



# Specialloy Digital Chart Recorder

# User Manual

Specialloy Instrumentation Houston, Texas, USA 09-2020





#### Contents

Cha	pter One: Overview	3
1	Introduction	3
2	System Components	3
3	System Setup	3
4	Starting a Test	5
5	Generating a Report	7
Cha	pter Two: Software Views	9
1	View Overview	9
2	Monitor View	9
3	Graph View	9
4	Sensor Calibration View	10
5	File Manager View	10
Cha	pter Three: Software Features	11
1	Sensor Settings	11
a	FIND:	11
b	MANAGE:	11
i.	Sensor Settings: Display Configuration	11
2	Software Settings	12
a	ALARM:	12
b	FILTER:	12
c.	ABSOLUTE/GAUGE:	12
d	LEAK TEST:	13
3	Reporting Settings	15
a.	ADD MARKER:	15
b	SETTINGS:	15
i.	FIELDS:	16
ii	WORD TEMPLATE:	16
ii	i. REPORT OUTPUT:	16
c.	GENERATE:	16
Chap	oter Four: Test Report	18
1	Overview	18
2	Test Report Template	18
a.	Identify the Test Report Template:	18
b	Modifying a Test Report Template:	19
i.	Section 1 - Test Object Identification	19
ii	Section 2 – Test Sensor Identification Information	20
ii	i. Section 3 – Chart Graph	20
iv	v. Section 4 – Test Data Table	21
c.	Saving a Test Report Template:	21





# **Chapter One: Overview**

#### 1. Introduction

Specialloy Instrumentation's Digital Chart Recorder is specially designed to collect real-time data of pressure and temperature units under test. The Specialloy Digital Chart Recorder (SDCR) is complete with ESI Pressure Transducer with Temperature for compensation, a Windows 10 Tablet, and ESI Software for Pressure & Temperature Recording. The SDCR components are assembled into a rugged pelicanized case for light-weight mobility.

The features of the SDCR:

- Graphical interface displaying real-time pressure & temperature
- Supports multiple instruments under test up to 16 in a single test
- Data Exporting & Report Writing

#### 2. System Components

- a. Rugged Pelicanized Mobile Case
- b. Windows Tablet
- c. <sup>1</sup>/<sub>4</sub>" NPT or <sup>1</sup>/<sub>4</sub>" HPF Bulkhead with mounted ESI Pressure Transducer(s)
- d. ESI Reporting Software
- e. 2x USB Ports
- f. AC 110V Power Plug (M)

#### 3. System Setup

First, Turn On the Windows Tablet and Login to Windows Account:



Next, double-click to open the ESI-USB Software Application







If no sensors are plugged into the USB Port, and the ESI Software does not recognize a USB sensor. Make sure the Sensor is plugged in and select YES to search for newly attached sensors:



Once a sensor has been detected, your ESI Software screen will display the MONITOR View:

n i Manage Main	P         A         III         IIII         IIIIII         IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	Linetek Matskein Cherk Prop Alment
	High Low <b>0.0</b> °F	00:00:00 0.0 psi
643 Semans           643 Semans           643 Semans           8           9           2010 Semans	Pressure Units pri di Decep di Pressure Fortran A.A. di Advectari di Tempendasi linte T. della di Octari di Pressure Interval T. della di Octaria Tempendasi fottoria (1000 di A	

Prior to beginning a Test, make sure to set the appropriate intervals and formats for the testing:

Pressure Units	psi	~	Gauge 🗸
Pressure Format	#.#	~	All Output
Temperature Units	°F	>	
Pressure Interval	1.000	\$	Oetails
Temperature Interval	1.000	≎ s	





#### 4. Starting a Test

When ready to start a test, make sure to ZERO your sensor:

		Zero	o Sens	or	
Zero Se Compl	nsor ete				
Success	fully zer	roed sens	or 0434	396	
					ОК

To begin Recording, press Start:



If Data Logging Feature is enabled, the ESI Software will require user to save the datafile prior to recording:

E Save As							×
🔶 😐 - 🛧 🚺 > This PC >	Documents + ESI-USB + Dat	uFile		~ O	Search DataFile		р
Organize · New folder						- E	0
public (\\10.1 # ^ Name     Masketing #     Google Drive #     Certificates     SOCR     STIKD      Dropbox     OneDrive     OneDrive     Donebrive		Date modified No terror a	Type untch your search	Sine			
File name Ethilitation	0						4
Save as type: Data Files (".bi	ing						×.
A Hide Folders					Save	Cancel	





