

Introduction

The EADS-TCDX allows the off line playback and analysis of:

- Doppler files recorded with the TCD-X Atys transcranial Doppler Holter
- Doppler files recorded with the LOOKI/WAKIe transcranial Doppler
- Wave files recording with any transcranial Doppler

The EADS-TCDX allows also of course the on-line (real time) analysis of Doppler signal recorded by the TCD-X.

The EADS-TCDX can be used by any TCD users not only by users of ATYS TCD.

The EADS-TCDX can be used if the considered TCD can export a wave file.

The EADS-TCDX is universally applicable to any TCD system

Analysis means:

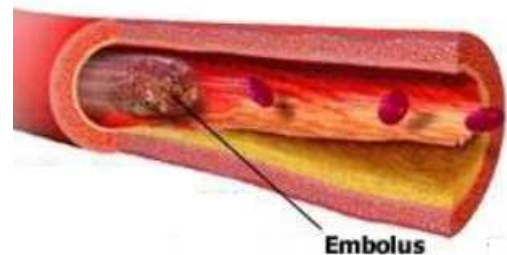
- Emboli detection
- Trend display
- Export of data
- Examination report print out

Emboli detection

The EADS-TCDX has been purely developed to detect the low intensity emboli of short duration which are seen in TIA, Stroke patients, Atrial Fibrillation

The EADS-TCDX detects HITS (high Intensity Transient Signal) in the Doppler signal and classifies them into either emboli or artefact.

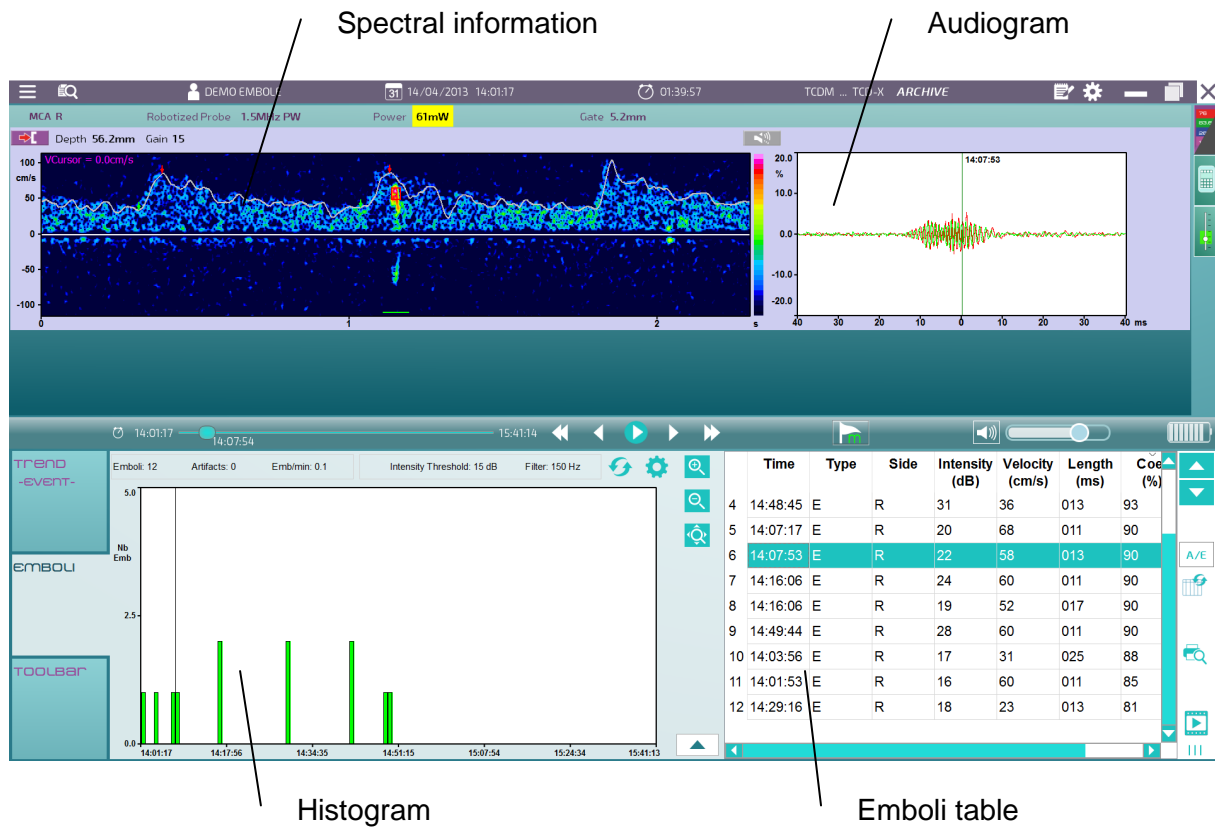
Emboli are defined as short, transient, high intensity, unidirectional signals travelling through the sample volume and by contrast, artifacts are identified as uni or bi-directional transient high intensity signals of varying duration, but without a velocity component within the sample volume.



