

Thales

**Installation
&
Getting Started**

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1. General Safety Information

Before installing the instrument, please read this information carefully for your safety and the safety of your system.

Only authorized personnel is allowed to open the cabinet of the *Zennium/IM6*. Plug-in cards must not be pulled out or pushed in with the instrument connected to the mains power.



NEVER INSTALL AN *IM*-EXTENSION MODUL TO THE LEFT OF THE AHSI-2 MODULE !!! THIS WILL CAUSE SEVERE DAMAGE TO BOTH, THE MODULE AND THE *IM* SYSTEM. ONLY INSTALL *IM* EXTENSION MODULES TO AN *IM*-EXTENSION SLOT RIGHT TO THE AHSI-2 CARD.

The device contains no user-serviceable parts. Furthermore, there may be non-insulated parts under voltage inside, which may cause an electric shock when touched. Servicing has to be done by Zahner personnel only.

Please note all information written on the devices and in the manuals for your own safety. Follow the instructions for the handling of the device in all points.

- Connect the *Zennium/IM6* only to the mains voltage shown on the mains plug on the backside of the instrument cabinet
- If the system is not used for a longer time, the mains should be disconnected
- The system must be protected from water and humidity above 65%
- Take care that no liquids can get into the cabinet
- Always place the system in a position that a sufficient ventilation through the ventilation slots is possible. Never place the system on top of a soft base.
- Never place the system close to a heat source
- Do not operate the instrument at an environmental temperature higher than 40° C.
- Do not clean the system with aggressive cleaning agents or with hard objects
- Switch of all power safe modes (harddisk, screen, etc.) and screen-safers on the instrument computer
- Deactivate all virus scanners on the instrument computer

This device consumes, produces and radiates electric energy. Improper installation may cause disturbances at radio transmitters and receivers. Also, emitters of electric fields may cause noise and artifacts to the instrument measurements.

Electrostatic Discharge



**ELECTROSTATIC DISCHARGE WILL DESTROY THE INPUT AMPLIFIERS OF THE *IM* INSTRUMENTS !
THEREFORE, BEFORE TOUCHING THE ELECTRODE CONNECTION OUTLETS OR THE ENDS OF THE CONNECTED ELECTRODE CABLES ALWAYS GET YOURSELF GROUNDED AND DISCHARGED!**



CONNECT THE ELECTRODE PLUGS ONLY IN THE FOLLOWING SEQUENCE:

1. TEST ELECTRODE
2. TEST ELECTRODE SENSE
3. REFERENCE ELECTRODE
4. COUNTER ELECTRODE

2. Unpacking

Zahner products are carefully produced, calibrated and tested so that they achieve their high quality standard. Also the assembling of the accessories and packing is done with great care. Nevertheless, the system may get defective during shipment. Therefore, we recommend to check all parts directly after receipt. If there are obvious damages or defects in function, please contact us immediately.

The shipment must contain the following parts:

ZENNIUM

- *Zennium* Electrochemical Workstation
- TestBox
- U-buffer
- Cell cable set: 4 BNC/clips cables (0.2 m), 4 BNC/banana cables (1 m)
- USB connection cable IM ↔ PC
- 3-button mouse
- Power cord
- CD-ROM with Thales software, and drivers (inside manual cover)
- CD-ROM with the individual calibration data (inside manual cover)
- This manual

3. Hardware Installation

The *Zennium* contains its own computer for controlling real-time tasks such as measurement, control outputs, online-processing etc. A Windows-PC is necessary as a user interface. In case the PC is provided by Zahner, it is configured correctly and the software is installed completely. The system is ready to use.

In case the PC comes from a third party supplier, the software has to be installed by the user. Please make sure that:



1. **The PC is running under Windows XP / Vista / 7 (32/64 bit versions)**
2. **The VGA controller is set to 24 or 32 bit color depth**
3. **All energy control features (especially the sleep mode of the hard drive) are disabled**
4. **The virus scanner is disabled**

3.1 USBLink

The USB connector is located on the backside of the instrument. The USB drivers are automatically installed with the Thales software installation under Windows (for Windows 7 refer to Cap 4.3) after the Thales software installation. USBLink supports the USB standards 1.1 and 2.0.

For installation proceed as follows:

1. Install the Thales software from the CD by starting **setup.exe** from the CD-root-directory
2. Reboot computer if necessary
3. Install the individual system calibration files with the Calibration Data CD
4. Connect the USB-IFC to an USB-port of the PC using a standard USB connection cable
5. Turn on the IM6/ Zennium
6. Install the USB device drivers and follow the instructions on the monitor

3.2 Mouse

For a comfortable handling of the *Thales* software a 3-button mouse is recommended. Clicking the middle mouse button leads to the one step higher level of menus, terminates a running process and escapes from a dialog without changes.

We recommend to use the mouse shipped with the system. The mouse device drivers is supplied on the *Thales* Installer CD. They are installed automatically with the Thales software installation if needed.

4. Software Installation

All software needed to operate the *Zennium/IM6* (and more) is located on the *Thales*-CD:

Software	Folder on CD	Installation
Thales	thales	installed automatically
PC interface drivers	flink	installed automatically
Hardcopy	hardcopy	installed automatically if needed
USB device drivers	thales\usb	installed automatically
COLT files	thales\colt	installed automatically if needed
CIMPS files	thales\cimps	installed automatically if needed
Manual add-ons (PDF files)	manuals	installed automatically
Online Display	OD	installed automatically
Thales View Extensions	flink	installed automatically
ZMan (scientific evaluation software)	ZMan	installed automatically
Adobe Acrobat Reader	Acrobat	installed automatically if needed

4.1 Setup Program

If the *autorun* function of Windows is enabled, the setup program will start after you inserted the *Thales* CD into your CD-ROM drive. The loading procedure may take a few seconds. If it does not start automatically, run *setup.exe* from the root directory of the CD. The setup program will

