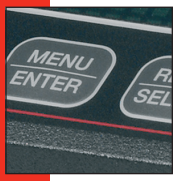
AMETEK®
TEST & CALIBRATION INSTRUMENTS

User Manual
JOFRACAL
for JOFRA Signal Calibrators









User Manual
JOFRACAL
for JOFRA Signal Calibrators

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1. INTRODUCTION

This manual contains installation and operating instructions for:

JOFRA WINDOWS® CALIBRATION PROGRAM

JOFRACAL

The program was developed by:

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DK-3450 Allerød
Denmark

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1.1 General information

The JOFRACAL program is designed to perform signal tests and to calibrate signal sensors using JOFRA equipment via RS–232 and USB based communication ports.

The software is supplied on a media device with update downloads available from the AMETEK home page.

Knowledge of the JOFRA equipment and system to be tested is essential in order to obtain the maximum benefit from this program. Knowledge of Windows® programs in general is an advantage.

- **Warranty**
  Use of the product remains the full responsibility of the user, and AMETEK Denmark A/S offers no warranty and is under no obligation in relation to this product. In addition, AMETEK Denmark A/S cannot be held responsible for any damage, which may occur in connection with the use of this product, including loss of earnings, loss of profit, loss of data or recovery of lost data, loss of goodwill and other similar incidental or consequential damage or loss.

- **Technical assistance**
  Please contact the distributor, if you require technical assistance.

1.2 Hardware requirements

JOFRACAL can communicate with the following JOFRA equipment and has the following requirements from the PC:

1.2.1 JOFRA models:

Available JOFRA models:

- ASC300
- ASC301
- ASC321
- ASC400

1.2.2 PCs, minimum hardware requirements:

- Intel® Pentium® II 1.4 GHz processor.
- 128MB RAM (256MB recommended)
- 512MB free disk space on hard disk (1GB recommended) prior to installation
- Standard VGA (800x600, 256 colours). 1024x768 recommended.
- USB port for installation.
- One or more free RS-232 serial and USB ports, if using devices requiring communication.

1.2.3 PCs, minimum software requirements:

- Microsoft Windows® XP(32bit), Vista(32bit) or later.
- System fonts: MS Sans Serif and Arial

1.3 Installing JOFRACAL

The JOFRACAL program is supplied complete with its own installation program.
Future upgrades available for download on www.jofra.com.

☞ Simply insert the data medium and execute the Autorun.exe then follow the instructions on screen.

By default, JOFRACAL is installed in the directory: *Default program folder*\JOFRACAL and an icon automatically appears on the Program's menu.

It is recommended that you uninstall the current JOFRACAL prior to installation. Your current data will be maintained.

If you want to install the program manually, the data medium also contains a SETUP.EXE file in the Jofracal folder.

1.3.1 DotNet Famework.

The JOFRACAL software requires Microsoft .NET FRAMEWORK SP1 which is installed if not already found on the PC.

1.3.2 RTC/PTC USB driver(temperature)

The RTC/PTC series calibrators required a driver to communicate with JOFRACAL. This driver is installed automatically during the installation of JOFRACAL.

☞ Note: when installing on Microsoft Windows® you must have Administrator's privileges. If not please contact your local System Administrator.

1.4 Reinstalling JOFRACAL

The installation program detects whether JOFRACAL is already installed on the PC. To reinstall the current installation must be uninstalled,
See section 1.8, page 9 for full details.

Databases are not deleted nor are they overwritten if reinstalled to the same location. If a complete reinstallation is required including databases, the old installation folder must be deleted manually or reinstalled to another location.

1.5 Connecting JOFRACAL to a JOFRA device

1.5.1 RS232 & USB communications

JOFRACAL can be connected to a JOFRA ASC3xx using a serial connection (RS232) port while the ASC400 uses a USB port.
The device should be connected to a free serial port on the PC - please refer to the PC manual for further information regarding the location and appearance of serial ports. Use the serial cable supplied with the device.

IMPORTANT!

- The JOFRA device must be switched off when connecting the cable from the PC.
- The JOFRA device and the PC must be earthed to avoid noise interference and damage to the equipment.
- You are advised not to switch the calibrator on until JOFRACAL has been started.

1.6 Starting the JOFRACAL program

1.6.1 Windows XP(32bit)/Vista(32bit)/7(32&64bit)/8/10®

- Click *Start*.
- Select *Programs*.
- Select *JOFRACAL*.
- Select *JOFRACAL Calibration software*.

1.6.2 First time access to JOFRACAL

On start up, JOFRACAL begins by displaying the login dialog in which the operator must select a user and key in the password.



User and access levels, these are described in section 1.11 page 19.

As no user-defined names have been added at this stage, you are required to use one of the default names. These are:

MASTER or USER
(No passwords are required)

JOFRACAL also remembers the location of the database last used and the complete path is displayed in the database field.

The first time you log in JOFRACAL a default database is located in the JOFRACAL subdirectory \DB.

Databases can be created, selected and deleted. This is described in section 1.10 page 16.
Note: The logon dialog can also be called from the menu in JOFRACAL allowing the user to change both database and user without closing the program.

1.7 Backup copies

ALWAYS MAKE BACKUP COPIES!

Loosing data can waste a great deal of time and resources, and it is important that you take the time required to make a backup copy of your database. The backup copy should include all files in the JOFRACAL\DB folder. Backup copies should be made using a suitable backup program - follow the manufacturer's instructions.

1.8 Uninstalling JOFRACAL

JOFRACAL is removed from the PC as follows:

- Open Control Panel
- Open Add/Remove Programs
- Select JOFRACAL
- Press Add/Remove button and follow instructions on screens

JOFRACAL default database (CDS files in the \DB folder) will not be deleted during the uninstall process. The database can therefore be used for subsequent installations of JOFRACAL or other programs.

1.9 Program structure for JOFRACAL

Like other Windows® programs, JOFRACAL uses buttons, dialog boxes, grids, tables, etc. JOFRACAL uses paging controls to navigate through the main areas of the program.



The JOFRACAL functions are divided into five main areas:

- Device maintenance (section 2 page 23)
- Calibration setup (section 3 page 33)
- Upload / Download (section 6 page 55)
- Scheduler (section 7 page 61)
- Online Calibrating (section 10 page 80)

Apart from the main program areas, there is the system configuration dialog (section11 page 87) called from the menu.

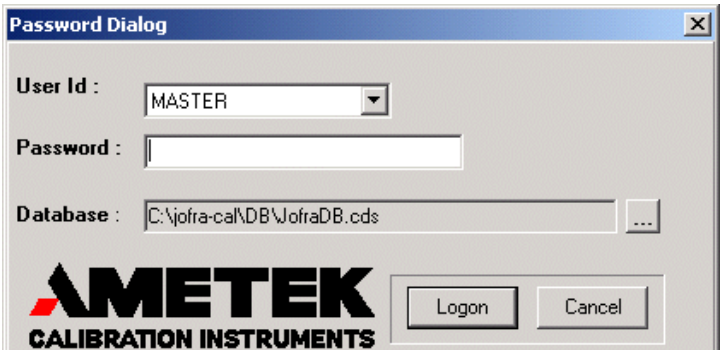
These functions are described in detail in the specified sections of this manual.

1.10 Database management

Under installation a default database is created. It consists of several CDS (Client Data Set) files and is located in the subdirectory \DB of the JOFRACAL installation folder.
For users who only require a single database, this database is always default start up database.

1.10.1 To select a database

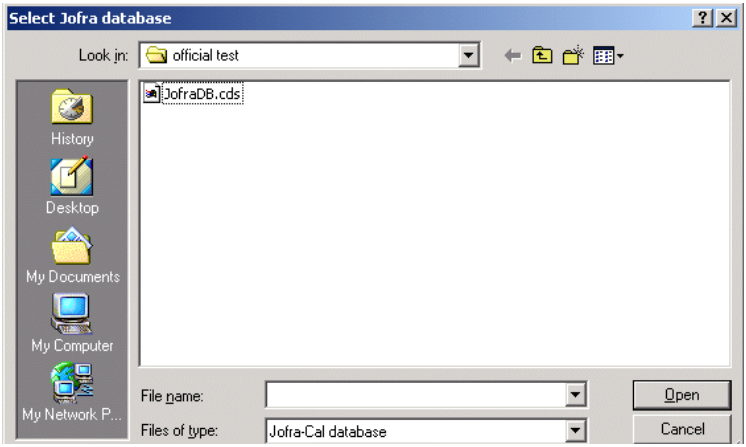
Program menu – database options



☞ When using multiple databases, the correct database must be selected before clicking the Logon button

Before logon, use the Select button ... to show the database selection dialog and find the required JOFRACAL.CDS file.

Program – Select Database



Use this dialog to locate and select the correct database.
Click Open to use the selected database and return to the login menu.

1.10.2 To create a new database

For those wishing to use multiple databases, simply create a new subdirectory and copy the new database files into the new folder. An empty database can be found on the installation medium.

☞ Warning. Make sure the CDS database files are not write protected after copying from the installation data medium. Remove the 'Read Only' property flag.

1.11 HOW TO SELECT A USER

☞ You must select a user in order to run JOFRACAL.

Select user:



Users are maintained in the System setup. Users can have either full access (*super users*) or restricted access (*normal users*) to the JOFRACAL system. Please note that users do not require full access to perform a calibration (section11.4.1 page 94).

Details of the default user names are found in section 1.11.4 page 20. These provide access to the program before any user names are defined.

1.11.1 Super users

Super users have access to the complete database and can create, delete and edit sensors, heat sources, procedures, etc.

1.11.2 Normal users

Normal users cannot create, edit or delete information, nor can they modify the system setup. They can only perform calibrations using existing information, but may create certificates once the calibration procedure has been completed.

1.11.3 Select a user

Select a user from the User list box.

Confirm by clicking 

- or -

to exit JOFRACAL, click 

.

An error message will be displayed if an unknown user or an incorrect password is entered.

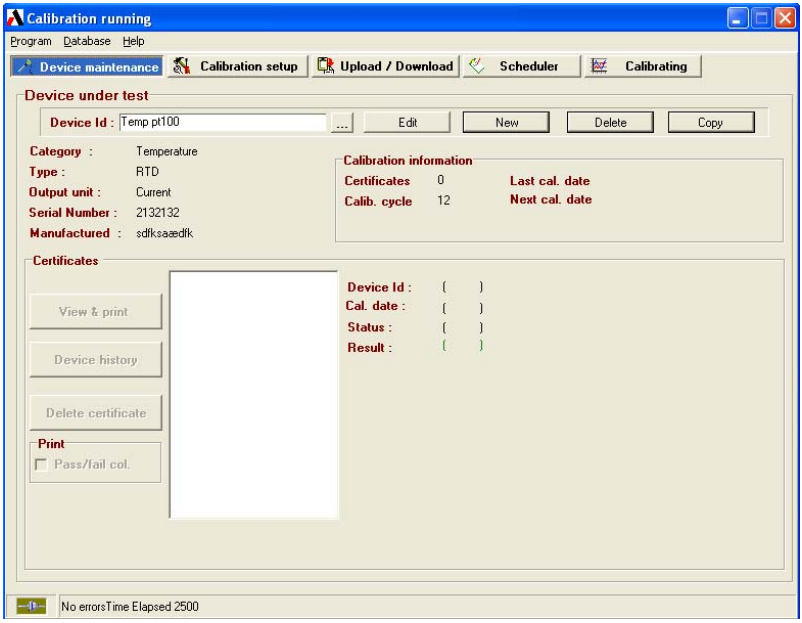
1.11.4 Program default user names

Two users will be set up the first time you run JOFRACAL. The first user name, *MASTER*, is a super user. The other user name, *USER*, is a normal user. No password has been linked to these two users. Once the 'real' users have been set up, *MASTER* and *USER* can be deleted. Note that user ID can only be deleted by a super user, and that the current user cannot be deleted
(Section 11.4.1 page 94).

1.12 Main menu

When JOFRACAL has accepted the selected user, the main menu is shown:

Main menu



JOFRACAL uses paging controls to navigate through the main areas of the program. The active page is always highlighted in blue. Select a page by clicking on the page tab.

The 5 main areas of JOFRACAL

Device Maintenance: Test device database and calibration history.

Calibration Setup: Select a device, set up and run a calibration.

Upload/Download: Up/download offline calibrations and maintain reference sensor database.

Scheduler: Earmark devices due for calibration.

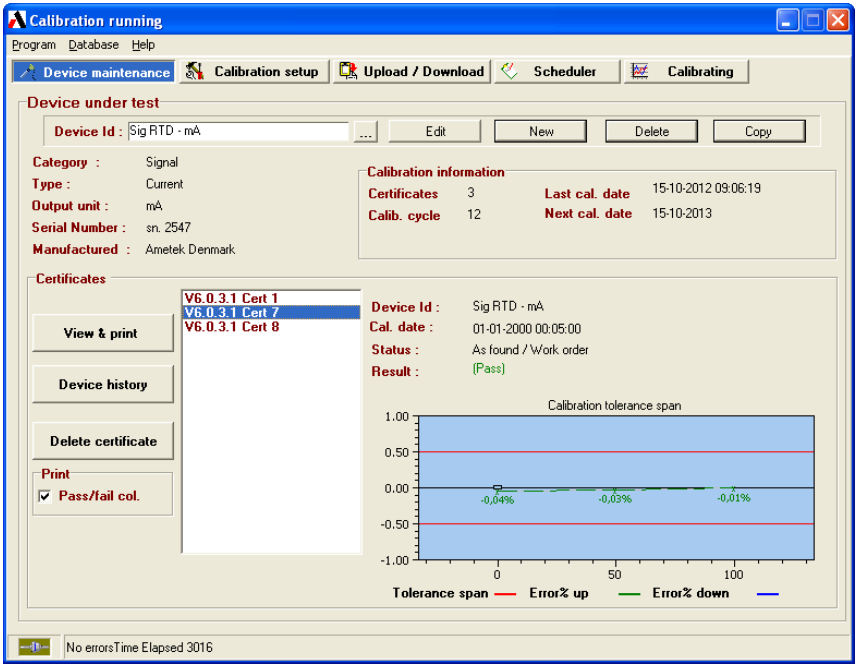
Calibrating: Online calibrating.

