GE Measurement & Control

# Intecal v10 Calibration Software

User Manual - K0420 Revision A

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Safety	Before you use the Intecal software program, make sure that you read and understand all the related data. This includes: the applicable local safety procedures, the instructions for the equipment you are using with the software, and this publication. When you use equipment with this software, make sure that it is serviceable and that it is in its normal condition for safe operation.		
	Before you start an operation or procedure in this publication, make sure that you have the necessary skills (if necessary, with qualifications from an approved training establishment). Follow good engineering practice at all times.		
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	other countries. InstallShield is a registered trademark and service mark of InstallShield Software Corporation in the United States and/or other countries.		
Software purpose	The Intecal calibration software is a Windows-based calibration management tool that helps you maintain and control your calibration environment to the highest standards of metrology. Available in different languages, you can use the software for these tasks:		
	<ul> <li>Manage the maintenance and calibration of all the measurement devices for a specified business location.</li> </ul>		
	• Set up a schedule of calibration work for different employees.		
	• Upload and download data to and from portable calibrators that have a USB/serial communications function or an IEEE 488 interface (Druck, Ruska, or devices with a Field Calibrator Interface - FCINTF).		
	<ul> <li>Manage the calibration records for devices that do not have a serial communications function or an IEEE 488 interface (Manual Data Entry).</li> </ul>		

	<ul> <li>Inspect your calibration history records. You can also make a permanent record of each calibration report. For example: For ISO 9000 quality control procedures.</li> </ul>	
	<ul> <li>(Intecal only) Set up automatic calibration systems to make full use of your GE calibrators and controllers (Ruska and Druck) or alternative systems with an FCINTF facility.</li> </ul>	
	<ul> <li>(Intecal only) Calibrate a <i>Device</i> that has a serial communications function or an IEEE 488 interface (Druck, Ruska, or FCINTF).</li> </ul>	
Registration	The Intecal calibration software is available for you to try as a fully functional product, with no obligation, for a period of 30 days. The trial period starts on the day it is first used - not on the day it is installed.	
	To change the 30 day license to a full license, please purchase the applicable software license (Intecal) from the GE Measurement and Control sales team at: https://www.gemeasurement.com/intecalv10/register.	
	Please read the <i>Registration Help</i> available in the <i>Registration Tool:</i> Use the Intecal program group (Figure 2-1) or use the Intecal menu: <i>Help &gt; Registration</i>	

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# **Chapter 1: Installation**

System specification	To use the Intecal software, this is the minimum specification for your computer:					
	<ul> <li>Operating system: Windows XP, 7 and 8 or 8, 32 or 64 bit operating systems.</li> </ul>					
	• 66 MHz processor (Pentium® recommended).					
	• 128 MB of RAM (256 MB recommended).					
	<ul> <li>Hard disk space: 40 MB for the installation, then 10 MB to permit expansion of the database.</li> </ul>					
Install Intecal	You can install the software from the Internet.					
Soltware	<i>Note:</i> Intecal v10 must be installed by a user with administrative privileges.					
	Windows 8/8.1 requires the .NET Framework 3.5. This feature is not enabled by default. Use 'Turn Windows features on or off' to enable .NET Framework 3.5.					
	Before you install the software, close all other Windows applications.					
Install Intecal from the Web:	<b>1.</b> Follow the instructions on the Web page to save the specified <i>File name</i> (Example: Intecal***.exe) to your computer.					
	2. When the <i>File Download</i> is complete, open the file from the specified <i>Save in</i> location.					
	<b>3.</b> When the InstallShield Wizard opens on your computer, follow the on-screen instructions.					
Manual Driver Installation	Manual driver installation procedures are described in Appendix B.					

Software updates	If a new version of the software becomes available, you can download it from the Internet at: (https://www.gemeasurement.com/intecalv10/register).	
After installation	When the installation is complete, you can start using the software (Refer to Chapter 2).	
	<i>Note:</i> Intecal v10 must be run by the user who installed the software.	
Remove the Intecal software	If it is necessary to remove the software from a computer, use these steps:	
	<ol> <li>On the Windows taskbar, click on the Start button and select Settings &gt; Control Panel &gt; Add/Remove Programs.</li> </ol>	
	2. Select the software program (Intecal) and select the "Remove" option.	
	3. Follow the on-screen instructions.	

# **Chapter 2: Getting started**

Introduction	This chapter gives a description of these items:			
	• the procedure the first time you use the Intecal software			
	• the general structure of the screens you will see.			
	• the general structure of the Intecal program.			
	<ul> <li>how to set up your <i>Employee</i> data and control the software tasks they can do.</li> </ul>			
	• the procedure to set a different language for the software.			
Start the software	The first time you use the Intecal software, use this log-in procedure.			
	Note: From Windows 7 onwards, communication with serial port driver may be limited due to access control restrictions. To inter-operate with these drivers the Intecal application should be run with administrator privileges. This can be done by either:			
	1. Right click the Intecal shortcut, select run as administrator			
	2. On Intecal.exe, select properties and modify the privilege level to run as administrator			
	For more informations, see: <u>http://windows.microsoft.com/en-gb/win-</u> <u>dows7/how-do-i-run-an-application-once-with-a-full-administra-</u> <u>tor-access-token</u> <b>1.</b> Double-click on the Desktop icon.			
	IntecalV10			

**2.** If you are in the 30 day trial period, the first display will show the demo version screen withe the number of days remaining.

**3.** When the log-in window opens, enter **1** in the *User Name* box. Leave the *Password* box empty.

Inteca	al	X
	User Name:	
	Password:	
Intecal	OK Cancel	

4. Click on OK.

Note: You can also start intecal from the Intecal program group (Figure 2-1).

After you log in, you can use the *Employee Manager* to set up a database of *Employees* (with applicable *User Name* data) and/or change your own password. Refer to "Employee Manager".

All other users must enter their specified *User Name*. This is also the default password the first time they log in. All passwords are case sensitive.

Start up - Program group Figure 2-1 shows the program group when you click on: Start > Programs > GE Intecal:

Intecal: This starts the Intecal software.

**ReadMeFirst:** This text file contains important notes and software release information.

**Registration Tool:** To purchase the software, you can use this option to read the *Registration Help* file and then set up the registration data.



Figure 2-1: Intecal program group

#### Screen structure

When you start the software, Figure 2-2 gives an example of the window that opens. These items are common to all the main program functions:

**1 - Navigation bar:** Use this to move between the different program functions (Plant structure, Procedures ... )

2 - Menu bar: Use this to select a task from a menu list.

3 - Tool bar: Use this to select a task with an icon.

The Menu bar and Tool bar include common items and special items for the program function you are using.

The common items include: Save, Exit, Employee Manager, Language Selection, Backup Database, Customer Report Details, Find, Intecal Help, and Registration.

1	2	3					
Integal - Plant	t Structure						
File Edit T	Fools View Help						
(† • t   🗹 🤅	8 🔒 🖱 🚭 💼 👗 🖻 💼 🖓 😰 🕻	D F	9				
Navigation	<ul> <li>Plant Locations</li> <li>Demo Sub-location 1</li> <li>→ DemoTag1</li> </ul>	Loca	tion ID: Demo Sub-lo	ation 2			
Plant Structure		De	no of an element of p	lant witho	out Tags		
Procedures	TIX400-123     Temperature Tranmitter	Loop	Diagram:				
Calibration Systems	♥       Demo Sub-Iocation 2         ■       ♥         ■       ♥         ●       ♥	SOP					
Work Orders	0 seap	Maint	enance Actions				
			Date (mm/dd/yy)	Туре	Asset ID	Employee	
		1	11/21/2007	Installat	Test Gauge	The Administrator	
Ready							

Figure 2-2: Screen structure - Common items

Program structure	The software has four main program functions: <b>Plant Structure:</b> To manage and organize your database of devices.		
	<b>Procedures:</b> To manage the calibration procedures in your database. A calibration procedure contains the values a calibration uses (test points, ramp time).		
	<b>Calibration Systems:</b> To manage the hardware configurations you use to do your calibrations.		
	Work Orders: To manage your calibration work.		
	Use the Navigation Bar to move between the different program functions.		
Employee Manager	Use the <i>Employee Manager</i> (Figure 2-3) to set up and maintain a list of your <i>Employees</i> . You can then use the software to see the <i>Employees</i> related to each task and calibration.		
	You can use the Employee Manager to do these tasks:		

	• Create a new <i>Employee</i> . To use the software, you must include a <i>User Name</i> and one of four permission levels.
	• Delete an <i>Employee</i> , change the status (Active/Not active) or change the <i>Employee</i> data.
	Change your own password.
Permission levels	The <i>Permission Level</i> that you set up for an <i>Employee</i> (Refer to "Set up Employee data") controls the software tasks they can do:
	Administrator: You can do all the program tasks.
	<b>Supervisor:</b> You can do all the program tasks but you cannot change the user <i>Permission Level</i> .
	<b>Technician:</b> You can do all the daily operations but you cannot set up or change <i>Procedures</i> or <i>Calibration Systems</i> .
	<b>Auditor:</b> You can read the Intecal data and change your own <i>Employee</i> data.
Set up Employee data	You must have the necessary Permission Level for this task.
	To set up a new <i>Employee</i> :
	<b>1.</b> Select <i>Tools &gt; Employee Manager</i> from the menu bar.

2. When the *Employee Manager* window opens (Figure 2-3), click on the *New* button.

Emplo	oyee Manager	X
	Employee ID:	1 • New Delete
		Active
	First Name:	The
	Last Name:	Administrator
	Job Title:	System Admin
	E-Mail:	Admin@ge.com
	Initials:	S
cal	Cha	ange Password Edit User Permissions
Inte	ОК	Cancel Apply

Figure 2-3: Employee Manager window

**3.** When the new *Employee ID* window opens (Figure 2-4), enter a unique number and click on OK.

Inteca	ıl	<b>X</b>
	Enter new Employee ID	
ntecal		
Ħ		

Figure 2-4: New Employee ID window

- **4.** In the *Employee Manager* window (Figure 2-3), click on the *Active* check-box. This sets the status (active or not active).
- **5.** Enter the applicable values in these boxes: *First Name*, *Last Name* (Mandatory), *Job Title*, *Email*, *Initials*.
- 6. (Administrator only) Click on the Edit User Permissions button.
- **7.** When the *Edit User Permissions* window opens (Figure 2-5), enter applicable values for these items:

**User Name:** An *Employee* can only use the software if they have a *User Name*. This is also the default password the first time they log in.