By clicking the Down Arrow on the Start Button, the ESI Software will allow you to adjust Start & Stop Times according to your desired Test:

	► Start ▼
Schedu	ed Measurement
Start m	easurement
Olmm	ediate
• At	07/Jun/2018 15:32:38
◯In	10 C Minutes
Stop m	easurement
Mar	ual
⊖At	07/Jun/2018 15:32:38
○ Afte	r 10 🗘 Minutes 🕑
	OK Cancel





а э





Once Pressure Recording has completed, Press Stop button:



Or, to set a specific Stop Interval, select the Drop Down Arrow on the Stop Button:

<ul> <li>Manual</li> <li>At</li> <li>O5/Jun/2018 16:20:27 </li> <li>After</li> <li>10 € Minutes</li> </ul>	Stop mea	surement			
At 05/Jun/2018 16:20:27      After 10      Minutes	O Manua	al			
O After 10 C Minutes	At	05/Jun/2018 16:20:27			
	⊖ After	10 C	Minut	es 🖂	

#### 5. Generating a Report

Under Reporting Section, Press the Generate Button to Start a Report:



Fill in the Custom Fields to Generate the Test Report:

Report Properties	
Output	
Name	Example Test 1
Fields	
Customer	
Project Name/Job Numbe	1
Report Number	
Contractor	
Purchase Order No.	
Duration	
End User	

Press OK to Generate the Test Report – This might take 20-30 seconds, depending on the size of the datafile.







A Test Report will generate after several seconds; it will Open in Microsoft Word:







## **Chapter Two: Software Views**

1. View Overview

Upon opening the ESI-USB Software, the main Dashboard view will be shown in Monitor View.



#### 2. Monitor View

Monitor View is the ESI Software main Dashboard view. From the Monitor View, the user can see:

- Pressure Reading
- Temperature Reading
- Elapsed Test Time
- High & Low Alarms (Visual)
- Sensor Start/Stop & Zero Buttons
- Pressure & Temperature Unit/Format/Interval Settings
- 3. Graph View

Graph View is the ESI Software Chart View. The user is able to easily see trending Pressure & Temperature readings, as well as toggling ON/OFF Temperature Readings & Alarm Limits







#### 4. Sensor Calibration View

Calibration View is the ESI Software View showing Serial & Calibration Data internally written inside the sensors plugged in. The user is able to easily see Calibration Dates, Manufacture Dates, Pressure Rating, & Unit Serial Numbers. All information is locked and only modifiable by trained factory representatives.

Find Manage	P a	ige Export	Add Marker	Generate Settings
Sensor	Settings	Tical	R	energing.
Serial Number		434396		
Manufacture Date	0/22/2017	400 AM		
Calibration Date		25-42 AM		
Temperature Offset		15413.45		
Temperature Linear		0035132		
Temperature Quadratic	1.18	7635-10		
Pressure Offset 1		3451		
Pressure Offset 2		2 35/0225		
Pressure Offset 3		1971281		
Pressure Gain 1		4005407		
Pressure Gain 2	3.167	089E-07		
Pressure Gain 3	2.48	0745-09		
Pressure Non-Linearity 1	-6.04	15376-13		
Pressure Non-Linearity 2	7.96	109E-15		
Pressure Non-Linearity 3	-4.99	0696-17		
Firmware Version		2		
Full Scale / bar		1500		

#### 5. File Manager View

File Manager View is the ESI Software Database of Saved Raw Data files. If Data Logging is Enabled, the stored Raw Data will be retrievable in the File Manager View.







# **Chapter Three: Software Features**

#### 1. Sensor Settings

At the top left of the ESI Software, you can manage up to 16 Sensors plugged into the system.



#### a. FIND:

FIND button will query the Software to search and Detect any ESI-USB Sensors that have been plugged in to a USB Port.

#### b. MANAGE:

MANAGE button will display all active Sensors and their configuration. From this view, up to 16 different Sensors can be managed – Toggled On/Off, and add special display configurations.

