

## CalView – AG500 calibration and measuring environment display.

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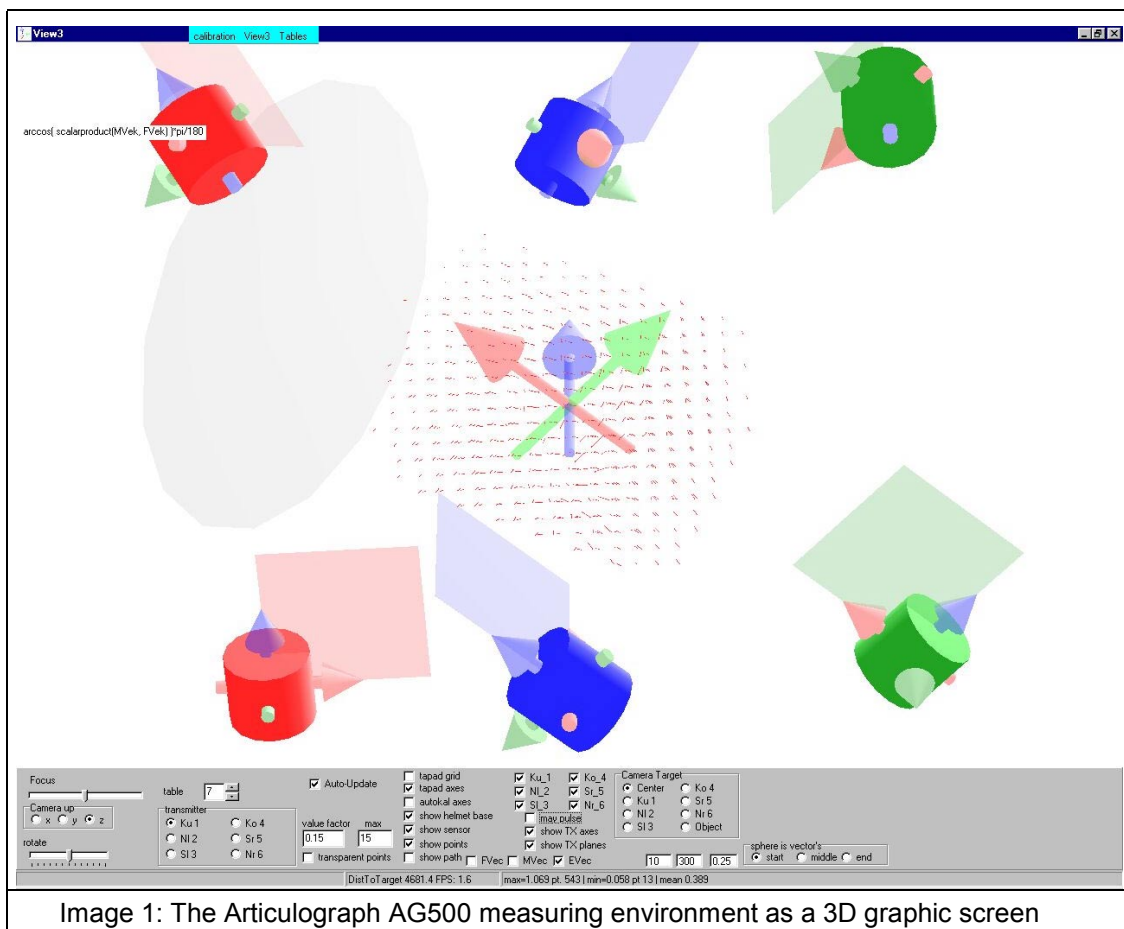
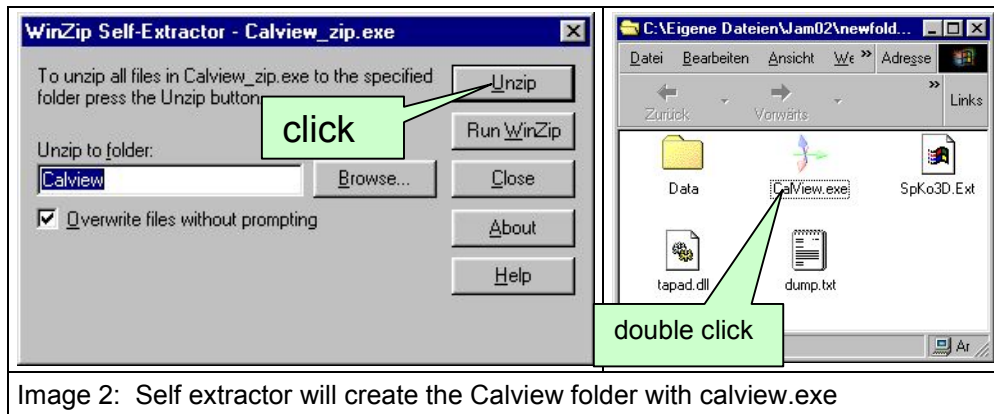