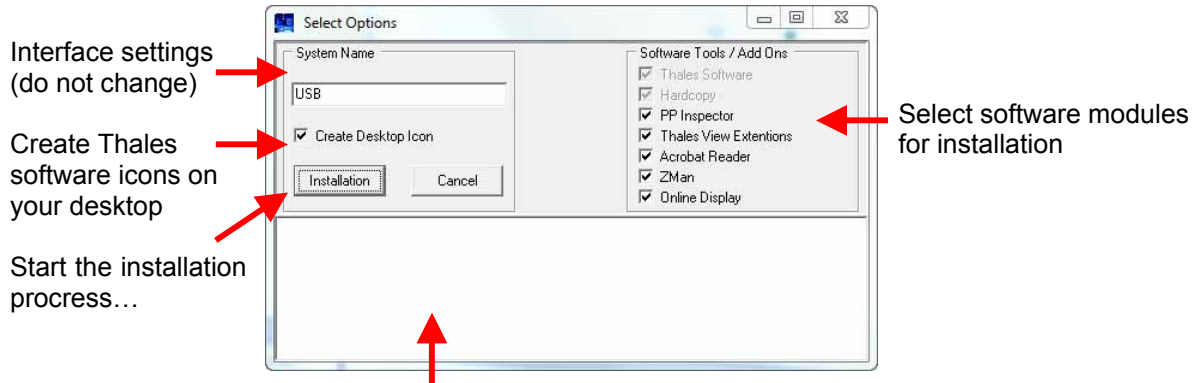
1. copy the *thales* folder to the c:\
2. copy the *flink* folder to c:\
3. install *AMOS USB IFC* device drivers
4. install the *Hardcopy* software (only if needed)
5. install *Thales View Extensions* if selected
6. install/update *Adobe Acrobat Reader* if selected
7. install *ZMan* impedance evaluation pc-software if selected
8. install *Zahner Online Display* if selected
9. reboot pc after complete installation



If an IMPC was shipped with the *Zennium/IM6* instrument, do NOT install any software anew! The complete software is pre-installed on the computer hard drive. The *Thales* CD then is meant as a backup only.

Let's go through the **setup procedure step by step**:

After starting *setup* the program you can setup the installation.



Additional information about selected software modules

After the installation is started the *flink* and *thales* folders are copied from CD to the c:\ partition of the PC.



The AMOS USB interface device drivers will be installed.



After the *Thales software* installation the *Hardcopy* software is installed.

Hardcopy is a useful tool for printing and copying screens, windows and screen areas at a mouse-click.

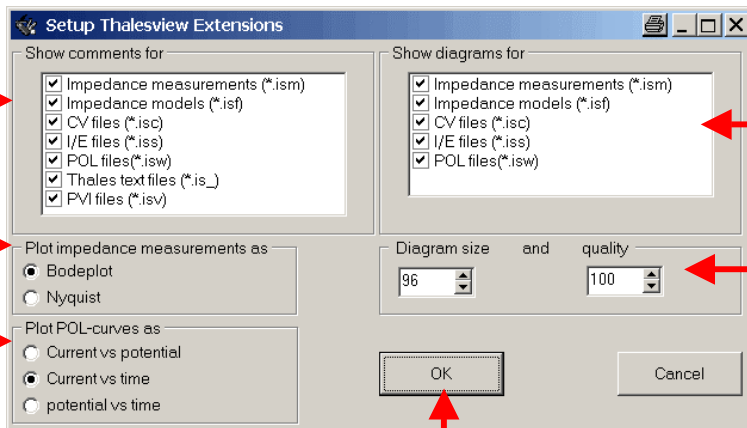


After the *Hardcopy* software installation you can setup the *Thales View Extensions* if selected.

