

Vib Meter 9085-Ex

Intrinsically Safe Smart Trend Meter

 II 1G Ex ia IIC T4 Ga (-20°C≤Ta≤+40°C)

Class 1, Zone 0, IIC T4 (-20°C≤Ta≤+40°C)

AEx ia IIC T4 Ga (-20°C≤Ta≤+40°C)

Class 1, Division 1, Groups A-D, T4 (-20°C≤Ta≤+40°C)



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1 OVERVIEW

The **Vib Meter 9085-Ex** is a simple to use vibration monitoring and analysis tool that allows easy display of vibration signals. The meter automatically performs vibration analysis functions based on machine running speed to help diagnose faults such as unbalance, misalignment and looseness, as well as indicating the degree of bearing wear. The Vib Meter 9085-Ex unit is designed to enable a user to collect vibration and temperature measurements from assets (e.g. pumps, motors, fans and bearings). The unit displays vibration frequency plots and allows vibration severity and bearing condition to be monitored, analysed and trended with the included C-Trend PC analysis software.

1.1 Special Requirement for Temperature Measurements

To measure temperature with the 9085-Ex the accelerometer with built in temperature sensor (p/n A9103) must be used. This is an intrinsically safe low power accelerometer with temperature sensor and built-in magnet.

1.2 Turning the unit ON and OFF

Turning the meter ON is achieved simply by pressing the center  or  button. The unit has an auto dimming feature that dims the display after 10 seconds to conserve battery life. Pressing any button will bring the unit back to full brightness. In addition, the 9085-Ex will automatically turn OFF if not used for 1 minute (this time period can be increased up to 60 minutes using the Setup Wizard).

1.2.1 Turning Bluetooth ON and OFF

Press and hold the factory  button to turn Bluetooth on for communication to and from a PC or mobile device running software compatible with the 9085. Pressing and holding this key will cycle from BT On to BT Always On. When set to BT On the 9085EX will turn on the Bluetooth until it is powered off. When set to BT Always On, the 9085EX will turn the Bluetooth on always. Note battery life will be reduced with Bluetooth always on. Pressing and holding the factory key will turn the Bluetooth off if it is on.

1.2.2 Using headphones

Press and hold the menu  button to activate Bluetooth for audio and bring up the search for headphones display. Activating search will enable the 9085EX to look for headphones, pair, and connect. Audio can be heard through the accelerometer. **Note:** An accelerometer must be connected for the headphone feature to operate properly. To exit headphone mode, press the center test  button. **Warning:** Intrinsically safe headphones must be used in areas when required.

1.3 Batteries

The Vib Meter 9085-Ex is powered by a wireless rechargeable Lithium-Ion battery. To charge the battery, remove the 9085-Ex from the protective boot by prying the boot off the bottom. Set the 9085-Ex on the charging pad so  symbol comes in contact with the pad. The display of the 9085-Ex will turn on to indicate it is



After removing the 9085 from the boot, place this area onto the charging pad.

1.4 Service

The Vib Meter 9085-Ex contains no user serviceable parts. In the unlikely case of malfunction please return the complete unit to your supplier for repair.

1.5 Intrinsic safety certification

	<h1>IECEX Certificate of Conformity</h1>	
INTERNATIONAL ELECTROTECHNICAL COMMISSION IEC Certification System for Explosive Atmospheres <small>for rules and details of the IECEX Scheme visit www.iecex.com</small>		
Certificate No.:	IECEX BAS 22.0061X	Page 1 of 3 Certificate history:
Status:	Current	Issue No: 0
Date of Issue:	2023-10-06	
Applicant:	TPI Europe Unit 6, Rutherford Way Ind Estate Rutherford Way Crawley RH10 9LN United Kingdom	
Equipment:	Smart Trend Meter	
Optional accessory:		
Type of Protection:	Intrinsic safety	
Marking:	Ex ia IIC T4 Ga (-20°C ≤ Ta ≤ +40°C)	
Approved for issue on behalf of the IECEX Certification Body:		Mr R S Sinclair
Position:		Technical Manager
Signature: (for printed version)		
Date: (for printed version)		<u>6/10/2023</u>
<ol style="list-style-type: none">1. This certificate and schedule may only be reproduced in full.2. This certificate is not transferable and remains the property of the issuing body.3. The Status and authenticity of this certificate may be verified by visiting www.iecex.com or use of this QR Code.		
Certificate issued by:		
SGS Baseefa Limited Rockhead Business Park Staden Lane Buxton, Derbyshire, SK17 9RZ United Kingdom		



IECEX Certificate of Conformity

Certificate No.: **IECEX BAS 22.0061X**

Page 2 of 3

Date of issue: 2023-10-06

Issue No: 0

Manufacturer: **Summit Co., Ltd**
58
Gaetbeol-ro Yeonsu-gu
Incheon 21999
Korea, Republic of

Manufacturing
locations: **Summit Co., Ltd**
58
Gaetbeol-ro Yeonsu-gu
Incheon 21999
Korea, Republic of

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEX Quality system requirements. This certificate is granted subject to the conditions as set out in IECEX Scheme Rules, IECEX 02 and Operational Documents as amended

STANDARDS :

The equipment and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards

[IEC 60079-0:2017](#) Explosive atmospheres - Part 0: Equipment - General requirements
Edition:7.0

[IEC 60079-11:2011](#) Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "I"
Edition:6.0

This Certificate **does not** indicate compliance with safety and performance requirements other than those expressly included in the Standards listed above.

