User Manual

Visual Factory Calibre 25

Revision January 2025

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CHAPTER 1

What is Visual Factory Calibre?

Visual Factory Calibre is a powerful software application that manages all aspects related to the implementation and management of a Calibration Plan in accordance with the guidelines set by current standards: ISO 9000:2015, ISO/TS 16949, MSA 4, EA-4/02 M:2013.

Note	See the References Chapter in the Calibration Guide for additional information on the standards used

The program covers the three basic sections that make up any Calibration Plan:

- Manages the inventory of all measuring instruments and equipment available in the company. This inventory documents all aspects of each device, including, in addition to the equipment's own data, the measurement process to be followed, the format of the data collection sheet, the different controls to be carried out (calibration, verification, etc.) and their periodicity.
- It allows systematic and scheduled testing of the equipment, according to the defined procedures and defined controls (calibration, verification, etc.).
- It guarantees the traceability and uncertainty of the measurements that are made by maintaining a link between the different existing measuring instruments and the standards used in each case to calibrate them.

Main features of the application

The main features of Visual Factory Calibre are as follows:

- Grouping of measuring equipment into Families. In each family we will define the most important parameters of the equipment: controls to be carried out, configuration of these controls, procedure... It can be said that the family constitutes the template that will be used to create each of the Equipment.
- Complete Equipment sheet. The equipment file reflects all the Possibilities that identify the equipment, the configuration of controls to be carried out, the patterns that are normally used and all its history.
- It allows you to configure different controls (calibration, verification, R&R, reception...). Each of these checks can be assigned the period in which it should be performed.
- There are two ways to carry out the tests: using the standard formats provided with the application and using formats designed with Microsoft EXCEL. The former are based on standard calibration and verification procedures. The latter allows the user to define their own procedures for acquiring and calculating results, but with the particularity that the Visual Factory Calibre data and the Excel sheets are fully integrated.
- The application provides an example base with a multitude of procedures applied to the most common measuring equipment. This example base can be the starting point for the user to start designing their own Calibration Plan.
- By configuring views and reports it is possible to obtain all the necessary information related to equipment, control planning, labels, etc.
- All reports can be viewed on the screen, printed, exported to PDF files and sent by mail.

- It allows different configuration and parameterization possibilities to adapt the application to the needs of each company.
- Starting with version 23 of Visual Factory Calibre, it is only possible to use MS SQL Server databases.
- There is a specific edition for the pharmaceutical sector that includes compliance with FDA (Food and Drug Administration) CFR 21 Part 11. This version also complies with the requirements specified in ISO 17025.
- It allows you to view the screen literals in Spanish and English.
- There are different modules to expand functionalities that can be attached to the Professional edition.

Documents of interest

In addition to this manual, the following documentation is provided with the application:

Note: All additional documentation can be found in the Documents folder of the media used for the installation.

Installation Guide

Explain in detail the installation process for Visual Factory Calibre.

This document is primarily intended for IT staff, who are the ones who typically perform the installation.

In this guide, you'll also find how-to's for installing and initializing SQL databases.

Calibration Guide

This guide is intended to help the user design the Calibration Plan. This document includes the following chapters:

- References to national and international standards related to calibration and verification.
- Elements involved in the Calibration Plan.
- Uncertainty calculation.
- Datasheet formats used by Visual Factory Calibre.

Visual Factory Calibre Extension Modules

Along with the user manual for the main functionalities of the application are the extension-specific manuals available in Visual Factory Calibre.

These expansion modules are:

- Access by departments and/or sections. It allows you to configure access to computers for each user depending on the department and/or the section they belong to.
- Location management. Keep track of the entry and exit history of each of the equipment to the warehouse.
- Usage control. It allows you to check the equipment by days of use. Use the location management module to track how long a piece of equipment is operational.

- Management of inputs and outputs to the laboratory. It records the inputs and outputs of the equipment to the laboratory from production, and the inputs and outputs from the internal laboratory to external laboratories to perform external calibration.
- Email notifications. It allows you to configure notifications that will be sent by email to different users, depending on the department or section associated with each Equipment.
- Generation of PDF certificates. Automatically make a copy of the PDF certificate. This module is a must-have for the Visual Factory Calibre WEB query application.
- Approval cycle. It allows you to define an editing, reviewing, and approval cycle for each of the controls performed.
- Digital signature. Allows you to sign certificates using a digital signature based on a certificate from a CA (Certificate Authority)
- Management of Equipment, instruments and relationships. Differentiation of equipment according to these concepts.

Visual Factory Application Framework

This manual is common to all Visual Factory applications. It explains all the functionalities that are common to all programs.

In this manual you will find:

- How to change the literals that appear in the app.
- How to define views to present the information of the different modules according to your needs. When you define a view, you can: filter the information, sort it, group it, change the format, define the printing conditions...
- Define the subviews that contain the detail of the different records in the application. For example, defining the detail that appears within the results history on a Equipment card.
- Define users and manage their permissions.

Visual Factory Reports

This manual is common to all Visual Factory applications. It explains in detail and at a general level how the report designer integrated with the application works.

CHAPTER 2

Introduction to Visual Factory Calibre

This manual includes information about using Visual Factory Calibre. Please refer to the "Installation *Guide*" for installation information and additional documents that are attached to the application.

This manual is complemented by the "Visual Factory Application Framework" manual, which describes the operation of the elements common to all Visual Factory applications.

Access to the app

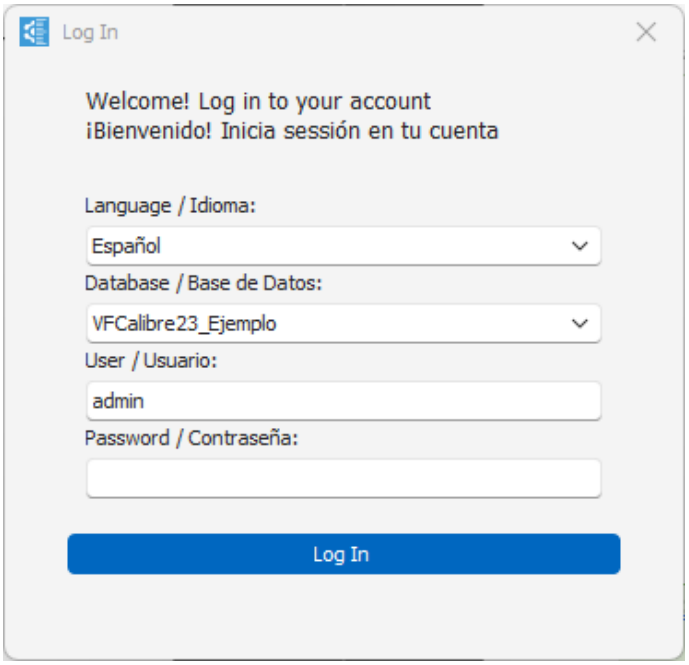
You can access the app using the shortcut on the desktop created in the installation.

You can also access it by searching under All Programs from the Windows Start button.

Starting the app

While Visual Factory Calibre is starting, the program displays a first window with the version number and the activated modules according to the serial number purchased:

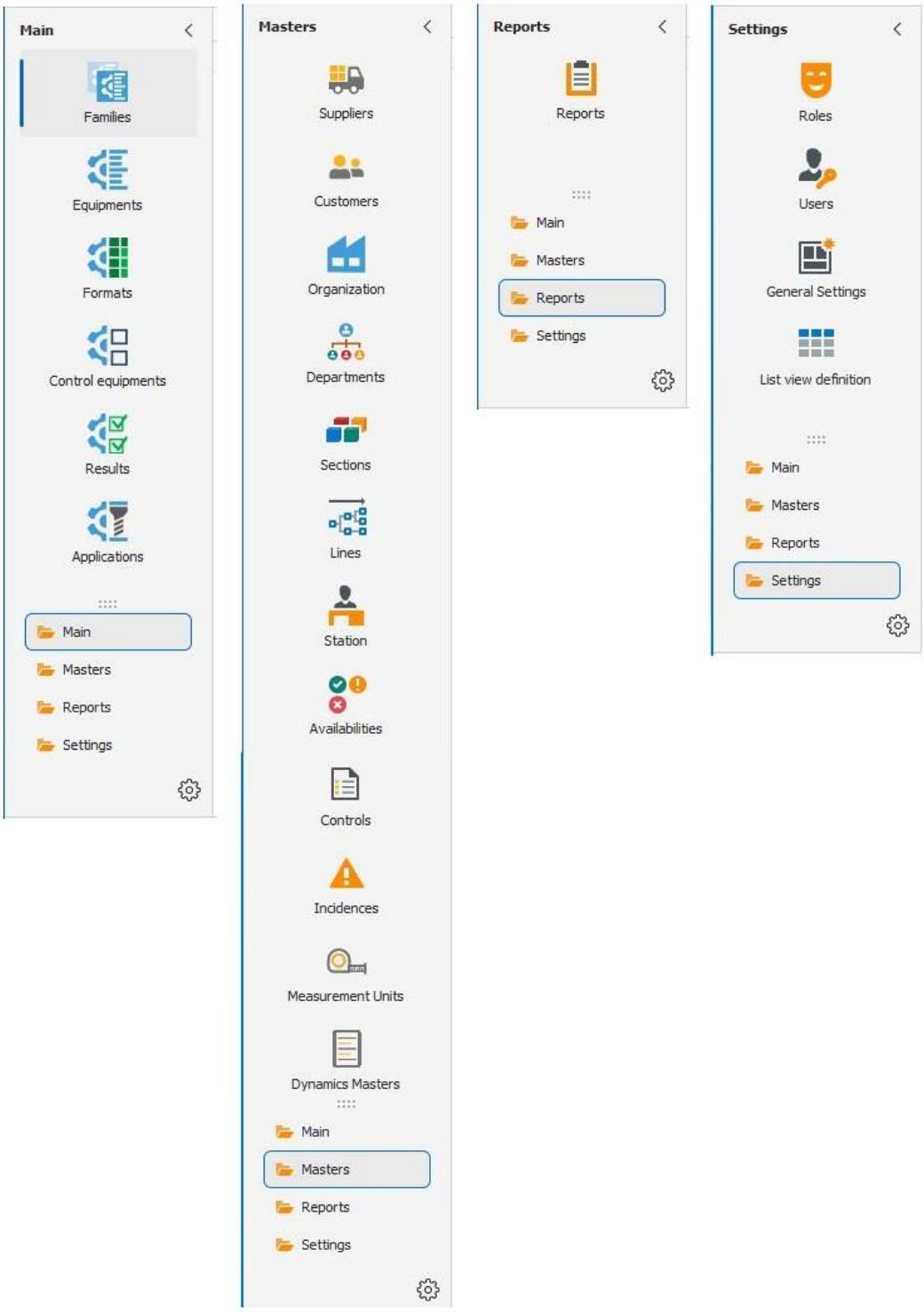
The Visual Factory Calibre then displays the sign-in window with the user who is logged on to Windows. In this window, you can select a language from the existing ones, and you must enter the Windows login password:



Note: See Visual Factory Calibre Installation Guide for Configuring Multiple Databases. See the Getting Started with Application Chapter of the Visual Factory Application Framework manual for more information.

Structure of the application

The different modules of the application can be accessed via the charm bar located on the left of the main screen.



The access bar is divided into three groups:

- **Main**. In this group are the modules that will be used normally:
  - **Families**. It allows you to configure equipment of the same type in a common way. Before defining a Equipment's listing, it is essential that we have defined the family to which the Equipment belongs.

- **Equipment**. In this module you will find all the information about a measuring device, including the history of controls. We will need to access this module to see the Possibilities of the equipment, the patterns it uses, to perform a control, or to see when a control was performed.
- **Formats**. It allows you to define under MS – EXCEL the different certificates of calibration, verification, MSA, etc. Access to this module will only be required if we need to create procedure data entry sheets that are not supplied in a standard way. *(This module is not available in the SME edition.)*
- **Equipment controls**. It presents in the form of a list the configuration of each of the controls that we carry out on the equipment. This module will be useful for obtaining reports from Equipment related to their check-up or next check-up date. For example: "Equipment pending control this month".
- **Results**. It presents in the form of a list the results of all the controls carried out on the equipment.
- **Applications**. It presents the applications assigned to the measuring equipment along with equipment information and equipment controls.

- **Master tables**. These modules serve as support for completing fields of the modules belonging to the main group (especially the file). It consists of the following modules:
  - **Suppliers**. It allows you to define suppliers and manufacturers of measuring equipment, and calibration laboratories.
  - **Customers**. The customer field and master is usually used by measurement labs to assign which customer each of the computers in the database belongs to.
  - **Organizations.** It allows you to define the company or the different locations if there are several.
  - **Departments**. It allows you to define and code the different departments of the company.
  - **Sections, lines and stations**. It allows you to code the situation where the measuring equipment is normally located.
  - **Availability**. It allows you to assign the availability of the equipment (e.g. available, low, in calibration, in repair, ...). Each of these options can have an available or unavailable status. For example, the equipment available, in calibration and in supplier will have an available status (can be used). However, decommissioned or missing Equipment will have an unavailable status (cannot be used).
  - **Controls**. Define the different controls we can use. Calibration, verification, R&R, ...
  - **Incidents**. It allows you to code the incidents that may occur when performing a control.
  - **Units of measurement**. Define the different units of measurement that we will use in the program. For each unit of measure, the "Multiplication factor" field is defined, which will allow the program to perform operations with data expressed with multiples and submultiples of a unit of measurement.
  - **Dynamic Master tables**. It allows you to define default values in some specific fields of the program in a dynamic way.
- **Reports.** It consists of the following modules:
  - **Reports**. It allows the presentation and design of reports using the powerful report designer integrated into the Visual Factory Calibre program.

- **Configuration**. Normally, the modules in this group will only be used in the implementation and configuration of the application. It contains the following modules:
  - **Roles**. Define the access permissions that each group of users will have.
  - **Users**. Define the users who will use the app.
  - **Configuration**. Configure the general usage parameters of the application.
  - **Definition of subviews**. It allows you to define the subviews that are presented in the different forms. For example, the Equipment Sheet has the subviews of patterns, history, results...

Practical tips

If this is your first time running the app, it is advisable to follow the steps below:

- Create a new database by following the steps in the installation guide. Also have the sample database handy to get ideas.
- If you have found datasheet families or formats that interest you in the sample database, you can import them using the **Import option** in the **Tools menu**.
- Configure the general parameters of the application by accessing the **Settings module**.
- Define users using the Users module.
- Define permission groups and assign the users to each group using the Roles module.
- Check the **Controls** master for any controls in addition to those already defined.
- Review the **Units of Measure master** for if you need to define more units of measure.
- Review the **Master Issues** and add new issues that may arise during the control of the equipment.
- The rest of the Master tables are not essential. Fill them out only if you are going to use them.
- Start by defining the families and sheets of standard equipment (both those you calibrate internally and externally) as you may need them to define the calibration of other equipment.
- Create the Equipment families. This is one of the most important steps in designing a new database. For the definition of families, consider the following points:
  - Appropriately select the grouping criteria. For example, you could create a single family for all Calipers or create different families of Calipers depending on the measurement range.
  - Create the controls that you're going to perform on the computers in that family. For example, for Calipers you may need to perform a periodic calibration every year, a check every month, a check upon receipt of the equipment (both the first time and when the equipment comes back from being repaired) and R&R check every 4 years. However, for a Go/No-Go gauge you will only perform a periodic check each year.
  - For each of the controls, select the most appropriate format type and configure it.
  - Typically, you will need to create one or more families of equipment that are externally calibrated.
  - Select the feature template to use for each family. A Vernier caliper, a Pass-Fail Device tool, a device with external calibration or a shape template will not have the same Possibilities.
- Once you have created the families, you can start registering all the Equipment. When you associate the family with the computer, most of the configuration parameters that you specified in the family are defined. However, it is possible that for some special Equipment the parameters of the card are not the same as those defined in the family. In this case, change the parameters that are specific to that computer.
- When you create the equipment card there is no control performed and therefore the result of each control and that of the card in general will be "Uncalibrated". You can enter the results of the

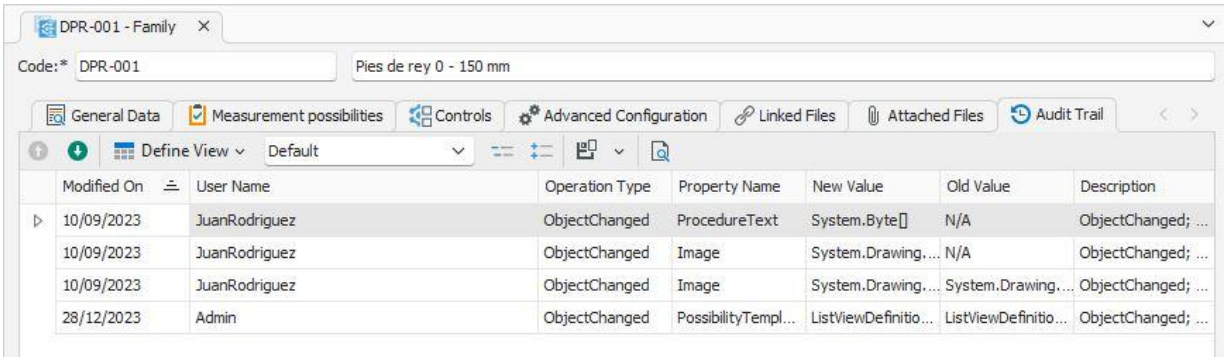
last calibration (or any other control) directly using the "special" data entry. This way you will assign a result to the Equipment and get the dates of the next check.

- With the **Equipment Controls** module you will be able to obtain different lists of the equipment in relation to their controls. For example, a list of all the checks you have pending for each of the Equipment.
- With the **Results module** you will be able to obtain different reports of the entire history of the results made to the Equipment.
- On a general level, both the Possibilities of measure and the formats, a "Tool" type is associated with equipment that gives the measurement by itself (e.g. standard blocks), and a "normal" type is associated with equipment with a presentation of the measurement on a display or on a scale (e.g. a Vernier caliper)
- If you have multiple tabs open and you make a change to the record of any of them, the other active tabs are automatically refreshed with the changes that have been modified. This can be turned off if the user prefers.

The following chapters will describe each of the modules and their relationship to each other. We'll start with the chapters on Masters and Configuration and Reports before getting into measuring equipment and calibrations.

Audit Trail

All tables associated with the application will have an Audit Trail section where the changes made to the information in these tables will be indicated.



All changes are reflected, both the creation of the object and the modifications.

Audit information will only be viewed by users with an Administrator profile.

(This functionality is not present in the SME edition)

CHAPTER 3

Master Tables

Visual Factory Calibre has a set of modules designed to facilitate the maintenance of the general information involved in the program's data entry tabs.

Through these modules we can register Suppliers, **Customers**, **Departments**, **Sections**, **Lines**, **Controls**, **Units of Measure** and **Incidents**. If we define the master files, the program allows us to validate the values entered in certain fields with the corresponding master. You can also list the records defined in each master to select the one you want without having to type it.

All Master tables have a first main screen of list type.

Vendors **and** Customers **Master tables** have a form to edit each record, however, the rest of the Master tables are edited from the same main window.

Master Suppliers and Customers

The Code field must be unique.

In the case of Suppliers, the following fields allow us to detail the type of supplier:

- Manufacturer: Related to the Manufacturer field on the equipment card.
- Vendor: Related to the Vendor field on the Equipment tab.
- Laboratory: related to different fields of equipment control and the performance of control.

For each vendor or customer, you can assign a table with your contacts.

Other Master tables

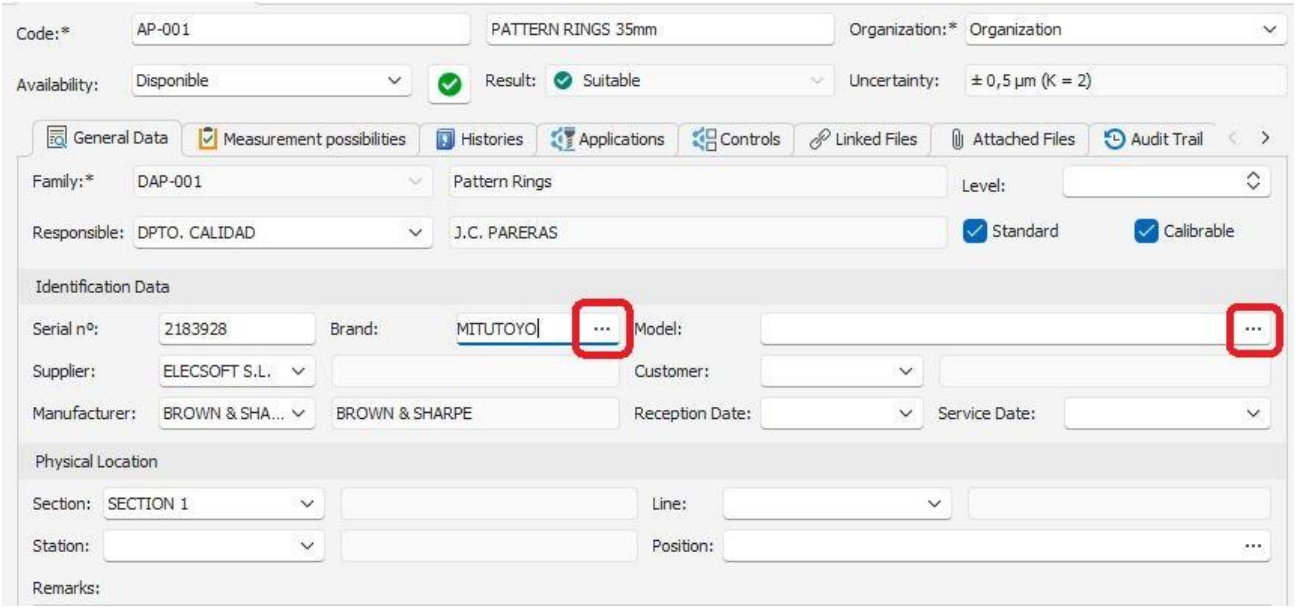
These masters are **Departments**, **Sections**, **Lines**, **Controls**, **Units of Measure** and **Incidents** and differ from those seen in the previous section in that they are edited from the window of the main screen.

These master tables generally have very few fields and serve as support for the selection and validation of different fields on the equipment sheet.

Master tables	**Single Field**	**Remarks**
Departments	Code	
Organization	Name	At the very least, you must have defined an organization.
Sections	Organization + Section	An organization can have multiple sections, and a section can be in multiple organizations.
Lines	Organization + Section + Line	A section can have multiple lines, and a line can be in multiple sections. The Section field can be left blank.
Season	Organization + Section + Line + Section	Within each Line, the corresponding stations are defined. It can be left blank.
Availability	Code	In Image, you can associate an icon
Controls	Code	The symbol indicates the legend that will appear in some of the predefined reports to reference each control.
Incidence	Code	
Unit	Unit	The multiplication factor is with respect to a base unit, so that the program knows what to do if, for example, the computer data is given in one unit and the pattern data in another. For example, m = 1 and mm = 0.001

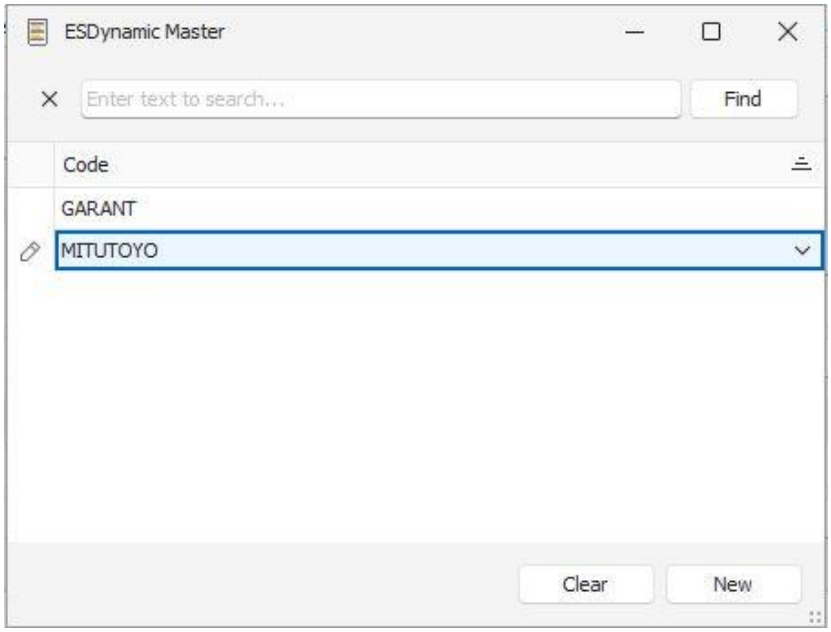
Dynamic Master

In some text fields we see that we can use a button to search for the content within a master:



Since there are several fields that support this functionality, we have chosen to define a single master in which we indicate which field it is for each record.

When you click on the selection button, you'll get the list of options related to the field you're editing:



From this same screen, you can create new options.

From the Dynamic Masters Module, we can perform the maintenance of this master, but we recommend that the new registrations be made from the selection option that we have seen before to avoid assignment errors.

CHAPTER 4

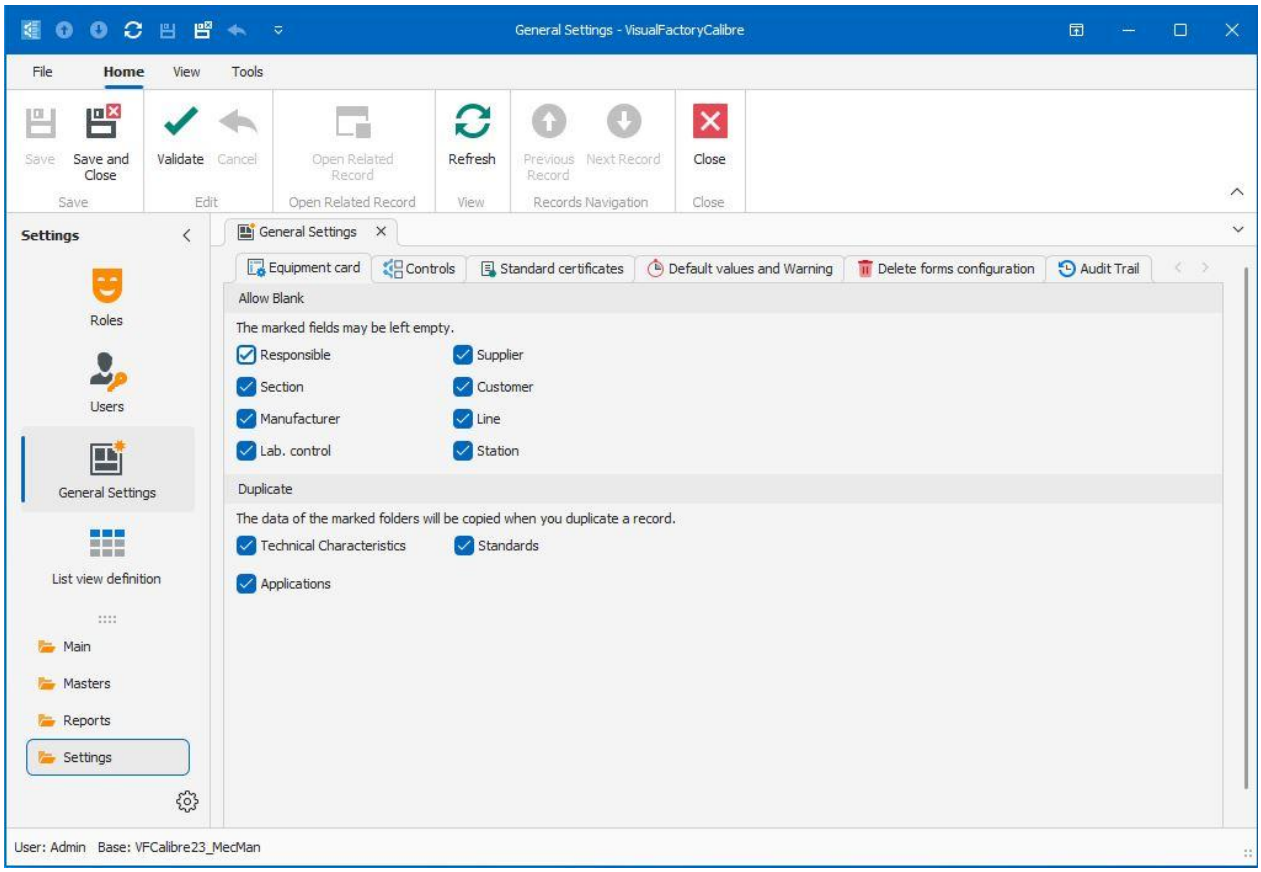
Configuration

This chapter explains how to configure Visual Factory Calibre to your needs. The program has a configuration window that allows you, for example, to choose from which folders in the equipment module you want the data to be copied when mirroring, etc.

Roles & Users

View Roles and Users definition information in the Visual Factory Application Framework 2023 General Guide.

General Settings



How to set up your workstation

By default, the program has a certain configuration that may not fit your needs exactly.

The options are categorized into folders based on their meaning: **Computer Tab**, **Controls**, **Standard Certificates**, **Defaults and Warnings, and Deletion Form Settings**.

The Equipment Card folder

The **Equipment Card** folder refers to the Equipment's module.

Allow Blank

Allows you to configure whether each of the indicated fields can be left blank or not. All of these fields are related to Master tables.

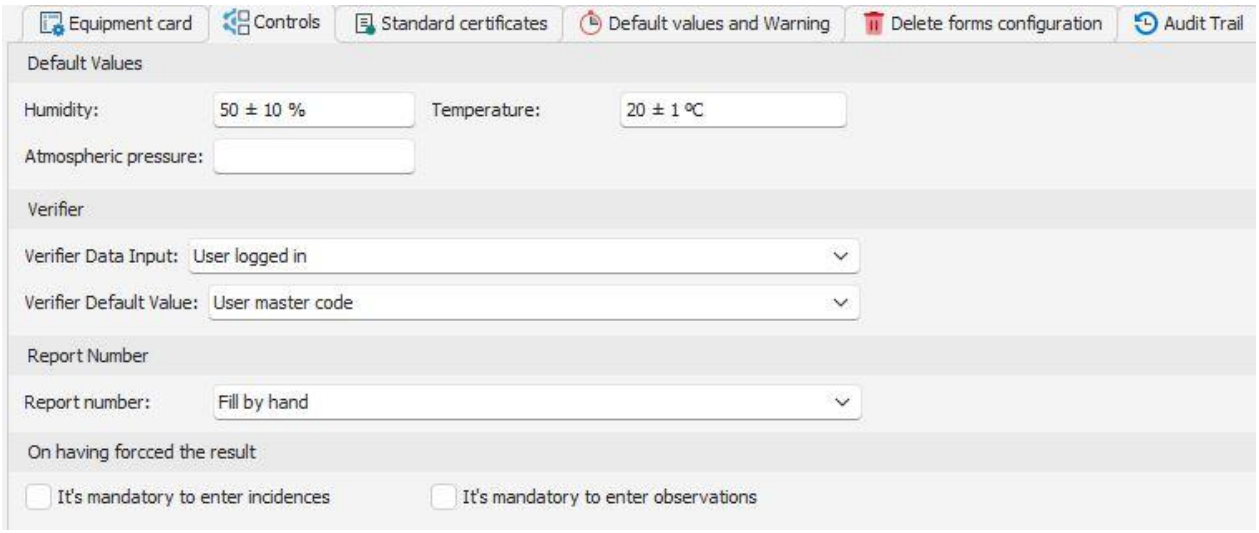
Duplicate

This box refers to four of the folders that make up the Equipment tab window. When you duplicate a tab, the data contained in the "General Data", "Other Data", "Remarks" and "Controls" folders are automatically copied to the new tab.

There are other folders for which you can configure, from this section, whether you want to include the data at the time of duplicating a tab.

The Controls folder

This folder allows you to configure the following options:



Defaults

It allows you to enter the default values of temperature, humidity and atmospheric pressure of standard formats. These defaults are used in standard data entry forms.

Verifier

Allows you to indicate the different possibilities that the user will have to fill in the **Checker** field. These defaults are used in standard data entry forms.

Report Number

Specifies how reports on calibrations and other checks carried out on measuring equipment will be numbered. The options are:

- **Filled in manually**: The report number will be filled in manually by the user.
- **Equipment code-nnnn:** The reports will be numbered automatically, adding the Equipment card code as a prefix.
- **Consecutive number N-nnnn:** Reports will be automatically numbered sequentially.
- **Year and number yyyy-nnnnn:** Reports will be automatically numbered using the current year and a sequential number that will be reset each year.
- **GUID Number**: Reports will be automatically numbered using a GUID (Global Unique Identifier). It is a code generated by the computer using an algorithm that guarantees that the code is unique from any code that could be generated by the same system from the same computer or from any other different computer.

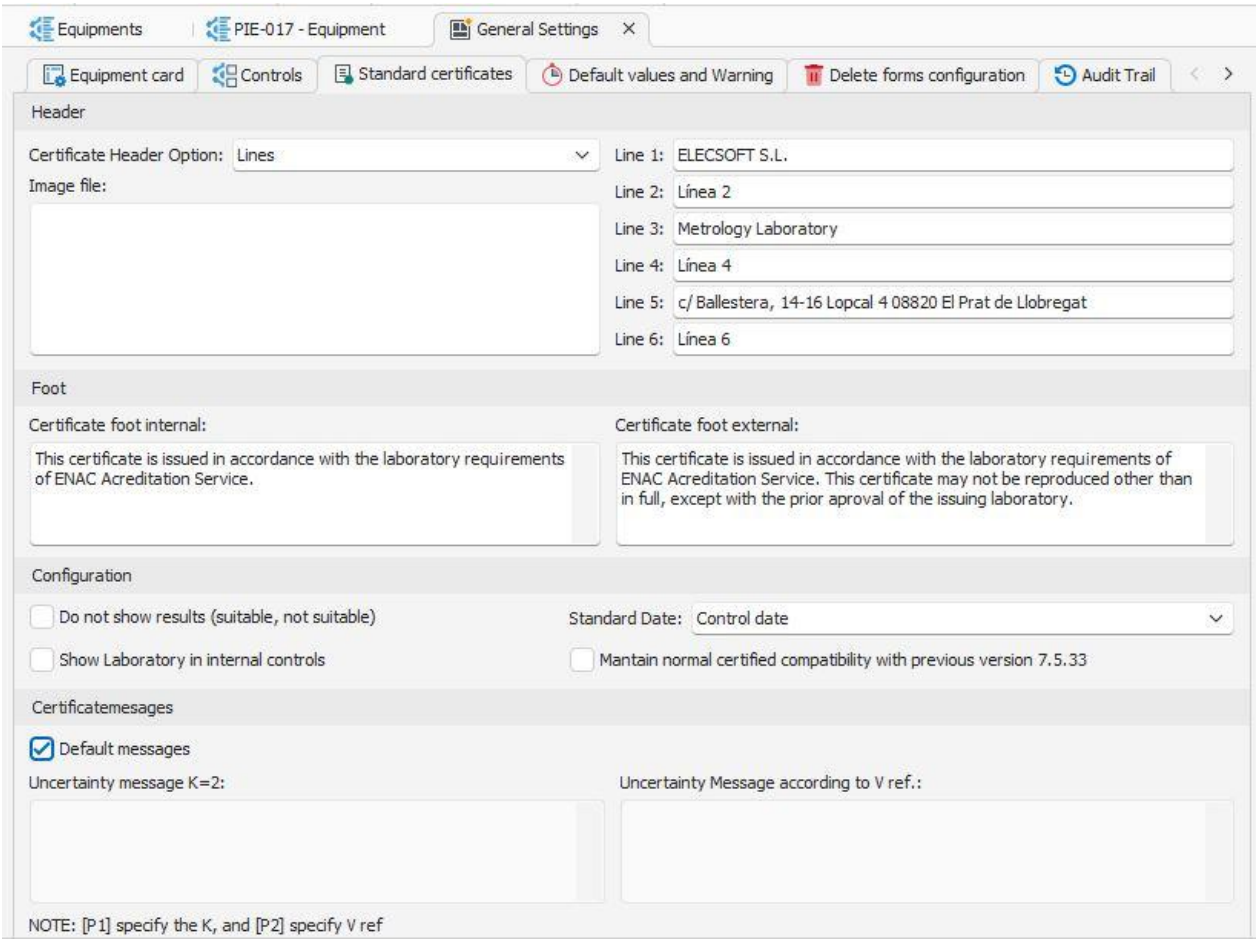
By forcing result

In some of the standard data processing processes, it is possible to force the result, regardless of the calculations performed by the format.

