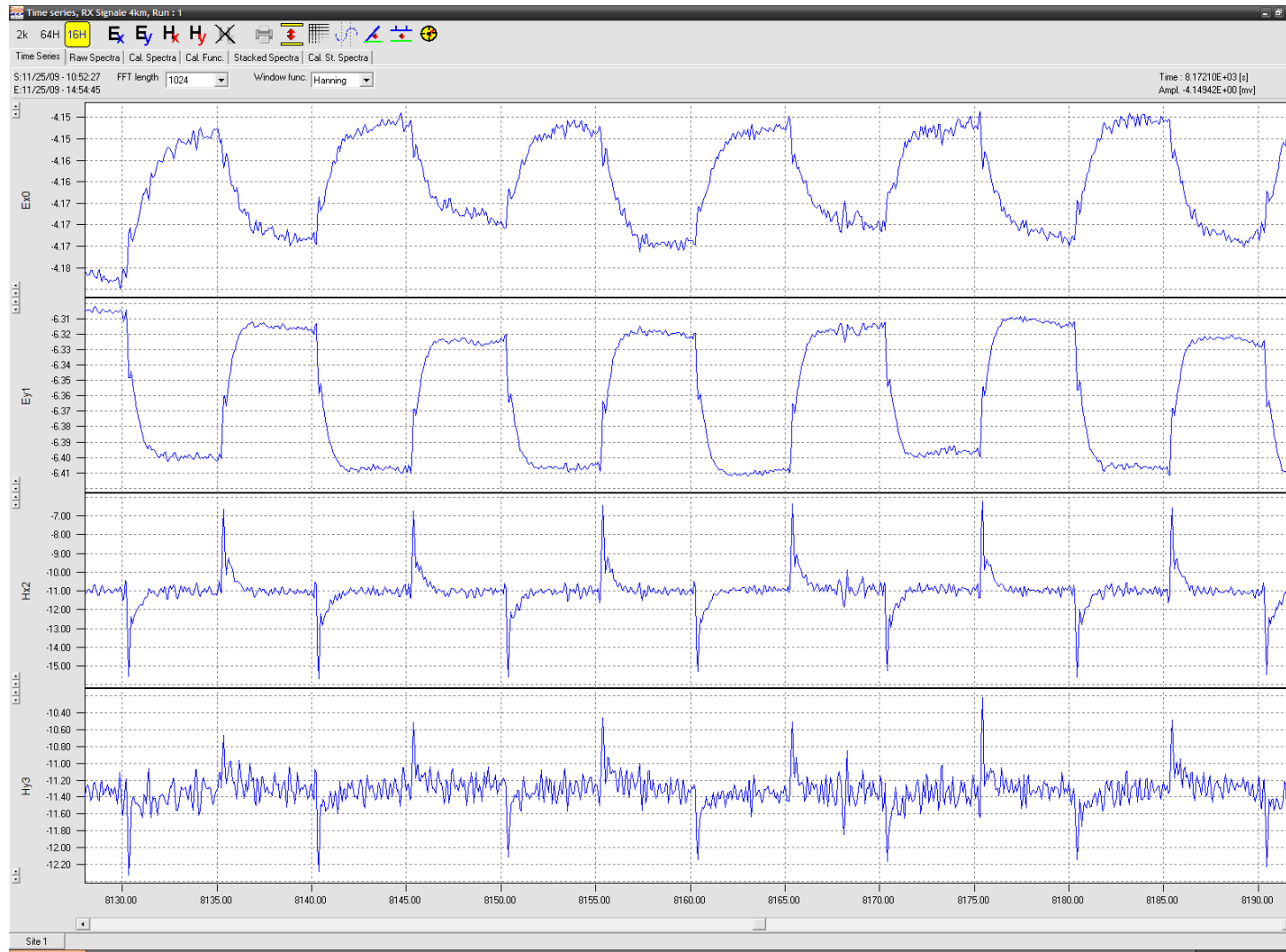
Navigation: [Left Arrow] [Right Arrow]