The EADS-TCDX algorithm performs the following assessment to help identify a potential embolus:

- Identifies a transient high intensity event
- Determines whether event is unidirectional
- Defines background energy

EADS interface



Emboli table

The user can select any event clicking on it in the emboli table and the system will automatically display the spectral information surrounding the event. Alternatively, the complete information, including audio, can be played back to assist with further analysis.

	Time	Type	Side	Intensity (dB)	Velocity (cm/s)	Length (ms)	Coe (%)	
4	14:48:45	E	R	31	36	013	93	
5	14:07:17	E	R	20	68	011	90	
6	14:07:53	E	R	22	58	013	90	A/E
7	14:16:06	E	R	24	60	011	90	
8	14:16:06	E	R	19	52	017	90	
9	14:49:44	E	R	28	60	011	90	
10	14:03:56	E	R	17	31	025	88	
11	14:01:53	E	R	16	60	011	85	
12	14:29:16	E	R	18	23	013	81	

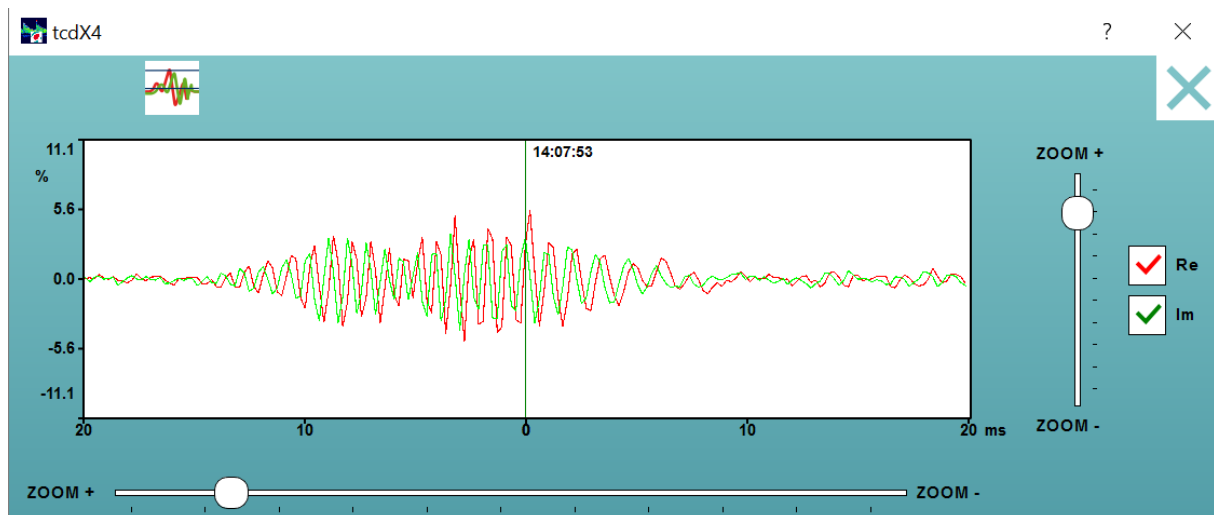
Verification of the detected emboli by the physician

The EADS-TCDX offers a variety of analysis options that allows the verification of every automatically detected embolus with the following tools:

- Review of the spectral information
- Playback of the spectrum and sound: emboli have a typical “chirping” or “clicking” sound
- Display and zoom of the audiogram
- Display of the characteristics of the emboli

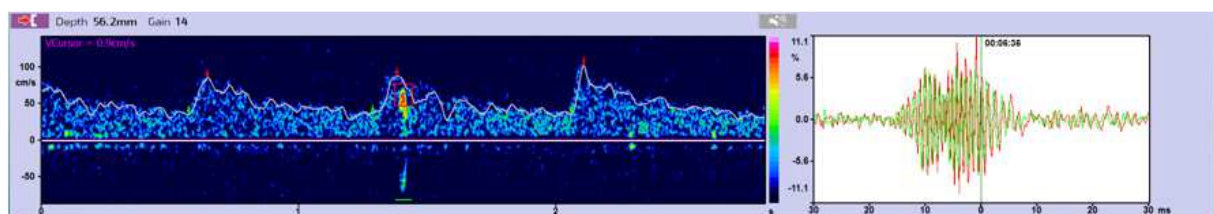
Audiogram

The audiogram displays the in-phase and quadrature components of the Doppler signal. A correlation between the two components displaying high frequency oscillations indicates a travelling signal, and as such indicates a potential embolus travelling in the blood stream.