This option allows you to configure whether observations and/or incidents should be entered when forcing the result when performing a control.

The Standard Certificates folder

This folder allows you to define the header and footer of the certificates that are obtained with the Standard For



Note: Most of these configurations are maintained for compatibility with versions prior to version 23, since from this version it is possible to define certificate reports through the designer, and therefore make the configurations on the same report designer.

Headboard

Allows you to set the following options:

- **Image**: The image file you want to add to the header will be indicated.
- **Lines**: Allows you to add up to 6 header lines.

Inner & Outer Foot

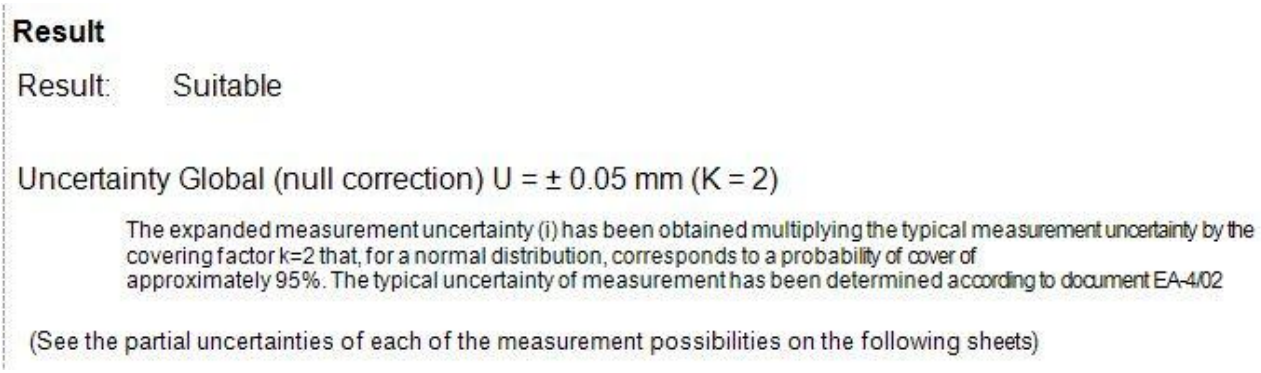
It allows you to define the text that will be displayed in the footer of the report for internal and external controls differently.

Configuration

- **Failure to submit a result (pass, fail, ...)**: If we check this option, the result will not be presented in the certificate.
- **Present internal controls laboratory:** If we check this option, the laboratory information will be displayed in the internal controls, this option will only be visible and the previous option **Do not present result is disabled**
- **Date Standards:** We can indicate whether we want the calibration date or the next calibration date to be shown on the certificate.

Certified Messages

Allow you to change the messages that accompany the uncertainty value when generating the control certificate:

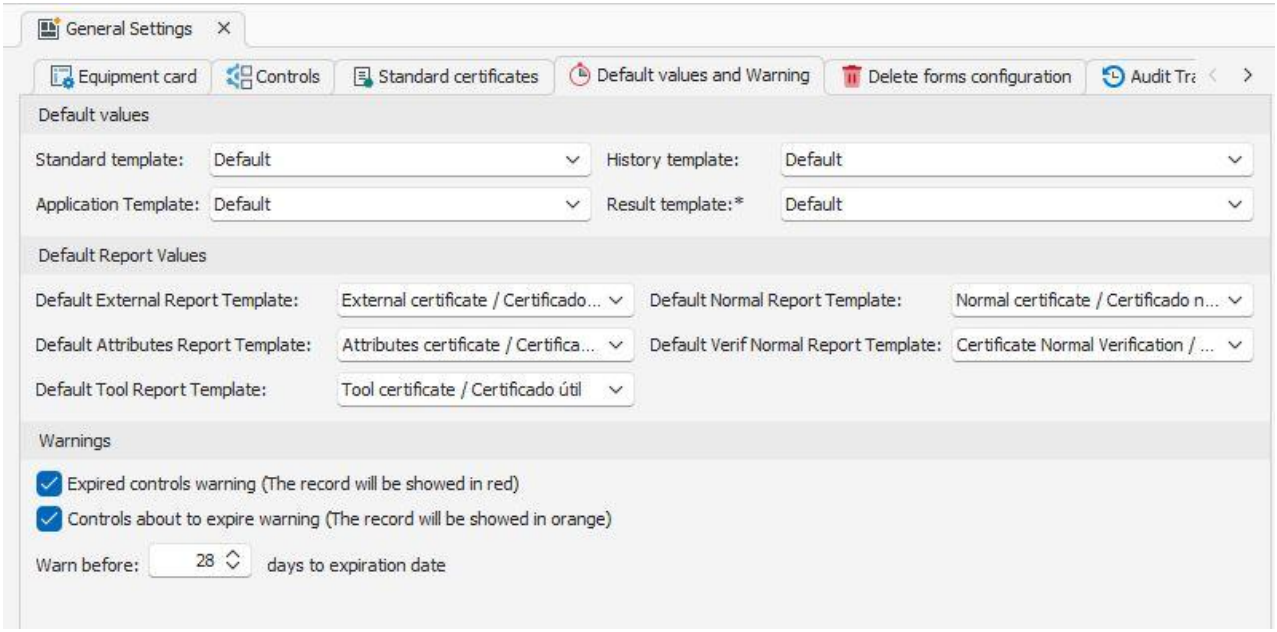


If the **Default Messages field** is enabled, the messages included in the application itself will be displayed. Otherwise, the user will be able to define their own messages.

The first is used when the result of the expanded uncertainty is expressed with k=2 and the second for when k is different from 2.

The Defaults & Reminders folder

This folder allows you to enter the default values for the pattern type, history type, and application type of the family, as well as for the template field results of the controls.



Defaults

- The first four fields allow you to configure the types of Patterns, History, Application, and Result that will appear by default.
- Enterprise. Allows you to specify the Company name that will appear by default in the standard reports of the Weekly and Monthly Tabs and for the Excel sheet formats.

Default Reporting Values

They allow you to configure report templates for different types of formats. For each control of each computer, you will be able to configure the template you will use, if it is not defined, the one you have configured here in General Settings is used.

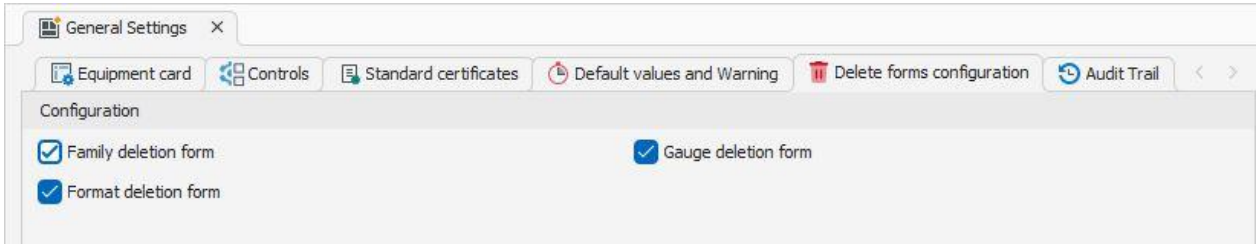
Notices

Allows you to configure the display of the following notifications in the Tab Controls module:

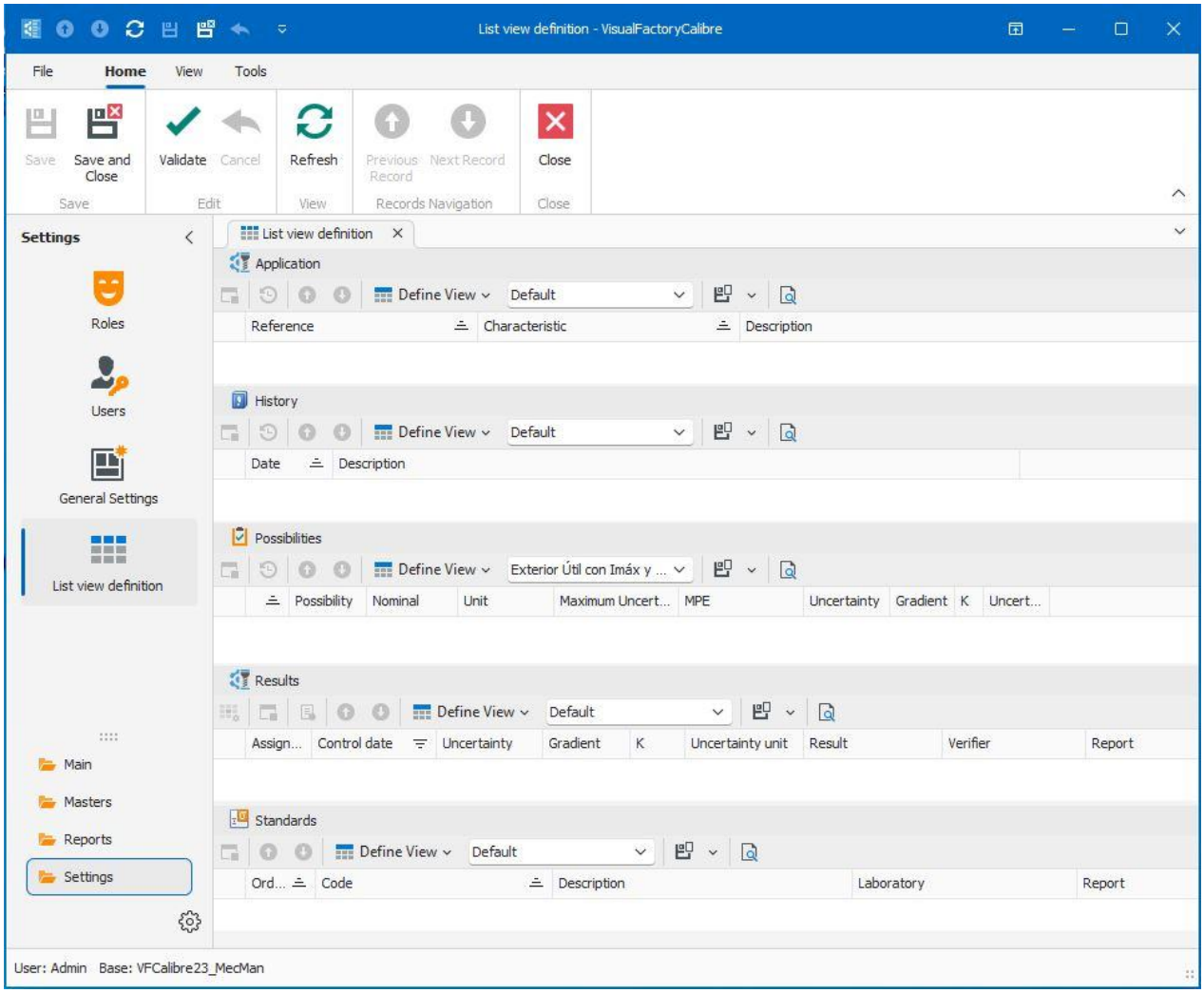
- **Notification of completed controls:** If this check is checked, the records of the cards with the date of the control completed will be presented in red.
- **Notification of controls about to be complied with:** If this check is checked, the records of the cards that the number of days until the date of the next control is less than the value entered in the Notify before xx days of compliance field will be presented in orange.

The Deletion Forms Settings folder

These options allow you to configure whether a confirmation window to delete a record will appear when you delete it.



Defining Subviews



Allows you to configure the views that appear within the Equipment tab and that can vary depending on the family to which the Equipment belongs.

Defining subviews uses the standard view definition structure that is explained in the Visual Factory Application Framework manual.

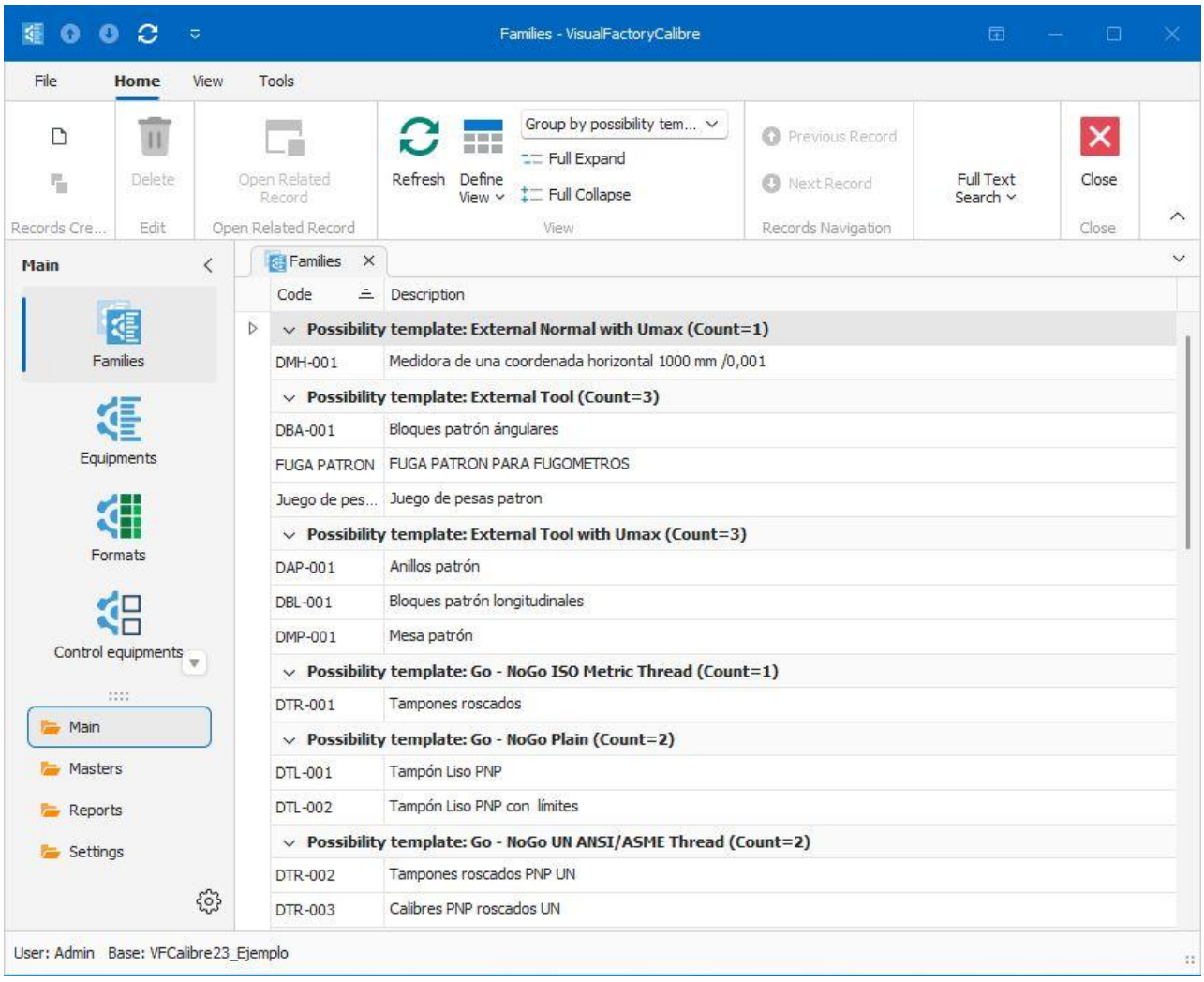
CHAPTER 5

Families

A family is a logical grouping of measuring devices that share the same calibration procedure and similar measurement possibilities.

It is important to define the families well from the beginning, as they will later serve as templates to create the Equipment sheets.

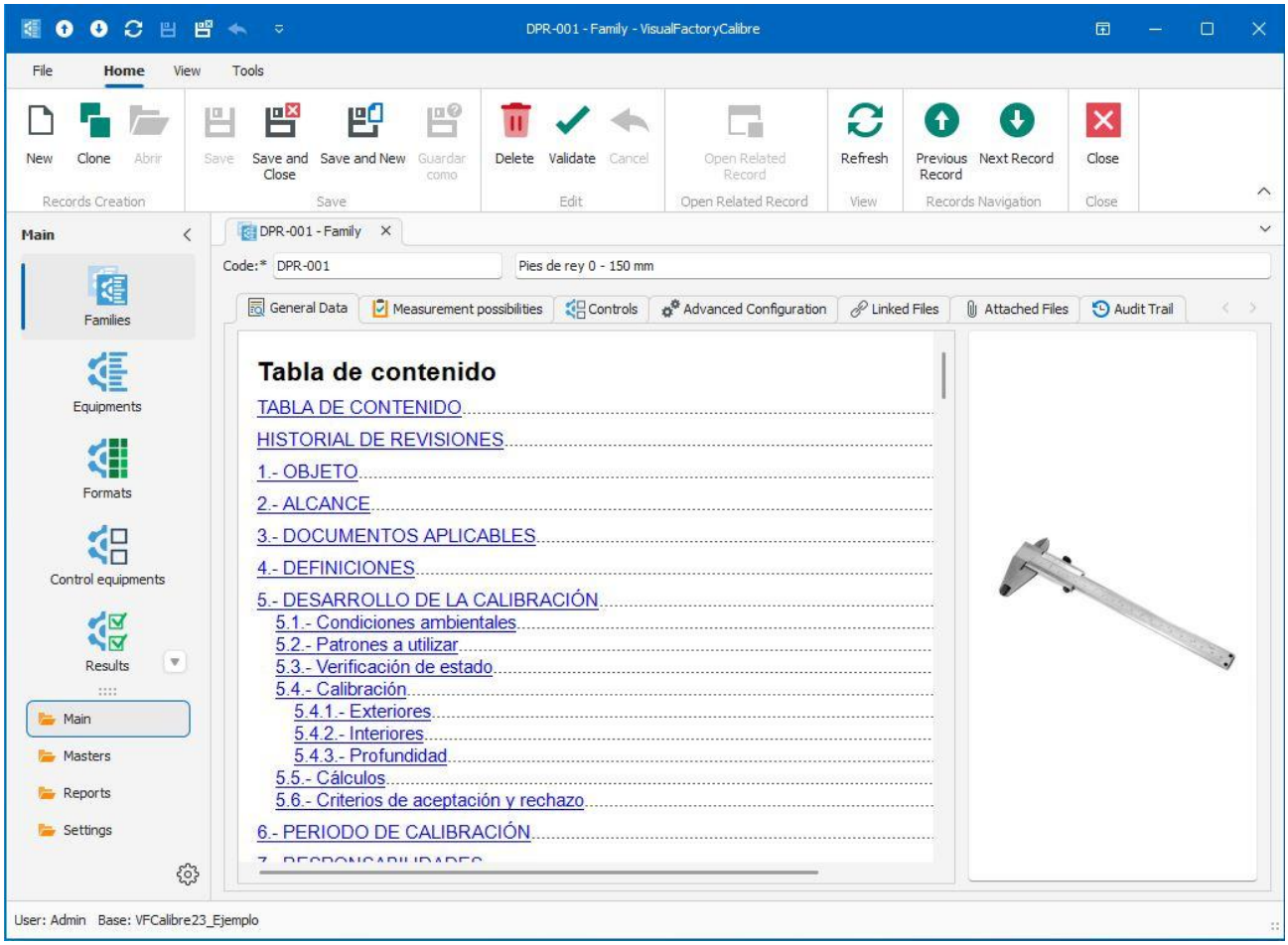
When you access the Families module, you will see the list of families, depending on the view you have applied (on the next screen we use the view "Group by Template possibility").



Note: The options available from this module of the Tools menu are explained in the chapter **Tools** at the end of this same manual.

Family Form

We can create new families or access the details of families already created; in this case we will see the following form:



Fields in the Family form

At the top of the form are the **Family Code** and **Family Description** fields. The family code must be unique in the database.

The rest of the fields are spread across different folders.

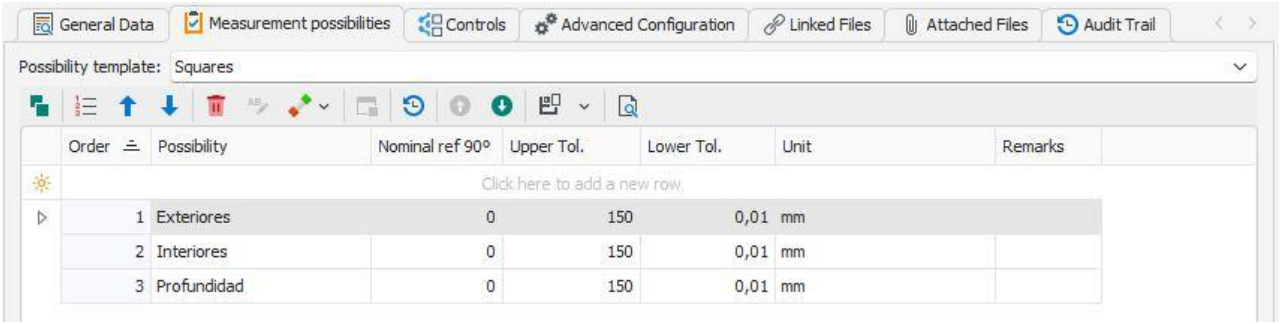
General Data Folder

The box on the left acts as a text editor very similar to Microsoft Word. By hovering over this box, the menu options are expanded, with specific options for text editing.

Since the operation is very similar to other standard word processors, we won't go into detail. It should simply be noted that we can work in full screen much more efficiently, to do this we can place the cursor inside the box and press the right mouse button. Then select the "Show in popup" option.

In the box on the left, we can insert an image that we can later use in reports and views. To insert the image, simply double-click on the box. By right-clicking on the mouse, you will have other options on the image.

Measurement Possibilities folder



For each family you can assign a table with its measurement possibilities, which may vary depending on the type of equipment. A Vernier caliper will not have the same specifications as a measuring tool or a tampon passes - it does not pass.

The appearance and meaning of the columns in the feature table will depend on the **possibility template** we select.

Important: The indicates that the row on which it is placed is in an edit state; The Indicates the position of the row on which it is placed.

The Uncertainty, **Pending**, **k,** and **Uncertainty Units** fields cannot be edited as they are fields that are automatically populated on the card with the results of the last control with the Assign Uncertainty property enabled.

On the other hand, all fields related to Pass – Don't Pass tools will also be blocked.

Defining Imax and EMA as a Straight Line Function

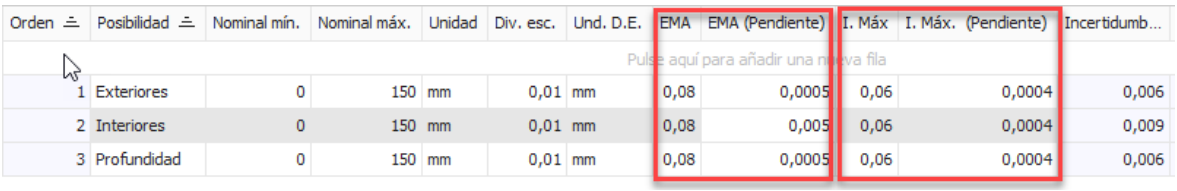
Sometimes the maximum uncertainty or EMA (Maximum Allowed Error) is expressed by a line, for example:

1. I. Max ≤ 0.06 + 0.0004 L

2. EMA ≤ 0.08 + 0.0005 L

In these cases, 0.0004 and 0.0005 are the slope of the line and 0.06 and 0.08, its original value. L is the maximum nominal for scaled equipment or the nominal for absolute measurement equipment. If L is expressed in a unit other than uncertainty (scale division), the slope values must be adjusted.

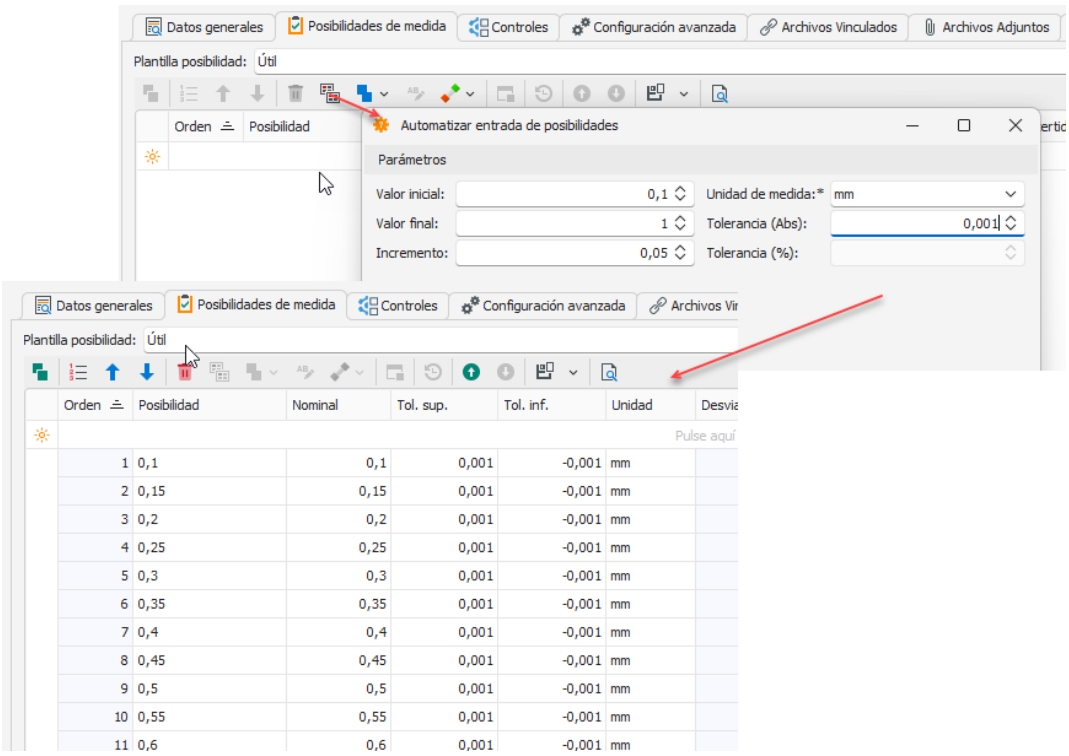
With the new functionality we would introduce these values as follows:



Note: The EMA (Pending) and I. Max (Pending) columns can be mapped within the Subview Configuration module.

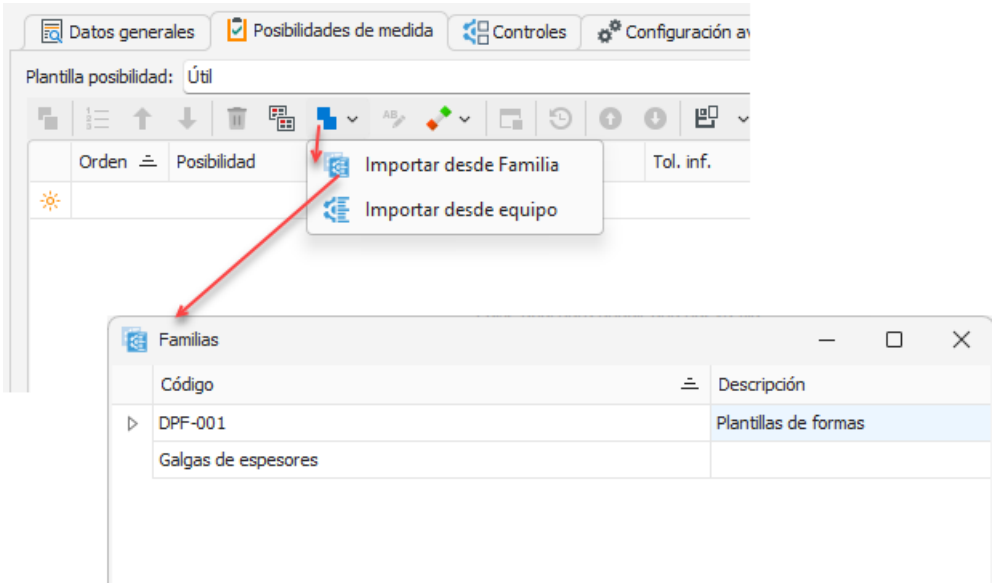
Automation of possibilities with a pattern

For tool sets with regular increments (e.g., gauges with thicknesses from 0.1 to 1 mm in 0.05 mm increments), it is now possible to enter all values automatically.



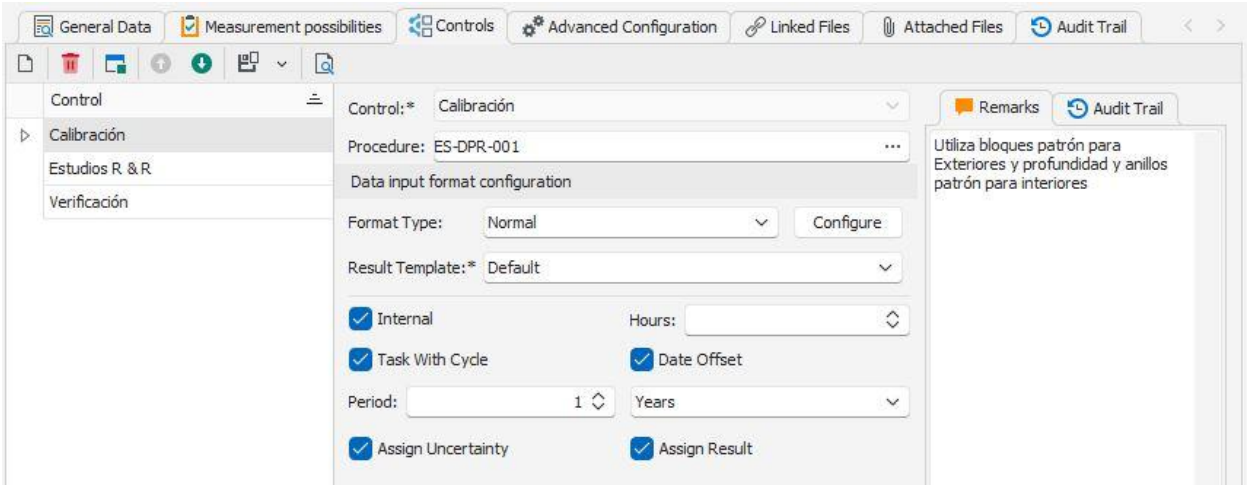
Copying possibilities between families and teams

It is possible to copy the measurement possibilities from one family or equipment to others, facilitating configuration and reducing management time.



Note: Later they describe the possibility templates that are supplied by default in the application.

Controls Folder



This folder allows you to configure the different types of controls to be carried out on the measuring equipment. Using the New and Delete buttons, you can add or remove controls from the list on the left side of the window, while on the right side you can configure each of these controls.

As part of the configuration, we can indicate the name of the procedure, the type of format of the control, the datasheet to be used (only if the format type is Excel), the report template to be used to generate the certificate (if this field is left blank it will default to the value configured in General Settings) and the template to be used to display the results of the controls. In addition, we can indicate if the control is going to be internal and the hours that are expected to be necessary to carry it out.

Note: See the "Format Types" section of this chapter for more information about the formats that come with your application and their relationship to the Fact Sheets and Result Templates.

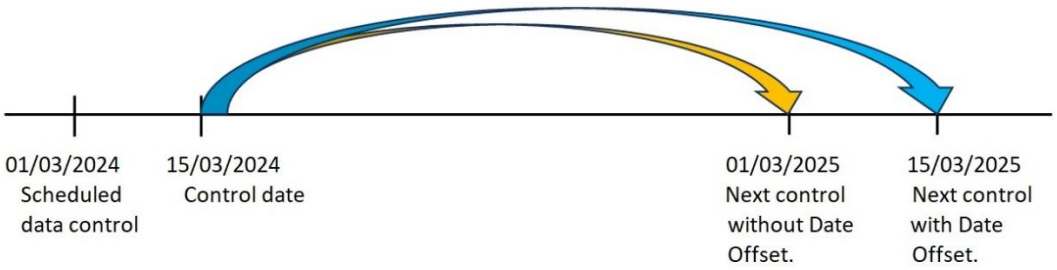
Regular check-ups

We will also indicate whether it is cyclical control and, if so, the period for which it is carried out.

When the **Offset** checkbox is selected, it means that, when performing the check, the next check date will be the date on which we checked plus the period, even if this was not the due date.

When the **Offset** checkbox is deactivated, it means that, when performing the check, the next check date will be the date on which the check was due, even if this date has not been met or we have exceeded that date.

As an example, let's assume that the expected control date was 01/03/2023 and the next control was dated 01/03/2024. We assume that the control is carried out on 15/03/2023. In the graph below, you can see the difference in dates depending on whether the **Offset checkbox** was checked or not.



Assign uncertainty

Each measuring device is assigned uncertainty values, depending on the results of the last control carried out. These results are the ones that will be used if the equipment is used as a standard to control other equipment. However, you may want to define special controls on the computer that do not provide a result in terms of uncertainty or for which you do not want to assign the obtained uncertainty to the computer. For these cases, the program allows you to indicate for each of the defined controls whether you want to assign the uncertainty of the same as the uncertainty of the computer.

Assign Result

Each measuring device is assigned a status that will generally be **Pass** or **Fail.** You may want to define special controls on your computer that do not provide a Pass/Fail result, or whose result does not condition your computer's Pass/Fail status. To this end, the program allows you to indicate for each of the defined controls whether you want to assign the result of this to the general state of the computer.

Advanced Settings Folder

This section indicates the template formats that will define the columns to be displayed in the Patterns, **History,** and **Applications** folders of the Equipment tab according to the subview formats previously (see section **Defining Subviews** in Chapter 4 of this manual)

Folders, attachments, and linked files

They allow you to attach or link the files you need accordingly.

Measurement Possibility Templates

Since not all measuring equipment is created equal and may have different ways of expressing or obtaining the measurement, Visual Factory Calibre is supplied with different types of measurement possibilities templates.

On a general level, we can divide measuring equipment into two large groups:

- Measuring equipment that provides the value of the measure being measured by means of a scale. This equipment usually has scale range and scale division as their main Possibilities. On this

equipment, a calibration is usually carried out with different standards within the entire scale and the correction at these points and the uncertainty of the measurement obtained in said correction are determined.

Examples of this equipment are: the Vernier caliper, the voltmeter, three-dimensional machine...

We will associate these devices with the "normal" type.

- Measuring equipment that provides the reference measurement itself. These devices are usually standards that provide a reference value for calibrating equipment in the first group. We can also consider within this section the equipment that serves to give the suitability by comparison of a calibration measure. The calibration of this equipment usually consists of obtaining the "real" value of the measurement they provide and the uncertainty with which the measurement has been made. In many cases, a check is simply made that the measurement is within tolerances.

  Examples of this equipment are longitudinal standard blocks, rods, Go/No-Go gauges, shape templates...

  We will associate these devices with the "Tool" type.

In this section, we'll look at different types of technical feature templates that come with the app.

The user can define new templates to meet their specific needs. Configuring technical feature templates is done from the **Subview Definition** module in the Charm Bar **Settings** group.

On a general level, there are a series of columns whose content cannot be modified and whose value will be obtained from the results of the last check. These columns are Deviation, Actual Measure, Uncertainty, k, Uncer Unit. and I. Correc. Null (this column tells us whether the uncertainty we are displaying has been calculated using null correction globalization or not). These columns will not always be displayed and will depend on the feature template that has been defined.

There are also other columns related to Pass – No Pass tools that cannot be modified since they are configured directly in the definition form of these said equipment.

In the Normal and Outdoor format types, it is possible to indicate that the uncertainty is globalized with zero correction. In these cases, the Uncertainty column of the Possibilities of measure will show the globalized uncertainty (within the uncertainty the correction will be taken into account) and the deviation (correction in absolute value) will be 0.

