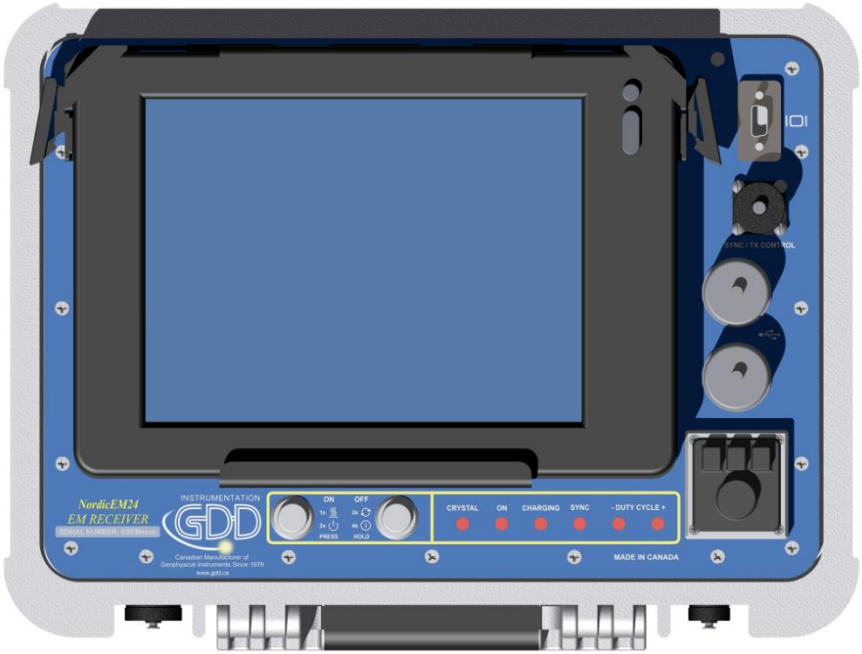
Time-Domain EM at GDD Instrumentation

By
Circé Malo Lalande, Eng., MASc.
Geophysicist & GM

GDD NordicEM24

NordicEM24
EM Receiver



GDD NordicEM24

FEATURES:

- ***Low noise** 24-bit ADCs Rx with **full-waveform** recording (Raw & Stacked files);*
- ***Friendly user** for field operators;*
- *Display scope, stacked data, profiles and decays;*
- ***Post-processing software** included for data QC and corrections;*
- *Components and wiring built to work from **+50°C down to -40°C**;*
- *Battery life optimized in cold temperature (Lithium-Ion batteries);*

GDD NordicEM24

FEATURES:

- *Detachable touch screen with onscreen keyboard;*
- ***Up to 8 input channels**, each with ADC and amplifier;*
- *Tested with different sensors: **dB/dt** (coil) and **B-field** (LT and HT squid, Fluxgate);*
- *Rx – Tx Controller **Crystal or GPS synchronization** (with built-in antenna);*
- *Download data via USB;*
- *Standard data file formats : AMIRA format (ASCII) **compatible with Maxwell®**.*

GDD NordicEM24

SPECIFICATIONS: EM Receiver

Dimensions: 42 x 33 x 18 cm
60 x 41x 23.5 cm with shipping box

Weight: 10 kg
20.4 kg with shipping box

Data storage: 64GB SSD

Battery: Four Lithium-Ion batteries

Input channels: up to 8

V Max input level: ± 3.25V

Bandwidth: Up to 60kHz

Operating system: Windows Embedded Standard 7

Time windows: Various Standard windowing and user defined

Display: 10.4” SVGA Resolution (800x600) with heater

GDD NordicEM24

NordicEM24
Transmitter Controller

GDD NordicEM24

SPECIFICATIONS: Tx Controller

Dimensions: 35 x 29 x 15 cm
54 x 38 x 21 cm with shipping box

Weight: 4.4 kg
13.4 kg with shipping box

Synchronisation: GPS and crystal

Duty cycle: 50%

Transmitter compatibility: Geonics, Zonge, Pheonix and others

Base frequency: 0.03125 to 30 Hz *(higher frequencies on the way)*

Battery: Two Lithium-Ion batteries

GDD NordicEM24

NordicEM24 in action in the field...