Image 1: The Articlograph AG500 measuring environment as a 3D graphic screen

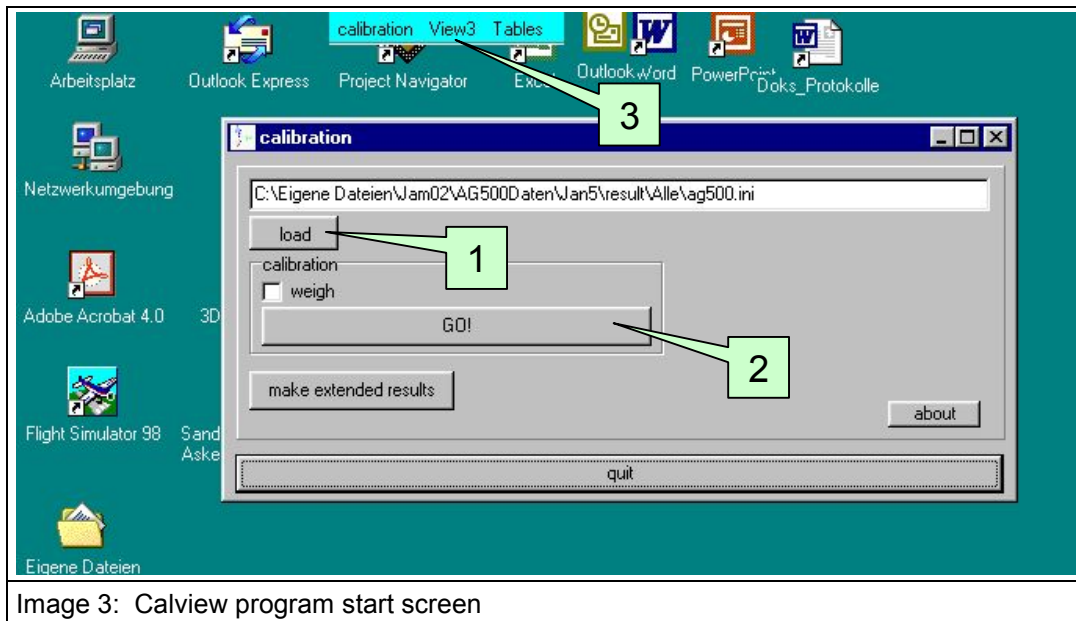
## Quick Start

The self extracting file "CalViev\_zip.exe" contains the program "Calview.exe" and a data set.

- copy "CalViev\_zip.exe" file to a new folder
- double click "CalViev\_zip.exe"



- open the new created Calview folder
- double click the "CalViev.exe"



- click the "load" button in the CalView

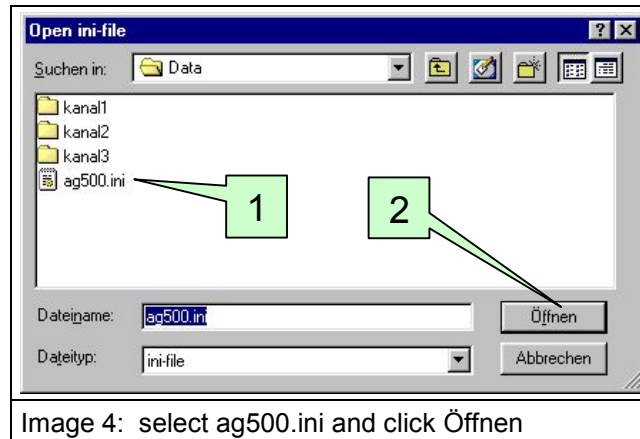


Image 4: select ag500.ini and click Öffnen

- select the “Data” folder in the “Calview” folder
- select the “ag500.ini” file and click Öffnen (open)
- click the “GO!” button in the CalView (image 2)
- wait some minutes until the “Done!” message appears
- click the “OK” button
- search for a light blue bar at the top of your screen (image 2)
- click the word “View3”
- the AG500 measuring environment appears as a three dimensional graphic.