Note	: Acceptance criteria for Maximum Uncertainty and Maximum Allowed Error (EMA) can be used. In addition, these criteria can be given in a straight-line format: I. Max. (calculated) = I. Max. + I. Max (slope) x Maximum Nominal (or Nominal as the case may be). EMA (calculated) = EMA + EMA (slope) x Maximum Nominal (or Nominal as the case may be).

Below are some of the most relevant templates that are already defined with the program.

Square

Designed specifically for squads. See examples provided in the sample database.

Exterior Normal

This template is designed to define scaled equipment that is externally calibrated.

Computers using this template will be calibrated externally, and typically the "Outdoor" format will be used to define the control.

Normal Exterior with Umax.

Same as above but includes the maximum uncertainty specification column.

Exterior Tool

This template is designed to define equipment that directly provide the measurement, for example, master blocks.

Computers using this template will be calibrated externally, and typically the "Outdoor" format will be used to define the control.

Exterior Tool with EMA and with Umax.

Same as above but include EMA or Umax columns.

Normal

This template is designed to define scaled equipment that is calibrated internally.

The columns used in this template are:

- **Nominal Min.** and **Nominal Max.** to specify the scale range of the measuring equipment. The units you use are those listed in the **Units column**.
- **Esc. Div.** Specifies the scale division of the Equipment. Use the units indicated in the **Und field. D.E.**
- **EMA** (Maximum Allowed Error) indicates the maximum error value that is allowed. The usefulness of this column will depend on the calibration method used and may be left blank if this acceptance criterion is not to be used.

  This field uses the units indicated in the Und column. **D.E.**tags.
- **I. Max.** It indicates what maximum uncertainty we will allow the Equipment. The usefulness of this column will depend on the calibration method used and may be left blank if this acceptance criterion is not to be used.

  This field uses the units indicated in the Und field. **D.E.**

Computers using this template will be calibrated internally, and typically the "Normal" format will be used to define the control.

Tool

This template will be used to calibrate or verify measuring equipment that has one or more dimensions to be checked, for example, standard blocks, measuring tools, shape templates, etc.

For each of the measurement possibilities, we will indicate the nominal value of the measurement, the tolerances (expressed as deviations from the nominal value) and the unit of measurement in which the specifications are expressed. It will be allowed to be allowed to put only one tolerance or none.

Computers using this template will be calibrated internally, and typically the "Helpful" format will be used to define control.

The columns Actual Measure, Uncertainty, k, and Unit Uncer. They will contain the calculated values of the last calibration.

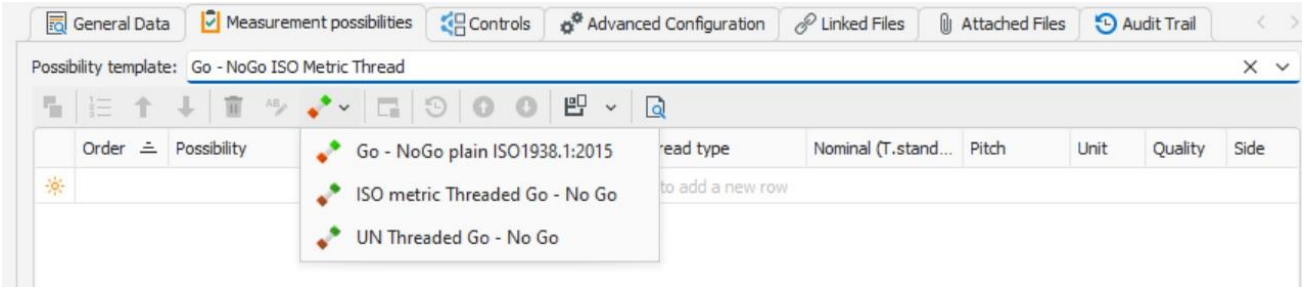
Plain PNP, ISO metric PNP thread and NPP ANSI/ASME A THREAD

These templates are used in conjunction with the wizard to calculate plain and threaded plug PNP values as we will see in the next section.

Important:	Even if we run the calculation wizard for Pass – Don't Pass plugs, we must manually assign the most appropriate template. The reason why the app doesn't automatically assign it is that the user himself could define new views of this type according to his needs.

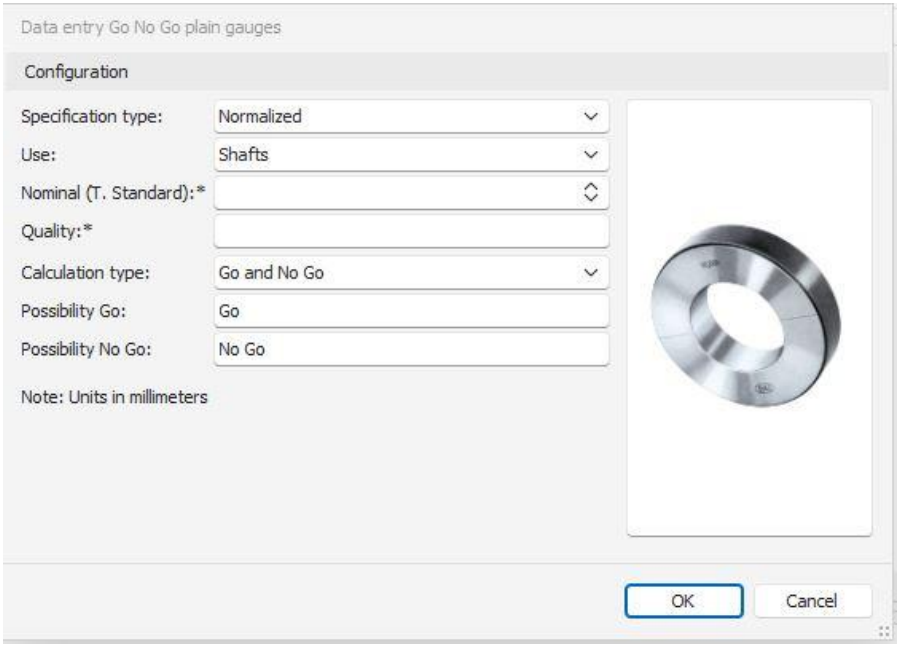
Specifications on Plain and Threaded PNPs

In the options bar of the Measurement Possibilities tab, there is a drop-down menu with the following PNP options:



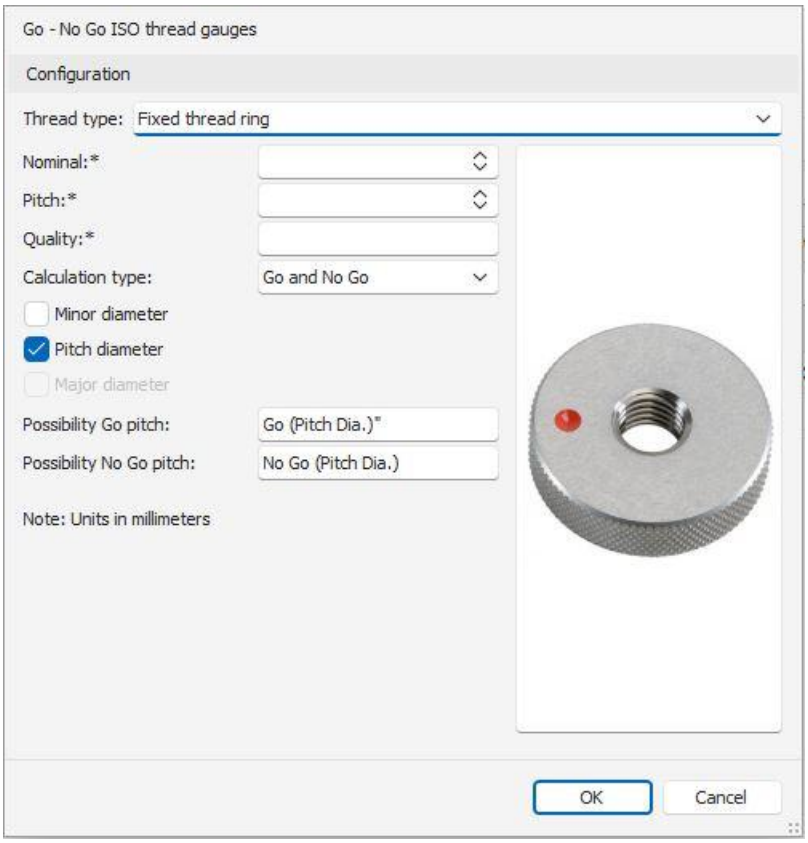
Note The hide option (Obsolete) plain PNP DIN 7150.2:2007 only appears if when migrating the base from an old version you have a chance that you are still using the old standard, i.e. you have not yet updated to the current ISO 1938.1:2015.

Pressing one of the first 2 options for plain PNPs opens the following window:

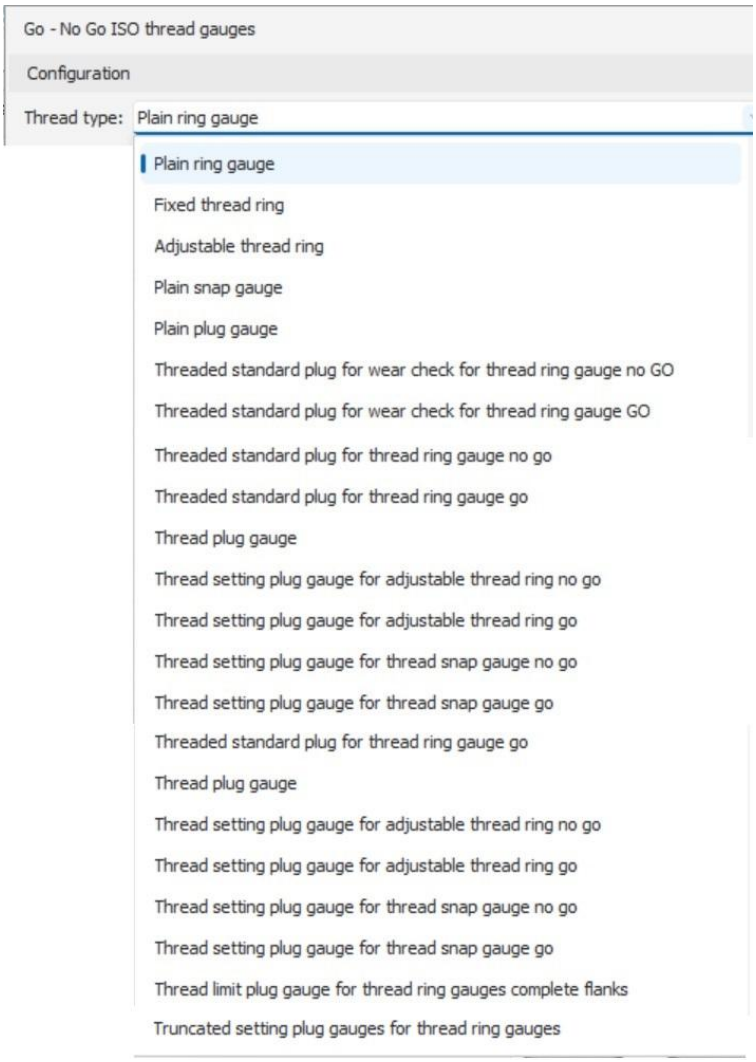


Supports shaft and hole types. By typing the Nominal and Quality, the program will calculate the limits.

For the ISO metric threaded plug PNP option, a different window opens:

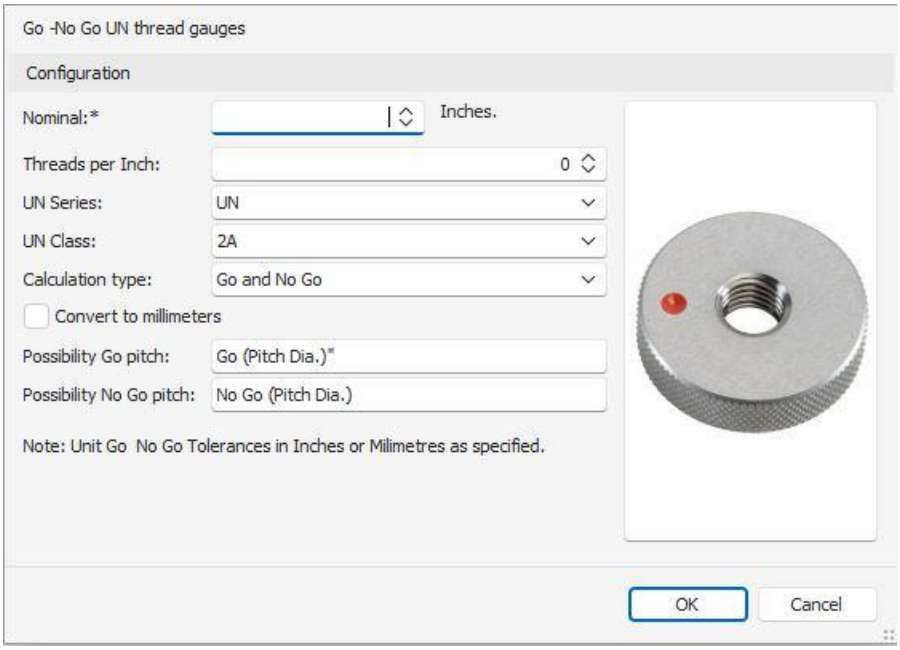


Supports several threads plug types:



By typing the Nominal, Pass, and Quality, the program will calculate the limits.

And finally, there is the option of UN threaded plug PNPs.



Considerations When Filling in Measurement Possibilities

As we have seen, the different measurement possibilities of the Possibilities of measure of a measuring device can be filled in from the Families module.

In general, this is not always the best solution, let's think, for example, that we define a general family of plain Go/No-Go gauges. Although the procedure and configurations will be general for all measuring equipment, each of them will have, in general, different Possibilities of measure (different nominal values and tolerances).

In this case, it is best to indicate in the family which Possibilities of measure template we are going to use, but without filling in the measurement possibilities. This operation will be performed for each of the plugs when the Equipment card is defined.

Also, for certain plugs, there is an intermediate solution, which consists of filling in part of the information of the Possibilities of measure in the family and then completing it in the file.

Format Types

When defining a control, we can select different types of control formats depending on the type of equipment we are defining.

Visual Factory Calibre incorporates the following:

Without Format

We will use this format when we do not want to make any special annotation when carrying out the control on a measuring equipment and we do not need to obtain a printed report of the control carried out.

This solution can be considered, for example, to annotate calibrations that are carried out externally, and where we are only interested in recording the general results of the calibration.

With this type of format, when performing the control, the application will present a form where the fields that are defined in the results template will be requested.

This format is maintained for backwards compatibility, as it is convenient to use the "Outdoor" format for external calibrations.

This format does not require specifying Data Sheet, the results template that is usually used is "Default" and the Possibilities of measure template is not usually indicated.

Excel Sheet

We will define this format when we use an Excel sheet to carry out the control.

(See the "Formats" chapter for more information on creating Excel datasheet formats.)

If we select this type of format, we must indicate the data sheet code that is going to be used.

The results and features template to be used will depend on the nature of the control and the design of the datasheet. For example, if the Excel spreadsheet is an R&R study, we will use the "R&R" control template.

External

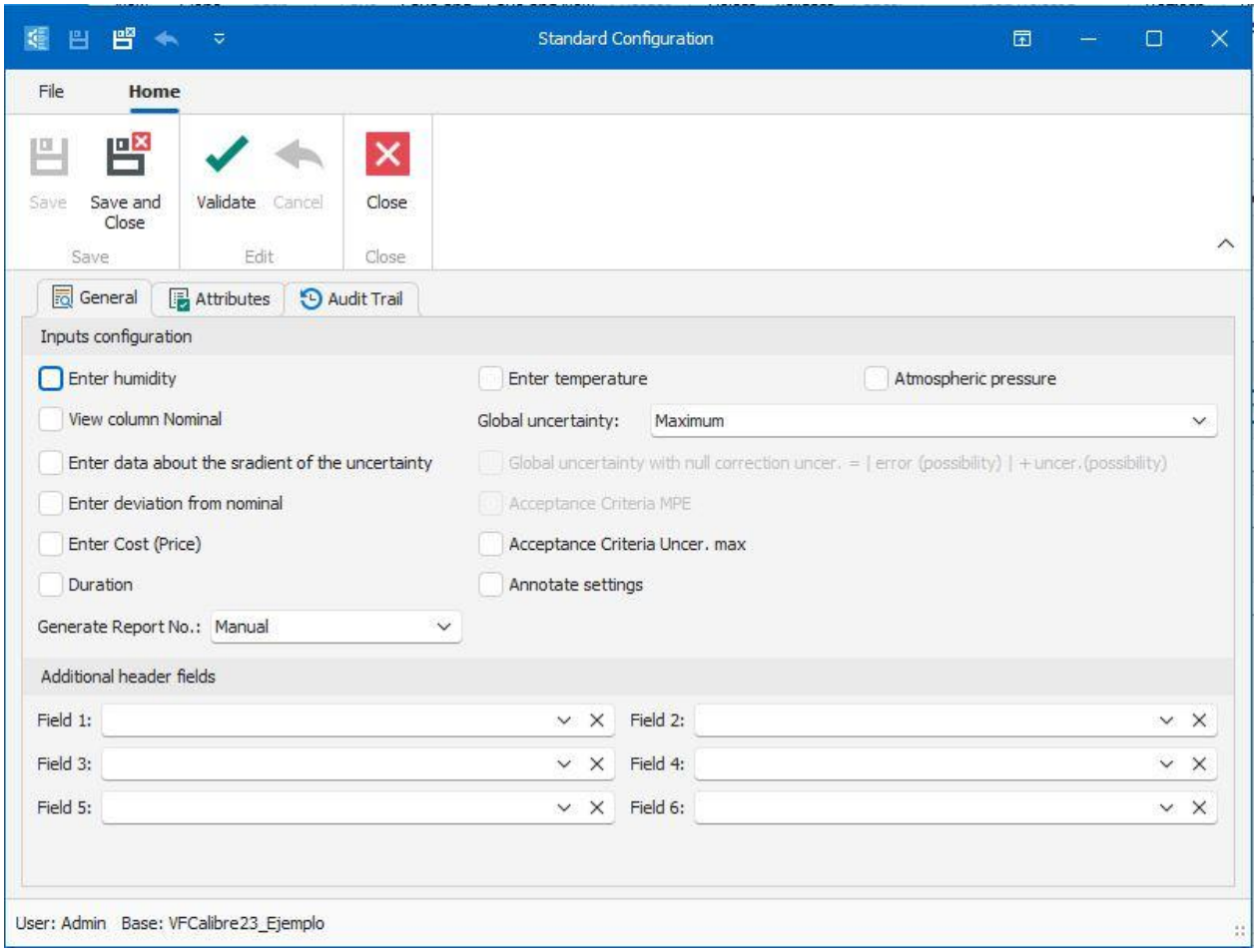
This type of format will be used to create the results of controls that have been carried out by an external company.

In general, this type of format will be assigned the "External" report template, which will serve as a template for printing the certificate.

The result template that is commonly used is "Default".

On this screen we will configure how we will perform the data entry of the controls whose calibration or verification is carried out externally.

By clicking on the configure button right next to the defined format type, we will get the following screen:



Under **Enter Temperature**, **Enter Humidity Atmospheric Pressure** we will indicate whether we will enter these values in the control. The default values will be taken from what is indicated in the application settings.

Display **the Nominal column** specifies whether the Nominal column of the Possibilities of measure will be displayed when the control data is entered. This will be appropriate only for Tool type equipment.

Enter **uncertainty slope data** will indicate whether the uncertainty slope can be entered. This option is necessary when the uncertainty is expressed as a regression line.

Under **Enter Nominal Variance**, you will indicate whether the nominal deviation (or indication error) values will be entered in the control data entry.

Enter **cost (Price)** indicates whether you want the Cost field to appear.

In **Duration,** we will indicate whether we want to display the duration field (in time) when performing the control.

The **Generate Report No. field** indicates how the report number will be generated, manual or according to the general settings *(See the chapter "Configuring* Visual Factory Calibre*" for more information about configuring the generation of the report number).*

The **Global Uncertainty field** indicates how the Equipment's global uncertainty will be mapped. You have four options:

- "It's not calculated." This option is necessary if it is a piece of equipment with different measurement possibilities of different nature. For example, a Tester, in which we have measurement possibilities that measure voltages, other intensities, other resistance, ...
- "Manual". We will manually indicate the overall uncertainty of the equipment.
- "Maximum." It takes the maximum value of each of the measurement possibilities as the overall uncertainty of the equipment. This option will not be active if **Enter Uncertainty Slope Data** is active.
- "Regression Line". It will express overall Equipment uncertainty like a fastball. This option will not be active if **Display Nominal column** is not active or **Enter uncertainty slope data** is active.

In **Global Uncertainty with zero correction,** we will indicate whether the correction (indication error) will always be 0 and the value of the correction is included by adding it to the uncertainty. It will only be active if **nominal deviation** is activated.

In **Umax Acceptance**. If it is activated, the acceptance criterion for Maximum Uncertainty will be considered. To be able to use this criterion, it is necessary that the value of Maximum Uncertainty has been entered in the Possibilities of measure. The acceptance criteria used are as follows:

If the uncertainty of the measurement possibility is less than or equal to I. max. the Equipment will be "Pass", otherwise the Equipment will be "Unfit".

This option will not be active if **Enter Uncertainty Slope Data** is active.

In **Acceptance by EMA (Maximum Error Allowed).** If it is activated, the EMA acceptance criterion will be taken into account. In order to be able to use this criterion, the EMA value must have been entered in the Possibilities of measure. The acceptance criteria used are as follows:

If the absolute value of the *maximum error + the uncertainty* of the measurement possibility is less than or equal to EMA, the equipment will be "Pass", otherwise the equipment will be "Fail".

This option will not be active if **Enter Uncertainty Slope Data** is active and/or **Enter Nominal Variance** is disabled.

Under **Annotate Settings**. If it is activated, a field will be presented in which we can indicate whether or not adjustments have been made to the control we have made. Adjustments made can be noted in the Observations field.

The **Additional Header Fields section** allows you to add fields with additional information in the control certificate header.

The Attributes folder

This folder allows you to enter as many tests by attributes as you want.

The **Code field** is the one that will appear on the certificate and in the **Description field** we can enter additional information that will be presented only on the screen.

The **Sort** button allows you to reassign the Order numbers consecutively if for some reason they are not consecutive or because a record has been previously deleted or modified.

The **Move Up** and **Move Down** buttons allow you to set the order in which you want the records to appear. All you must do is hover over a register and press one of the two.

The **Import button** allows you to import attributes from a particular family.

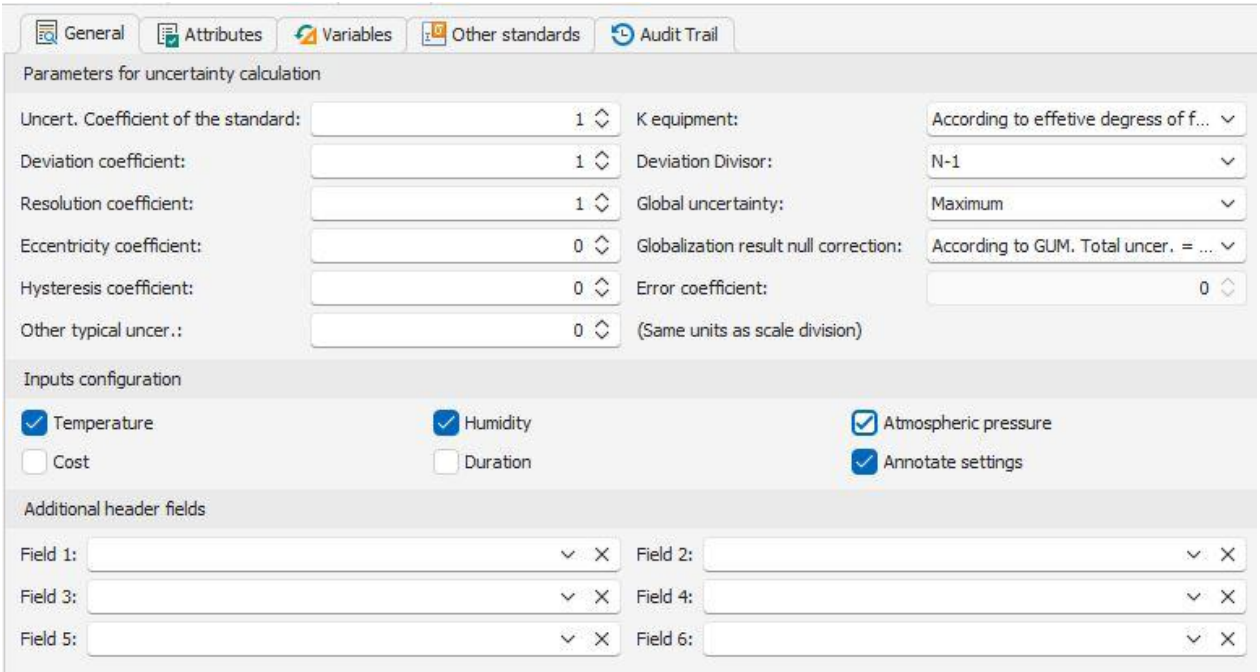
Normal

This type of format will be used to perform calibration-type checks on scaled measuring equipment.

In general, this type of format will be assigned the "Normal" report template, which will serve as a template for printing the certificate.

The result template that is commonly used is "Default".

The General Folder



First, let's set up the parameters needed to perform the uncertainty calculation.

The recommendations of the ISO Uncertainty Calculation Guide (GUM) have been used to perform the uncertainty calculations. A summary of this guide can be found in ENAC with reference EA-4/02 M:2022 Rev.3.

Uncertainty Calculation Parameters

Typical uncertainty is calculated as:

$$u^2 = (c_1.u_0)^2 + (c_2.u_s)^2 + (c_3.u_r)^2 + (c_4.u_e)^2 + (c_5.u_x)^2 + (c_6.u_h)^2 + u_o^2 + u_f^2$$

Being:

$u_0 = \frac{I_0}{k_0}$ The typical uncertainty of type B due to the pattern.

$u_s = \frac{s}{\sqrt{n}}$ Typical Type A uncertainty due to repeatability.

$u_r = \frac{R}{\sqrt{12}}$ Typical B-type uncertainty due to scale splitting.

$u_e =$ Indication error. Typical type B uncertainty due to the error in the indication of the measurement.

$u_x = \frac{Máx - Mín}{\sqrt{12}}$ Typical type B uncertainty due to eccentricity. To calculate the eccentricity, 5 values are taken at different points. For example, on a plate on a scale we will take a value in each corner and a value in the center. The eccentricity effect is usually measured at 1/3 or half of the total range. Of the values obtained, the maximum and minimum values will be used to calculate the uncertainty.

$u_h = \frac{|Creciente - Decreciente|}{\sqrt{12}}$ Typical type B uncertainty due to hysteresis. For example, for a scale: you start from 0 and put a mass of value in the middle of the range, this value will be the increasing value, then you put an additional mass to bring the reading to the end of the range. Once this is done, this mass is removed, and the value is noted as decreasing.

u_o Other typical uncertainties that are introduced directly.

u_f Formulate other typical uncertainties. You can enter a formula that includes the following key fields: MIN, Max, and SC.

The expanded uncertainty will be calculated:

$$U = k.u$$

If the effective degrees of freedom (e.g.p.) are greater than 10, the coverage factor k=2 can be considered for a probability of coverage of approximately 95%.

If the degrees of freedom are less than or equal to 10, the value of k should be calculated according to Student's t-distribution for the degrees of freedom obtained and a probability of coverage of approximately 95%.

According to GUM, and for the formula used, it can be simplified to obtain the effective degrees of freedom such as:

$$v_{ef} = \frac{u^4}{(c_2.u_s)^4}(n-1)$$

We will indicate a coefficient c4=1 if we want to include the correction within the uncertainty, in this case the correction of the calibration will always be 0.

The Globalization result **null correction field** will allow us to express the result of the calibration always with correction 0 (or what is the same with indication error 0), since this correction will be included in the uncertainty.

There are two ways to realize globalization:

- "Include typical error inc. ". In this case, you will enable the **Error Coefficient** field (c4). A coefficient of 1 is usually specified to include the error within the formula for calculating typical uncertainty.
- "According to GUM. Total I = max. error + I. max". The uncertainty shall be calculated as the sum of the maximum indication error plus the maximum obtained uncertainty. This second alternative is the one we recommend as it is referenced in GUM.

If the "None" option is selected, no globalization will take place.

For the calibration of a piece of dimensional equipment (e.g. a micrometer) we recommend setting the coefficients c1, c2, c3 equal to 1 and c4 equal to 0. On the other hand, we will globalize the result to null correction using the option "According to GUM. Total I = max. error + I. max".

The **k Equipment field** allows you to select the strategy for the calculation of the coverage factor k. It has two possible values:

- "k=2. Hypotheses: reliable type A data". This option does not perform the calculation of degrees of freedom and always assigns a coverage factor k=2.
- "According to effective degrees of freedom." This option will calculate the effective degrees of freedom and assign the coverage factor k depending on those degrees of freedom.

The **Variance Divider field** allows you to assign the divisor used in the standard deviation calculation. Although the values "N" and "N-1" can be selected, according to GUM, it is normal to use "N-.1”

The **Global Uncertainty field** indicates how the Equipment's global uncertainty will be mapped. You have two options:

- "It's not calculated." This option is necessary if it is a piece of equipment with different measurement possibilities of different nature. For example, a Tester, in which we have measurement possibilities that measure voltages, other intensities, other resistance...
- "Maximum." It takes the maximum value of each of the measurement possibilities as the overall uncertainty of the equipment.

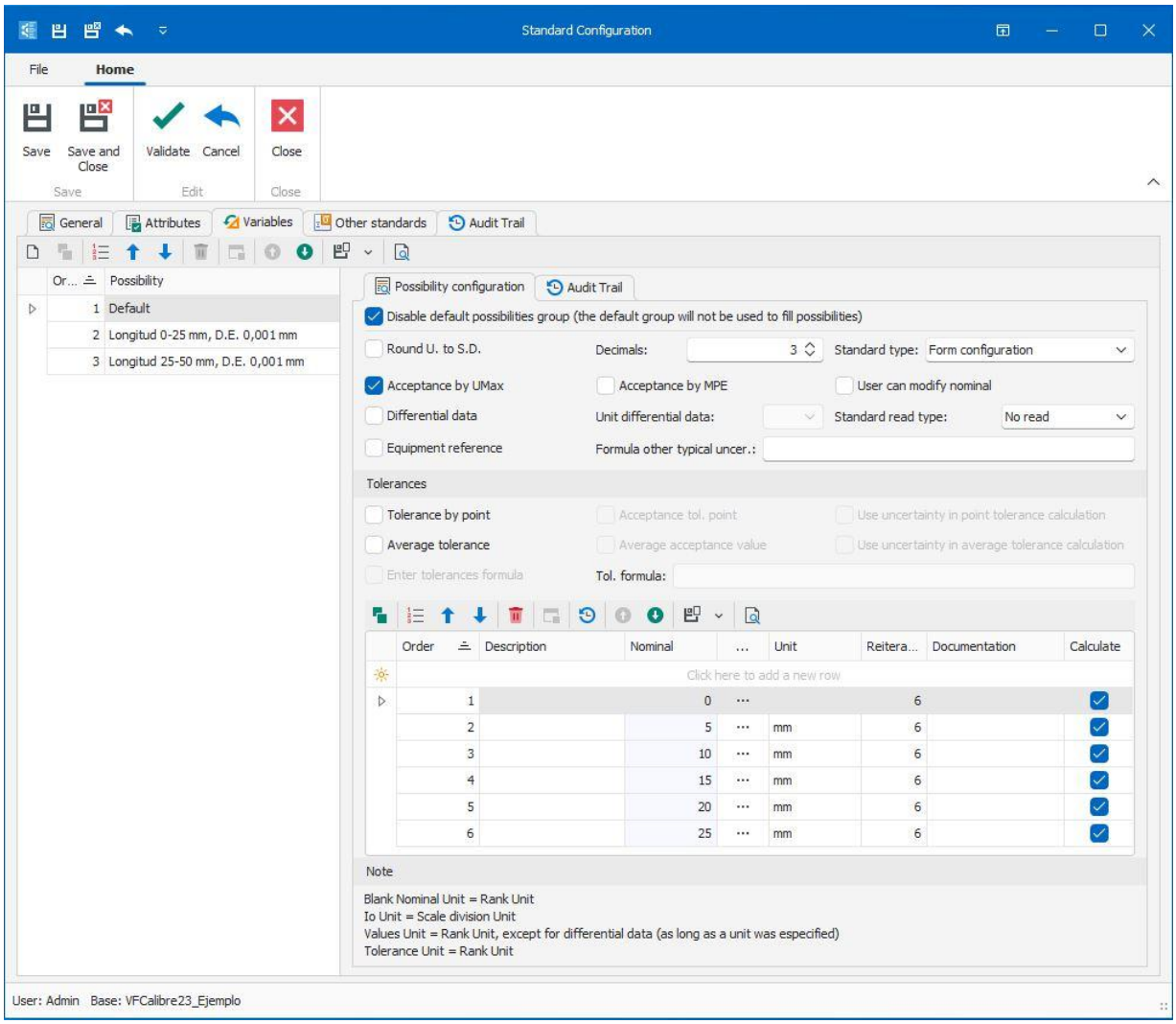
In the **Input Configuration section,** we will indicate whether we will enter the values of temperature, humidity, atmospheric pressure, cost, duration of the control and note settings in the data entry.

The **Additional Header Fields** section allows you to add fields with additional information in the test certificate header.

The Attributes folder

See overview in the explanation of the Exterior format.

The Variables folder



In this folder, the calibration points within the scale and their Possibilities will be specified for each of the measurement possibilities.

On the left side of the screen, a list of the different measurement options appears. When the format is configured for the first time, only the measurement option "(Default)" appears. This possibility will always be present and contains the configuration values of all measurement possibilities that are not explicitly defined.

The measurement possibility "(Default)" cannot be deleted, but it can be deactivated with the "Disable the default possibility group" check, then the default group will not be used to complete the possibilities.

With the **New button** we will include Groups of possibilities according to a specific filter:

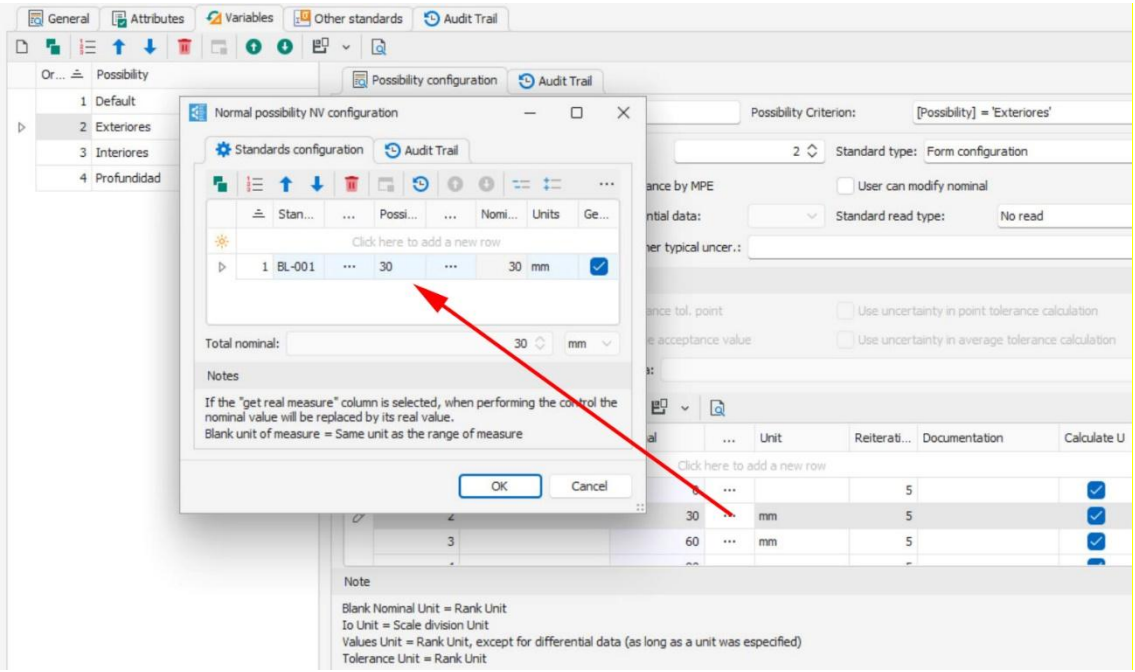
The filter can be as simple as the one shown in the example and would maintain compatibility with versions lower than Visual Factory Calibre 23, or much more complex.