TEST & ASSESSMENT REPORTS:

A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in:

Test Report:

[GB/BAS/ExTR22.0225/00](#)

Quality Assessment Report:

[GB/BAS/QAR22.0009/00](#)



IECEX Certificate of Conformity

Certificate No.: **IECEX BAS 22.0061X**

Page 3 of 3

Date of issue: 2023-10-06

Issue No: 0

EQUIPMENT:

Equipment and systems covered by this Certificate are as follows:

The Smart Trend Meter is a vibration meter that can be used to take measurements of vibration using an intrinsically safe accelerometer connected via a connector on the top of the unit. The vibration meter is capable of displaying vibration in a variety of different formats such as overall values of acceleration, velocity or displacement, frequency spectra or vibration in various frequency bands centred on multiples of a machine's running speed, for example.

The vibration meter comprises a handheld unit with processor PCB, Bluetooth RF module, LCD and a membrane keypad. The keypad is used to initiate readings and navigate through the various different vibration display formats.

The unit is powered by an integral rechargeable Lithium Ion cell which can only be recharged in the non-hazardous area with an appropriate wireless charger with power derived from a SELV/PELV source.

The only electrical connection that can be made to the vibration meter is the connection of an intrinsically safe accelerometer such as the A9103 accelerometer (coded Ex ia IIC T4 Ga and covered by SGS22ATEX0103X) via an integral 5-pin connector.

The equipment connector has the following parameters.

Accelerometer connector

$$U_0 = 5,36V \quad C_1 = 0 \quad C_0 = 65\mu F$$

$$I_0 = 144,4mA \quad L_1 = 0 \quad L_0 = 1,71mH$$

$$P_0 = 193,5mW$$

Wireless charging

$$U_{M1} = 125Vac \text{ (to the charging coil)}$$

SPECIFIC CONDITIONS OF USE: YES as shown below:

1. The equipment must not be used in the hazardous area without the protective boot.
2. The equipment must only be recharged within a non-hazardous area.

1 **EU - TYPE EXAMINATION CERTIFICATE**

2 **Equipment or Protective System Intended for use in Potentially Explosive Atmospheres
Directive 2014/34/EU**

3 EU - Type Examination Certificate Number: **SGS22ATEX0102X**

4 Product: **Smart Trend Meter**

5 Manufacturer: **Summit Co., Ltd**

6 Address: **58, Gaetbeol-Ro, Yeonsu-Gu, Incheon, 21999, Republic of Korea**

7 This product and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

8 SGS Fimko Oy, Notified Body number 0598, in accordance with Article 17 of Directive 2014/34/EU of the European Parliament and of the Council, dated 26 February 2014, certifies that this product has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of products intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in confidential Report No. **GB/SGS/ExTR23.0224/00**

9 Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN IEC 60079-0:2018 EN 60079-11:2012

except in respect of those requirements listed at item 18 of the Schedule.

10 If the sign "X" is placed after the certificate number, it indicates that the product is subject to the Specific Conditions of Use specified in the schedule to this certificate.

11 This EU - TYPE EXAMINATION CERTIFICATE relates only to the design and construction of the specified product. Further requirements of the Directive apply to the manufacturing process and supply of this product. These are not covered by this certificate.

12 The marking of the product shall include the following:

Ⓔ II 1G Ex ia IIC T4 Ga (-20°C ≤ Ta ≤ +40°C)

SGS Fimko Oy Customer Reference No. **7980**

Project File No. **20/0149**

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Mikko Välimäki
SGS Fimko Oy

13 **Schedule**

14 **Certificate Number SGS22ATEX0102X**

15 **Description of Product**

The Smart Trend Meter is a vibration meter that can be used to take measurements of vibration using an intrinsically safe accelerometer connected via a connector on the top of the unit. The vibration meter is capable of displaying vibration in a variety of different formats such as overall values of acceleration, velocity or displacement, frequency spectra or vibration in various frequency bands centred on multiples of a machine's running speed, for example.

The vibration meter comprises a handheld unit with processor PCB, Bluetooth RF module, LCD and a membrane keypad. The keypad is used to initiate readings and navigate through the various different vibration display formats.

The unit is powered by an integral rechargeable Lithium Ion cell which can only be recharged in the non-hazardous area with an appropriate wireless charger with power derived from a SELV/PELV source.

The only electrical connection that can be made to the vibration meter is the connection of an intrinsically safe accelerometer such as the A9103 Accelerometer (coded Ex ia IIC T4 Ga and covered by SGS22ATEX0103X) via an integral 5-pin connector.

The equipment connector has the following parameters.

Accelerometer connector

$U_o = 5.36V$	$C_i = 0$	$C_o = 65\mu F$
$I_o = 144.4mA$	$L_i = 0$	$L_o = 1.71mH$
$P_o = 193.5mW$		

Wireless charging

$U_m=125Vac$ (to the charging coil)

16 **Report Number**

GB/BAS/ExTR22.0224/00

17 **Specific Conditions of Use**

1. The equipment must not be used in the hazardous area without the protective boot.
2. The equipment must only be recharged within a non-hazardous area.