**Permission Level:** Select the applicable *Permission Level* from the drop-down list. Refer to "Permission levels".

Edit User Permissions	23
Employee ID :	1
User Name:	Admin1
Permission Level:	Administrator
OK	Cancel

Figure 2-5: Edit User Permissions window

	8. When the User Permissions data is set up, click on OK. Then click on the applicable button in the Employee Manager window:
	<b>OK:</b> To confirm the data and leave the <i>Employee Manager</i> window.
	<b>Cancel:</b> To cancel the data and leave the <i>Employee Manager</i> window.
	<b>Apply:</b> To apply the data and continue to use the <i>Employee Manager</i> window.
Change Employee data	You must have the necessary <i>Permission Level</i> for this task. Refer to "Permission levels".
	To change the <i>Employee</i> data:
	<b>1.</b> Select <i>Tools &gt; Employee Manager</i> from the menu bar.
	2. When the <i>Employee Manager</i> window opens (Figure 2-3), select the applicable <i>Employee ID</i> from the drop-down list.
	<ol> <li>Change the applicable data. Refer to "Set up Employee data", steps 4 to 8.</li> </ol>
Set up your password	You can only set up or change your own password. To set a password:
	<b>1.</b> Select <i>Tools &gt; Employee Manager</i> from the menu bar.
	2. When the <i>Employee Manager</i> window opens (Figure 2-3), select the applicable <i>Employee ID</i> from the drop-down list.
	3. Click on the Change Password button.
	<b>4.</b> When the <i>Change Password</i> window opens (Figure 2-6), enter the applicable password.

*Note:* All passwords are case sensitive.

Chang	ge Password
	Enter New Password:
	Re-enter New Password:
Intecal	OK Cancel

Figure 2-6: Change Password window

	5. When you confirm the password in the second box, click on OK.				
Delete an Employee	You must have the necessary <i>Permission Level</i> for this task. Refer to "Permission levels".				
	Note: If you cannot delete an Employee ID because it is used in a calibration, you can set it to not active.				
	To delete an <i>Employee</i> :				
	<b>1.</b> Select <i>Tools &gt; Employee Manager</i> from the menu bar.				
	2. When the <i>Employee Manager</i> window opens (Figure 2-3), select the applicable <i>Employee ID</i> from the drop-down list.				
	3. Click on the <i>Delete</i> button.				
	You must confirm that you want to delete the <i>Employee ID</i> .				
Select a language	The software can operate in a number of different languages.				
9	To change to a different language, use one of these methods:				
	• Click on the Language Selection button in the tool bar.				
	• Select <i>Tools &gt; Language Selection</i> from the menu bar.				
	When the <i>Language Selection</i> window opens (Figure 2-7), select the applicable language and click on OK.				
	Note: When you click on OK, the software immediately closes and restarts.				
	Selection         Select Language:         CN - 中文(简体)         DE - Deutsch         ES - Español         FR - français         IT - italiano         NL - Nederlands         PL - polski         RU - русский         SE - svenska         US - English				
	Сапсеl				



Backup Database	Use this option to make a backup copy of your Intecal database.
	<b>1.</b> Select <i>Tools &gt; Backup Database</i> from the menu bar.
	2. In the window that opens, set a file name and file location for the *.mdb file and click on <i>OK</i> .

Set Customer Report Details

Use this option to set up your calibration reports (Chapter 7) with a company logo (1), a company address (2) and standard footer text (**3**). See Figure 2-8.

thi logozono logoletikrese	Calibration Report Report No: 7 GE Sensing Fir Thee Lane Creby Lescenter 0110/231/100
	Test Gauge
DEVICE DETAILS POSITION NAME LOCATION: Demo Sub-location 2 LOOP.	CALIBRATION CALIBRATION DATE: 7/6/2007 2:24:30PM CALIBRATION DUE DATE 7/6/2007 12:00 0GAM
SERIAL NUMBER 7890	WORK ORDER DemoWorkOrder
MODEL NUMBER: MANUFACTUREF	as Found as Left AMBIENT TEMPERATURE 21.20 °C HUMOITY % RH AIR PRESSURE: mbar
RANGE DETAILS	CALIBRATION STANDARDS
RANGE INPUT OUTPUT: RELATIONSHIP PASSFALL TOLERANC ADLIESTIMET	INPUT STANDARD CALIBRATION DUE INPUT CONTROLLER DEFUTE STANDARD
0.0 0.0 0.4	as Feund     Error Links     Subset 3
0.2	

Date : (dd/mm/yy) 04/02/2008 16:22:10	Approved :	Admin 1 Groby
Calibration Management 3 Software		
PC6-6023 AsL 4-2-2008		Page 1 of 2

Figure 2-8: Calibration Report Details (Header/Footer)

(Report details)

Setup procedure 1. Select Tools > Customer Report Details from the menu bar. See Figure 2-9.

Address 1:	GE Sensing	Edit logo.bmp
Address 2:	Fir Tree Lane	to add your own logo/address
Address 3:	Groby	
Address 4:	Leicester	
Address 5:	0116 2317100	Select User Logo
eport Details		
lser Text1:	Intecal	
lser Text2:	Calibration	Database Refresh Timer
lser Text3:	Software	Set Timer (mins): 0

Figure 2-9: Calibration Report Details

2. Set the necessary data (Address; Report Details):

Address (1 to 5): Enter up to 15 characters on each line.

User Text (1 to 3): Enter up to 67 characters on each line.

- **3.** To change the company logo, click on *Select User Logo*. A file selection window opens.
- **4.** If necessary, select a different Directory. Then select the \*.bmp file for the applicable company logo and click on OK.

The software uses the specified \*.bmp file to replace the file "logo.bmp" in the Intecal folder on your computer. For example: In folder C:\Program Files\... \Intecal. It also makes a backup of the old logo file.

- Note: The logo you use must have width less than or equal to 80 pixels; length less than or equal to 170 pixels.
- 5. To accept the settings, click on *OK*. The software applies the new *Address* and *Report Details* to all new calibration reports. The new logo goes on all your calibration reports.

**Use the Find facility** When you have different *Devices* in different *Locations* in your *Plant Structure*, you can find them quickly with *Find*. This includes all or part of these items:

- Location ID
   Asset ID
- Tag ID
- Device Description

Setup procedure 1. Select Tools > Find from the menu bar. See Figure 2-10. (Find)

Find		x
Find : Location ID	•	
Equals 🔻		
ОК	Next Cancel	



- 2. Click on the Find drop-down menu ▼ and select one of the options: Location ID; Tag ID; Asset ID; Device Description
- 3. Enter the applicable characters you want to find.
- **4.** Click on the drop-down menu ▼ and set how the *Find* operation is done:

**Equal:** The specified characters give the complete *ID* or *Description*.

**Begin:** The specified characters give the initial characters of the *ID* or *Description*.

**Contain:** The specified characters give part of the *ID* or *Description*.

- 5. Click on *OK*. If the software finds the characters, it shows the *Plant Structure* window and the first item.
- 6. To find the next item with the specified characters, click on *Next*.
- 7. To close the Find window, click on Cancel.

# **Chapter 3: Plant Structure**

Introduction

Use Intecal *Plant Structure* to manage and organize your database of devices in the same way as you use Windows® Explorer to organize files and folders. Figure 3-1 shows the *Plant Structure* window.

Intecal - Plant Structure								
File Edit Tools View Help								
0 4 0 5 4 <b>0 5</b> 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	▶ ⊁ 🖾   😵							
Navigation	General     Input     Output     Re       Calibration Due Date:     Implement     Implement       Procedure:     2point test       Criteria     Pass/Fail       % Span:     1       1     (Whicheve       % Reading:     0       Driver Range:     0	lationship 6/28/2005 • • Adjustment 0.5 ris Greater] 0	Calibration Inter	rval (days): 0				
C	SOP:							
Work Orders	Calibration History	35	5.				92 - 1	
	Calibration Date (mm/d.	As Found	As Left	Technician	Work Order	Location	Report Number	Pass/Fail
	1 10/6/2003 12:11:10 PM	No	Yes	The Supervisory	DemoWorkOrder	DemoTag2	8	Failed
	2 10/6/2003 12:11:10 PM	No	Yes	The Supervisory	DemoWorkOrder	DemoTag2	3	Failed
Ready								

Figure 3-1: Plant Structure window

The tree structure lets you represent all the physical locations and devices for your site in a single view. You can set up: sub-locations, tags, devices and device ranges.

When you click on an item in the tree structure, the screen shows the related data. For example:

- the data set up for the *Location*, *Tag* or *Device* and the related *Maintenance Actions*
- the range calibration data and the related Calibration History

You can use the *Plant Structure* function to do these tasks:

• To set up or change the sub-locations, tags, devices and device ranges.

	<ul> <li>To set up or change the related <i>Maintenance Actions</i>.</li> <li>Chapter 6: To add items to a <i>Work Order</i>.</li> <li>Chapter 7: To see the calibration history for a <i>Device</i> or <i>Range</i>.</li> <li>Chapter 7: To calibrate a <i>Device</i> or to make calibration</li> </ul>
Locations	A location or sub location usually represents a physical location on your site (Example: a building or room) but you can set up any alternative group structure (Example: Druck, Ruska). You can put more than one device in a location
Create a Sub-location	<ul> <li>To create a Sub-location, click on an applicable location or sub-location and use one of these methods:</li> <li>Click on the new Sub-Location button in the tool bar</li> <li>Select File &gt; New &gt; Sub-Location from the menu bar.</li> <li>Right-click and select New &gt; Sub-Location</li> </ul>
Edit a Sub-location	When you create a <i>Sub location</i> , the Intecal software gives it the next <i>Location ID</i> in the sequence (Figure 3-2).

Location ID: Plant Locations	
Description:	
Demo Plant Item	*
	Ŧ
Loop Diagram:	
SOP:	
•	
Maintenance Actions	

Figure 3-2: Location Detail View

**Description:** Up to 123 characters.

Loop Diagram: Up to 255 characters.

**SOP (Standard Operating Procedure):** Use this to set up a link to a file on your computer system (Example: PDF, TIFF, TXT, DOC).

Rename a Sub-location To change the *Location ID*, click on it in the *Plant Structure* tree, and then use one of these methods:

- Select *File > Rename* from the menu bar.
- Right click and select Rename.

A location cannot have two sub-locations at the same level with the same *Location ID* (Maximum: 50 characters).