A filter that might be useful is to define the control points according to the possibility and maximum value of the range. In this case, we would define a filter as the following:

Note: Value1 corresponds to the Nominal Tool Equipment and the Minimum Nominal Rating of the range of normal type equipment. Value2 with the Maximum Nominal and Value3 with the scale division.

On the right-hand side of the screen, the configuration parameters of the selected measurement option are displayed:

- **Round I. to D.E**. If this field is enabled, the calculated uncertainty of the measurement possibility is rounded to the nearest upper multiple of the equipment's scale division.
- **Decimals**. Indicates the number of decimal places we will use in data entry. This field is limited to 5.
- **Type of pattern**. Configure how the patterns will be entered. You can select one of the following three options:
  - **No pattern is used**. The control is performed without specifying the uncertainty of the pattern.
  - **Direct entry**. The uncertainty values of the patterns are entered *directly* into the nominal configuration table at the bottom of the window.
  - **Configuration form**. When you select this option, a radio button appears in the column corresponding to the Nominal in the table. Clicking on it brings up the following form:



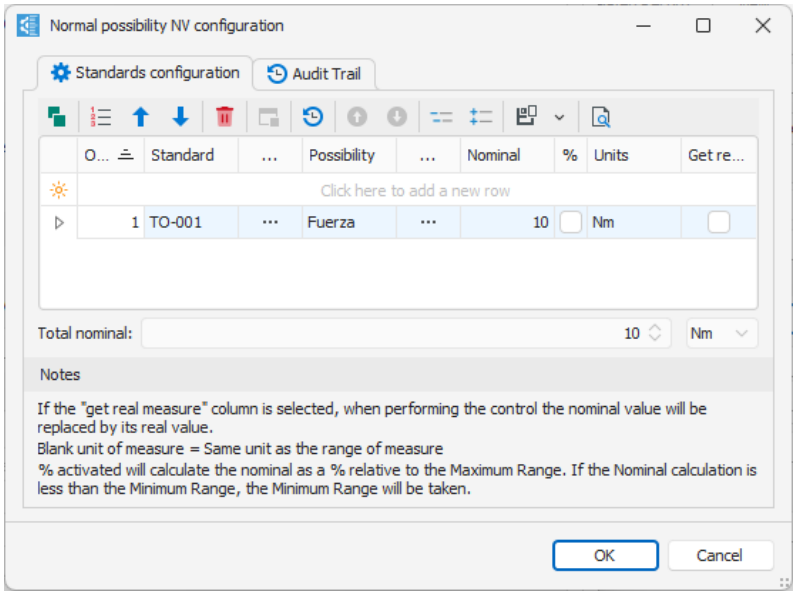
Thus, it is possible to indicate the composition of several patterns. As an exceptional case, if the Nominal is 0, the **Pattern** and **Possibility** fields can be left empty, and no associated uncertainty will be searched.

If the Possibility field is not specified, the uncertainty values will be searched in the computer's overall results.

If the Standard **and** Possibility **fields are entered,** the uncertainty data assigned to the measurement possibility will be searched and the nominal will be automatically filled with the value of the Possibility.

If the **Get Actual Measurement field** is selected, the nominal value defined for the standard is displayed, and at the calibration it will be replaced with its actual value.

The % column allows us to enter the % of the measurement range, instead of a fixed nominal. This option can be very useful for defining calibration points, for example torque wrenches. For example:



In this case, if the range of the key to be calibrated is 1 – 50 Nm, the indicated configuration will have a nominal of 50 * 0.1 = 5 Nm. Where 0.1 represents the 10% indicated.

For this % option we must take into account the following:

- If we indicate a % whose value is less than the minimum range, the minimum value will be presented. For example, if for the previous example we indicate the %, the nominal that it will present will be 1 Nm.
- This option will only be active for direct measurement standard equipment, i.e. one that has a range and a scale.
- When a line is defined with %, it can no longer be defined, that is, there is no possibility of composition.

- **Umax acceptance**. If it is activated, the acceptance criterion for Maximum Uncertainty will be taken into account. In order to be able to use this criterion, it is necessary that the value of Maximum Uncertainty has been entered in the Possibilities of measure. The acceptance criteria used are as follows:

  If the uncertainty of the measurement possibility is less than or equal to I. max. the Equipment will be "Pass", otherwise the Equipment will be "Unfit".

- **Acceptance by EMA (Maximum Allowable Error).** If it is activated, the EMA acceptance criterion will be taken into account. In order to be able to use this criterion, the EMA value must have been entered in the Possibilities of measure. The acceptance criteria used are as follows:

  If the absolute value of the *maximum error + the uncertainty* of the measurement possibility is less than or equal to EMA, the equipment will be "Pass", otherwise the equipment will be "Fail".

  Note: The acceptance criterion for Maximum Uncertainty is usually selected when the correction has been included in the uncertainty.

- **The user will be able to modify nominal and Io** in the case that the **Pattern Type** field is "Direct input", but when this field is "No pattern is used" or "Configuration form" the field will be called "**The user will be able to modify nominal".** If we have "Direct Input" the user will be able to modify the Nominal, Pattern Uncertainty and Pattern k fields at the time of performing the result. If we have "No pattern used" the user will only be able to modify the Nominal field when performing the result, since the Uncertainty of the pattern and k of the pattern fields will not appear. In the case of "Configuration Form" the user must fill in the "Master Value" field.

  The "**User may modify nominal" check** will only be available if Pattern Read Type has the value "Do not read".

- **Differential data**. If this field is activated, we can enter differential data with respect to the nominal value. For example, if the nominal value is 10 mm, the data obtained is, we will only enter 0.001.10,001 mm
- **Differential data unit**. This field will be active only if the **Differential Data** field is also active. Allows you to enter values in units other than those indicated in the specifications. Continuing with the previous example, if we define the units in microns, instead of entering 0.001 we will enter 1.
- **Pattern reading type**. This field has the following 3 options: Do Not Read, Media = Average (Pattern – Equipment), and Media = Average (Equipment – Pattern). If we check the second or third option, the data entry will present two columns for each value, one to enter the value of the pattern and one to enter the value of the equipment.

Reference mm	Standard Composition	U. standard mm	Stand... K	Val. 1 Std. mm	Val. 1 Equ. mm
29,99999	30	0,0001	2	30,05	30,06
60	60	0,0001	2	60,01	60,00
89,99999	60/30	0,0001	2	90,02	90,01

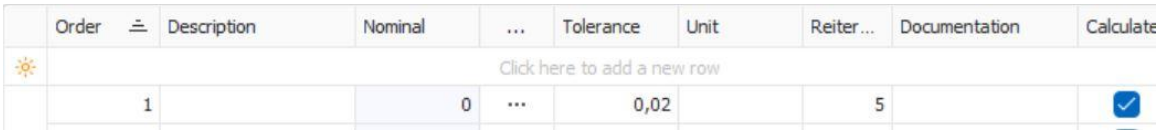
This option is useful when the standard used does not provide exactly the same measurement as the nominal one. For example, when it comes to testing a thermometer in a heat bath, the standard used is usually another thermometer. If the nominal is 50ºC, it is likely that the standard will not provide exactly the same measurement, but will vary a little (e.g. 50.01 in the first measurement, 50.02 in the second, etc.). In this way, it is possible to enter the value provided by the pattern and then the value provided by the equipment itself.

In these cases, the result of the calculation of the average will be the difference between the skipper and the Equipment (or vice versa).

Since there is only room for 20 iterations in the data entry, if this option is selected, the number of iterations will be limited to a maximum of 10, as two values (pattern and Equipment) will be used for each iteration.

If hysteresis and/or eccentricity is being used, the two columns for each value will also be presented if the **Pattern Reading Type field** is checked as the second or third option.

- **Equipment Reference**. If this field is activated, it will indicate that the measurement will be used to set the equipment instead of setting the standard. This functionality will not be available if **Pattern Reading Type has been specified**.
- **Formula other typical Uncerts**. It allows you to make another contribution to the uncertainty calculation for the particular possibility. You can enter a formula that includes the following key fields: Min, Max, and SC.
- **Nominal eccentricity**. We will indicate the nominal of the standard that we will use to calculate the uncertainty due to the eccentricity. It will only be displayed if a non-zero coefficient has been set.
- **Nominal hysteresis.** We will indicate the nominal of the standard that we will use to calculate the uncertainty due to hysteresis. It will only be displayed if a non-zero coefficient has been set.
- **Tolerances per point**. If this field is checked and the **Enter Formula Tolerances field is** not, the **Tolerance column** will be visible and you must enter the supported tolerance at that point on the scale.



In addition, when entering data, if the point is out of tolerance, the value will appear in red.

- **Acceptance to. point**. If this field is active, the acceptance criteria will consider that all points on the scale are within tolerances. If it is not active, even if there are points out of tolerance, the result for this concept will be "Pass". This field will only be activated if the **Point Tolerances field is also activated**.

  In addition, when entering data, if the point is out of tolerance, the value will appear in red, also conditioning the result as Fail.

- **Consider Uncer. in the calculation of point tolerances.**

It allows uncertainty to be taken into account when determining whether a piece of data is out of tolerance or not when performing a result.

In addition, if the point plus the uncertainty is out of tolerance, the value will appear in orange, also conditioning the result as Suitable with reservations if Acceptance is marked **full point**.

- **Average value tolerances**. If this field is checked and the **Enter Formula Tolerances field is** not, the **Tolerance column** will be visible and you must enter the supported tolerance at that point on the scale.

  Also, when entering data, if the average is out of tolerance it will appear in red.

- **Acceptance value average**. If this field is active, the acceptance criteria will consider that the average is within tolerances. If it is not active, even if the average is out of tolerance, the result for this concept will be "Pass". This field will only be activated if the **Average Value Tolerances** field is also activated.

  In addition, when entering data, if the average is out of tolerance, the value will appear in red, also conditioning the result as Fail.

- **Consider the Uncer. in the calculation of average value tolerances.**

  It allows uncertainty to be taken into account when determining whether the mean is out of tolerance or not when performing a result.

  In addition, if the mean plus the uncertainty is out of tolerance, the value will appear in orange, also conditioning the result as Suitable with reservations if the average value is marked **as Acceptance**.

- **Enter tolerance formula**. If this field is active, the Formula field will be activated. This field is only activated if one of the **Point Tolerances or Average Value Tolerances fields is also activated**.

- **Formula tol**. A mathematical formula can be written including the following key fields:
  - **MIN:** Minimum nominal corresponds to Value1.
  - **MAX:** Maximum nominal corresponds to Value2.
  - **SC:** Scale division corresponds to Value3.
  - **UMAX:** Maximum uncertainty
  - **EMA:** EMA
  - **TOLORIGIN:** Origin Tolerance corresponds to Value8.
  - **TOLSLOPE:** Tolerance Slope corresponds to Value9.
  - **NOMINAL:** Nominal

  Examples:
  - 2.5% Scale Background: MAX*2.5/100
  - Straight with slope: TOLORIGIN+TOLSLOPE*NOMINAL

In the table at the bottom, enter each of the points on the scale where values will be taken.

The **Reiterations field** should be between 1 and 20 if the Pattern Read Type option is not selected, and between 1 and 10 if this option is selected.

The **Description**, **Standard Composition,** and **Documentation** fields allow you to enter information to help perform calibration. These fields only appear on the screen and are not available on the printed certificate.

The **Calculate I field** indicates whether the uncertainty will be calculated for the scale point in question.

It is very important to consider the **Note** that appears at the bottom of the screen, which tells us the units that we must keep in mind in each of the values that we enter.

The **Sort** button allows you to reassign the Order numbers consecutively in the event that for some reason they are not consecutive or because a record has been previously deleted or modified.

The **Move Up** and **Move Down** buttons allow you to set the order in which you want the records to appear. All you have to do is hover over a register and press one of the two.

The Other Patterns folder

This folder will specify all the standards that can also be involved in the calibration but do not directly affect the uncertainty calculation.

The **Pattern field** allows you to select one of the patterns defined in the application.

You can add as many patterns as you want, and you can delete existing patterns.

Tool

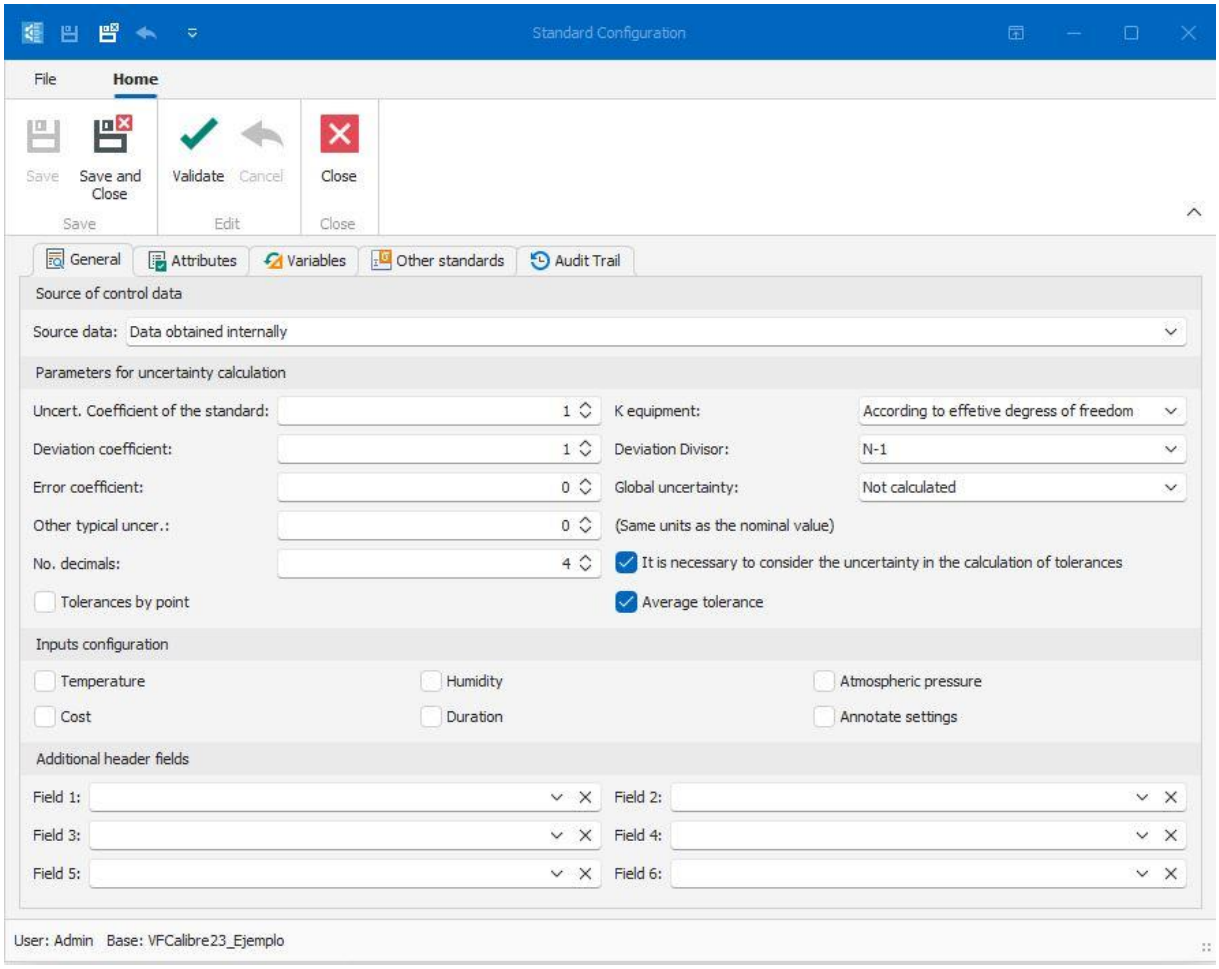
This type of format will be used to perform calibration-type checks on measuring equipment that presents the measurement directly, e.g. longitudinal standard blocks.

In general, this type of format will be assigned the "Tool Report" template, which will serve as a template for printing the certificate.

The result template that is commonly used is "Default".

The Possibilities of measure they use must be of a useful nature.

The General Folder



First, let's set up the parameters needed to perform the uncertainty calculation.

The recommendations of the ISO Uncertainty Calculation Guide (GUM) have been used to perform the uncertainty calculations. A summary of this guide can be found in ENAC with reference EA-4/02 M: 2022 Rev. 3.

Uncertainty calculation

The standard uncertainty of each possibility is calculated:

$$u_0^2 = u_{Pat1}^2 + u_{Pat2}^2 + u_{Pat3}^2 + u_{Pat4}^2 + u_{Pat5}^2$$

Typical uncertainty is calculated as:

$$u^2 = (c_1.u_0)^2 + (c_2.u_s)^2 + (c_4.u_e)^2 + u_o^2 + u_f^2$$

Being:

$u_0 = \frac{I_0}{k_0}$ the typical uncertainty of type B due to the pattern.

$u_s = \frac{s}{\sqrt{n}}$ typical Type A uncertainty due to repeatability.

$u_e = Error$ typical type B uncertainty due to measurement deviation.

u_o other typical uncertainties that are introduced directly. The units to be used will be those used at face value.

u_f Formulate other typical uncertainties. You can enter a formula that includes the following key fields: MIN, Max, and SC.

Under normal conditions the coefficients will be: c1=1, c2=1, c4=0.

The expanded uncertainty will be calculated:

$$U = k.u$$

If the effective degrees of freedom (e.g.p.) are greater than 10, the coverage factor k=2 can be considered for a probability of coverage of approximately 95%.

If the degrees of freedom are less than or equal to 10, the value of k should be calculated according to Student's t-distribution for the degrees of freedom obtained and a probability of coverage of approximately 95%.

According to GUM, and for the formula used, it can be simplified to obtain the effective degrees of freedom such as:

$$v_{ef} = \frac{u^4}{(c_2.u_s)^4}(n-1)$$

The coefficient c1 corresponds to the **Pattern Uncert coefficient field**.

The coefficient c2 corresponds to the Deviation **Coefficient field**.

The coefficient c4 corresponds to the **Error Coefficient field**.

The **k Equipment field** allows you to select the strategy for the calculation of the coverage factor k. It has two possible values:

- "k=2. Hypotheses: reliable type A data". This option does not perform the calculation of degrees of freedom and always assigns a coverage factor k=2.
- "According to effective degrees of freedom." This option will calculate the effective degrees of freedom and assign the coverage factor k depending on those degrees of freedom.

The **Variance Divider field allows** you to assign the divisor used in the standard deviation calculation. Although the values "N" and "N-1" can be selected, according to GUM, it is normal to use "N-.1”

The **Global Uncertainty field indicates** how the Equipment's global uncertainty will be mapped. You have two options:

- "It's not calculated." This option is necessary if it is a piece of equipment with different measurement possibilities of different nature. For example, a tester, in which we have measurement possibilities that measure voltages, other intensities, other resistances...
- "Maximum." It takes the maximum value of each of the measurement possibilities as the overall uncertainty of the equipment.

The **Decimal No. field allows** you to indicate the number of decimal places to be used in the tool configuration.

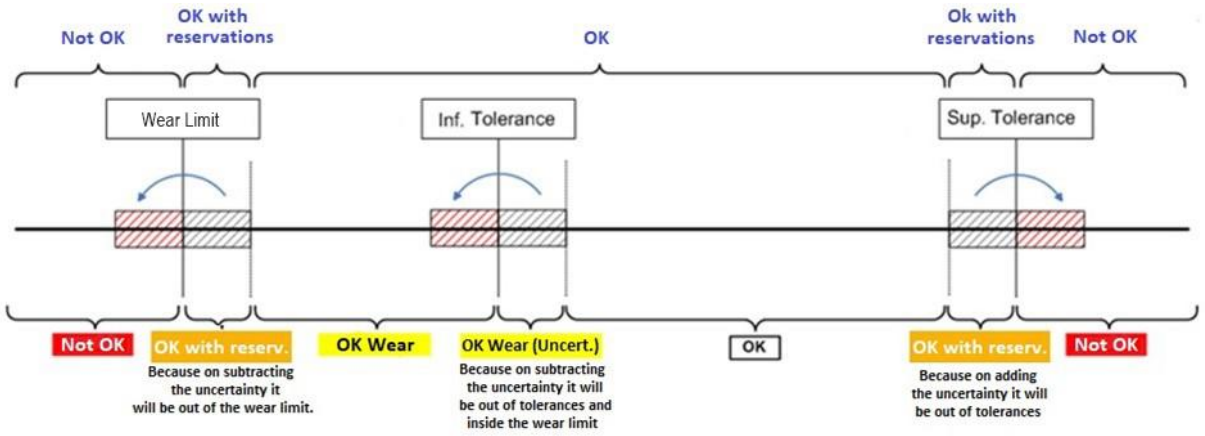
In the **Consider the Uncer., in the tolerance calculation,** we will indicate whether you want to consider the uncertainty in the tolerance calculation when calibrating the tool. If the point or mean, depending on what type of tolerances are marked, plus the uncertainty is outside tolerances, the value will appear in orange.

For smooth and threaded buffers, in the data entry, *when the data entered by the user is out of tolerance* the partial result will be directly No OK and the cell shading will be red, if it is not within the wear limit, in which case the partial result will be **OK Wear** and the cell shading will be yellow.

When the data entered by the user is within the wear limit, and it has been indicated in the control configuration that uncertainty will be considered in the out-of-tolerance calculation, the data entered by the user ± the uncertainty shall be compared to determine whether it is outside the wear limit. If, considering the uncertainty, the data goes outside the wear limit, the partial result will be No OK and the shading of the cell will be orange.

On the other hand, if *the data entered by the user is within tolerances*, if it has been indicated in the control configuration that uncertainty will be considered in the calculation of tolerances, the data entered by the user + the uncertainty will be compared to determine if it is outside the upper tolerance. and the data entered by the user – the uncertainty to determine if it is outside the lower tolerance.

If, considering the uncertainty, it is out of tolerance, the partial result will be No OK and the shading of the cell will be orange, as long as the data ± the uncertainty is not within the wear limit, in which case the partial result will be **OK Wear (Uncert.)** and the shading of the cell will be yellow.



The order of priority of the partial results is as follows:

- No OK: Not Fit (in red)

- Ok with reservations: Suitable with reservations (in orange)
- OK Wear: Apt (in yellow)
- OK Wear (Uncert.): Apt (in yellow)
- OK: Apt

Note:As of version 23 of Visual Factory Calibre, the Tool and Pass-Don't Pass formats have been unified, while maintaining compatibility. It is now possible to indicate wear limits, if required, in any useful type of format.

When the **Point Tolerances** field is active, if the point is out of tolerances, the value will appear in red. On the other hand, when the **Average Tolerances field is active**, if the mean is outside of tolerances, the mean will appear in red.

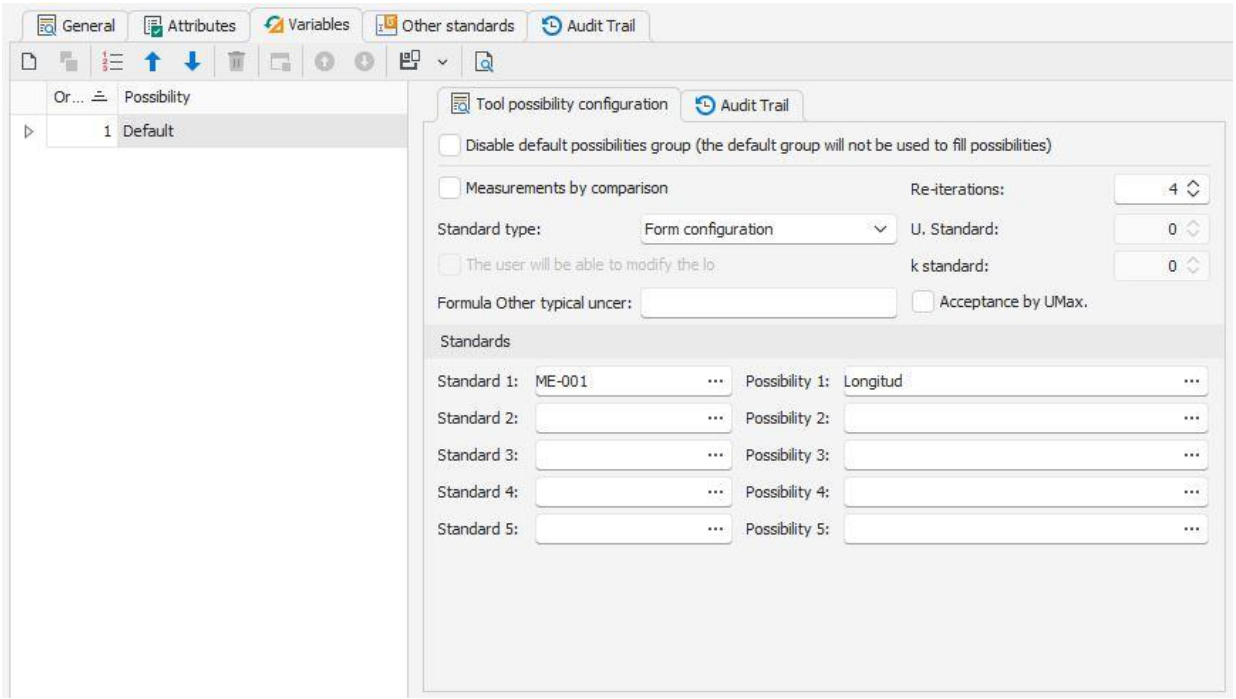
In the **Input Configuration section,** we will indicate whether we will enter the values of temperature, humidity, atmospheric pressure, cost and duration of the control in the data entry. The default values will be taken from what is indicated in the application settings.

The **Additional Header Fields** section allows you to add fields with additional information in the test certificate header.

The Attributes folder

See overview in the explanation of the Exterior format.

The Variables folder



In this folder, the calibration points and their Possibilities are specified for each of the measurement possibilities.

On the left side of the screen, a list of the different measurement options appears. When the format is configured for the first time, only the measurement option "(Default)" appears. This possibility will always be present and contains the configuration values of all measurement possibilities that are not explicitly defined.

The measurement possibility "(Default)" cannot be deleted, but it can be deactivated with the "Disable the default possibility group" check, then the default group will not be used to complete the possibilities.

With the **New button**, we will include Possibility Groups according to a specific filter. See full description in the Normal format section.

On the right-hand side of the screen, the configuration parameters of the selected measurement option are displayed. Let's look first at the case without measures by comparison: **Type of pattern**. Configure how the patterns will be entered. You can select one of the following three options:

  - **No pattern is used**. We will perform the control without specifying the uncertainty of the pattern. When you select this option, all fields will be disabled except for Reiterations, Formula Other Uncert. Typical and Umax Acceptance.
  - **Direct entry**. The uncertainty values of the patterns are entered directly into the I**. Pattern** and **k Pattern** fields.
  - **Configuration form**. The pattern is selected using the **Pattern n** and **Possibility n fields**, and up to 5 patterns can be placed.

    If the Possibility field is not specified, the uncertainty values will be searched in the computer's overall results.

    If you specify the **Standard** and **Possibility fields,** the uncertainty data assigned to the measurement possibility will be searched.

    The uncertainty will be calculated using the square root of the quadratic sums of the uncertainties of the patterns.

- **The user will be able to modify the Io**. This field will only be active if the **Pattern Type** field is "Direct Input". With this option, the user will be able to modify the values of the uncertainty of the pattern and k of the pattern at the time of the result.
- **Reiterations**. Indicates the number of iterations we will perform on each measurement possibility. The value entered must be between 1 and 20.
- **I. Pattern**. This field will only be active if the **Pattern Type** field is "Direct Input". We will enter the value of the uncertainty of the standard in the same units as those specified for the nominal and tolerances of the measurability.
- **K pattern**. This field will only be active if the **Pattern Type** field is "Direct Input". We'll enter the coverage factor k of the pattern.
- **Formula other typical Uncerts**. It allows you to make another contribution to the uncertainty calculation for the particular possibility. You can enter a formula that includes the following key fields: Min, Max, and SC.
- **Umax acceptance**. If it is activated, the acceptance criterion for Maximum Uncertainty will be taken into account. In order to be able to use this criterion, it is necessary that the value of Maximum Uncertainty has been entered in the Possibilities of measure. The acceptance criteria used are as follows:

  If the uncertainty of the measurement possibility is less than or equal to I. max. the Equipment will be "Pass", otherwise the Equipment will be "Unfit".

  - **Include C in I**. When Imax Acceptance is activated, it allows you to select whether to add the absolute value of the correction to the uncertainty. This option would be similar to the null uncertainty calculation we have in the Normal format, but it is not mapped to the total uncertainty of the possibility field. The latter is in this way since the result of the possibility also indicates the correction

- **Pattern 1 to 5**. This field will only be active if the **Pattern Type** field is "Configuration Form". We will introduce the standard from which the uncertainty values will be obtained.
- **Possibility 1 to 5**. This field will only be active if the Pattern Type field is "Configuration Form" and the corresponding Pattern n has been selected. We will introduce the possibility of measuring the indicated standard from which the uncertainty data will be searched.

Now let's look at the case of having the "**Measures by comparison" checkbox** checked.

Here you can also use up to 5 patterns, indicating a possibility for each of them.

- **Comparison pattern.** This section will be active if the "**Measures by comparison**" field is checked on the General tab.
  - **Boss.** This field allows you to select the pattern that is used as the comparison pattern.
  - **Possibility.** This field will only be active if the "Use same code possibility" field is not active. We will introduce the possibility of measuring the indicated standard from which the uncertainty data will be searched.
  - **Differential data**. This field will be activated, and we will have to enter differential data with respect to the nominal value. For example, if the nominal value is 10 mm, the data obtained is, we will only enter 0.001.10,001 mm
  - **Units**. This field will be active only if the **Differential Data** field is also active. Allows you to enter values in units other than those indicated in the specifications. Continuing with the previous example, if we define the units in microns, instead of entering 0.001 we will enter 1.

In some special cases it might be useful to be able to present the deviation in the results instead of the correction. *Consult Elecsoft for more information*.

The equipment will have a "Pass" result if all attributes are correct and either all measurements are within tolerances, or the average value is within tolerances. If all values are within tolerances, but when the uncertainty is applied, some values are out of tolerance, the computer will have a result of "Fit with reservations".

The Other Patterns folder

This folder will specify all the standards that can also be involved in the calibration but do not directly affect the uncertainty calculation.

The **Pattern field** allows you to select one of the patterns defined in the application.

You can add as many patterns as you want, and you can delete existing patterns.

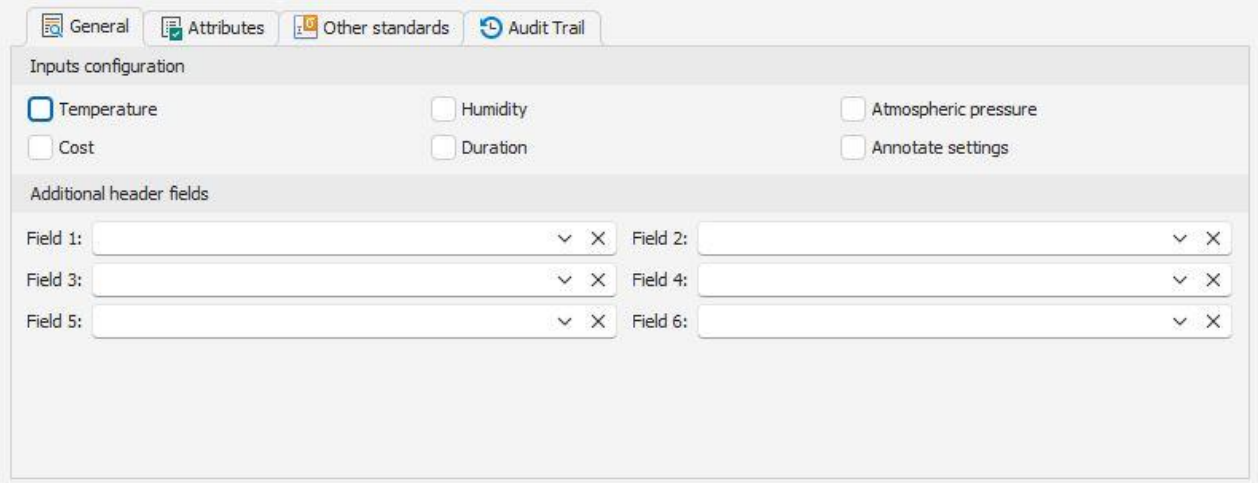
Attributes

This type of format will be used to perform attribute-only checks, without having to enter any variables.

In general, this type of format will be assigned the "Attribute report" data sheet, which will serve as a template for printing the certificate.

The result template that is commonly used is "Default".

The General Folder



In the **Input Configuration section,** we will indicate whether we will enter the values of temperature, humidity, atmospheric pressure, cost and duration of the control in the data entry. The default values will be taken from what is indicated in the application settings.

The **Additional Header Fields** section allows you to add fields with additional information in the test certificate header.

The Attributes folder

See overview in the explanation of the Exterior format.

The Other Patterns folder

This folder will specify all the standards that can also be involved in the calibration but do not directly affect the uncertainty calculation.

The **Pattern field** allows you to select one of the patterns defined in the application.

You can add as many patterns as you want, and you can delete existing patterns.

Verification - normal

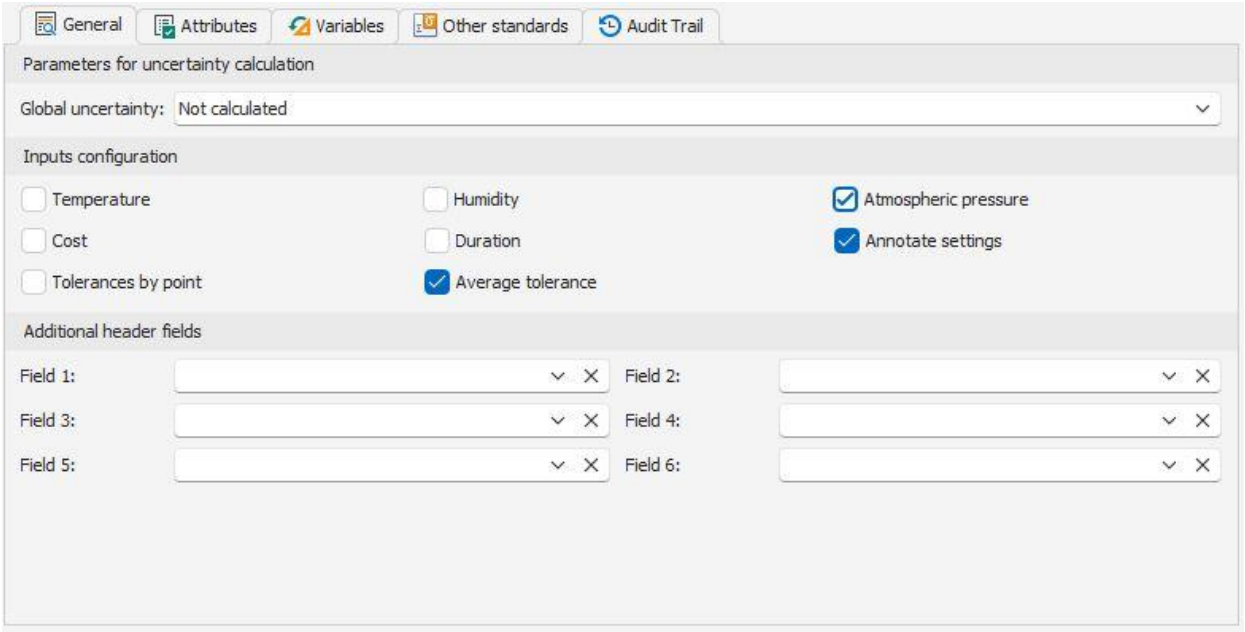
This type of format will be used to perform verification checks of scaled measuring equipment.