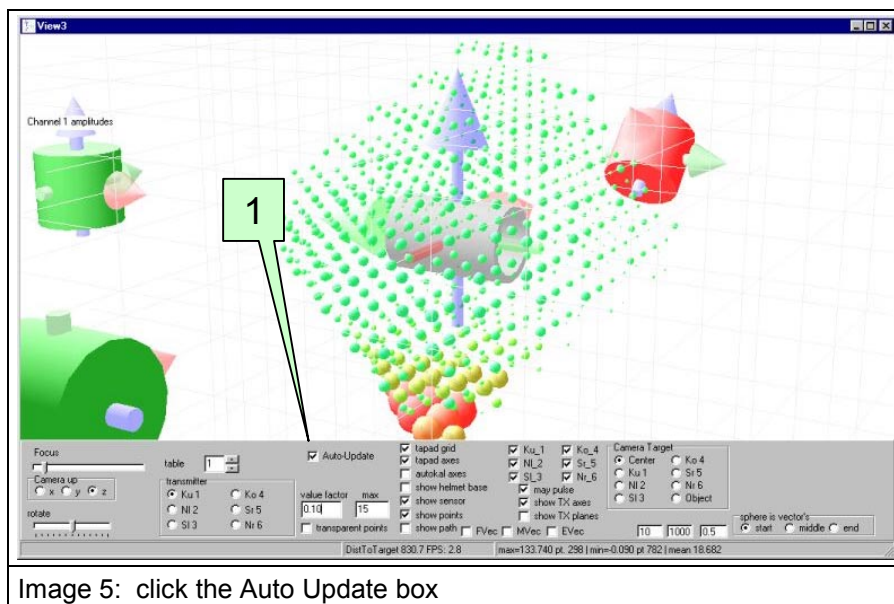


Image 5: click the Auto Update box

- click the check box “Auto-Update”
- read this manual
- go to “View3 - 3D display of the AG500 measuring environment” in this manual

## CalView Program Functions

### Program results

The program is for evaluation and display of measurement data gathered with the Articulograph AG500 together with the AutoKal.

In this version data from a calibration cube connected to channel 1,2 and 3 are required. The calibration cube offers data from 3 sensors at an identical location while each sensor axis is perpendicular to the both other axis.

With help from the AutoKal, all positions are recorded simultaneously with the sensor signals.

The CalView program uses this information to calculate the following parameter:

#### a) AutoKal Offset

Distance from the sensor to the centre of the measuring area when the AutoKal is at the position  $x=0$ ,  $y=0$ ,  $z=0$ .

#### b) sensors angle $\varphi$

The angle in the XY plane from the measuring area (TAPAD co-ordinate system). Angle  $\varphi$  runs from  $-180^\circ$  to  $+180^\circ$  ( $0^\circ$  to  $360^\circ$ )

#### c) sensors angle $\vartheta$

The elevation angle relative to the XY plane. It runs from  $-90^\circ$  to  $+90^\circ$

#### d) calibration factors

For each sensor – transmitter combination, the factor is calculated that offers the best fit between measured signal and expected signal.

#### e) measured magnetic field vector

Out of the three components from the perpendicular sensor signals and the calibration factors, the magnetic field vector is calculated for each measuring point.

#### f) expected magnetic field vector

From the known AutoKal position, corrected with the AutoKal Offset, the magnetic field vector is calculated out of the mathematical field model.

#### g) deviation between measured and expected magnetic field

The deviation of the field vectors and its component are calculated and displayed as spheres and vectors.

## program start

On program start, the calibration window and a light blue “window switch bar” appears. The “window switch bar” that always stays on top and allows you to select any of the according Calview windows.

