U3800 PAS Vision Operation Manual (Requirement: U3800s Ver.B00 or later)

Ver. 1.0

ADVANTEST

Outline:

This software is a sample software to acquire the level and the phase that developed for our company's U3800 (CDA: Cross Domain Analyzer) series. (U3800 PAS Vision: Phase and Amplitude of Space Vision) As for the measurement data, the level and the phase can be recorded in the array of X-Y (36 x 31) by the pair. The level and the phase are displayed in two graphs of independent X-Y (36 x 31). As for the indicative data, the original data of the point is recorded as 1001 data though the peak level etc. The data is displayed in another independent graph. The method of the record in the array of X-Y selects the best one from the menu. A semiautomatic measurement including the manual operation of the turntable antenna elevator in the EMC measurement is also possible. We think that a lot of new measurement method is developed. Please use this software to evaluate U3800 (CDA). This software is free software.

Operating environment:

U3800 (CDA):	U3800 Cross Domain Analyzer series.
Initial setting:	Setup the conditions: Trace-1001Points, AT Command-Mode.
	(You have to set the function not initialized by presetting.)
Personal Computer:	Windows XP (Recommendation OS), VISTA/ 7 (Checked on part), Interface: LAN
Driver:	NI_VISA made by the National Instruments is necessary. Please install it from the home page of NI or an attached driver of U3800 FEFS…Sample software when PC has not the driver. (There are for XP/2000 or VISTA/7)

Installation and startup of software:

1. The installation: Execute the setup.exe in directory of Installer.
2. **Run:** Start -> Programs -> U3800 PAS Vision -> **U3800 PAS Vision**
3. Measurement: IP address of U3800 is confirmed, and it inputs it to the IP address column of the menu. Press the **CONNECT** button.
   (Set the basic menu of U3800 (CDA) before the connect button is pressed. After connected, you can not change the menu.)
   (The last measurement parameter is done from the startup of the second times and the recall is done.)
4. **Stop and Reboot:** It stops with the END button. The reboot presses an upper right **=>** and presses the CONNECT button. The end is ×.
5. **Help:** When **"Display Help"** is selected from help of the pull-down menu, the explanation of the button of the mouse point is displayed.

Measuring methods:

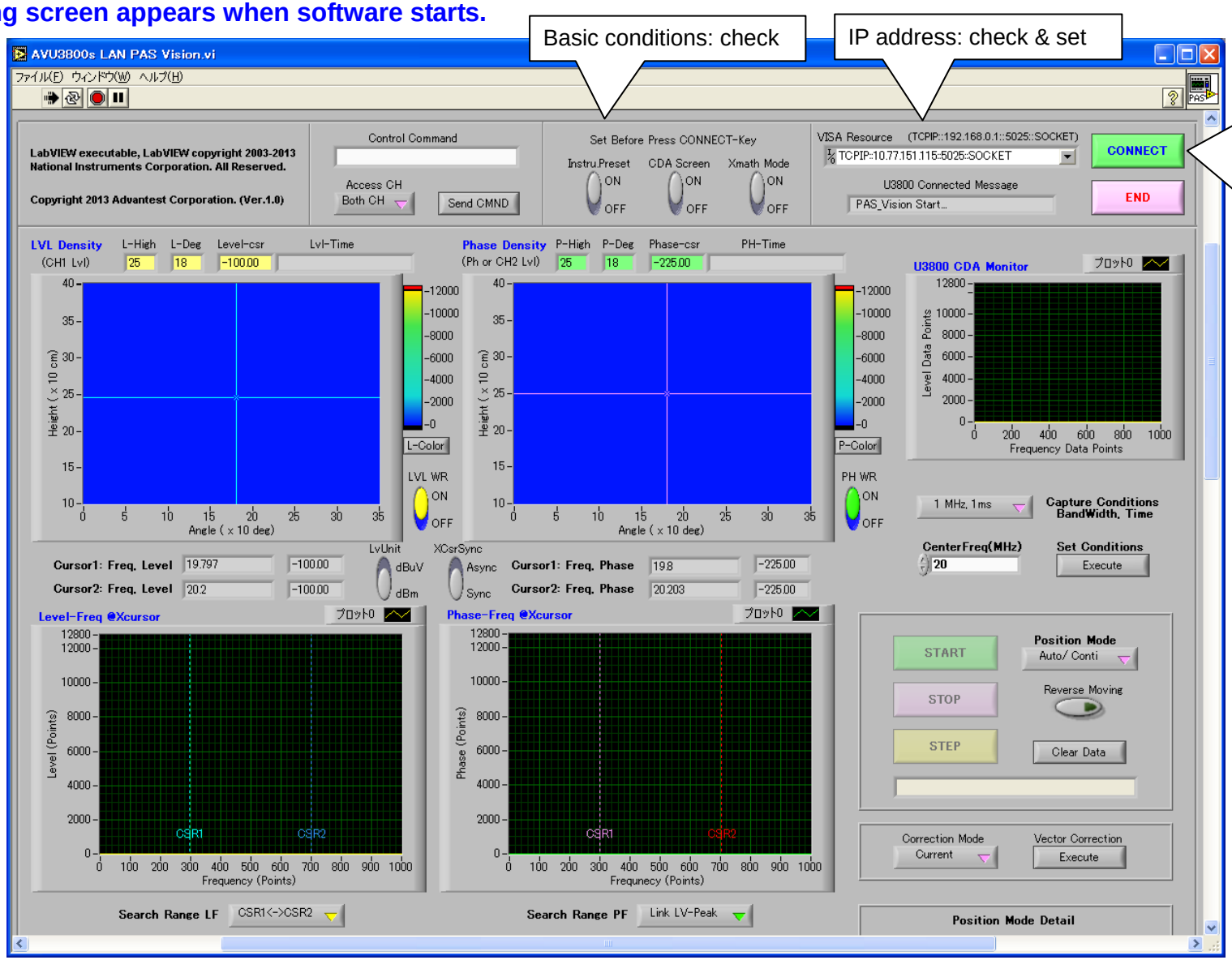
1. **Xmath Mode On** (Default)**:** Get the data of **level (CH1)** and **phase difference (CH1/CH2).** (CH2 is the reference.)
   The CH1 level contains the correction factor when Vector Correction On. (The correction factor can be confirmed by the utility menu.)
2. If it is necessity, set the Center Frequency and the Capture Band. Then press the Set Conditions Execute button.
3. To correct the vector correction, Vector Correction Execute button is usually pressed with Current mode. (It is unnecessary if it was corrected.)
   (It becomes phase difference 0 if the reference signal and antenna position of CH2 is decided, and the Vector Correction is done.)
4. Select the **Position Mode** and press the **START** button. Then, the measurement is begun.
5. The data is recorded in the array of 36x31 by the method of the menu that exists in the Position Mode.
6. After the measurement ends, the measurement data can be saved. (Save (Bin)) The recall can be done with this software.
   (The CSV format is for customer's data analysis. It is only making (save) in this software.)
7. **Xmath Mode Off:** It operates as two-input analog spectrum analyzer. Each input becomes acquisition of the level data.