... with 3D Coil sensor

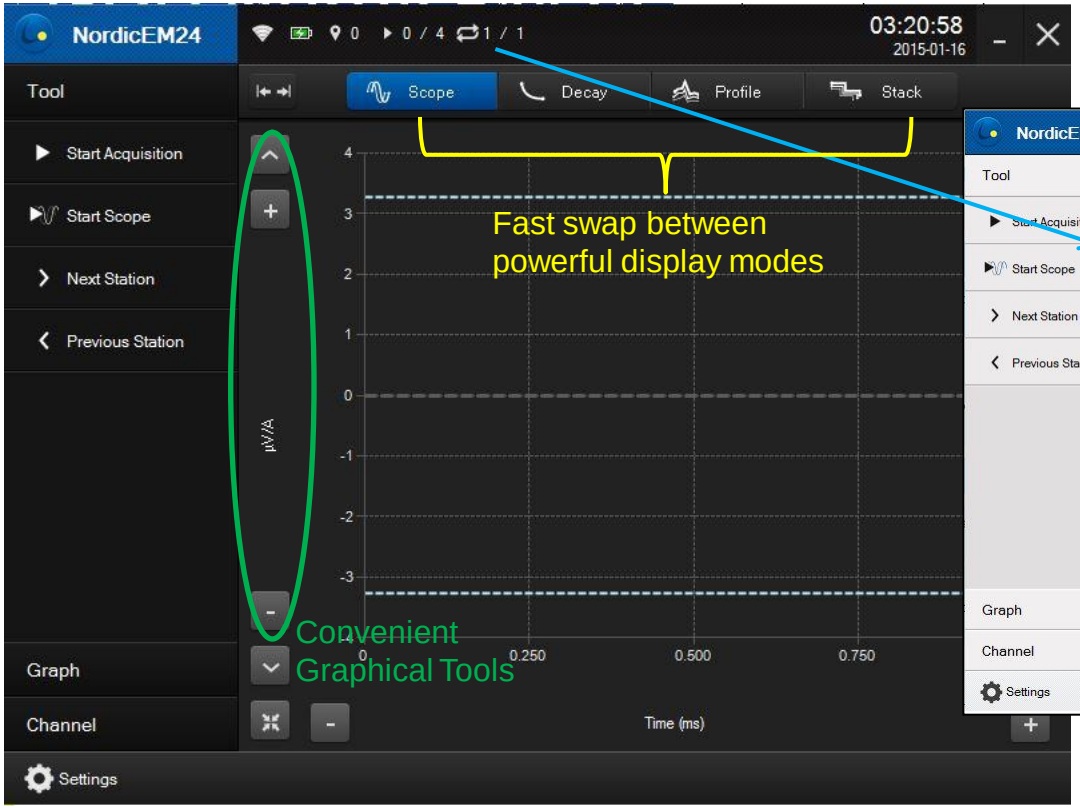
NordicEM24 Tx Controller

NordicEM24 Rx with 1D coil

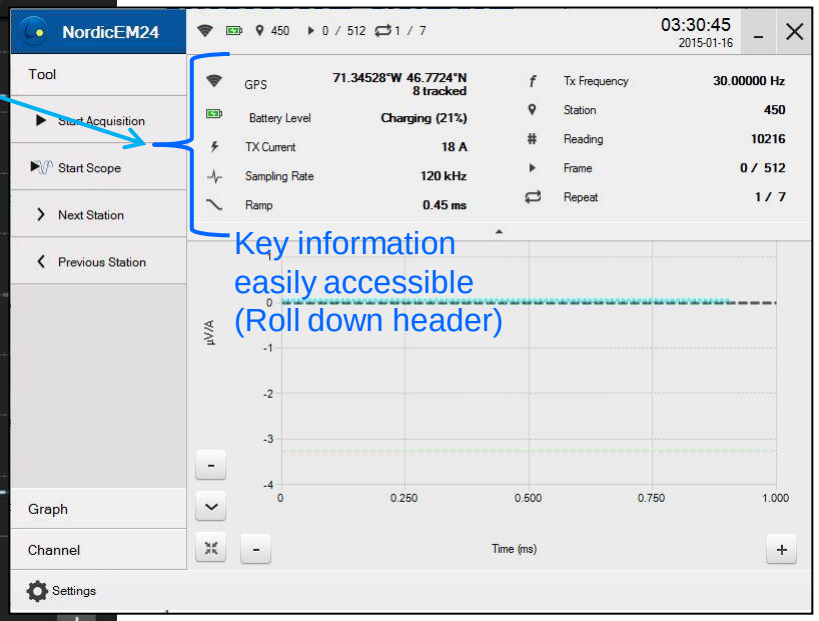
NordicEM24 Rx with SQUID sensor

GDD NordicEM24

The leading edge NordicEM24 receiver was designed to be user friendly:



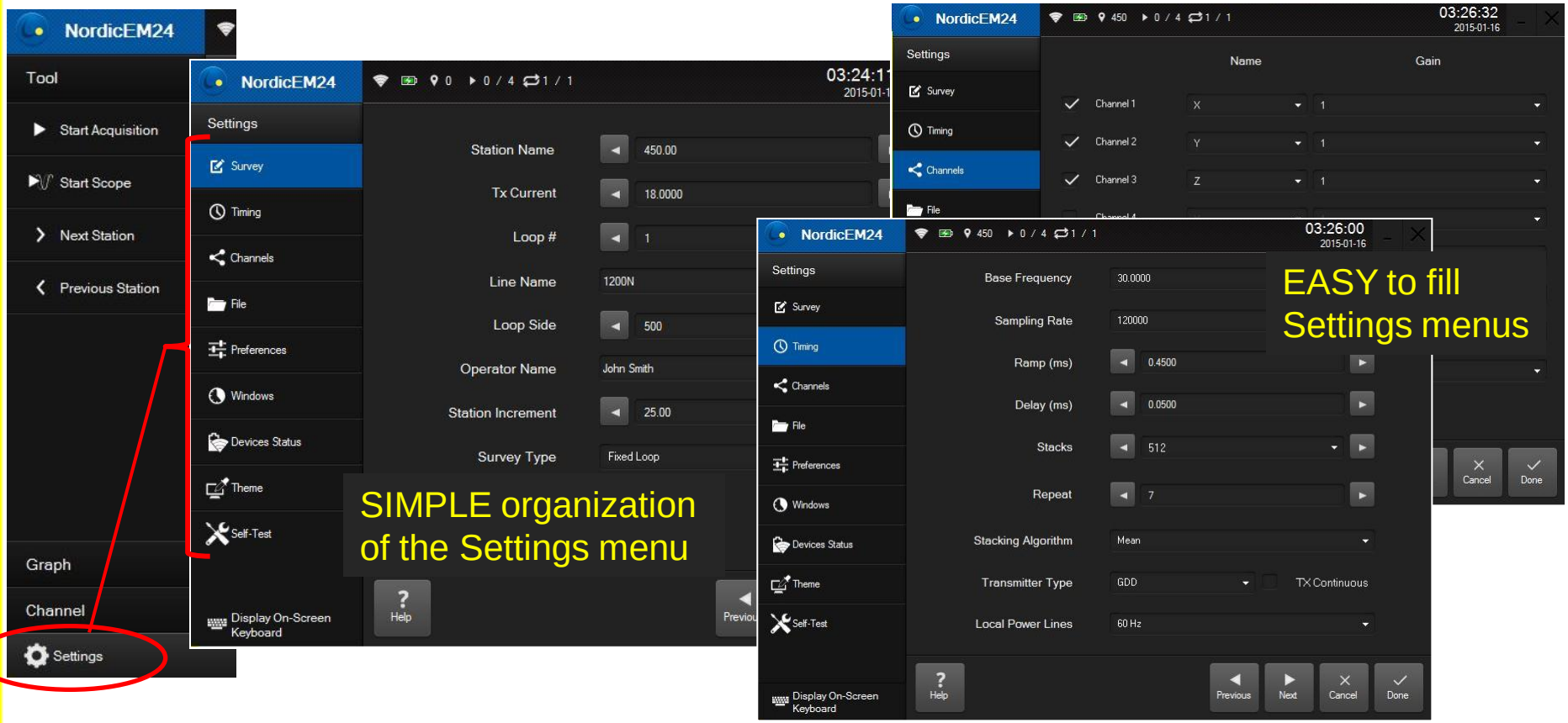
Main window



GDD NordicEM24

The leading edge NordicEM24 receiver was designed to be user friendly:

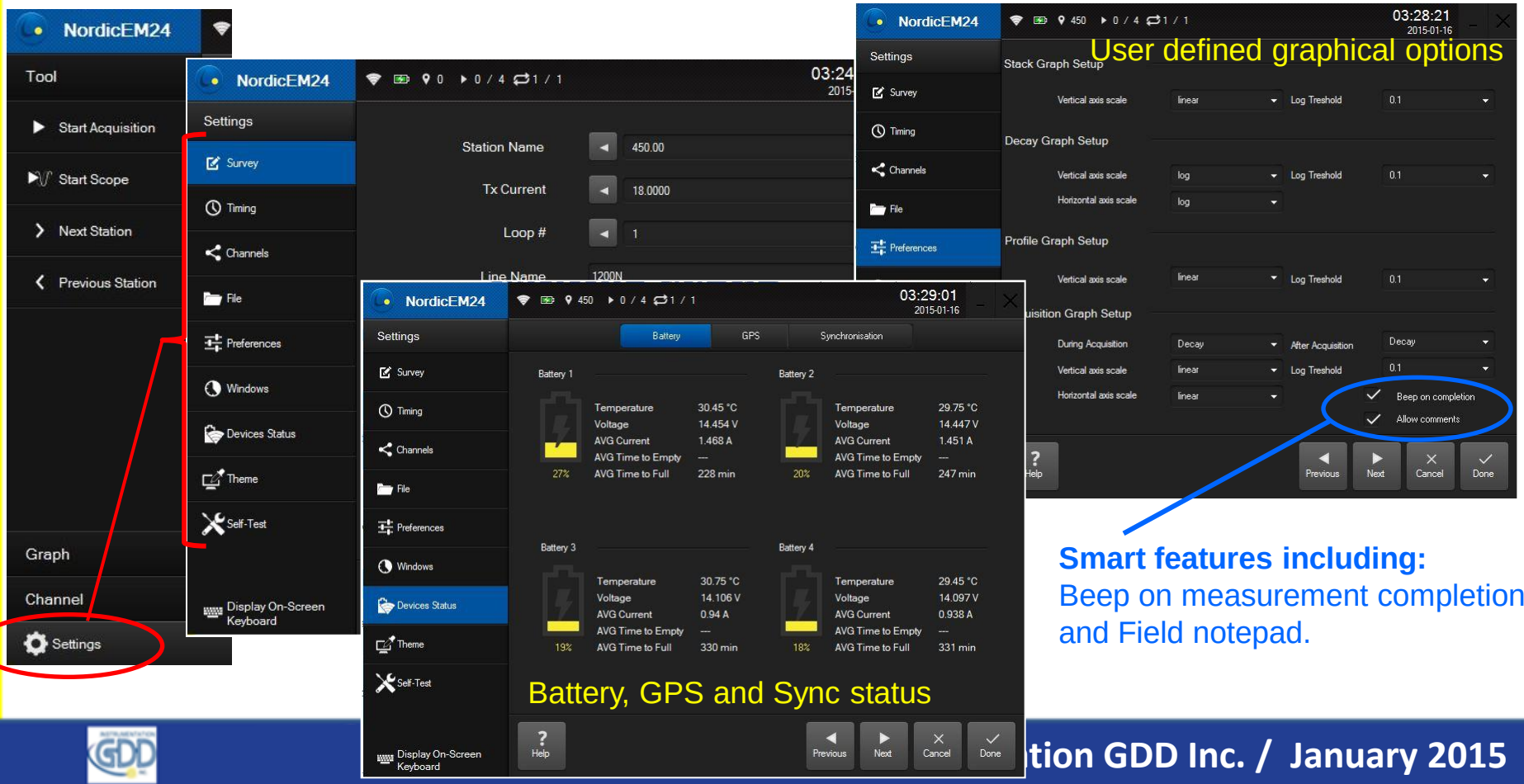
Settings windows



GDD NordicEM24

The leading edge NordicEM24 receiver was designed to be user friendly:

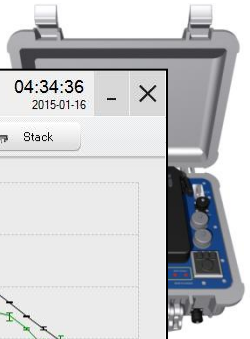
Settings windows

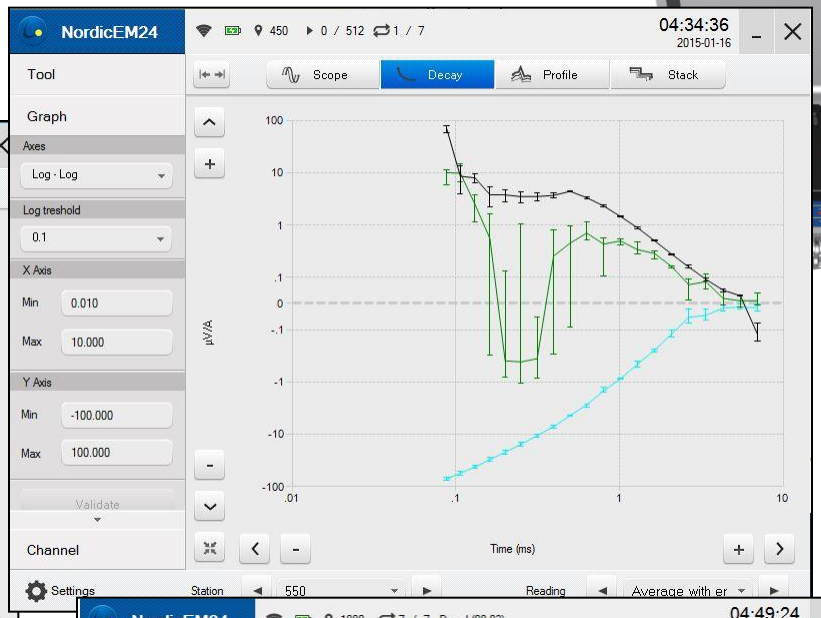


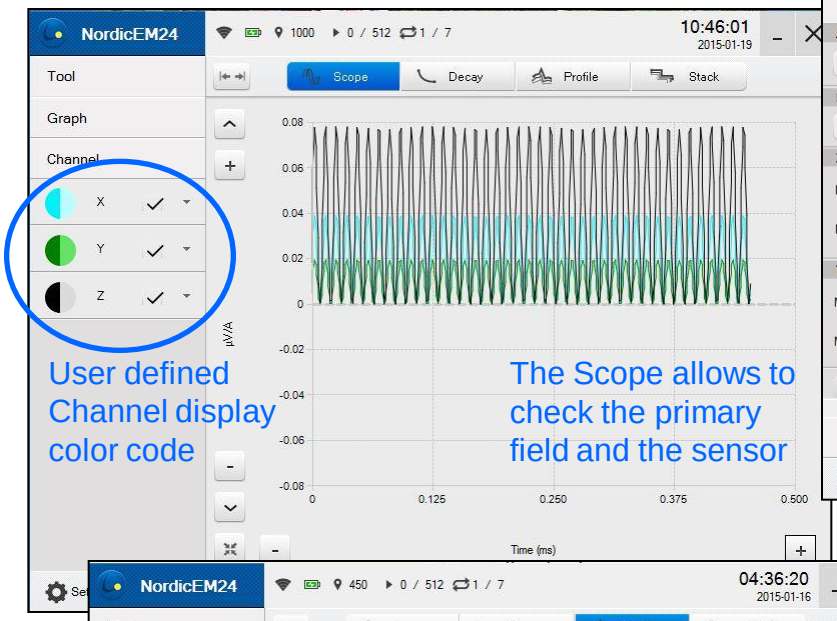
Smart features including:
Beep on measurement completion and Field notepad.