Delete a Sub-location

Before you can delete a sub-location, you must remove all the related items. You can then use one of these methods to delete it:

- Click on the *Delete* button in the tool bar.
- Select *File > Delete* from the menu bar.
- Right click and select Delete.

device and the tag.

• Press the Delete key on the keyboard.

You must confirm that you want to remove the item.

Tags

Create a Tag



To create a *Tag*, click on an applicable location or sub-location and use one of these methods:

A tag is similar to a location but a tag can only hold one device at a

time. For example: You can set up a tag for a unique device operation. If you calibrate the related device, there is a link to the

- Click on the new *Tag* button in the tool bar
- Select *File > New > Tag* from the menu bar.
- Right-click and select New > Tag.

Edit a Tag

When you create a *Tag*, the Intecal software gives it the next *Tag ID* in the sequence (Figure 3-3):

Tag ID: DemoTag2
Description:
Demo plant item
Loop Diagram:
SOP: <u>C:\GEDruck\ptx500.pdf</u>
Maintenance Actions

Figure 3-3: Tag Detail View

Description: Up to 123 characters.

Loop Diagram: Up to 255 characters.

**SOP (Standard Operating Procedure):** Use this to set up a link to a file on your computer system (Example: PDF, TIFF, TXT, DOC).

Rename a tag

To change the *Tag ID*, click on it in the *Plant Structure* tree, and then use one of these methods:

- Select *File > Rename* from the menu bar.
- Right click and select Rename.

A location cannot have two tags at the same level with the same *Tag ID* (Maximum: 50 characters).

Delete a tag



You cannot delete a tag if it has a *Device* or a calibration record. You must remove all the related items. You can then use one of these methods to delete it:

- Click on the Delete button in the tool bar.
- Select *File > Delete* from the menu bar.
- Right click and select *Delete*.
- Press the Delete key on the keyboard.

You must confirm that you want to remove the item.

### Devices

Create a device (Manual method)



A *Device* has one or more measurement ranges. For example: pressure sensors, or measurement and test equipment. Each *Device* must a have a unique *Asset ID*.

To create a *Device* manually, select the applicable location or tag for the *Device*, and then use one of these methods:

- Click on the new *Device* button in the tool bar.
- Select *File > New > Device* from the menu bar.
- Right-click and select *New > Device*.

You can then edit the necessary device data (Figure 3-5)

Create a device (New Device Wizard method)



If the *Device* has a digital communication interface that the Intecal software supports, you can use the *New Device Wizard* (Figure 3-4) to set up the necessary data.

- **1.** Connect the *Device* to the computer (refer to the user manual for the applicable *Device*).
- **2.** Select the applicable *Location* or *Tag* for the *Device*, and then use one of these methods:
- Click on the New Device Wizard button in the tool bar
- Select Tools > New Device Wizard from the menu bar.

New D	evice Wizard	23
	Asset ID:	
	Driver:	GE Druck Calibrator 🔹
	Port:	USB
ច្ច	Calibrator:	GE Druck DPI620IS (3506914 💌
Inte	OK	Cancel

Figure 3-4: New Device Wizard views

Edit a Device

Note:	The Calibrator drop down box is only for use with USB devices and
	when using comm devices or if no USB devices are attached then
	the box will remain blank and is not required.

3. When the New Device Wizard opens, set up the necessary data.

Asset ID: Enter a unique Asset ID (Maximum: 50 characters).

**Driver:** Click on the drop-down list and select the applicable device driver.

**Port:** Click on the drop-down list and select the communication *Port* for the *Device*.

Calibrator: Select the applicable USB device.

**Properties:** Set the applicable communication properties (refer to the user manual of the applicable device).

**4.** To start the data transfer, click on the OK button in the device wizard.

If the device does not support all the data in the Intecal *Device* view (Figure 3-5), these data items stay empty. But, before you calibrate the *Device*, make sure that all the data is correct. This includes the *Device* data and the related *Ranges* (Figure 3-7).

When you create a *Device* manually, the Intecal software gives it the next *Asset ID* in the sequence (Figure 3-5):

Device: TTX 400-123   Asset ID: TTX 400-123   Hook up Diag:   Serial Number:   1234   Remarks:   Demo Temperature Transmitter   Model Number:   GE   Calibrator   SOP:					
Asset ID: TTX400-123 Hook up Diag: Serial Number: 1234 Remarks: Demo Temperature Transmitter A Model Number: GE Calibrator SOP: Calibrator	Device:	TTX400-123	Driver:		•
Serial Number: 1234 Remarks: Demo Temperature Transmitter Model Number: Manufacturer: GE Calibrator SOP:	Asset ID:	TTX400-123	Hook up Diag:		
Model Number: Manufacturer: GE Calibrator SOP:	Serial Number:	1234	Remarks:	Demo Temperature Transmitter	*
Manufacturer: GE Calibrator SOP:	Model Number:				
SOP:	Manufacturer:	GE			Ŧ
	SOP:	Calibrat	tor		

Figure 3-5: Device Detail view

**Reference:** The software uses the *Reference* name in the *Plant Structure* tree. When it is first set up, it is the same as the *Asset ID but* you can change it in the *Plant Structure* tree (Refer to Rename a Device).

Asset ID: A unique identifier for the Device (Maximum: 50
characters). If you change the Asset ID, use the Intecal Save facility
to save it.

Note: If the Device has a related Work Order or a Calibration History, you cannot change the Asset ID.

**Serial Number:** The serial number specified by the manufacturer. To upload/download data with the Work Orders function (Chapter 6), make sure the serial number is set.

Model Number: The model number specified by the manufacturer.

Manufacturer: The manufacturer.

**Driver:** If applicable, click on the drop-down list and select the applicable *Device Driver*. The *Devices* you use in a *Calibration System* (Chapter 5) must have a *Device Driver*.

Hook up Diag: Use this for reference data (Up to 255 characters).

Remarks: Use this for reference data (Up to 70 characters).

**Calibrator:** If you use the *Device* in a hardware configuration to calibrate other *Devices* (Chapter 5), click on this box. This includes *Calibrators, Controllers, Auxiliary Devices.* 

When you create a *Device*, the Intecal software automatically adds a *Maintenance Action* (Figure 3-6) and a *Range* (Figure 3-7).

#### device To change the *Reference* name for a *Device*, click on it in the *Plant Structure* tree, and then use one of these methods:

- Select *File > Rename* from the menu bar.
- Right click and select *Rename*.

You can use the same *Reference* name for more than one device (Maximum: 50 characters).

You cannot delete a *Device* if it has a calibration record. You must remove all the related records. You can then use one of these methods to delete it:

- Click on the *Delete* button in the tool bar.
- Select *File > Delete* from the menu bar.
- Right click and select Delete.

Rename a device

#### Delete a Device



• Press the Delete key on the keyboard.

You must confirm that you want to remove the item.

### Maintenance actions

When you create a *Device*, the Intecal software automatically adds a *Maintenance Action* (Figure 3-6).

Edit a maintenance action To edit a Maintenance Action, use one of these methods:

- Double-click on the row.
- Click on the row and press the Enter key.
- Right-click on the row and select *Edit Row*.

Figure 3-6 shows an example of the Edit view:

Maint	tenance Actions			
	Date (mm/dd/yy)	Туре	Location Employee	
1	11/21/2007 -	Installation 👻	DemoTag2 👻	The Administrat 🔻

#### Figure 3-6: Maintenance Action - Edit view

**Date:** Click on the drop-down list to show the calendar function. Select the month/year and click on an applicable date. Use the check-box to show it is complete.

**Type:** Click on the drop-down list to select the type of *Maintenance Action*:

- Undefined
   Remove
- Installation
- Inspected
- Calibrate

**Location:** Click on the drop-down list to select an applicable *Location.* 

**Employee:** Click on the drop-down list to select an applicable *Employee*.

Create a maintenance action

To create a *Maintenance Action*, use one of these methods:

• Select *File > New > Maintenance Action* from the menu bar.

- Click under Maintenance Actions and press the Insert key.
  - Right-click under Maintenance Actions and select Add Row.

Delete a maintenance action

- To delete a *Maintenance Action*, use one of these methods:
- Click on the row and press the Delete key on the keyboard.
- Right-click on a row and select *Delete Row*.

Ranges

When you create a *Device*, the Intecal software automatically adds a *Range* (Figure 3-7). A *Range* describes the measurement capabilities of the *Device*. You can add more ranges but the minimum is one.

Create a Range



If you create a *Device* with the *New Device Wizard* (Refer to Devices), the Intecal software can create the applicable number of ranges and set up the necessary data.

To create more ranges, click on the *Device* in the *Plant Structure* tree, and then use one of these methods:

- Click on the New Range button in the tool bar.
- Select *File > New > Range* from the menu bar.
- Right click and select New > Range.

#### Edit a Range A Range has four tabs (Figure 3-7 to Figure 3-10):

General tab: To set up how and when the calibration is done.

**Input tab and Output tab:** To set up the applicable input/output values that the device uses.

**Relationship tab:** To set up the relationship between the input/ output values.

# General TabThis tab lets you set up how and when the calibration is done.Figure 3-7 shows the data on the General tab:

General Input	Output Relationship	
Calibration Due Dat	e: 📝 6/28/2005 🗐 🛪	Calibration Interval (days): 0
Procedure:	2point test	Edit
Criteria		
	Pass/Fail Adjustment	
% Span:	1 0.5	
	(Whichever is Greater)	
% Reading:	0 0	
Driver Range:	0	
SOP:		

Figure 3-7: Range General Tab

**Calibration Due Date:** Click on the drop-down list to show the calendar function. Select the month/year and click on an applicable date. Use the check-box to show it is active and/or complete.

**Calibration Interval (days):** Enter the number of days between each calibration.

**Procedure:** You cannot add a *Device* to a *Work Order* if it does not have a *Procedure*. Click on the drop-down list and select the necessary calibration *Procedure* (Chapter 4). To change how the *Procedure* works, click on the *Edit* button.

Note: More than one Device can use a Procedure. Make sure that the changes you make are applicable to all the related Devices.

**Criteria:** Enter the necessary calibration limits for *Pass/Fail* and the permitted amount of *Adjustment* (*Adjustment % £ Pass/Fail %*). The Intecal software uses the largest value (% *Span* or % *Reading*). After a calibration, this data is permanent.

**Driver Range:** (Reference data) If the *Device* has more than one *Range*, set the applicable range number (1, 2, 3 ...). After a calibration, this data is permanent.

Input/Output Tab These tabs let you set up the applicable input/output values that the device uses. Figure 3-8/3-9 shows an example of the Input tab and the Output tab for a pressure device that gives a mA output.