Application:

1. EMC R&D	Level (CH1) and the Phase difference (CH1/CH2)
>Phase Behavior:	The level and the phase data of max 40MHz band of center frequency can be acquired.
>Using Prove:	Electric field/magnetic field are calculated when the electromagnetic field probe is used and the immediate data is obtained. (Ie and Im mode are in the utility menu.)
>Horizontal, Vertical:	The same time measurement sees influence on other CH. (Measurement time reducing)
2. RF Wave Monitor:	The two-input measurement or the two-band measurement.
>Flash Noise:	The flash noise is recorded by the Max Hold function.
>Level down Monitor:	The level down signal is recorded by the Min Hold function. (Max and Min are done between the sampling point and the sampling point. Then, the performance of data acquisition has improved.)
>Level Variation Monitor:	About 1000 spectrum waveforms can be recorded. The data of about one week can be acquired by doing the data logging by 600sec spacing.

Software Starting Screen:

The starting screen appears when software starts.

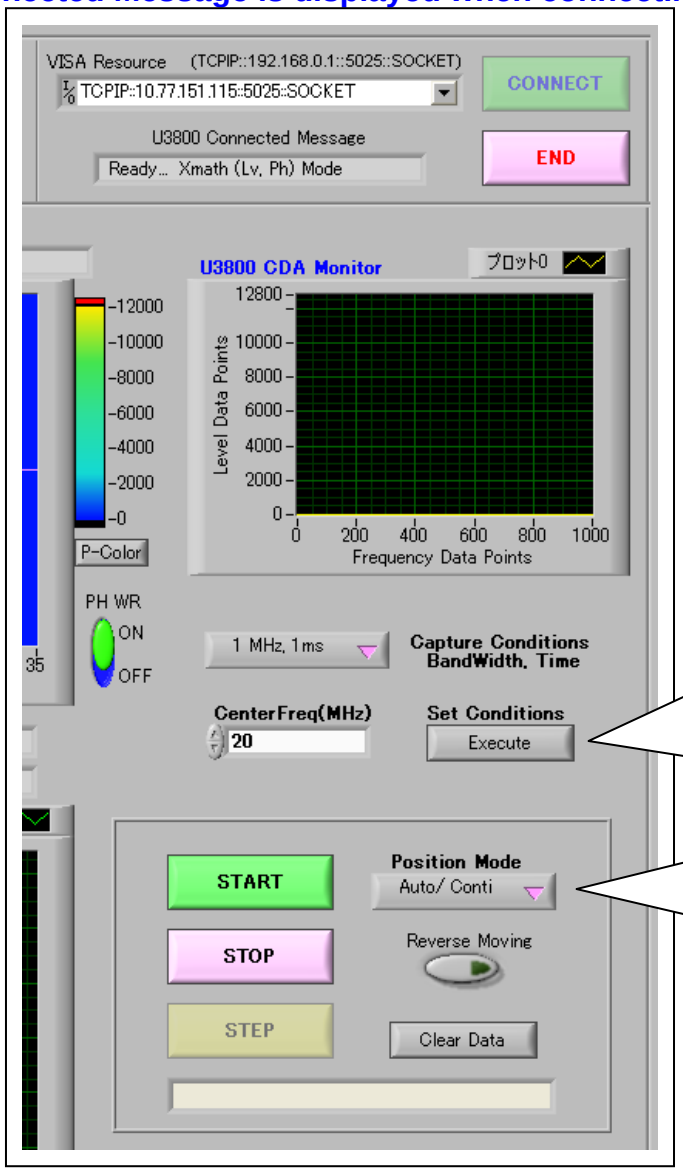


Press the CONNECT Button for LAN Connection

Before press CONNECT, Please set Conditions & IP address

Measurement Starting:

Connected Message is displayed when connecting it.

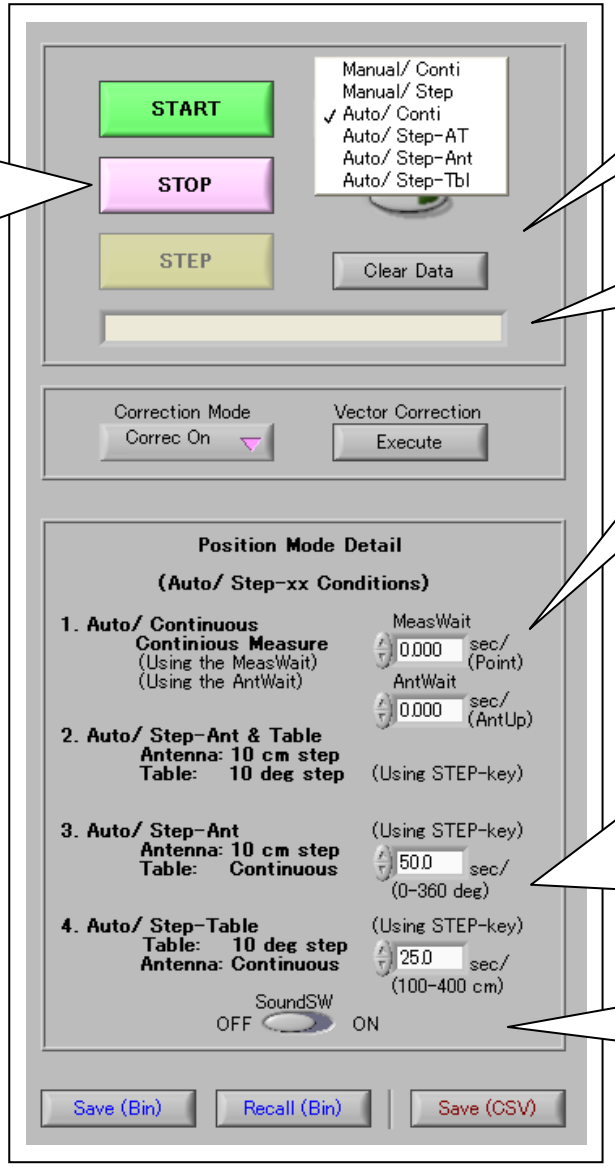


STOP:
Program end
STEP:
Start the next
Measurement

Confirm or set
Band Width,
Center Freq.
And press
Execute button

Select the
Position Mode,
And press
START button

There are six kinds of the Position Mode.