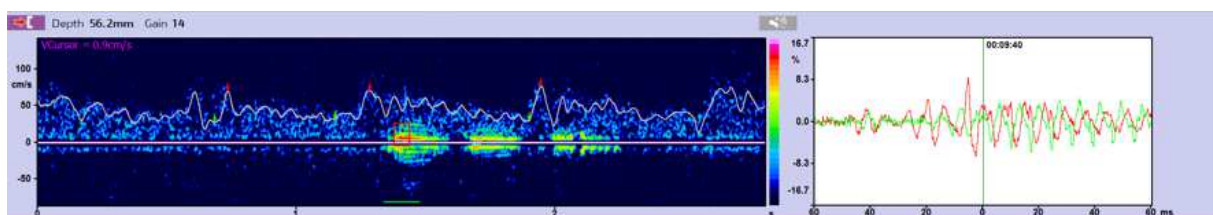


Emboli versus Artifact

Emboli

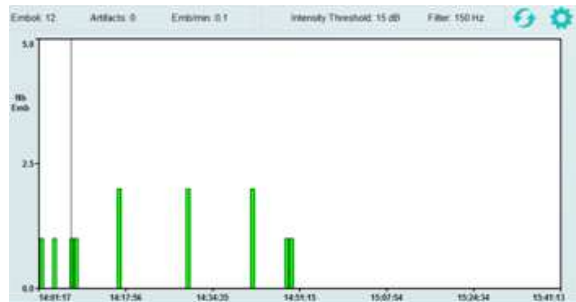


Artefact

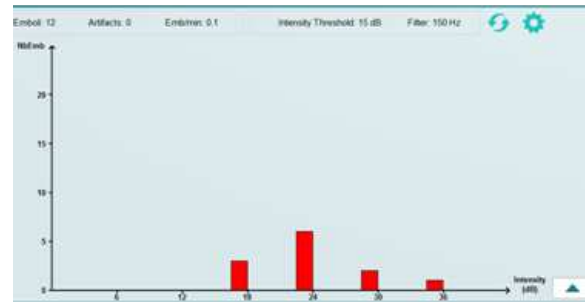


Histogram

Different histograms are available. Display of the number of emboli against: time, intensity, energy, duration, position, confidence coefficient.



Number of emboli against time

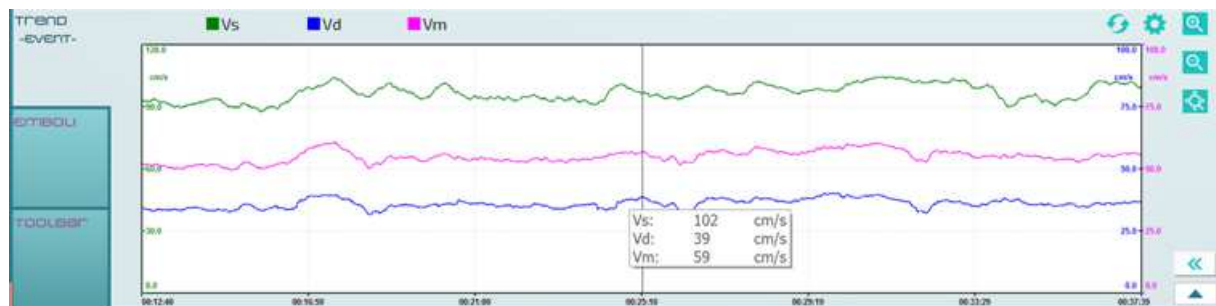


Number of emboli against intensity

Trend display and analysis

The EADS-TCDX has been developed not only for emboli detection but also for trend display. This is well appreciated for physiological tests.

Markers can be added in the trends.



Output

- Customized Report
- Video of emboli
- Export of the table of the detected emboli
- Export of the envelop in Excel file
- Export of the indices in Excel file
- MPEG file
- Wave file
- DICOM

