CEM DT-178A 3-Axis Vibration Datalogger User Manual

Contents

CEM

CEM DT-178A 3-Axis Vibration Datalogger

Safety Information

Read the following safety information carefully before attempting to operate or service the meter.
Use the meter only as specified in this manual:

Environment Conditions

1. Altitude lower than 2000 meters
2. Relatively humidity <90%RH
3. Operation Ambient o – 40°C

Maintenance & Clearing

1. Repair or servicing not covered in this manual should be performed by qualified personnel.
2. Periodically wipe the case with a dry cloth. Do not use solvents or eradicator On this instrument.

Safety Symbols

CE Comply with EMC

Functions Description

This datalogger is engineered to record acceleration data of shock/vibration. This device will record and time 3-axis vibrations and peaks to provide a history of shock/vibration conditions. It is applied to the shock/vibration measurement such as transportation and Shipping Applications, building vibration, endurance testing, etc.

- Records 3-axis shock/vibration
- Build-in accelerometers

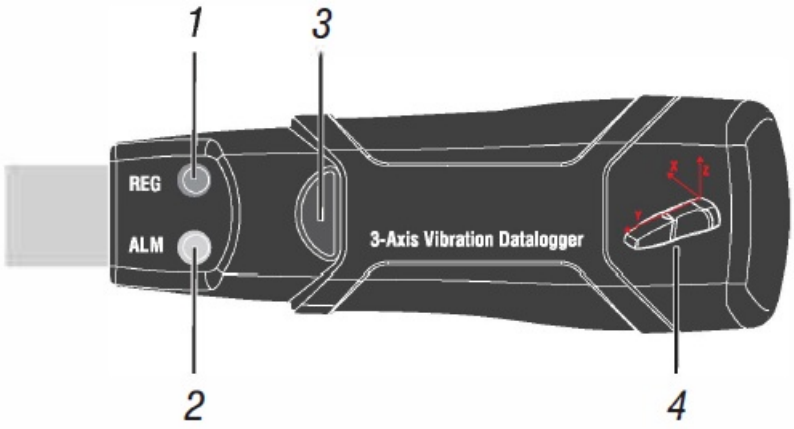
- Measures dynamic and static acceleration
- Real-time operation
- Normal & Motion detecion mode
- Real-time FFT for frequency analyse
- Manual & Automatic start

  Note: In motion detection mode, the datalogger only takes data when the trigger level(user preset) is exceeded.

Specification

- **Acceleration Sensor:** MEMS Semiconductor
- **Acceleration Range:** ±16g
- **Acceleration Resolution:** 0.004g
- **Calibrated Accuracy:** ± 0.5g
- **Frequency Range:** 0Hz – 60Hz
- **Data Memory:** 8Mbit total memory (normal mode: 168042 peak acceleration samples per channel; Motion Detection mode: 112028 peak acceleration samples per channel)
- **Data Format:** Time stamped peak acceleration and freefall,average and peak vector sum
- **Sampling Rate:** 3.9ms/256Hz(note:data is sampled at this rate,only peak value are written at the end of recording interval)
- **Recording Interval:** 20Hz to 12 hours for shock, selectable through software.
- **Real Time Recording:** Maybe used with PC to monitor and record instaneous acceleration in real time(500 ms or slower reading rate)
- **Power:** 3.6V battery, specs:14250 or 1/2AAA
- **Power Consumption:** 2.8mA (average)when running; <15μA idle
- **Battery Life:** About 400 hours
- **Computer Interface:** USB
- **Operation Temperature and Humidity:** 0 C -40°C, 10%RH-75%RH
- **Storage Temperature and Humidity:** -10°C -+60°C, 10%RH-90%RH
- **Dimension:**
  - **The pedestal:** 106mm x 56mm x 33.5mm
  - **The datalogger:** 95mm x 28mm x 21 mm
- **System Requirement:** Windows 2000 or Windows XP or Vista
- **Minimum Hardware Requirement:** BM EMS memory,2M hard disk,a free USB jack
- **Accessories:** Instruction manual, battery, windscreen, transparent cap, CD, USB cable, pedestal

