

## smartEDDY® 4.0 Advanced Test Software

SE Systems' Advanced Test Software provides many important enhancements to the standard smartEDDY 4.0 processing, display, storage and control functions. *Please refer to SE's data sheet entitled "smartEDDY 4.0 Standard Test Software" for a description of the many standard features included with the advanced test software.*

The equation could be a simple linear scaling of the eddy-current response or a complex non-linear combination of up to four vector components. smartEDDY Measurement Software can be used to develop up to a cubic equation that relates the physical parameters to the eddy-current response vectors. Third party fitting programs can be used to develop the equation or it may be based on empirical or theoretical models.

**Polar/time display:** This is another unique feature of smartEDDY. It is identical to Cartesian/time display except that the vector response is represented by its magnitude and phase angle rather than the horizontal and vertical components of the vector. Alarm thresholds set in this mode represent a pie alarm rather than a box alarm.

In some testing, the phase angle of the response is directly related to the depth of the flaw and the magnitude of the response is related to the volume of the defect. In particular with many heat exchanger tubing inspections, there is interest in detecting defects that penetrate more than a certain fraction of the wall. Setting alarms in this display mode permits automatic real-time detection of critical tubing flaws.

**Cartesian/position display:** This is identical to Cartesian/time display except that the vector response is shown as a function of position rather than time. An encoder interface card is required to utilize this feature. SE Systems supplies an interface card that can read most encoder or stepping motor signals and translate them into position.

As with the time display option, the operator can move the *start* and *end flag* to any position represented on the screen. Response values at a flag and the maximum response values between flags will be shown. A magnified view of the data is accomplished by pushing *enter*.

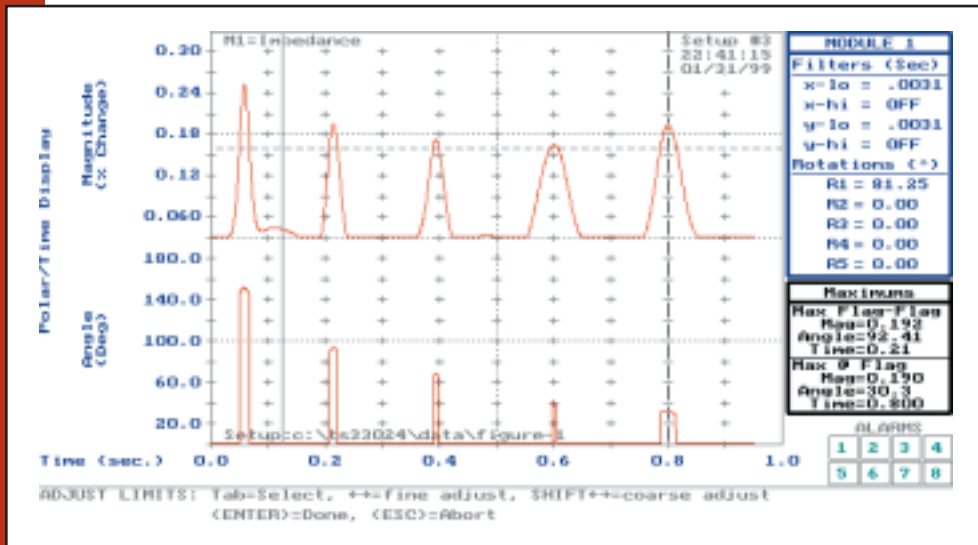


Figure 1 Replay of Polar/time Display

### ► Advanced Processing and Display Features.

A number of useful analysis and display functions are added.

**Parametric Analysis:** Parametric analysis and display is a unique and powerful feature of smartEDDY. Many physical parameters such as conductivity, permeability, hardness, case depth, wall thickness, coating thickness, hole diameters, flaw depth, weld penetration, etc., are related to the eddy-current response. However, the eddy-current response does not quantify the physical parameter of interest. This advanced feature processes the eddy-current response in order to give a direct measure and display of physical parameters. The scales can be labeled with the appropriate titles (conductivity, hardness, diameter, etc.) and in the appropriate units (%IACS, Rockwell C, inches, etc.). All that is required is an equation relating the eddy-current response to the parameter of interest.