	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

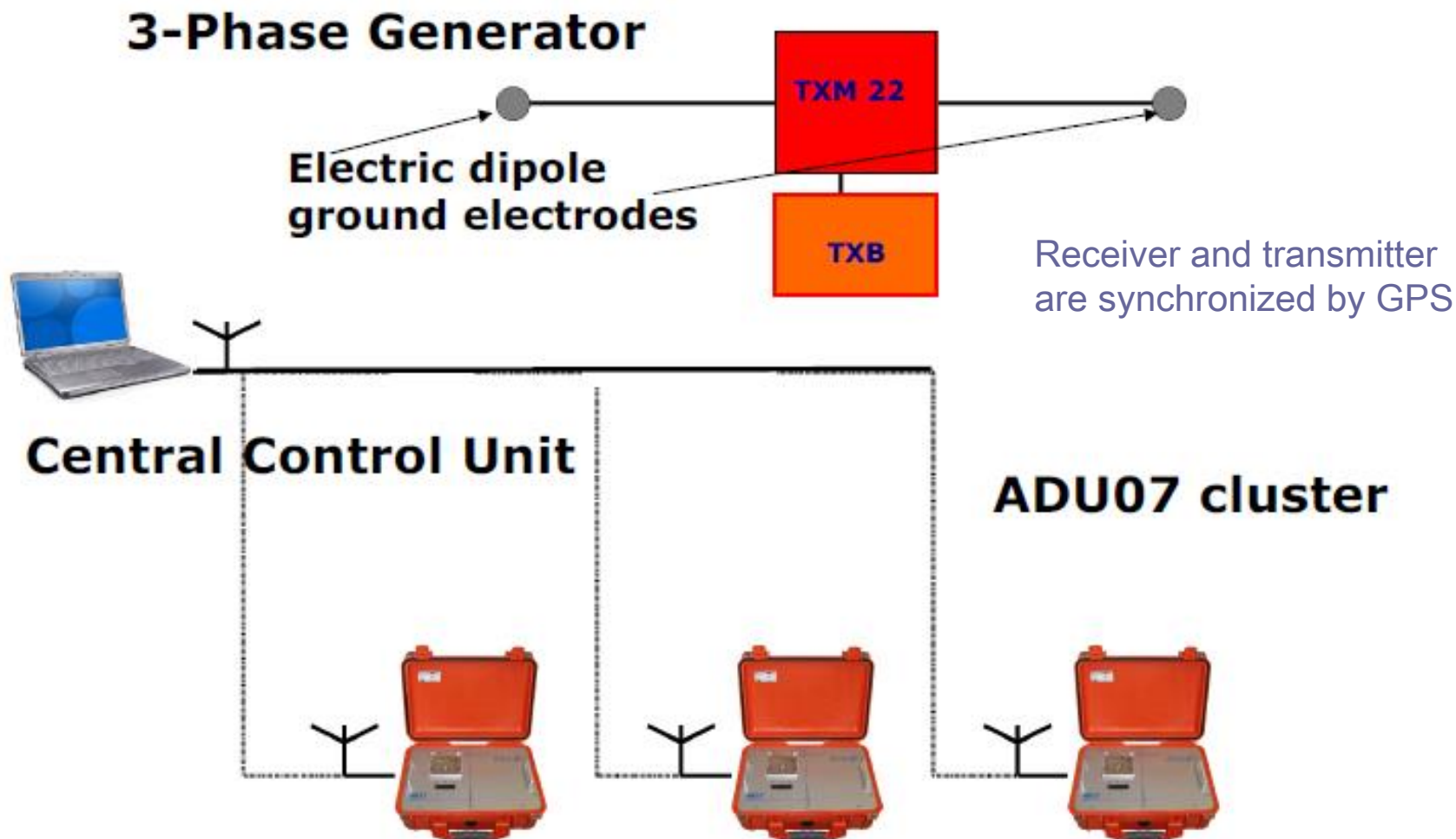
Different Tx-Signals



Raw Time Series of Tx signal in 5km Dist.



Measuring Cluster along with ADU-07



Receiver Units ADU-07e