Clear Data of
Measurement

Display of
Message

Wait time:
Measure N to
Measure N+1

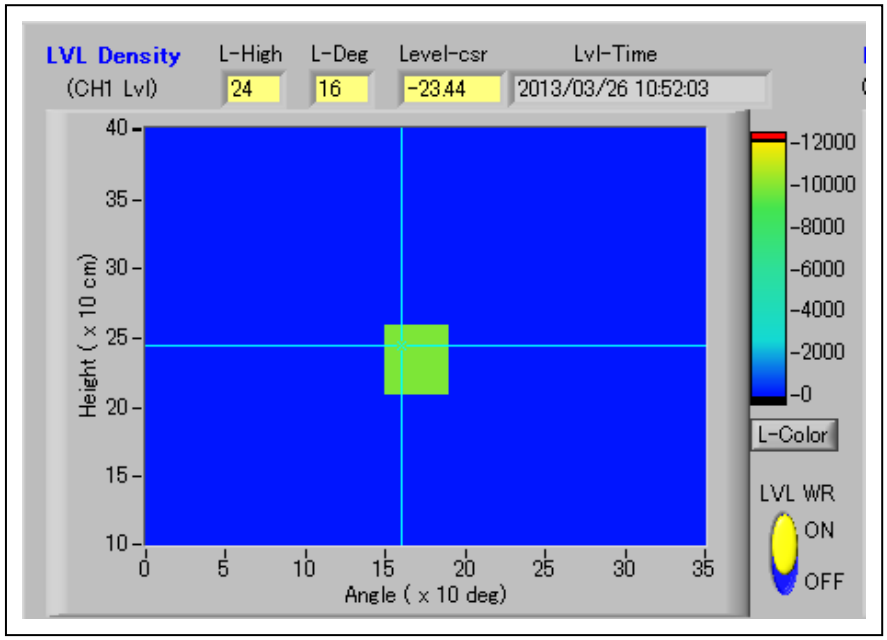
Table:
Moving time
0 - 360 deg

Antenna:
Moving time
100 - 400 cm

Beep On
For next
Measurement

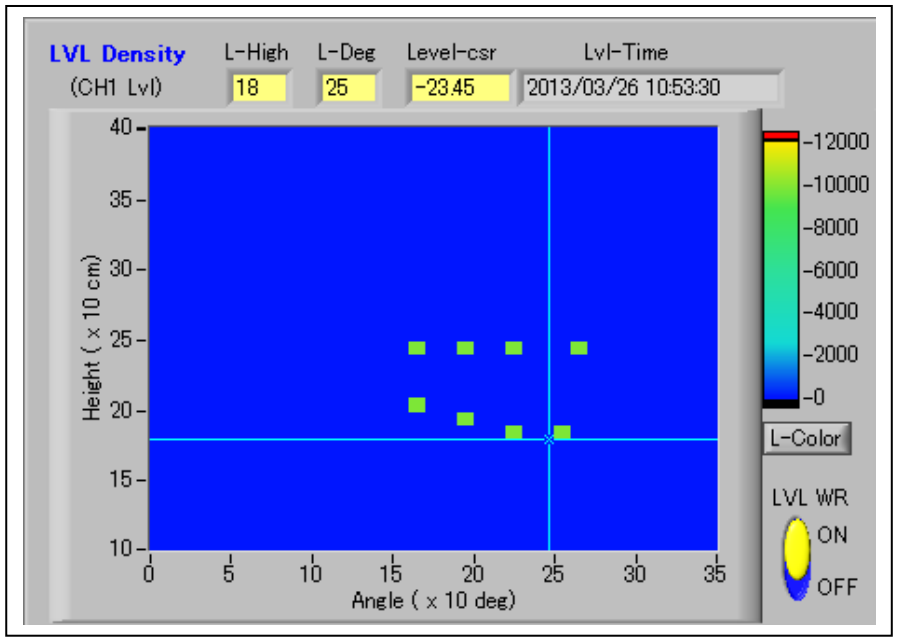
The Position Mode Detail:

1. Manual/ Conti (Manual Op/ Continuous)



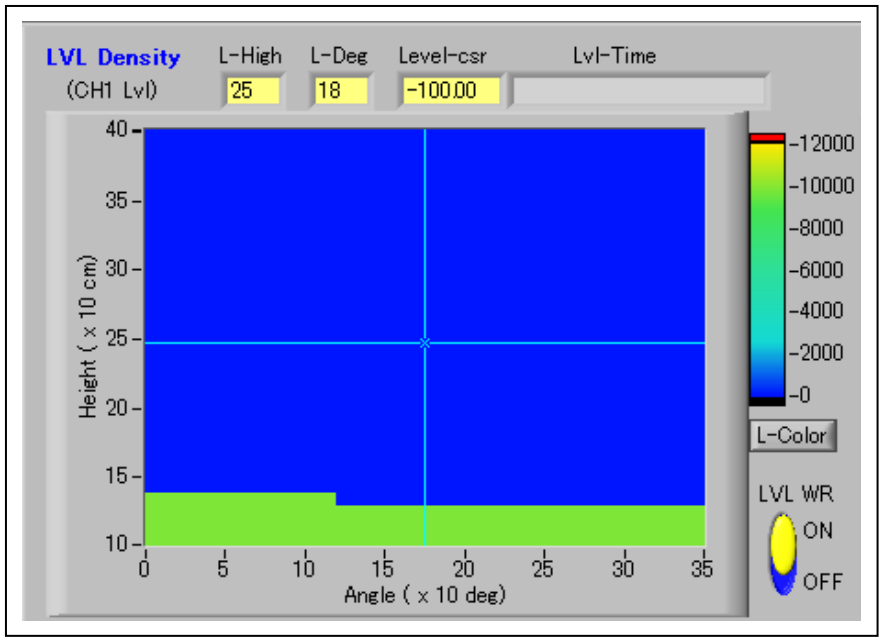
Data is recorded at the position of the cursor.
(It keeps always writing data.)
The cursor can be freely moved.

2. Manual/ Step (Manual Op/ Step)



Data is recorded by pressing the STEP button after the cursor is moved. (Data can be recorded at a specified position according to specified timing.)

3. Auto/ Conti (Table-Antenna/ Continuous)



Data is automatically recorded.

The start position is an antenna 100cm, and table 0 degrees.

It moves in the direction from the table 0 deg to 350 deg first.

It moves continuously from the antenna 110 cm (ex.) position

to the direction from the table 0 deg. to 350 deg.