Select file types for showing comment

Select plot type for impedance measurement and model files

Select plot type for polarization measurements

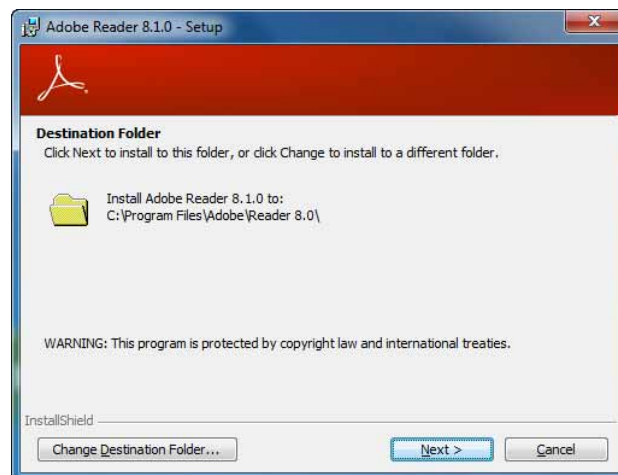


Select file types for thumbnail preview

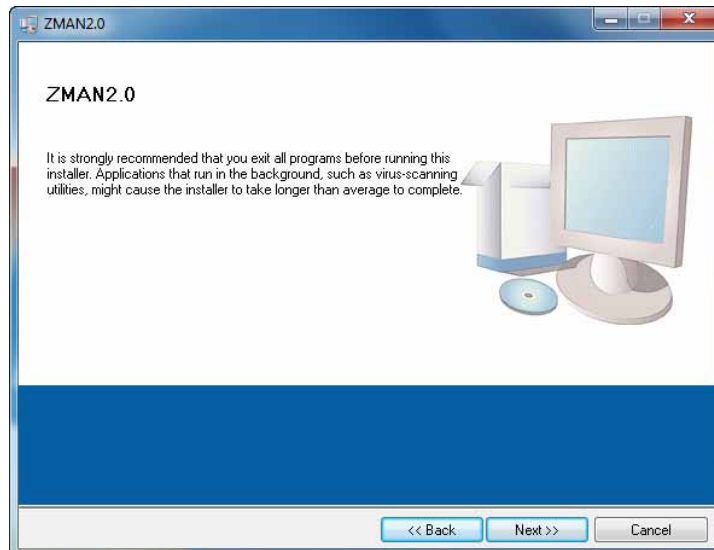
Size and quality of thumbnail plots

Save settings and proceed installation process

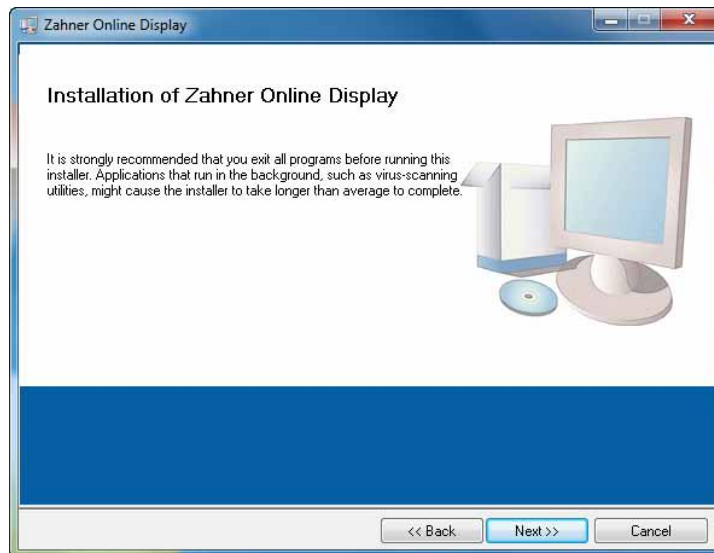
The online help functionality requires the *Adobe Acrobat Reader* 8.0 or higher. If selected, the installation of *Adobe Acrobat Reader* 8.1.0 starts. Follow the installation guide and finish installation of *Adobe Acrobat Reader*.



If selected, the installation wizard of ZMAN2.0 will start. Follow the installation instructions and wait a few seconds after finish.



If selected, the installation wizard of Zahner Online Display will start. Follow the installation instructions and wait a few seconds after finish.



The installation process of the Thales software package has now completed. The installation of ZMAN2.0 and/or Zahner Online Display require a reboot of your PC. The system will be restarted automatically after confirmation **Yes**. If you don't want to restart your system press **No**.



Please note that Thales can handle only 12 partitions of your PC file system. If you have got more, the first 12 partitions are accessible whereas the rest will be ignored. You may access floppy disk, hard drive, CD-ROM or network drives.

After installation you will find new icons on the desktop and a new entry in the START menu of Windows.



Starts the Thales application - please turn on the USB device some seconds before



Diagnostic tool for Thales – refer to manual “Diagnostics and Troubleshooting”

In order to start the Thales application click on the *Thales* icon.



You need read, modify and write permissions for the C:\thales and C:\flink folders and subfolders to run the Thales software.

4.2 Copying of the calibration data

The calibration data are individual for each device and therefore cannot be stored on the *Thales* CD. They come on a second CD called “Calibration Data” you can find on the inside of the manual cover. The CD contains the calibration data for the complete system including *Zennium*, external potentiostats, light sources (CIMPS), HiZ probe, etc. in a small setup routine.

Simply insert the calibration data CD into your CD-Rom drive. If autostart is activated for your CD-Rom drive the installation of the calibration data starts automatically. You can also start the installation by running *CaliData.exe* in the CD-Rom root path. You only have to follow the installation process.



It is obligatory to copy the calibration data to the IM-PC. Otherwise you lose the excellent accuracy of the system.

4.3 USB Driver Installation

The USB drivers are digitally signed and available for the following operating systems:

- Microsoft Windows XP 32-Bit
- Microsoft Windows XP 64-Bit
- Microsoft Windows Vista / 7 32-Bit
- Microsoft Windows Vista / 7 64-Bit

• Windows Vista / 7

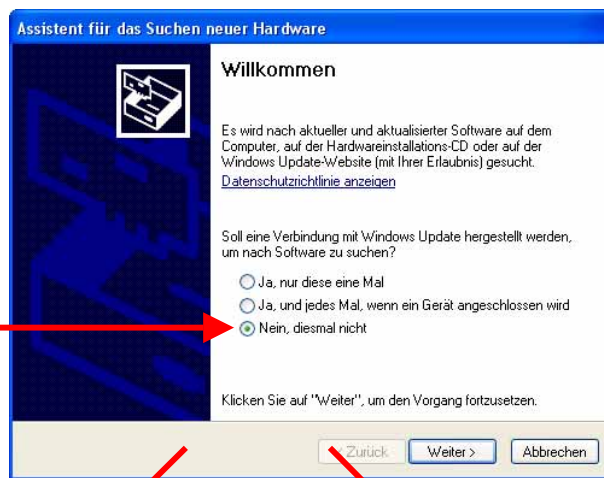
After connecting the **IM6/Zennium** to the PC the **AMOS USB IFC** drivers will be installed automatically.

• Windows XP

After connecting the **IM6/Zennium** to the PC the **“New Hardware Wizard”** will appear.

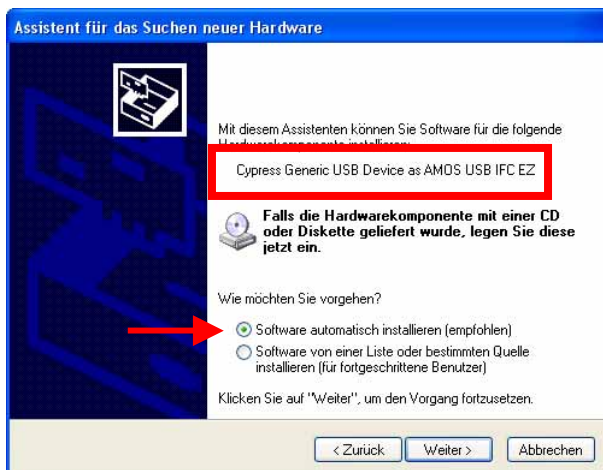
Choose **“No, not this time”** and continue

Continue the driver installation for the matching hardware device !