18 **Essential Health and Safety Requirements**

In addition to the Essential Health and Safety Requirements (EHSRs) covered by the standards listed at item 9, the following are considered relevant to this product, and conformity is demonstrated in the report:

Clause	Subject
1.4.1.	External effects
1.4.2.	Aggressive substances

19 **Drawings and Documents**

Number	Sheet	Issue	Date	Description
D341-01-00	1 of 1	-	2021-06-24	Front Label Printing TPI9085Ex
D341-02-02	1 of 1	3	2022-12-12	Back Label TPI9085Ex
D341-03-02	1 of 1	3	2022-12-15	Battery Cover Label Printing TPI9085Ex
D341-04-06	1 of 1	6	2023-09-20	Boot Label TPI9085Ex
D341-05-00	1 of 1	-	2021-06-24	Front Case TPI9085Ex

Number	Sheet	Issue	Date	Description
D341-06-00	1 of 1	-	2021-06-24	Back Case TPI9085Ex
D341-07-00	1 of 1	-	2021-06-24	Battery Cover TPI9085Ex
D341-08-00	1 of 1	-	2021-06-24	Boot TPI9085Ex
D341-12-00	1 of 1	-	2021-06-25	Front Label TPI9085Ex
D341-13-00	1 of 1	-	2021-06-24	Keypad TPI9085Ex
D341-14-03	1 of 1	3	2023-09-06	ATEX TPI Vibration Monitor TPI9085Ex
D341-21-01	1 of 1	1	2021-07-24	Machined Back Case TPI9085Ex
D341-22-01	1 of 1	1	2021-07-14	Machined Front Case TPI9085Ex
D341-11-02	1 of 1	1.3	2023-08-28	Safety Circuit Schematic TPI9085Ex
D341-29-02	1 of 1	-	2023-08-28	Safety Circuit Part List TPI9085Ex
D341-31-01	1-7	1.11	2021-08-11	Safety Circuit PCB TPI9085Ex
D341-32-00	1 of 1	-	2021-07-12	Safety Circuit PCB Assembly Top TPI9085Ex
D341-33-00	1 of 1	-	2021-07-12	Safety Circuit PCB Assembly Bottom TPI9085Ex

All drawings are common to IECEx BAS 22.0061X.



SGS



CERTIFICATE OF COMPLIANCE

Certificate Number: SGSNA/22/CA/00021X

Contract Number: 800071
Certificate Project Number: BAS-CERT221200008

Certified Product: 9085-Ex Smart Trend Meter
Trademarks:



Model(s): 9085-Ex Smart Trend Meter
Technical Data: Class 1, Zone 0 AEx ia IIC T4 Ga;
Ex ia IIC T4 Ga;
Class 1, Division 1, Groups A-D T4;
-20°C ≤ Ta ≤ +40°C

Certificate Holder: TPI Europe
Unit 6, Rutherford Way Industrial Estate, Rutherford Way, Crawley, West Sussex,
RH10 9LN, United Kingdom

This certificate supersedes previous certificates issued with the same certificate number. Certification is valid when products are indicated on the SGS directory of certified products at www.sgs.com, or using the QR code below. The product is certified according to ISO/IEC Guide 17067, Conformity assessment - Fundamentals of product certification, System 3, and in accordance with:

UL 60079-0 Explosive Atmospheres – Part 0: Equipment – General Requirements – 7th Edition – Revision: March 26, 2019.

UL 60079-11 Explosive Atmospheres – Part 11: Equipment Protection by Intrinsic Safety "i" – 6th Edition – Revision: February 15, 2013.

CAN/CSA C22.2 No. 60079-0:19 Explosive Atmospheres – Part 0: Equipment – General Requirements (IEC 60079-11: 2017, MOD) – Revision: February 2019.

CAN/CSA C22.2 No. 60079-11:14 Explosive Atmospheres – Part 11: Equipment Protection by Intrinsic Safety "i" (IEC 60079-11, MOD) – Revision: February 2014.

UL 913 Intrinsically Safe Apparatus and Associated Apparatus for Use in Class I, II and III, Division 1, Hazardous (Classified) Locations – 8th Edition, 12 October 2018

Authorized by:

David Brearley

Effective date: 22 February 2024

Page 1 of 2



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Certification Body

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Certifier

CERTIFICATE OF COMPLIANCE

Certificate Number: SGSNA/22/CA/00021X

Contract Number: 800071

Certificate Project Number: BAS-CERT221200008

Product Description

The Smart Trend Meter is a vibration meter that can be used to take measurements of vibration using an intrinsically safe accelerometer connected via a connector on the top of the unit. The vibration meter is capable of displaying vibration in a variety of different formats such as overall values of acceleration, velocity or displacement, frequency spectra or vibration in various frequency bands centred on multiples of a machine's running speed, for example.

The vibration meter comprises a handheld unit with processor PCB, Bluetooth RF module, LCD and a membrane keypad. The keypad is used to initiate readings and navigate through the various different vibration display formats.

The unit is powered by an integral rechargeable Lithium Ion cell which can only be recharged in the non-hazardous area with an appropriate wireless charger with power derived from a SELV/PELV source.

The only electrical connection that can be made to the vibration meter is the connection of an intrinsically safe accelerometer such as the A9103 accelerometer via an integral 5-pin connector.

Terminal Parameters and Electrical Ratings

Battery powered – 3.6V (Nominal) 2200mAh NCA103540 Lithium-Ion secondary cell

Rechargeable by an appropriate wireless charger.