In general, this type of format will be assigned the "Verif. Normal Report" data sheet, which will serve as a template for printing the certificate.

The result template that is commonly used is "Default".

The Possibilities of measure they use must be of the "Normal" type.

The General Folder



In the Parameters section **of the uncertainty calculation,** we will indicate whether the overall uncertainty is not calculated, or the Maximum is calculated.

In the **Input Configuration section,** we will indicate whether we will enter the values of temperature, humidity, atmospheric pressure, cost and duration of the control in the data entry. The default values will be taken from what is indicated in the application settings. It shall also be indicated whether the tolerance will be checked by point or by average value.

The **Additional Header Fields** section allows you to add fields with additional information in the test certificate header.

Uncertainty calculation

In this type of format, the uncertainty is directly assigned to the uncertainty of the pattern.

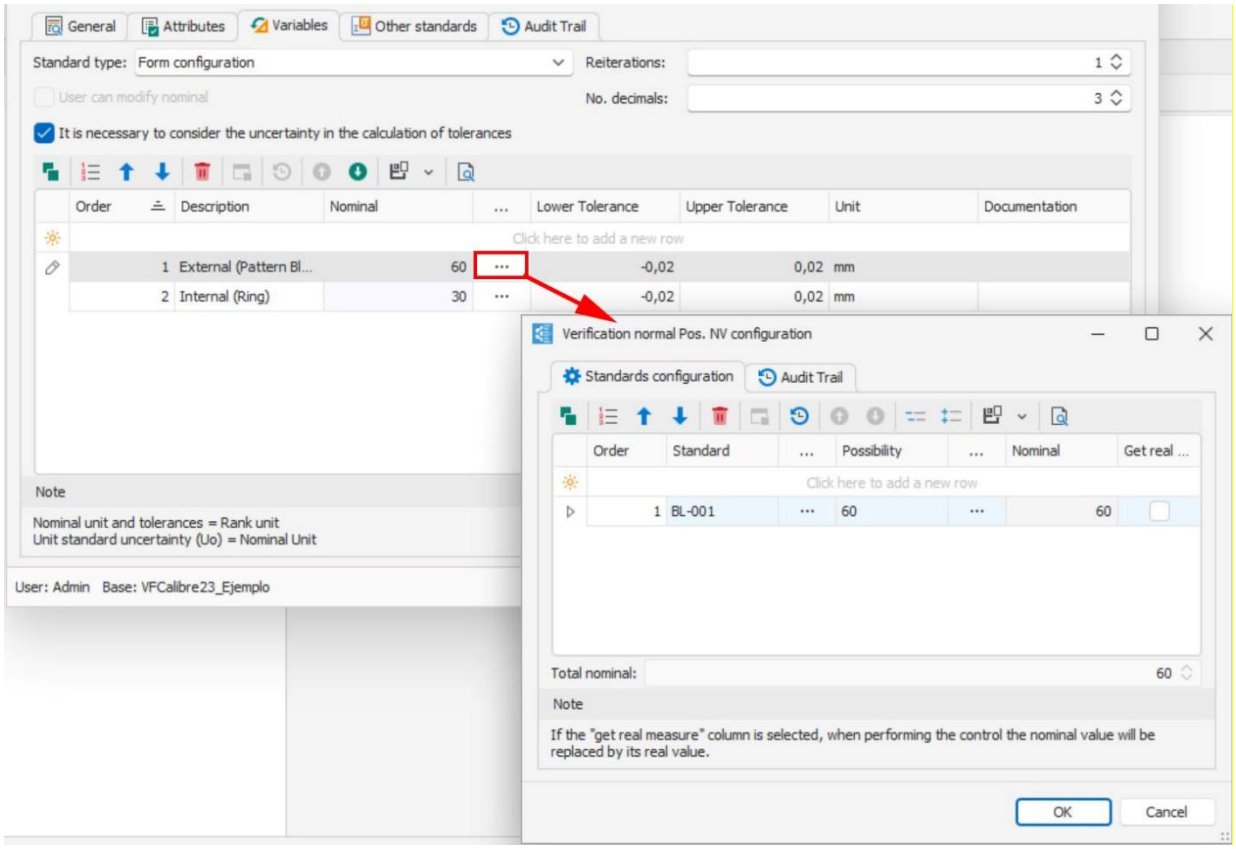
The **Global Uncertainty field indicates** how the Equipment's global uncertainty will be mapped. You have two options:

- "It's not calculated." This option is necessary if it is a piece of equipment with different measurement possibilities of different nature. For example, a tester, in which we have measurement possibilities that measure voltages, other intensities, other resistances...
- "Maximum." It takes the maximum value of each of the measurement possibilities as the overall uncertainty of the equipment.

The Attributes folder

See overview in the explanation of the Exterior format.

The Variables folder



This folder will specify the calibration points within the scale and their Possibilities.

The meaning of the various configuration parameters is as follows:

- **Type of pattern**. Configure how the patterns will be entered. You can select one of the following three options:
  - **No pattern is used**. The control is performed without specifying the uncertainty of the pattern.
  - **Direct entry**. The uncertainty values of the patterns are entered *directly* into the nominal configuration table at the bottom of the window.
  - **Configuration form**. When you select this option, a radio button appears in the column corresponding to the Nominal in the table. In this way it is possible to indicate the composition of several patterns. As an exceptional case, if the Nominal is 0, the **Pattern** and **Possibility** fields can be left empty and no associated uncertainty will be searched.

    If the Possibility field is not specified , the uncertainty values will be searched in the computer's overall results.

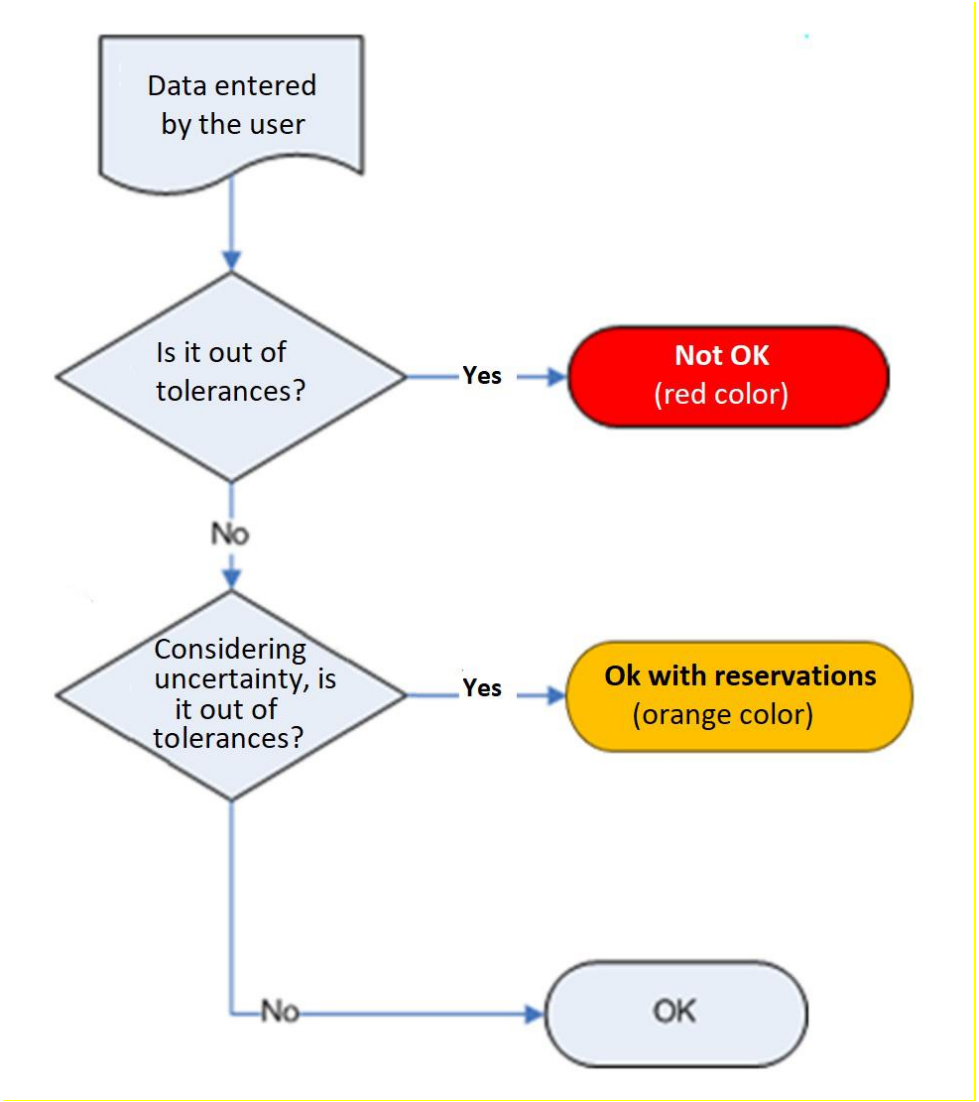
    If the Standard **and** Possibility **fields are entered** , the uncertainty data assigned to the measurement possibility will be searched and the nominal will be automatically filled with the value of the Possibility.

    If the **Get Actual Measurement field** is selected, the nominal value defined for the standard is displayed, and at the calibration it will be replaced with its actual value.
- **The user will be able to modify nominal and Io**. This field will only be active if the **Pattern Type** field is "No Pattern Used" or "Direct Input". With this option, the user will be able to modify the Nominal, Pattern Uncertainty and Pattern k fields at the time of the result. Of course, if the **Pattern Type** field is "No pattern used" the user will only be able to modify the Nominal field when performing the result, as the Pattern Uncertainty and Pattern k fields will not appear.

- **Reiterations**. Indicates the number of iterations we will perform on each measurement possibility. The value entered must be between 1 and 8.
- **No. Decimals**. Indicates the number of decimal places we will use in data entry.
- **Consider the Uncer. in the calculation of tolerances**. It allows uncertainty to be taken into account when determining whether a piece of data is out of tolerance or not when performing a result.

  In data entry, when the data entered by the user is *out* of tolerance, the partial result will be directly Not OK and the shading of the cell will be red.

  On the other hand, in case the data entered by the user is *within* tolerances, if it has been indicated that uncertainty will be taken into account in the calculation of tolerances, the *data entered by the user + the uncertainty will be compared* to determine if it is outside the upper tolerance, and the *data entered by the user – the uncertainty* to determine if it is outside of the lower tolerance. If, taking into account the uncertainty, it is out of tolerance, the partial result will be OK with reservations and the shading of the cell will be orange



  On a general level, when the data entered by the user is out of tolerance taking into account uncertainty, the overall result will be *Suitable with reservations*.

The equipment will have a "Pass" result if all measurements are within tolerances and all attributes are correct.

The Other Patterns folder

This folder will specify all the standards that can also be involved in the calibration but do not directly affect the uncertainty calculation.

The **Pattern field** allows you to select one of the patterns defined in the application.

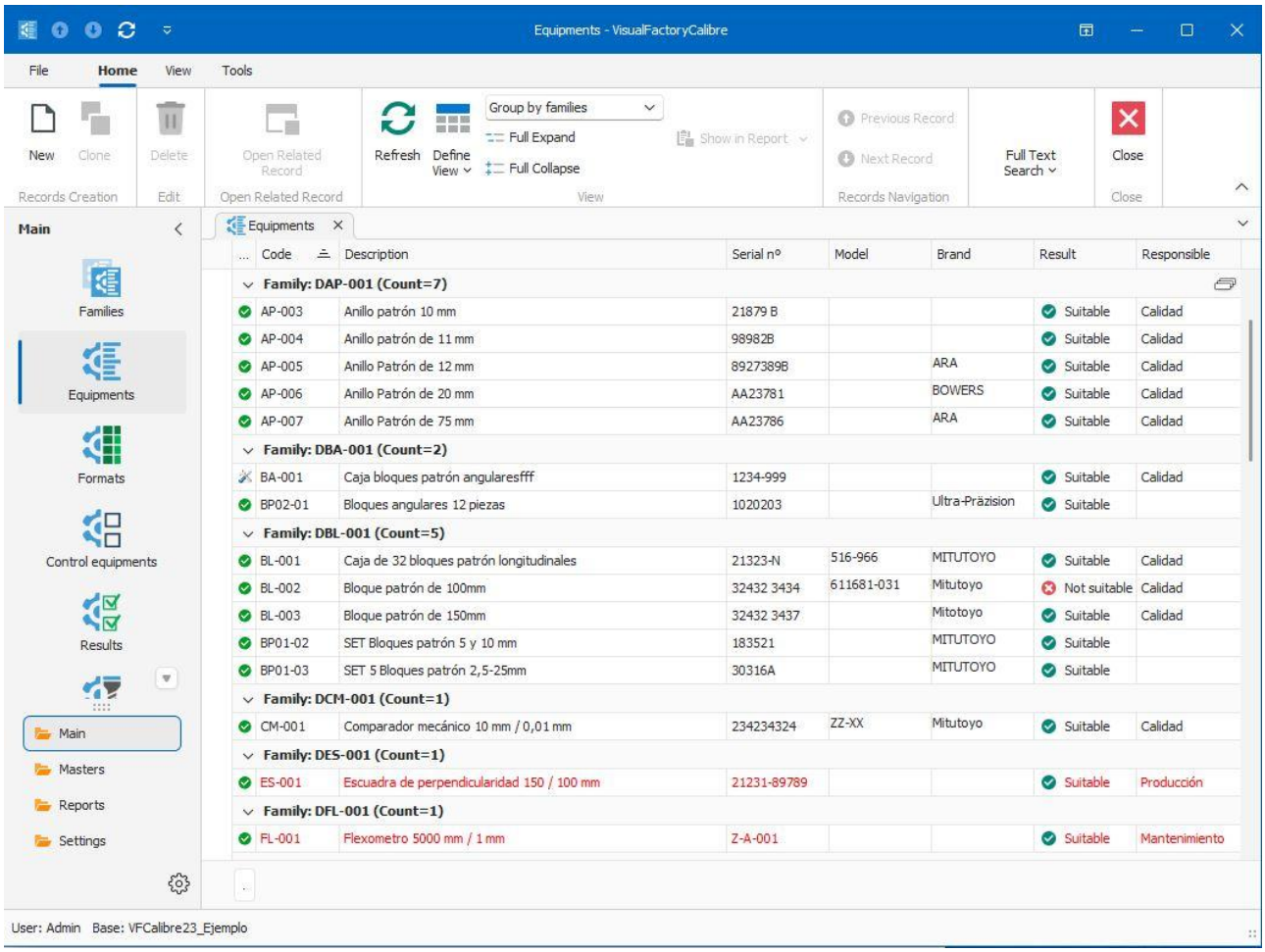
You can add as many patterns as you want, and you can delete existing patterns.

CHAPTER 6

Equipment

This chapter describes how the equipment module works. Visual Factory Calibre allows you to define a complete equipment for each caliber in which it is possible to indicate the general data of the same including the Possibilities of measure for each of the measurement possibilities, the standards used in its calibration, the results of the controls carried out, the history of the caliber and its applications.

Views from the Equipment module

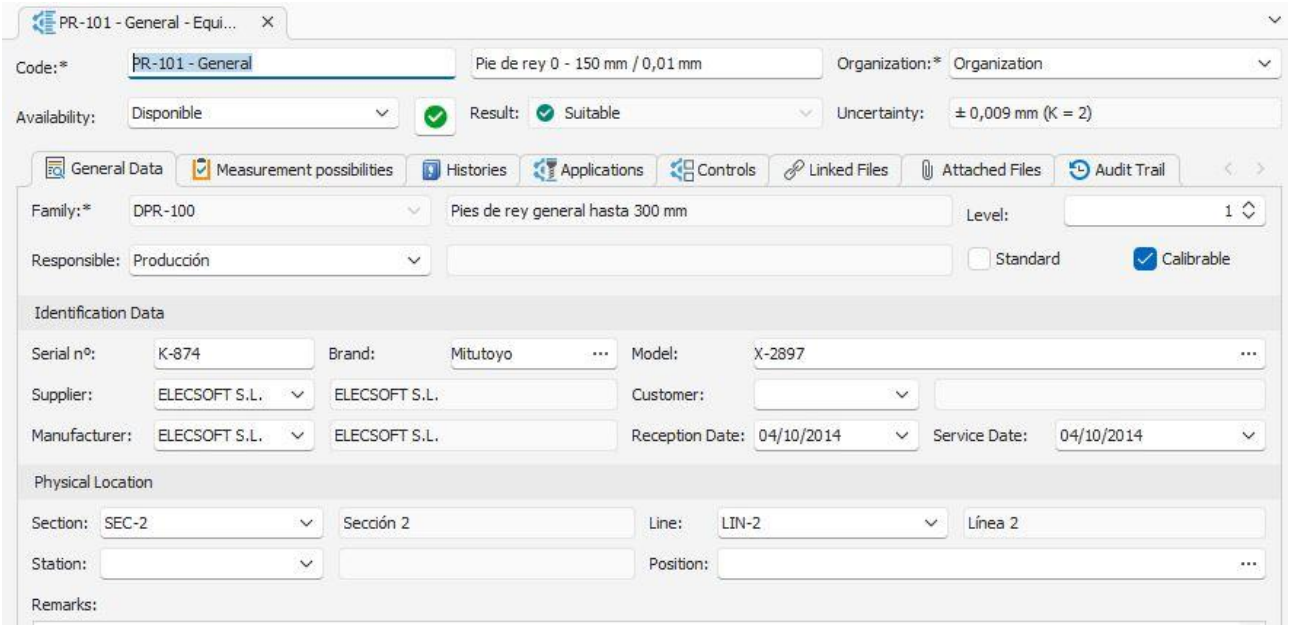


When the Equipment module is accessed, the last view that was used is presented by default. From here you can select a different view. The views that are defined with the application are as follows:

- **Defect**. It presents all the Equipment cards without applying any kind of filter.
- **Grouped by Families**. Same as Default, but groups records by the Family field.
- **Grouped by Pattern**. Same as Default, but groups records by the Pattern field.
- **Grouped by Sections**. Same as Default, but groups records by the Section field.

Note: The options available from this module of the Tools menu are explained in the chapter **Tools** at the end of this same manual.

Equipment Form



For each measuring instrument, you can define a complete calibration sheet, the data of which is organized in the form of a header and several tabs (the number of tabs depends on the configuration given in the family and the additional modules purchased). This distribution allows for easier consultation of information.

At the top of the form are the **Family Code, Description, Availability, Result, and Uncertainty** fields. The computer code must be unique in the database.

Caliber Availability

The **Availability** field represents the situation in which the measuring device is located. Although this field is independent of the status (pass or fail) of the computer, generally, the status will influence its availability.

The options in this field are, by default: **Available**, **Under Repair**, **Vendor**, **Cancellation**, **Other,** and **Observation**.

Note You can redefine availability statuses and even add new statuses from the Availabilities master.

If modifying a tab changes the Availability, the application will present a window giving you the opportunity to note this change in the History tab:

Result assigned to the Equipment

The state in which a measuring device is at any given time will be determined by the result of the last control carried out (calibration, verification, etc.), provided that the Assign result box has been ticked in the control definition. Possible statuses are:

- **Apt**. The Equipment passed the tests of the last control.

- **Suitable by reservation.** The Equipment passed the tests of the last control, although it cannot be defined that its result is one hundred percent suitable.
- **Not Suitable**. The Equipment failed the tests of the last control.
- **Without calibrate**. The equipment has not yet been controlled. This status will be automatically assigned when you create a new tab.

Uncertainty assigned to the Equipment

Displays the uncertainty values assigned to the equipment of the last control, provided that the Assign Uncertainty box is checked in the control definition.

General Data Folder

The general data folder indicates the family to which it belongs, the person in charge, the identification data and dates of receipt and commissioning of the instrument. This data is important and some of it must also be recorded on the device itself, since it is what guarantees the correspondence between a physical device and a calibration sheet.

Note Visual Factory Calibre It will not allow you to leave some fields blank if it is indicated in the folder **Equipment sheet** of the module **Configuration**.

Mark the gauge as a standard and calibrable

Equipment that can act as standards for calibrating or controlling other equipment should be marked as standards. This will allow them to be selected as such when configuring a control.

You may also decide that a certain appliance is not calibratable. Simply clear the **Calibratable check box**.

The Family Field

Each Equipment token must be assigned to a family. When you create a tab, you can assign one of the existing families to the Equipment.

When you create a new Equipment card and assign it a family, various fields on the card are updated with the values specified in the family. These fields are the **Features folder** and the **Controls folder**.

Once the tab has been created, you will not be able to directly change the Family. To switch, you must select the la **Change Family option** from the **Start menu**.

In the Change Family window, you must select the new Family. If you want the Possibilities of measure of the computer card to be updated with those defined in the Family, activate the **Update Possibilities of measure check**.

If a control is in the new family, but not on the tab, the app asks if you want to add the control.

In the controls that are on the tab, but not in the new family, if the control does not have any results, it is asked if you want to delete it and if it has a result, it is left but unlinked from the family.

If the control is in the new family and is unlinked from the family on the tab, ask if you want to leave the control unlinked (with the data it currently has) or link it.

If the control is in the new family and is linked on the tab, it is replaced by the control in the new family.

Caliber Identification Data

In this section, you will indicate important information about the measuring equipment that will allow you to identify it and know where it comes from.

Physical situation of the caliber

This table contains the three parameters that will allow you to immediately locate the place where the measuring device is intended.

The Observations Field

The Observations field is a field to indicate any additional information regarding the caliber.

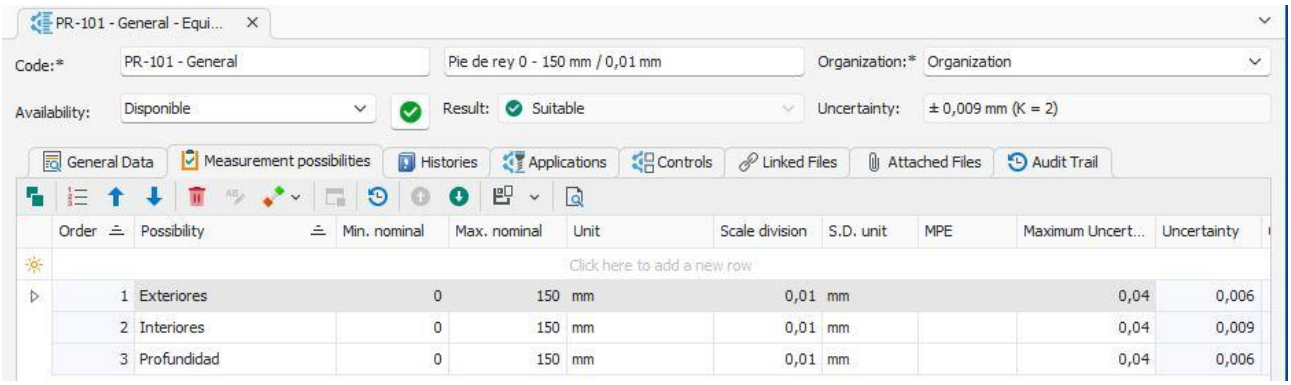
The remarks field acts as a text editor with the same functionality as the editor already described in the chapter on **Families**.

How to Define Configurable Fields

To add user-configurable fields, you must go to the "Show Customizations Screen" option in the header and right-click.

(For more information, see the "Customizations Screen" chapter of the VFApplication Framework manual.)

The Measurement Possibilities Folder



This folder is equivalent to the one that appears in Families and allows you to customize the family values to each specific Equipment.

When you create a Equipment file, the Possibilities of measure of the Equipment are automatically inherited from the family that has been assigned to it. The data may be modified at a later date. To modify the type of measures, you must do so from your corresponding family.

Note The type of gauge measurements is linked to the family assigned to you. Therefore, if you change the type of family measures, the changes will be reflected in *all* the calibers assigned to that family. Similarly, if you change the family assigned to a caliber, the type of measurements will be marked by the type contained in the new family. In no case are the measurement possibilities assigned to the gauge lost.

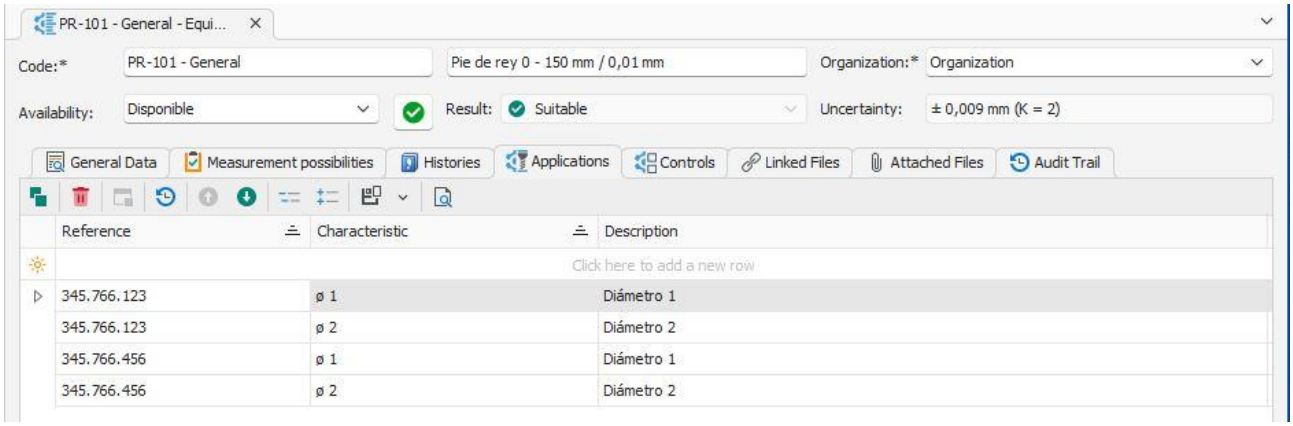
The **Sort** button allows you to reassign the Order numbers consecutively if for some reason they are not consecutive or because a record has been previously deleted or modified.

The History folder

This folder allows you to indicate a history of actions performed on the caliber, such as modifications and repairs. Visual Factory Calibre allows you to make an unlimited number of annotations for each gauge.

Note The history folder is only displayed if the family assigned to the tab has defined a format for it. As a result, if you change the family story type, the format changes will be reflected in *all* the calibers assigned to that family. Similarly, if you change the family assigned to a caliber, the type of story will be marked by the one the new family contains. In no case are the annotation data assigned to the caliber lost.

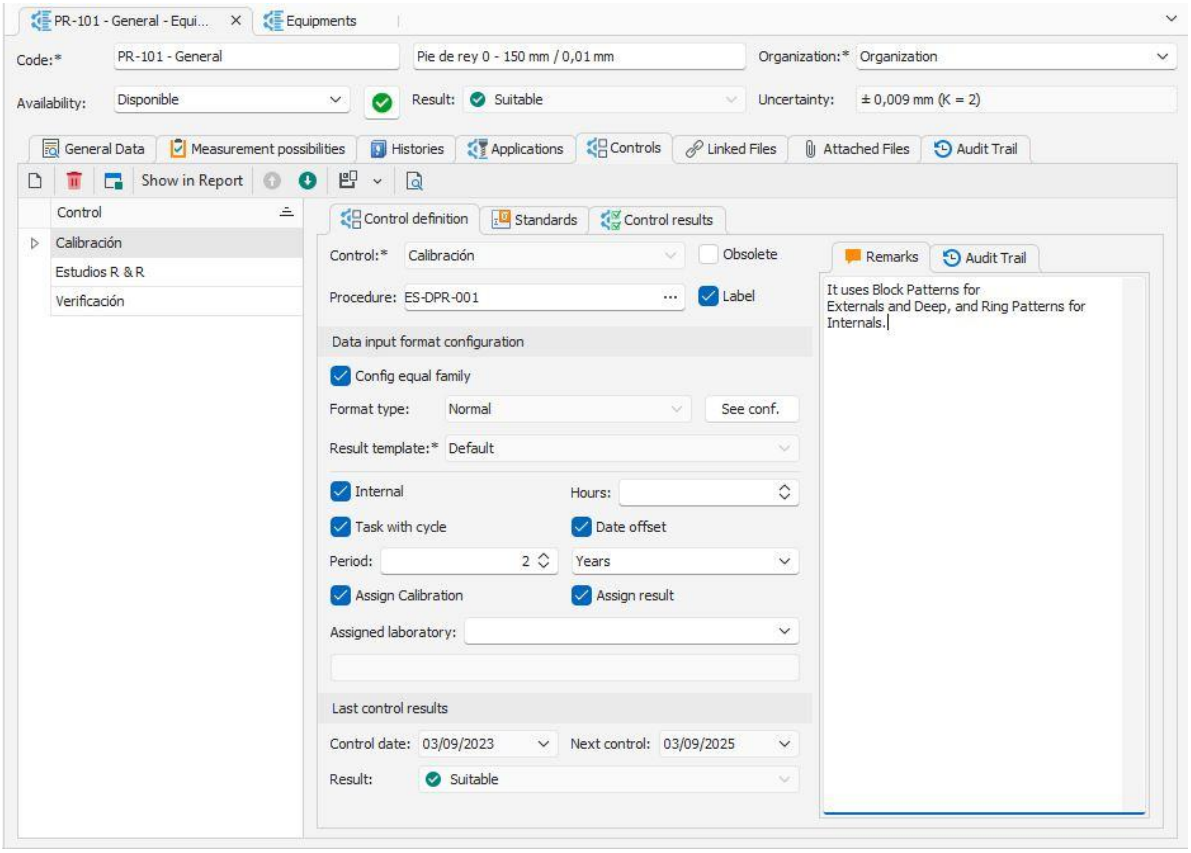
The Applications Folder



This folder allows you to indicate the reference of the parts or processes, as well as the Possibilities of these to be measured with the caliper. Visual Factory Calibre allows you to include an unlimited number of references for each caliber.

Note The applications folder is only displayed if we have defined a template format for the tab in the family assigned to the tab. Therefore, if you change the type of applications in the family, the formatting changes will be reflected in *all* the calibers assigned to that family. Similarly, if you change the family assigned to a caliber, the type of application will be marked by the one contained in the new family. Under no circumstances are the application data assigned to the caliber lost.

The Controls Folder



This folder indicates for each control its definition, patterns, and results.

Defining the Control

This can be taken from the family or customized for each Equipment. In this case, the screen includes additional information regarding the dates of the control and the results obtained.

The **Procedure** field allows you to specify the calibration procedure indicated for each control of the equipment.

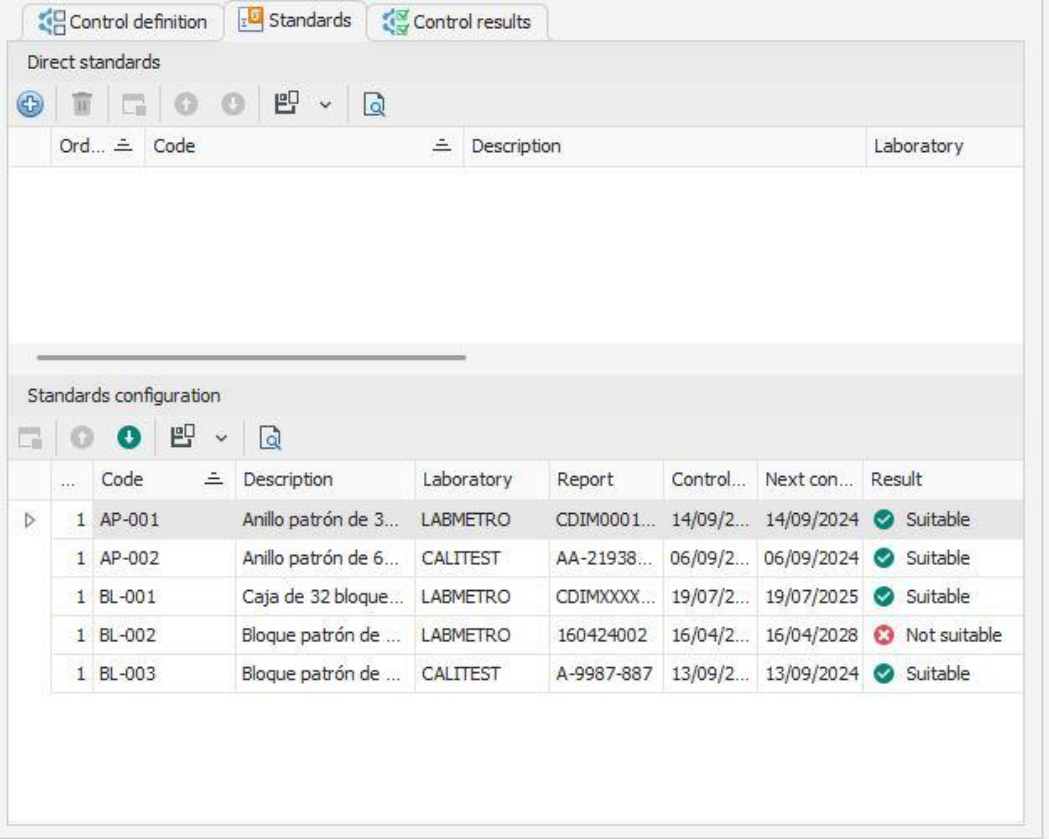
The **Label** field allows you to indicate whether labels will be printed for this computer. You can use this field to perform filters in Tab Control views.

The last and next check dates are automatically calculated by the program each time you perform a check. To change these dates, you must edit the last calibration of the measuring device.

If the **Configure Same as Family** field is enabled, the control will take the **Format Type**, **Datasheet, Report Template,** and **Result Template values** from the settings made on the family.

(For more information, see the "Control Folder" and "Format Types" sections of the "Gauge Families" chapter.)

Patterns

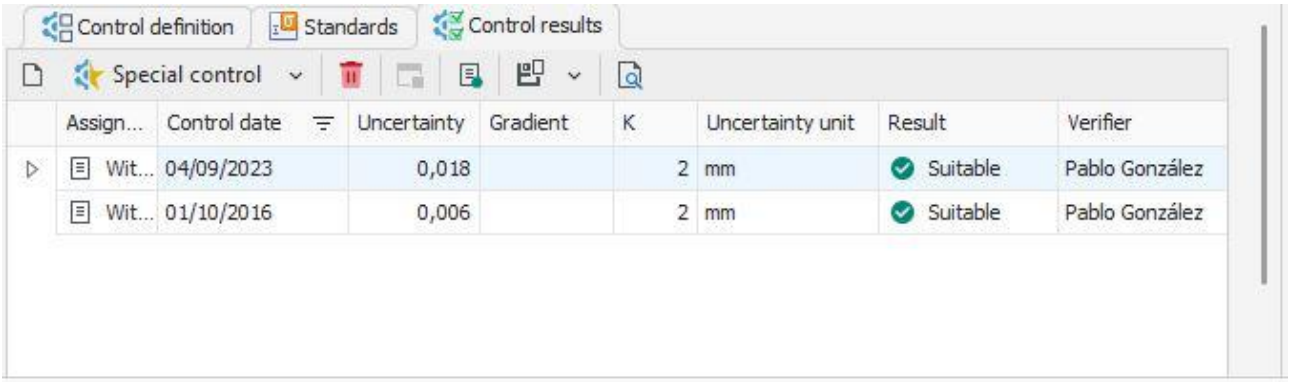


At the top you can indicate the patterns used in the control. They are added with the **Add Pattern button** .

On the other hand, at the bottom are listed the patterns defined in the configuration that are involved in the calculation of uncertainty. These patterns defined in the control configuration cannot be deleted from here, you will have to go into the configuration.

The former are typically used with calibration processes or other controls associated with Excel spreadsheets and the latter with standard processes defined from the application itself.

Control Results



This folder contains a history of the checks performed, for each of the defined control types. It allows you to perform new checks, as well as to view the detail sheet of any control performed. Similarly, it allows you to delete a control, if desired.