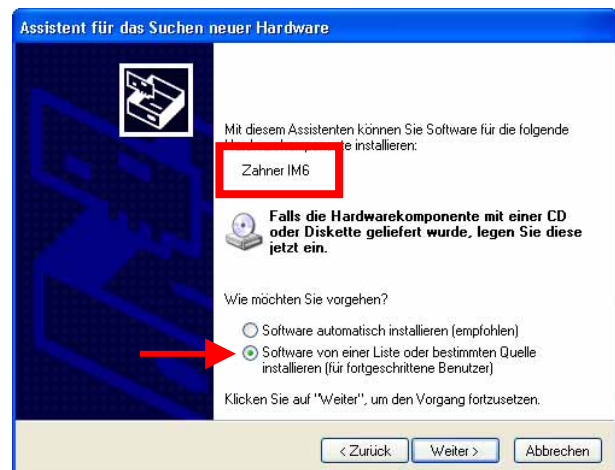


Cypress Generic USB Device as AMOS USB IFC EZ
(for Cypress USB devices)

Zahner IM6 or Zahner Zennium
(for FTDI USB devices)



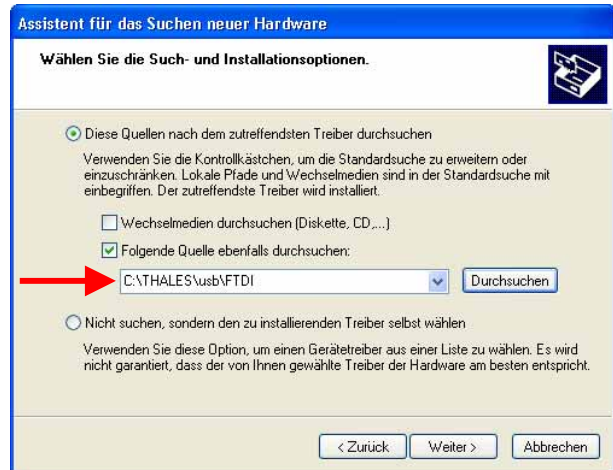
Choose **“Install the software automatically”** and continue



Choose **“Install from a list or specific location”** and continue



Choose **“Continue anyway”** and finish the driver installation



Search for best driver in location **“C:\THALES\usb\FTDI”** and finish the driver installation

4.4 More than one instrument controlled by one PC

It is possible to control more than one *IM6/Zennium* and/or *Thalesbox* from the same PC. For each device running the Thales software creates an individual parameter file (*SERNUM.ini*) after start up. These files are located in the *c:\flink* folder and show the extension *.ini*. The default ini-file is named *usb.ini* and is configured to detect any Zahner USB device. The serial number of the IM system you can find on the backside of the device.

To create a Thales shortcut for a certain Zahner USB device you have to make a copy of the present "THALES USB" shortcut. Just right-click the "THALES USB" shortcut and click create shortcut on the context menu. Then right-click the "THALES USB (2)" shortcut and open the property page. In the target entry after *C:\FLINK\Term129.exe* change the parameter USB to *SERNUM*. Finally you can rename the individual Thales shortcut (right-click and rename). Repeat this instructions for each IM device controlled by the pc.

Now you can open an individual Thales window for each device and control them simultaneously.

```

:*****
: thales windows driver basic adjustments
:*****
[SETUP]
SERNUM=65535
WallPaper="c:\flink\pics\wallpaper.bmp"
:***** Helpfile (actually not in use) *****
HelpFile=c:\flink\fhelpl.hp
USBWDTIME=1000

:*****
: Actual version of Thales- and Termsoftware
:*****
Termversion=126.06.09.15
Thalesversion=3.14

: values for 'devicetype'
: 1=IM6/6e workstation
: 2=Thalesbox
: 0=invalid or temporary (not involved/listed during setup)
devicetype=1

:***** select driver for communication interface *****
:**** flink isa card:      flha12k.dll
:**** lpt dongle:         lpthalcp.dll
:**** lpt+com cable:     lptha12k.dll
:**** TCP/IP remote:     netha12k.dll
:**** usb:                usb2ha1.dll
HALDLL=C:\FLINK\usbha12k.DLL

:**** TCP/IP remote configuration ****
: if HALDLL=nethal*.dll then configure the slave,
: identified as REMOTEIPA=internet protocol address
: with the according REMOTEHAL as HALDLL
REMOTEHAL=c:\flink\lpthalcp.dll
;REMOTEIPA=192.192.1.1

```

Up to eight devices can be controlled by one PC.


4.5 Data Paths

All new *Zennium/IM6* systems (from 2005 on) use the PC file system to store/load data and program files. Older systems may have an internal SCSI hard drive on which data and the complete Thales software are located. The internal IM hard drive cannot be accessed from the PC side but must be handled with the **UTILity** => **DISKOPS** section of the Thales software.