Accelerometer connector (5 pin connector on top of unit)

$U_o =$	5.36V	$C_i =$	0	$C_o =$	65 μ F
$I_o =$	144.4mA	$L_i =$	0	$L_o =$	1.71mH
$P_o =$	193.5mW				

Certification Condition

1. The equipment must not be used in the hazardous area without the protective boot.
2. The equipment must only be recharged within a non-hazardous area.

Certification Body

2 Operation

2.1 Fitting the sensor

The Vib Meter 9085-Ex is supplied with a cable connected A9103 accelerometer (sensor) that connects to the 5 pin M12 connector on the meter. The nominal sensitivity of the sensor is 30mV/g and this is the meter's default setting for sensor sensitivity.

The Vib Meter 9085-Ex must be used with the A9103 intrinsically safe low power accelerometer with temperature sensor. The sensor sensitivity setting of the 9085-Ex can be adjusted to accommodate different accelerometer sensitivities (see section 2.3.3.3 in Manual Setup).

2.2 Taking a reading

To take a reading, press the circle button  to turn the unit ON. Place the sensor on a **rigid** part of the machine as close as possible to the desired measurement point (e.g. bearing block) using the magnet mount.

Pressing the circle button again takes the reading.

N.B. for best results the sensor should be placed gently onto the measurement point by “rolling” the magnet onto the machine.

This is in order to avoid any sudden shocks that would be seen as large acceleration peaks by the sensor and could take some time (several seconds) to die away.



Taking a reading causes the overall vibration numbers and temperature screen to be displayed as shown in the example screen left.

This screen gives an overall view of the machine's vibration condition as explained in the following section.

2.2.1 Vibration & Temperature readings

Once a vibration reading has been taken, the display will show four values, as shown in the example screen opposite. The values are colour coded to show their alarm status as explained in the following sections.

The four values shown in the readings screen are:

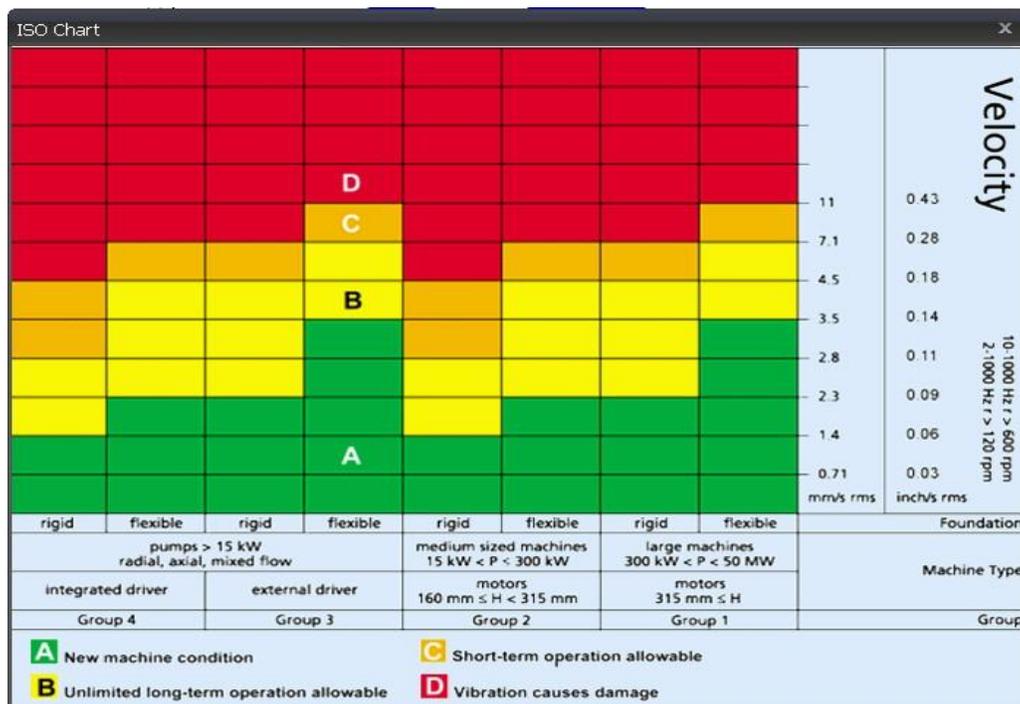
- ISO value (velocity in mm/second or inch/s)
- Bearing Noise in BDU (Bearing Damage Units)
- Total g (acceleration)
- Temperature

These readings are explained in more detail below with some examples of what they actually mean:

ISO value (mm/s)

The ISO value (in mm/s or inch/s) is the large number displayed at the top of the screen, which is the RMS (average) of the vibration velocity in the frequency band 10Hz (600 RPM) to 1kHz (60,000 RPM) or 2Hz (120 RPM) to 1kHz (60,000 RPM), as specified by the ISO standard¹. The correct frequency band is automatically selected by the meter based on running speed.

The ISO value background is colour coded according to the ISO 10816-1 vibration velocity level chart (see below). The colour coded background indicates the condition of the machine according to the size and type of machine selected with the **Setup Wizard** (see section 2.3.1).



¹ ISO 10816-1:1995. Mechanical vibration -- Evaluation of machine vibration by measurements on non-rotating parts

Bearing Noise (BDU)

Below the displayed ISO value and to the left is the value of bearing noise (high frequency vibration) in **Bearing Damage Units** (BDU), where 100 BDU corresponds to 1g RMS (average) vibration measured above 1kHz. This is a measure of the wear state of the bearings in the equipment being monitored. The higher the number, the more worn the bearing.