General Input	Output Relationship			
Parameter	Pressure	Reference Mode	Gauge 🔻	
Measurement Units	bar 💌			
Minimum	0			
Maximum	20			
Settling Time (s)	5			
	Link to the first Range			

Figure 3-8: Range Input tab

General Input	Output Relationship
Parameter	Current 👻
Measurement Units	mA 🔻
Minimum	4
Mauroum	20
	0
Settling Time (s)	0

Figure 3-9: Range Output tab

Parameter: Click on the drop-down list and select the applicable Parameter. The parameters include:

 Current • Observed \*

Pressure

•

• Temperature

Density

•

- Temperature (RTD)
- Frequency Resistance
- Temperature (TC)
- Humidity Switch \*
- Voltage

\* Only available as an output parameter

Intecal adds more data items to the tab if they are necessary for the specified Parameter. Example: Probe Type for an RTD or Thermocouple. After a calibration, this data is permanent.

Measurement Units: Click on the drop-down list and select the applicable units (See Appendix A). After a calibration, this data is permanent.

**Minimum/Maximum:** Enter applicable values for the *Device*. After a calibration, this data is permanent.

**Settling Time (s):** Enter an applicable value (in seconds) that lets the *Device* give a stable reading (Value > 0). Refer to the user manual for the *Device*.

Relationship Tab

This tab let you set up the relationship between the input/output values. Figure 3-10 shows an example *Relationship* tab:

General I	nput	Output	Relationship	
Relationshi	ір Туре:	Lir	near	•

Figure 3-10: Range Relationship tab

**Relationship Type:** Click on the drop-down list and select the applicable type. These include:

- Linear: A typical straight-line relationship.
- Square Root: Flow calculations use this type of relationship. The data includes the option to set a *Break Point*.
- Switch: For switches only.

After a calibration, this data is permanent.

#### Delete a Range



A *Device* must have one *Range*. You cannot delete it. Also, if a *Range* has calibration records, you must remove all the related records before you can delete it. You can then use one of these methods:

- Click on the *Delete* button in the tool bar.
- Select *File > Delete* from the menu bar.
- Right click and select *Delete*.
- Press the Delete key on the keyboard.

You must confirm that you want to remove the item.

Copy/move items	Similar to Windows® Explorer, you can cut, copy and paste these items in the Plant Structure tree: Sub-Locations, Devices, Ranges. You can also use your mouse to drag and drop these items.
	If the item includes a sub-structure, the cut, copy and paste operation will included these items as well.

# **Chapter 4: Calibration procedures**

#### Introduction

Use Intecal *Procedures* to set up and manage the calibration *Procedures* in your database. A calibration *Procedure* contains the values a calibration uses (test points, ramp time). You can then use the same calibration *Procedure* for all the applicable *Devices* under test. Figure 4-1 shows the *Procedures* window.

You can use the *Procedures* function to do these tasks:

- create a *Procedure*
- edit, copy, delete or rename a *Procedure*.

Intecal - Proce	edures					23
File Edit T	fools View Help					
1 🔒 💼 🛙	d 🕫 🕴					
Navigation	Procedure ID	Description	Туре	Number of Points		
	1 2 point calibration		Proportional	3		
Plant Structure	2 25 percent steps		Proportional	5		
	3 2point test		Proportional	2		
Ê	4 3 up-down		Proportional	5		
Procedures	5 5 points		Proportional	5		
	6 switch test		Switch	0		
Calibration Systems Work Orders						
Ready						

Figure 4-1: Procedures window

Create a procedure



To create a *Procedure*, use one of these methods:

- Click on the *New Procedure* button in the tool bar.
- Select *File > New Procedure* from the menu bar.

• Right-click and select New Procedure.

This opens the "Procedure Creation Wizard" (Figure 4-2).

	Procedure Creation Wizard				
	Procedure Name:  Procedure Type  Proportional  Switch				
	< Back Finish Cancel Help				
	Figure 4-2: Procedure creation wizard				
	1. Enter a unique Procedure Name (maximum 50 characters).				
	2. Select the Procedure Type:				
	<i>Proportional</i> : For <i>Procedures</i> with a set of test points. <i>Switch</i> : To do a switch test on a portable calibrator.				
	3. Click on the <i>Finish</i> button.				
Edit a procedure	Note: More than one device can use a Procedure. Make sure that the changes you make are applicable to all the related Devices.				
	To edit a <i>Procedure</i> , select the <i>Procedure</i> in the list, and then use one of these methods to edit it:				
	• Select <i>Tools &gt; Procedure Editor</i> from the menu bar.				
	• Right-click and select <i>Procedure Editor</i> .				
	• Double-click on the <i>Procedure</i> .				

This opens the *Procedure Editor* (Figure 4-3/4-4). It has two tabs:

General tab: To set up how the Procedure works.

**Affected Devices tab:** This shows a list of devices that use the procedure.

Procedure editor for proportional procedures

Figure 4-4 shows an example of the *General* tab when the *Procedure* has a set of test points:

Procedure Editor - 5 points						
General	Affected Devic	es				
Description:						
Show Procedure in Reference To:					•	
<ul> <li>Proportional Test Settings</li> </ul>			External Power			
Test Points: Double Click to Edit			Setup Wizard			
	% Span			Add Test Point		
1	0			Remove Test Point		
2	25			Insert Test Point		
3	50			Test Point Tolerance		
4	75			(% Span):		
5	100			10		
				Exercise Cycles:		
				0		
OK Cancel Apply						

Figure 4-3: Procedure Editor for proportional procedures

Description: Up to 255 characters.

**Show Procedure in Reference To:** If you select one of the *Affected Devices* from the drop-down list, the software adds another column of test points. The new test point values are in the measurement units of the specified *Device*.

**External Power:** Use the check-box to show that the device must have an external power supply.

**Test Points:** This shows each test point as a percentage of Span. To add another column of test points, use *Show Procedure in Reference To.* To edit a test point, double-click on the value.

**Setup Wizard:** Click on this button to open the *Procedure Point Wizard*. Use this to create a set of test points.

Add/Remove/Insert Test Point: Click on the applicable button to add, remove or insert one test point.

**Test Point Tolerance:** To set an applicable calibration tolerance.

**Exercise Cycles:** To set the number of cycles before a test can start (for example: to get a stable operating temperature).

Procedure Editor for switch procedures

Figure 4-4 shows an example of the *General* tab when the *Procedure* is for a switch test.

Note: The Switch test is for portable calibrators only.

Procedure Editor - switch test	? <mark>×</mark>
General Affected Devices	
Description:	
Ramp Time (s) 30	
Test Reset	
	OK Cancel Apply

Figure 4-4: Procedure Editor for a switch test

Description: Up to 255 characters.

**Ramp Time:** Set the period (in seconds) for the portable calibrator to go from the low value to the high value.

Test Reset: Select this option to see if the switch resets correctly.

Rename a procedure	To rename a Procedure, select the Procedure in the list, and then
-	use one of these methods to rename it:

- Select *File > Rename* from the menu bar.
- Right-click and select *Rename*.
Copy a procedure
 To copy a Procedure, select the Procedure in the list, and then use one of these methods to copy it:

 • Click on the Copy button in the tool bar.

- Select *Edit > Copy* from the menu bar.
- Right-click and select *Copy*.

A window opens for you to enter a new Procedure ID.

## Delete a procedure



To delete a *Procedure*, select the *Procedure* in the list, and then use one of these methods to delete it:

- Click on the *Delete* button in the tool bar.
- Select *File > Delete* from the menu bar.
- Right-click and select Delete.
- Press the delete key on the keyboard.

You must confirm that you want to delete the Procedure.

Note: If a device uses the Procedure, when the Procedure is deleted the Procedure is removed from all of the Devices which use it.

## **Chapter 5: Calibration systems**

Introduction	Use Intecal <i>Calibration Systems</i> to manage the hardware configurations you use to do your calibrations. A <i>Calibration</i> <i>System</i> includes the <i>Devices</i> you use in the hardware configuration and the applicable <i>Device Variables</i> that control the calibration.
	You can then use the same <i>Calibration System</i> for all the applicable <i>Devices</i> under test (Chapter 7). Figure 5-1 shows the <i>Calibration Systems</i> window.
	You can use the Calibration Systems function to do these tasks:

- create a Calibration System
- edit, copy, delete or rename a *Calibration System*.

🎱 Intecal - Calib	ration Systems					
File Edit T	ools View Hel	р				
<b>0</b> 💼   40 0	r 🕫 🕴					
Navigation	Configuratio	on ID C	Description	Calibrator	Controller	
	1 2492 no baror	meter		PC-87	PC-87	
Plant Structure	2 2492-7220			PC-87	PC-87	
	3 7250LP-3497	0 7	250LP with Aglient 34970 Multiplexer	PG-7250LP	PG-7250LP	
Procedures						
æ						
Calibration						
Systems						
E.						
Work Orders						
Ready	<u> </u>					

Figure 5-1: Calibration Systems window

Create a CalibrationTo create a Calibration System, use one of these methods:System



- Click on the New Calibration System button in the tool bar.
- Select *File > New Calibration System* from the menu bar.

- Right-click and select New Calibration System.
- When you start a calibration (Chapter 7), click on the *New Calibration System* button.

This opens the "Calibration System Creation Wizard" (Figure 5-2).

### Wizard - Page 1

Calibration System Creation	Wizard	<b>X</b>
Configuration ID:	1	]
Description:		
	< Back Nex	ct > Cancel

Figure 5-2: Calibration System Creation Wizard - Page 1

- 1. Enter a unique Configuration ID (Maximum: 50 characters).
- 2. If necessary, enter a Description (Maximum: 164 characters)
- **3.** Click on the *Next* button (Figure 5-3).

Calibration System Creation Wizard	X
Device that will Provide the Standard Reading (Calibrator):	
Device that will Control the Input (Controller):	
Generate 0 Point By: Control Zero	
< Back Next > Cancel Help	

Figure 5-3: Calibration System Creation Wizard - Page 2

**1.** Enter the applicable values:

## Wizard – Page 2

**Device ... (Calibrator):** Click on the drop-down list and select the applicable *Calibrator Device* (Chapter 3): This is the *Device* that reads the standard values used in the calibration.

**Device ... (Controller):** Click on the drop-down list and select the applicable *Controller Device* (Chapter 3): This is the *Device* that controls the standard values used in the calibration.

Note: The Calibrator and the Controller can be the same Device.