Exit: Not visible during online calibration.

☞ Note that the ‘Calibrating’ page tab replaces the ‘Exit’ during online calibration.

2. DEVICE MAINTENANCE

Device maintenance dialog:



The device maintenance allows the user to maintain and view the test instrument database. The user can create, copy, delete and edit a test device. (To Edit see Section 2.3 Page 31).

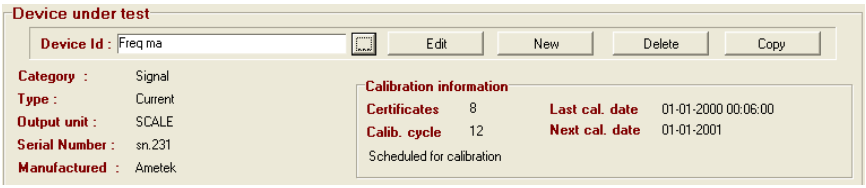
2.1 View a test device

To view a device the user must click the  select button to display the Device search dialog. (Section 9 page 73).

2.1.1 Device summary details

When a device is selected the user can find information regarding the device's basic properties, calibration history, and a list of previous calibration certificates.

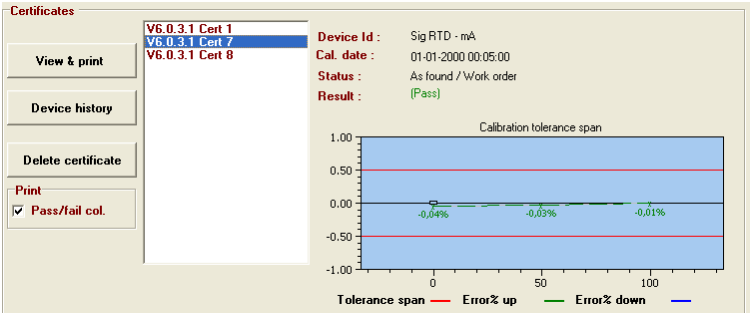
Device summary details – maintenance



2.1.2 Calibration certificates & history

Device calibration history is seen in the lower half to the device maintenance screen including a list of all completed certificates. A brief summary of the highlighted certificate (date, pass/fail, deviation graph) is detailed to the right.

Device calibration certificates - maintenance



2.1.3 Viewing a certificate

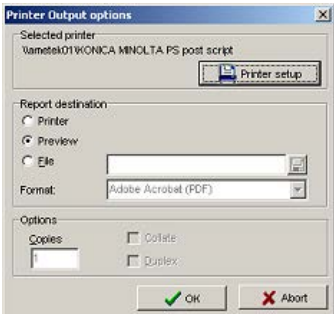
All certificates created by JOFRACAL are saved in a certificate database file 'siCertFile.CDS'. These may be viewed, printed and saved in PDF format as, and when, required.

Highlight the Certificate you wish to view from the certificate list, then click the 

button.

The system displays the following window:

Certificate output options - maintenance



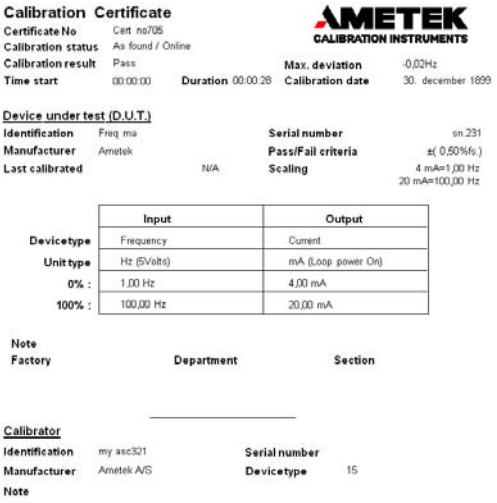
The user has 3 output options:

1. Send direct to the printer.
2. Preview the certificate on the screen.
3. Save as a PDF of NDF formats.

If the user chooses to preview the certificate the following screen appears.

A two-page report is displayed.

Certificate preview – page 1:



Calibration Certificate

AMETEK CALIBRATION INSTRUMENTS

Certificate No	Cert no705				
Calibration status	As found / Online				
Calibration result	Pass			**Max. deviation**	-0,02Hz
Time start	00:00:00	**Duration**	00:00:28	**Calibration date**	30. december 1899

Device under test (D.U.T.)

Identification	Freq ma	**Serial number**	sn.231
Manufacturer	Ametek	**Pass/Fail criteria**	±(0,50%fs.)
Last calibrated	N/A	**Scaling**	4 mA=1,00 Hz 20 mA=100,00 Hz

	Input	Output
Devicetype	Frequency	Current
Unit type	Hz (5Volts)	mA (Loop power On)
0% :	1,00 Hz	4,00 mA
100% :	100,00 Hz	20,00 mA

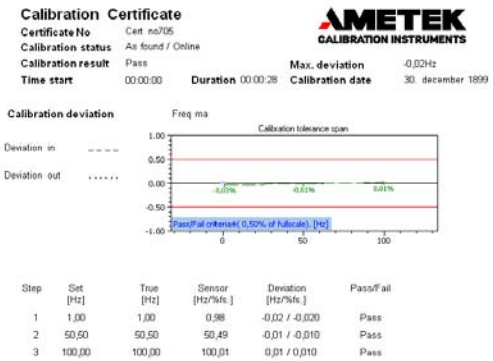
Note

Factory **Department** **Section**

Calibrator

Identification	my asc321	**Serial number**	
Manufacturer	Ametek AVS	**Devicetype**	15
Note			

Certificate preview – page 2 results:



Calibration Certificate

AMETEK CALIBRATION INSTRUMENTS

Certificate No	Cert no705				
Calibration status	As found / Online				
Calibration result	Pass			**Max. deviation**	-0,02Hz
Time start	00:00:00	**Duration**	00:00:28	**Calibration date**	30. december 1899

Calibration deviation Freq ma

Deviation in

Deviation out

Step	Set [Hz]	True [Hz]	Sensor [Hz/%fs.]	Deviation [Hz/%fs.]	Pass/Fail
1	1,00	1,00	0,98	-0,02 / -0,020	Pass
2	50,50	50,50	50,49	-0,01 / -0,010	Pass
3	100,00	100,00	100,01	0,01 / 0,010	Pass

The window may be resized by dragging its corners, or it can be maximized to fill the entire screen.



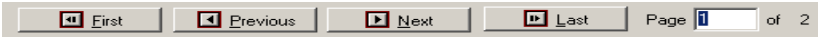
The buttons at the top of the screen provide the following functions:



Save certificate in PDF format.

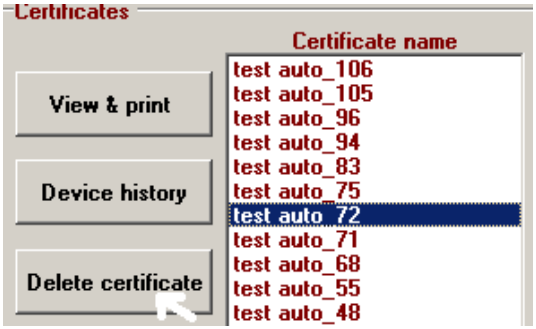


Print certificate currently displayed



Page navigating. First, Previous, Next, last page, select page number.

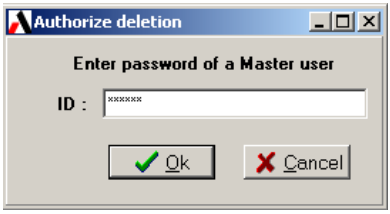
2.1.4 Delete certificate



Delete a certificate by first selecting the certificate from the list you wish to delete then click the Delete certificate button.

☞ Super users can only delete certificates.

To confirm deletion JOFRACAL will ask for authorization from a registered Master User. Here the user simply types in a valid password for a Master user.



2.2 View History

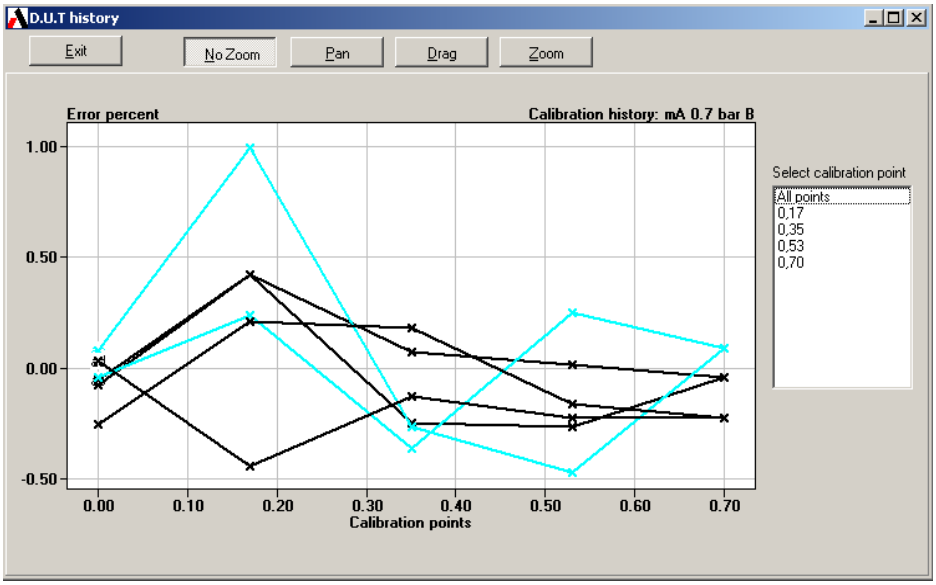
All calibrations to a particular sensor can be viewed on screen as a graph. This indicates changes in the sensor's sensitivity and accuracy between different calibrations. This can be useful to show changes over time or variations between different calibration groups:

Click 

to view the history of the currently selected test device.

A window containing a graph is shown:

History - viewing:



The buttons at the top of the screen provide the following functions:



This returns you to the device maintenance page.



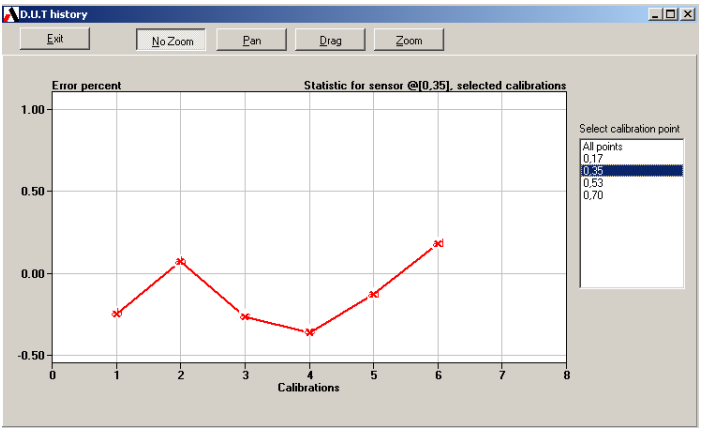
These buttons allow the user to further scrutinize the history graph with zoom, drag and pan functions.



You can define the axis settings and zoom on areas of interest.
This provides a numeric list of all the calibration test points on the graph.

Use this list to select a specific calibration point and view all the measured values at a particular point for the sensor.

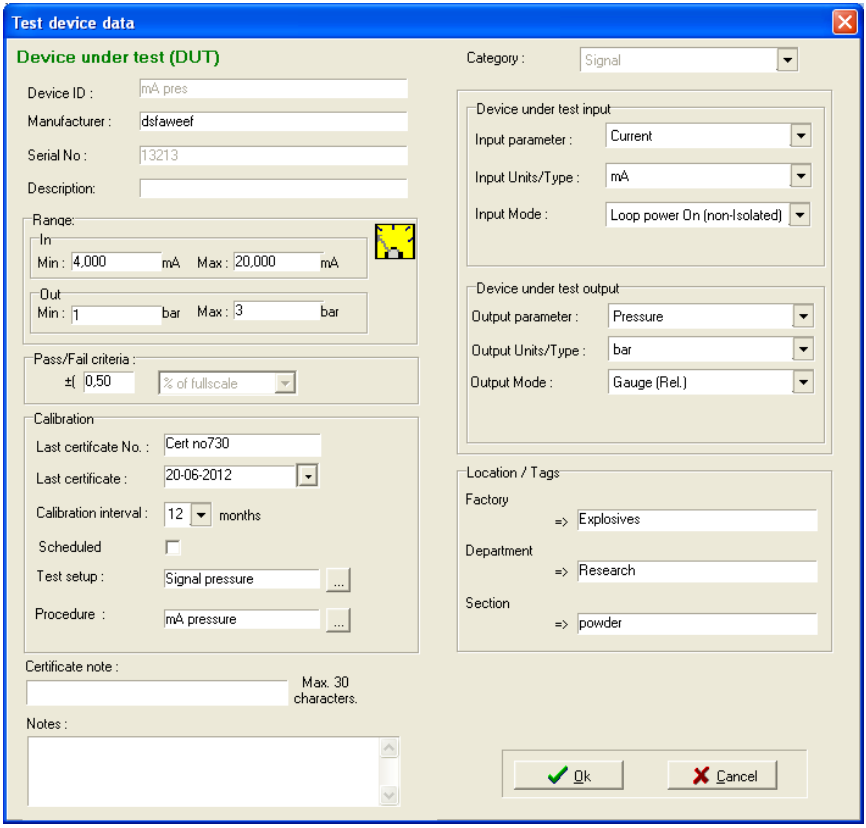
Deviation



2.3 Edit a test device

Device under test data form contains the properties of a test device instrument.

Edit test device properties - Maintenance:



☞ Changes can only be made by a user with MASTER access.

2.3.1 Test device properties

Contain information identifying the test device.