It is commonly held that 1g of high frequency vibration (100 BDU) corresponds to a relatively high level of bearing noise and so can be considered indicative of a damaged bearing. In other words, it may be helpful to think of the Bearing Noise figure as being very roughly equivalent to “**percentage**” of bearing wear. By default, the bearing noise is displayed on a **Red** background if it is above 100 BDU, an **Amber** background between 50 and 100 BDU and a **Green** background below 50 BDU. However, the BDU alarm levels can be changed using the **Manual Setup** menu (see section 2.3.2.1).

Total acceleration (g)

This is the RMS (average) value of the total vibration acceleration measured by the meter over its entire frequency range (2Hz to 10kHz). This reading is shown in units of **g** (Earth’s gravitational constant, where $1g = 9.81 \text{ m/s}^2$).

Displacement

Pressing either the left (<) or right (>) arrow button when the reading screen is displayed will cause the meter to display RMS displacement (in mm or thou) on a blue background. Pressing either left or right arrow button again will revert to display of the ISO value (mm/s or inch/s).

Temperature

The measured temperature will be displayed at the bottom of the LCD. Once the “Take Measurement” key is pressed the 9085-Ex will take a vibration measurement and then begin a 10 second countdown which allows the temperature sensor to stabilize. After the countdown the temperature will be displayed. Various settings can be adjusted for the temperature range like save mode, minimum save time, auto save time, and whether the temperature readings are saved with the vibration readings. These are explained later in the manual.

2.2.2 Vibration Analysis

Pressing the down arrow button brings up a display similar to that shown below, which shows the readings of vibration velocity (mm/s or inch/s), or displacement (mm or thou) if selected, broken down into each of 3 bands.

The display shows the vibration level in frequency ranges that are all based on multiples (1X, 2X and 3X) of the specified **Run Speed** of the machine as displayed beneath the 3 bar graphs.



N.B. in order to perform a vibration analysis it is important that the running speed of the machine is entered correctly. This can be done with the “Setup Wizard” as described in Section 2.3.1 of this user guide, or by using the strobe attachment (see Section 5.1)

The frequency ranges of the VA bands are based on the following multiples of running speed²:

1X = Unbalance:

The level of vibration in the frequency band based on the running speed is usually indicative of how well balanced the machine is. A **large** vibration at the running speed usually indicates that the machine is out of balance. However even a very well balanced machine will typically show some vibration at the running speed but this figure should ideally be quite low (e.g. typically less than about 2 mm/sec for a medium sized machine).

2X = Misalignment:

A high level of vibration in the frequency band centred at twice the running speed is a possible indication of misalignment. This is based on the fact that shaft misalignment can result in a double peak in the waveform due to there being two different centres of gravity (one from each shaft). In other words the accelerometer picks up a peak as each centre of gravity passes by and hence there will be two positive and two negative peaks each revolution of the shaft. This will typically give rise to a vibration signal at **double** the running speed of the machine.

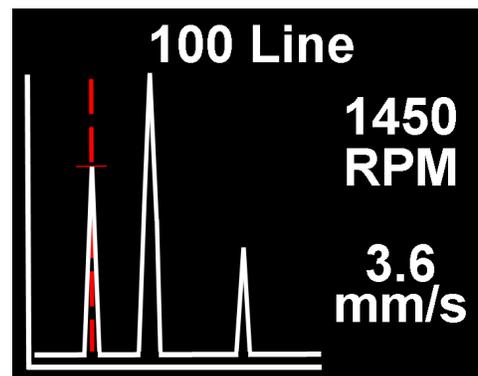
3X = Looseness:

High vibration in the frequency band centred at 3 times running speed is a possible indication that something may be loose (e.g. loose mounting bolts, weak foundations etc.) as it is not usual to see third order vibration in a machine unless there is some structural looseness that is being “excited” by the vibration of the machine.

2.2.3 Frequency spectrum

Pressing the down arrow button once more brings up a display similar to that shown opposite, where the vibration levels are shown as a frequency spectrum in the range from 0 to 1kHz.

The heights of the peaks indicate the RMS vibration level (in mm/s or inch/s) at each frequency point in the spectrum.



² Multiples of running speed are sometimes referred to as “orders”

The readings to the right of the screen show the frequency (in Hz or RPM) and the RMS vibration level (in mm/s or inch/s) at the position of the cursor (red dotted line). The cursor position can be moved by use of the left (<) and right (>) arrow buttons.

Pressing the down arrow button increases the resolution of the frequency axis from 100 Lines (i.e. 10Hz or 600 RPM resolution) to 800 Lines (i.e. 1.25Hz or 75 RPM resolution). Increasing the resolution effectively **zooms** into the frequency spectrum. In order to display the full spectrum at the higher resolution the display must be **scrolled** using the left and right arrow buttons.

2.2.4 Live Update Mode

It is possible to have the meter continuously display readings that are taken at intervals of approx. 1 second.

Live Update is selected from the **Configuration menu**, which is entered by holding down the circle button for approx. 2 seconds

It is possible to use live update with the basic readings screen, the VA bands screen or 100 line frequency spectrum. Pressing the circle button at any time during live update will capture a full (800 line) resolution reading.