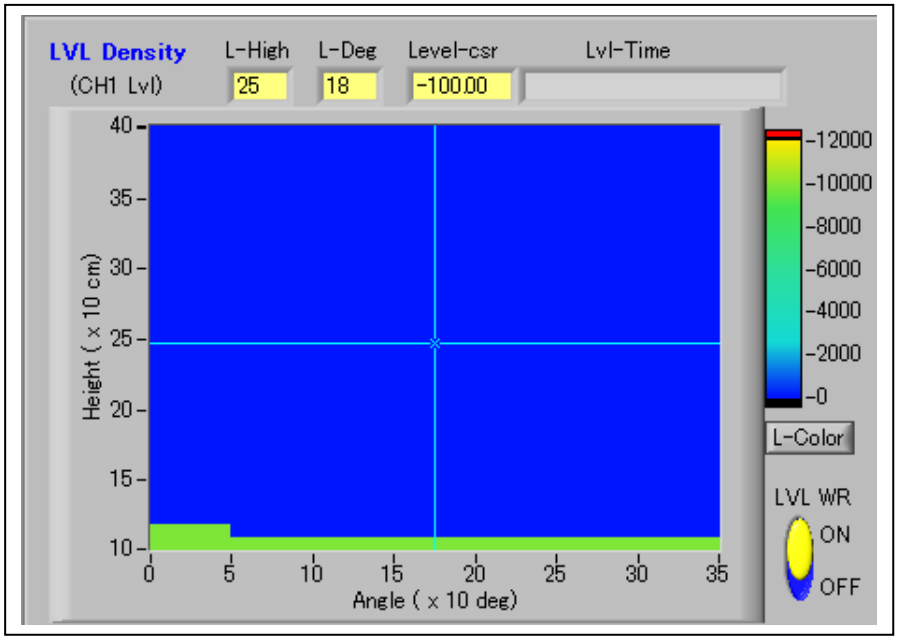
The data of all positions are acquired in this repetition.

The wait time between the measurement points can be set. (MeasWait)

And, the wait time of the antenna step-up can be set. (AntWait)

The wait time contains the error margin by the measurement condition.

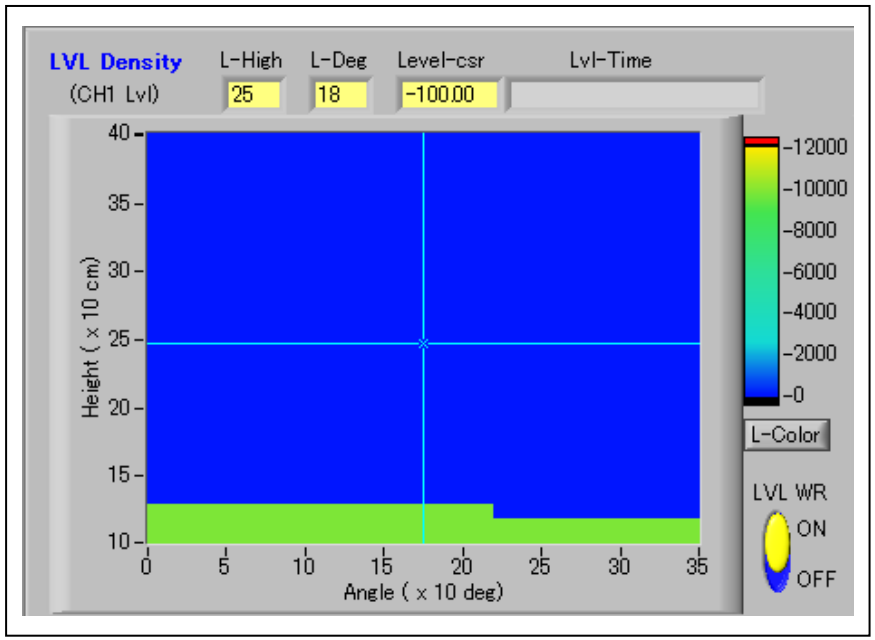
4. Auto/ Step-AT (Table-Antenna/ Step)



The acquisition position is the same as left Auto/ Conti.

The timing of data acquisition presses the STEP button.

5. Auto/ Step-Ant (Table/ Auto)



The record of data is semiautomatic.

Start Position: Ant: 100 cm, Table 0 deg.

1. Input the moving time Table 0 – 360 deg.

2. The moving time(50) = Tbl moving(60) – tot meas. time(10)

3. It doesn't become accurate Wait Time by the conditions.

It moves in the direction from the table 0 to 350 deg first.

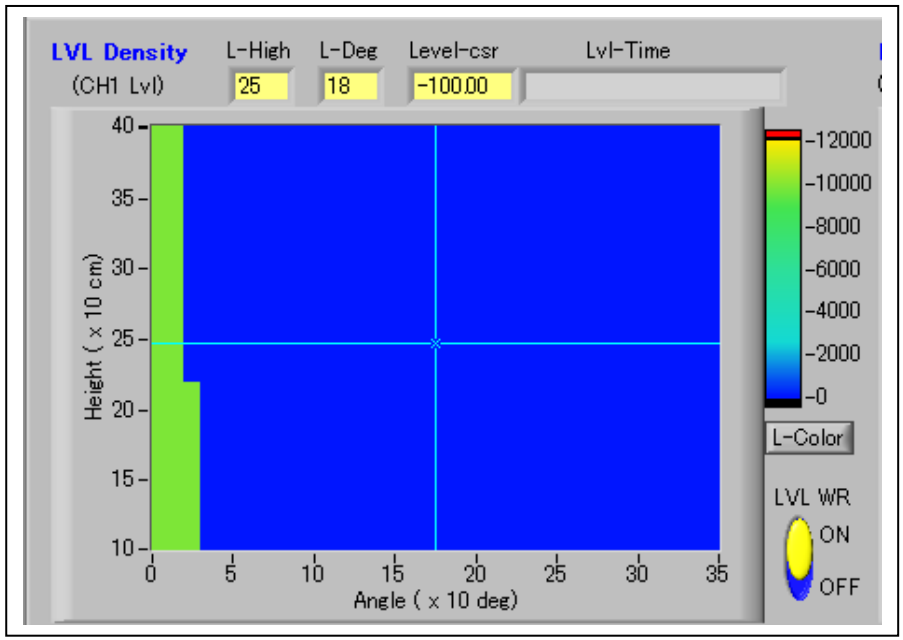
Next, please set the Ant by manual operation by 110cm (ex.).

Then, press the STEP button. The table position moves

to the direction from 0 to 350 degrees. (or reverse)

The data of all positions are acquired in this repetition.

6. Auto/ Step-Tbl (Antenna/ Auto)



The record of data is semiautomatic.