Name of Parts and Positions



1. Red Green LED
2. Green Red LED
3. Button: turn on/off the Datalogger
4. Direction indication of 3-axis

LED Status Guide

LED Status	Meaning	Action
ALM ○ REG ○	No LEDs flash -No logging started -No battery fitted -Battery completely discharged	Fit Battery Data won't lose. Replace battery and download data
ALM ○ REG ◎	Green single flash every 10 sec. * --Logging	Press the black button in housing of datalogger untill Green LED flash four times sequencely, and then logging will start
ALM ◎ REG ○	Red single flash every 30 sec.* --Low battery	If logging , it will stop automatically. Data won't los. Replace battery and download data
ALM ◎ REG ◎	Red and Green single flash every 60 sec. --Logger memory full	Download data

Operating Instructions

- Setup the DataLogger by software before use it.
- Under the Manual mode, press and hold the button for 2s, DataLogger start to measure, and LED indicates the function at the same time. (See LED FLASH INDICATION for details.)

- Under the Automatic mode, the DataLogger start to measure after setup in software, LED indicate the function at the same time. (see LED FLASH INDICATION for details.)
- If Motion Detect function is selected, the datalogger only takes data when the trigger level(user preset) is exceeded
- Under the Real-time FFT mode, the data update automaticly ,the latest FFT data will be stored.
- During measurement, the green LED indicates the working state by flashing During measurement, the green LED indicates the working state by flashing with the frequency setup in the software.
- When datalogger memory full, Red LED and Green will flash every 60 sec.
- As the battery power is not suflicient, red LED will flash every 30 sec for indication.
- Press and hold the button for 2s untill Red LED sequencly flash four times, and then logging will stop,or connect the datalogger to the host and download the data, the datalogger will stop automaticlly.
- DataLogger data can be read time after time, the readings you are checking are the real time measured ones. (1 to 168042 readings); if set the datalogger the last data will be losed.
- Without battery, the latest 1 hours (the most) data will be lost. Other data can be read in software after battery is installed.
- When replacing the battery, turn off the meter and open the battery cover. Then, replace the empty battery with a new 1/2AAA 3.6V battery and go for the cover. with the frequency setup in the software.
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- As the battery power is not sufficient, red LED will flash every 30 sec for indication.
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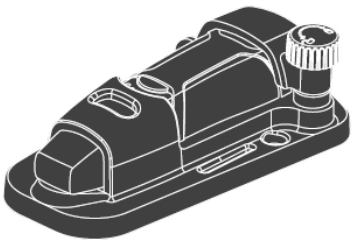
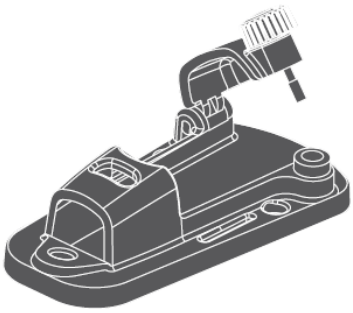
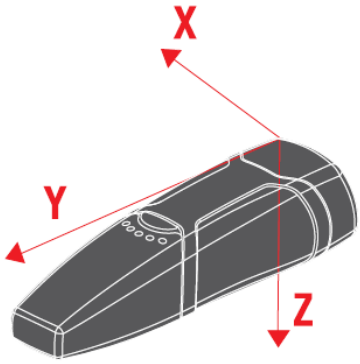
Installation Instructions