- Device ID. (Unique value identifying every device in database)
- Maker
- Serial number
- Description
- Ranges.
  - Devices' minimum & maximum input limits
  - Devices' minimum & maximum output limits.
- Pass-Fail. Calibration pass/fail criteria
- % of Full-scale.
- Last certificate. Date and name of last calibration certificate
- Calibration interval. How often device is to be calibrated
- Schedule. Is the device scheduled for calibration?
- Calibration parameters. Calibration Setup and procedure ID's
- Notes. Certificate and general notes
- Location/tags. Identifies the devices' position

See Section 8.1 Page 64 for full details on Test device definition.

3. CALIBRATION SETUP

Click on the 

tab to begin a calibration.

The calibration process is divided into 3 distinct stages and is navigated by “Vertical page tabs” on the right of the form.

1. Selecting the test device(s).
2. Create or select a predefined scenario.
3. Create or select a procedure method.

If the scenario and procedure have already been defined then the user must only select the device and click on the 

button.

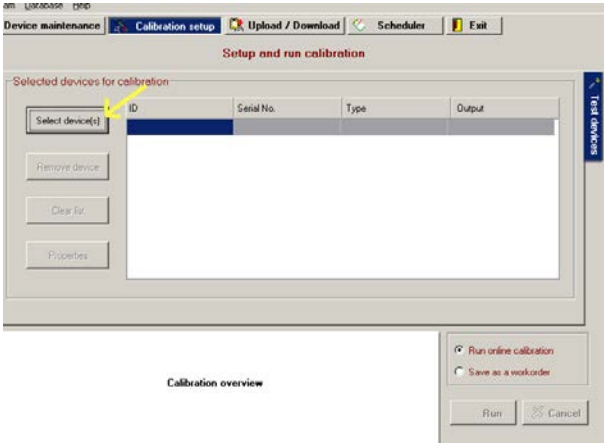
Normally the scenario and procedure are defined when the user creates a test device in the Edit Test device Dialog. (Section 8 Page 64).

3.1 Select a test device for calibration

First step is to select the devices to be calibrated.

Click on the ‘Select devices’ button highlighted by the yellow arrow in the below picture.

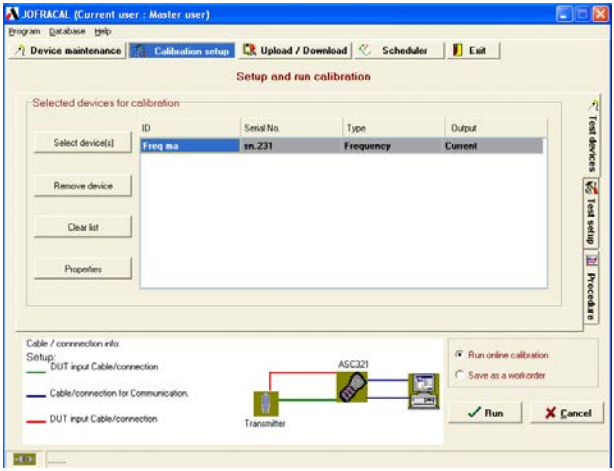
Initial screen – calibration setup



The JOFRACAL Search dialog is displayed. See (Section 9 Page 73) for details on the search dialog.

After selecting a device, JOFRACAL returns to the setup pages.

Calibration setup after selecting a device



☞ Note the 2 extra vertical tabs now displayed: Test setup and procedures. **The procedure setup tab is not applicable to pressure switch calibration.**

In this case, the device in question has been assigned a setup routine, seen by the graphic scenario summary below the device list.

There are 4 control buttons on the device selection page.



Select device(s) for calibration.



Remove the device currently highlighted from list.

.



Remove all selected devices from list.



View the properties of the device currently highlighted. See (Section 8 Page 64) for details on the test device dialog.

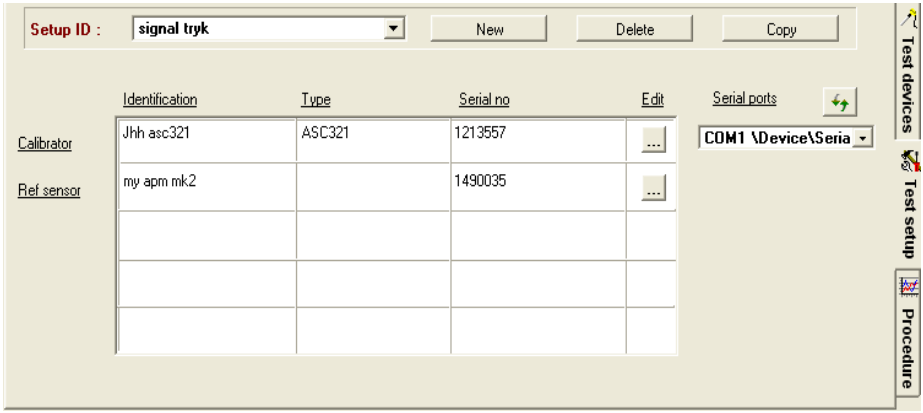
3.2 Defining the calibration test setup scenario

The second stage of setting up a calibration is defining the test environment.

A ”test setup” method can be defined and saved, then later assigned to any other test device in the database.

The **Test setup** can actually first be assigned in the **Edit Test device Dialog** when first creating the Test device See (Section 8.2 Page 68) or later here in the Calibration setup.

Test setup page – Calibration setup



☞ Required serial communication ports are defined to the right of each component.

The following buttons allow the user to maintain the Test setup definitions database.



Select a predefined Test setup definition.



Create a new Test setup definition.



Delete the current “Test setup” definition. Be sure no other device uses this record.

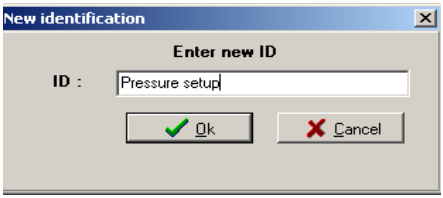


Copy the current “Test setup”.

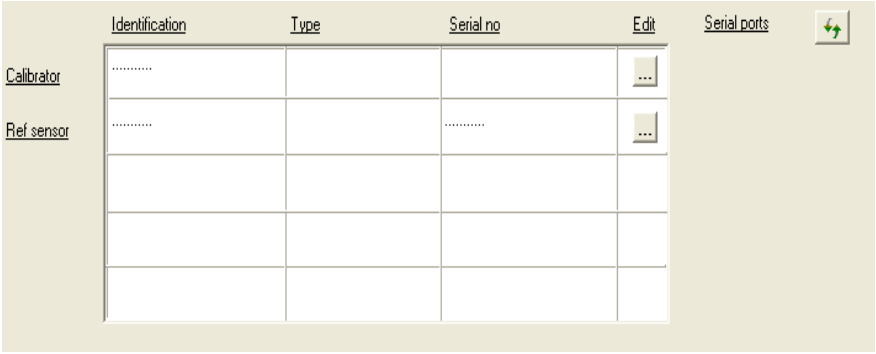
3.2.1 Creating a new Test setup

When copying or creating a new scenario, the user is requested to enter a new Test Setup ID.

Request Test Setup ID



Key in the new ID and click OK. A blank Test Setup page is presented ready for a complete new definition.



3.2.2 Test Setup parameters

The following calibration variables are defined in this page:

Calibrator : Defines the Test device measurement reading method and the signal calibrator used under calibration, either ASC321, ASC301 or ASC300.

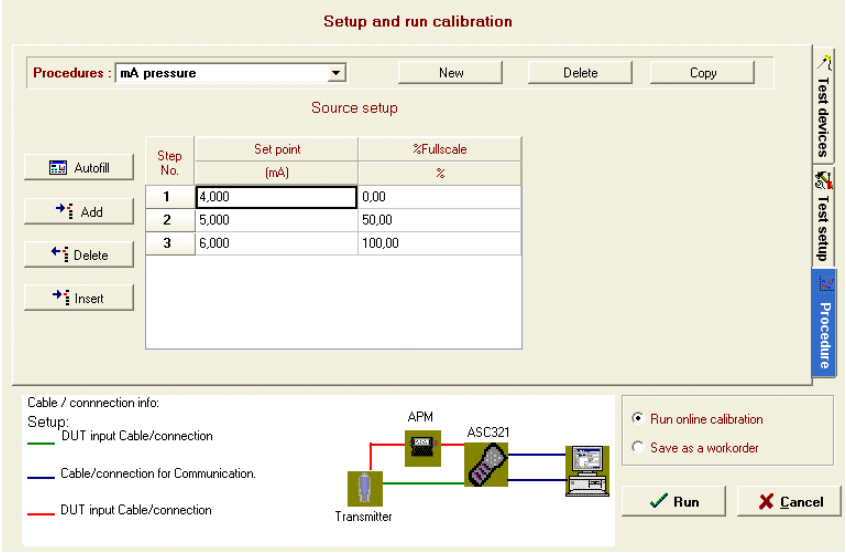
To select a pressure calibrator, click on the select  button adjacent calibrator label.
(For details on the calibrator dialog see Section 4 Page 44)

Reference Sensor: If the True logging instrument is using an "external pressure module", then this parameter must be defined.

Click on the select  button adjacent Ref Sensor label.
For details on the Reference sensor dialog See (Section 5 Page 50).

3.3 Defining the calibration procedure

This window is used to select a calibration procedure.



The 3rd and final stage of the **calibration setup** is to define the pressure steps called procedures. Procedures can be defined, saved and reused by any test device.

The **Procedure** can actually first be assigned in the **Edit Test device Dialog** when first creating the Test device (See Section 8.3 Page 68) or later here in the Calibration setup.

The following buttons allow the user to maintain the **Procedures** database.

3.3.1 Selecting an existing Procedure



Select a predefined Procedure definition. Click on the list box and select the desired Procedure.

3.3.2 Creating a new Procedure



Create a new Test setup definition.

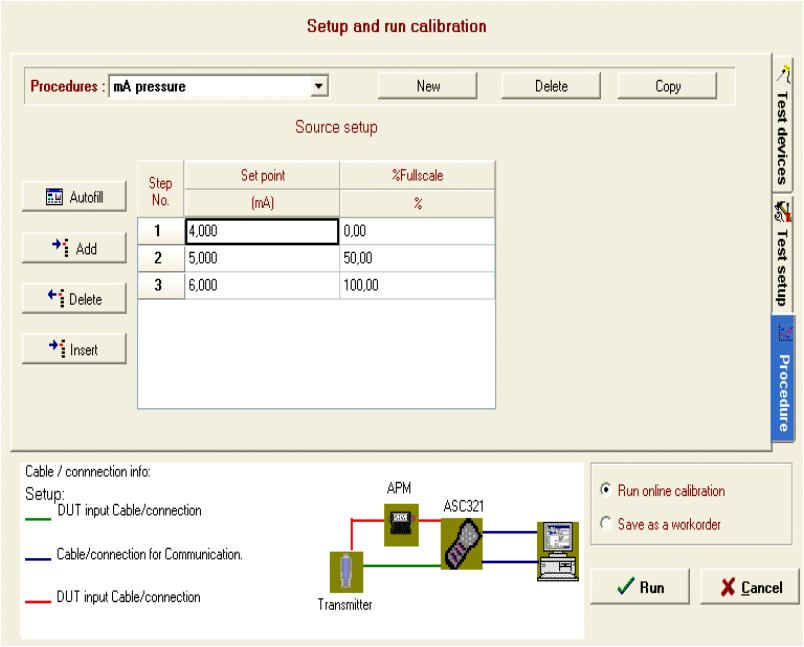
When creating a new procedure, the user is requested to enter a new Procedure ID.

Request Procedure ID



Type in the new ID and click OK. An initialised Procedure page is presented ready for editing

Procedure definition page



3.3.3 Deleting a procedure

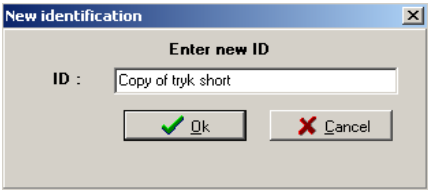
Delete Delete the currently displayed Procedure definition. JOFRACAL requests confirmation prior to final deletion.

Be sure no other device uses this record.

3.3.4 Copy a procedure

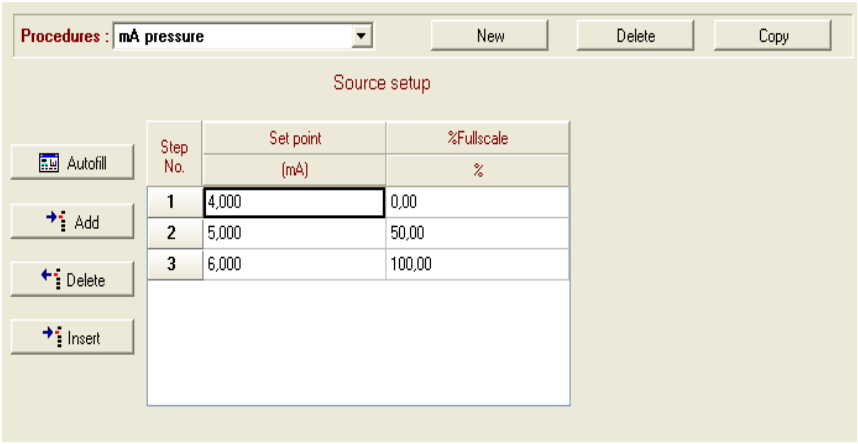
Copy Copy the currently displayed Procedure.
When copying the new procedure, the user is requested to enter a new Procedure ID.

Request Procedure ID



Enter the new ID and click OK. An identical procedure with a new name is displayed in the Procedure page however with a new name.

Procedure definition page



3.3.5 Test Setup parameters

The following calibration variables are defined in this page:

3.3.6 Pressure points

The calibration set pressure points are entered and must be within the admissible temperature range.



Autofill pressure points.



Add a line to the calibration steps.

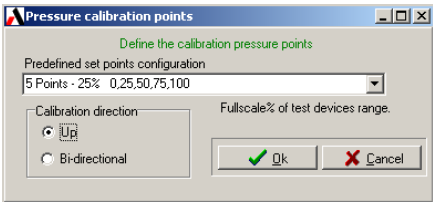


Delete a line to the calibration steps.