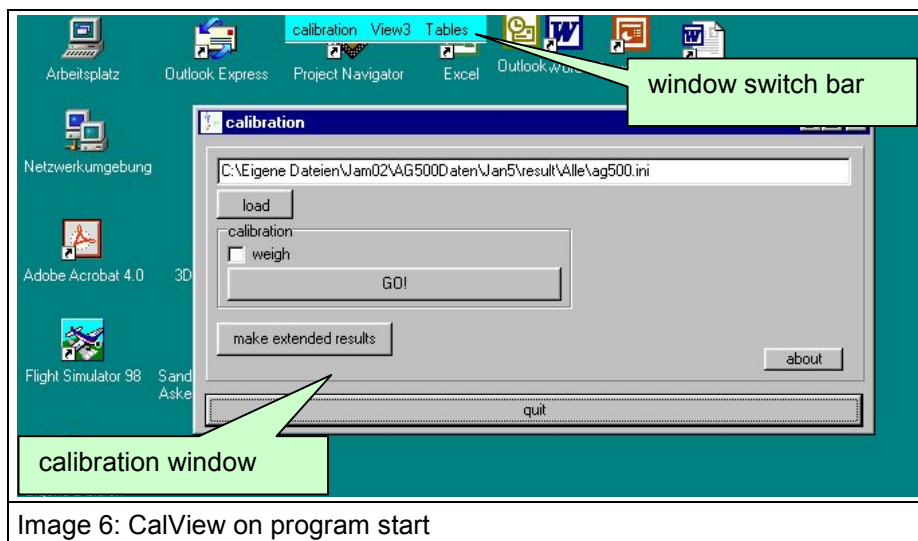


Image 6: CalView on program start

The calibration window is the main window. It is necessary for data loading and calibration.

## load measurement data

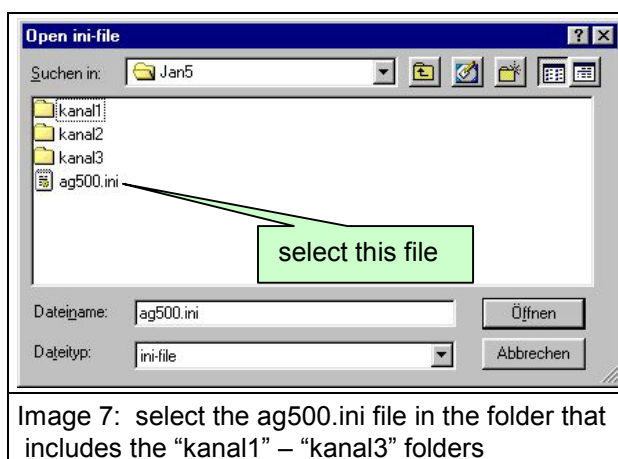


Image 7: select the ag500.ini file in the folder that includes the “kanal1” – “kanal3” folders

The AGMaster program stores its data in one folder for each channel (kanal). This data set is identified by opening the “ag500.ini” file.

## perform calibration and sensor parameter calculation - GO

The “GO” button starts the complete calculation. This is a complex calculation procedure and may last for several minutes. Please wait until the Done window appears – then click “OK”.

This function is only necessary when you work the first time on a data set.

## make extended results

If you want to work on data that have been processed before, this button is to use instead of the “GO” button.

## show the results – View3

Opens the graphic window, see “View3 - 3D display of the AG500 measuring environment”.

## Tables

This option is only if you want to have access to the data that are used by the program. The tables headlines describes the contents of each row. Value-names starting with "M" are measured values and value-names starting with "C" are calculated values.