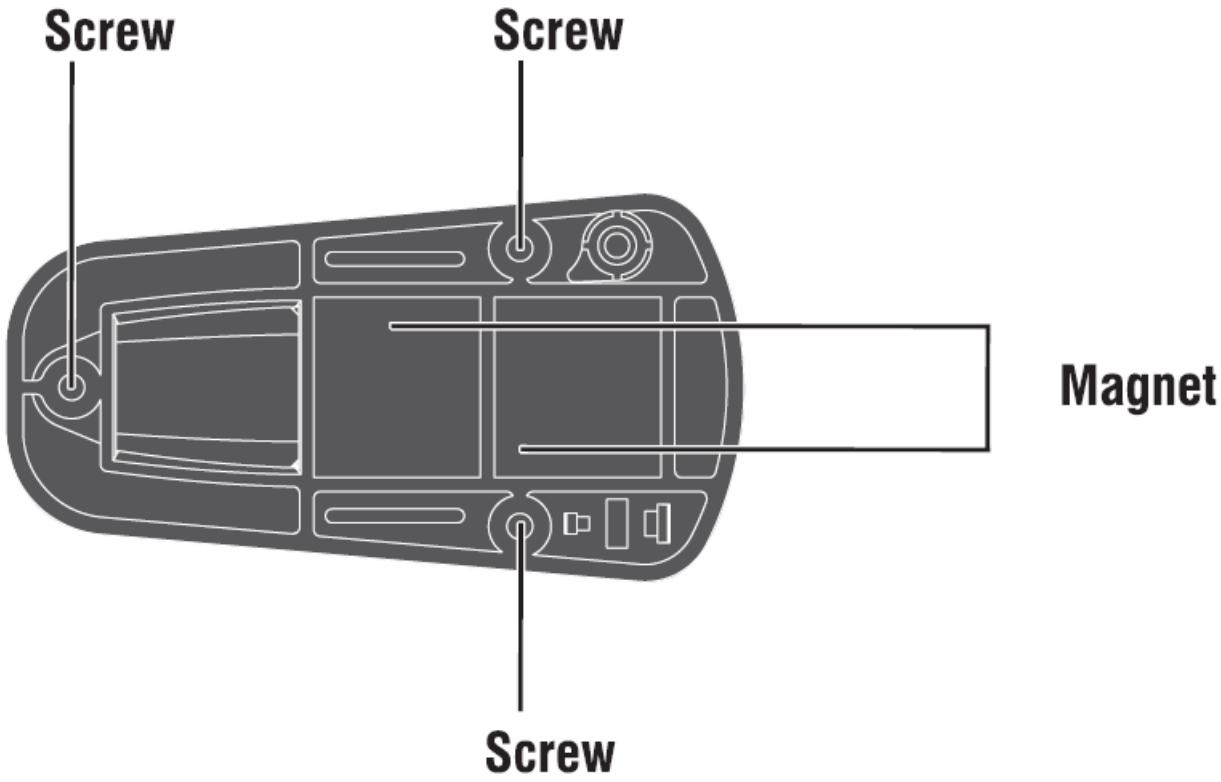






You have to fix the datalogger to the object rigidly, there are three ways as follow:

1. **Screw Install**
   Fix the pedestal with three Screws , if screws is permitted in your application, this way will be preferable.



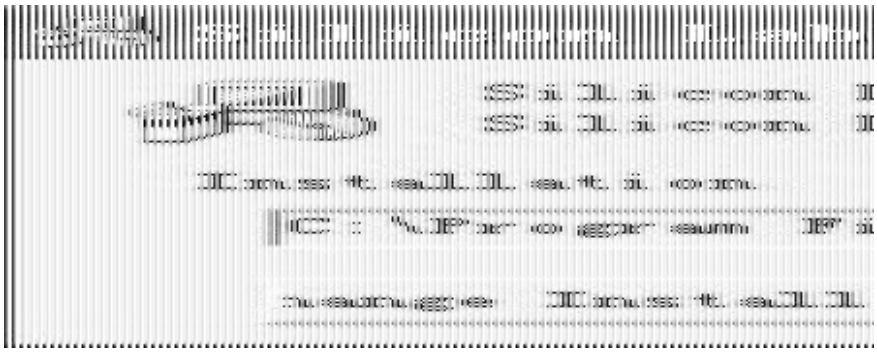
2. **Glue Install**
   Fix the pedestal with glue.wait for the pedestal is tightly sticked to the object.
3. **Magnet Install**
   Connect the pedestal and the object with magnetism, this way need the object can be absorbed with a magnet.

Notice

- Do not store or operate the instrument at high temperature and high humidity environment.
- When not in use for long time, please take out the battery to avoid battery liquid leakage and cautery on the instrument
- Without battery, the latest 1 hours (the most) data will be lost.
- The logger will log peak value of vibration,'shock during sampling interval.
- You have to setup the Datalogger by software before use it.
- For the affection of gravity, the axis which is parallel with gravity will have 1g output

