

MTFA 50

Classification of PD and Arc Signals in Magnitude, Time, Frequency, and Phase Angle

- 3-Dimensional Pulse Sequence Analysis: F-NoDi*
- PD and Arc Detection in the Inverter-Powered System



**Operation and Maintenance Solution
for the AI era**

MTFA 50 for the AC and DC Power Equipment

- In an AC system, the MTFA map synchronized with the power frequency offers real-time classification of partial discharge sources, arcs, and external noise across four dimensions: magnitude, time, frequency, and phase angle.
- In DC systems, signals can be analyzed in three dimensions: magnitude, time, and frequency (MTF), or in a magnitude pulse sequence (MPS) map. Additionally, the MTFA map allows examination in four dimensions, including phase angle information.

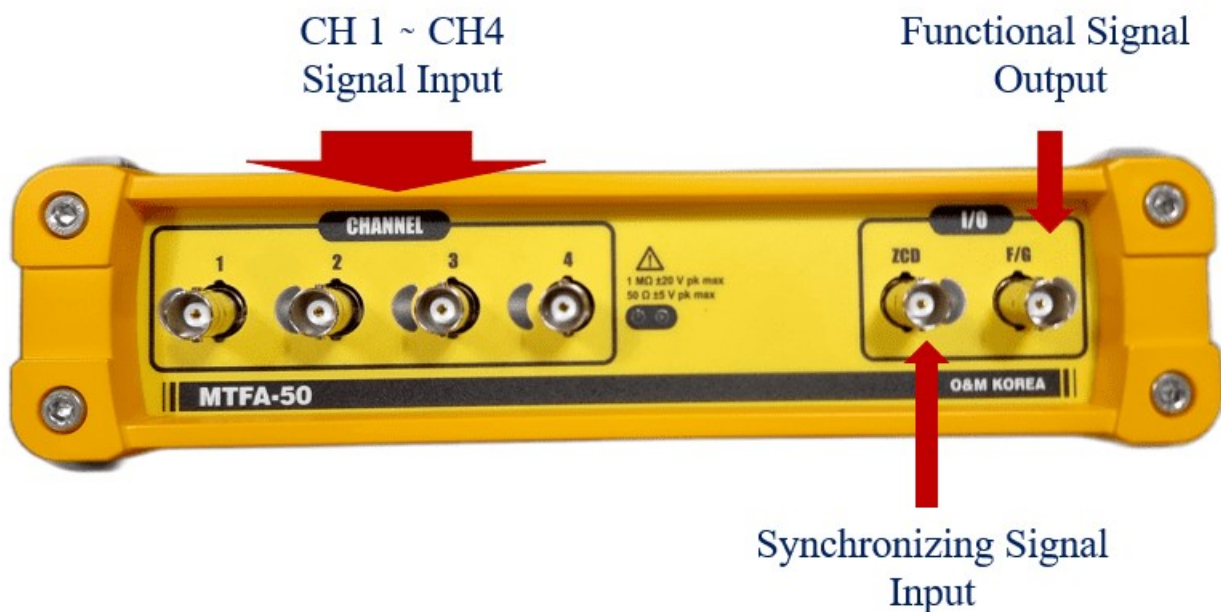
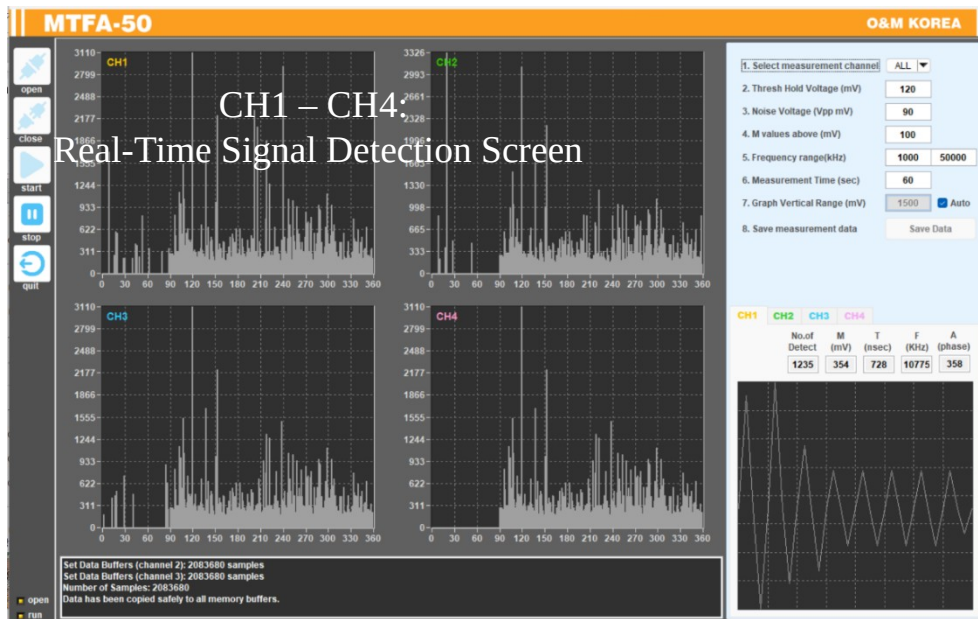