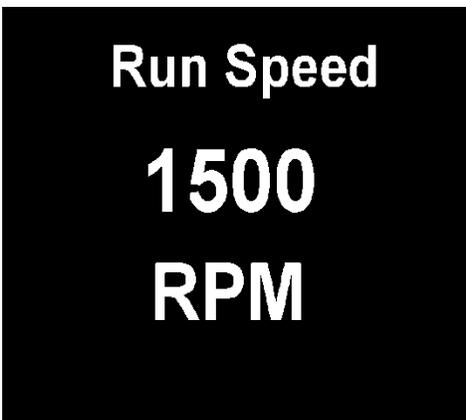
2.3 Configuration menus

The configuration menu is entered by pressing and holding down the circle button for **2 seconds**.

Moving up and down the menu is achieved by pressing the left (up) and right (down) buttons which causes the menu item to be highlighted. Pressing the circle button will select the highlighted menu item. Left and right arrow buttons can be used to move backward and forward through the menus.



2.3.1 Setup Wizard



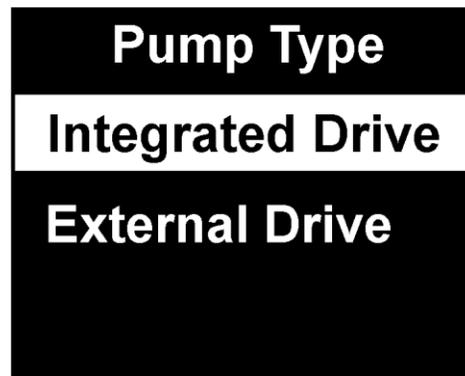
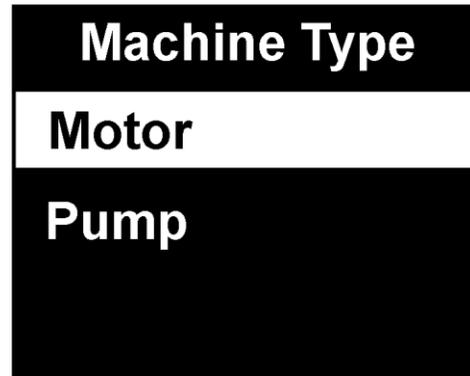
Selecting the Setup Wizard opens a dialogue that allows the machine running speed to be entered and the ISO alarm levels to be set automatically according to the size and type of machine to be monitored.

The first Setup Wizard screen to be displayed shows the currently selected running speed in the pre-selected units (Hz or RPM).

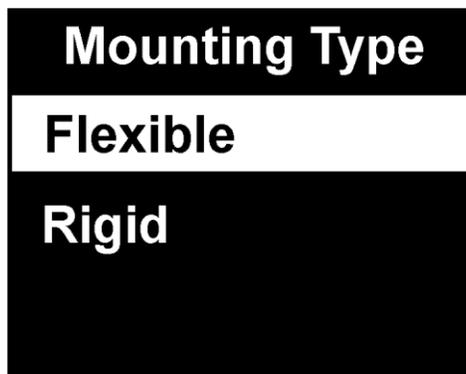
Changing the running speed is achieved by pressing the up arrow button (to increase run speed) or down arrow button (to decrease run speed).

Pressing the circle button again brings up the next screen which allows the machine type (motor or pump) to be selected.

If a **motor** is selected the size must be selected (under or over 300kW) or if a **pump** is selected, it must be specified whether it has an integrated or external drive unit.



Selecting the machine type and size allows the ISO alarm levels to be set accordingly, as does specifying the type of mounting (rigid or flexible).



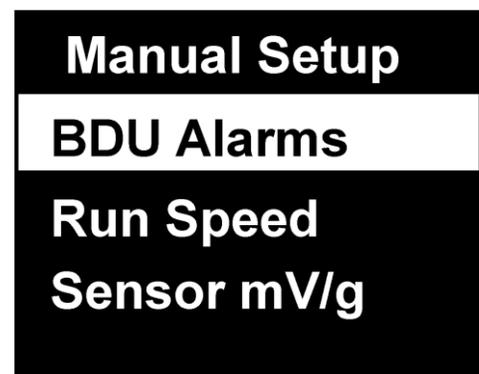
As a basic “rule of thumb”, unless a machine is bolted down to a concrete floor, its mounting should be considered as being **flexible**.

Most motors and pumps are mounted on some kind of frame or structure and as such should definitely be considered as flexibly mounted.

2.3.2 Manual Setup

2.3.2.1 BDU alarm settings

Selecting **BDU Settings** allows the alarm levels at which the BDU readings change colour to be altered by the user. Normal levels are displayed on a **Green** background.



BDU Alarms
Warning
Critical

The BDU threshold values are designated as Warning (where readings turn **Amber**) and Critical (where readings turn **Red**).

Both these threshold values can be set independently using the up and down arrow buttons.

The default BDU thresholds are 50 for **Warning** and 100 for **Critical**. These levels are typical for medium sized machine bearings operating at run speeds in the region of 1000 to 3000 RPM. Larger bearings or higher run speeds may need increased BDU threshold values to identify worn or bad bearings.

BDU Warning
Threshold
50

2.3.3.2 Run Speed

Run speed can also be set manually via the up and down arrow buttons.