Note The format in which the results table is presented is linked to the family assigned to it. Therefore, if you modify the family outcome template, the changes will be reflected in *all* the calibers assigned to that family. Similarly, if you change the family assigned to a gauge, the calibration type will be marked by the type contained in the new family. Under no circumstances are the calibration data assigned to the gauge lost.

From the Results Table, the following operations can be performed:

- **New**. Perform a new control with the default settings assigned to that control (Format type, datasheet, etc.).
- **Special Control**. Allows you to perform controls with a different format than the one assigned in the control settings. The first option "Input without using any formatting" allows you to enter values directly on the columns defined in the Results Template (the columns that are displayed in the Results table of the results folder). This option does not generate any type of certificate and can be useful for entering externally performed checks. It can also be used to change the date or result of a check.

  The second option "Use an existing certified format" allows you to perform a check with any of the defined Excel datasheets.
- **Delete**. Allows you to delete the selected result in the table.
- **Print certificate**. Allows you to print a certificate according to the template defined in the control.

Note If the result was generated using the same format defined in the family control, it will be displayed according to the template set in that control. Otherwise, or if there is no report template defined in the family, the format specified in the general settings will be used.

- **Data template.** For controls formatted as normal or useful type, it allows you to get a certificate template without data. It can be useful to write down the data that will then be transferred to the program.

Types of results

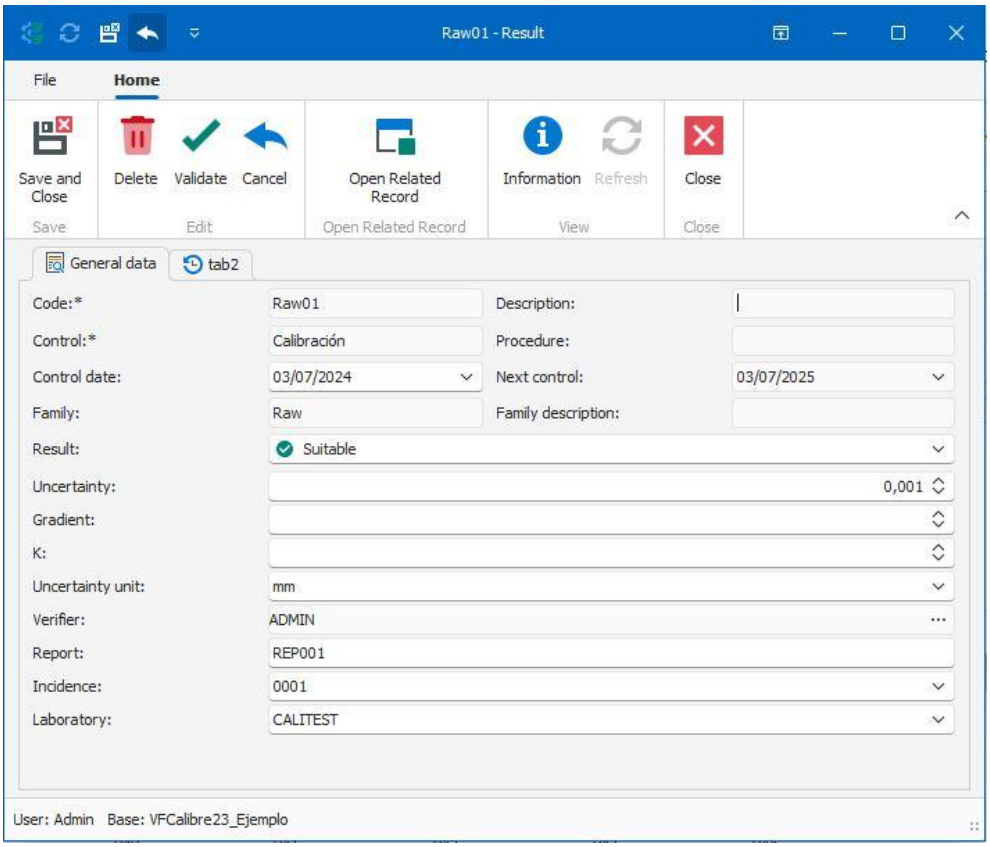
There are two types of results:

- With Assignment: Indicates that the results obtained are assigned to the control.
- Unassigned: Indicates that the results obtained are not assigned to the control.

Entering Results

Depending on the format specified in the control definition, the application will present one data entry form or another. There are three basic types of forms:

"Without Format" Entry

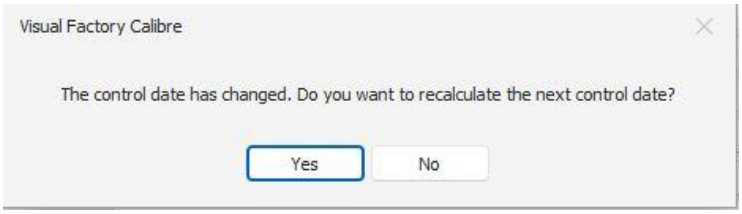


This data entry is presented when the user has set **the "Formatted Type" option** in the Format Type field.

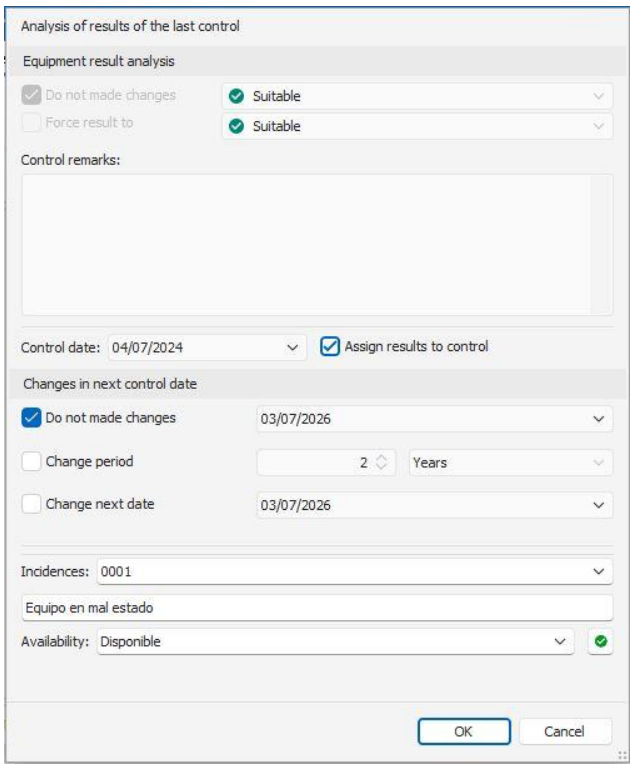
In this case, the application presents a standard form, where you can enter the fields that are defined in the Results Template.

All data is entered manually. If this is a new result, changing the control date will automatically recalculate the next control date.

If, on the other hand, an existing result is being edited and the control date is changed, the application will present the following message, asking if you want to recalculate the next control date:



When you press the **Save and Close button**, and if you are performing a new result or modifying the most recent result, the Result Analysis dialog box appears, as shown below:



From here you can assign the results to the control, make changes to the next control date, add issues, and make changes to availability.

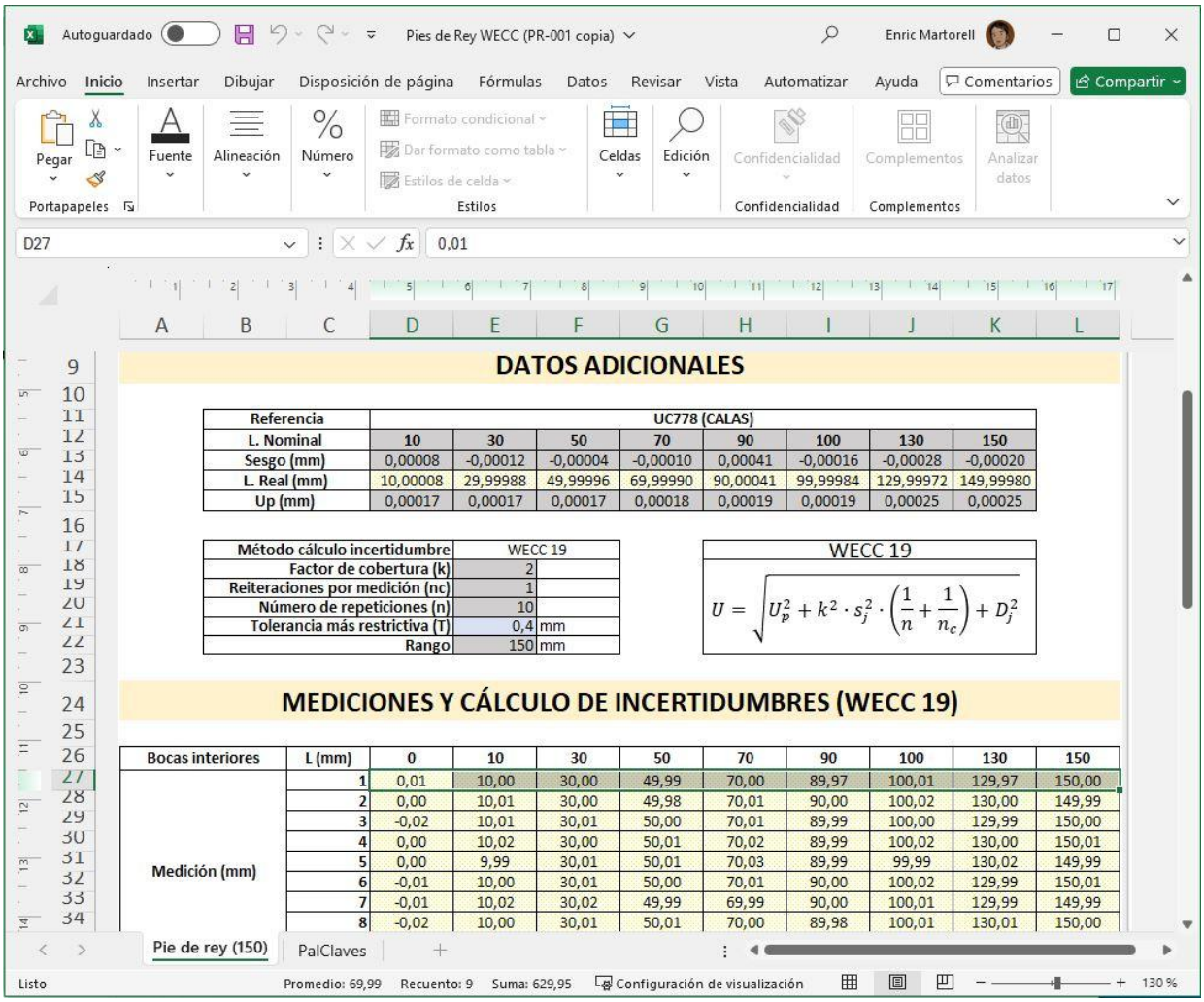
When you change the availability, the application will present a new dialog box giving you the opportunity to note this change in the History of the listing.

If the result is "Uncalibrated", the **Assign results to control** field is disabled.

Data entry using an Excel spreadsheet

Such a data entry form will be presented when **the "EXCEL" option** has been defined in the Format Type field.

The application will directly present a form with the Excel sheet:

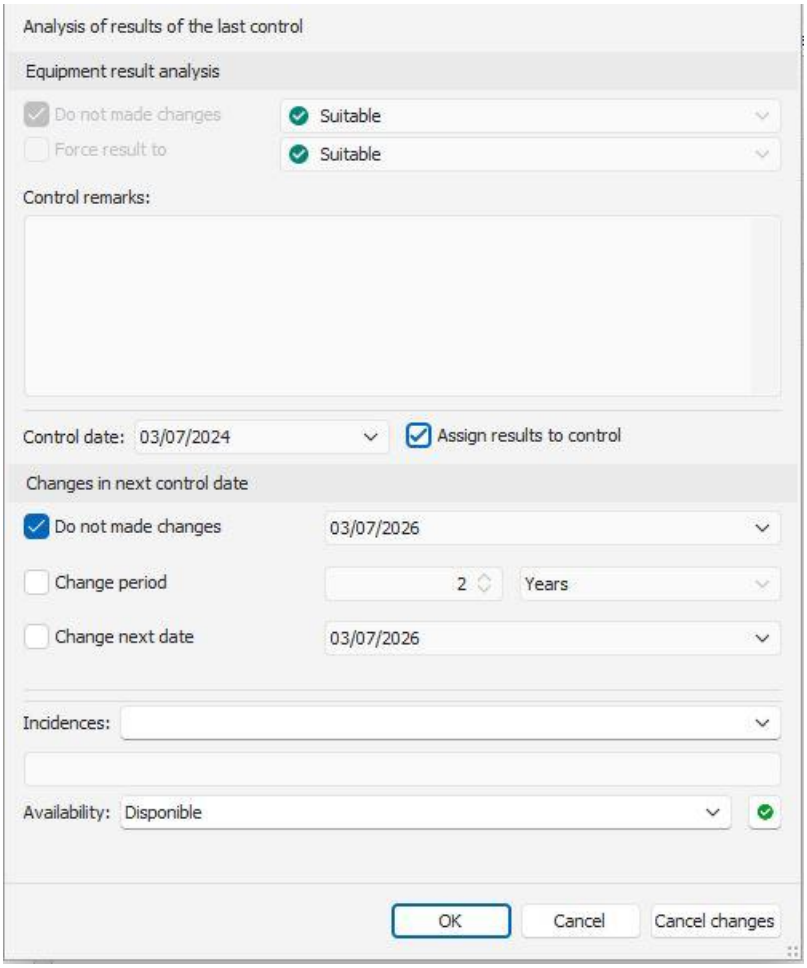


The user must enter the data indicated in the Excel sheet, normally the cells where data must be entered are colored in yellow.

Note The data sheet formats supplied by ELECSOFT have an additional document for use and a validation procedure.

In this case, all calculations are done using the spreadsheet.

To finish entering, saving them, and returning to Visual Factory Calibre, you must close the Excel window. The **Result Analysis window appears**.



From here we can assign the results to the control, make changes to the next control date, add incidents and make changes to availability.

When you change the availability, the application will present a new dialog box giving you the opportunity to note this change in the History of the listing.

If the OK button is pressed, the annotation will be recorded in the History of the card. If, on the other hand, the **Cancel button** is pressed, no annotation will be recorded.

If you're not performing a new result or modifying the most recent result, you won't be able to change the tab's Availability, and the **Assign results to control** and **Changes to next control date fields** will be disabled.

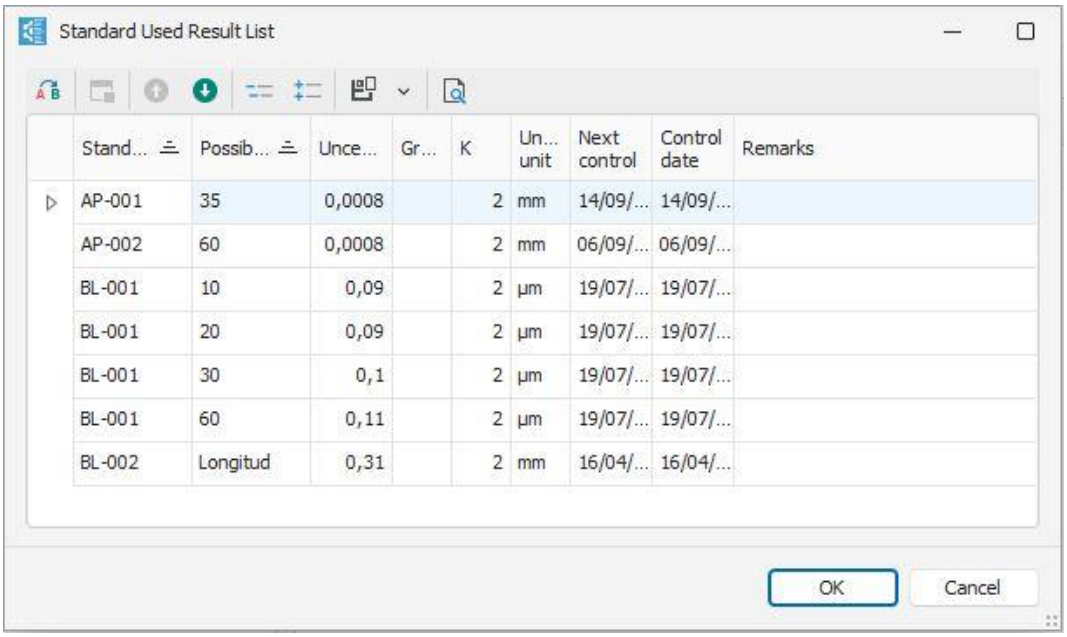
If the result is "Uncalibrated", the **Assign results to control** field is disabled.

Data Entry with Standard Forms

These forms refer to the other options in the **Format Type field**: "Outdoor", "Normal", "Tool", "Attributes", and "Verification – Normal".

Note: The data entry will depend on what we have configured, but in general it will be enough to follow the screens of the application and fill in the data that is requested.

As general to all types of formats that support pattern processing, when you perform a new result, and if the control has been configured to use patterns, the **Patterns Involved in Composition** window appears, as shown below:



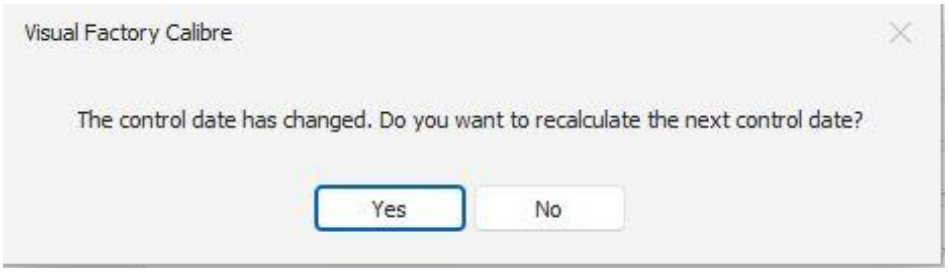
In this window it is possible to view the different patterns involved in the configured composition, as well as their corresponding possibilities, if they have been indicated. It is also possible to display other data such as uncertainty, slope, the unit in which the uncertainty is expressed, and the date of the next control.

It should be noted that even at this point it is possible to change the patterns involved in the composition for the result to be created. To do this, simply press the **Change button**

and select the new pattern and one of its possibilities from the lists that appear in the Change Pattern window. The pattern will then be automatically replaced and all the data in the pattern will be updated.

The form submitted by the application below will depend on the configuration made.

If this is a new result, changing the control date will automatically recalculate the next control date. If, on the other hand, an existing result is being edited and the control date is changed, the application will present the following message, asking if you want to recalculate the next control date:



The General folder

In this first folder, the general data of the equipment is presented, and the general values of the control will be entered.

The **Report** field can be entered manually, or it will be calculated automatically, depending on what is indicated in the general settings of the application. In any case, if the control we are carrying out uses the "Exterior" format, this field will always be entered manually.

The Temperature**, Humidity, Atmospheric Pressure, Duration, and Cost fields** will be presented depending on the control configuration. The default values for these fields will be taken from what is defined in the general settings of the application.

The entry of values in the **Checker field** will be conditioned by those indicated in the general configuration of the application.

In the event that incidents occur during the control, they can be noted in the **Incidents field**.

The Attributes folder

The result field will also depend on whether the attribute test performed is successful or not. If only one of the attributes is incorrect, the application will assign the "Fail" result to the computer.

The Variables folder

In this folder, we'll enter the control's repeatability values. This folder is the most differentiated depending on the type of format selected and its configuration.

Depending on the configuration made, the application will give the equipment as Fit or Fail if all the values are within tolerances, the criteria of Umax, EMA, etc. are met.

(For more information, see the "Types of Format" section of the "Families" chapter.)

In the "Outdoor" format, there is also a button just above the table below that allows you to copy the unit of measurement of the register in which you are located. By pressing this button and, after accepting the confirmation message that appears, the unit of measurement of the record on which we are located will be copied to all the following records, thus facilitating the task of having to change it one by one.

Depending on the configuration made, more or less columns will appear in this form. For example, Nominal, Deviation from nominal, Uncertainty correction zero, I. Max, EMA...

The Patterns folder

Presents the standards that have been used for calibration.

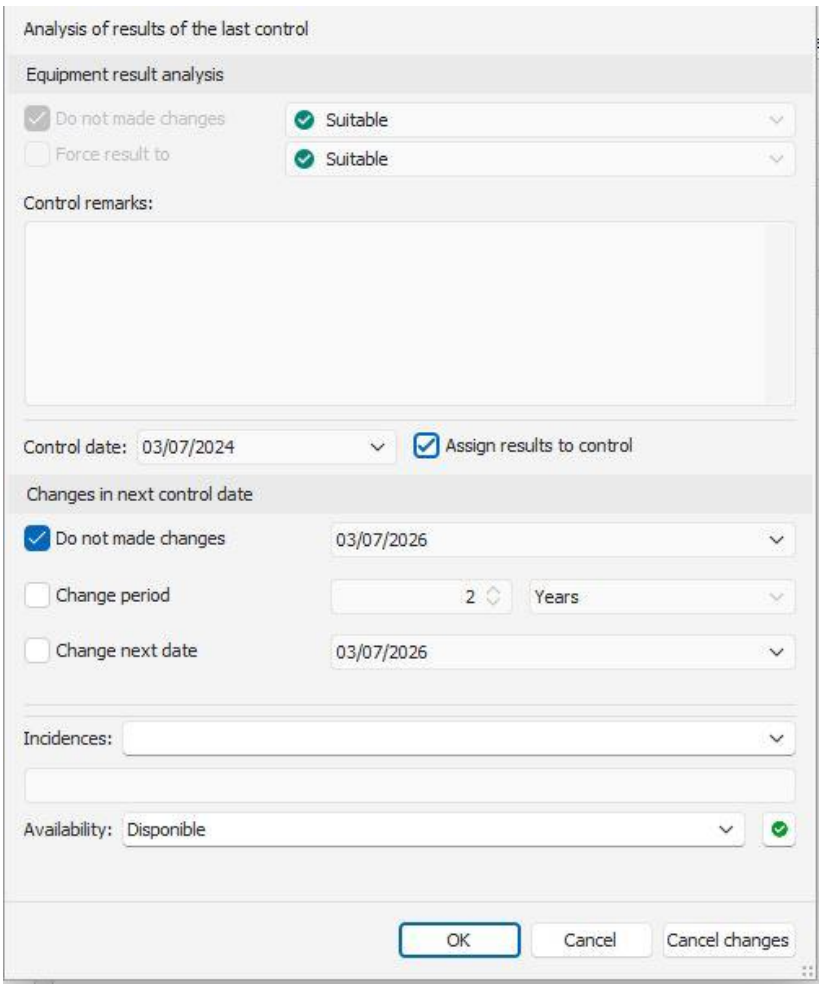
By default, it presents all the patterns indicated in the patterns folder of the tab, however, from here we can delete or add new patterns.

Folders, attachments, and linked files

They allow you to attach or link the files you need accordingly, for example, you can attach the external certificate in an external format.

Analysis of the results of the last control

When you press the **Save & Close** button and if it's the last result of the control, the following window appears:



From here we can assign the results to the control, make changes to the next control date, add incidents and make changes to availability.

When you change the availability, the application will present a new dialog box giving you the opportunity to note this change in the History of the listing.

If the OK button is pressed, the annotation will be recorded in the History of the card. If, on the other hand, the **Cancel button** is pressed, no annotation will be recorded.

If the result is "Uncalibrated", the **Assign results to control** field is disabled.

In calibrations where the program performs the result calculation, it is possible to force the control result to a different one than the one that the application has automatically calculated. To do this, simply select the **Force result to** option and select the new result from the list.

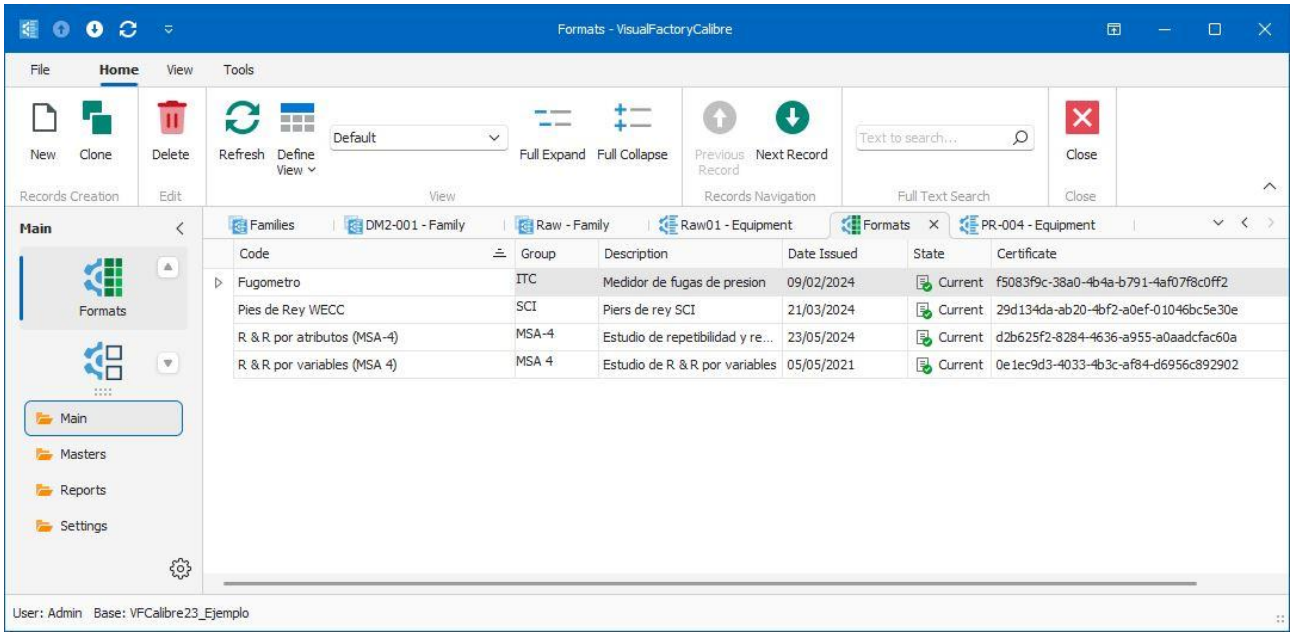
Depending on what is specified in the configuration options, it may be necessary to enter observations into the control and/or issues when forcing a result. *For more information, see the "The Controls Folder" section of the "Configuring Visual Factory Calibre" chapter*.

When the result of a control has been forced, the certificate shall present the result calculated by the program and, in parentheses, the result to which the control has been forced.

Note This functionality is only available for standard formats where the result is calculated automatically.

CHAPTER 7

Data Sheet Formats



The Formats module allows you to define the data entry format for controlling a computer using Microsoft EXCEL. *(This module is not available in the SME edition.)*

As an alternative to standard formats, Visual Factory Calibre allows you to work with Excel datasheets. The program provides some examples of MSA 4 (R&R by variables and attributes, linearity, stability, etc.) and allows the user to define and design new formats and modify existing ones.

Statuses of a Format

A datasheet format can have one of the following statuses:

Editing: Status when creating a new format. We can modify the blade. Results of controls cannot be performed.

Current: Validated sheet format. Allows you to perform control results. Exceptionally, a format can be edited as long as no calibration has been performed. From this state, it can be updated and generate new issues.

Deprecated: When you move a format from Edit status to Current state, if any previous formatting exists in the Current state, the latter automatically becomes obsolete.

History: If we import calibrations from a database and the target database does not have the sheet format, the import process will go beyond that format to be able to consult the aforementioned calibrations.

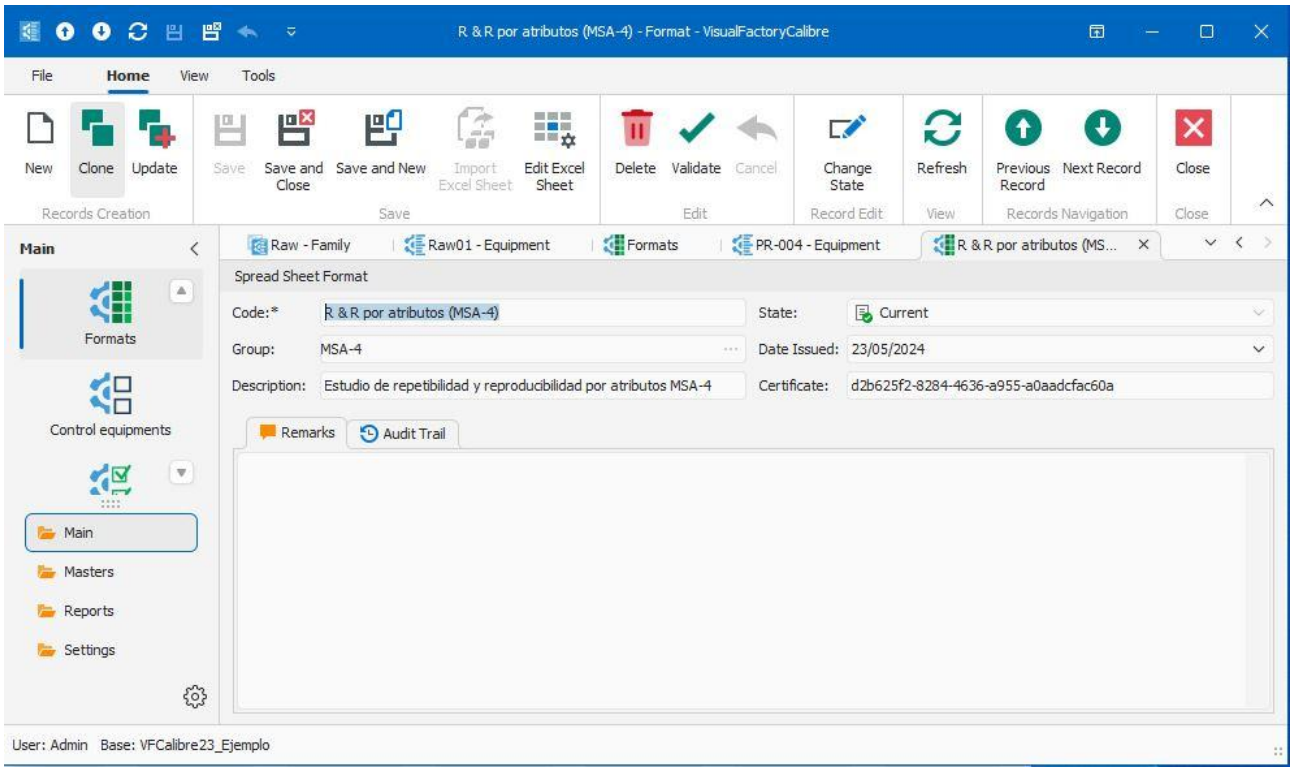
A format can be passed from one state to another, within the following criteria:

- Format in **Edit** can only be set to **Current**.
- Format in **Current** may be downgraded.

- Format in **Obsolete** can be changed to **Current** as long as there is no other format with the same code in the Current state.
- Formatting in **History** can be changed to **Current** as long as there is no other format with the same code in the Current state.

Note: The options available from this module of the Tools menu are explained in the chapter **Tools** at the end of this same manual.

Formats Form



Format Editing

You can edit a format when you create or duplicate a format, or when you modify a field in the format.

Formats form fields

The **Certificate** field uniquely identifies the datasheet format. When we perform a check using a datasheet format, this certificate number is assigned to that check. This field can never be modified.

The **Code** and **Issue Date** fields can only be modified if the format is in the **Edit state**.

Keywords: A Fundamental Part of Fact Sheets

The data collection sheets are the support that you can use to carry out some of the controls of your equipment. These sheets are, in fact, powerful spreadsheets. However, they wouldn't make much sense if they weren't closely linked to the calibration program. Visual Factory Calibre uses the definition of cell names to exchange information with the data collection sheets at the time of calibration. The program automatically inserts the information related to the equipment and, once the control has been recorded, collects all the results and data of interest. That is, you will not have to write on the data collection sheet, the date of calibration, the description of the device, the name of the procedure being used, etc. Visual Factory Calibre will do this work for you using the keywords.

Important A keyword is the name associated with a cell in the datasheet. There can't be two cells with the same name on the same datasheet.

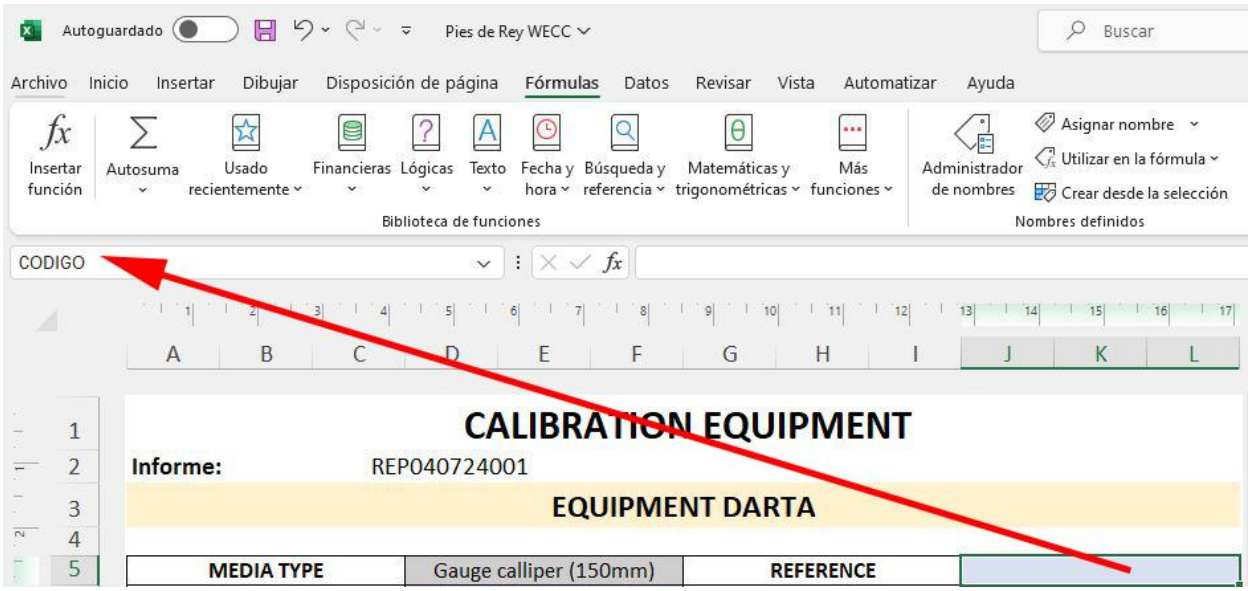
With the keywords we can decide:

- Which Visual Factory fields you want to be updated directly in the datasheet when you start a control.
- Which information in the datasheet you want to pass into Visual Factory Calibre and in which fields to place it.

In the first case, it is typical to transfer the code and description of the equipment, the make, model and serial number, among other fields. The way to distinguish the keywords that transfer data in this direction is as follows: When explaining keywords, the text usually starts with "when creating a calibration...".

In the second, you want to transfer the uncertainty obtained, the Verifier.... The way to distinguish the keywords that transfer data in this direction is as follows: When explaining keywords, the text usually begins with "when recording a calibration...".

The way to indicate a keyword in the Excel sheet is very simple. All you must do is fill in the keyword in the box dedicated to the cell reference:



Note: Once the keyword is entered, always press Enter to save it.

List of available keywords

The table below shows all the words you can incorporate into your data collection sheets, along with their meaning.