**Port:** Click on the drop-down list and select the communication *Port* for each *Device*.

**Generate 0 Point By:** If applicable, click on the drop-down list and select the method to set a zero pressure value:

- Control Zero: The Controller takes the pressure to zero.
- *Vent*: The *Controller* vents the pressure to atmospheric pressure.

**Vent Delay Time (s):** If applicable, enter the time interval (in seconds) before the system vents to atmospheric pressure.

- *Draw Vacuum*: A vacuum pump reduces the pressure to an approximate absolute zero.
- 2. When the values are set up, click on the *Next* button (Figure 5-4).

Ca	libration System Cr	eation Wizard	ł			×
	Use Auxiliary Device:	evice to measu	ure DUT Output	Port	IEEE-488	-
_						
			< Back	Finish	Cano	el

Figure 5-4: Calibration System Creation Wizard - Page 3

Enter the applicable values or click on the Finish button:

### Wizard – Page 3

	<b>Use A</b> (Exam (DUT),	<b>uxiliary Device</b> ple: a multimete click on this che	<b>. Output:</b> If t r) to read the ck-box.	here is a output c	n auxilic of the de	ary <i>Device</i> vice unde	? er test
	Note:	lf you do not se necessary data	t an Auxiliary during the cc	Device, y alibratior	you mus 1.	t enter th	е
	<b>Auxilio</b> applic	a <b>ry Device:</b> Click able <i>Calibrator I</i>	k on the drop- Device (Chapt	-down lis er 3).	st and se	elect the	
	<b>Port:</b> ( Port fo	Click on the drop or the <i>Device</i> .	o-down list an	d select	the com	nmunicati	on
Edit a Calibration System	Note:	More than one sure that the ch related Devices	Device can us hanges you m	se a Calit ake are d	pration S applicab	System. Mo le to all th	ake 1e
ť	To edi Syster	t a Calibration S n in the list, and	<i>ystem</i> , select then use one	the appl e of these	icable C e metho	<i>alibration</i> ds to edit	it:
	• Clic	ck on the Cal Sys	stem Configur	<i>ator</i> but	ton in th	ie tool bai	r.
	• Select Tools > Cal System Configurator from the menu bar.						•
	<ul><li>Right-click and select Cal System Configurator.</li><li>Double-click on the Calibration System.</li></ul>						
	This of	pens the Calibra	tion System C	Configuro	ator (Figu	ure 5-5).	
Calibu	ration System Conf	igurator					
Calibi	Devices:	guracel	Variables:				
	Asset ID		Variable Name	Value	Units	Device	

1         PACE         1         Standard         0         PACE           2         GENII         2         Controller         0         PACE           3         DUT         0         GENII	As	set ID		Variable Na	me Value	Units	Device
2 GENII         2 Controller         0         PACE           3 DUT         0         GENII	1 PA	CE		1 Standard	0		PACE
3 DUT     0     GENII       New     Delete     Edit	2 GE	INII		2 Controller	0		PACE
New Delete Edit				3 DUT	0		GENII
						I	

Figure 5-5: Calibration System Configurator

There are two lists:

**Devices:** Use this list to set up and change the *Devices* you use to do the calibration.

**Variables:** Use this list to set up and change how the *Calibration System* uses the *Variables* to do the calibration.

Add, edit, deleteTo change the Devices in the Calibration System, click the<br/>applicable button to add, edit, or delete a Device. To edit an item,<br/>you can also double-click on it.

You can only add a *New Device* if is set up with a *Device Driver* (Figure 3-4/3-5). When you add a *New Device*, it must have a specified communications port. Use the drop-down list to select one.

Note: When you edit a Device to change the communications port, the software tries to communicate with it. Make sure that the Device has a connection to the PC.

Add, edit, delete calibration variables

To change the *Variables* in the *Calibration System*, click the applicable button to add, edit, or delete a *Variable*. To edit an item, you can also double-click on it.

		<b>c</b> 1		
	the databa	rind a ma ise.	tching TagiD/Device combination in	
	Uploaded T	agID :	RTX1000	
	Uploaded S	/N :	6	
	Press Acce	ept to upl	pad results and keep the database	serial
	Press Reje	ect if the u	uploaded serial number is correct.To	save the
		reate a r	iew device and then upload again	
Asset ID	Ra	Serial No	Manufacturer/Model	
		PTV1000	BTY1000-BTY1000	
RTX1000	Ra	KIX1000	KIX1000-KIX1000	
RTX1000	Ra	KIXIOO		
RTX1000	Ra	KIXIOO	J KIA1000-KIA1000	
RTX1000	Ra	KIXI00	, KIX1000-KIX1000	
RTX1000	Ra	KIXIOO	, KIX1000-KIX1000	
RTX1000	Ra	KTAIOO	, KIX1000-KIX1000	
RTX1000	Ra	KIAIOO	, KIXI00-KIXI000	

Figure 5-6: Data for a Variable

	Variable Name: Enter a unique Name (maximum 50 characters).
	<b>Type:</b> Click on the drop-down list and select the applicable type for this <i>Variable</i> . These include:
	• Automated: A specified <i>Device</i> supplies the <i>Variable</i> value (Specified in <i>Device</i> :).
	• Constant: It is a constant value (Specified in <i>Default Value</i> :).
	• Manual: During the calibration a <i>Prompt</i> asks you to supply the necessary value (The text is specified in <i>Prompt</i> :).
	<b>Device:</b> (Automated Variables only). Click on the drop-down list and select the applicable <i>Calibrator Device</i> (Chapter 3).
	<b>Parameter:</b> Click on the drop-down list and select the applicable <i>Parameter</i> . See Appendix A, Table A-2.
	<b>Range:</b> (Automated Variables only). If the <i>Device</i> has more than one <i>Range</i> , set the applicable range number (1, 2, 3).
	<b>Units:</b> Click on the drop-down list and select the applicable units. See Appendix A, Table A-2.
	<b>Default Value:</b> (Constant Variables only) Enter an applicable constant value.
	<b>Prompt:</b> (Manual Variables only) Enter the applicable text to ask the operator for a value during the calibration.
Rename a calibration system	To rename a <i>Calibration System</i> , select the <i>Calibration ID</i> in the list, and then use one of these methods to rename it:
	• Select <i>File &gt; Rename</i> from the menu bar.
	Right-click and select <i>Rename</i> .
Copy a calibration system	To copy a <i>Calibration System</i> , select the <i>Configuration ID</i> in the list, and then use one of these methods to copy it:
Co	• Click on the <i>Copy</i> button in the tool bar.
-	• Select <i>Edit &gt; Copy</i> from the menu bar.
	• Right-click and select <i>Copy.</i>

A window opens for you to enter a new *Calibration System ID*. Default: "Copy of XYZ" (XYZ is the ID you are copying).

# Delete a calibration system



To delete a *Calibration System*, select the *Configuration ID* in the list, and then use one of these methods to delete it:

- Click on the *Delete* button in the tool bar.
- Select *File > Delete* from the menu bar.
- Right-click and select *Delete*.
- Press the delete key on the keyboard.

You must confirm that you want to delete the Calibration System.

## Chapter 6: Work Orders

Introduction	Use Intecal <i>Work Orders</i> to manage your calibration work. Figure 6-1 shows the <i>Work Orders</i> window.
	You can use the Work Orders function for these tasks:
	<ul> <li>Create a new Work Order and set up a schedule of work for specified employees. To help you, a Query function can show you all the calibrations that are due in a specified period.</li> </ul>
	• Change the Work Order, or delete it.
	• Upload and download data ( <i>Procedures</i> , calibration results) to and from portable calibrators that have a USB/serial communications function or an IEEE 488 interface (Druck, Ruska, or FCINTF).
	• Close a Work Order and, if necessary, examine its history.
	• Chapter 7: Manage the calibration records for <i>Devices</i> that do not have a serial communications function or an IEEE 488 interface ( <i>Manual Data Entry</i> ).
	• Chapter 7: Calibrate a <i>Device</i> that has a serial communications function or an IEEE 488 interface (Druck, Ruska, or FCINTF).

Intecal - Work File Edit T	Orders ools View Help								
Ct 🔒 🗎 C		* >> <<   ?							
Navigation	Work Order: DemoWork	Order	▼ Work Orde	r History: 💌		Assig	ned To: The Administ	rator 🔻	•
Plant Structure	Calibration due: 11	/2/2004	Date C	losed: 7/	8/2015		Cal Date Qu	uery	
Procedures	Notes:						Print Conte	nt .	E
Calibration Systems	Download/Upload to	Portable Calibrato		<u>&gt;&gt;</u>	<del>\$</del>		Close Work C	order	
<b>C</b> Work Orders	Port: USB Calibrator:		- - ?		T				
[	Tag /Reference	Asset ID	Range ID	Description	Status	Procedure	Pass/Fail	Calibrated With	
	1 DemoTag1	PTX500-345	0	Pressure Transmit	Completed	5 points	Failed		
	2 Test Gauge	Test Gauge	0	10 bar	Ready	2point test			
	3 Test Gauge	Test Gauge	0	10 bar	Ready	2point test			
	4 Test Gauge	Test Gauge	0	10 bar	Completed	2point test	Passed		
	5 Test Gauge	Test Gauge	1	100bar	Ready	5 points			
	6 DemoTag2	TTX400-123	0	Temperature Tran	Completed	2point test	Failed		

Figure 6-1: Work Order window

Create a new Work Order	To create a Work Order, use one of these methods:
	<ul> <li>In the Work Orders window, click on the New button in the tool bar.</li> </ul>
	<ul> <li>In the Work Orders window, select File &gt; New from the menu bar.</li> </ul>
	• In the <i>Plant Structure</i> window:
	a. Right-click on an item and select Add to Work Order.
	<b>b.</b> When the Add to Work Order window opens, click on the New Work Order button.
	You must enter a unique <i>New Work Order ID</i> and click on the OK button. You can then set up your <i>Work Order</i> data.
Set up your Work Order data.	To set up what is done in a <i>Work Order</i> you need to add <i>Devices</i> to it. You can also add <i>Employee</i> data and work instructions.
Add Devices to a Work Order	You can add <i>Devices</i> to a <i>Work Order</i> , from the <i>Work Order</i> window or from the <i>Plant Structure</i> window.
	In the Work Orders window:
	• Click on the <i>Cal Date Query</i> button. This facility lets you set calendar limits for <i>Devices</i> that are overdue for calibration. You can then move the applicable <i>Devices</i> into a <i>Work Order</i> . See Figure 6-2.
	• Select <i>Tools &gt; Get Overdue Items</i> from the menu bar. The software uses the <i>Calibration Due Date</i> for each <i>Device</i> to add ALL the applicable items to the <i>Work Order</i> .
	In the <i>Plant Structure</i> window, you must select an item from the <i>Plant Structure</i> tree ( <i>Location, Sub-Location, Tag, Device, Range</i> ), and then use one of these methods:
	• Click on the Add To Work Order button in the tool bar.
	<ul> <li>Select Tools &gt; Add To Work Order from the menu bar.</li> </ul>
	• Right-click on the item and select Add to Work Order.
	A drop-down list lets you add the item to an applicable <i>Work</i> <i>Order.</i> When you click on the <i>OK</i> button, the software adds all the related <i>Devices</i> to the specified <i>Work Order.</i>

Note: If a Device is not set up with the necessary Range data (Parameter, Procedure), the software ignores it.