**Polar/position display:** The polar/ position display is unique to smartEDDY and is identical to Cartesian/position display. The exception is that the polar coordinates are displayed.

**Cartesian/frequency scan display:** This advanced feature measures and displays sensor resistance and reactance as a function of frequency. It provides a whole new dimension to the control of eddy-current test sensors by de-mystifying the sensor spectrum. For example, the effect of different cables, ferrite types, coils and shielding become evident. Also, the sensor spectrum can be tagged with a name, serial number and date, and stored for future use. Sensor spectra can be recalled for direct comparison with spectra of different sensors, or comparison with spectra for the same sensors at different times or under different conditions.

► **Advanced Data Storage Features**

Advanced Test Software augments smartEDDY's standard data storage capabilities.

**Auto Store:** Auto Store automatically stores data to the smartEDDY floppy disk, hard disk, or optical disk.

**Streaming inspection data:** This provides automatic permanent storage of raw eddy-current data along with the test processing and display parameters. Auto Store replaces conventional magnetic tape recorders previously used to store raw data. It permits direct streaming of raw inspection data to installed or network storage media. Since data is in a digital format, arch-

ival integrity is superior and unlimited copies can be made without deterioration. Data is stored with operator specific labels and comments. This eliminates the need for voice-overs and attendant potential for misinterpretation.

**Auto defect store:** Eddy-current inspections can generate a massive amount of data, most of which corresponds to normal eddy-current response and is of little interest. This problem can be solved with the auto-defect-store feature. The user sets alarm thresholds. Any eddy-current signal which exceeds the thresholds will activate data storage. A preset amount of data prior to and after the alarm will be automatically stored. When position recording is on, position data will be recorded.

**ASCII File Generator:** This feature processes smartEDDY data files according to the appended data analysis instructions and converts the data to an ordered text file. Data files can be converted individually or as a batch. Text files can be exported to any number of third party programs such as spreadsheet, statistical analysis, curve fitting or customer programs for further analysis or manipulation.

► **Advanced Remote Control**

Advanced Test Software augments smartEDDY's standard input functions to permit additional remote control. Twelve different set-ups, programmed by the user, can be called by a PLC or other control interface. SE Systems' factory can add other functions as required by the user

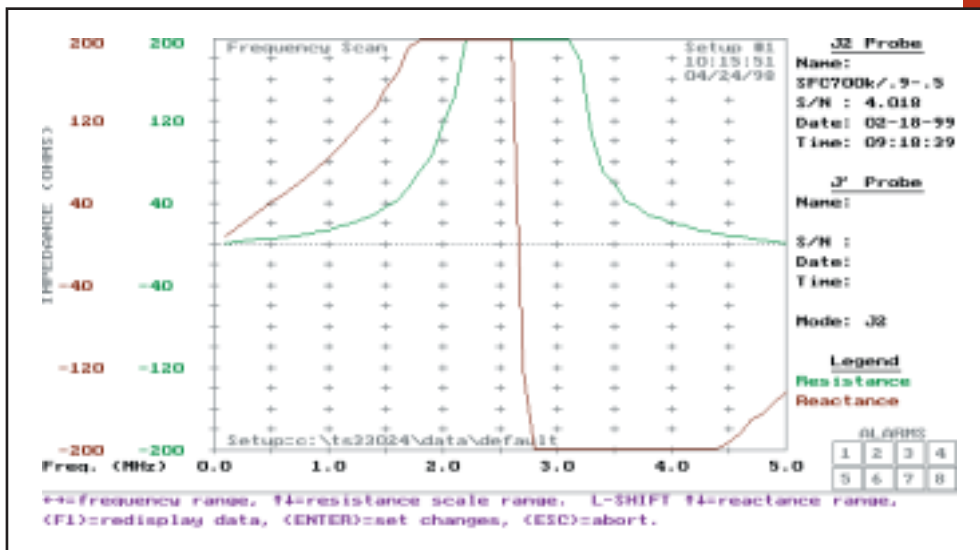


Figure 2 Sensor spectrum

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