Fig. 1 Front Panel of the MTFA 50

- A laptop PC and screen menu allow for flexible and advanced PD and Arc classification.
- A compact and portable design, making it suitable for use in both laboratory settings and field applications..

Measurement Mode

Start-Stop
Control
Menu

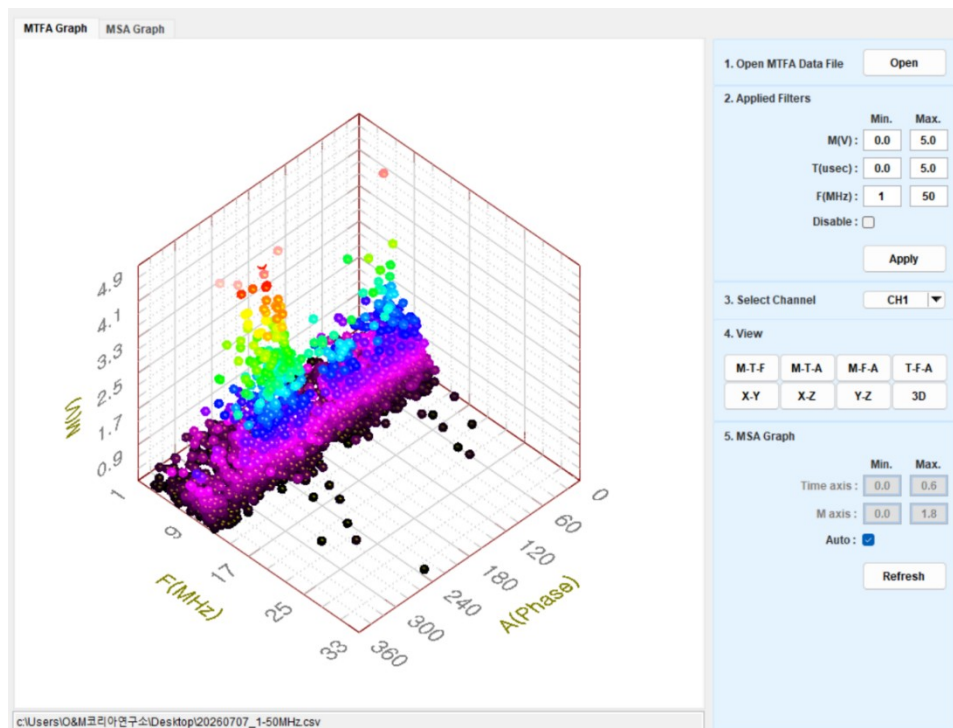


MTFA
Range
Selection
Menu

MTFA
Channel
Signal
Menu

Fig. 2: Measurement screen and menu

Plotting Mode (3D)