- Setup procedure **1.** In the Work Orders window (Figure 6-1), click on the *(Cal Date Query)* button. See Figure 6-2. The window shows all the applicable *Devices* in the *Query Results* panel.
  - **2.** Use one of these options to set the calendar limits for *Devices* that are overdue for calibration:

Calibration Window ... ▼: Set the number of months (1 to 6).

**Calibration Due Date between** ... ▼ and ... ▼: Click on the dropdown list to show the calendar function. Select the month/year and click on an applicable date.

**Show Overdue:** Click on this button to show ALL the *Devices* that are overdue for calibration.

Usery Hesults:       Work Under:       New Work Under:       New Work Under:         T       Asset ID       Serial No       Model       Manufact       Range       Due Date (mm)         Device       PG-72       654321       Range 1       7/16/2015       Tits 40       10 bar       7/6/2007         PG-72       654321       Range 1       7/16/2015       Tits 40       1234       GE       Tempe       6/28/2005       E         D       TIX40       1234       GE       Tempe       6/28/2005       E         D       PTX50       345       GE Druck       Pressur       11/2/2004         D       PTX50       345       GE Druck       Pressur       11/2/	Cal Da	te ( Ci	)uery alibrati alibrati	on Window on Due Dal	te between	1 ▼ 7/16/20	months 15 <del></del> and	8/16/	2015 👻					4101	7		
			T	Asset ID Device PC-87 PG-72	Serial No 123456 654321	Model	Manufact GE	Range Range 1 Range 1 Range 1	7/16/2015 7/16/2015 7/16/2015 7/16/2015	>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>	T D D D D D D	Asset ID Test G TEst G TTX40 TTX40 PTX50 PTX50 PTX50 PTX50 Test G	Serial No 7890 7890 1234 1234 345 345 345 345 345 345 345 345	Model	GE GE GE Druck GE Druck GE Druck GE Druck GE Druck GE Druck	Range 10 bar 10 bar Tempe Pressur Pressur Pressur Pressur Pressur 10 bar	Due Date (mm)         ▲           7/6/2007         7/6/2007           6/28/2005         €           6/28/2005         €           11/2/2004         11/2/2004           11/2/2004         11/2/2004           11/2/2004         11/2/2004           11/2/2004         11/2/2004           11/2/2004         11/2/2004

Figure 6-2: Calibration History

- 3. Set the Work Order you want to use:
- For an available *Work Order*, click on the drop-down list ... ▼.
- For a new *Work Order*, click on the *New Work Order* button. You must enter a unique *New Work Order ID* and click on *OK*.
- 4. To move the applicable Devices into the specified Work Order:
- For one *Device* at a time, select the *Device* in the left-hand panel and click on >.
- For ALL the Devices in the left-hand panel, click on >>.

	5. When the Work Order is complete, click on Close.
Add instructions to a Work Order	In the <i>Work Orders</i> window (Figure 6-1), select the applicable <i>Work Order</i> from the drop-down list. You can then add the necessary instructions:
	<b>Assigned to:</b> (Administrator/Supervisor only) Click on the drop-down list to select an applicable <i>Employee</i> .
	<b>Calibration Due /Date Closed:</b> The <i>Calibration Due</i> date is set up with the <i>Device</i> data (Chapter 3, Figure 3-7). <i>Date Closed</i> is set when you use the <i>Close WorkOrder</i> button.
	Notes: Up to 260 characters.
Work Order reports	To get a <i>Work Order</i> report that shows all the related <i>Devices</i> and the current status:
	<b>1.</b> In the <i>Work Orders</i> window (Figure 6-1), select the applicable <i>Work Order</i> from the drop-down list.
	2. To include <i>Device</i> locations in the report, click on the checkbox.

**3.** Click on *Print Report* > See Figure 6-3.

	Information	Sheet for Wor	k Order	- DemoW	/orkOrder		
Location							
Tag Name	Device Name	Manufacturer	Model	SerialNo	Range Name	Due date (mm/dd/yy)	Status
Demo Sub-loca	tion 1						
DemoTag2	TTX400-123	GE		1234	Temperature Tranmitter	6/28/2005	Completed
DemoTag2	TTX400-123	GE		1234	Temperature Tranmitter	6/28/2005	Completed
DemoTag1	PTX500-345	GE Druck		345	Pressure Transmitter	11/2/2004	Completed
DemoTag1	PTX500-345	GE Druck		345	Pressure Transmitter	11/2/2004	Completed
DemoTag1	PTX500-345	GE Druck		345	Pressure Transmitter	11/2/2004	Completed
DemoTag1	PTX500-345	GE Druck		345	Pressure Transmitter	11/2/2004	Completed
DemoTag1	PTX500-345	GE Druck		345	Pressure Transmitter	11/2/2004	Completed
Demo Sub-loca	ation 2						
	Test Gauge			7890	10 bar	7/6/2007	Ready
	Test Gauge			7890	10 bar	7/6/2007	Ready
	Test Gauge			7890	10 bar	7/6/2007	Completed
	Test Gauge			7890	10 bar 100bar	11/30/2004	Com
	Test Gauge			7890	10 bar	7/6/2007	Complete

Figure 6-3: Example Work Order report

**4.** You can print the file and/or export the file in a different format (Table 6-1).

Item	Operation
6	To set up the printer and print the report.
	To export the file in a different format. You can set the applicable format, filename and location. Formats: Portable Document Format (PDF), Microsoft Word, Microsoft Excel, Text file (with tab separators).
47	To refresh the contents of the display.
	To go to the first or last page.
•	To go to the previous or next page.
#4	To find text in the report.

Table 6-1:	Report	window -	Tool bar
------------	--------	----------	----------

Delete items from a	To delete an item from a Work Order:
	<ol> <li>In the Work Orders window (Figure 6-1), select the applicable Work Order from the drop-down list.</li> </ol>
	2. Click on the applicable item in the <i>Work Order</i> list, then use one of these methods to delete it:
	• Click on the <i>Delete</i> button in the tool bar.
	• Select <i>File &gt; Delete</i> from the menu bar.
Delete a Work Order	To delete a <i>Work Order</i> , Select the applicable <i>Work Order</i> from the drop-down list, and then use one of these methods to delete it:
LUL I	• Click on the Delete Work Order button in the tool bar.
	• Select <i>File &gt; Delete Work Order</i> from the menu bar.
Upload/download	To upload and download data ( <i>Procedures</i> , calibration results) to and from a portable calibrator, connect the <i>Device</i> to the
	applicable communication port (COM port, IEEE-488 interface or USB).

Note: The portable calibrator must have the necessary serial communications function or an IEEE 488 interface (Druck, Ruska, or FCINTF).

Then:

- **1.** In the *Work Order* window (Figure 6-1), select the *Work Order* from the drop-down list.
- 2. In *Download/Upload to* ..., click on the applicable drop-down list and select the necessary portable calibrator driver and the communication port. For a USB device, select the Port as 'USB' and then select the required USB device from the Calibrator drop down box.
- 3. Click on the download button to download the procedure.



Download button in the tool bar Download button in the *Work Order* window

- Note: To prevent error messages, make sure the data you download includes the correct serial number for each Device. See Chapter 3, Figure 3-5.
- 4. Do the necessary calibration:
- Intecal: Refer to Chapter 7.
- Local calibration methods Refer to the applicable local calibration procedures.
- 5. Click on the upload button to upload the results.



Upload Button in the tool bar Upload Button in the *Work Order* window

**6.** If the data you upload includes a *Device* serial number that is not in the Intecal database, the software gives you two options (Figure 6-4):

	Unable to the databa	find a mate ase.	hing TagID/Device combina	tion in	
	Uploaded 1	FagID :	RTX1000		
	Uploaded S	5/N:	6		
	Press Acc	ept to uploa	d results and keep the data	base serial	
	Press Rej data first	ect if the up create a ne	loaded serial number is cor w device and then upload a	rect.To save the gain	
Asset ID	Ra	Serial No	Manufacturer/Model		
Asset ID RTX1000	Ra Ra	Serial No RTX1000	Manufacturer/Model RTX1000-RTX1000		
Asset ID RTX1000	Ra Ra	Serial No RTX1000	Manufacturer/Model RTX1000-RTX1000		
Asset ID RTX1000	Ra Ra	Serial No RTX1000	Manufacturer/Model RTX1000-RTX1000		



- Accept: To accept the results but use them with the specified *Device* serial number in the database.
- **Reject:** To reject the results. The serial number in the uploaded data is correct.
- 7. If you *Reject* the results, set up a *New Device* with the applicable serial number (Chapter 3) and then do the upload again.

## Close a Work Order

When all the *Device* calibrations for a *Work Order* are at status *Completed*, you can close it and start again with all *Devices* at status *Ready*.

- Note: You cannot close a Work Order if there is a Device with status Ready or Downloaded.
- 1. In the *Work Orders* window (Figure 6-1), select the applicable *Work Order* from the drop-down list.
- 2. Click on *Close WorkOrder*. The message window gives three options:
- Yes: To save the *Work Order* in the format workorder\_datetime (Example: ABC123456\_05-Feb-200814:51).

	When you save a <i>Work Order</i> , you can use the <i>Work Order History</i> drop-down list to examine its calibration history.
	• No: To close the <i>Work Order</i> and not save it.
	• <b>Cancel:</b> To leave the <i>Work Order</i> unchanged.
	<b>3.</b> If you click on Yes, the software saves the Work Order and you see the workorder_datetime in the Work Order History.
See the Work Order History	To see the records in your Work Order History:
	<ol> <li>In the Work Orders window (Figure 6-1), select the applicable Work Order from the drop-down list.</li> </ol>
	<ol> <li>Click on the Work Order History drop-down list and select a record (if available).</li> </ol>
	<b>3.</b> To see the calibration history for a <i>Device</i> , double click on the applicable row. See Chapter 7, Figure 7-1.