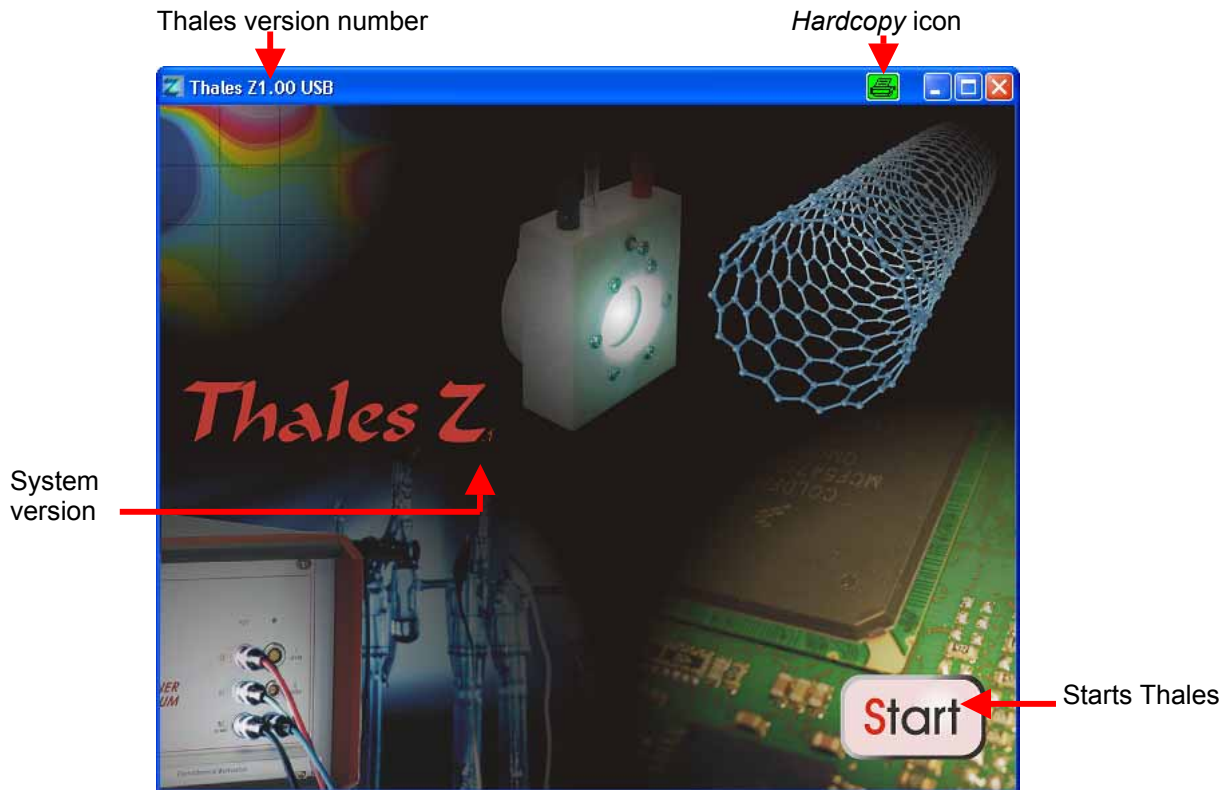
The data paths for the different file types can be set individually. This may be done each time you save a file. Furthermore, you may define standard data paths in the **UTILity** => **Edit Setup** section of the Thales software. These paths will be suggested for each saving you do in any section of Thales. Please note that you may individually set the paths for all file types Thales supports. This allows you to save e.g. EIS data to a different folder than I/E or PVI data without taking care of path names during the saving procedure. In order to save data directly to the PC file system (floppy disk, harddisk, virtual drives) you simply have to select the appropriate path in the Edit Setup page.

During the Thales-software installation a set of data paths are created on the PC hard drive in the folder `c:\thales\examples`. You may save your data to these paths or to others individually created by you.

5. Configuring & Starting the Thales Software

In order to start the Thales application click/double-click on the  icon.

This will open the Thales window showing the start-up screen:

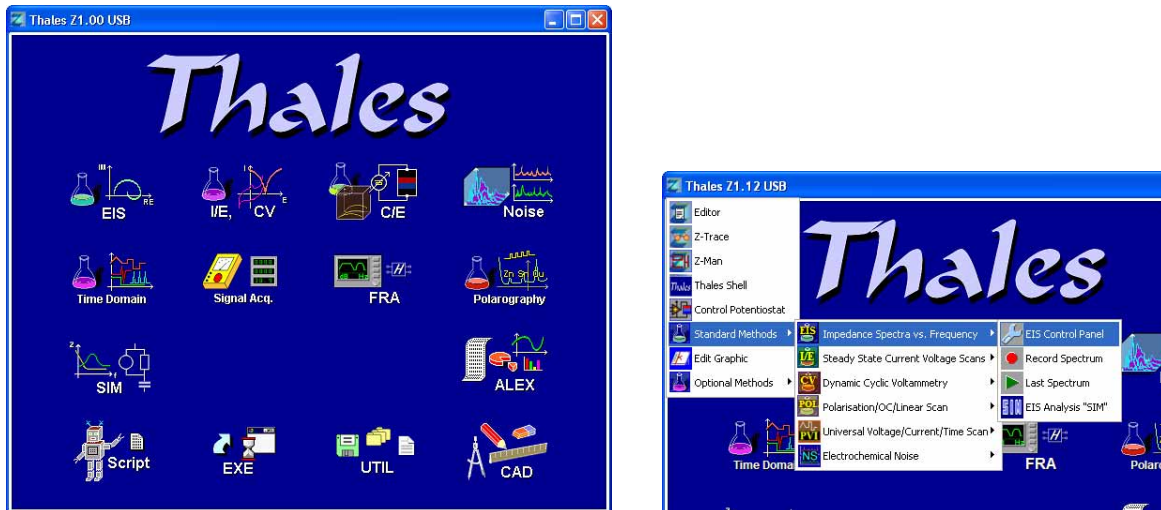


The size of the Thales window can be maximized with the mouse or zoomed in steps 80 pixel. For zoom in press **CTRL** + **+** and for zoom out press **CTRL** + **-**.

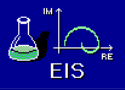
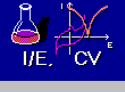
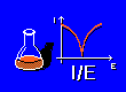

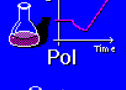



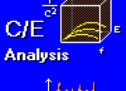
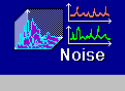
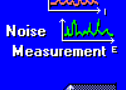

The **autostart** function is described in detail in chapter "Thales & FLink Folders". For users of older systems with IM hard drive this function is used for booting the IM hard drive.

5.1 Main Menu

After starting the Thales software by first clicking on the Thales icon on the Windows desktop and the clicking on the **Start** button in the Thales window the Thales main menu shows.