GDD NordicEM24

Main window



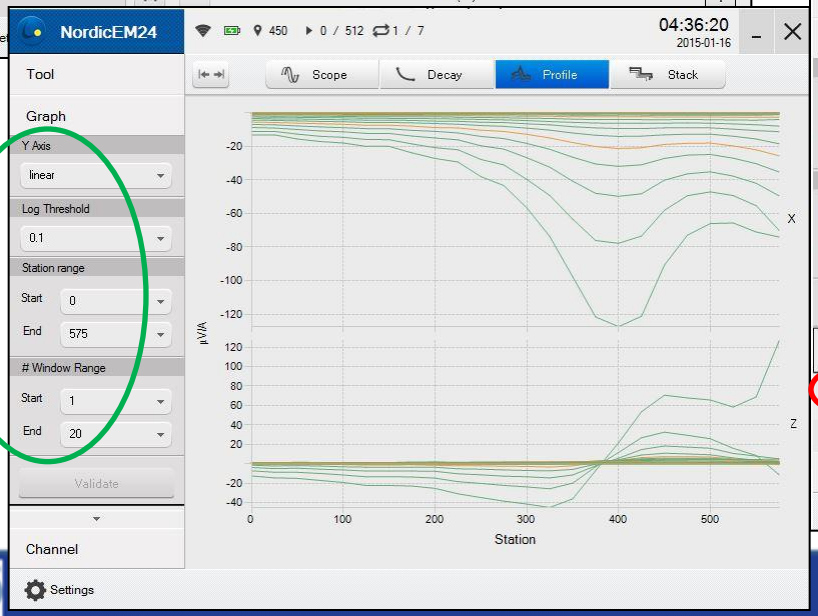


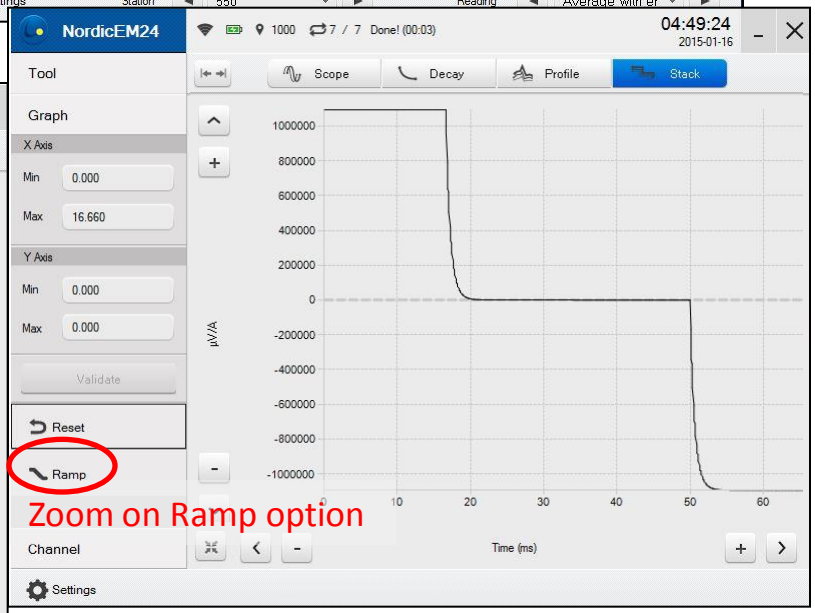


User defined Channel display color code

The Scope allows to check the primary field and the sensor

Convenient Graphical Tools



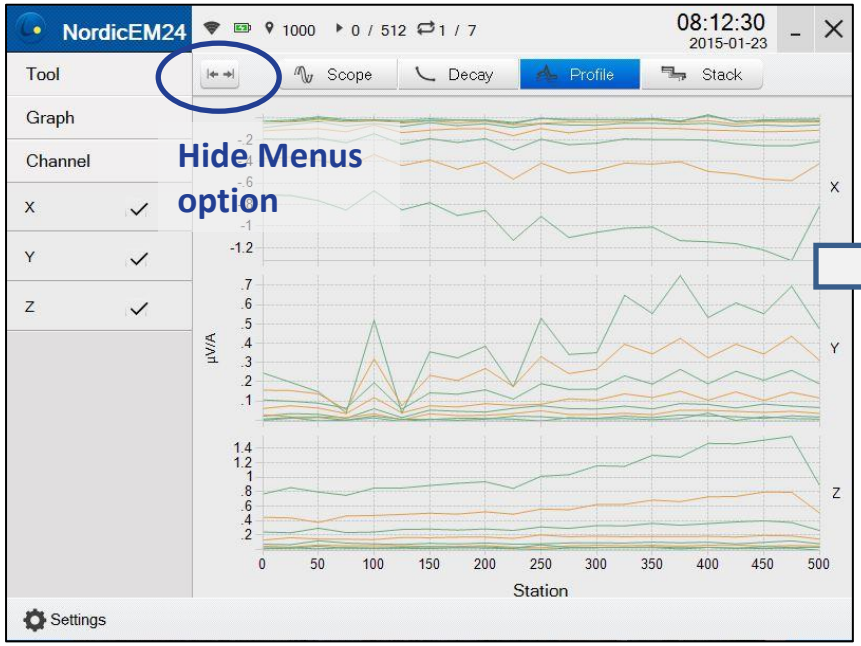


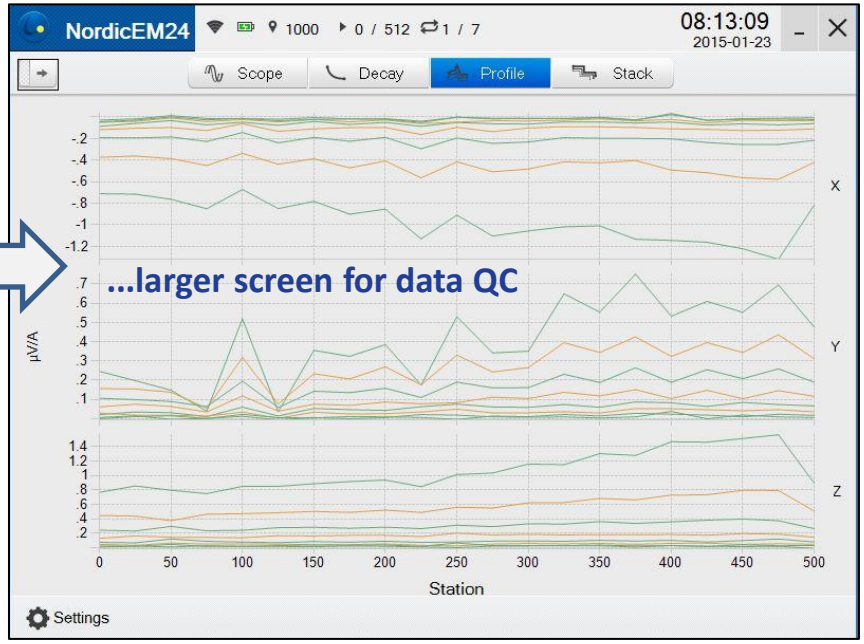
Zoom on Ramp option

GDD NordicEM24

The leading edge NordicEM24 receiver was designed to be user friendly:

Visual tools to help validating your EM data



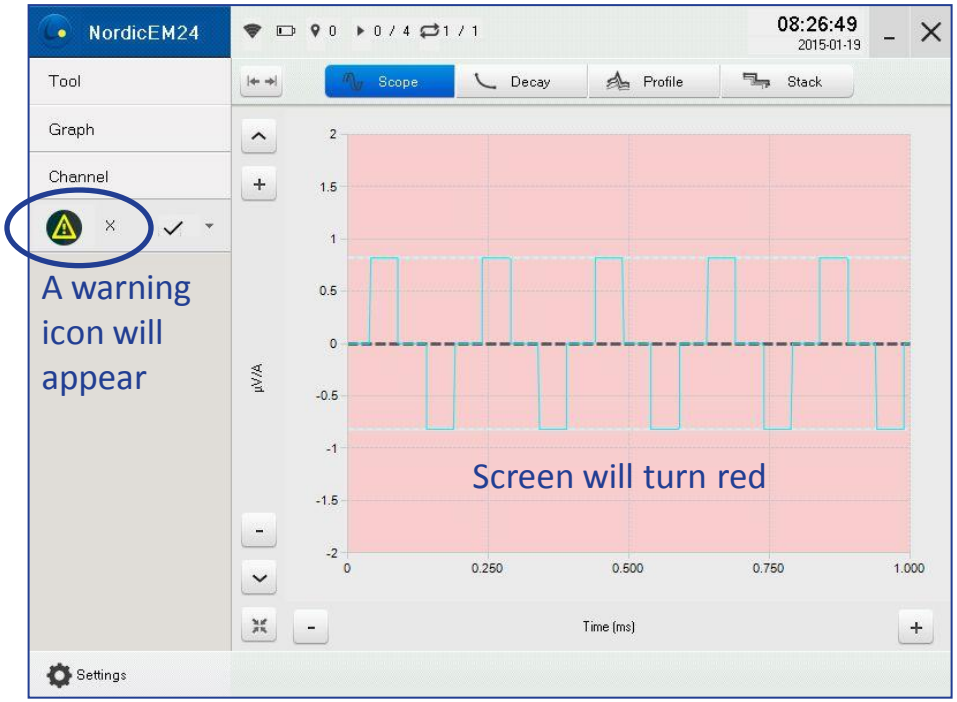


GDD NordicEM24

The leading edge NordicEM24 receiver was designed to be user friendly:

Visual tools to help validating your EM data

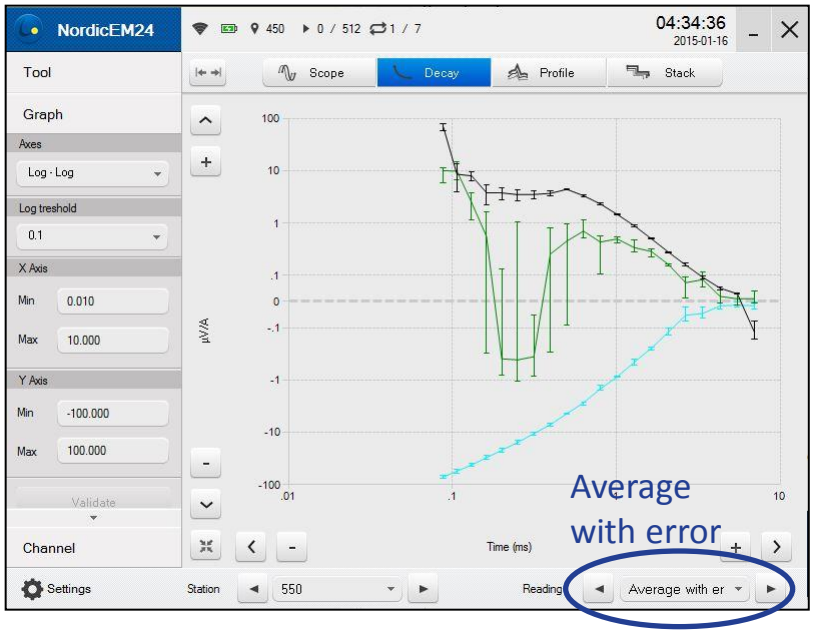
Example of signal saturation on the X component of a B-field survey