Start Position: Table: 0 deg, Ant: 100 cm

1. Input the moving time Antenna 100 – 400 cm.

2. The moving time(21) = Ant moving(30) – tot meas. time(9)

3. It doesn't become accurate Wait Time by the conditions.

It moves in the direction from the ant 100 to 400 cm first.

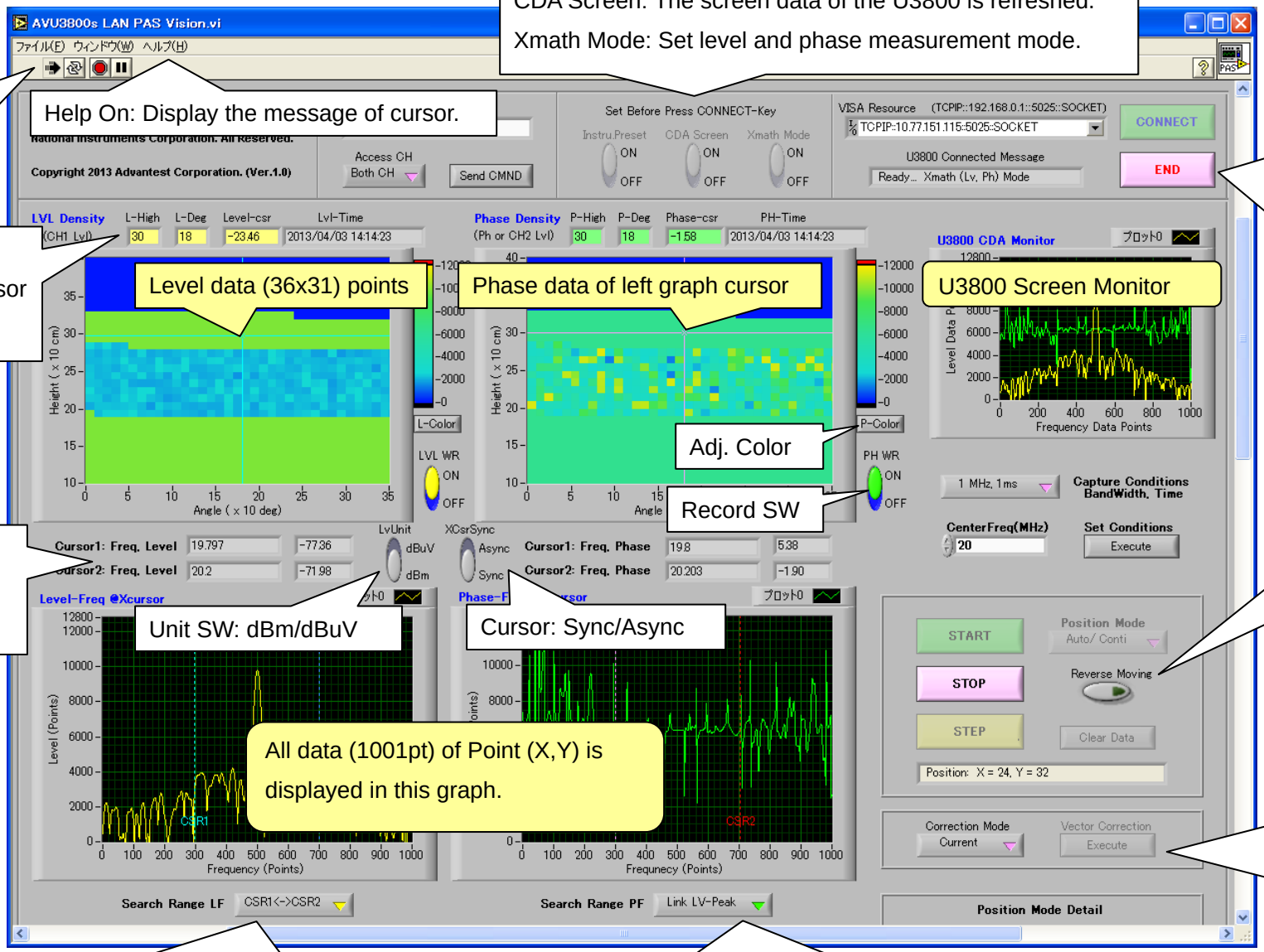
Next, please set the Table by manual operation by 10 deg. (ex.).

Then, press the STEP button. The antenna position moves

to the direction from 100 to 400 cm. (or reverse)

The data of all positions are acquired in this repetition.

Menu Detail:

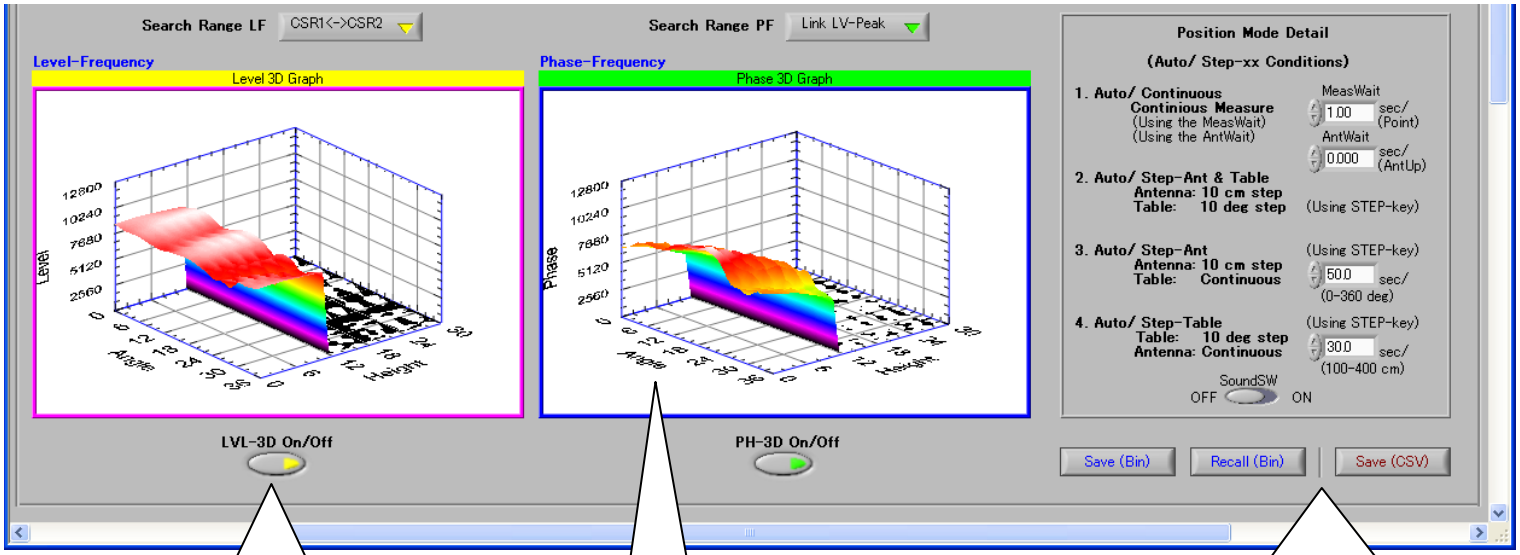

AVU3800s LAN PAS Vision.vi
Instru.Preset: This SW initializes the U3800.
CDA Screen: The screen data of the U3800 is refreshed.
Xmath Mode: Set level and phase measurement mode.
Re-
Start
=>
Help On: Display the message of cursor.
Set Before Press CONNECT-Key
Instru.Preset
CDA Screen
Xmath Mode
VISA Resource (TCPIP::192.168.0.1::5025::SOCKET)
TCPIP::10.77.151.115::5025::SOCKET
CONNECT
END
U3800 Connected Message
Ready... Xmath (Lv, Ph) Mode
Access CH
Both CH
Send CMND
Copyright 2013 Advantest Corporation. (Ver.1.0)
END:
Program end
1. Press X
Close screen
2. Re-Start
Press =>
Next press
CONNECT
LVL Density
L-High
L-Deg
Level-csr
Lvl-Time
Phase Density
P-High
P-Deg
Phase-csr
PH-Time
U3800 CDA Monitor
Data of
Cross Cursor
Point
Level data (36x31) points
Phase data of left graph cursor
U3800 Screen Monitor
Height (x 10 cm)
Angle (x 10 deg)
Angle
Frequency Data Points
L-Color
P-Color
Adj. Color
LVL WR
PH WR
Record SW
ON
OFF
1 MHz, 1ms
Capture Conditions
BandWidth, Time
CenterFreq(MHz)
Set Conditions
Execute
Data of
Cursor-
1 and 2
LvUnit
dBuV
dBm
XCsrSync
Async
Sync
Cursor1: Freq, Level
Cursor2: Freq, Level
Cursor1: Freq, Phase
Cursor2: Freq, Phase
Unit SW: dBm/dBuV
Cursor: Sync/Async
Level-Freq @Xcursor
Level (Points)
Frequency (Points)
Frequnecy (Points)
CSR1
CSR2
All data (1001pt) of Point (X,Y) is
displayed in this graph.
START
STOP
STEP
Position Mode
Auto/ Conti
Reverse Moving
Clear Data
Position: X = 24, Y = 32
Reverse
Moving:
It is for
Table & Ant
Correction Mode
Current
Vector Correction
Execute
Vector
Correction:
It is for
Xmath mode
Detail: see
Op. manual
Search Range LF
CSR1<->CSR2
Search Range PF
Link LV-Peak
Position Mode Detail
Menu that chooses one point level data (*1)
Menu that chooses one point phase data (*2)
(*n): Next Page

(*1): Method of choosing 1-point level from 1001-points: (1) Between cursor 1 and cursor 2 (2) Data of cursor 1

(*2): Method of choosing 1-point phase from 1001-points: (1) Position of peak point at level (2) Same as cursor 1 & 2 at the level

(3) Between cursor 1 and cursor 2 at phase (4) Data of cursor 1 at phase

The lower side of starting panel (Please move to scroll)



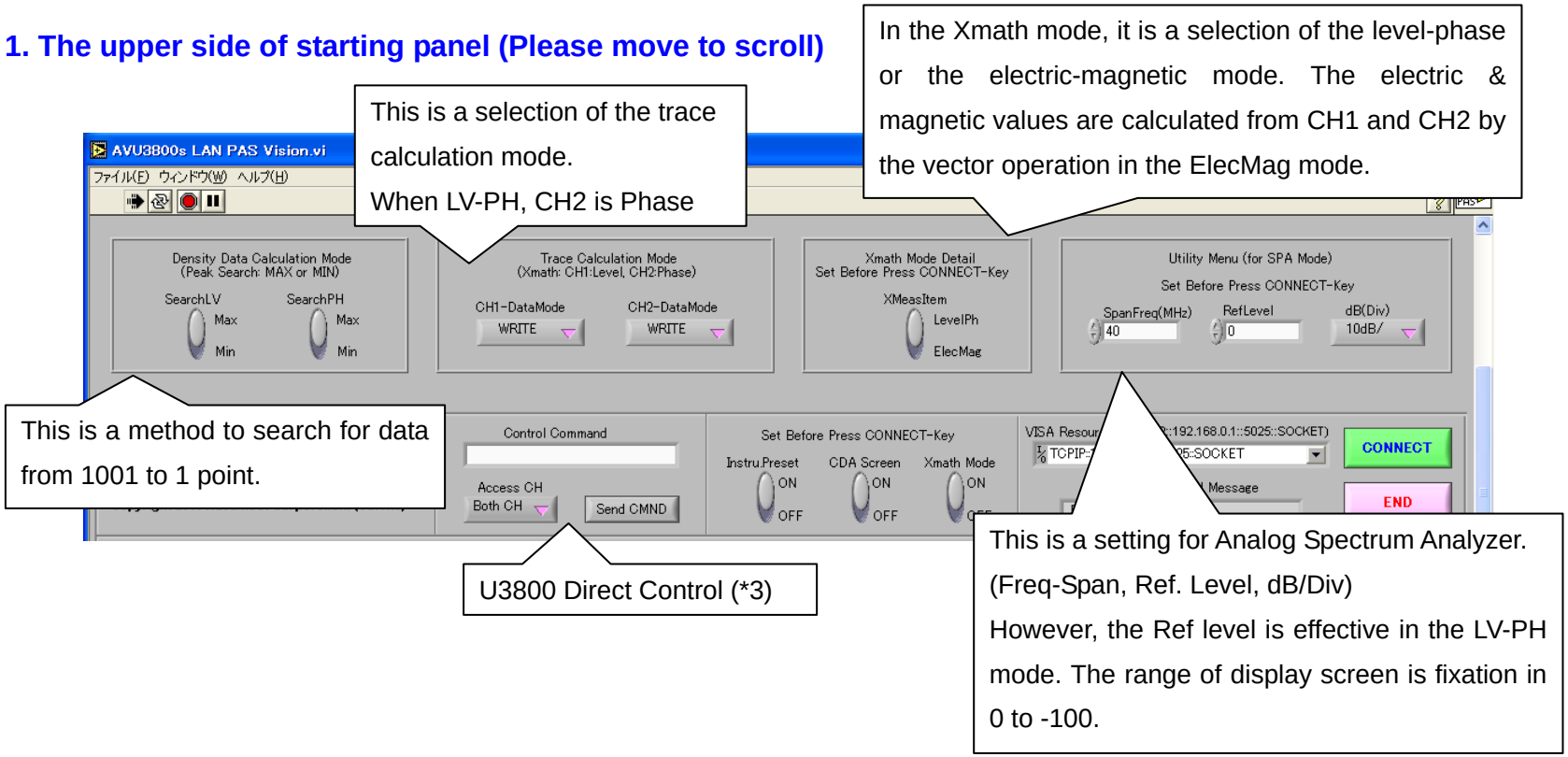
Display On/Off SW:
Off is recommended while measuring it because of the operation time.