## View3 - 3D display of the AG500 measuring environment

### 3D display

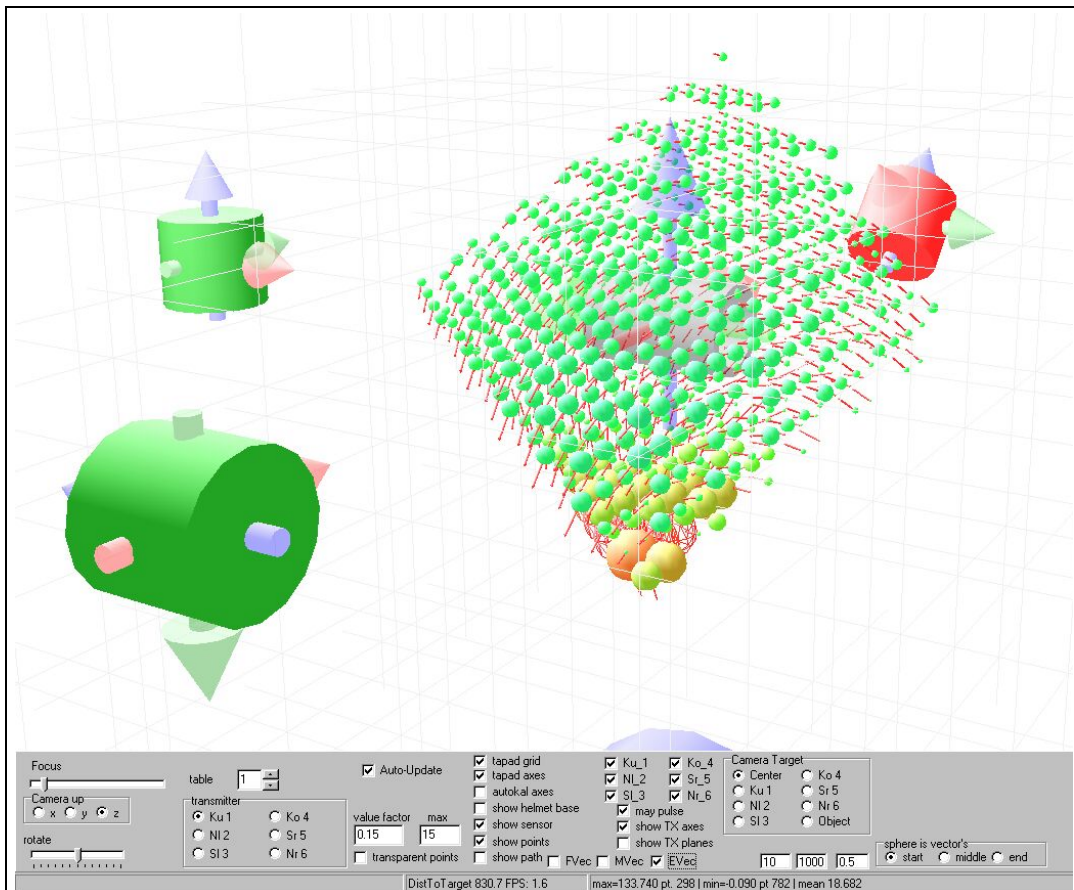


Image 8: The measuring area with spheres showing the channel 1 amplitude deviation

The complete Articulograph AG500 measuring environment appears as a three dimensional graphic.

In the measuring area, the difference between calculated and measured signal is shown as a sphere at that location, where it was recorded.

The diameter is scaled by the deviation between the measured- and the expected value.

With mouse move while the left button is held down, you can rotate and tilt the graphic.

On start up, the "camera" looks to the centre of the measuring area and the Z- axis is the rotation axis.

With both mouse buttons simultaneously pressed you can zoom in or out by moving up / down the mouse.

The red, green and blue cylinders show the transmitter in original size, position and orientation. The gray pipe in the center is an enlarged model from the actual selected sensor. It is only visible when the "table" in the display control panel is set to 1, 2 or 3.



The different co-ordinate systems appear as color coded arrows.