This menu is leading you to the main pages of the methods implemented. By pointing (not clicking) on the icons some of them are showing up a sub-menu with additional icons. Clicking on an icon will bring you to the appropriate software section. The following program section are available:

Main icon	Sub-menu icon	Program section
 	   	<ul style="list-style-type: none"> - Testsampling, Check Cell Connections - Impedance Spectroscopy (EIS) Measurements - Series EIS Measurements
		Current/Voltage Curves
		Cyclic Voltammetry
		Polarization
		Multi-Cell Current/Voltage Curves
	 	Capacity/Voltage Measurements
		Capacity/Voltage Analysis
	 	Measurement of Electrochemical Noise (only with NPROBE)
		Analysis of Electrochemical Noise

 <p>Time Domain</p>	 <p>PVI</p>	<p>Time Domain Measurements</p>
	 <p>TOMMY</p>	<p>Not Available</p>
	 <p>Pulse</p>	<p>High-Current-Interrupt-Measurements (only with HCI option)</p>
	 <p>TRC</p>	<p>Fast Time Domain Measurements (only with TR8M or HCI option)</p>
 <p>Signal Acq.</p>	 <p>Signal Acquisition Setup</p>	<p>Setup of Additional Measurement Channels (only with optional TEMP/U, DIO, DA4, etc.)</p>
	 <p>Signal Acquisition</p>	<p>Online-Display of Additional Measurement Channels</p>
 <p>FRA</p>		<p>Frequency Response Analysis</p>
 <p>Polarography</p>		<p>Polarography Methods</p>
 <p>SIM</p>		<p>Simulation & Fitting Software</p>
 <p>ALEX</p>		<p>Import of Data Measured by Third Party Hardware</p>
 <p>Script</p>		<p>Script Sequencer</p>
 <p>EXE</p>		<p>Execution of Special Software</p>
 <p>UTIL</p>	 <p>text editor</p>	<p>Zahner Text Editor</p>
	 <p>file manager</p>	<p>File Manager</p>
	 <p>calculator</p>	<p>Online-Calculator</p>
	 <p>notes</p>	<p>Notepad</p>
	 <p>time date</p>	<p>Setting Time and Date</p>
	 <p>setup</p>	<p>General System Setup</p>
 <p>CAD</p>		<p>Graphics Software</p>

5.2 Thales & FLink Folders

There are two folders copied to the c:\ partition of the computer hard drive during installation of the Thales software, the THALES folder and the FLINK folder.

5.2.1 THALES Folder

The THALES folder contains all programs and data necessary to run the THALES software. These are all *Thales* applications, setup data, support files, and calibration data. In the c:\THALES\examples folder you can also find all default data folder. They are created during the installation and they are pre-set in the *Thales* software. If you do not change these paths in the *Thales* software, you can find your measurement and analysis data here.

5.2.2 FLINK Folder

The FLINK folder contains all programs and data necessary for the interface driver. Files of interest are mainly the driver itself (**term129.exe**; the number may change with the versions), the Zahner editor (**zedit.exe**) and the **.ini** files.

The **.ini** file(s) for driver are created automatically during the installation. Which **.ini** file is used by the driver you can read in the target line of the properties of the *Thales* link on the desktop. The name of the **.ini** file follows the application name (e.g. c:\FLINK\term126.exe USB). In the example the file **usb.ini** is used.

The **.ini** files normally should not be modified by the user. Anyway, there are some parameters of interest with which the user can adapt some features to his own needs. As the **.ini** files are pure text, they can be opened and edited with any text editor. We recommend the Windows Notepad because it does not save format codes in addition to the text. If you use other programs like Word or WordPad be sure that no format code is saved with the text.

parameter	function	default
HALDLL	Driver DLL	c:\FLINK\usb2hal.DLL
DEVICESHOW	Opens TCP/IP protocol window	off
DEVICESUP	on = enables remote control over TCP/IP	off
DEVICESRV	TCP/IP server name	127.0.0.1 (local host)
ClipColors	Defines the color saturation at which b/w are swapped for print-out (0 for color printers, 160 for b/w printers)	160

After you edited an **.ini** file the new parameters will be used with the next start of Thales application.

5.2.3 Autostart

Pressing the NMI button on the *USBIfc* board of the *Zennium* lets the system load and run the software located in the c:\THALES\boot folder. In older hardware versions which use an internal IM hard drive this function is used for booting or updating the Thales software to the IM hard drive.

In newer hardware versions without IM hard drive this function may be used for automatically starting an individual software (e.g. a SCRIPT procedure). As for that purpose various software modifications have to be done, you may get those pro-configured autostart folders from Zahner on request. There is a folder for TCP/IP remote autostart (*bootremote*) already on the Thales CD.

6. Handling of the Thales Software

The *Thales* software has got an easy-to-handle user-interface. Step by step it guides the user through all necessary settings. If you are familiar with your application, you are able to use the *Thales* software without a special training. Because of the variety and complexity of the field of electrochemical measurements and analysis as well as because of the powerful and very useful functions of *Thales*, we strongly recommend to read this manual carefully, anyway.

6.1 Pull Down Menu

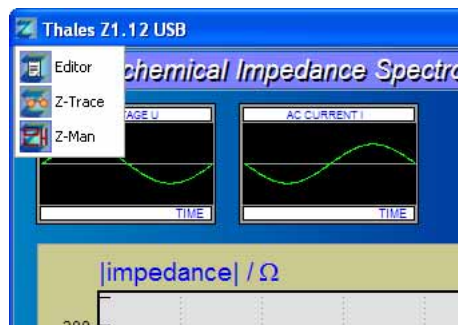
The Thales pull down menu lets you access your applications faster and clearer.

Click on the Thales icon in the title bar to open the pull down menu.

You can easily navigate through the most common used applications and access them directly by one click.