2.3.3.3 Sensor mV/g

Accelerometer sensitivity (in mV/g) can be manually set using the up and down arrow buttons to allow use of any desired sensitivity sensor within the range 1mV/g to 1000mV/g. This enables the resolution and range of the meter to be set by the user.

Accelerometer
Sensitivity
30.0
mV/g

2.3.4 Device Settings

There are three pages of Device Settings menus. To advance to the second and third pages the down arrow button should be used. Selecting a menu option is achieved by the up and down arrow buttons and by pressing the circle button.

Device Settings
Auto Off Time
Brightness
Languages
Factory Reset

Device Settings
Graph Mode
Colour Scheme
Date & Time
Units

Device Settings
Temp Settings
Lock Device
Lock Settings
Information

The **Auto Off Time** can be set from 1 minute up to a maximum value of 60 minutes, in increments of 1 minute.

The **Brightness** level can be set anywhere between 1 (least brightness) up to 10 (full brightness).

The operating **Language** can be selected from any one of a number of different languages depending on the exact model.

Factory Reset will reboot the 9085-Ex and set all parameters back to factory

The **Graph Mode** can be set to display the frequency spectrum as either a **Line** graph or a **Bar** graph.

The display **Color Scheme** can be configured as standard (full colour) or monochrome, e.g. for convenient viewing in direct sunlight.

Color Scheme
Standard
White on black
Black on white

Date & Time setting can be achieved using the up, down, left and right arrow buttons.

Selecting **Units** from the Device Settings menu allows the velocity readings to be displayed in either mm/s or inch/s. Run Speed units can be displayed in units of Hertz³ (Hz), revolutions per minute (RPM) or cycles per minute (CPM). The velocity type can be selected between RMS and Peak. Displacement units can be set to Peak or Peak to Peak. Temperature units can be set to Celsius or Fahrenheit.

Selecting **Temp Settings** enables several temperature parameters to be set. **Save with Vib** can be enabled or disabled. When disabled the temperature reading will be displayed only and not saved for download. When enabled, the temperature reading will be saved with the vibration readings and transmitted to C-Trend software when the 9085-Ex is docked. **Save Mode** can be set to Manual or Auto. In manual mode the 9085-Ex will prompt you to press the center key after the countdown timer goes to zero to save the temperature reading. This can be useful if you would like to control when the reading is saved. In auto mode the temperature reading will be saved automatically after the countdown. Use **Min Save Time** to set the minimum countdown before the 9085-Ex prompts you to save the temperature reading. This can be set from 2s to 120s. **Auto Save Time** allows adjustment of the time before the temperature reading is automatically saved. This can be set from 2s to 120s.

Lock Device immediately locks the 9085-Ex to prevent unauthorized use. To unlock the 9085-Ex turn the 9085-Ex on and press the center key for several seconds until you are prompted to enter the unlock code. The default unlock code is 375.

Lock Settings locks out the ability to get into the menu to change settings without the unlock code. In this mode the 9085-Ex will still take readings but the menu is inaccessible unless the unlock key is entered. To unlock and turn off this feature turn the 9085-Ex on and press the center key for several seconds until you are prompted to enter the unlock code. The default unlock code is 375.

Information displays the firmware version of the 9085-Ex and the serial

Temperature Only Mode displays only the temperature reading. Pressing and holding the menu key  puts the 9085-Ex in temperature display only mode. Pressing the test key  will return the 9085-Ex to normal

³ Hertz are equivalent to, and also sometimes referred to as, cycles per second (CPS).

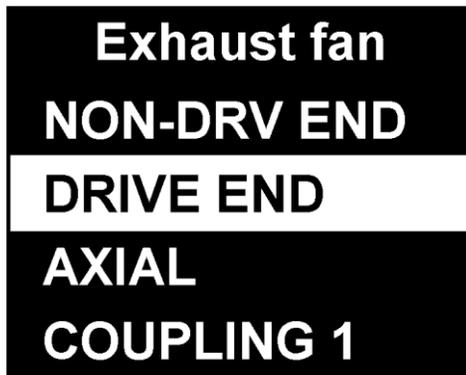
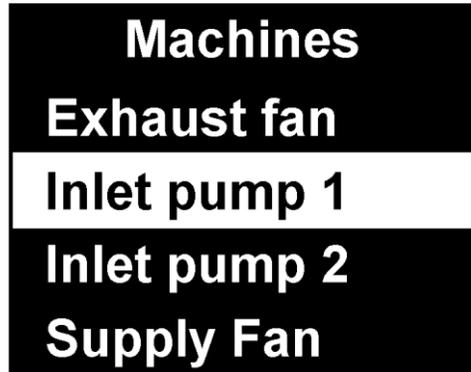
3 Asset Management

Pressing the Asset Manager button (factory key,  located just below the down arrow button) brings up the Machines menu.

Machines have user-defined names **up to 16 characters long**.

Scrolling the list of machines is achieved with the up and down arrow buttons.

Selecting a machine is done with the circle button, which then brings up a list of **measurement points** for that machine.

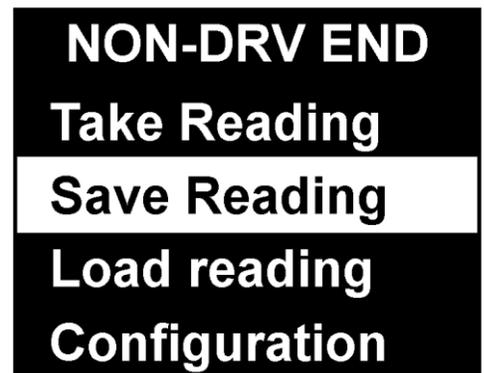


Measurement points also have user-defined names up to 16 characters long.