Insert a line to the calibration steps.

3.3.7 Autofill function



This dialog allows the user to use some pre-defined procedures with varying number of set points and intervals, to define the procedure.

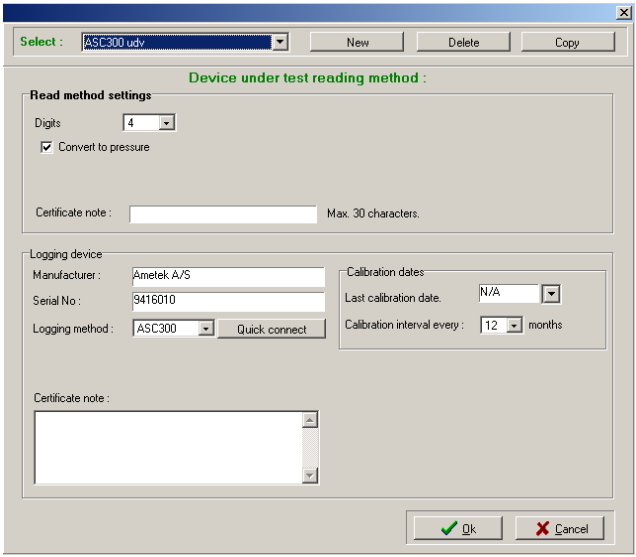
4. DEFINING THE CALIBRATOR AND READING METHOD

The Device Under Test reading method is used to define the reading method and the signal calibrator used.

This dialog n test setup and is called from the Calibration Setup page. (See Section 3.2.2 page 37)

The purpose of this form is to define the measuring method for the device under test.

D.U.T reading method dialog

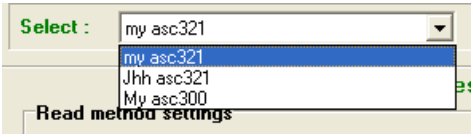


For signal all reading Reading methods are user defined

4.1 User-defined methods

The user must define the reading methods which normally include one of the ASC3xx calibrator models.

4.2 Selecting a D.U.T reading method



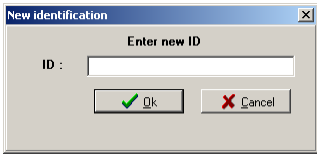
Use the drop down list of previously defined reading methods.
The methods listed are directly dependent upon the output on the test device and True reading method.

4.3 Creating a user-defined method

Click on the 

button and the JOFRACAL prompts the user for an identification name.

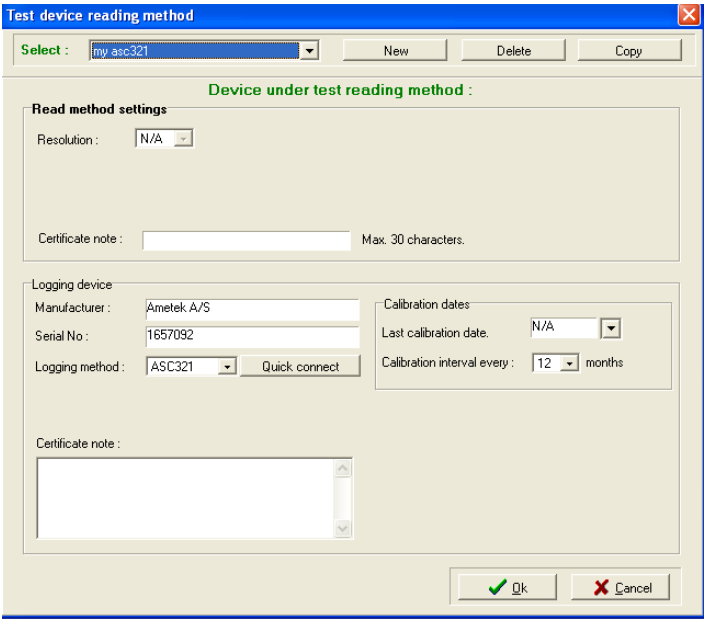
New read method ID



Enter the new ID and Click 

.

A new empty form is displayed and ready for editing.



When a user-defined method is selected, the **logging device section** of the dialog is visible to enable the user to define the logging device. Example: ASC300, ASC301 or ASC321.

See D.U.T read parameters for a description of all parameters.

When all parameters and logger information are keyed, click the 

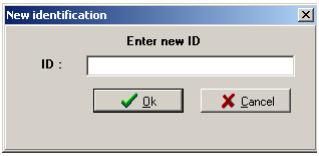
button to save the information.

4.4 Copy a User-defined method

Click on the 

button and the JOFRACAL prompts the user for an identification name.

Enter new read method ID



Follow the same instructions as if creating a new User-defined method.

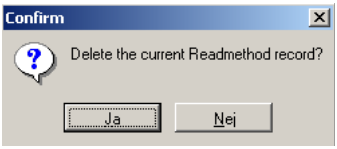
4.5 Deleting a D.U.T reading method

Only User-defined methods may be deleted from the list.

Select the reading method you wish to delete then click the delete 

button.

JOFRACAL will ask the user to confirm the deletion.



Click Yes (Ja) to confirm deletion.

4.6 D.U.T read parameters

4.6.1 General parameters

resolution:

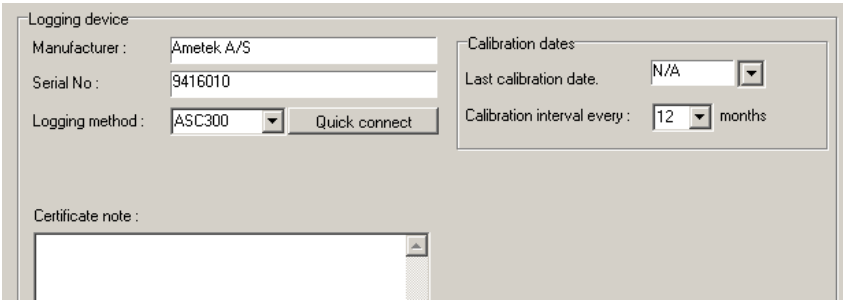


Is not applicable to signal calibration.

4.6.2 Logging device parameters

The device section parameters of the D.U.T **read dialog** describe the logging device used for the True reading method and are visible in User-defined reading methods.

Logging device section of the D.U.T read dialog



Manufacturer

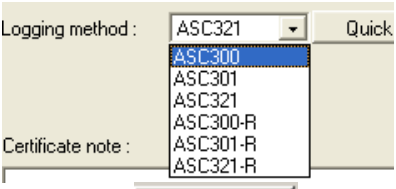
The logger manufacturer is displayed on the certificate.

Serial number

The logger serial number is displayed on the certificate.

Logging type

Select the device type from the drop down list.
The device list contains the names of the ASC3xx calibrators known to JOFRACAL and can communicate via RS-232 serial port.



It is possible to use the 

to retrieve the type and serial number of the device.

Calibration dates

The date the logger was last calibrated and the interval between calibrations.

Resolution:

Displays the maximum resolution for the logger.

Notes

This field may be used to enter a comment about sensor usage (maximum 240 characters). Not displayed on the certificate.

Certificate note

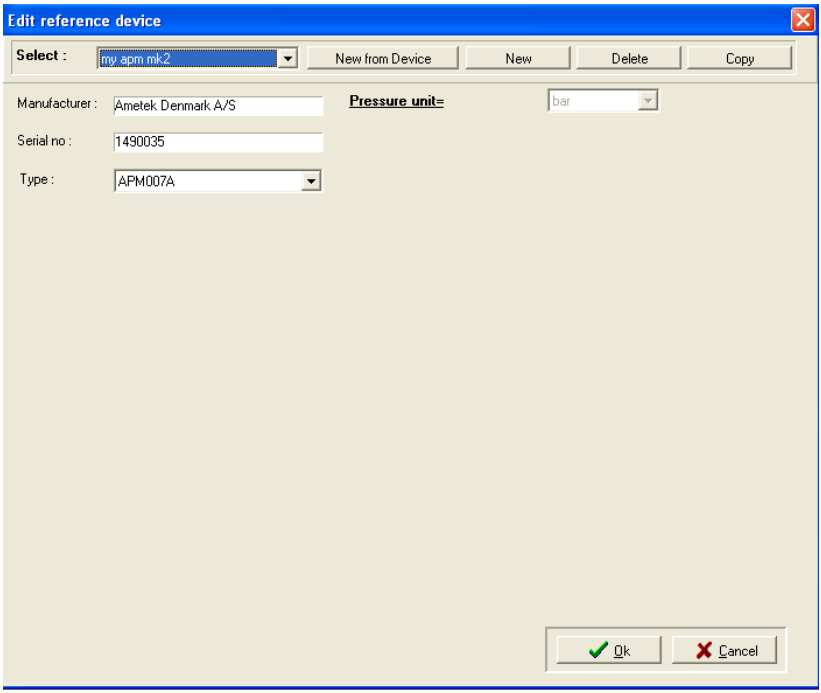
This field may be used to enter a certificate comment (maximum 29 characters).

5. REFERENCE SENSORS

The reference sensor dialog is active when pressure is defined as the output unit and used in the administration of external pressure module database, for example APM's. The dialog enables the user to select, create, delete and edit these records.

☞ **Note. Definition of pressure related reference devices is only possible when called from calibration setup not from the Upload / Download screen.**

Reference sensor dialog:



☞ You may create any number of external pressure modules within the system, but two external modules may not have the same

name or the same serial number.



Closes the dialog and saves any changes.



Closes the dialog and prompts to discard changes.

5.1 Selecting an external reference module



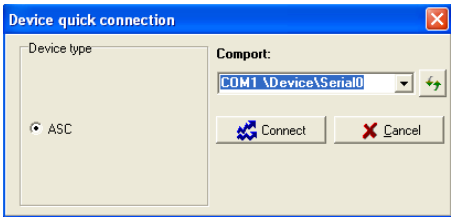
Use the drop down list of previously defined reference modules to select the required module. The Reference module properties are displayed. (See Reference module properties Section 5.5 Page 53).

5.2 New reference module from device

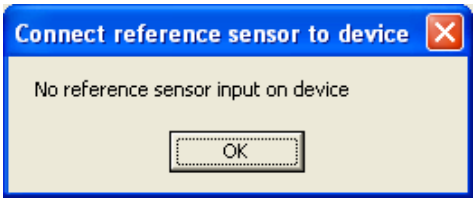
It is possible to create a new reference module record by using the 

button. It allows the user to make a quick connection to an ASC device connected by a RS-232 serial port.
First the user is asked for the serial port and the device type.

Quick connect dialog



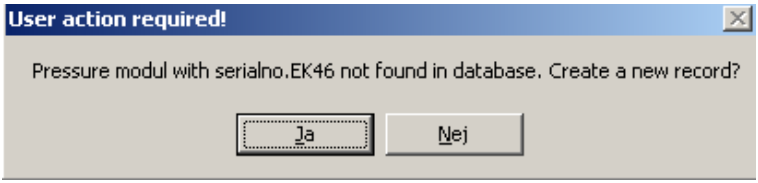
If no pressure module is attached, JOFRACAL informs the user with the following message.



If successful, JOFRACAL retrieves the reference module serial number and the database scanned for an existing reference module.

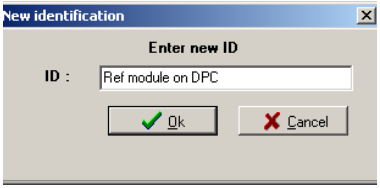
If a record with the same serial number and device type exists then it will retrieve and present that reference module.
If not, JOFRACAL will ask the user to create a new reference module record.

Confirm creation of a new record



If the user answers yes, the user is prompted for a new ID.

Enter new reference sensor ID



Click OK and a new reference module will be created and displayed.

5.3 Copy reference module

The 

button copies the current reference module to a new record. The user is again prompted for a new ID. An identical reference module is displayed albeit with a new ID.

5.4 Delete reference module

The 

button deletes the current reference module. JOFRACAL requests confirmation from the user before the actual deletion.

5.5 Reference module properties

This section describes the properties in the reference sensor dialog.

5.5.1 Manufacturer

The reference module manufacturer is displayed on the certificate.

5.5.2 Serial number

The reference module serial number is displayed on the certificate.

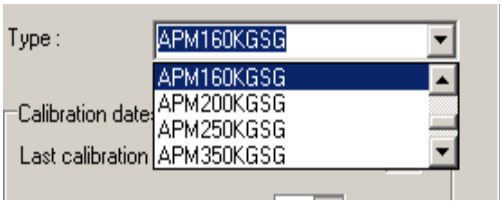
It should also be unique. When using the 

button, it is the retrieved serial number that is used to scan the database to check if an existing reference module already exists.

5.5.3 Reference module type

This dropdown control lists the available reference module types.

The list contains the available APM’s for the ASC models.



5.5.4 Calibration dates

The date the reference module was last calibrated and the interval between calibrations.

5.5.5 Minimum/maximum pressure

This is used to specify the reference module admissible temperature range.

5.5.6 Notes

This field may be used to enter comments about module's usage. Maximum length 240 characters. Not displayed on the certificate.

5.5.7 Certificate note

This field may be used to enter a certificate comment.
(Maximum length of 30 characters).