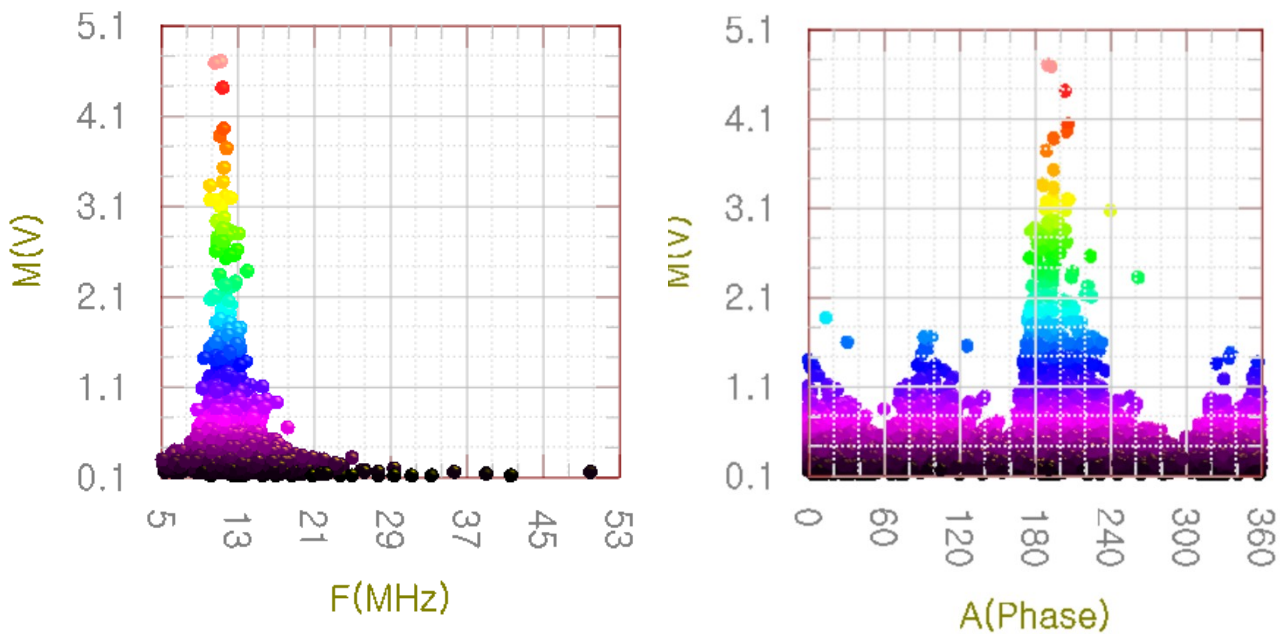


MTFA
Range
Selection
Menu

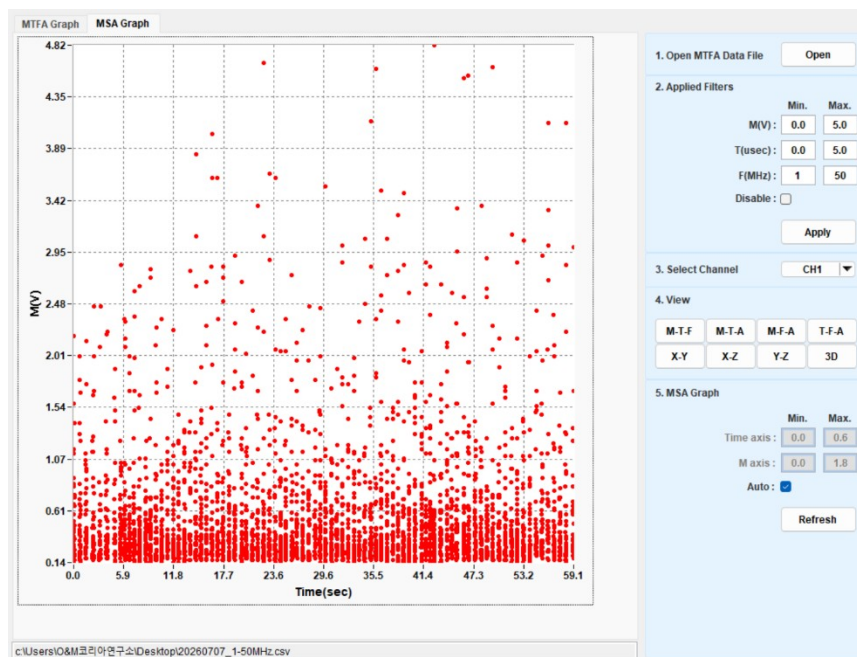
MTFA
Graph
Selection
Menu

Fig. 3: Three-dimensional plotting screen and menu

Plotting Mode (2D)



MPS map



MPS
Range
Selection
Menu

Fig. 4: MPS plotting and menu

F-NoDi* Analysis of Arcing and Partial Discharge

Common approaches to measuring and analyzing arcing and partial discharge under DC conditions include analyzing signal magnitudes and occurrence counts as described in IEC 60270 (2025 edition), or using the NoDi* (Normalized Difference) technique. NoDi* uses two-dimensional Del T–Del M analysis, where Del T represents the time interval between signal events and Del M represents the difference in signal magnitude.

The NoDi* technique requires additional measurements to analyze frequency characteristics. In contrast, the F-NoDi* technique uses the MTFA 50 device to measure Del T, Del M, and frequency F in real time, providing three-dimensional information as shown in Figure 5.

In environments where corona discharge, surface discharge, internal discharge, and arcing occur simultaneously, F-NoDi* can distinguish the origins of the signals through real-time frequency analysis.