3D graph can be a position, be expanded, and it reduce with the cursor.
The color is not changed.

Save (Bin): Recall (Bin): (BIN Format)
It is a save/recall for this software.
Save (CSV): (CSV format)
Present data is preserved with the CSV file.
It preserves it with BIN, and the BIN file is loaded when it is necessary.
Next, it is convenient to make the CSV file with Save(CSV).

Utility Menu:

1. The upper side of starting panel (Please move to scroll)

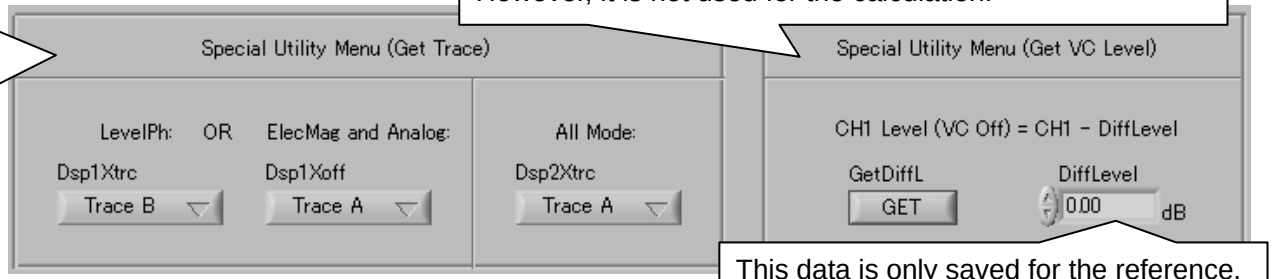


(*3):U3800 Direct Control: When a detailed measurement condition is set to U3800 Cross Domain Analyzer, it is used. Write the GPIB command, and press the Send CMND button. The control channel is selected with Access CH. Additionally, there is U3800 local mode as a method of controlling U3800 directly. Press the U3800's LOCAL-key before the measurement. Because the U3800 manual setting becomes possible, then sets the measurement condition. Next, press the START button. However, please do not set the numerical data that exists in the panel directly. (Example: CenterFreq, CaptureBand, Ref.Level etc…) The numerical data set directly to U3800 is not reflected in the panel. In this case, the displayed level etc. is not correct.

2. The next upper side of starting panel (Please move to scroll)

The acquisition trace data can be set. The relation between the trace data and the PC screen is the following structures. When it is set, the setting condition etc. of the panel might be different. Please confirm whether it is target data and use it.

When Vector Correction is On, the correction data of CH1 can be acquired. Moreover, you can input the arbitrary data. However, it is not used for the calculation.

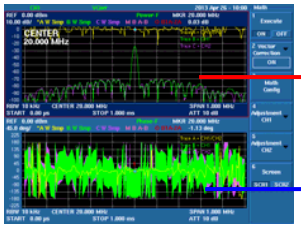


This data is only saved for the reference.

Dsp1Xtrc:
OR
Dsp1Xoff

Dsp2Xtrc:

Xmath (LevelPh) --- OR --- Xmath (ElecMag) --- OR --- Xmath Off (Analog)

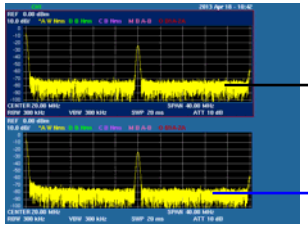


Trace: B

Trace: A

Trace: A

Trace: A

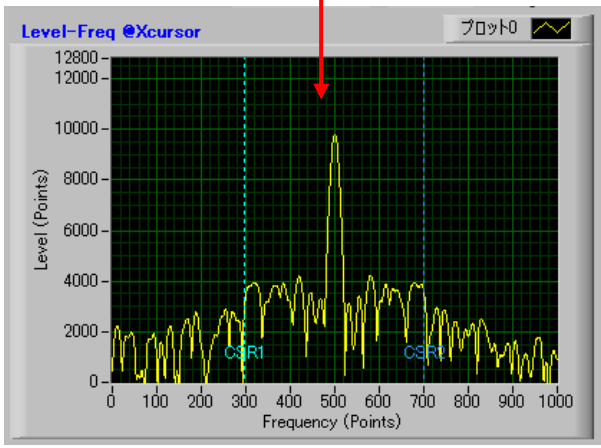


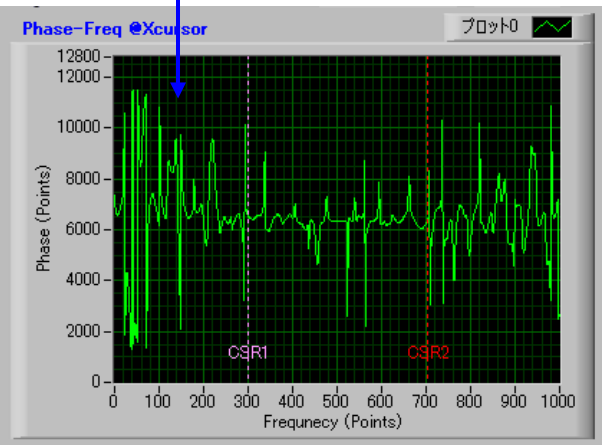
Trace: A

Trace: A

Lv-Graph on PC:

Level from Dsp1
(Trace B/A)





Ph-Graph on PC:

Phase from Dsp2
(Trace A)

CSV File Data Format:

Column →

Line:

1. Message: ADVANTEST PAS_Vision CSV_Data		Version	1.0	
2. Center Frequency	(F:Hz)			
3. Span Frequency (for Analog SPA)	(F:Hz)			
4. Reference Level (for Analog SPA)	(dBm)			
5. dB/Div	(0:10dB, 1:5dB, 2:2dB, 2:1dB)			
6. Display dBuV On/Off	(1:On, 0:Off)			
7. Select CapBW&Time List	(0-12)	See Table *7		
8. Vector Correction Mode	(0-3)	0:Current, 1:Inband, 2:On, 3:Off		
9. CH1 Level Correction	(dB)	Different Level between Vector Corr. On and Off		
10. Position Mode (Measurement)	(0-5)	0:Manual/Conti ---> 5:Auto/Step T mode		
11. Measurement Wait Time	(sec)	Wait Time for Measurement Step (Auto/Conti mode)		
12. Antenna Step Up Wait Time	(sec)	Wait Time for Antenna Step Up (Auto/Conti mode)		
13. Table Conti Wait Time (Auto Step-A)	(sec)	Moving Time for Table 0-360 deg (Auto/Step-A)		
14. Ant Conti Wait Time (Auto Step-T)	(sec)	Moving Time for Ant 100-400cm (Auto/Step-T)		
15. Tbl/Ant Reverce Moving mode	(1, 0)	1:Reverce moving. 0:Normal		
16. Instrument Preset	(1, 0)	1:Instrument Preset On, 0:Off		
17. CDA Screen On/Off	(1, 0)	1:On, 0:Off		
18. Xmath Mode	(1, 0)	1:On, 0:Off		
19. Xmeas Item (LvPh or IeIm)	(1, 0)	1:On (Mode = LvPh)		
20. Display LvPh mode Flag	(1, 0)	1:On (Disp = LvPh)		

*7. CapBW/Time Code				
Code	CapBW		CapTime	
0	40	MHz	50	us
1	30	MHz	0.1	ms
2	10	MHz	0.2	ms
3	3	MHz	0.33	ms
4	1	MHz	1	ms
5	300	kHz	3.3	ms
6	100	kHz	10	ms
7	30	kHz	40	ms
8	10	kHz	100	ms
9	3	kHz	330	ms
10	1	kHz	1	sc
11	300	Hz	3.3	sc
12	100	Hz	10	sc

Column →

Line:

				Left Graph
21. Level Data Original (LV-Original (CH1):)	Height 0 - 30	Angle 0 - 35	Data (1001p) 16bit Bin: (0-12800) * 1001p	CH1 (LV)
22. Level Density-LV (Y) (LV-Density-Y:)	Height 0 - 30	Angle 0 - 35	Data (Position) 16bit data (0-12800) * 1p	
23. Level Density-Freq (X) (LV-Density-X:)	Height 0 - 30	Angle 0 - 35	Data (Position) 16bit data (0-1000) * 1p	
24. Level Meas DateTime (LV-Time:)	Height 0 - 30	Angle 0 - 35	DateTime Chracter: TimeData	
				Right Graph
25. Phase Data Original (PH-Original (CH2):)	Height 0 - 30	Angle 0 - 35	Data (1001p) 16bit Bin: (0-12800) * 1001p	CH2 (PH or LV)
26. Phase Density-PH (Y) (PH-Density-Y:)	Height 0 - 30	Angle 0 - 35	Data (Position) 16bit data (0-12800) * 1p	
27. Phase Density-Freq (X) (PH-Density-X:)	Height 0 - 30	Angle 0 - 35	Data (Position) 16bit data (0-1000) * 1p	
28. Phase Meas DateTime (PH-Time:)	Height 0 - 30	Angle 0 - 35	DateTime Chracter: TimeData	

*The index of the data array is 0 - 30 are used for 100 cm to 400 cm. (Index 0 = 100 cm)

Item 21-28 Detail:

Column →

Detailed Format: *21(LV-Original (CH1)), *25(PH-Original (CH2))

Line:

[0,0,0]		A	B	C	D		
	Height 0	Point-0	Ponit-1	Ponit-2	Point-3		Ponit-1000
nn	Angle 0	Data	Data	Data	…		Data
nn+1	Angle 1	Data	Data	Data	…		Data
nn+2	Angle 2	Data	Data	Data	…		Data
nn+3	Angle 3	Data	Data	Data	…		Data
		.	.	.			.
		.	.	.			.
		.	.	.			.
nn+n	Angle 30	Data	Data	Data	…		Data

[1,0,0]		A	B	C	D		
	Height 1	Point-0	Ponit-1	Ponit-2	Point-3		Ponit-1000
mm	Angle 0	Data	Data	Data	…		Data
mm+1	Angle 1	Data	Data	Data	…		Data
mm+2	Angle 2	Data	Data	Data	…		Data
mm+3	Angle 3	Data	Data	Data	…		Data
		.	.	.			.
		.	.	.			.
		.	.	.			.
mm+m	Angle 30	Data	Data	Data	…		Data

[2,0,0] …

[H,0,0] …

[30,0,0]	Height 30	Point-0	Ponit-1	Ponit-2	Ponit 3		Ponit-1000

*The index of the data array is 0 - 30 are used for 100 cm to 400 cm. (Index 0 = 100 cm)

Column →

Detailed Format: *22(LV-Density-Y), *23(LV-Density-X), *24(LV-Time)

Detailed Format: *26(PH-Density-Y), *27(PH-Density-X), *28(PH-Time)

		A	B	C	D		
		Angle 0	Angle 1	Angle 2	Angle 3		Angle 35
Line: nn	Height 0	Data	Data	Data	…		Data
nn+1	Height 1	Data	Data	Data	…		Data
nn+2	Height 2	Data	Data	Data	…		Data
nn+3	Height 3	Data	Data	Data	…		Data
	.	.	.	.			.
	.	.	.	.			.
	.	.	.	.			.
nn+n	Height 30	Data	Data	Data	…		Data

*The index of the data array is 0 - 30 are used for 100 cm to 400 cm. (Index 0 = 100 cm)

Transformation from point data to real number data:

Frequency, Level and Phase Formula:

Frequnecy : using PonitX (PointX: 0 - 1000 Integer: X-Position)
Level and Phase: using PointY at X-Position (0 to Full: 0 - 12800 Integer)

Frequency PonitX:

Frequency(Hz)(PointX) = (Center Frequency - Span/2) + (Span/1000) * PointX (Real)

Center Frequency = (Data No.2)
IF Xmath On: Span = Capture Band (Data No.7)
IF Xmath Off: Span = Span Frequency (Data No.3)

Level PointY:

Full Scale = (dB/div) * 10
Reference Base = Reference Level - Full Scale
Level (dB) (PointY) = Reference Base + (Full Scale / 12800) * PointY (X-Position) (Real)

IF Xmath On: (dB/div) = 10 (Fixed)
IF Xmath On: Reference Level = 0 (Fixed)

IF Xmath Off: (dB/div) = dB/div (Data No.5)
IF Xmath Off: Reference Level = Reference Lev (Data No.4)

Phase PointY:

Phase (deg) = (450/12800) * (PointY - 6400) (Center = 0 deg) (Real)
(Upper: +255, Bottom: -255)