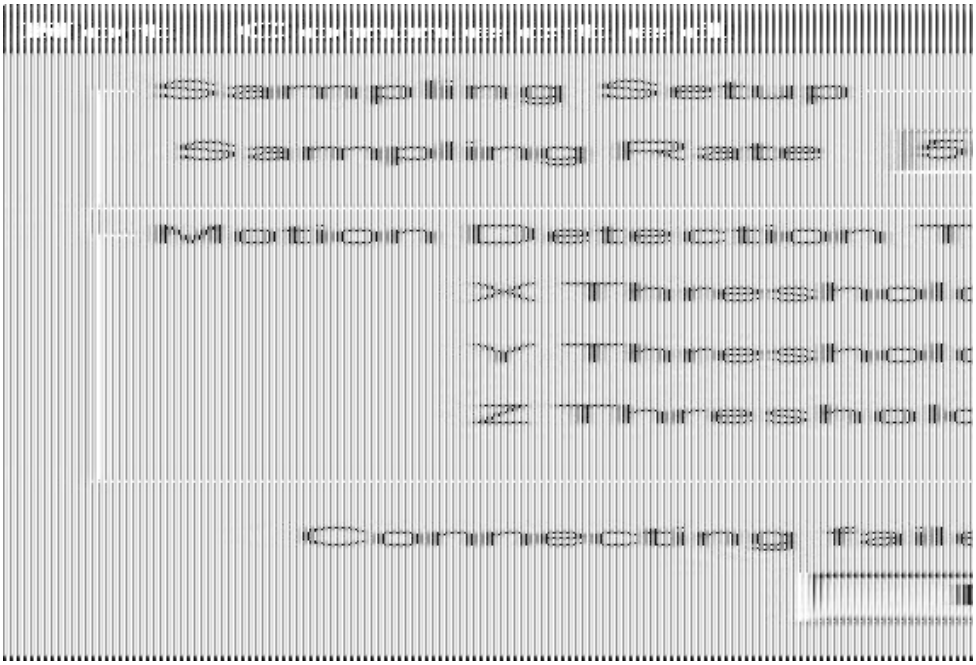
Software Installation and Operation

- Start windows
- Insert the CD into the CD-ROM
- Run SETUPGUIDE.EXE installation program in file DISK1, install it to the directory of C:\Program Files\Vibration Datalogger.
- After finishing the Vibration Datalogger software installation, this window will pop-up



Click “Install” to finish the driver installation. After a successful installation of software and drivers, you can run the Vibration Datalogger software and communicate with the meter.

- Double click the icon ”  ” to start the software,Click on the icon  on the menu bar. The Setup window will appear as shown below; descriptions for each field in the Setup window are listed directly below for illustration:



The Sampling Setup field instructs the DATA LOGGER to log readings at a specific rate . You can input specific sampling rate data at the left Combo box and select the time unit at the right Combo box.

The Motion Detec1ion Threshold Setup filed allows the user to set the accelera1ion detection threshold. Once the acceleration value is over the threshold, the DATALOGGER will work.

The LED Flash Cycle Setup field can be set 1 Os/2Os/3Os by the user depending on the requirement. By selecting “No Light” option, there will be no flash there by increase the battery life.

The DATA LOGGER Record Mode can be set as Normal and Motion Detection. Free-fall Detection field can be set for detecting Free-fall events or not.

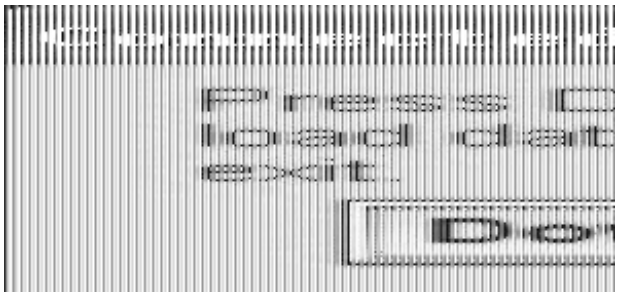
The Manual and Automatic select buttons allows the user to start data logging immediately when exit the Setup window(Automatic) or at a later time (Manual).

Click on the SETUP button to save changes. Press the DEFAULT button to set the Logger to factory default condition. Press the CANCEL button to abort the setup.