#### i. Sensor Settings: Display Configuration

From this view, up to 16 different Sensors can be managed with different configurations, especially Differential Pressure settings:

	Serial Number	Fast	Manufa	tured	Firmware	Calibration	Serial Port
1	0434396	2	9/22/0	017	2	10/30/2017	COM6
	Serial Number 1	Operat	tion	Serial	Number 2	Name (Max 7 cl	hars)
9	0434396	Add	-	04343	96	Specialloy	
2							

#### Press OK to implement these configurations.

High ● High	0.0 psi
Aligh High	0.0 psi





#### 2. Software Settings

Under the Software Settings section, you are able to manage Alarms, Filters, and Pressure Reading.



#### a. ALARM:

Manage High Pressure & Low Pressure Alarms for each sensor plugged in. The Alarm Levels will be shown on the CHART Display.

Sensors		
0434396	Specialloy	
High Pre	ssure Alarm	
Fnabled	⊻ Level	72000 🔯 ps
Low Pres	sure Alarm	
Enabled	Z Level	504 😂 ps

#### b. FILTER:

**Low Pass Filter** passes signals with a frequency lower than a certain cutoff frequency and attenuates signals with frequencies higher than the cutoff frequency.

Low Pass Filter		
Sensor 0434396		
Filter Cut-Off Frequenc Enabled 🔲	y	□ 0] Hz
1	OK	Cancel

#### c. <u>ABSOLUTE/GAUGE:</u>

Absolute/Gauge settings displays the Absolute Pressure corresponding to Gauge Pressure.

Absolute to	Gauge Dif	ferential
Sensor		
0434396		
Please enter correspondi reading,	the absolution the absolution of the second	ite pressure o gauge
Pressure	14.504 🔅	psi
	ОК	Cancel





#### d. <u>LEAK TEST:</u>

The LEAK TEST feature allows users to set an allowable percentage drop in pressure over a determined period of time.



Press the **SETTINGS** button to pre-set the **TIME** length of your test and the allowable **PRESSURE DROP** Percentage.

Measurement Time	15	0	Minu	tes
Pressure Drop	2.00	0	%	
			ОК	Cancel

Determine the test's allowable **PRESSURE DROP** Percentage and the **TIME** length of your test. Press **OK**.

When ready to start a test, make sure to ZERO your sensor:

Comp	ete		
Success	fully zeroed ser	nsor 04343	396

To begin the Test, press Start:



Once you have reached the Pressure to Start the Test, press START.







Once you have reached the Pressure to Start the Test, press START. Over the period of the Test, the software will calculate the Percentage Drop – from the START Time (the Time when you pressed the START Button) – to either the Pre-set Period of time, or if the user presses the STOP Button.



The software will automatically provide calculated results.

Leak Test Results	
Sensor	0434381
Starting Pressure	0.0 psi
Final Pressure	0.0 psi
Percentage Drop	-94.10 %
Tolerance	2.00 %
Result	N/A
	Close

If the user presses the CLOSE button, you can recall the Leak Test Results by pressing the SHOW button.







#### 3. Reporting Settings

Reporting Section includes a Timestamp button, a Report Settings button, and Report Generate Button:



#### a. ADD MARKER:

While Under Test, Press the Add Marker button to insert a Timestamp on the Chart:



#### b. <u>SETTINGS</u>:

Report Settings displays Test Report Configurations:

Re	port Settings	
Fie	lds	
	Name	
1	Customer	
2	Project Na	me/Job
3	Report Nur	mber
4	Contractor	
5	Purchase C	Order No.
6	Duration	
Wc Ma Ou Ou	ord Template rker Type tput Format tput Folder	C:\Users\Public\Documents\ESI\ESI-USB\Report - Specia Unlimited v Word Document v C:\Users\HK FLEX 4\Documents\ESI-USB\Saved Reports
		OK Cancel





#### i. <u>FIELDS</u>:

Up to 100 Customizable Fields may be used within your Report Template. This Fields section allows for easy customization

# FieldsName1Customer2Project Name/Job...3Report Number4Contractor5Purchase Order No.6Duration

\*\*Note: Any changes made here must also be duplicated on the Microsoft Word Template file directly with corresponding software instruction code. \*Ask Specialloy for additional details

#### ii. <u>WORD TEMPLATE</u>:

Choose the directory destination filename of the Microsoft Word Template selected to Generate Test Reports:

Word Template	C:\Users\Public\Documents\ESI\ESI-USB\Report - Specia	

#### iii. <u>REPORT OUTPUT</u>:

Choose the directory destination filename of the Microsoft Word Template selected to Generate Test Reports:

Output Format	Word Document 🗸	
Output Folder	C:\Users\HK FLEX 4\Documents\ESI-USB\Saved Reports	

#### c. <u>GENERATE:</u>

Under Reporting Section, Press the Generate Button to Start a Report:

Add Marker	Generate	Settings
Re	porting	





Fill in the Custom Fields that were set up from Section 3.b.i

Output	
Name	Test 1
Fields	
Customer	Specialloy
Test Object	High Pressure Valve
Part No.	12345
Serial No.	6789
Test Fluid	Water
Technician	ER

Press OK to Generate a Report – this will take 20-30 seconds or slightly longer, depending on the amount of data collective over the length of time.

Overformer: Text Object: Part Net	Test Ck	sec Serie No Serie No Trei Mediani	Speciality recritic) Audiospecial 2010 (Austrophysic) 19, 702 - Table Source group (Expect 2019)
Overformer: Text Object: Part Net		Serie No Trei Meduari	Subseque d'un aire
Outloner: Test Object: Part Net		Sector Nor Tree: Medium:	
Test Object: Pwri Net		Social No. Toral Mediums	
Pari Ne:		Test Medium:	
	Certific	elius, information	
Used Gir Dover	004035-009	Devel 054209-010	0809201719:00:00
Denai Nu	HORTON .	Famil Dota:	2840820413122.41
Manufacture:	ES: Twittenapy Ltd.	Two: Regrammer	
	M	Z	
		V	





## Chapter Four: Test Report

1. Overview

The ESI Software reads the ESI-USB Pressure Sensor while utilizing the Windows Operating System to display and store live pressure and temperature data. Additionally, the ESI Software utilizes Microsoft Word to Generate Test Reports. These Test Reports can be in the desired format within a Microsoft Word Template File. The ESI Software will create a new Test Report within a Microsoft Word Document by organizing actual Test Data onto a pre-formatted Template File.

2. Test Report Template

Upon installation, The ESI Software includes a standard Test Report Template within the directory files. Referring to **Chapter 3.b.ii** to select the Template File before generating a report, this section will show how to modify a Test Report Template.

a. <u>Identify the Test Report Template</u>:

Within Windows Explorer, Identify the ESI-USB File Folder Destination. Open the ESI-USB Folder



Identify the Microsoft Word Template file within the ESI-USB Folder. Open the Template File:







Once the Microsoft Word Template File has been opened, the user is able to modify the format and layout of the template.

Customer:         INSERT_CustomField_1         I           Test Object:         INSERT_CustomField_2         Serial No:         INSERT_CustomFiel           Part No:         INSERT_CustomField_3         Test Modum:         INSERT_CustomField	Boylos.com
Customer:         INSERT_CustomField_1         I           Test Object:         INSERT_CustomField_2         Serial No:         INSERT_CustomFiel           Part No:         INSERT_CustomField_3         Test Medium:         INSERT_CustomField	
Test Object: INSERT_CustomField_2 Serial No: INSERT_CustomFiel Part No: INSERT_CustomField_3 Test Medium: INSERT_CustomFiel	
Part No: INSERT_CustomField_3 Test Medium: INSERT_CustomFiel	1.4
	1_5
Certification Information	
Used Cal. Device: GS4200-USB Cal of GS4200-USB INSERT_Sensor1_C	alibration
Senial No: INSERT_Sensor1_Senial Test Date: INSERT_StartTime	
	6_b

### b. Modifying a Test Report Template:

i. Section 1 - Test Object Identification

Referring to **Chapter 3.3.b.i** in the Customizable fields of Report Settingd, if any custom fields were modified in this section, the user must insert the corresponding code for this custom field number. Up to 99 Custom Fields can be created and inserted onto the Test Report Template. If the user adds an additional Custom Field (as in Chapter 3.3.b.i), the corresponding Code should be inserted by the user onto the Microsoft Word Template.