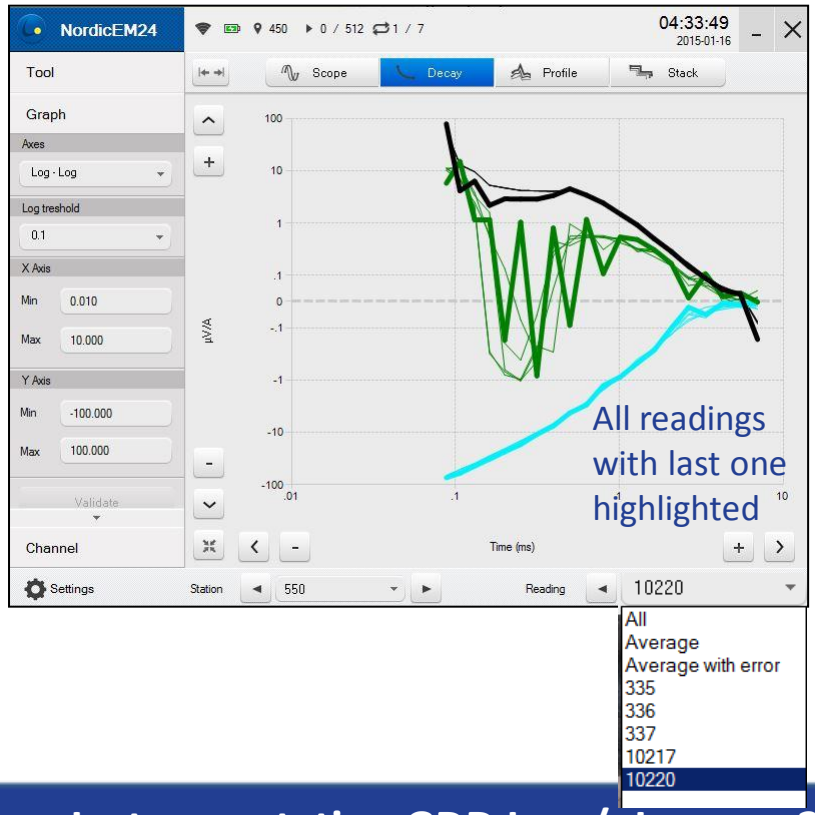


GDD NordicEM24

The leading edge NordicEM24 receiver was designed to be user friendly:

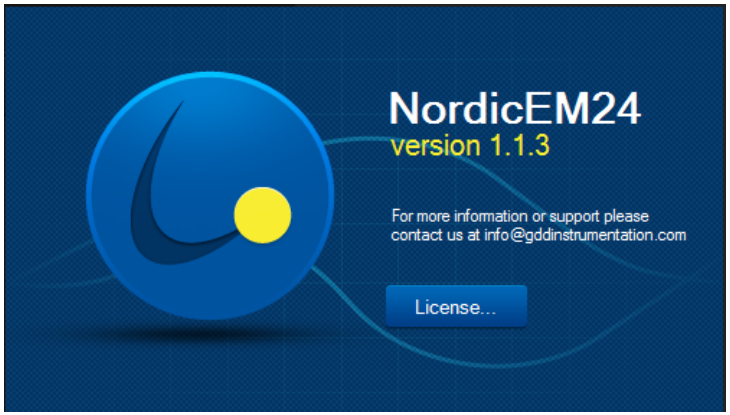
Visual tools to help validating your EM data

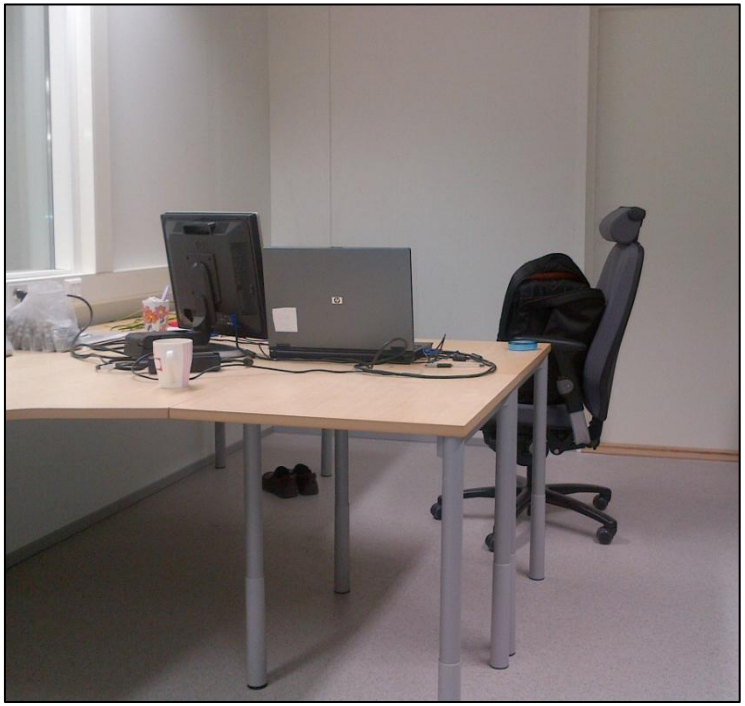




GDD NordicEM24

NordicEM24 data post-processing...

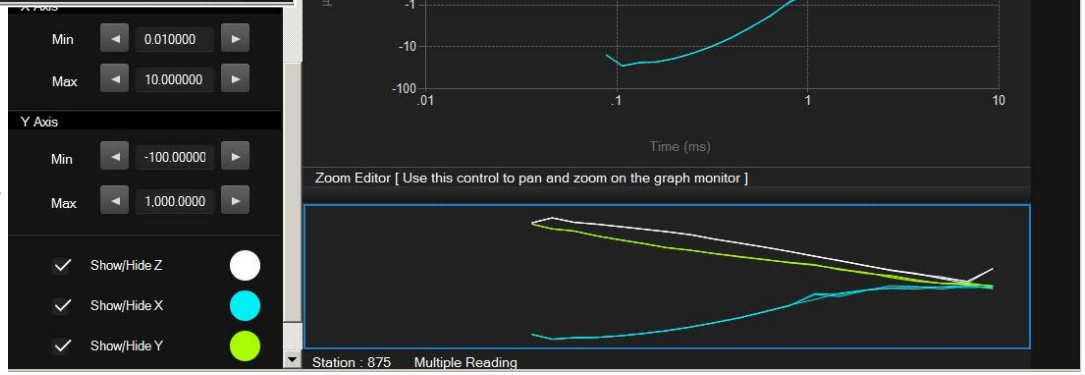




GDD NordicEM24 Post-processing software

Powerful tool to visualise **Profiles**:

Zoom options, linear and log scales, channels and time gates selection.