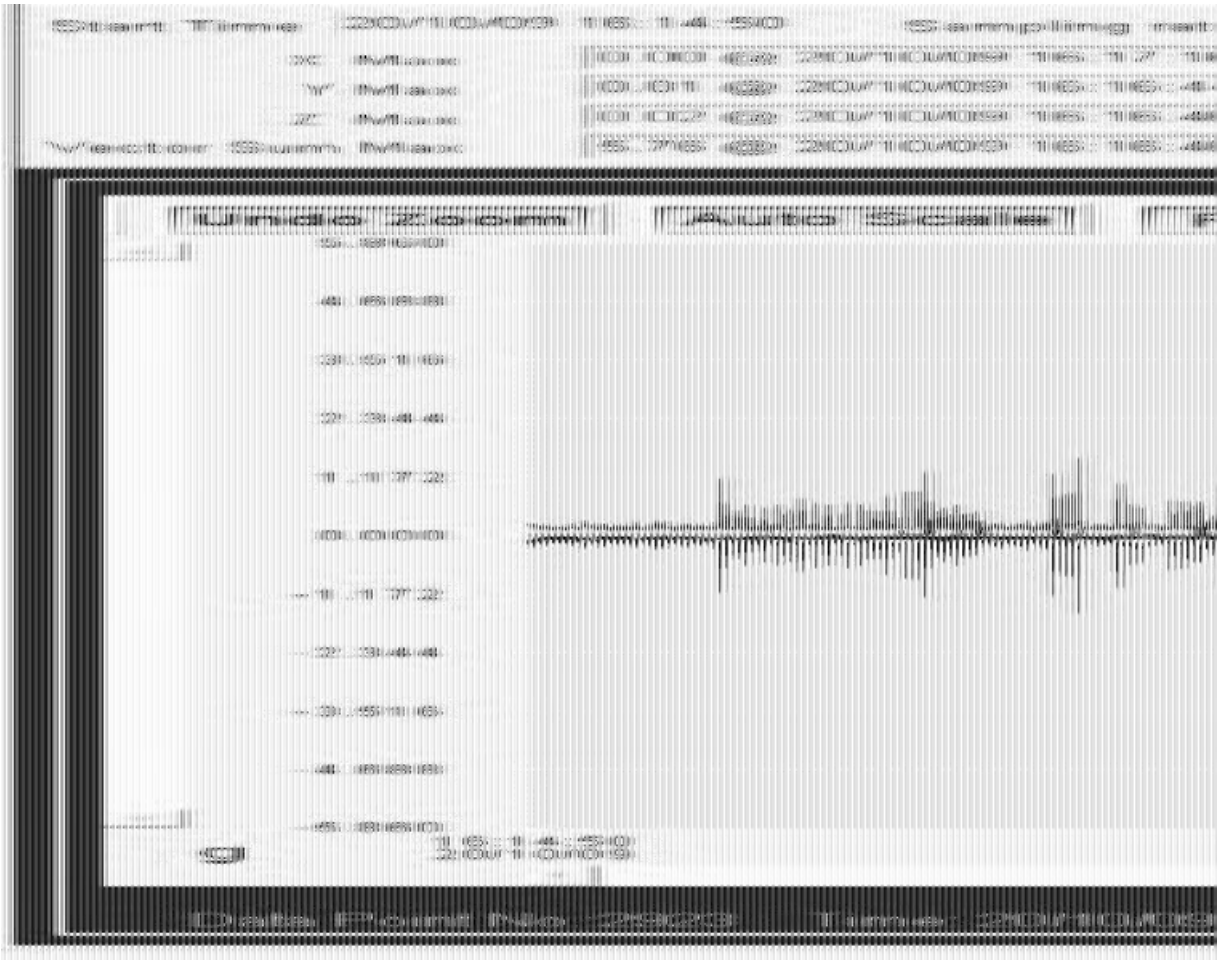
Notes: All stored data will be permanently erased when Setup is finished. To enable you to save the data before it is lost, click Cancel and then you need to download data.

The battery might be exhausted before logger finish specified sample points. Always ensure that the remaining power in the battery is sufficient for completing your logging task. If in doubt, we recommend that you always install a fresh battery before logging critical data.