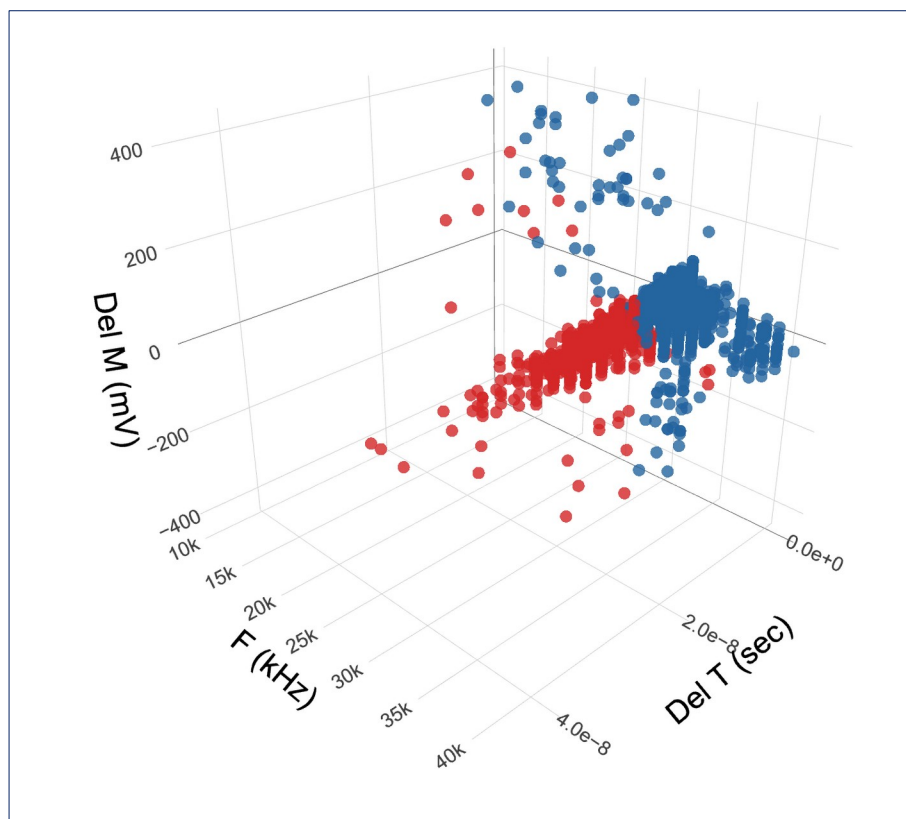


Fig. 5: 3-dimensional F-NoDi* plot

DC Arc Detection in the Inverter-Powered System

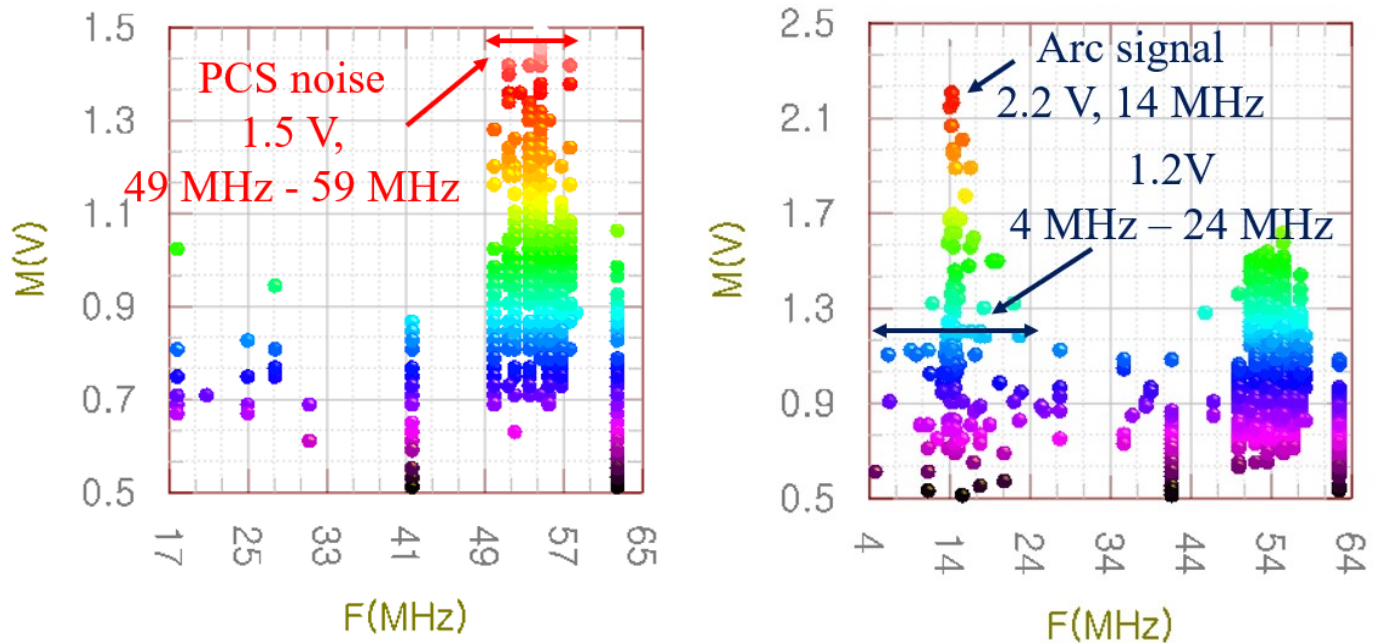


Fig. 6: DC arc and Inverter noise

Technical Specification

- Real-time 4-channel signal measurement
- MTFA map: 16 plotting modes: 4 modes in 3D and 4 modes in 2D
- MPS map: magnitude-time measurement
- 3-Dimensional Pulse Sequence Analysis: F-NoDi*
- PD and Arc Detection in the Inverter-Powered System
- ADC: 4 nanoseconds (1 CH), 16 nanoseconds (4 CH)
- Frequency error: ~ 50 MHz ($< 0.02\%$)
- Maximum voltage input: 20Vp-p
- Voltage measurement error: $< 1.8\%$
- Size (mm): 270*65*170 (W*H*D)



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