Powerful tool to visualise **Decays**:

Zoom options, linear and log scales, channels selection, single or multiple readings display.

GDD NordicEM24 Post-processing software

Powerful tool to visualise the **RAW** data (time series):

Eg. Complete XYZ **B-field** raw data at a specific reading

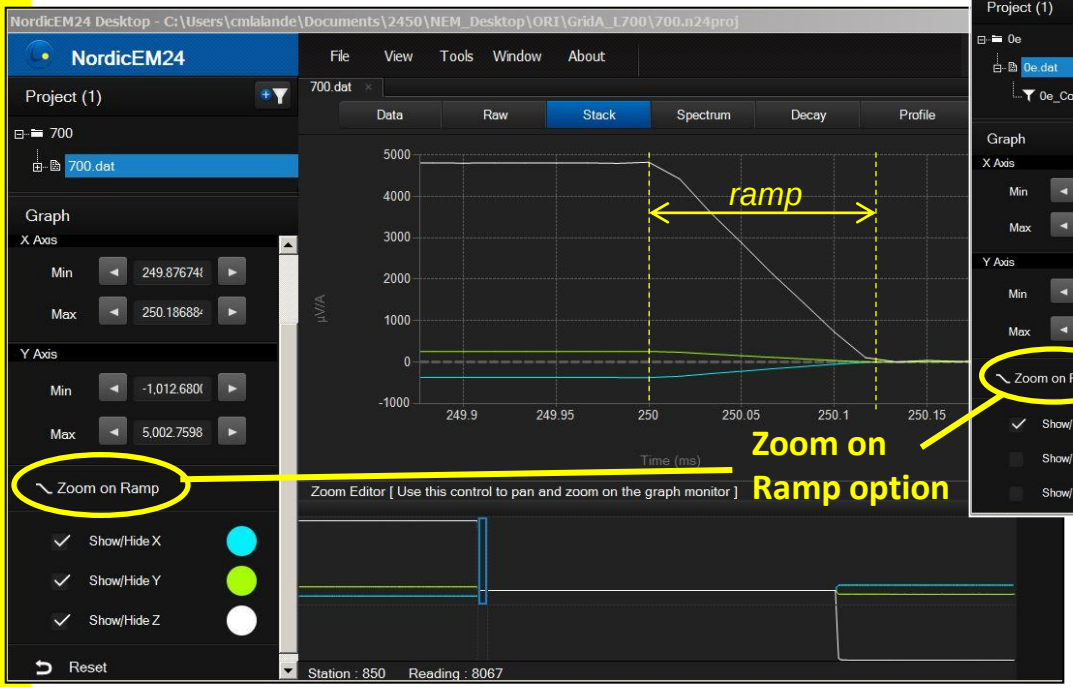
Eg. Portion of ZXY **Coil** raw data at a specific reading

GDD NordicEM24 Post-processing software

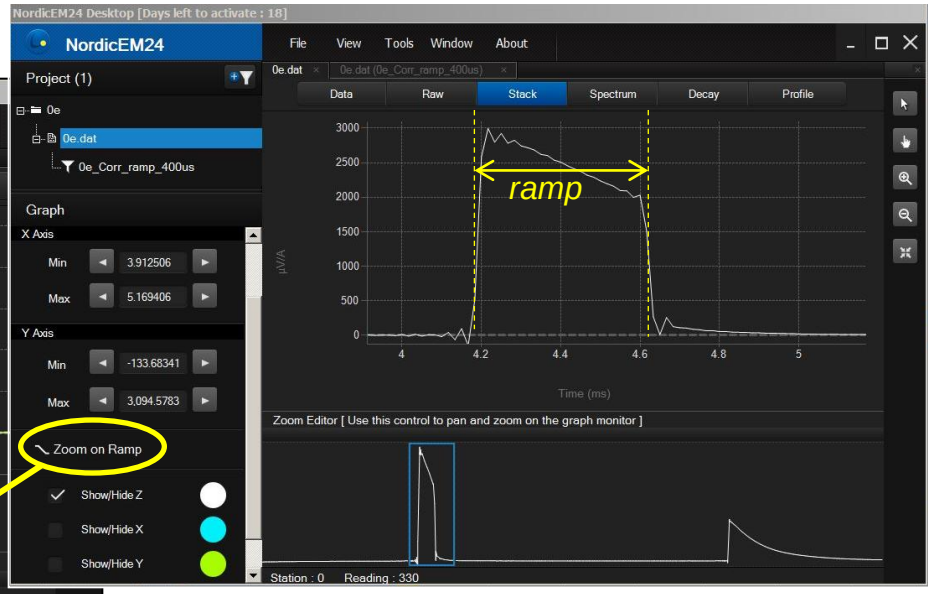
Powerful tool to visualise the **Stacked** data:

Zoom options including a "zoom on ramp" function, channels selection, single reading display.

Eg. XYZ **B-field** stacked data zoomed on the ramp



Eg. Z **Coil** stacked data zoomed on the ramp



GDD NordicEM24 Post-processing software

Powerful tool to visualise the **Spectrum**:

Zoom options, linear and log scales, channels selection, single reading display, user defined FFT off-time focus.