For example, below Figure 1 shows Custom Field #1 – "**Customer**". The corresponding Code is then inserted onto the Microsoft Word Template, shown in Figure 2 as: "Customer: **INSERT CustomField 1**"

Fields		
	Name	
1,	Customer	
2	Project Name/Job	
3	Report Number	
4	Contractor	
5	Purchase Order No.	
6	Duration	

Above Figure 1 Referring to Chapter 3.3.b.i

Customer:	INSERT_CustomField_1		
Test Object:	INSERT_CustomField_2	Serial No:	INSERT_CustomField_4
Part No:	INSERT_CustomField_3	Test Medium:	INSERT_CustomField_5

Above Figure 2 Referring to corresponding Custom Fields within the Template File





 ii. Section 2 – Test Sensor Identification Information The Available Codes available to be utilized from the standard software are included below:

#### **Certification Information**

Used Cal. Device:	GS4200-USB	Cal of GS4200-USB:	INSERT_Sensor1_Calibration	
Serial No:	INSERT_Sensor1_Serial	Test Date:	INSERT_StartTime	
Manufacturer:	ESI Technology Ltd	Test Engineer:	INSERT_CustomField_6	
Sensor	Serial Number:	INSERT_Ser	nsor1_Serial	
Sensor Calibration Date:		INSERT_Sensor1_Calibration		
Test Da	ate:	INSERT Sta	rtTime	

NOTE: If multiple sensors will be used within the Test Report, the User will need to add additional code for each additional sensor utilized. For example, an additional Sensor will need "INSERT\_Sensor2\_Serial" and corresponding "INSERT\_Sensor2\_Calibration" as well as for each additional sensor added.

iii. Section 3 – Chart Graph

The Available Codes available to be utilized for the Chart Graph as included below:

INSERT_Graph TimeUnits-Minutes ShowTemperature-True	
Temperature serves as indication only	_

Graph Insert Command:INSERT\_GraphUnits (Time):TimeUnits=Minutes or HoursShow Temperature Results:ShowTemperature=True or False





iv. Section 4 – Test Data Table The Available Codes available to be utilized for the Test Data Table as included below:

#### Test Data Chart

INSERT\_DataTable TimeUnits=Minutes

#### **Tablet Insert Command:**

INSERT\_DataTable

Units (Time):

TimeUnits=Minutes or Hours

c. Saving a Test Report Template:

When the user has finished modifying and customizing a Test Report Template, the file must be saved in a Microsoft Word Template format.

Save as a Microsoft Word Template format by clicking FILE>SAVE AS



Double Click the Save As destination to "This PC" and best to save directly into the ESI-USB File Folder:





	Cours Ac	Seve As			×
Info	Save As	← → + ↑ 🧮 × ESI > ESI-US8	v & Search ESI-US8		p
New	12121	Organize 👻 New folder		10.4	0
Open	Dropbox	Desktop / Name	о О	lata modified	
Save	(L) Recent	Documents	No items match your search.		
Save As	0	Marketing *			
Print	OneDrive - Specialloy, Inc	💪 Google Drive #			
Share	Evan@specialloyinc.com	ESI-USB			
Expert	Sites - Specialloy, Inc	ED IKD Y C			3
Cione	Exam@specialloyinc.com	File name: TEST REPORT			
407	This PC	Authors: HEFLEX 4	Tagis Add a tag		
Account	+ Add a Place	Mantain	Seve Thumbnail		
Feedback		competibility with previous versions of			
Options	erowse	Word			

Choose "Word Template" as the file format within "Save As Type"

🕎 Save As		×
$\leftarrow$ $\rightarrow$ $\checkmark$ $\uparrow$ $\Box$ $<$ ESI $\rightarrow$ ESI-USB	✓ O Search ESI-USB	P
Organize 🔻 New folder		?
ESI-USB ^ Name	^ Date modified	
SDCR	No items match your search.	
> 🛯 Microsoft Word		
> 🗦 Dropbox		
> 🧥 OneDrive		
> 🕋 OneDrive - Specia		
🗸 🚍 This PC 🗸 🗸		)
File name: TEST REPORT		~
Save as type: Word Template		~
Authors: HK FLEX 4	Tags: Add a tag	
Maintain compatibility with previous versions of Word	Save Thumbnail	
∧ Hide Folders	Tools 🔻 Save Cancel	

Referring back to **Chapter 3.3.b.ii**, make sure to set the Report Generating Settings to identify the correct Microsoft Word Template that has been newly saved.

Word Template C:\Users\Public\Documents\ESI\ESI-USB\Report - Specia ...