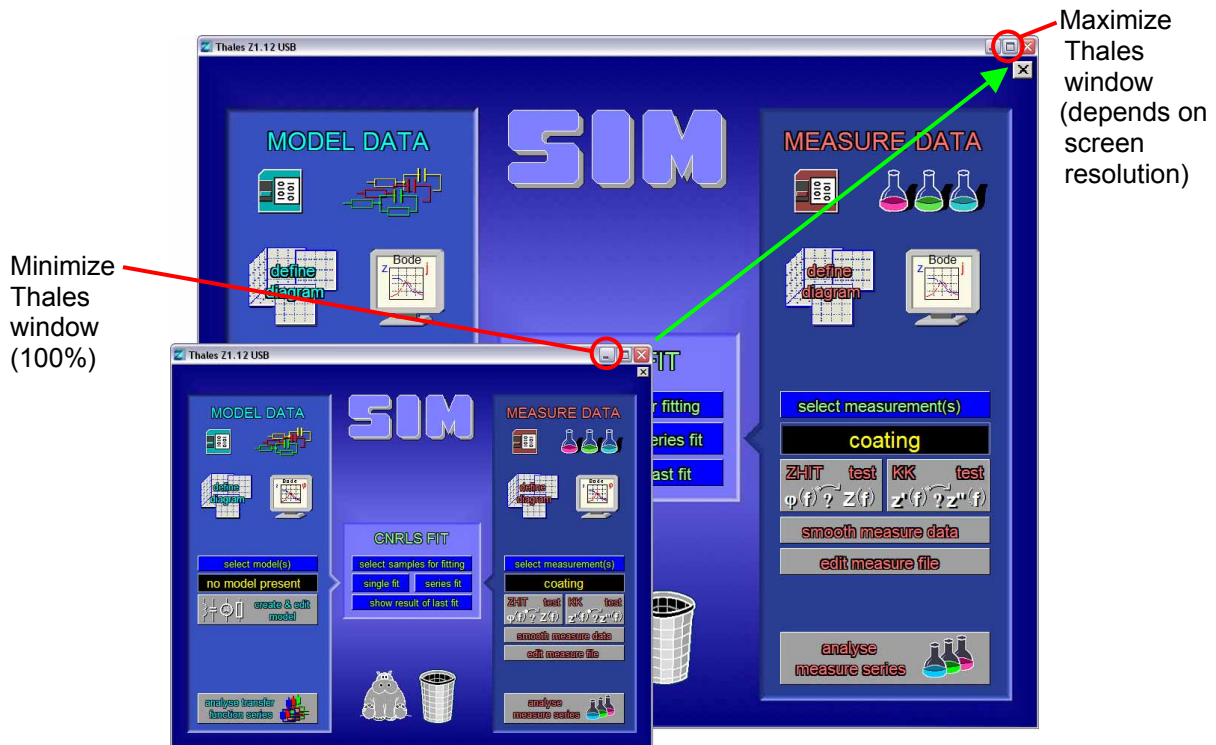


During a measurement you can only start external software modules. The pull down menu shows only the available options.



6.2 Scalable Thales Window

The Thales window is proportional scalable from 80% to maximum screen resolution in steps of 80 pixels (width). Zoom in with **CTRL** + **+** and zoom out with **CTRL** + **-** or use minimize and maximize window buttons.



6.3 Mouse

The *Thales* software mainly is handled by means of the mouse as you know it from Windows. When you are pointing with the mouse cursor on a “button”, it will change its color and/or its shape so that you easily can identify buttons by leading the mouse cursor through the Thales window. To activate the function of a button, **left-click** on it.

With the **middle mouse button** you have one of three similar functions depending on the context:

- you reach the next higher menu level
- you terminates a running process
- you escapes from a dialog without accepting the changes made.

It is equal to a click on the close button of a window **X** or pressing the **ESC** key.

The **right mouse button** is used in some pages to call a help window (e.g. in SIM). In other contexts (e.g. directories, selecting curves), it is used to select/unselect (toggle) an entry. If you input numerical values, a right-click will replace the input number by a default value or clear the input default.

The mouse cursor in many situations is guided. That means it is placed automatically to the position it is needed most likely. This function helps to save a lot of mouse movements and time.

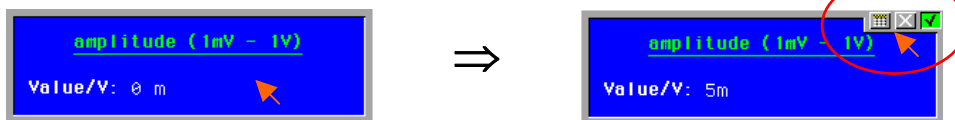
6.4 Special Keys

Some keys have special functions when handling the user interface of the Thales software:

ESC	<p>With the ESC key you have one of three similar functions depending on the context:</p> <ul style="list-style-type: none"> - you reach the next higher menu level - you terminates a running process - you escapes from a dialog without accepting the changes made.
Space	<p>The space key can be used to select or deselect (toggle) items such as directory entries, curves etc. In this context it has the same functions as the right mouse button.</p>

6.5 Input Boxes

All inputs are done in blue input boxes. This guarantees that all inputs can be done in the same way and by using the same tools. An input box has got three symbols at the upper right end which are shown only when the mouse cursor comes close to the upper end of the input box.



In the **Thales** environment, all input-boxes accept not only pure values but also the following technical **multiplier prefixes (engineer's units)**:




prefix	meaning	multiplier
a	atto	10^{-18}
f	femto	10^{-15}
p	pico	10^{-12}
n	nano	10^{-9}
u	mikro	1/1000000
m	milli	1/1000
k, K	Kilo	1.000
M	Mega	1.000.000
G	Giga	10^9
T	Tera	10^{12}
E	Exa	10^{15}
P	Peta	10^{18}




You need not input the unit (V, Hz, A, etc.). This is done by the software automatically (exception: amplitude in pseudo-galvanostatic (V) and galvanostatic (A) mode).



Examples:

0.1 = 100m = 1e-1
 1000 = 1k = 1K = 1e3
 1000u = 1m = 0.001 = 1e-3




If you click on one of these symbols the following actions will be carried out:

	Closes the box accepting the input
	Closes the box rejecting the input
	Calls the Thales Calculator

An input box may have one or more lines for one or more parameters or texts to be input. You finish a line by pressing the  key. If the box only had one line or you edited the last line, the box will close then and the new value is accepted. If the box has more than one line and you did not edit the last line, you will come to the next line. No matter in which line you are, clicking on the close buttons will close the box accepting the new value(s)  or rejecting it .