The list of measurement points can also be scrolled by using the up and down arrow buttons and each measurement point can be selected using the circle button.

The various options for each measurement point (MP) are then displayed:

1. Take Reading – takes a new reading and saves it to this MP
2. Save Reading – saves the previously taken reading to this MP
3. Load Reading – loads a previous reading (e.g. for re-display)
4. Configuration - allows the run speed and alarm levels to be set independently for each individual MP.



Machines and their measurement points are downloaded from **VibTrend**, the supplied trending and asset management software for PC using the supplied USB docking cradle.

The exact list of machines to be downloaded is determined by the user in VibTrend.

There will also always be a machine downloaded named '**off route**' that contains 10 MPs. This is done to allow users to save readings for upload to VibTrend where they can then be saved to a new or existing machine.

4 C-Trend II - Trending Software

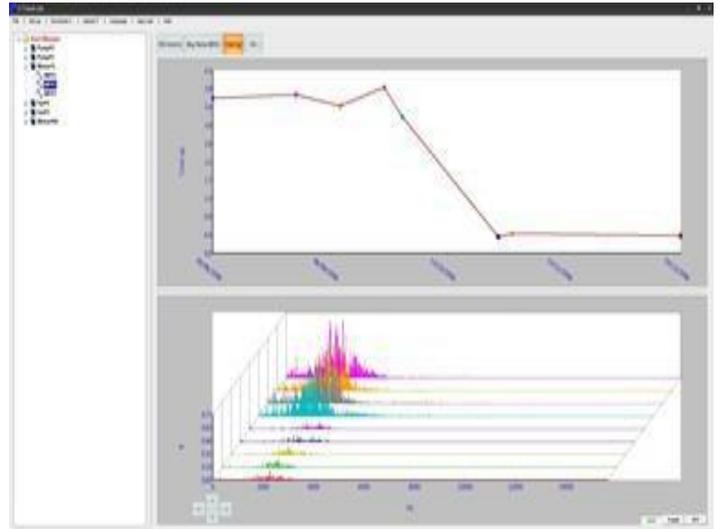
C-Trend II is the PC based software that allows users to view trends of vibration readings taken with the Vib Meter 9085-Ex, in a way that enables predictions to be made about machine condition.

C-Trend II is included with the 9085-Ex. Once the software is installed go to the activation screen and email the Hardware Key that is displayed to:

tech@testproductsintl.com

C-Trend II is very intuitive and very easy to drive and its full functionality is described in more detail in its built-in Help Guide.

In brief, C-Trend II allows display of vibration data in a variety of different ways including vibration frequency spectra, bearing noise and ISO trend plots, waterfall diagrams (see figure below) and can generate reports either manually or automatically (e.g. by sending out **email alerts**).



5 Specifications

Size	200 mm x 60mm x 26mm
Weight	280g (not including sensor)
Environmental	
Water, Sand & Dust:	IP67 Waterproof
Operating:	-4°F to 104°F (-20°C to 40°C)
Storage:	-4°F to 158°F (-20°C to 70°C)
Power supply	Lithium-Ion wireless rechargeable battery
Battery life	Auto power OFF - typically 20 hours continuous operating time depending on brightness setting.
Frequency range	2 Hz to 1 kHz (ISO) / 1 kHz to 10 kHz (BDU)
Max frequency resolution	1.25 Hz @ 800 lines FFT setting
Accuracy	+/-5%
Measurements	Acceleration in g, Velocity in mm/s (or inch/s), Bearing noise in BDU (bearing damage units), Displacement (mm, microns, inch), Temperature (F/C)
Displayed Frequency Units	Hertz (Hz), RPM or CPM
Input range	User selectable with accelerometer sensitivity
Dynamic range	96 dB (0.01g resolution)
VA diagnostic bands (RPM = run speed)	Unbalance 1x RPM / Alignment 2x RPM /Looseness 3x RPM
Temperature Measurement Range & Accuracy	Range: -60°F to 300°F (-50°C to 150°C) Accuracy: (+/- 4°F) / (+/- 2°C)
Accessories	<ul style="list-style-type: none"> · A9081A PC docking cradle – USB connection · A9106 Carrying case · A9103 Low power accelerometer with temperature & built-in magnet · A9105 Curly cable for low power accelerometer with temperature · A9095 Intrinsically Safe Protective boot · A9091 C-Trend II software
Optional Accessories	

6 Basic operation

Colour coded display shows ISO reading, bearing quality in Bearing Damage Units (BDU) and RMS acceleration (g)

ISO and BDU values are alarm colour coded in Green, Amber and Red

Additional screens show temperature, displacement (mm or microns), frequency spectrum with cursor, and diagnostics for unbalance, misalignment and looseness.

5 pin MIL connector enables connection of the temperature and non-temperature accelerometers.

Power On/Off (left) and Menu (right) buttons.

Press **Circle** button to take readings - left, right, up and down arrows to navigate display

Asset manager button for downloading routes to the 9085-Ex or transferring machine readings to PC for **TRENDING**

Accesses menu for adding readings to machines (assets)