## **Chapter 7: Calibration**

Introduction	You can use the Intecal software for these calibration tasks:
	• To see the <i>Calibration History</i> for a <i>Device</i> or <i>Range</i> . You can also make a permanent record of each calibration report. For example: For ISO 9000 quality control procedures.
	• To manage the calibration records for <i>Devices</i> that do not have a USB/serial communications function or an IEEE 488 interface ( <i>Manual Data Entry</i> ).
	• To calibrate a <i>Device</i> that has a USB/serial communications function or an IEEE 488 interface (Druck, Ruska, or FCINTF).
	• Calibration adjustment: Set up automatic calibration systems to make full use of your GE calibrators and controllers (Ruska and Druck) or alternative systems with an FCINTF facility.
Calibration history	If a <i>Device</i> or <i>Range</i> has a <i>Calibration History</i> , you can see each set of results on the screen.
BM	If you have the correct Permission level (Administrator / Supervisor), you can give final approval to a set of results. You can then make a permanent record of each calibration report with an applicable address and/or company logo.
	To see the Calibration History, use one of these methods:
	• In the Plant Structure window:
	<b>1.</b> Click on the related <i>Tag</i> , <i>Device</i> or <i>Range</i> .
	2. Click on the Calibration History button in the tool bar. OR
	Select Tools > Calibration History from the menu bar.
	• In the Work Orders window:
	If a <i>Device</i> in a <i>Work Order</i> has status <i>Completed</i> , you can double click on it to see the <i>Calibration History</i> . <i>OR</i>

If a Work Order is closed, click on the *Work Order History* drop-down list and select a record. See Chapter 6.

Figure 7-1 shows an example of the *Calibration History* window.

ration I	History						×
10/	/6/2003 12:11:10	) PM As Left	-	Report Style: Proportional			-
		🗌 As Fou	und		/ As Left		
	Input (°C)	Output (	Input Units	Absolute	%Reading	%Span	
	1 -0.500000	4.020000	0.125	0.099	2.490	0.625	
	2 251.2000	19.94000	99.625	-24.252	-122.000	-152.000	
			_			_	
	Maximum	Status	:	Faile	d		
	Maximum 1 -24.252000	Status Status 17.219457		Faile	d		
	Maximum 1 -24.252000 Calibrated By	Status Standard 17.219457 y: The Superv	:	Faile	e <b>d</b> View Repor	t New R	eport
	Maximum 1 -24.252000 Calibrated By Approve	Status Standard 17.219457 The Superv The Admin	: /isory /istrator	Faile	View Repor Report Numb	t New R	eport

### Figure 7-1: Calibration History

**3.** If there is more than one record, click on the drop-down list (left-hand side) and select the calibration record you want to see.

A typical Calibration History record includes these items:

As Found/As Left: This shows the type of results:

- As Found: The values before adjustment.
- As Left: The values after the checks/adjustments.

Report Style: There are two types:

- Proportional: The report includes all the calibration data.
- *Proportional-Blank*: The report shows the *Device* data but no calibration data.

**Input (...), Output (...) :** The type of *Device*, and the *Procedure* you use controls the type of data in the calibration record. To calculate the error values for each test point (Absolute Error, %Reading, %Span), the software uses the specified *Device* pass/fail and adjustment criteria (Chapter 3).

The software has three categories for the calibration results:

Calibration History records

- Passed: The test point values have a white background.
- *Needs Adjustment*: The test point values have a yellow background.
- Failed: The test point values have a red background.

**Status:** *Passed* (Green) - All the test points are in the specified limits for the *Device*.

*Needs Adjustment* (Yellow) - Some of the test points are not in the specified limits but they are in the limits for adjustment.

*Failed* (Red) - The equipment is unserviceable. For example: It must go back to the manufacturer or to a calibration laboratory.

**Maximum/Standard Deviation:** The software calculates these values for information only.

Calibrated by: The Employee that did the calibration.

**Approve:** (Administrator/Supervisor only) If the results are correct and the approval is not set, click on the *Approve* button. The approval is permanent.

**View Report:** After approval, you can click on this button to see the contents of the calibration report and make a permanent record (electronic or paper).

**New Report:** After approval, you can click on this button to add comments to the report. To see the new report with the comments, click on OK.

Calibration History reports If you use the *View Report* or *New Report* buttons (Figure 7-1), the Intecal *Report* window opens (Figure 7-2). You can print the file and/or export the file in a different format. See Chapter 6, Table 6-1.

If the *Report Style* is set to *Proportional*, there are two pages:

- Page 1 has the necessary *Device* and calibration data (Figure 7-2).
- Page 2 shows the calibration results in a graph (Figure 7-3).

To set up your calibration reports with a company logo, a company address and standard footer text, refer to Chapter 2, Figure 2-8.



Figure 7-2: Example calibration report (Page 1 - Data)

## Calibration - Manual Data Entry



If you are using a calibrator that does not have a serial communications function, you can add calibration results to your Intecal database manually:

**1.** In the *Work Order* window (Figure 7-4), select a *Work Order* from the drop-down list.

Edit T	Tools									
		View Help								
- ÷ C	r 🖱	♥   & ▷ ▷	* >> <<   ?							
gation	Work Order: DemoWorkOrder   Work Order History:   Assigned To:  The Administrator									
Tructure	Calibration due: 11/2/2004 Date Closed: 7/ 9/2015 Cal Date Query									
Ì	N	Notes:								
adures								Print Conte	ent	
ration			Portable Calibrator	r						
tems Criders		Port: IEEE-4 Calibrator:	Portable Calibrato	γ • Γ • ?	>> <<	\$		Close Work C	Order	
ms rders		Port: IEEE-4 Calibrator: Tag /Reference	Asset ID	Range ID	Description		Procedure	Close Work C	Calibrated With	
rs	1	Port: IEEE-4 Calibrator: Tag /Reference DemoTag 1	Asset ID PTX500-345	Range ID	Description Pressure Transmt.	Status Completed	Procedure 5 points	Close Work C Pass/Fail Failed	Calibrated With	
s	1	Port: IEEE-4 Calibrator: Tag /Reference DemoTag1 Test Gauge	Asset ID PTX500-345 Test Gauge	<b>Range ID</b> 0	Description Pressure Transmt., 10 bar	Status Completed Ready	Procedure 5 points 2 point test	Close Work C Pass/Fail Faied	Calibrated With	
ers		Port: IEEE.4 Calibrator: DemoTag1 Test Gauge Test Gauge	Asset ID PTX500-345 Test Gauge Test Gauge	Range ID 0 0	Description     Pressure Transmt 10 bar 10 bar	Status Completed Ready Ready	Procedure 5 points 2 point test 2 point test	Close Work C Pass/Fail Faied	Calibrated With	
ers		Port: IEEE.4 Calibrator: DemoTag1 Test Gauge Test Gauge Test Gauge	Asset ID PTX500-345 Test Gauge Test Gauge	Range ID 0 0 0	Description Pressure Transmit 10 bar 10 bar	Status Completed Ready Ready Completed	Procedure 5 points 2 point test 2 point test 2 point test	Close Work C Pass/Fail Failed Passed	Calibrated With	
ers		Port: IEEE-4 Calibrator: DemoTag1 Test Gauge Test Gauge Test Gauge Test Gauge	Asset ID PTX500-345 Test Gauge Test Gauge Test Gauge	Range ID 0 0 1	Description Presure Trensnt 10 bar 10 bar 10 bar 10 bar	Status Completed Ready Ready Completed Ready	Procedure 5 points 2point test 2point test 2point test 5 points	Close Work C Pass/Fail Faied Passed	Calibrated With	

Figure 7-3: Work Order - Manual Data Entry

- 2. Select the applicable Device from the Work Order list of Devices.
- **3.** Click on the *Manual Data Entry* button in the tool bar. This opens the *Manual Data Entry* window (Figure 7-4).

Manua	l Data Entry	1				X
Teo Rep	chnician:	Proportional-Bla	Date:     As F	7/ 9/2015	- Calibrator Manufac	t Info
					Model N	umber:
	Nominal I	nput (psi)	Actual Input (psi)	Actual Output (psi)		
1	0.000				Serial Nu	imber:
2	25.000					
3	50.000					
4	75.000				Device S	erial No.
5	100.000					
					Ambient	Temperature (*C):
Comm	ent				Humidity	(%RH )
					Air Press	ure(mbar)
	Save	Ca	ncel Print Blank R	eport		

Figure 7-4: Manual Data Entry window

4. Add the necessary data:

**Technician:** Click on the drop-down list to select an applicable *Employee*.

**Date:** Click on the drop-down list to show the calendar function. Select the month/year and click on an applicable date.

As Found/As Left: Use the check-boxes to show the type of results:

- As Found: The values before adjustment.
- As Left: The values after the checks/adjustments are complete.

**Nominal Input (...), Actual Input (...):** The type of *Device*, and the *Procedure* you use controls the type of data in the calibration record. Click on a box and enter the applicable values.

**Calibrator Info:** To make sure that the calibration is traceable to the necessary standards, identify the calibrator used to do the calibration (Manufacturer, Model Number ... ).

	<b>Print Blank Report:</b> Click on this button to see a report with the <i>Device</i> data but no calibration data.				
	5. To complete the calibration, click on Save.				
	6. Please confirm Yes/No: Click on Yes to accept the data.				
Calibration - Automatic	<ul> <li>Use this function to calibrate a <i>Device</i> or a <i>Range</i>.</li> <li>Before you start:</li> </ul>				
	<ul> <li>Read and understand the "Safety" section.</li> </ul>				
	<ul> <li>Make sure the <i>Device</i> is set up with the necessary <i>Range</i> data (Chapter 3).</li> </ul>				
	<ul> <li>Make sure that there is a connection between the PC communications port and the applicable test equipment.</li> </ul>				
	When all the connections are correct, you can do the automatic calibration from the <i>Plant Structure</i> window or from the <i>Work Order</i> window.				
Automatic calibration -	To do a calibration from the <i>Plant Structure</i> window (Chapter 3):				
Plant Structure window	<b>1.</b> Select an item in the <i>Plant Structure</i> tree, and use one of these methods to start the calibration:				
	• Click on the <i>Calibrate</i> button in the tool bar.				
	• Select <i>Tools &gt; Calibrate</i> from the menu bar.				
	• Right-click and select Calibrate				
	2. When the Select Calibration System window opens (Figure 7-5), select an applicable Calibration System from the drop-down list or click on the New Calibration System button.				
	Select Calibration System				
	Calibration System:				
	E New OK Cancel				

New

ΟK

Cancel

- Note: A Calibration System Creation Wizard (Chapter 5) helps you set up a new Calibration System.
- **3.** When the *Calibration System is correct*, click on OK. This opens the "*Calibration*" window (Figure 7-6).