Keyword	It is equivalent to	Description
ANTCALFEC (*)	Date of previous calibration	When you create a calibration, the date of the previous calibration is displayed in this cell.
CALDEC1	Contents of the Calibration Decision1 field	When recording a calibration, this value ("Yes" or "No") will be taken as decision content 1.
CALDEC2	Contents of the Calibration Decision2 field	When recording a calibration, this value ("Yes" or "No") will be taken as decision content 2.
CALDEC3	Contents of the Calibration Decision3 field	When saving a calibration, this value ("Yes" or "No") will be taken as decision content 3.
CALFEC (*)	Calibration Date	When you create a calibration, the system date appears in this cell. When storing, this date will be taken as the Last Calibration date.
CALFEC1	Calibration Date 1	When recording a calibration, this date will be taken as date content1.
CALFEC2	Calibration Date 2	When recording a calibration, this date will be taken as date content2.
CALFEC3	Calibration Date 3	When saving a calibration, this date will be taken as date content3.
CALHORAS (*)	Calibration Hours	Calibration hours are displayed in this cell.
CALIBRA (*)	Is the caliber calibratable?	This cell displays "Yes" if the caliber is calibratable and "No" otherwise.
CALINT (*)	Internal Calibration	If the calibration of the device is internal, "Yes" and "No" appear in this cell if it is external.
CALMEMO1	Contents of the Calibration Memo1 Field	When recording the calibration, this value will be taken as memo 1.
CALMEMO2	Contents of the Memo2 Calibration Field	When saving the calibration, this value will be taken as memo 2.
CALPROX (*)	Upcoming Calibration	This cell displays the date of the next calibration, calculated from the contents of the CALFEC cell.

Keyword	It is equivalent to	Description
CALRESUL (*)	Calibration Result	The calibration result is obtained from this cell. In this cell, you can type any of the following values, both uppercase and lowercase: **When the gauge is suitable, you can enter any of the following values.** • SUITABLE • YES • YES • OK • Not bad • WELL • APT • YES • OK • WELL • GOOD **When the caliber is suitable with reserves...** • SUITABLE WITH RESERVATIONS • APT WITH RESERVES **When the caliber is not suitable...** • Any other word
CALTXT1	Contents of the Calibration Text1 field	When saving the calibration, this value will be taken as text 1.
CALTXT2	Contents of the Calibration Text2 field	When the calibration is recorded, this value will be taken as text 2.
CALTXT3	Contents of the Calibration Text3 field	When the calibration is recorded, this value will be taken as text 3.
CALTXT4	Contents of the Calibration Text4 field	When recording the calibration, this value will be taken as text 4.
CALTXT5	Contents of the Calibration Text5 field	When recording the calibration, this value will be taken as text 5.
CALTXTL1	Contents of the Calibration LongText1 field	When saving the calibration, this value will be taken as long text 1.
CALTXTL2	Contents of the Calibration LongText2 field	When saving the calibration, this value will be taken as long text 2.
CALTXTL3	Contents of the Calibration LongText3 field	When saving the calibration, this value will be taken as long text 3.
CALVAL1	Contents of the Calibration Value1 field	When the calibration is recorded, this value will be taken as a value of 1.
CALVAL2	Contents of the Calibration Value2 field	When saving the calibration, this value will be taken as a value of 2.

Keyword	It is equivalent to	Description
CALVAL3	Contents of the Calibration Value3 field	When the calibration is recorded, this value will be taken as a value of 3.
CALVAL4	Contents of the Calibration Value4 field	When saving the calibration, this value will be taken as a value of 4.
CALVAL5	Contents of the Calibration Value5 field	When saving the calibration, this value will be taken as a value of 5.
CALVAL6	Contents of the Calibration Value6 field	When the calibration is recorded, this value will be taken as a value of 6.
CALVAL7	Contents of the Calibration Value7 field	When recording the calibration, this value will be taken as a value of 7.
CALVAL8	Contents of the Calibration Value8 field	When recording the calibration, this value will be taken as a value of 8.
CALVAL9	Contents of the Calibration Value9 field	When saving the calibration, this value will be taken as a value of 9.
CERTIFICATE	Certificate Number	This cell displays the certificate number of the format used in the control.
CLIENT (*)	Caliber Client	In this cell the name of the customer of the caliber appears.
CODE (*)	Caliber Code	This cell displays the code of the device being calibrated.
COST	Cost of calibration	When you save the calibration, this value will be taken as the cost of the calibration.
DECISION1 (*)	Caliber Decision1	Decision content 1 ("Yes" or "No") appears in this cell.
DECISION2 (*)	Caliber Decision2	Decision content 2 ("Yes" or "No") appears in this cell.
DECISION3 (*)	Caliber Decision3	Decision content 3 ("Yes" or "No") appears in this cell.
DEPART (*)	Department	This cell shows the department to which the caliber belongs.
DESCFAMI	Family Description	In this cell is the description of the family to which the caliber belongs.
DESCRIP (*)	Caliber Description	In this cell the description of the caliber appears.
USER DESCRIPTION	User Description	This cell displays the user's description.
DISPONIB (*)	Caliber Availability	In this cell you will see the text corresponding to the availability of the caliber: Available, Under repair, etc.
DURATION	Calibration Duration	When saving the calibration, this value will be taken as the duration of the calibration.
ENTERPRISE	Company Name	This cell displays the name of the company that owns the license.

Keyword	It is equivalent to	Description
LABEL (*)	Label	In this cell, "Yes" appears if the label of the device being calibrated is to be printed. Otherwise, "No" appears.
MANUFACTURER (*)	Manufacturer's Name	This cell displays the name of the manufacturer of the caliber.
FACMULINCER	Multiplying factor of the unit of measurement of uncertainty with respect to a reference unit	From this field the multiplication factor of the calibration uncertainty is obtained, which will also be assigned to the Caliber.
FAMILY (*)	Family Code	In this cell is the family to which the caliber belongs.
DATE1 (*)	Caliber Date1	In this cell appears the date 1 of the caliber.
DATE2 (*)	Caliber Date2	In this cell appears the date 2 of the caliber.
DATE3 (*)	Caliber Date3	In this cell appears the date 3 of the caliber.
FECRECEP (*)	Caliber Receipt Date	This cell displays the date the caliber was received.
FECSERV (*)	Caliber Commissioning Date	This cell shows the date the caliber was put into service.
DATA SHEET (*)	Data Collection Sheet Code	This cell displays the name of the datasheet that is being used in the calibration.
INCERT (*)	Value of Uncertainty	From this field the uncertainty of the calibration is obtained, which will also be assigned to the Caliber.
INCIDENTS	Calibration Incident Code	In this cell, the code of the issue entered during the calibration is displayed.
REPORT	Report Number	From this cell you get the report number that will be saved with the calibration.
INFORMECAL	Report number assigned to equipment calibration	This cell displays the report number assigned to the computer's calibration.
K	Uncertainty hedging factor	The uncertainty coverage factor appears in this cell.
LABORATORY	Laboratory that performed the calibration	This cell shows the laboratory that performed the calibration.
LABORATORYCAL	Laboratory assigned to the calibration of the equipment	This cell displays the laboratory assigned to the calibration of the equipment.
LABORATORYCONTROL	Laboratory assigned to the control of the equipment	This cell displays the laboratory assigned to control the computer.
BRAND (*)	Gauge Brand	In this cell the caliber mark appears.
MODEL (*)	Caliber Model	This cell displays the model of the gauge being calibrated.
LEVEL (*)	Caliber Level	This cell displays the level to which the caliber belongs.

Keyword	It is equivalent to	Description
NUMSERIE (*)	Caliber Serial Number	This cell displays the serial number of the caliber.
OBSERV (*)	Caliber Observations	In this cell the observations of the caliber are displayed.
PATTERN (*)	Is the gauge a pattern?	In this cell, "Yes" appears when the device being calibrated is a standard. Otherwise, "No" appears.
PENDING (*)	Caliber Earring	From this field you get the slope of the calibration, which will also be assigned to the gauge.
PERIOD (*)	Calibration Period	This cell displays the calibration period (1,2,3,...)
POS_n.CALI	Quality of Measurement Possibility	In this cell, the quality of the possibility indicated in cell POS_n.NOM is displayed.
POS_n.DEC1	Content of the Measureability Decision1 field	Decision 1 ("Yes" or "No") of the possibility indicated in cell POS_n.NOM.
POS_n.DEC2	Content of the Measure Possibility Decision2 Field	Decision 2 ("Yes" or "No") of the possibility indicated in cell POS_n.NOM appears in this cell.
POS_n.DEC3	Content of the Decision3 field of the measurement possibility	Decision 3 ("Yes" or "No") of the possibility indicated in cell POS_n.NOM appears in this cell.
POS_n.DEVIATION	Contents of the Measurement Possibility Variance field	This cell displays the contents of the Possibility Deviation field specified in cell POS_n.NOM.
POS_n.DIVESC	Scaling Of Measurement Possibility	In this cell, the scale division of the possibility indicated in cell POS_n.NOM appears.
POS_n.EMA	Maximum Allowable Error of Measurement Possibility	This cell displays the maximum allowable error of the possibility specified in cell POS_n.NOM.
POS_n.FACMUL	Multiplication factor of the unit of measurement with respect to the unit of reference.	In this cell, the multiplication factor of the unit of measurement of the possibility indicated in cell POS_n.NOM is displayed.
POS_n.FACMULDE	Multiplication factor of the unit of measurement of the scale division with respect to the reference unit.	This cell displays the multiplication factor of the unit of measure of the scale division with respect to the unit of measure of the possibility indicated in cell POS_n.NOM.
POS_n.FACMULINCER	Multiplying factor of the unit of measurement of uncertainty with respect to the reference unit	This cell displays the multiplication factor of the unit of measurement of the uncertainty with respect to the unit of measure of the possibility indicated in cell POS_n.NOM.

Keyword	It is equivalent to	Description
POS_n.FEC1	Contents of the Date1 field of the measurement possibility	In this cell, the date 1 of the possibility indicated in cell POS_n.NOM appears.
POS_n.FEC2	Contents of the Date2 field of the measurement possibility	In this cell, date 2 of the possibility indicated in cell POS_n.NOM appears.
POS_n.FEC3	Contents of the Date3 field of the measurement possibility	This cell displays the date 3 of the possibility indicated in cell POS_n.NOM.
POS_n.IMAX	Maximum Uncertainty of Measurement Possibility	This cell displays the value of the maximum uncertainty of the possibility indicated in cell POS_n.NOM.
POS_n.INCER	Uncertainty of the possibility of measurement	From this cell, the uncertainty value for the possibility indicated in cell POS_n.NOM is obtained.
POS_n.K	Measurement Possibility Uncertainty Hedging Factor	This cell displays the uncertainty coverage factor for the possibility indicated in cell POS_n.NOM.
POS_n.SIDE	Measurement Possibility Side	In this cell, the side of the possibility indicated in cell POS_n.NOM appears.
POS_n.LI	Lower side of the measurement possibility	This cell displays the lower side of the possibility indicated in cell POS_n.NOM.
POS_n.LID	Lower Wear Limit of Measurement Possibility	In this cell, the lower wear limit of the possibility indicated in cell POS_n.NOM is displayed.
POS_n.LIMDESG	Wear limit of the measurability	In this cell, the wear limit of the possibility indicated in cell POS_n.nom is displayed.
POS_n.LS	Upper side of the measurement possibility	This cell displays the upper side of the possibility indicated in cell POS_n.NOM.
POS_n.LSD	Upper limit of wearability of measurement	This cell displays the upper limit of the possibility indicated in cell POS_n.NOM.
POS_n.MAXIMUM	Maximum Measurement Value	This cell displays the maximum value of the possibility indicated in cell POS_n.NOM.
POS_n.ACTUAL MEASUREMENT	Actual measurement of the possibility of measurement	This cell displays the actual measure of possibility indicated in cell POS_n.NOM.
POS_n.MEMO1	Content of the Measure Possibility Memo1 Field	In this cell, the value of the Memo1 field of the possibility specified in cell POS_n.NOM appears.
POS_n.MEMO2	Content of the Memo2 field of the measurement possibility	In this cell, the value of the Memo2 field of the possibility specified in the cell POS_n.NOM appears.
POS_n.MINIMUM	Minimum Value of Measurement Possibility	This cell displays the minimum value of the possibility specified in cell POS_n.NOM.

Keyword	It is equivalent to	Description
POS_n.NOM	Name of the measurement possibility	This cell is the one that refers to the measurement possibilities of the caliber. It can be used in two different ways: 1. **By typing the name of the P. of Measure**. If you know the name of the measurement possibility involved in calibration in advance, this is the most straightforward method. Just type the name of the measurement possibility in this cell. **For example**: If the "Interior" measurement option is always involved in the calibration of devices using this data sheet, you can type "Interiors" in the cell with the keyword "POS_0.NOM". 1. **Using the @{PM$_n$}** metacommand. With this system, you can refer to the order of each measurement possibility regardless of the name of each one. $_n$ is the p.m. number you want to reference. **For example**: If you want to include the possibility of measuring with order 2 in the calibration, regardless of the name it has, type in the cell with the keyword "POS_0.NOM", "@{PM2}". When you create the calibration, the program will automatically replace this metacommand with the name of the order 2 p.m.
POS_n.NOMINAL	Nominal value of the measurable	In this cell, the nominal of the possibility indicated in cell POS_n.NOM appears.
POS_n.NOMINALEST	Nominal Value (Standard Tolerance) of Measurement Possibility	In this cell, the nominal is displayed, with standard tolerance, of the possibility indicated in cell POS_n.NOM.
POS_n.NOMINALMAX	Maximum nominal value of the measurable	In this cell, the maximum nominal of the possibility indicated in cell POS_n.NOM is displayed.
POS_n.NOMINALMIN	Minimum nominal value of the measurable	In this cell, the minimum nominal of the possibility indicated in cell POS_n.NOM is displayed.
POS_n.OBS	Observations on the measurability	This cell displays the observations of the possibility indicated in cell POS_n.NOM.
POS_n.ORDER	Order of Measurement Possibility	In this cell, the order of the possibility indicated in cell POS_n.NOM appears.

Keyword	It is equivalent to	Description
POS_n.PENDING	Pending the uncertainty of the possibility of measurement	In this cell, the slope of the uncertainty of the possibility indicated in cell POS_n.NOM appears.
POS_n.TYPE	Measure Possibility Smooth Buffer Type	In this cell, the type of plain buffer of the option indicated in cell POS_n.NOM is displayed.
POS_n.TIPOROS	Threaded Buffer Type Measurement Possibility	In this cell, the type of threaded buffer of the possibility indicated in cell POS_n.NOM.
POS_n.TXT1	Contents of the Text1 field of the measurement possibility	In this cell, text 1 of the possibility indicated in cell POS_n.NOM.
POS_n.TXT2	Contents of the Text2 field of the measurement possibility	In this cell, text 2 of the possibility indicated in cell POS_n.NOM appears.
POS_n.TXT3	Content of the Text3 field of the measurement possibility	In this cell, text 3 of the possibility indicated in cell POS_n.NOM appears.
POS_n.RXT4	Contents of the Text4 field of the measurement possibility	In this cell, text 4 of the possibility indicated in cell POS_n.NOM appears.
POS_n.TXT5	Content of the Text5 field of the measurement possibility	In this cell, the text 5 of the possibility indicated in cell POS_n.NOM appears.
POS_n.TXTL1	Contents of the MeasureabilityLengthText1 field	This cell displays the contents of the LongText1 field of the possibility specified in cell POS_n.NOM.
POS_n.TXTL2	Contents of the Measureability's LongText2 field	In this cell, the contents of the LongText2 field of the possibility indicated in cell POS_n.NOM appear.
POS_n.TXTL3	Content of the Measureability's LongText3 field	This cell displays the contents of the LongText3 field of the possibility indicated in cell POS_n.NOM.
POS_n.UNDINCER	Unit of measurement of the uncertainty of the possibility of measurement	This cell displays the unit of measurement of the uncertainty of the possibility indicated in cell POS_n.NOM.
POS_n.UNID	Units of Measurement Possibility	In this cell, the unit of measurement of the possibility indicated in cell POS_n.NOM is displayed.
POS_n.UNIDDE	Measurement Possibility Scale Division Unit of Measurement	This cell displays the unit of measurement for the scale division of the possibility indicated in cell POS_n.NOM.
POS_n.VAL1	Content of the Measure Possibility Value1 field	In this cell, the value 1 of the possibility indicated in cell POS_n.NOM appears.
POS_n.VAL2	Contents of the Measure Possibility Value2 field	In this cell, the value 2 of the possibility indicated in cell POS_n.NOM appears.

Keyword	It is equivalent to	Description
POS_n.VAL3	Content of the Measure Possibility Value3 field	In this cell, the value 3 of the possibility indicated in cell POS_n.NOM appears.
POS_n.VAL4	Content of the Measure Possibility Value4 field	In this cell, the value 4 of the possibility indicated in cell POS_n.NOM appears.
POS_n.VAL5	Contents of the Measure Possibility Value5 field	In this cell, the value 5 of the possibility indicated in cell POS_n.NOM appears.
POS_n.VAL6	Contents of the Measure Possibility Value6 field	In this cell, the value 6 of the possibility indicated in cell POS_n.NOM appears.
POS_n.VAL7	Contents of the Value7 field of the measurement possibility	In this cell, the value 7 of the possibility indicated in cell POS_n.NOM appears.
POS_n.VAL8	Contents of the Value8 field of the measurement possibility	In this cell, the value 8 of the possibility indicated in cell POS_n.NOM appears.
POS_n.VAL9	Contents of the Measure Possibility Value9 Field	In this cell, the value 9 of the possibility indicated in cell POS_n.NOM appears.
PROCEDI (*)	Code of Procedure	This cell displays the name of the procedure that is used to calibrate.
SUPPLIER (*)	Supplier Code	This cell displays the name of the supplier supplying the gauge.
RANK (*)	Stand	This cell shows the position where the caliber is located.
SECTION (*)	Section Code	This cell displays the section in which the gauge is located.
TEXT1 (*)	Contents of the Gauge Text1 field	In this cell, the text 1 of the caliber appears.
TEXT2 (*)	Contents of the Gauge Text2 field	In this cell appears the text 2 of the caliber.
TEXT3 (*)	Contents of the Caliber's Text3 field	In this cell appears the text 3 of the caliber.
TEXT4 (*)	Contents of the Text4 field of the gauge	In this cell appears the text 4 of the caliber.
TEXT5 (*)	Contents of the Text5 field of the gauge	In this cell appears the text 5 of the caliber.
TIPOPERI (*)	Type of calibration period	This cell displays the type of period between one calibration and the next: DAYS, WEEKS, MONTHS, YEARS.
UNDINCER (*)	Unit of measurement of uncertainty	From this field, the unit of measurement of the calibration uncertainty is obtained.
USER	Username	This cell displays the user's name.
VALUE1 (*)	Contents of the Gauge Value1 field	In this cell, the value 1 of the gauge is displayed.
VALUE2 (*)	Contents of the Gauge Value2 field	In this cell, the value 2 of the gauge appears.

Keyword	It is equivalent to	Description
VALUE3 (*)	Contents of the Gauge Value3 field	In this cell, the value 3 of the gauge appears.
VALUE4 (*)	Contents of the Caliber's Value4 field	In this cell, the value 4 of the gauge appears.
VALUE5 (*)	Contents of the Caliber's Value5 field	In this cell, the value 5 of the gauge appears.
CHECK	Calibration Verifier Name	From this cell you get the name of the person who performed the calibration.
VERIFICACAL	Name of the verifier assigned to the measuring equipment	From this cell you get the name of the verifier assigned to the measuring device.

Keywords marked with an asterisk (*) refer to gauge data. In turn, these keywords refer to pattern data. If you want to use any of these keywords (*) to reference a pattern, you must follow the following format:

PAT_n.[keyword]

For example, let's say you want to reference the code and description of a pattern, the keyword format would look like this:

PAT_0.CODE

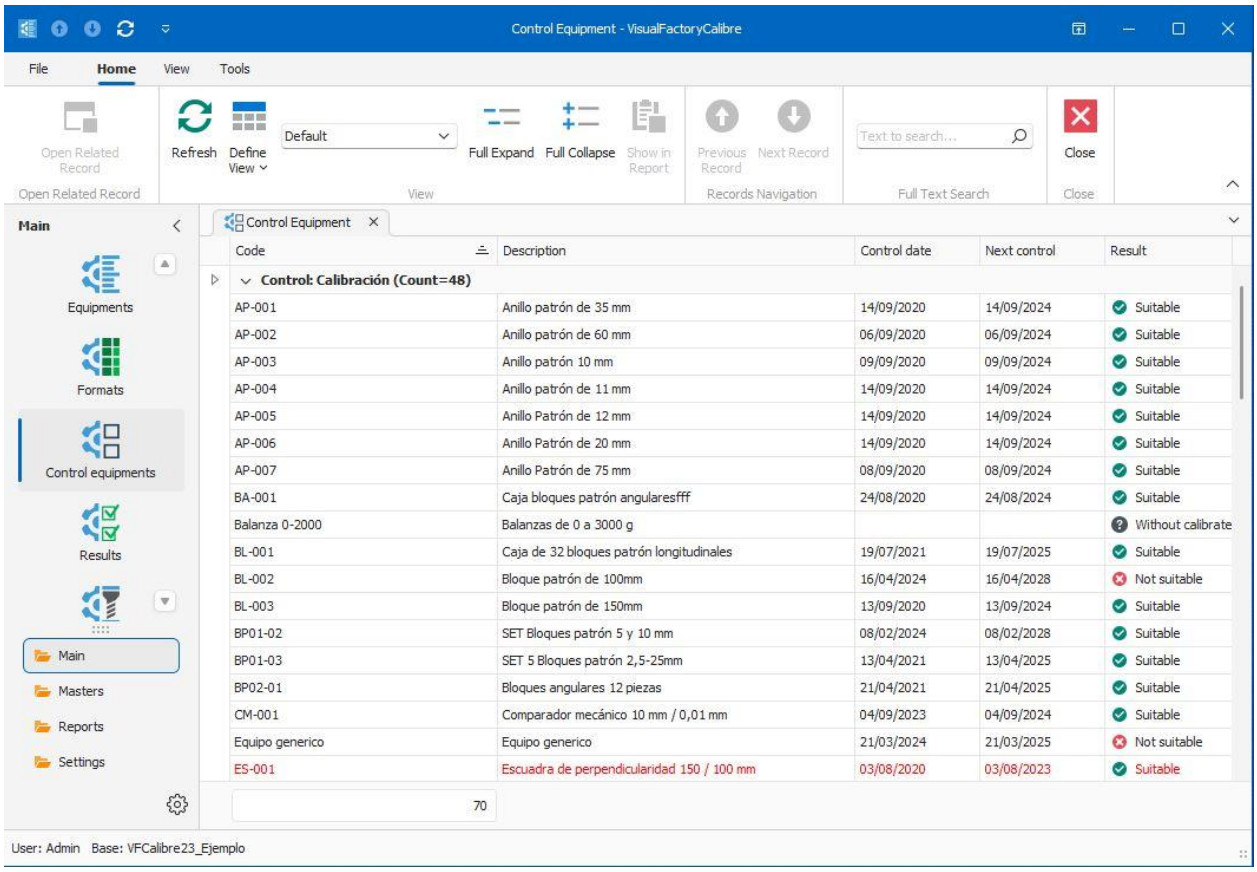
PAT_0.DESCRIP

If you want to refer to the measurement possibilities of a standard, the format to follow is as follows:

PAT_n.POS_n.[keyword]

CHAPTER 8

Equipment Controls



The objective of the Equipment Controls module is to have information on the controls that are being carried out. Unlike the equipment module, in which we can see the equipment inventory, here we can work with the information regarding the controls. This is very useful to make views that indicate information about the date of the control and, above all, the dates of the next control.

By pressing the ENTER key or double-clicking on a record, the application enters the Results folder of the corresponding Tab. Once inside the File, we can edit it as if we had entered it from the Files module.

Views from the Controls Equipment module

When you access the Controls tabs module, the last view that was used is presented by default. From here you can select a different view. The views that are defined with the application are as follows:

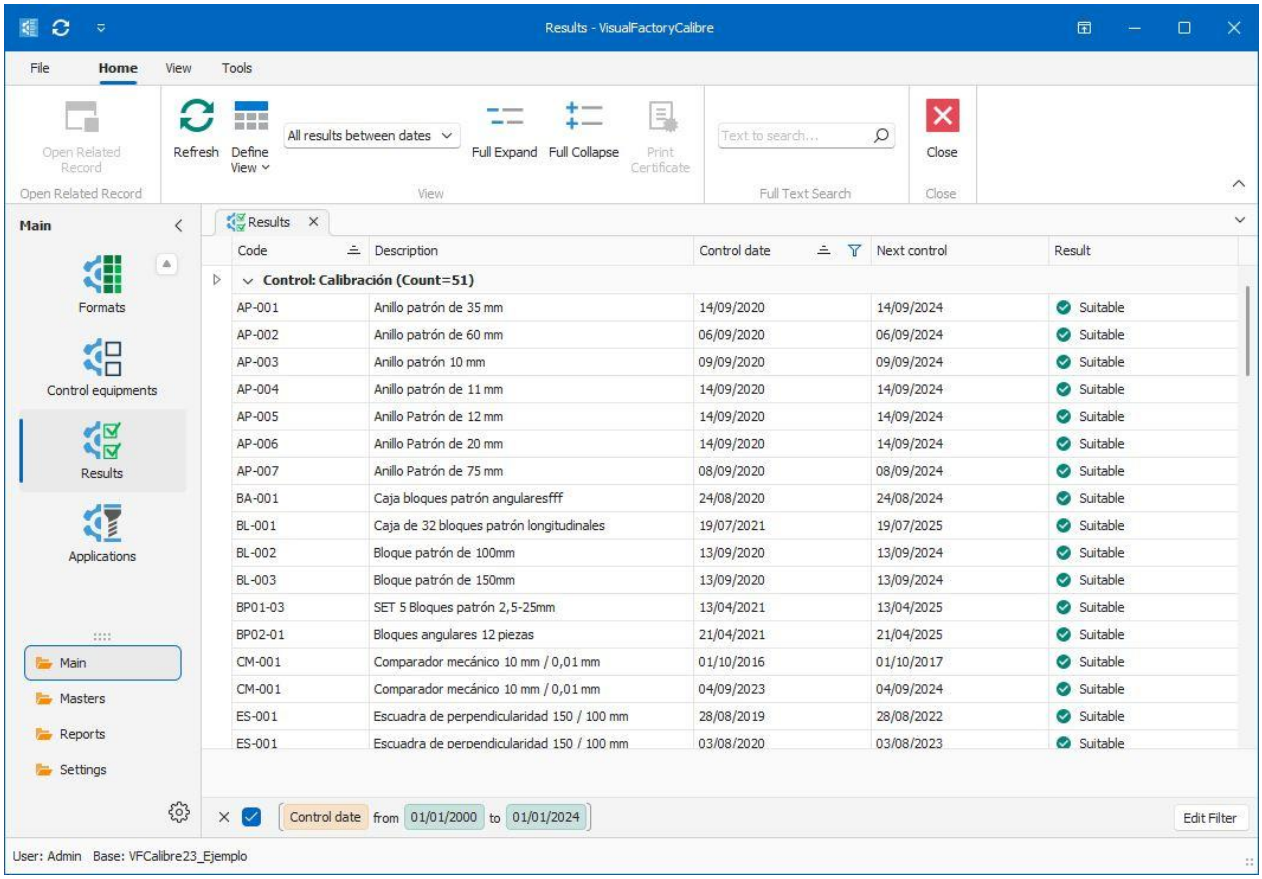
- **Defect**. Presents all controls for all computers grouped by the Control Code field.
- **Available this month.** It presents a list of the "available" equipment that is scheduled to be checked in the current month.
- **Available next month.** It presents a list of the "available" equipment that is scheduled to be checked next month.
- **Pendings**. It presents a list of the equipment that has some pending control, as long as they are assigned in the definition that cyclical controls are carried out.

- **Pendings + this month. Only available**. Same as the previous one but only the Equipment that have the availability to "Available" and also those that have the control this month (even if it has not expired).
- **Pendings + this month. Only available**. Same as the previous one but grouped by section.
- **Pendings available on a date**. List of "available" equipment to be checked before a certain date. The date is requested as a parameter every time we access the view.
- **Pendings only available**. Same as Pending but only for Equipment that have the availability to "Available".

Note: The options available from this module of the Tools menu are explained in the chapter **Tools** at the end of this same manual.

CHAPTER 9

Results



This module presents all the results obtained for each of the controls of each of the measuring equipment.

This module can be useful for obtaining information on the evolution of results for one or more measuring equipment.

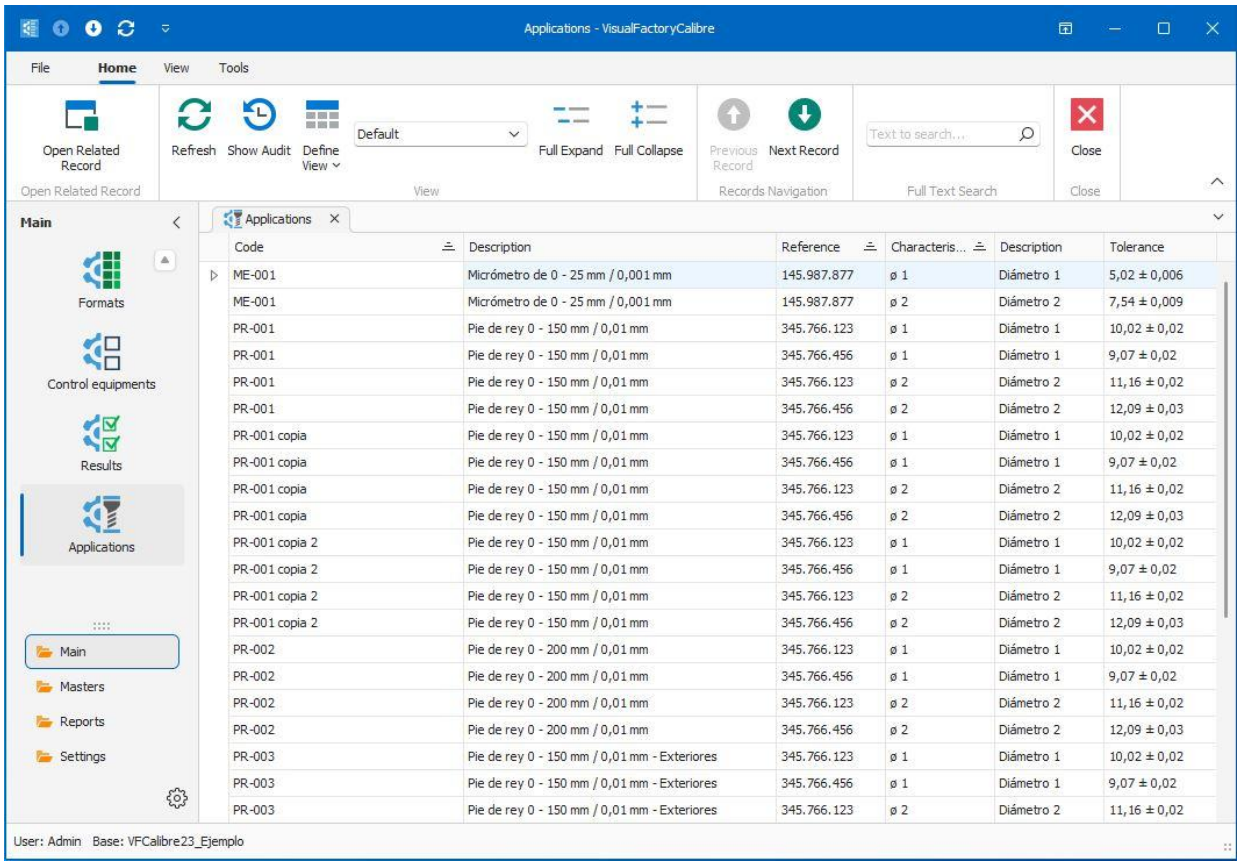
Views from the Results module

When the Results module is accessed, the last view that was used is presented by default. From here you can select a different view. The views that are defined with the application are as follows:

- **Defect**. Displays all the results for all computers grouped by the Control Code field.
- **Results with Incidents between dates**. It presents a list of all the results with some incidence and filtered between two dates.
- **Results that were not suitable last year**. List all of last year's Fails results.
- **Ineligible results between dates**. It presents a list of all Ineligible results and filtered between two dates.
- **Results not suitable this year**. Present a list of all the current year's Unfit results.
- **All Results between dates**. It presents a list of the results of the Equipment between two dates.

By pressing the ENTER key or double-clicking on a record, the application directly presents the data entry form with the entered results.

Applications



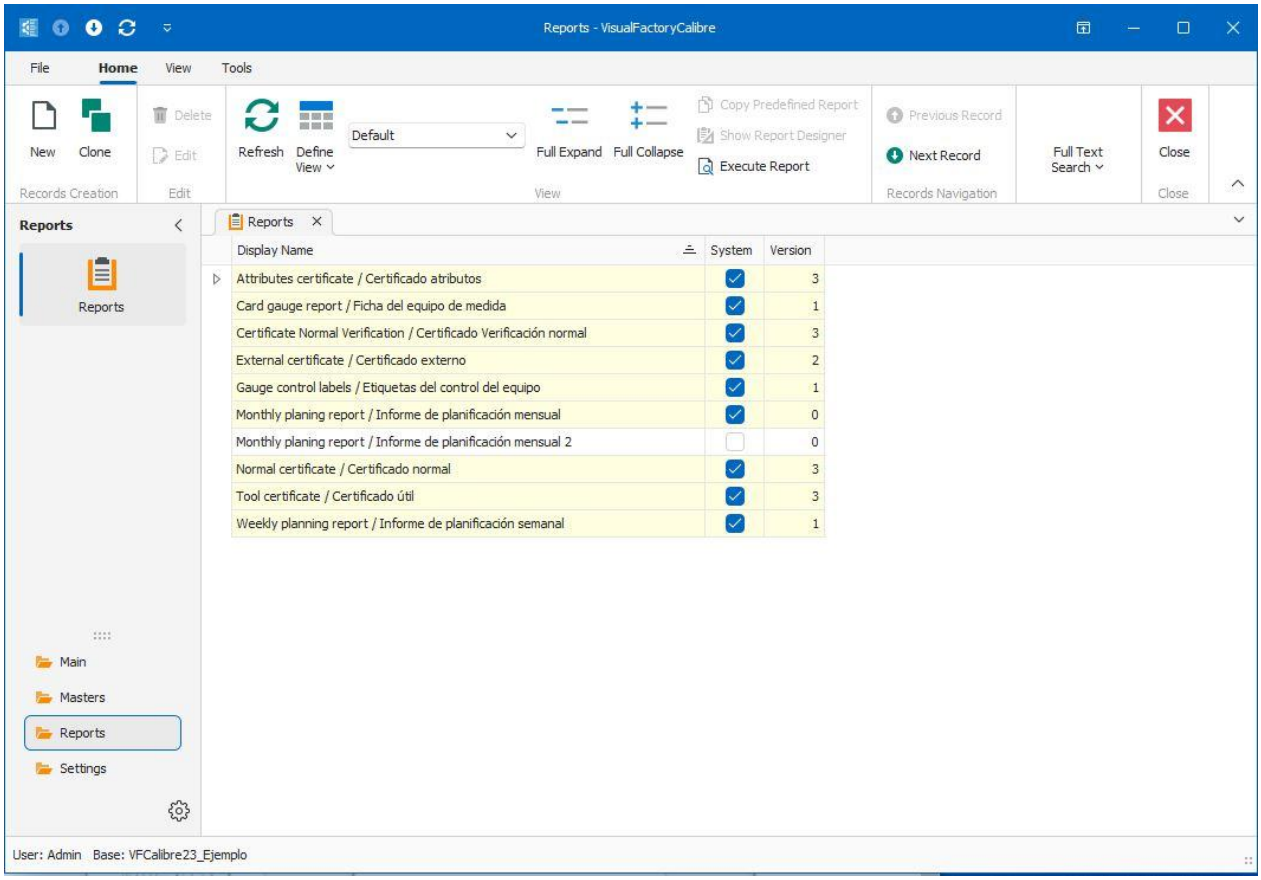
This module presents information about the equipment, controls, equipment and applications of each of the measuring equipment. This information can be useful for presenting, for example, the equipment involved in the manufacture of a particular part.

With this information, we can make, for example, views that associate product references with equipment.