In more-line-boxes you can also position the text cursor to a specific line by clicking with the mouse onto the line. If you do want to reject the new value, click the middle mouse button, press the  key or click on the close button  of the input box.

6.6 Calculator

The **Thales Calculator** implemented in the Thales software can be called by clicking on the calculator icon  in the upper right corner of an input box. It will pick up automatically the value of the input box as the first value of a calculation. By closing the calculator after the calculations have been carried out, the result is set as the new input value. You can accept this value , change it or reject the complete edit .

The **Thales Calculator** provides a lot of scientific functions. You will learn later on how to use it. For online help do a right-click on the calculator.



6.7 Hardcopy

Every page displaying curves provides a *hardcopy* button. Clicking on it will produce either a print-out of the recent page or a copy of the graphic in the Windows clipboard. The printout is done on the "Windows Standard Printer" installed under Windows. Most of the Windows compatible printers will also work with Thales. There may be printer models which do not work properly with Thales although they work under Windows. Those problems do not lie in our responsibility. Please use a different printer model in that case. Please try a printer also with Thales before you buy it.

6.8 Hardcopy Software

The *Hardcopy* software you can find on the Thales CD is NOT needed for the Thales hardcopy function. It is an additional Windows tool which you may install and use as you need. It prints screens, windows, and areas on any Windows printer or copies it to the Windows Clipboard.

6.9 Default Parameters

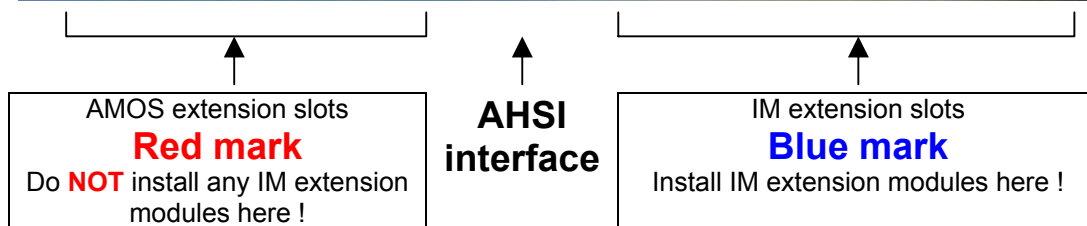
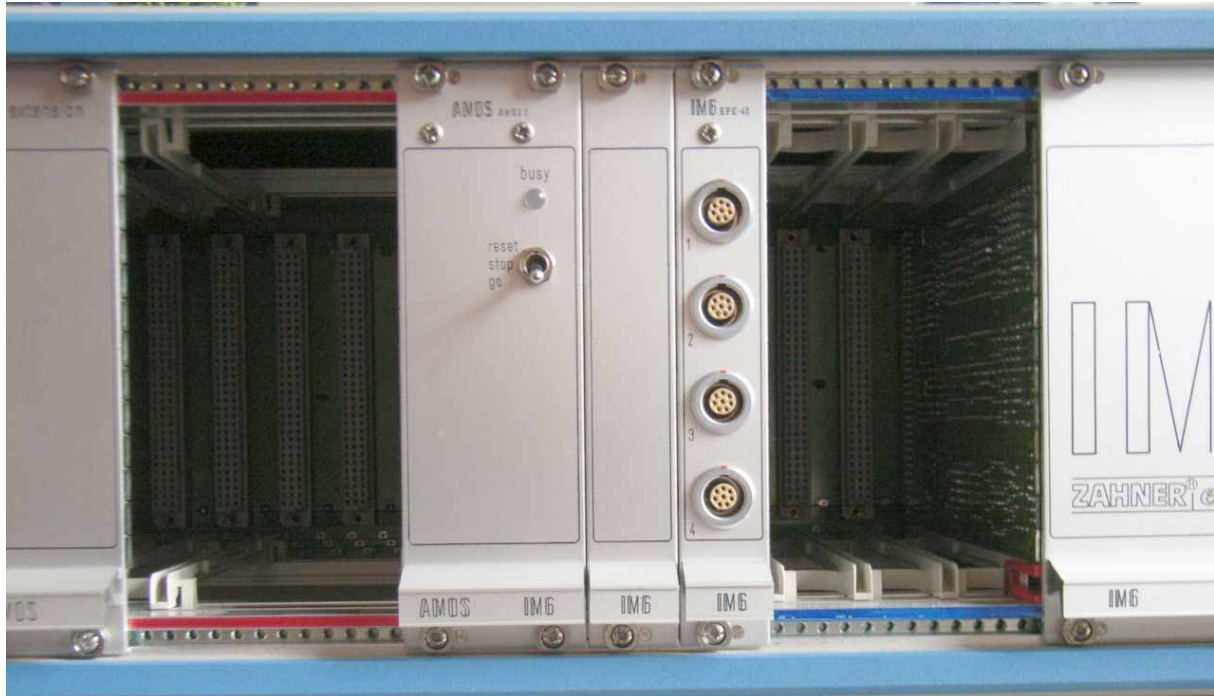
The EIS measurement section of Thales is pre-set with default values (for standard application) which make sense for many applications. If these parameters fit your needs you may perform e.g. an EIS measurement without editing parameters. In all other cases you only need to edit one or only a few of the parameters just as needed.


The default EIS parameters are as follows

Parameter	Default value
Upper frequency limit	100 kHz
Lower frequency limit	100 mHz
Starting frequency	1 kHz
Sweep mode	start -> high -> low frequency
Steps per decade (above 66 Hz)	10
Steps per decade (at lower limit)	4
Number of measure periods (above 66 Hz)	20
Number of measure periods (at lower limit)	4
AC amplitude	off
Potentiostat	off
POT mode	potentiostatic

In all other measurement sections of Thales appropriate default values are set by factory.

7. Installation of Extension Modules





Never install IM extension modules on the **red marked** left hand side of the AHSI interface !

Only install IM extension modules on the **blue marked** right hand side of the AHSI interface !