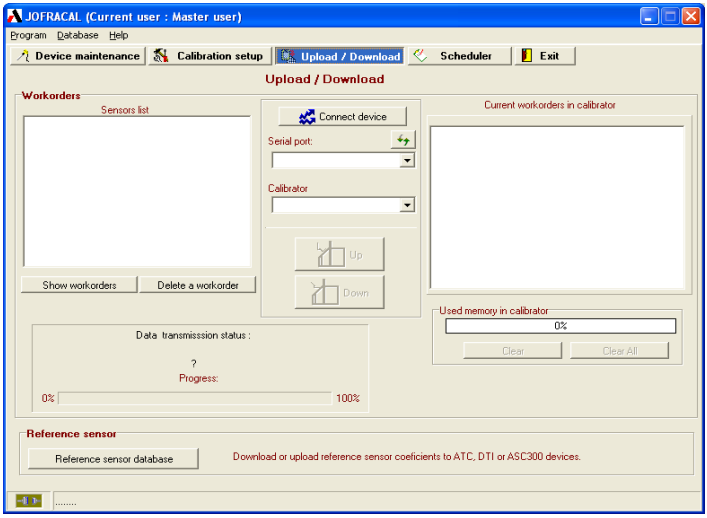
6. UPLOAD/DOWNLOAD

This function can only be used with the following JOFRA calibrators

- ATC-B series (temperature)
- RTC/PTC-B series (temperature)
- ASC321 (signal)
- DPC-500 (pressure)

Using this function with the JOFRA ASC321 signal calibrator allows calibration procedures to be semi-automated. Calibrations are defined in the JOFRACAL 'Calibration Setup' and saved as work orders. These work orders are then downloaded to the ASC321 via the RS-232 interface. Calibrations are run offline with the results saved as in the calibrator, which can be later uploaded to JOFRACAL. The resulting certificates can be later displayed or printed in JOFRACAL.

The Reference sensor panel contains a link to the Reference sensor dialog; however only applies to temperature devices from here.



6.1 Work orders

The calibrator can store up to 32 work orders. These can be deleted from the JOFRACAL interface. When all the calibrator's memory is used, it is necessary to remove (delete) some of the resident work orders before new ones can be downloaded.

6.1.1 Creating a work order

Defining a work order is the same as preparing and running an online calibration (See Section 3 Page 33) with the exception that the user must select Save as a workorder then click Save.

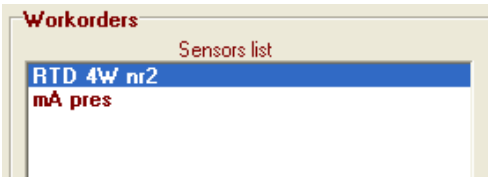


JOFRACAL jumps directly to the Up/down screen with the list of defined calibration work orders, ready for downloading.

6.1.2 The work order list

Click on the Show prepared workorders to display the defined work order calibrations if not already listed.

Work orders ready for download



To delete a defined work order in the JOFRACAL database, simply select an ID from the Sensor list and click Delete a workorder.

6.1.3 Connecting to the ASC321.

To connect to the ASC321, select a serial port, ASC in the calibrator list then click on the connect device button.



After communications are opened successfully, JOFRACAL retrieves the work order list currently in the Calibrator. (See Section 6.1.4 page 57).

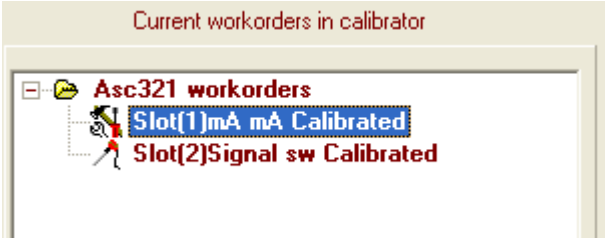
Also Up upload and Down download buttons are active during open communications.

The user can now download or upload calibration procedures to and from the ASC321 calibrator.

6.1.4 Current work orders in calibrator

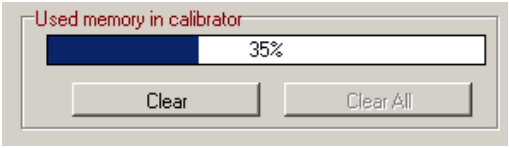
These are listed in the Grid to the right hand side of the page along with details of their completion status. Unlike the ATC, the “as found / as left” status is first decided by the user when retrieved from the ASC321. Status is set to “As left” by default.

List of work orders currently in the **ASC321**



There is also a memory gauge indicating the available space in the ASC321.

Memory usage on the **ASC321**





Delete the selected work order on the ASC321.



Delete all the listed work orders on the ASC321.

6.1.5 Up / downloading work orders

To download a calibration, select a sensor from the work orders list then Click the 

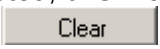
button.
When the download is completed

- The work order ID appears in the ”Work orders in calibrator” grid.
- The work order ID is deleted from the PC’s ”work order” list.
- The ATC memory usage gauge will be updated.

To upload any completed work orders, select from the ”work orders” in “calibrator” list then select the job from the list then click the 

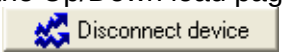
button.

When upload is complete, the certificate can then be viewed from the Viewing certificates in the Device maintenance page. (See Section 2.1.3 Page 25).

☞ The actual workorder in the ASC321 is not automatically deleted, this must be done explicitly by the user through use of the 

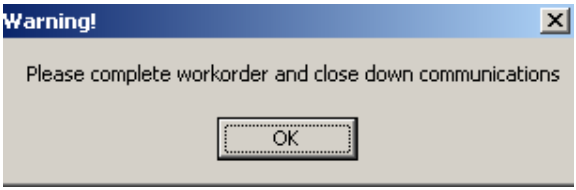
button

6.1.6 Disconnecting the device Up/Download

It is important to disconnect the ASC321 when finished or before proceeding to other areas of JOFRACAL. Therefore JOFRACAL prevents the user from leaving the Up/Down load page until closing communications by clicking the 

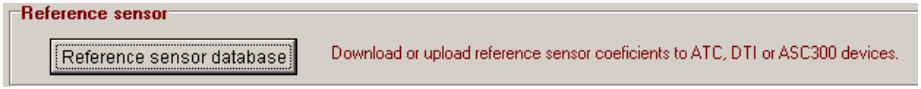
button.

The following warning will appear if the user attempts to leave the Up/Down load page.



6.2 Reference sensor

Allows quick access to the reference sensor dialog click on the Reference sensor database button but **only applies to temperature related devices**.

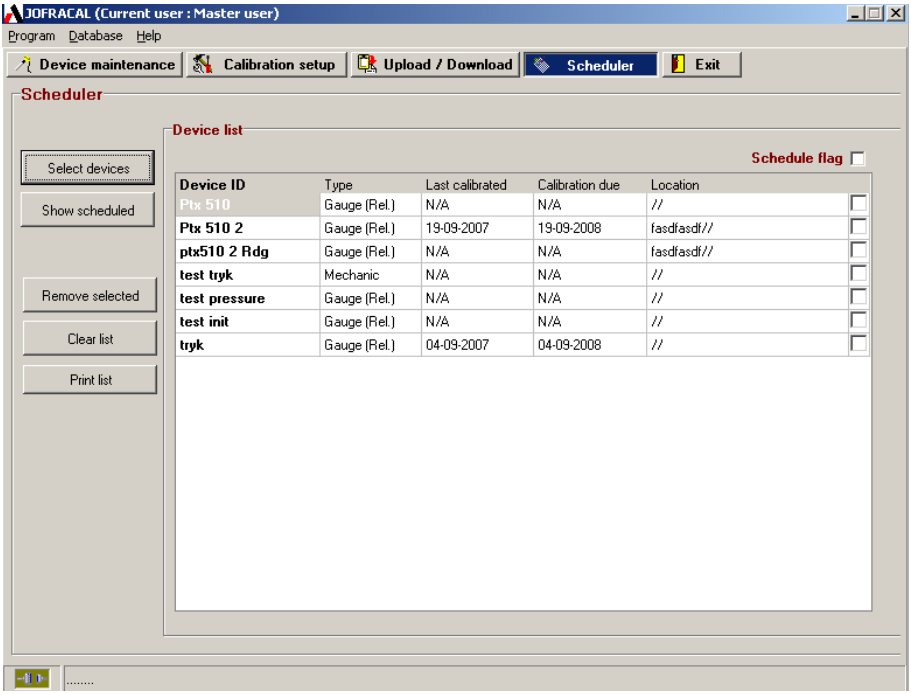


See (Section 5 Page 50) for details regarding maintaining reference sensor databases.

7. SCHEDULER

The scheduler allows a user to easily administrate the calibration of test devices.
Typically a supervisor would build a list of devices due for calibration, flag them for calibration and if required generate a report for those responsible for the actual calibration.

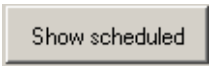
JOFRACAL scheduler page



7.1 Selecting devices

To select devices from the Test device database click the 

button to open the JOFRACAL search dialog.
(See Section 73 Page 9).

The 

button will display all the devices already flagged as scheduled for calibration.

7.2 Scheduling for calibration

The devices displayed in the list can now be scheduled or unscheduled through the checkbox controls on the right hand side.

This can be done on an individual basis by using the checkboxes on each device row 

or

scheduling all devices at once by checking the top checkbox 

7.3 Remove from schedule list



Remove a selected device from the list.



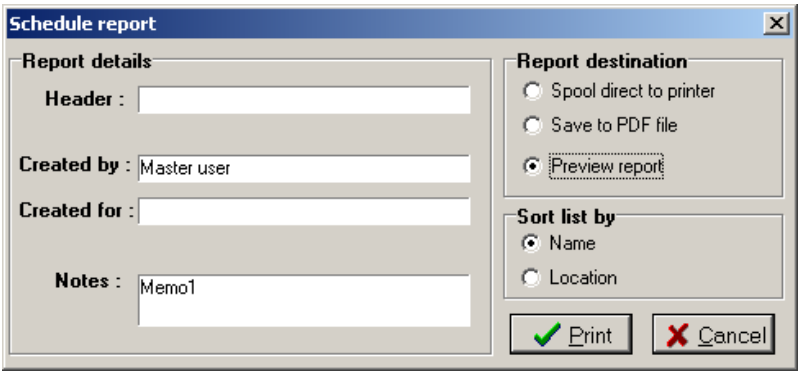
Remove all devices from scheduler list.

7.4 Scheduled devices report

The 

button will generate a report from the listed devices. JOFRACAL requests various report parameters.

Scheduled devices report parameters



To give the report more flexibility, the user can define the following report parameters:

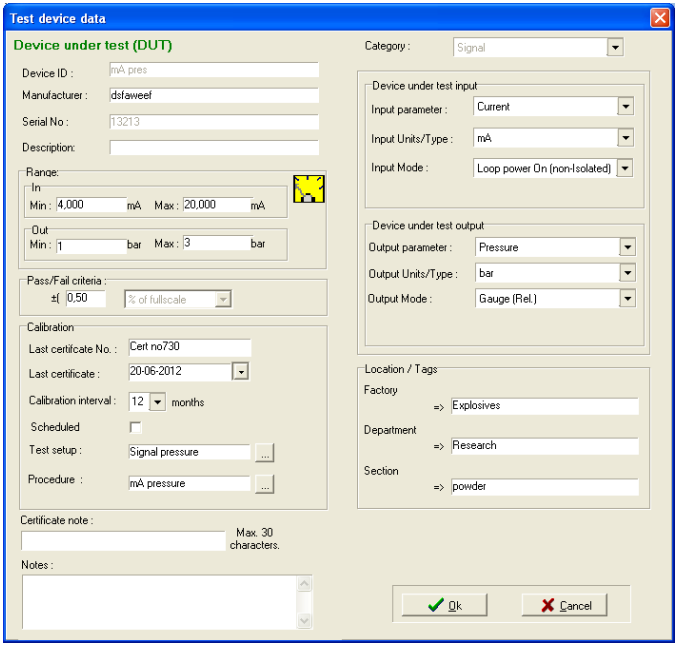
- Report header. Title of the report.
- Created for. Who is the report for?
- Notes. Any relevant comments.

The user can also determine the destination of the report and the sort sequence for the listed devices.

8. HOW TO EDIT A TEST DEVICE

Device under test data form contains the properties of a test device instrument.

Edit test device properties – Maintenance:



☞ Changes can only be made by a user with MASTER access.

8.1 Test device properties

This section describes briefly the fields where you can enter information and where this information is displayed.

8.1.1 Manufacturer

The sensor's manufacturer is displayed on the certificate.

8.1.2 Serial number

The sensor's serial number is displayed on the certificate.

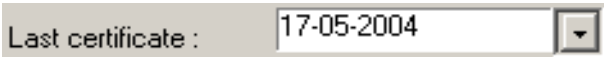
8.1.3 Output/Input properties

Definition of a test device comprise of an input and output components.

- Parameter
- InputUnit/Type
- Mode

See section 8.4 Page 69for complete description of the definition parameters.

8.1.4 Last calibration date



The date of calibration is automatically inserted in this field when JOFRACAL has calibrated a sensor. Any date entered manually will be overwritten when JOFRACAL performs a new calibration using the sensor. The field may be left empty. The current Windows® date format is shown to the right of the field.

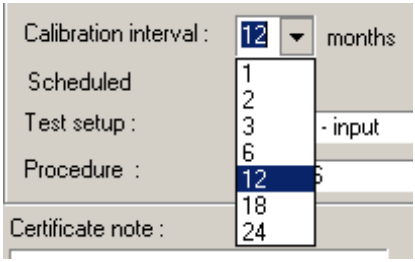
☞ Note. Once a calibration date is inserted, JOFRACAL requires confirmation to change the attributes of the test device.

8.1.5 Last certificate number



JOFRACAL automatically inserts the certificate number of the last calibration. Any text entered will be overwritten when JOFRACAL performs a new calibration using the sensor.

8.1.6 Calibration interval

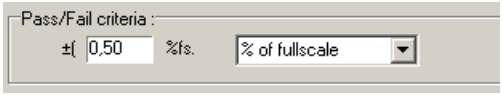


Define how often the test device should be calibrated by selecting the interval (months) from the dropdown list. JOFRACAL uses the interval together with the last calibration date to warn uses of outdated test devices.

8.1.7 Scheduled

Check the control to mark the test device as scheduled.

8.1.8 Pass/Fail criteria



Pass/Fail criteria are defined as a percent of Full scale and is determined by a percentage of the test devices full scale.

Example:

The Pass/Fail criterion is specified as **±1.5% %fs** and the test device pressure range = **2 bar to 10 bar**.

(MaxRange - MinRange) x (perc value / 100)
(10 - 2) x (1.5 div 100) = ±0.120bar.

8.1.9 Notes

This field may be used to enter a comment about sensor usage (maximum 240 characters). Not displayed on the certificate.