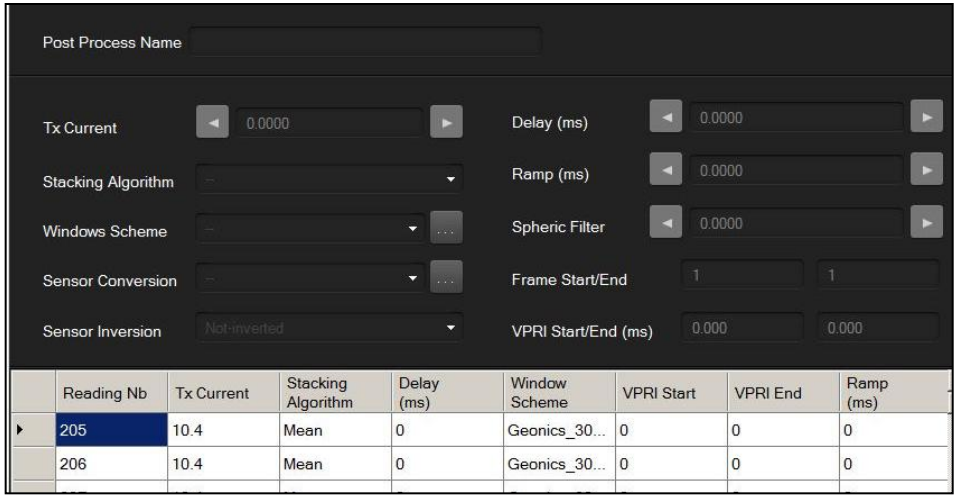
Eg. FFT of the ZXY **B-field** stacked data

Eg. FFT of the ZXY **Coil** stacked data

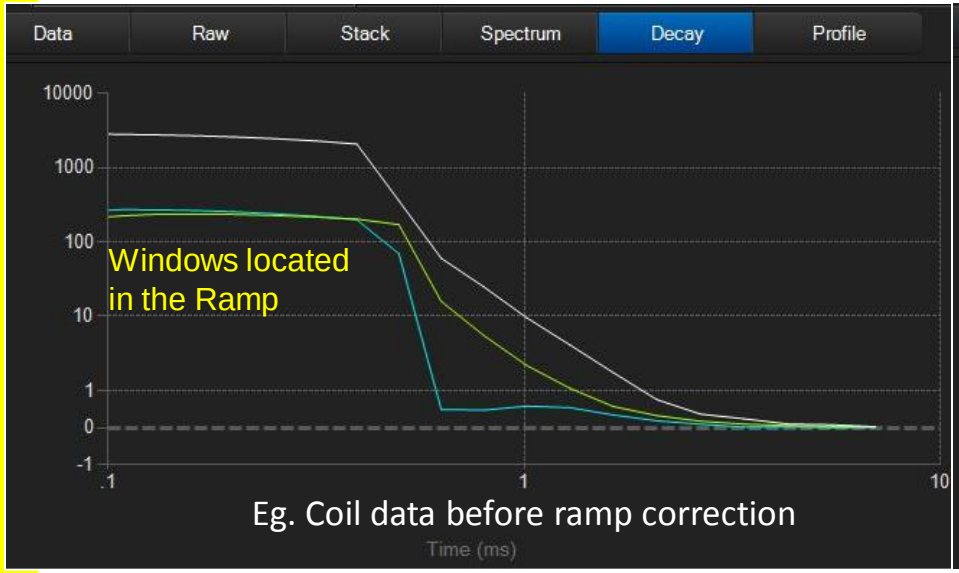
GDD NordicEM24 Post-processing software

NordicEM24 **Post-Process Options**:

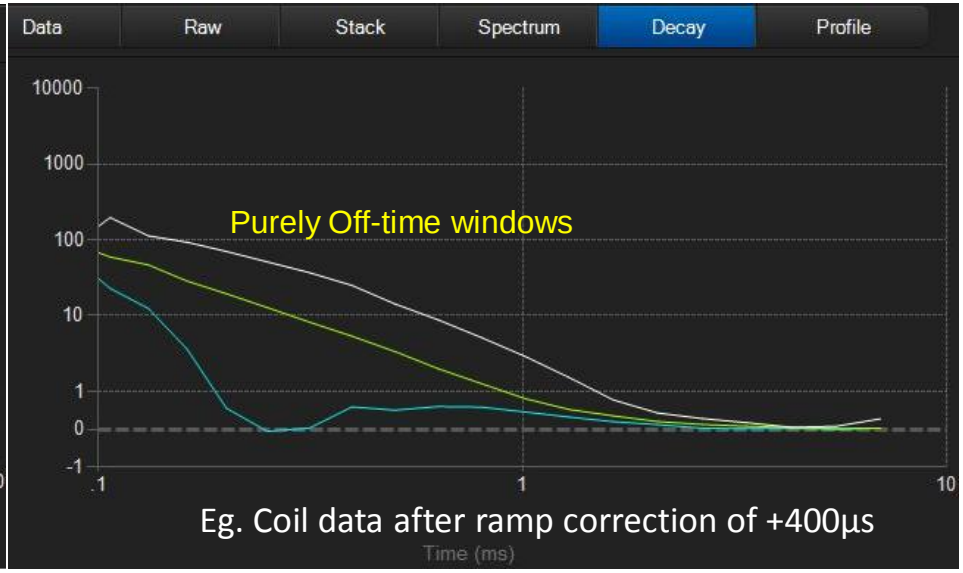
- *Ramp, Delays and Current corrections;*
- *Re-calculation of Primary field*;*
- *Apply sensor conversion factors;*
- *Reverse a single reading (all channels);*
- *Modify stacking algorithm or windowing;*
- *Remove noisy Stack from Raw data.*



Reading Nb	Tx Current	Stacking Algorithm	Delay (ms)	Window Scheme	VPRI Start	VPRI End	Ramp (ms)
205	10.4	Mean	0	Geonics_30...	0	0	0
206	10.4	Mean	0	Geonics_30...	0	0	0



Eg. Coil data before ramp correction



Eg. Coil data after ramp correction of +400µs

GDD NordicEM24

Base metals and Environmental applications

Field training

Affordable
EM Receiver - Tx Ctlr

Compatible with a wide range of Ground and Borehole sensors (dB/dt and Bfield)

Compatible
with: Geonics (Tx)
EMIT (Tx Ctlr)
Zonge (Tx)
Pheonix (Tx)

Worldwide Customer Services

No Synchronization loss (GPS + crystal back-up)

No survey day lost with the NordicEM 24 Post-Process software

GDD NordicEM24

For more information:

INSTRUMENTATION

GDD

Canadian Manufacturer of
Geophysical Instruments Since 1976

www.gdd.ca

gdd@gdd.ca