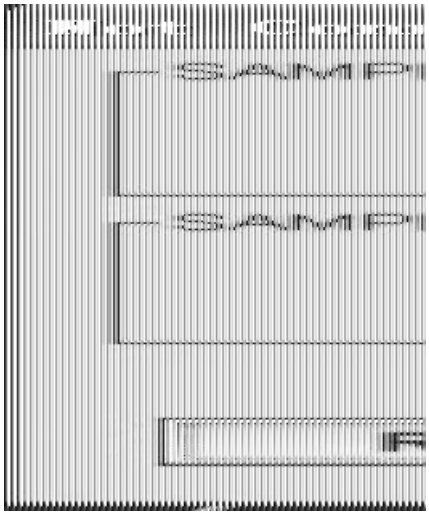
- Download Data, To transfer the readings stored in the Logger to the PC:
    1. Connect the DATA LOGGER to the USB port.
    2. Open the Datalogger software program if it is not still running
    3. Click the Download icon
    4. The Window shown below will appear. Click DOWNLOAD to begin transferring data



Once the data is successfully downloaded, the window shown below will appear.

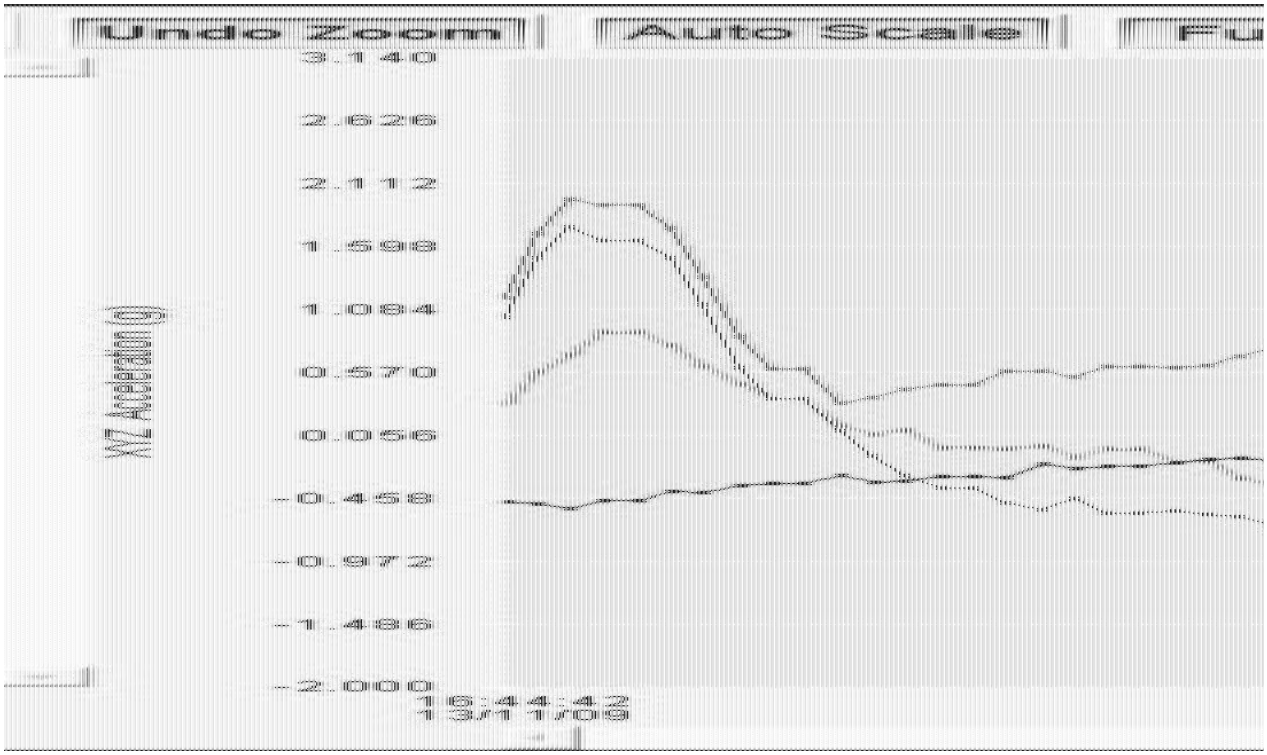


- Run,Click icon to read real-time data from the DATA LOGGER.