CHAPTER 11

Reports

Here's how Visual Factory Calibre-specific reports work. For more information about the report designer, see the Visual Factory Reports 2023 manual.



Note: The reports provided by Elecsoft will be marked with a yellow background, the System box will be checked and cannot be modified. However, the user will be able to make modifiable versions of these reports using the duplicate button.

The Version field indicates the report revisions that are being made for system reports (those marked in yellow).

Card gauge report

It allows you to display the relevant information of one or more measuring devices. Basically, the general data of the equipment, its possibilities and the definition of its controls are shown.

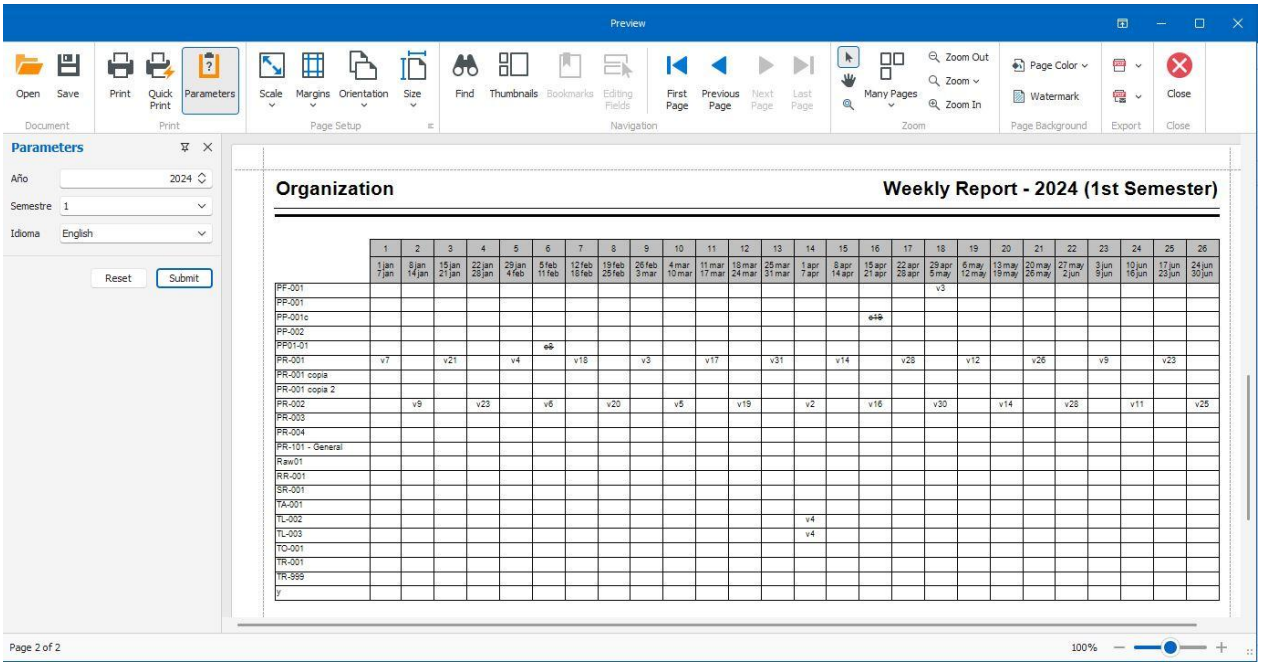
Gauge control labels report

It allows you to print labels with the most relevant information of one or more controls of measuring equipment, such as the Result and the date of the next control.

Weekly planning report

The purpose of this report is to show a weekly schedule with the checks carried out and to be carried out by a series of Equipment. *(This functionality is not available in the SME edition.)*

It is possible to view the schedule for the first or second semester of a given year, as well as any of its four quarters. To do this, enter the corresponding year in the Year text box, select the semester and language.



Weekly Planning Report

As you can see, the report arranges, in the form of columns, the different weeks of which the selected period is composed. In each of the boxes (for each Card and week) the type of control that has been carried out/will be carried out is shown, followed by the day that it was/will take place.

Note You can specify a symbol for each type of control from the master of **Controls**. The length of the symbol is 1 digit.

The operations that are performed to display the report are as follows:

From the date of the next calibration onwards, and until the end date of the selected period, the different controls that the Sheet in question will have are displayed. To do this, you select all the Tabs in the current view that have the field **Tasks with cycle** = Yes, and using the values entered in the **Period** and **Period Type fields**, the date on which the control will take place is calculated.

If there is no next calibration date, the current date will be taken as the starting point.

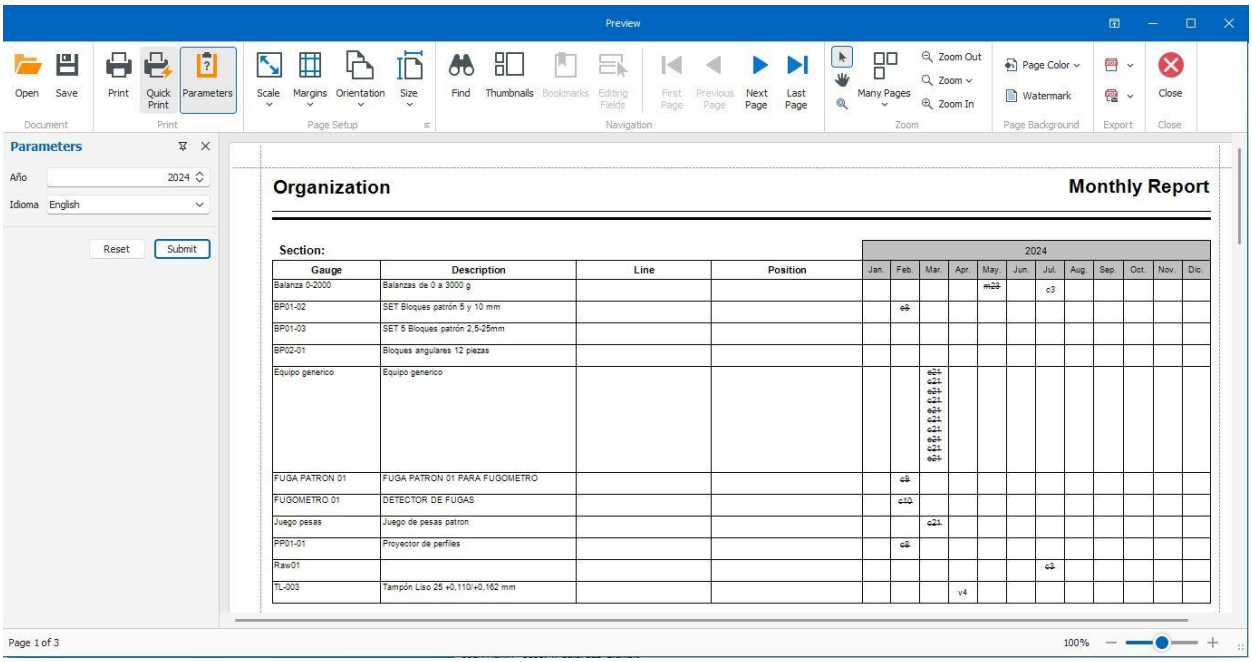
It is possible that the next calibration date is earlier than the start date of the selected period. In this case, the date for the next control is calculated repeatedly until the resulting date falls within the selected time period.

On the other hand, from the date of the next calibration (or the current date in its absence) backwards, and until the start date of the selected period, all the controls that the Card has already had must appear. These are displayed in the same way as the intended controls, except that they are displayed **crossed out**.

Monthly planning report

The purpose of this report is to show a monthly schedule with the checks carried out and to be carried out by a series of Equipment. *(This functionality is not available in the SME edition.)*

This report is analogous to the weekly planning report except that it is grouped by sections and shows the Description, Line and Position fields:



Monthly Planning Report

Certified Reports

The following reports present a certificate of calibration or verification for each of the format types. These reports are compatible with those introduced in Visual Factory Calibre version 7.6.

- External certificate. Associated with the External format type.
- Certificate attributes. Associated with the Attributes format type.
- Normal certificate. Associated with the Normal format type.
- Tool certificate. Associated with the Tool format type.
- Normal verification certificate. Associated with the Normal Verification format type.

CHAPTER 12

Tools

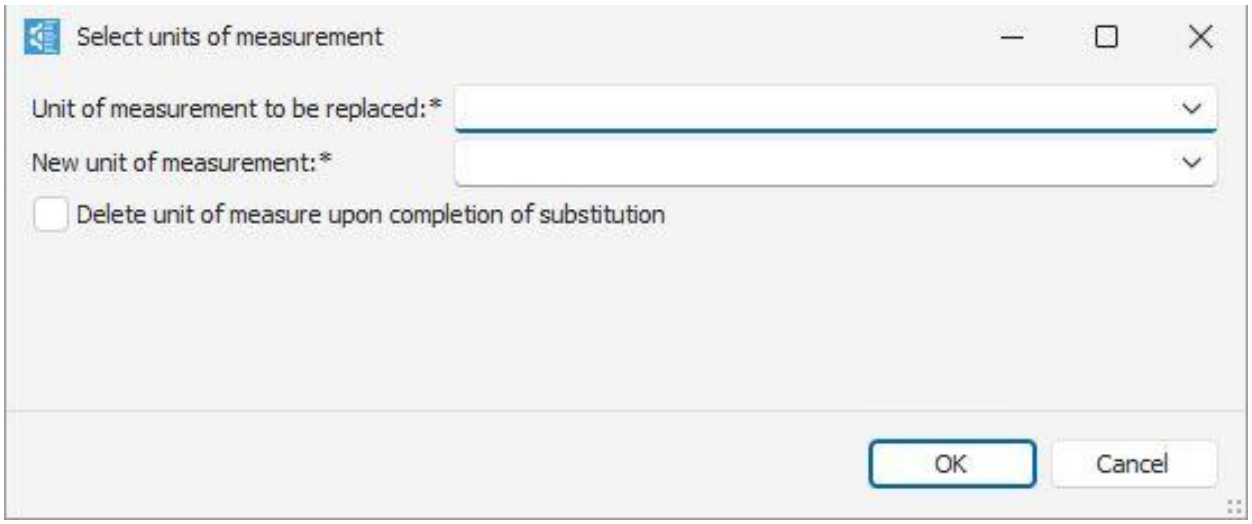
Here we explain how the tools menu works according to the different modules of the application.

There are two options listed for all modules:

- **Define Literals**: This is explained in the *Visual Factory Application Framework 2023* manual because it is common for Visual Factory programs.
- **Substitution of Units of Measure**: This is explained below as it is specific to Visual Factory Calibre.
- **Import:** This tool allows you to import data from one database to another.

Substitution of units of measure

This tool allows you to replace one unit of measurement with another in all tables in the database.



If you want the replaced unit of measure to be removed from the database after the substitution is performed, select the **Delete unit of measure upon completion of the replacement** check box.

Import

IMPORTANT: Before making any import it is highly advisable to make a backup of the database, since the import modifies the data permanently.

It's important to note that when migrating data (such as a family), the system will check if all the necessary elements exist for that family.

- **Creating Required Items:** If the family you want to import depends on a "pattern" (for example, a computer that is needed for it) and that pattern does not exist in the system, it will be automatically created to allow the family to be imported.

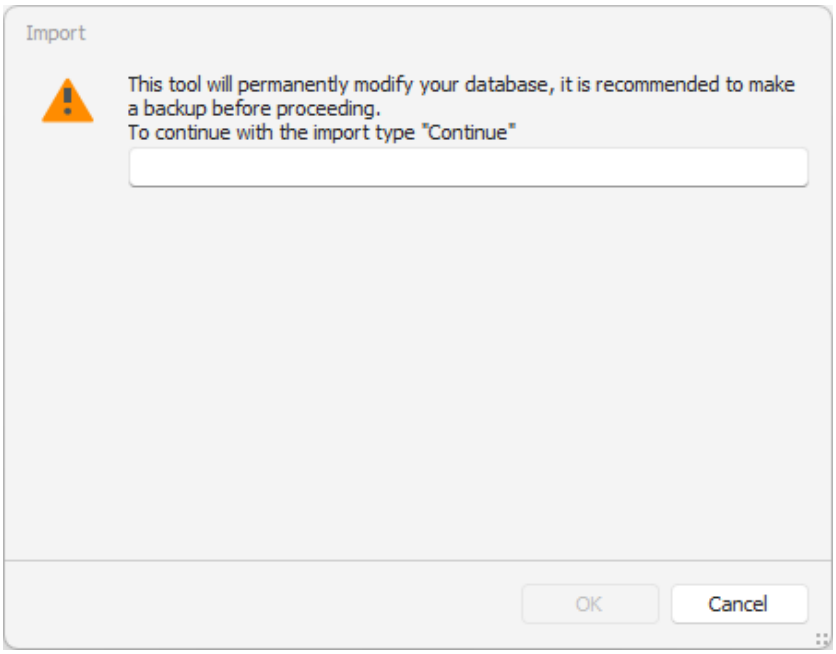
- **Recursive process:** This process is applied recursively. If the pattern also needs additional items to be created (such as other computers, families, or other objects), those items will also be created automatically, one after the other, until the entire dependency chain is complete.

In short, the system will make sure that, for each object you want to import, all the required elements are automatically created, building each level of necessary dependencies.

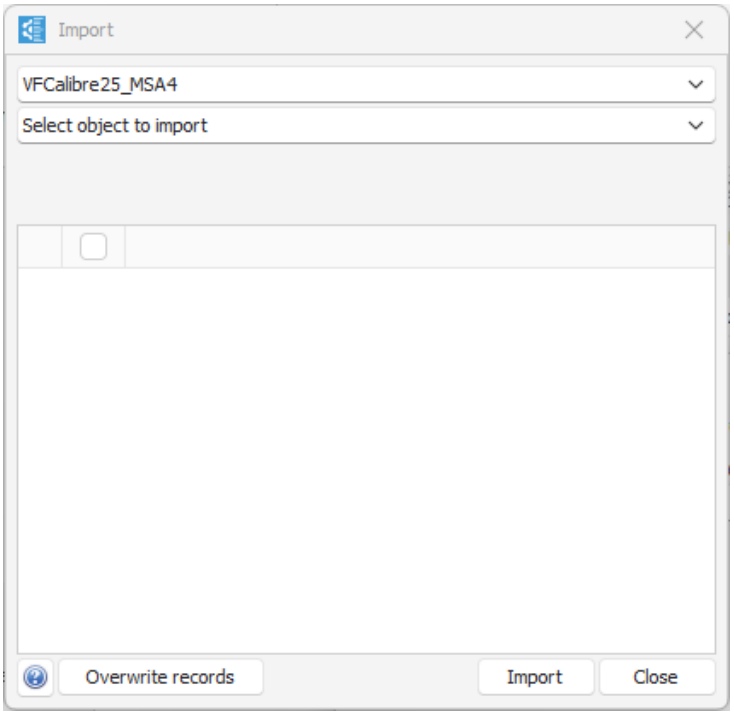
The first thing we must do is configure the database we want to point to in the configuration file.

Note See VF Installation GuideInstallation section -Modify the configuration file on page 14

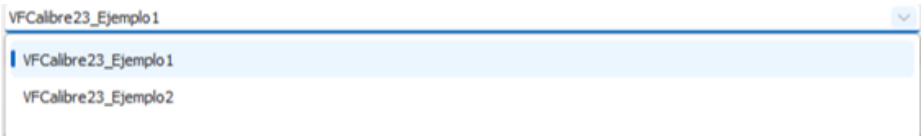
This is the first screen that will show us when we press the import button.



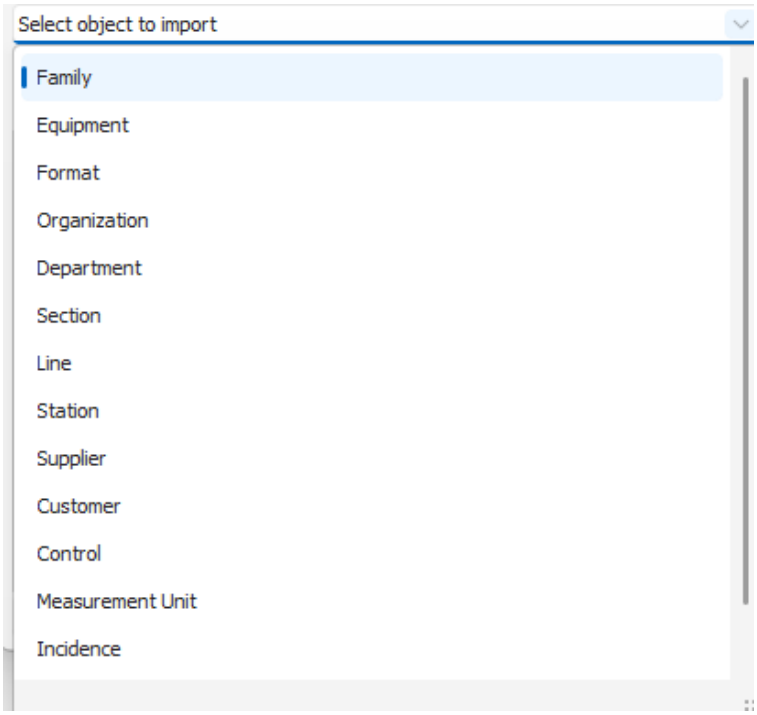
We will proceed to type the word "Continue" to access the import form.



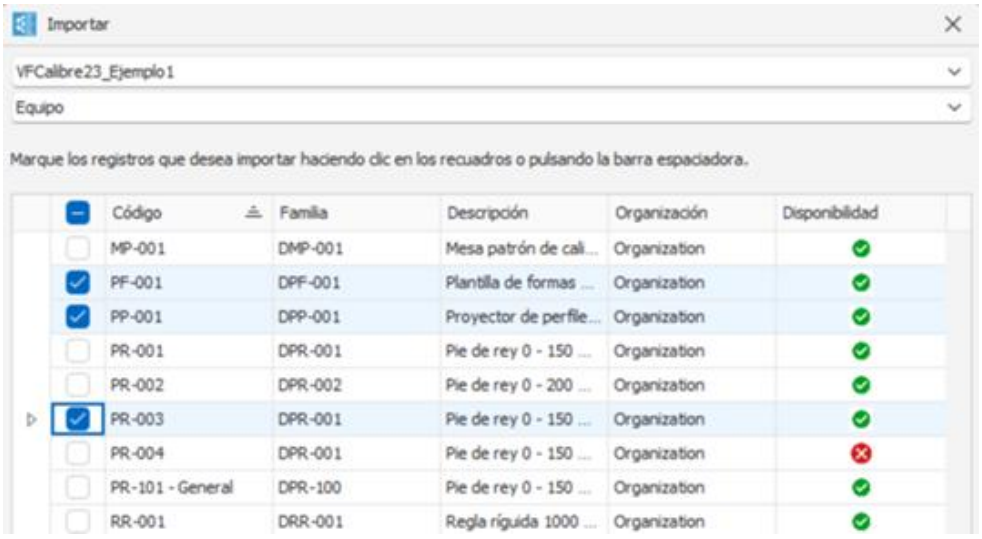
In the first drop-down menu we can select the database from which we want to import the data.



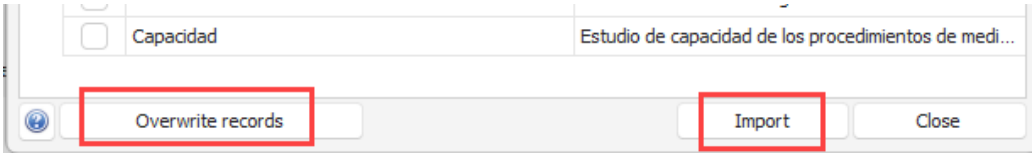
And the second is used to select what type of object you want to migrate.



Once selected, we will see all the records contained in the database from which we want to import and we will be able to select one or more records.



Once the records have been marked, we can choose to import them in two different ways:



1. Import (Without overwriting): When we press import, the program will search and copy everything necessary to copy the selected records, if they exist, they will be omitted.
2. Import (Overwriting): If we press the overwrite records button the process will be similar, but in this case if the selected record exists instead of being omitted, it will be overwritten and any modifications made previously will be lost. For example: If a computer is overwritten, any calibration performed that does not exist in the database from which we are receiving the record will be deleted.

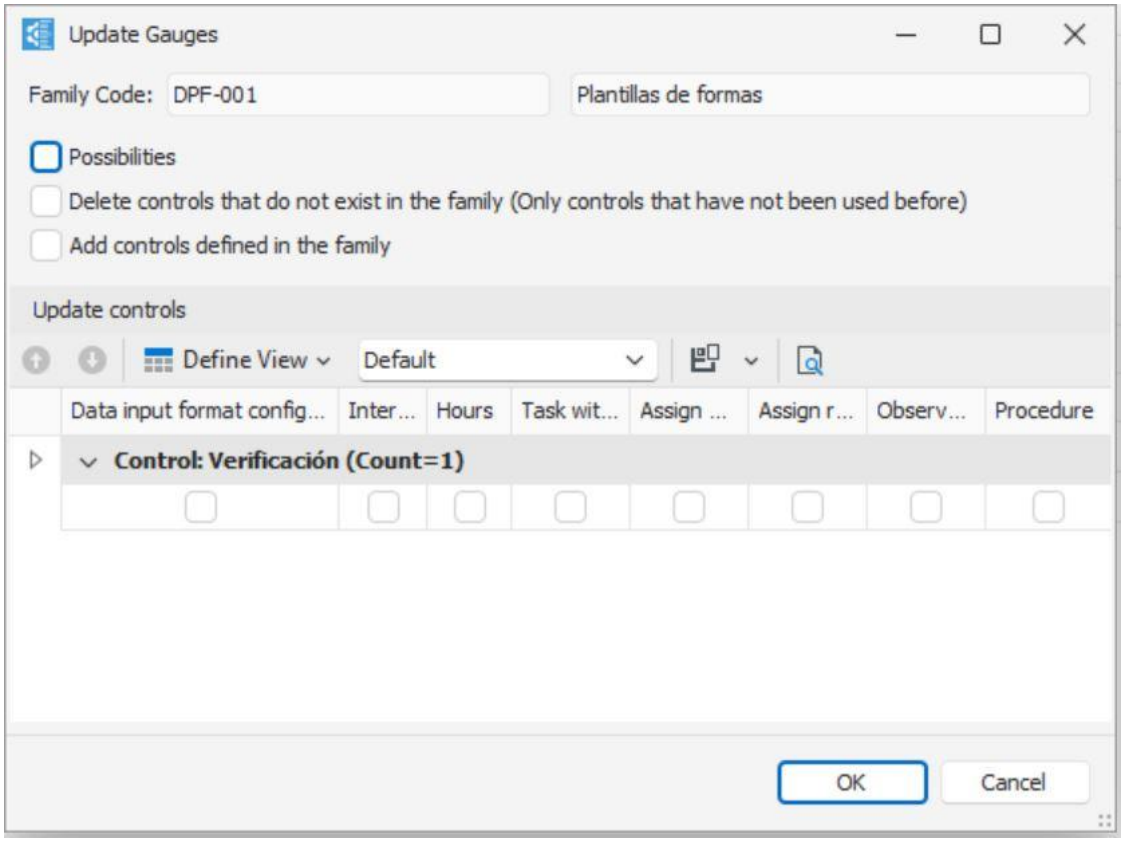
When finished, it will show us a screen indicating which records have been copied and which records have been omitted.

In the Families module

Upgrade equipment

The aim is to allow you to update the data o5n the cards with that of your family. *(This functionality is not available in the FDA edition.)*

When you run this option, you'll be presented with a window where you can select which data you want to change. The window that will be presented will be as follows:



The **General Data** section displays the family code and description.

The **Changes to be made section** allows you to select the following fields: **Possibilities** (takes the possibilities from the tab, deletes them and puts those that are in the family), **Delete controls that do not exist in the family** (only if no results have been entered) and **Add controls defined in the family**.

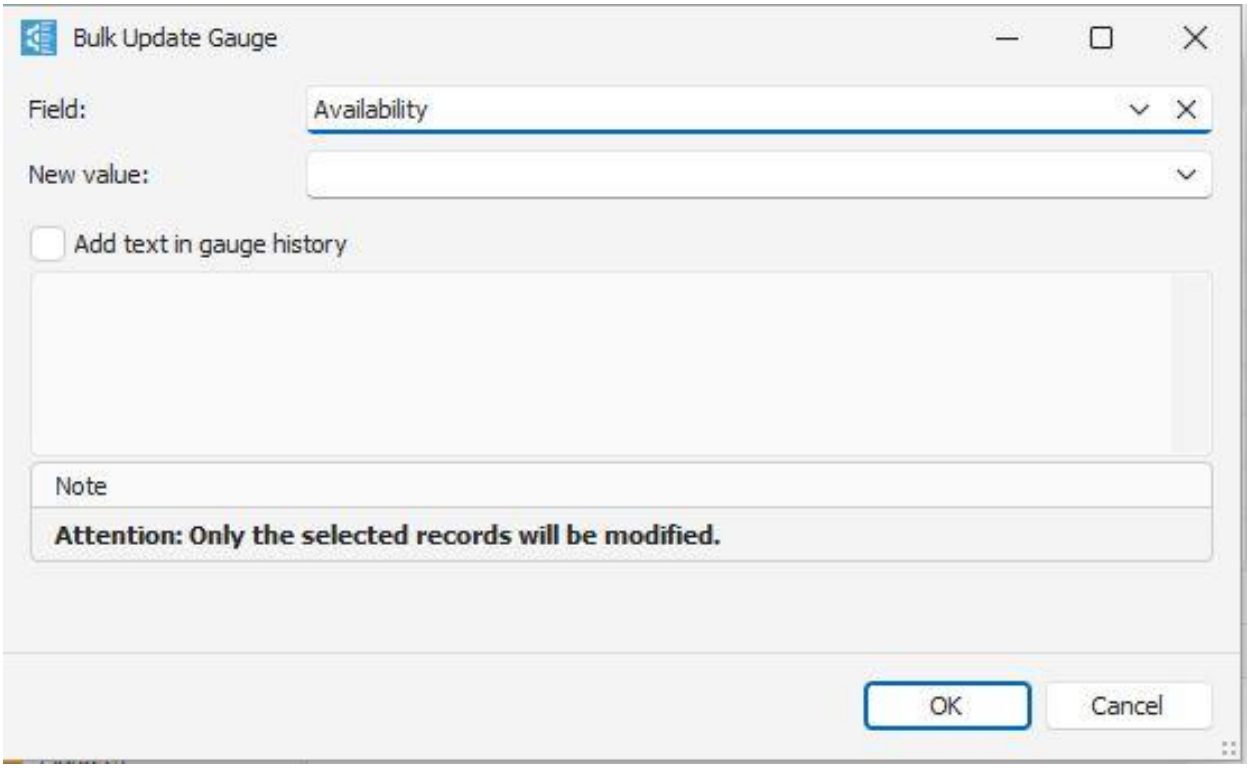
The **Update Controls** section allows you to select the following fields: Data Entry Format Settings, Internal, Hours, Tasks with Cycle and Period, Assign Uncertainty, Assign Result, Observations, and Procedure.

In the Equipment module

Update with family data

The purpose is to allow you to update the data in a file with that of your family. *(This functionality is not available in the FDA edition.)*

When you run this option, you'll be presented with a window where you can select which data you want to change. The window that will be presented will be as follows:



The **General Data section** displays the code and the description of the family you have defined and the code.

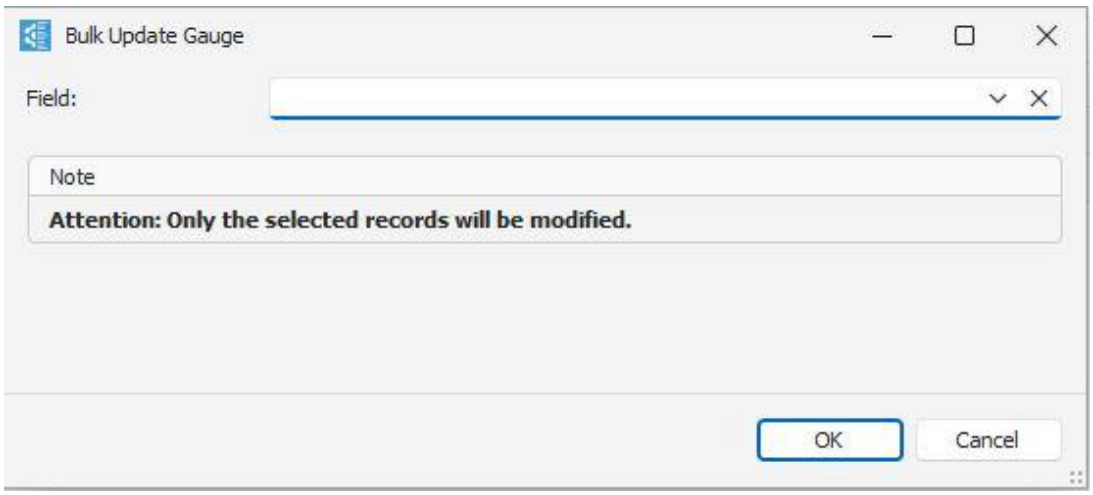
The **Changes to be made section** allows you to select the following fields: **Possibilities** (takes the possibilities from the computer, deletes them and puts those in the family), **Delete controls that do not exist in the family** (only if no results have been entered) and **Add controls defined in the family**.

The **Update Controls** section allows you to select the following fields: Data Entry Format Settings, Internal, Hours, Tasks with Cycle and Period, Assign Uncertainty, Assign Result, and Observations.

Massive Changes in Equipment

The goal is to allow you to change a field of the Equipment globally and massively.

After selecting one or more records in the view, running the **Bulk Changes option** will bring up the following window:



Select the field you want to modify and its new value.

If you select the **Annotate in tab history** check box, what you type in the text box will be annotated to the Equipment History folder. Otherwise, if the field is Availability, the default comment of change in availability will be noted; for the other fields, nothing will be noted.

Important:	Allow this functionality only to administrators and verify that a backup has been made before using it.

In the Formats module

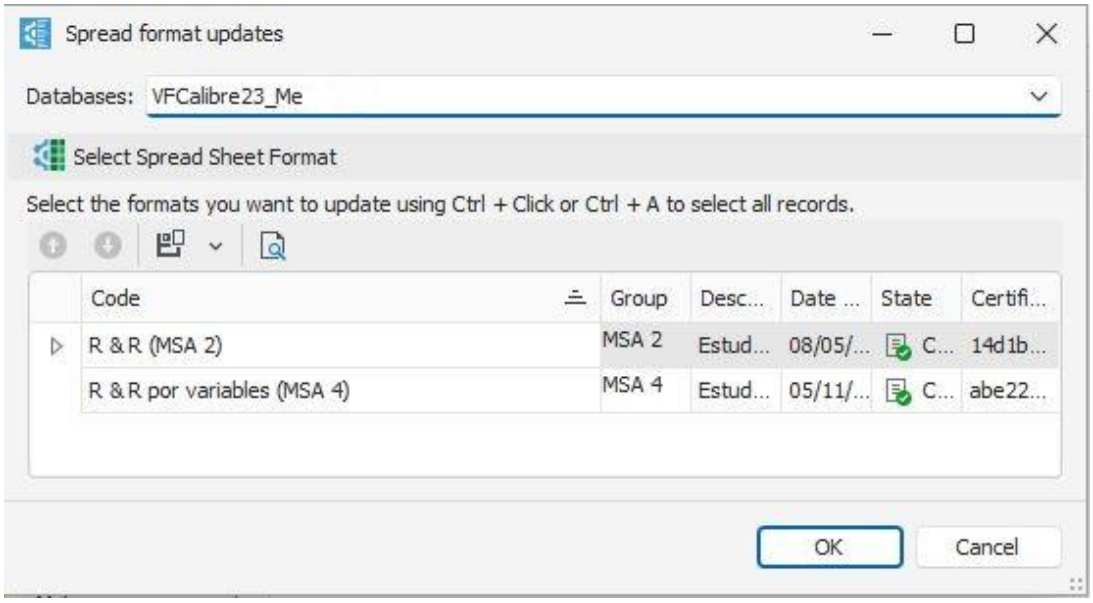
Update a format from another database

Visual Factory Calibre offers the ability to update formats with more recent issues of the same from other databases.

Note	To access this option, you need to have the necessary permissions to **create** and **modify** Formats.

The database displays the list of additional databases that have been defined in the configuration file.

After selecting the base with the MSA4 formats supplied by Elecsoft, the available formats to be updated will be displayed.



Then, select the formats you want to update and press **Ok**.

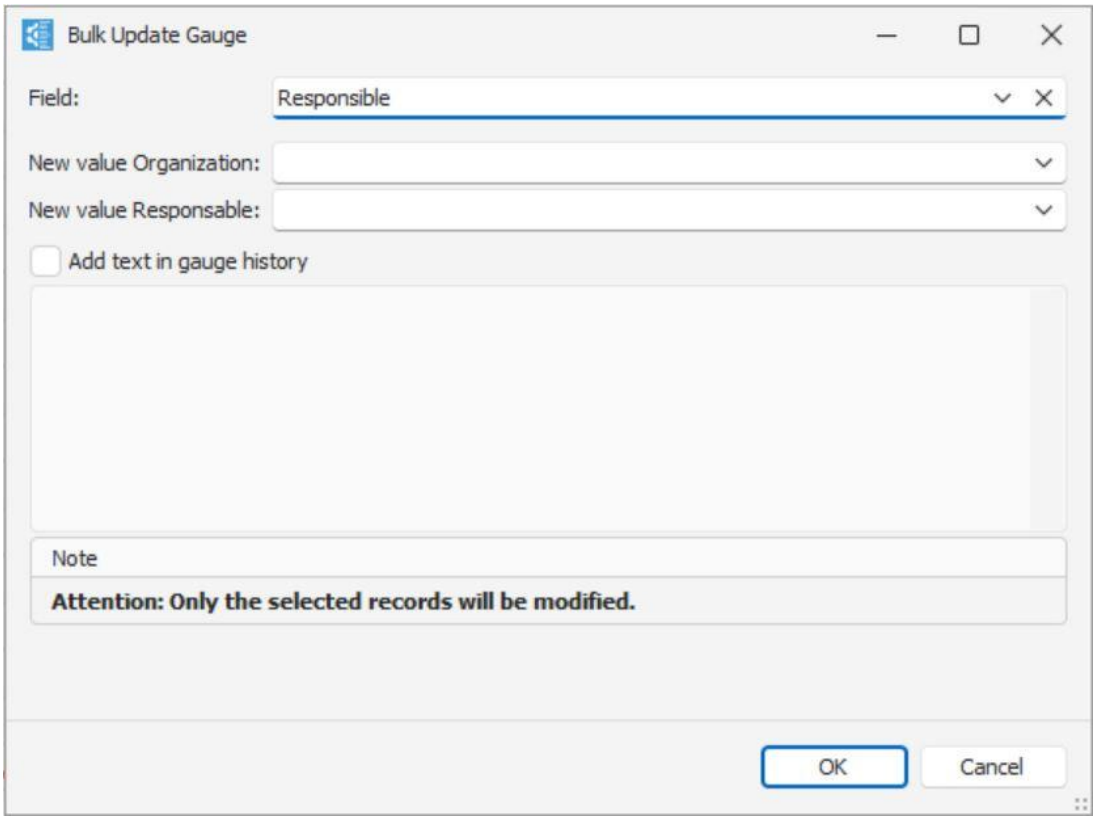
Visual Factory Calibre will update your database formats accordingly. The format of your current database will be deprecated and a new record will be created with the updated format. A window will then appear with the results of the update.

In the Equipment Controls module

Massive Changes

The goal is to allow you to change a field in a global and massive way from those contained in the computer controls.

After selecting one or more records in the view, running the **Bulk Changes option** will bring up the following window:



Select the field (controls) you want to modify and its new value.

If you select the "Annotate in tab history" checkbox, whatever you type in the text box will be annotated in the Equipment History folder. If the field is Availability, the default comment "change in availability" will be noted. For other fields, no annotations will be made.

Important:	Allow this functionality only to administrators and verify that a backup has been made before using it.