8.1.10 Certificate note

This field may be used to enter a certificate comment (maximum 29 characters).

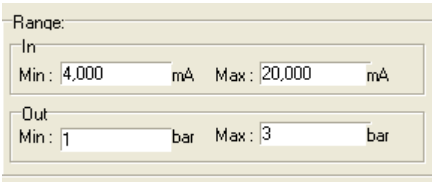
8.1.11 Sensor location tags

Each test device has 3 location parameters to the identification and search process. The operator determines how many location levels are implemented.

These are optional. The explanatory location labels can be changed in the System Setup, see section 11.4.1 page 94.

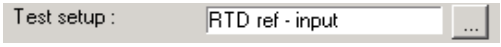
8.1.12 Input/Output ranges

This is used to specify the sensor's admissible input and output ranges for the test instrument. When the calibration procedure is set up, JOFRACAL controls whether the given test pressure points are admissible, i.e. whether the set points are within the ranges of the sensor.



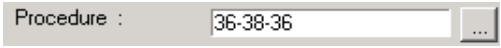
8.2 Defining a test device calibration setup

It is possible to create or assign an existing calibration setup definition from within the "Edit test device" dialog.

Click on the select  button to define the Test setup. See (Section 3 page 33)

8.3 Defining a test device Procedure

It is possible to create or assign an existing procedure definition from within the "Edit test device" dialog.

Click on the select  button to define the calibration test points. See (Section 3.3 page 39)

☞ **Note. There is not procedure definition for the Switch pressure calibration.**

8.4 Defining a device type

Every test device has the following properties, which completely describe its attributes.

8.4.1 Category

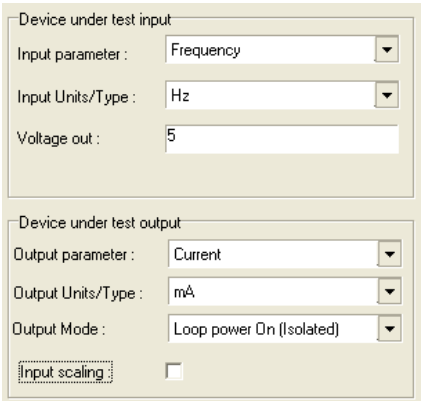
There are 3 fields of measuring JOFRACAL will work in:

- Temperature (See JOFRACAL temperature manual)
- Pressure (See JOFRACAL pressure manual)
- Signal (See Section 8.4.2 page 69)

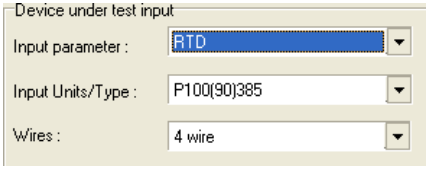
Each category offers a different set of Device type options, as do different device types offering a different set of Sub types and output unit options.

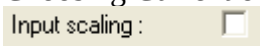
Details of the definition components can be found below.

8.4.2 Signal device definitions



The options available in the 2nd and 3rd tier controls are dependent upon the selection of the upper parameter.
Eg. RTD would list the RTD types and the number of wires.



Choosing Current or Volt (scalable) in output displays the  control.

A complete list of the array of options for signal test devices are listed below.

Input :

Parameter	*Input Units/Type*	*Mode*
Current	mA	Loop On/Off
Volts	V	-
Millivolts	mV	-
Resistance	Ohm	-
Thermocouple	TC type	CJ on/off
RTD	Rtd	2,3,4 wire
Frequency	CPM, Hz, kHz	Voltage out
Manual	All parameters	(°C),(°F),CPM,Hz,kHz

Output :

Parameter	*Input Units/Type*	*Mode*
Current	mA	Loop On/Off
Volts	V	-
Millivolts	mV	-
Resistance	Ohm	-
Thermocouple	TC type	CJ on/off
RTD	Rtd	2,3,4 wire
Frequency	CPM, Hz, kHz	Voltage out
Pressure	Unit of measure	
Switch	-	
Manual	All parameters	(°C),(°F),CPM,Hz,kHz

Available pressure unit types.

There are 3 categories of test sensors:

- Gauge(relative)
- Absolute
- Difference

The following pressure engineering units are can be used depending on the logging devices.

- Bar,
- MBar,
- PSI,
- Pa,
- MPa
- HPa,
- KPa,
- kgcm2,
- cmH204C,
- cmH2020C,
- mH204C,
- mH2020C,
- mmHg0C,
- inHg0C,
- inH204C,
- inH2020C,
- inH2060F,
- ftH204C,
- ftH2020C,
- ftH2060F,
- Torr
- CmHg
- MmH20

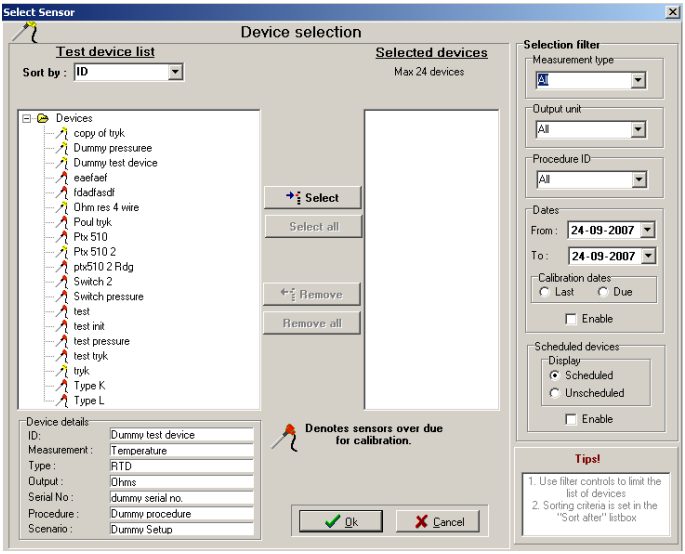
9. USING THE DEVICE SEARCH DIALOG

The Test device search dialog is used to select one or more devices from the test device database depending from where it is called.

The list of test devices available for selection appears in the left panel while those selected appear in the right.
The test device list is in a typical Windows file browser format where maps can be folded or unfolded.
As the user navigates through the device list by mouse or cursor, details of the individual sensors can be seen below the list in the “device details”. The highlighted device can be selected either by a double mouse click or by clicking on the 

Select button.

Device search & selection dialog:



9.1 Selected / deselecting

Depending on where the search dialog is called from, the following controls are used for the selection process.



- Select the highlighted device (or Double mouse click)



- Select all devices listed (when called from the scheduler)



- Remove the highlighted device from the selected list.

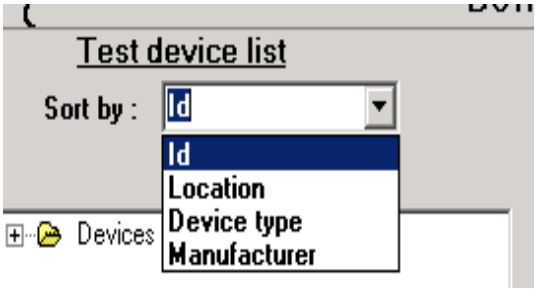


- Remove all selected devices.

9.2 Sorting devices

Devices can be grouped and sorted according to their type, location, manufacturer or ID.

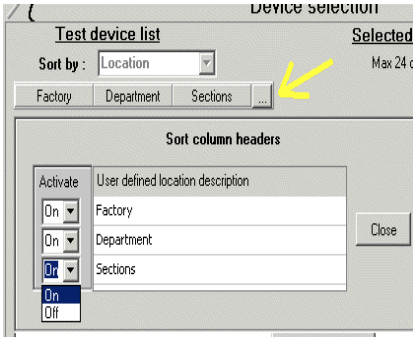
Sorting parameters



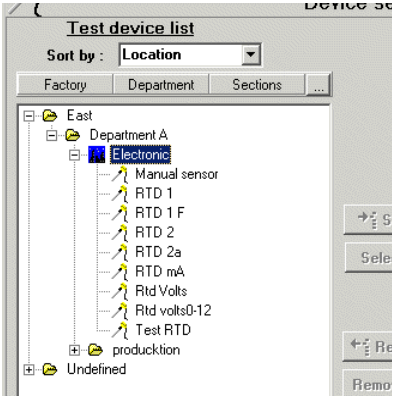
9.2.1 Sorting by location

When sorting by location, the user can determine the levels of grouping/sorting by clicking the define button indicated by the yellow arrow. The defined location levels can be activated or deactivated as desired.

Location sort parameters:



Devices sorted by location:



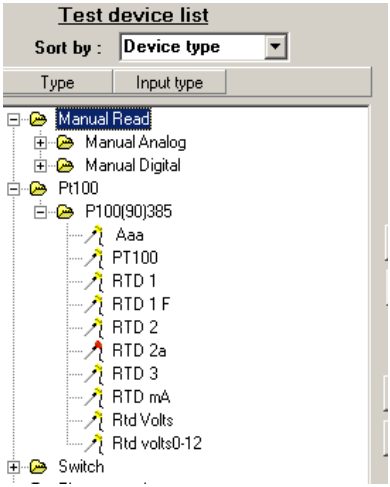
The location descriptions are defined in the system configuration.
(See Location labels Section 11.4.1 Page 94).

☞ Note! It is essential that the users are careful with the keying of device location parameters for the location sorting to work correctly.

9.2.2 Sorting by device type

Devices are listed according to their type and subtype.

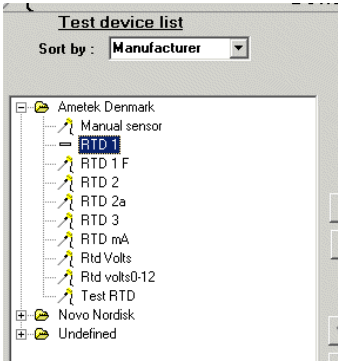
Devices sorted by device type:



9.2.3 Sorting by manufacturer

Devices are listed according to their manufacturer.

Devices sorted by manufacturer:

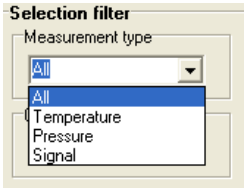


9.3 Selection filters:

The selection filter controls can refine the list of displayed test devices to a manageable level. There are several parameters the user can use to reduce the displayed devices.

9.3.1 Filter with device type and output unit

Type, output filters



Measurement type:

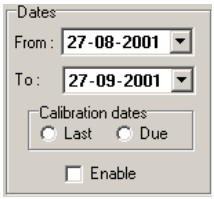
- Temperature
- Pressure
- Signal

Output units: (not applicable to Signal)

- Native (Ohms, mV, switch, manual)
- mA
- Volts

9.3.2 Filter with dates

Date range filters

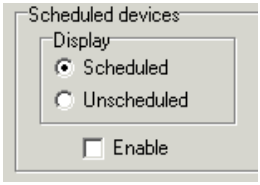


Display devices within certain dates. The date range can be applied to either last calibration or calibration due.

To activate the date range, check the  checkbox.

9.3.3 Filter using the device scheduled property

Scheduled property filters

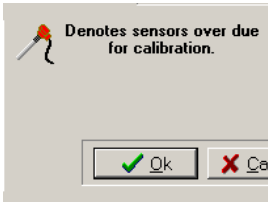


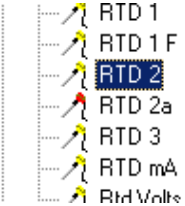
All test devices contain a scheduled flag property. This can be used to filter the listed devices.

To activate the date range, check the  checkbox.

9.3.4 Due for calibration indicator.

All test devices due for calibration are listed with a red icon.


Denotes sensors over due for calibration.
Ok
Ca


RTD 1
RTD 1 F
RTD 2
RTD 2a
RTD 3
RTD mA

10. ONLINE CALIBRATION

The online **calibration** page enables the user to run and follow progress of a calibration.

The online **calibrating** page tab 

is only visible when an online calibration is in progress and actually replaces the **EXIT** tab.

Directly after clicking 

from the calibration setup page, the user is presented with either the single device calibration form or the multi device calibration form, depending on the number of test devices.

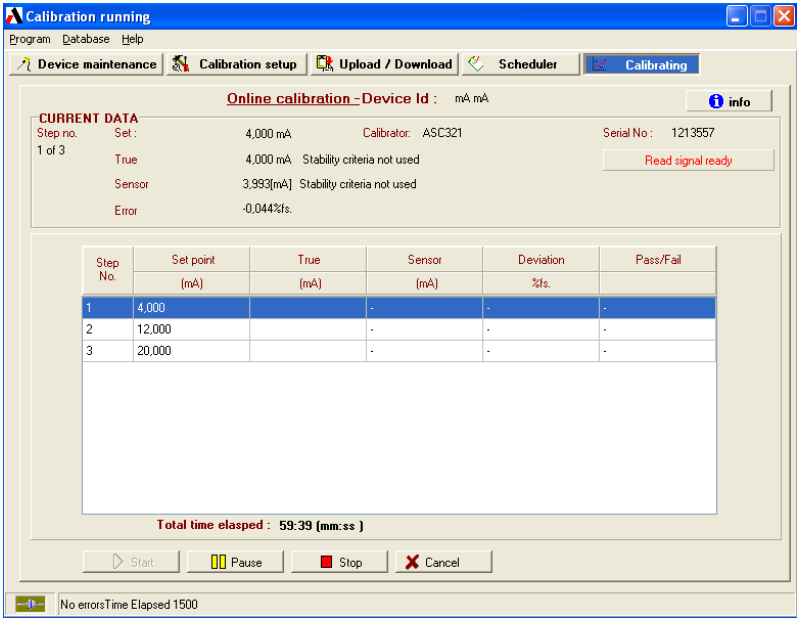
Communication lines have been established and JOFRACAL awaits the 

command from the user.

10.1 Single device calibration

When calibrating a single device, the data grid rows represent the test points for the calibration. The current steps' reading can be seen in the "Current Data" area.