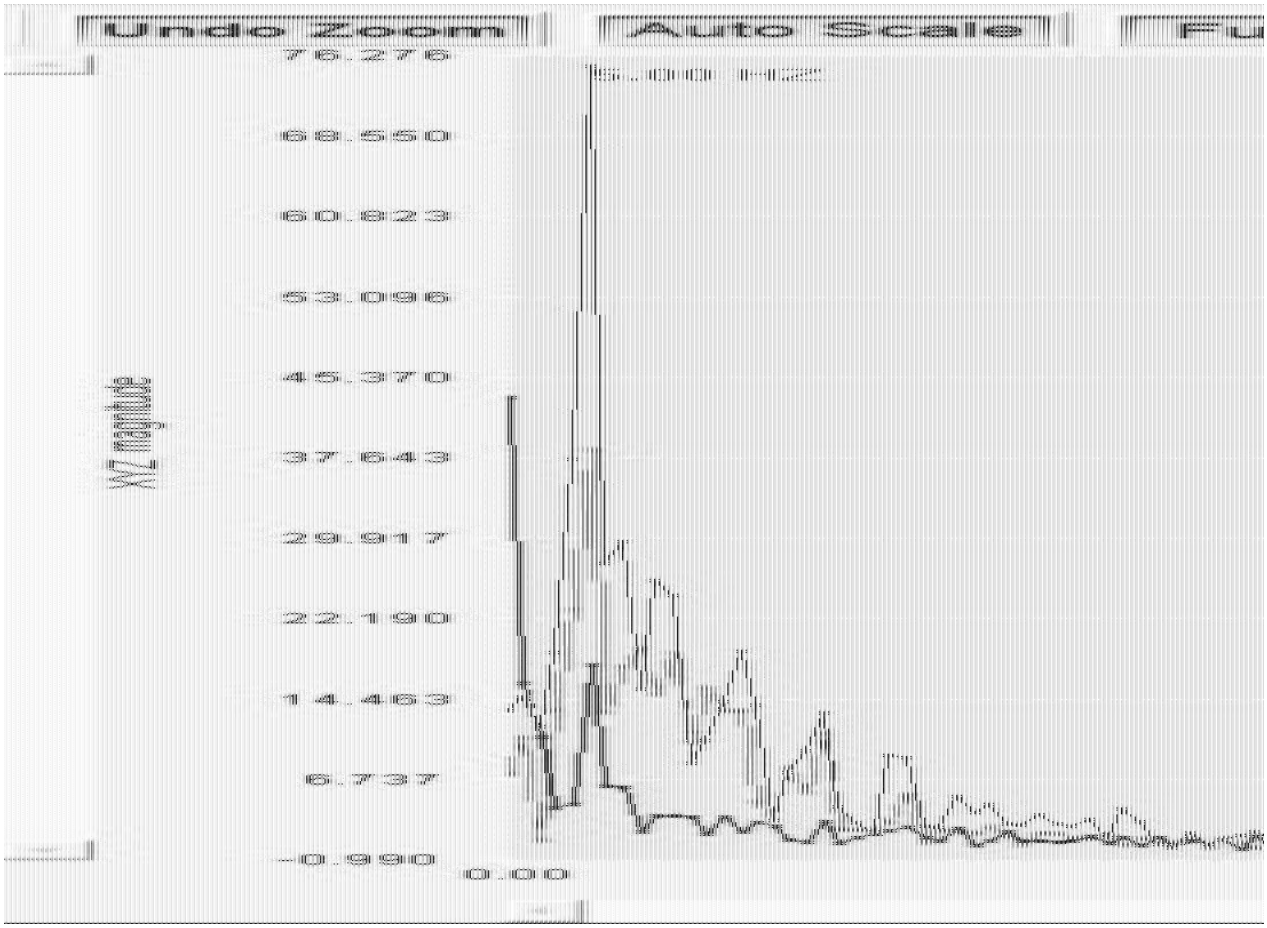


First, Setup the sampling rate and sample data points, then click RUN to start reading.

- Reading for FFT Analysis
  - Click FFT icon to read real-time spectral data for FFT analysis.
  - Click I to show the lime-domain graph.



  - Click F to show the frequency-domain graph.



The software computes real-time spectral data using an FFT from Oto 256HZ. The frequency of the max magnitude will be showed on this panel\

- Please view the Help file for specific application of the software

Documents / Resources

	CEM DT-178A 3-Axis Vibration Datalogger [pdf] User Manual DT-178A, 3-Axis Vibration Datalogger