To do a calibration from the Work Order window (Chapter 6):

- 1. Select the Work Order from the drop-down list.
- **2.** Use these methods to select the applicable items from the *Work Order*:
  - Select *Edit* > *Select All* (*Deselect All*) from the menu bar. All selections have a green background.
  - Click on an item and, if necessary, select *Edit* > *Select* (*Deselect*) from the menu bar.
- 3. Use one of these methods to start the calibration:
  - Click on the *Calibrate* button in the tool bar.
  - Select Tools > Calibrate... from the menu bar.
- **4.** When the Select Calibration System window opens (Figure 7-5), select an applicable Calibration System from the drop-down list or click on the New Calibration System button.
- Note: A Calibration System Creation Wizard (Chapter 5) helps you set up a New Calibration System.
- 5. When the Calibration System is correct, click on OK. This opens the "Calibration" window (Figure 7-6).

### Calibration window Figure 7-6 shows the *Calibration* window that opens:

Automatic calibration -Work Order window



Intecal - Calibratio	n						
X O D II =							
Controller PACE 6000 Device: GE Druck PACE6000 Module 21.00 to 1 Tolerance: 94 Span: 0. 0	(3086601) • • • • • • • • • • • • • • • • • • •	Calbrator PACE 6000 Device: GE Druck PACE6000 (3086601) 0.0001010	IBar     Device     GE Dr     G	RTX DUT			
	Properties	DTY DU	Properties	Properties	)		
1 0 000000	Standard #1 1 Bar	RIX DU					
1 0.000000							
2 0.000000							
3 0.000000							
4 0.000000							
5 0.000000							
6 0.000000							
7 0.000000							
8 0.000000							
Ready							
<b>3</b> (0)		<b>B</b>			-	EN	▲ 🛱 🐗 Φ) 13:57 08/07/2015

Figure 7-6: Calibration window

**Controller/Calibrator:** Specified by the *Calibration System* (Chapter 5).

Controller: Click on the drop-down list and select the Device to control the pressure generated for the test. Then select the Module and range from the second drop-down list.

Calibrator: Click on the drop-down list and select the Device to measure the pressure generated for the test.

**Device:** Click on the top drop-down list and select the Device you want to calibrate. Then select, from the second and third drop-down list respectively, the Device (Calibrator) to be used to measure the output from the device under test and if required the channel to be used.

**Tolerance:** Specified by the *Procedure* set up for the *Device Range* (Chapter 3).

**Hold Before Readings:** If you want to stop and examine the data before each reading, click on this check-box.

**Driver Properties:** To examine or change the applicable communication properties (Controller, Calibrator, Device), click on this button. Refer to the user manual for the applicable *Device*.

**Properties:** To examine the applicable *Device* properties (Controller, Calibrator, Device), click on this button.

The large "Play" button and the tool bar at the top of the screen lets you select the applicable calibration task (Table 7-1).

Item	Operation
×	Exit: Leave the calibration screen.
Q	Refresh: Update the data on the screen.
Δ	Play: Start the calibration.
Π	Pause: Stop the calibration temporarily. To continue, click on "Pause" again.
	Stop: Stop the calibration completely.
₹	Redo: Go back and do the previous test point again.
	Skip: Go to the next test point.
7	Zero: Set the <i>Device</i> to zero.
$\leq$	Exercise: Make sure that the <i>Device</i> works correctly and to get a stable operating temperature.

Table 7-1: Calibration window - Tool bar

The bottom half of the screen shows the calibration results:

**Nominal:** Shows the calibration values specified by the *Procedure* (Chapter 3).

Standard: Shows the applied calibration values.

**XXX:** (Applicable *Device ID*) Shows the reading that the specified *Device* gives back.

## Appendix A: Parameters and units

# Parameters and units for Devices

Table A-1 gives a list of the available *Parameters* and *Units* that you can use when you set up a Device (Chapter 3, Figure 3-5).

Parameter	Available units		
Current	mA		
Density	g/cm <sup>3</sup>		
Frequency	hertz		
Humidity	%RH		
Pressure	atm	in H <sup>2</sup> O @ 0°C	kPa
	bar	in H <sup>2</sup> O @ 20°C	lb/ft2
	cm H <sup>2</sup> O @ 4°C	in H <sup>2</sup> O @ 25°C	mbar
	cm H <sup>2</sup> O	in H <sup>2</sup> O @ 4°C	mH <sup>2</sup> O
	cm Hg @ 0°C	in H <sup>2</sup> O @ 60°C	mHg
	cm Hg	inH <sup>2</sup> O	mm H <sup>2</sup> O @ 4°C
	ftH <sup>2</sup> 0 @ 20 °C	inH <sup>2</sup> O @ 60°F	mmH <sup>2</sup> O
	ftH <sup>2</sup> O	inHg	mmHg
	ftH <sup>2</sup> O @ 4°C	inHg @ 0°C	mmHg @ 0°C
	ftH <sup>2</sup> O @ 60°C	inHg @ 60°F	MPa
	hPa	kg/cm <sup>2</sup>	Pa
		kg/m <sup>2</sup>	psi
		kgf/cm <sup>2</sup>	Torr
Resistance	kOhm	Ohm	
Temperature	°C	°R	
	°F	°Κ	
Voltage	mV	V	
Observed *	User specified		
Switch *	Set by the input		

Table A-1: Parameters and units for Devices

\* Only available as an output parameter

# Parameters and units for Variables

Table A-2 gives a list of the available *Parameters* and *Units* that you can use when you set up a *Variable* in a *Calibration System* (Chapter 5, Figure 5-6).

Parameter	Available units				
Area	cm <sup>2</sup>	in <sup>2</sup>	mi <sup>2</sup>		
	ft <sup>2</sup>	km <sup>2</sup>	mm <sup>2</sup>		
	ha	m <sup>2</sup>	yd <sup>2</sup>		
Current/Current AC	А	Amps			
	mA	mAmps			
Density	g/cm <sup>3</sup>	g/m <sup>3</sup>	oz/gal		
	kg/cm <sup>3</sup>	kg/m <sup>3</sup>			
	lb/ft <sup>3</sup>	lb/in <sup>3</sup>			
Frequency	GHz	Hz			
	kHz	MHz			
Mass	g	kg	mg		
	OZ	ton	ug		
Pressure	atm	in H <sup>2</sup> O @ 4°C	mm H <sup>2</sup> O @ 4°C		
	bar	in H <sup>2</sup> O @ 60°C	mmH <sup>2</sup> O		
	cm H <sup>2</sup> O @ 4°C	inH <sup>2</sup> O	mmHg		
	cm H <sup>2</sup> O	kg/cm <sup>2</sup>	MPa		
	cm Hg @ 0°C	kg/m <sup>2</sup>	Pa		
	cm Hg	kPa	psi		
	ftH <sup>2</sup> O	lb/ft <sup>2</sup>	tonf/ft <sup>2</sup>		
	hPa	mbar	tonf/in <sup>2</sup>		
	in H <sup>2</sup> O @ 0°C	mH <sup>2</sup> O	Torr		
	in H <sup>2</sup> O @ 20°C	mHg			
	in H <sup>2</sup> O @ 25°C				
Resistance	MOhm	Ohm			
Temperature	°C	°R	Celsius		
	°F	°K	Fahrenheit		
			Kelvin		
Voltage	mV	V	Volts DC		
	mVolts	Volts			
Voltage DC	mV	V			
	Volts	Volts DC			

### Table A-2: Parameters and units for Variables

Parameter	Available units		
Voltage AC	V	Volts	
	Volts AC		

Table A-2: Parameters	and un	its for Vario	bles (Continued)

## Appendix B: Driver Installation

## Manual Driver Installation

IT security policy settings may prevent GE drivers from auto configuring on installation. This will be apparent if Intecal is unable to communicate with the following equipment:

DPI620 DPI620IS DPI620 Genii DPI611 PACE1000 PACE5000 PACE6000

To resolve this issue, the GE drivers may be configured manually. Please consult your local IT representative if you are unsure about this or require further assistance.

To install manually perform the following steps:

1. On the desktop, right click "Computer" and select "Manage".



2. From the Computer Management panel select "Device Manager".



- 3. Scroll through the list of USB devices to find the device that is not configured ("Unknown Device" or "Other devices..."). Right click and select "Update Driver Software...".
- Other devices
   AMC USB Serial Function
   Ports (COM & LPT)
   Update Driver Software...

4. Select "Browse my computer...".



- 5. In the "Search for driver", enter the system "inf" folder location e.g. "C:\Windows\inf".
- 6. Tick "Include subfolders".
- 7. Click "Next" to complete driver installation.



8. If any system security messages are displayed – allow access to the driver to continue.



#### Windows 8/8.1/10

Windows 8/8.1/10 may prevent the above procedure from completing successfully due to the driver signature enforcement that was introduced for these versions.

To restart Windows with driver enforcement disabled follow these steps:

Settings -> Change PC Settings -> Update and recovery -> Recovery -> Advanced start-up -> Restart now -> Troubleshoot -> Advanced Options -> Start-up Settings -> Restart -> F7

See:

<u>http://windows.microsoft.com/en-gb/windows-8/windows-startu</u> <u>p-settings-safe-mode</u> for more information.

Note: If Windows 8 fails to install the drivers and the error in the Figure below is displayed. This issue is resolved by copying the driver files to a local folder which does require administrator access privileges.



### Serial Port Drivers (COM Ports)

From Windows 7 onwards, communication with serial port driver may be limited due to access control restrictions. To inter-operate with these drivers the Intecal application should be run with administrator privileges. This can be done by either:

- 1. Right click the Intecal shortcut, select run as administrator.
- 2. On Intecal.exe, select properties and modify the privilege level to run as administrator.

See:

<u>http://windows.microsoft.com/en-gb/windows7/how-do-i-run-an</u> <u>-application-once-with-a-full-administrator-access-token</u> for more information. **Customer service** Visit our web site: www.gemeasurement.com.