Single online calibration form:



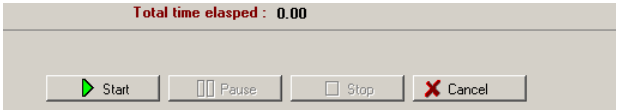
10.2 Online control buttons

Only the **Start** and **Cancel** buttons are enabled which are used to begin and cancel the online calibration.

No data is logged initially. Start the calibration process by clicking 

.

Online control buttons



When the calibration is in progress, the remaining control buttons are enabled.

The 

button closes down the calibration completely and returns to the Calibration setup page.

To interrupt the calibration process, click 

. Click 

again to continue the process.

To stop the calibration, click the 

button. The 

is then enabled to allow the user to restart the calibration at test step 1, and all previously logged data is deleted.

10.3 Calibration completion

When the calibration is complete, the 

button appears allowing the user to close and save the calibration results as a certificate.



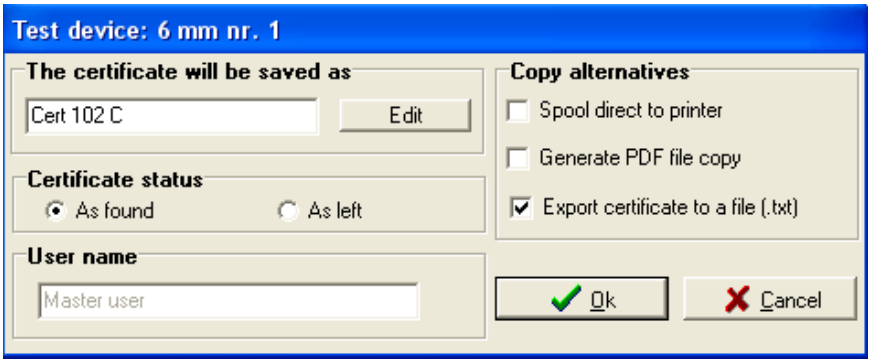
The user is asked if the results are to be saved. If Yes, then the

'Save certificate' form is displayed.

10.4 Saving the calibration certificate

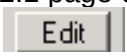
When the user chooses to save the calibration results the following screen is presented.

Save results as certificate dialog



The default values when the Window is displayed are defined in the system configuration. See (Section 11 page 89).

10.4.1 Certificate name

If Automatic certificate number applies (see Section11.2.1 page 90), it is still possible to edit the default certificate ID by clicking 

button.

10.4.2 Certificate copy alternatives

Apart from saving the certificate to the database, copy of the certificate can be also:

- **Sent direct to the printer** 

- **Saved as a PDF file** 

- **Saved to text file**. 

10.4.3 AsFound AsLeft

Define the certificate status by checking the relevant control.

AsFound AsLeft



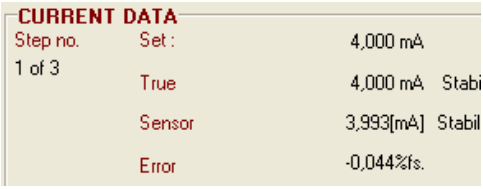
10.5 Online Information

Information regarding the ongoing calibration can be viewed by clicking on the 

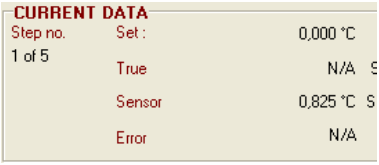
.

10.6 Reading of data from devices

Data is read from the connected device(s) and displayed in the top left *CURRENT DATA* box. The live data consists of the true pressure reading and the device under test value either in pressure or the measured unit (mA, Volts etc.)



If the test device is configured to manual input, the corresponding fields will be shown as Not applicable.



☞ JOFRACAL retrieves data from the devices approximately once every second. A change in, for example, the calibrator switch input will, therefore, be displayed by JOFRACAL up to one second later.

10.7 Logging results.

Signal calibration is not automated, there is no stability requirements to initiate the logging of results, this is done by user action.

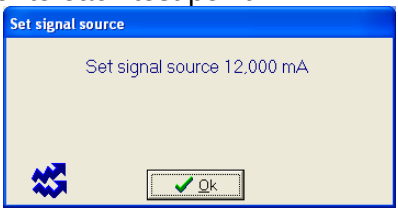
When the operator is satisfied the test stability conditions are fulfilled and ready for logging, the user must manually initiate reading.

To log the current reading the click the 

button to save the results.

10.8 Manual input.

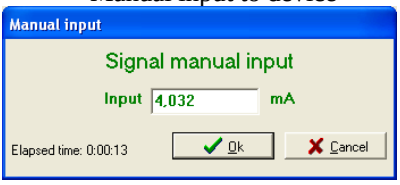
If “Manual” is the input method to the test device the following dialog is displayed prior to each test point..



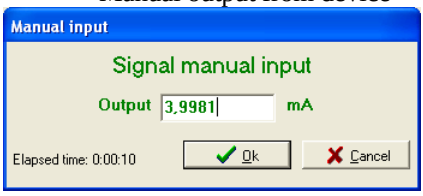
When the 

button is selected the following dialog is displayed for the manual input value.

Manual input to device



Manual output from device



Otherwise the device(s) are read and logged automatically.

11. SYSTEM CONFIGURATION

Click ‘program’ from the main menu then select ‘system configuration’.



The system configuration dialog consists of 5 main areas:

- Company information
- Certificate configuration
- User registration
- Default measure units
- Miscellaneous

System setup - menu:



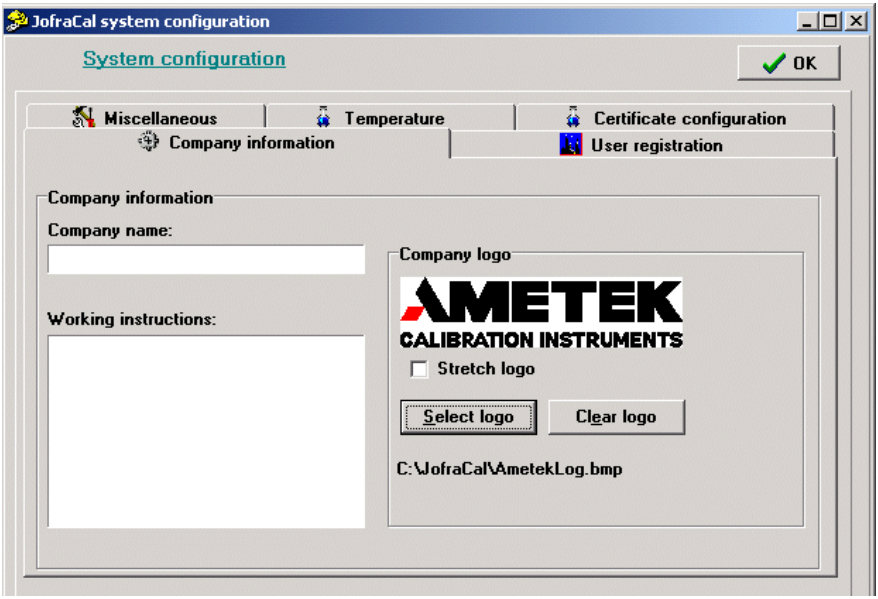
These options are described in the following sections.

11.1 Company information

Click 

to edit company information.

System setup - company information:



There are three main parameters:

11.1.1 Company name

The name is inserted at the top of all new certificates.

11.1.2 Working instructions

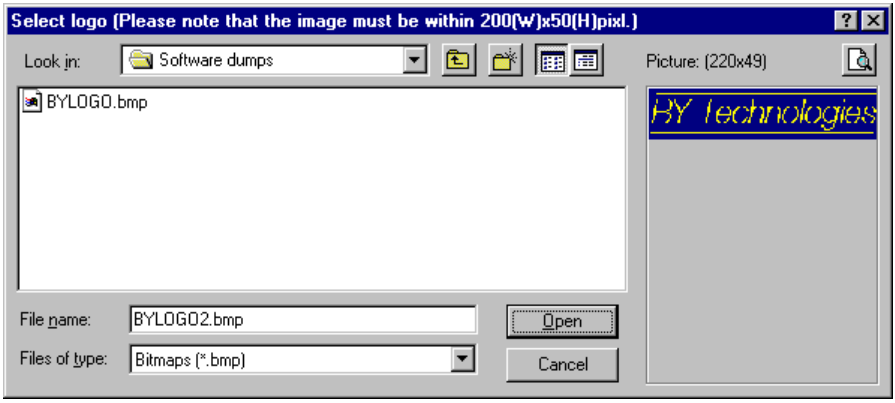
Working instructions are inserted on all new certificates immediately below the company name. The field may be used to enter general information.

11.1.3 Company Logo

This inserts a logo in the top right-hand corner of your certificates. The logo is included as a Bitmap (*.BMP) file. For the best results, the logo should have the dimensions 200 x 50 pixels. However, if the logo does not match these dimensions exactly, it can be stretched to fit.

To include a logo in your certificate, Click Select logo and use the Select Logo dialog to locate and select your logo.

System setup – select logo:



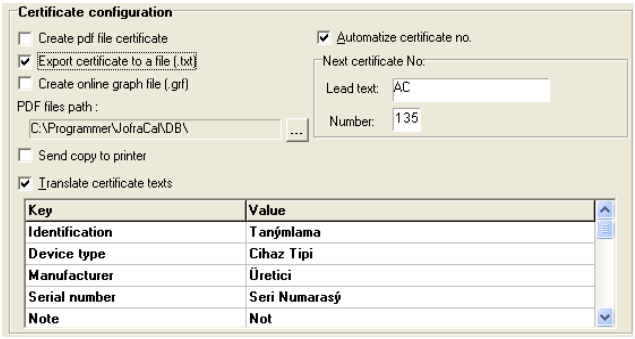
If, as in the example above, your logo does not fit the 200 x 50 pixels, use the *Stretch logo* option to fill out the space. However, note that this may result in your logo being distorted.

To change the logo, repeat the above step. To remove the logo from your certificates click Clear logo.

11.2 Certificate

Click on the Certificate configuration page tab to edit the certification setup.

System setup - certificate:



The certificate setup consists of three parts, certificate numbering, default output selection, (PDF, text & graph files) and certificate translation.

11.2.1 Certificate numbering

All certificates are assigned an ID as they are created. JOFRACAL can be set to two possible numbering methods:

- Automatic numbering. If you select this option, IDs will consist of a *Lead text* (which you define) followed by a consecutive number. You define the first number in the series, e.g. *AMETEK certificate No. 7*. The Lead text (*AMETEK certificate No.*) and the number (*7*) are automatically separated by a space.
- Manual numbering. The ID must be entered manually when a new certificate is created. JOFRACAL checks whether the ID assigned to the certificate is already in use. Two certificates may not have the same ID.

Three parameters are used to control certificate numbering:

11.2.2 Automatic numbering of certificates



Check this field if you want JOFRACAL to number certificates automatically.

11.2.3 Next certificate - lead text

Only used with automatic numbering. The field contains the fixed text for the certificate ID.

11.2.4 Next certificate - number

Only used with automatic numbering. The field contains the number of the next certificate. Certificates are numbered consecutively.

11.2.5 Certificate translation

All certificate texts can be translated. This option may be used if a different language or different explanations are required. Certificate translation is based around a table and a number of additional parameters.

☞ Please note that translated texts are not saved with each certificate. This means that when a certificate is printed using the translated texts, the current translated texts are used. This may lead to confusion if the meanings of texts are changed once a certificate has been generated and the certificate is reprinted at a later date.

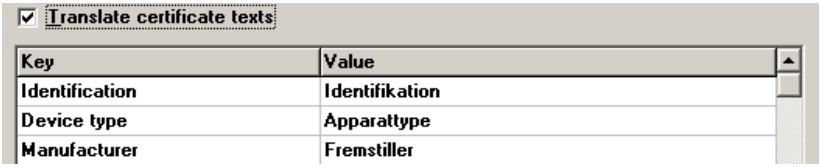
11.2.6 Translate certificate texts

Check this field if you want JOFRACAL to translate all certificate texts. The original English texts will be used if the field is not checked.
Arial typeface supports text in all languages.

11.2.7 Translation table

The table consists of two columns. The left-hand column contains the original English texts, while the right-hand column contains the translated texts. Initially, the two columns are identical. Please note that only the right-hand column may be edited.

Certificate translation table



The translation text is stored in a file: AmTransl.INI. This can be edited manually, but it is recommended that edits be made from JOFRACAL.

11.2.8 Certificate output defaults.

Set the default output for when the calibration is complete and the certificate is generated.

- Save a copy in PDF format and select the location.
- Save the online graph file.
- Send copy to the printer.
- Export certificate data to text file.

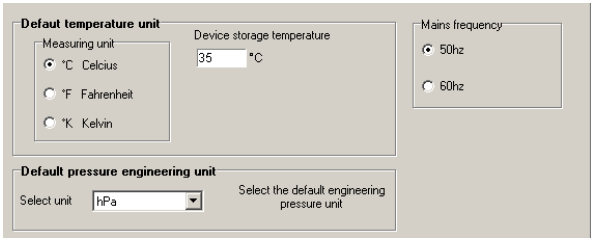
- The export function creates a semi-colon separated file, which can be imported to Microsoft Excel or Access.

11.3 Default measure units

Click on the 

page tab in system setup to edit the measuring related parameters for temperature and pressure.

System setup – Default measuring units



The window contains the following parameters:

11.3.1 Default temperature measuring unit

JOFRACAL incorporates the following three temperature units:

- Celsius (°C)
- Fahrenheit (°F)
- Kelvin (K)

11.3.2 Default pressure engineering unit

Select the preferred pressure unit from the below list.