X = light red

Y = green

$Z = \text{blue}$

control panel for 3D display

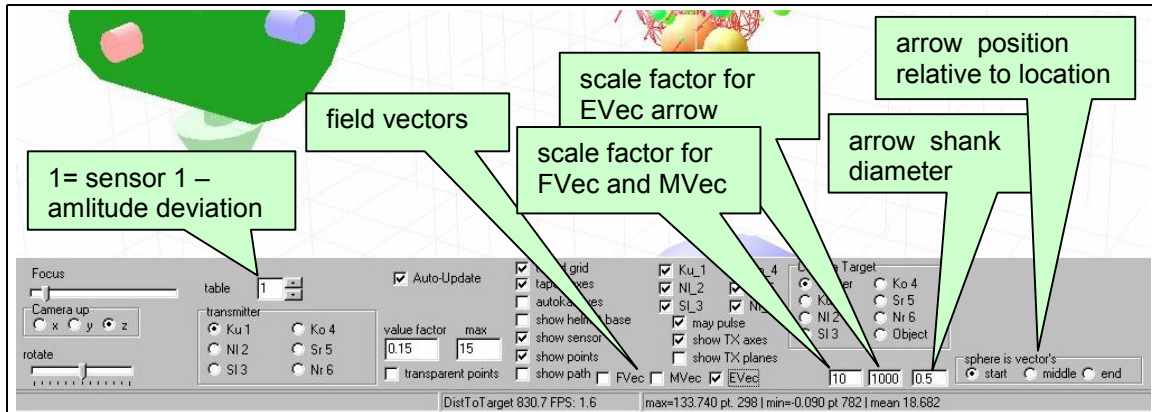


Image 9: control panel for 3D display

The panel on the lower screen has check boxes and elements to control the display of the graphical elements. They are described in the order of their arrangement from left to right.

## h) Focus

Adjust the cameras zoom lens.

- i) Camera up

From the cameras view, always one coordinate axis is in the vertical position. If “z” is selected, the blue transmitter coils stay always on a horizontal line because they are located at the positive and negative end of the z – co-ordinate.

- j) rotate

If the glider is outside the middle position, the camera is rotating by itself.

k) table

The box next to the word “table” shows which of the 7 tables is selected. The different tables represent the following data as diameter of the speres:

- (1) amplitude deviation of Channel 1
- (2) amplitude deviation of Channel 2
- (3) amplitude deviation of Channel 3
- (4) x-component of measured- and calculated field vector
- (5) x-component of measured- and calculated field vector
- (6) x-component of measured- and calculated field vector
- (7) resulting vector between measured and calculated field

l) transmitter

The displayed spheres always refer to one sensor - transmitter combination.

one of the 6 transmitter is selectable.

To mark the selected sensor and transmitter, check the “show sensor” and “may pulse” check boxes.

m) value factor

The diameter of the spheres is scaled by the value factor. If the value factor is set to 1, a sphere with one mm diameter represents 1 dquit (16 Bit ADC) deviation .

n)  $\max$

This value sets the limit for the maximum sphere diameter [mm]. Spheres with a larger value are shown as wired models with the max value as diameter.

**o) transparent Points**

To toggle between transparent or solid display of the spheres.

**p) Check Boxes "tapad grid" .... "show TX planes"**

The display of objects is "on" when the related check box is checked.

**q) FVec, MVec and EVec – field vectors**

FVec checked – shows the measured magnetic field vectors

MVec checked – shows the field vectors as expected from the mathematical model

EVec checked – shows the error vector. Its length and orientation is defined by the connection line between endpoints of the FVec and EVec (positioned at the vectors origin).

Refer to image 4 for scaling the length of the vector arrows.

**r) sphere is vector's**

The checked button selects where the vector arrow is located relative to the sphere's center. In other words, the x, y, z location of the measured point is seen at the start, middle or the end of the arrow.

**s) Camera Target**

The centre of the measuring area, one of the transmitter or a selected object can be the fix point where the camera looks to. This point stays in the centre of the screen. This is helpful, if you want to the data relative to a local co-ordinate system.

## Mouse functions

**t) Left Mouse button**

(1) Click on an objekt

selects an objekt and shows its information in the status bar. If the object is a data point, its position and value is also shown.

(2) Mouse move while left button down

rotates and tilts the camera

(3) Double click

inside the panel → the panel disappears

inside the status bar → the panel appears

(4) Mouse move and left button down together with the Ctrl key

the object at the mouse cursor is scaled by moving the mouse.

To reset the object to its original size, select the object and hit the Escape key.

**u) right mouse button on a transmitter**

this transmitter becomes active – its data points are displayed.

**v) both mouse buttons simultaneously**

mouse move up zooms out – mouse move down zooms in

## Keyboard functions

A → toggles the objects axis display of a selected object

W → switch between wired and solid display mode for the selected object

X → zoom in – Y zoom out

V → makes the selected object invisible

W → toggles the wireframe display (on/off) from a selected object

Ctrl and left mouse move → scale the selected object

Esc → reset size of the selected object.