- Bar,
- MBar,
- PSI,
- Pa,
- MPa
- HPa,
- KPa,
- kgcm2,
- cmH204C,
- cmH2020C,
- mH204C,
- mH2020C,
- mmHg0C,
- inHg0C,
- inH204C,
- inH2020C,
- inH2060F,
- ftH204C,
- ftH2020C,
- ftH2060F,
- Torr
- CmHg
- MmH20

11.3.3 Storage temperature

(Temperature only)

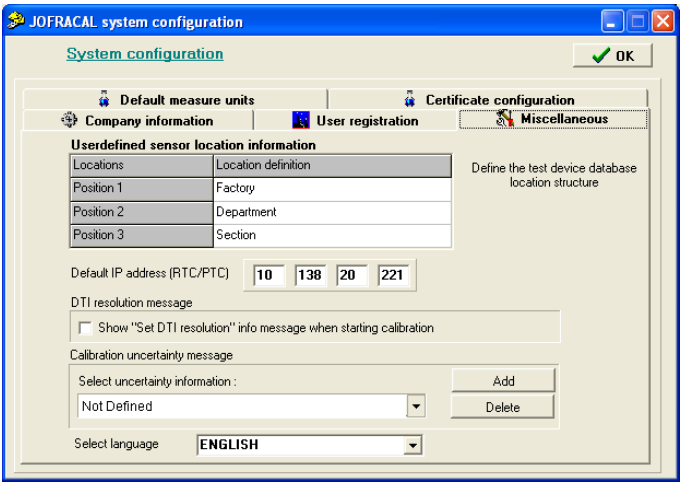
11.3.4 Mains frequency

Frequency parameter sent to ASM-80x during configuration.

11.4 Miscellaneous

Click on Miscellaneous page tab in system setup to edit various parameters:

System setup - miscellaneous:



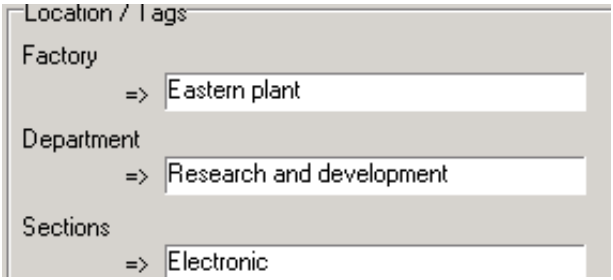
The window contains the following parameters:

11.4.1 User defined sensor location labels

Location: The miscellaneous page allows the user to define the devices' location structure. Each test device has 3 location parameters to simplify identification and search of a device.

The example below from the test sensor selection & editing window uses all 3 levels starting with a factory ID, department and finally sections.
(See **Sorting by location** section 9.2.1 page 74).

Sensor under test window – location tags:



11.4.2 IP address for TCP/IP Ethernet communication

(RTC/PTC - Temperature only)

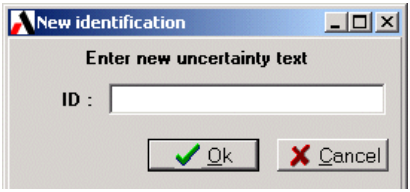
11.4.3 DTI resolution message

(Temperature only)

11.4.4 Calibration Uncertainty information

This field allows you to type in comments about factors that may affect the reliability of the calibration. These comments are stored in a database and can be displayed when a calibration commences. Select from the previous defined comments from the dropdown list.
To define a new uncertainty description, click on the Add button.

Uncertainty description



Type in the new description and click OK.

11.4.5 Language selection

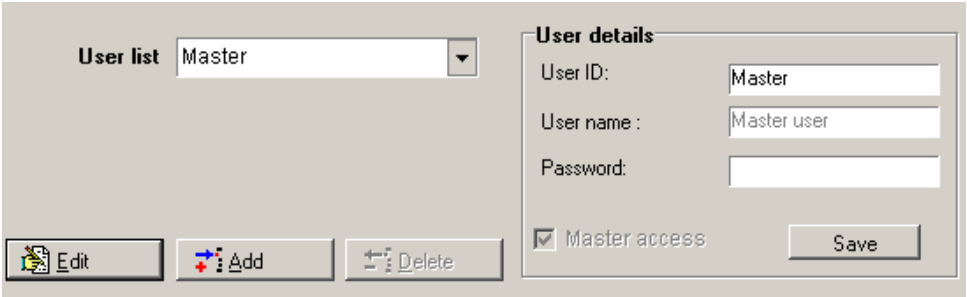


JOFRACAL is now available in several languages. The available languages are restricted by the licence which is downloaded on installation. Select the desired language from the available languages in the dropdown list. Default is English.

11.5 User registration

Click on the 

page tab in system setup to define user's ID, name and Password. Check the Master access to allow the user full access to JOFRACAL.



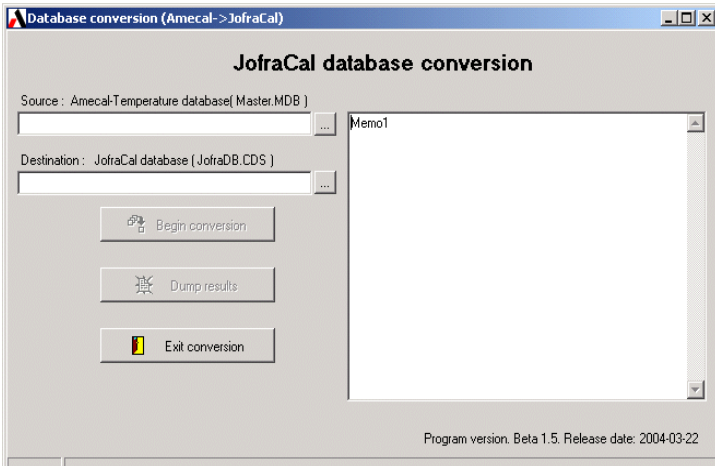
11.6 Database Conversion program

The database conversion program converts an existing Amecal-Temperature database (MSACCESS) to a JOFRACAL database
(Client dataset based database - CDS files).

This is done using the conversion program that is installed together with JOFRACAL.

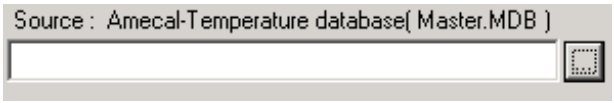
1. Click *Start*.
2. Select *Programs*.
3. Select *JOFRACAL*.
4. Select *Database conversion*.

Database conversion program

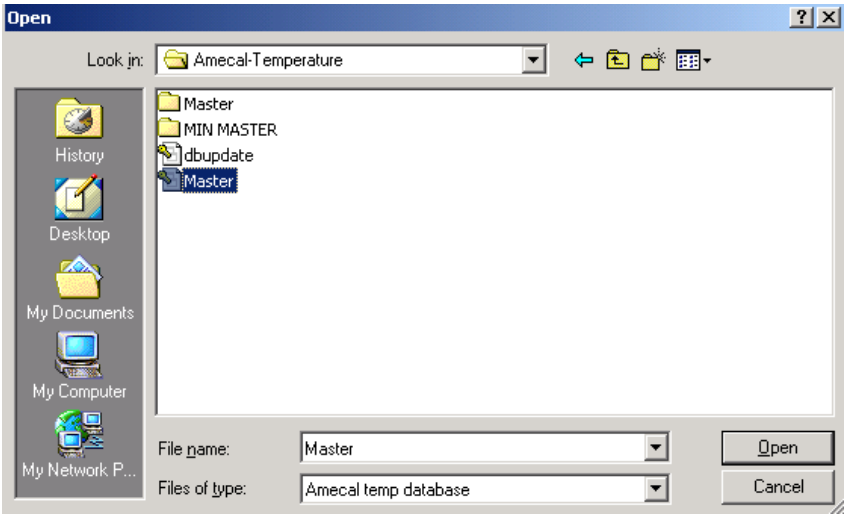


11.6.1 Selecting the Amecal-Temperature database

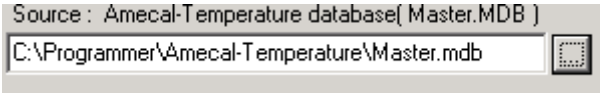
Click on the Select button to find the **Source** database.



A standard windows search dialog is displayed.



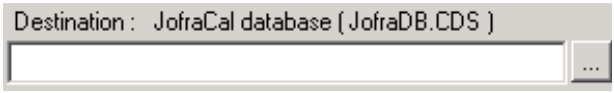
Locate and select the Amecal-Temperature database file and click open.

The 

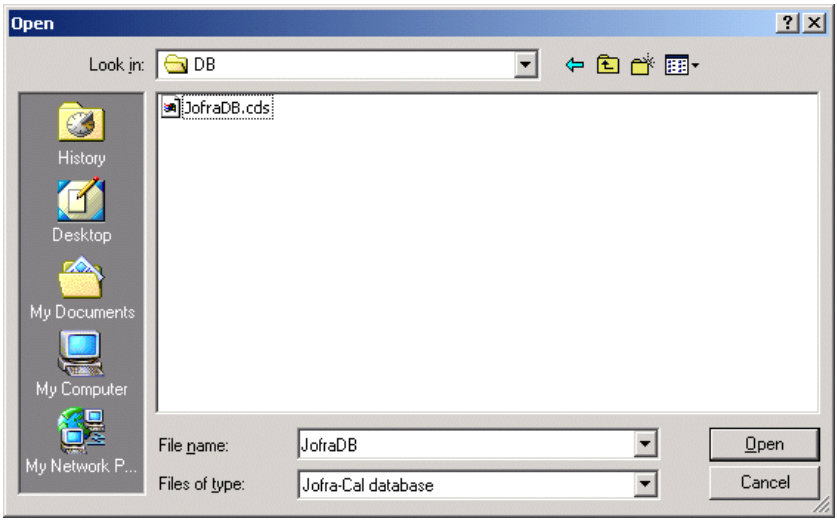
file path is now displayed in the source component.

11.6.2 Selecting the JOFRACAL database

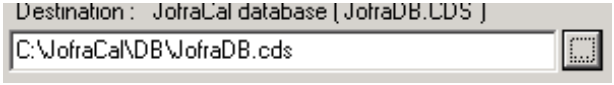
Click on the Select button to find the **Destination** database.



Using the same windows search dialog, locate the JOFRACAL database. JOFRACAL.CDS file.

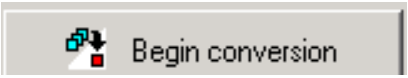


Locate and select the JOFRACAL database “JOFRACAL.CDS” file and click open.



The file path is now displayed in the source component.

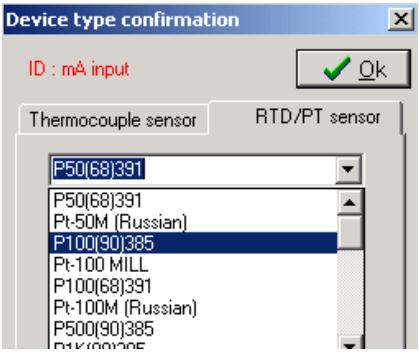
11.6.3 Running the conversion

To begin the conversion, click the 

button.

Occasionally the program requires more information to ensure that the correct data is converted and will prompt the user to determine a Test device type.

Define the type and subtype



Select the type and/or subtype of the test device then click OK.

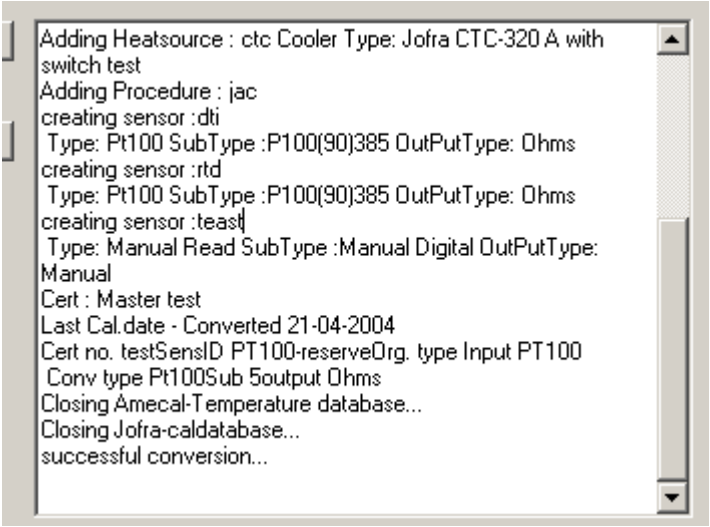
11.6.4 Conversion log panel

Progress of the conversion can be seen in the scrolling window to the right of screen.

A scrolling screen displays the conversion of

- Test devices
- Heat sources
- Procedures
- Certificates

Conversion log window



The last line of the log file will report if the conversion was successful or was aborted.

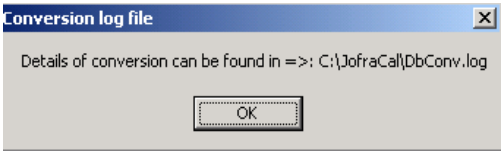
11.6.5 Close and save the conversion details

When completed, the user has the possibility to save the conversion log details to a file.

Click the 

button to save details to the "DBConv.log" file saved in the JOFRACAL folder.

The conversion program informs the user where the file is saved.



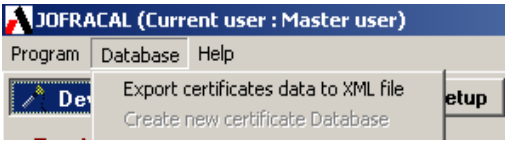
To close, simply select the 

button.

11.7 Export certificate database

It is possible to export the contents of the certificate database to an external file in XML format. XML is a widely accepted standard and compatible with most database systems.

From the top menu in the main form under database select 'Export certificates data to XML file'.



The following message informing the user where the data is saved is displayed.



Both pressure and temperature certificates are saved in the default database folder.
File containing pressure -> prcertifile.xml.
File containing temperature -> certFile.xml.

APP. A. SERIAL COMMUNICATION

The PC and the JOFRA devices must be connected using the correct type of serial cable. Use a JOFRA cable and ensure that the device is switched off when you connect the cable from the PC. Both the device and the PC should be earthed to avoid noise interference and damage to the equipment. The PC and the device should also be connected to the same mains circuit.

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Signal Instruments
Process signal measurement and simulation for easy control loop calibration and measurement tasks.

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Materials testing machines and software that guarantees expert materials testing solutions. Also covering Texture Analysers to perform rapid, general food testing and detailed texture analysis on a diverse range of foods and cosmetics.

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