

## Specifications Hardware

- Waterfall plot Analog input channels : 14/22/30 channels
- Tacho input channels : 2 channels
- Sensor types : Displacement, velocity and acceleration sensors
- Input range :  $\pm 20V$
- Input impedance : 1 M $\Omega$  (for all analog and tacho input channels)
- Max frequency band : 40 kHz (102.4kHz sampling rate)
- Range of tacho input : 12~120k RPM
- Coupling of input channels : DC 、 AC 、 IEPE
- IEPE power : hard switch on the back panel
- Resolution of A/D converters : 24bit
- Types of tacho signals : Proximity Probes 、 Optical Sensors 、 TTL 、 Displacement Sensor or other AC type signals

## Specifications Software

- Input channel setup : channel label, angle, sensor type, sensitivity, direction of rotation.
- Tacho channel setup : orientation, Hysteresis, trigger method, trigger slope, range of speed, max number of records, etc.
- Triggering slope : positive, negative, both
- Measurement control panel (accessible during measurement) : Start/Stop/change RPM interval/Change time interval
- Tacho signal : Can observe waveform of tacho during measurement
- Measurement control
  - (1)Control method : Delta RPM (up or down) 、 Delta Time  
Delta RPM : Up/Down, interval (5 、 10 、 20 、 30 、 40 、 50 、 75 、 100 RPM or user defined)  
Delta Time : set by Min 、 Sec or 1/10 Sec
  - (2)Measured functions : Time Waveform, Spectrum, Orbit, Trend, Bode, Polar, Waterfall (Map), Tabular Data
  - (3)Overlap% : 0% 、 25% 、 50% 、 75% 、 Max
  - (4)Start data recording as one of the following conditions happens
    - ▶ Date and time : When a date and time value has been met
    - ▶ Speed : Rotation speed enters the specified range
    - ▶ Amplitude : Direct amplitude (overall) or a filtered component of the direct amplitude like 1x 2x, 0.5x etc. is achieved.
    - ▶ Phase : A phase value enters the specified range
  - (5)Order resolutions : 1/4 、 1/8 、 1/16 、 1/32
  - (6)Maximum order : 5 、 10 、 20 、 50 、 100 、 200
  - (7)Average types : Linear 、 Exponential 、 Peak-Hold
  - (8)Spectrum setup :
    - ▶ Frequency band : 50 、 100 、 200 、 500 Hz
    - ▶ Resolutions : 100 、 200 、 400 、 800 lines
    - ▶ Windows : Hanning 、 Flattop 、 Rectangular

**BENSTONE**  
Condition monitoring

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# TurboStar

**Turbomachinery condition monitoring & analysis system**



**BENSTONE INSTRUMENTS, INC**

32905 Northland Court- St.Paul,MN 55045

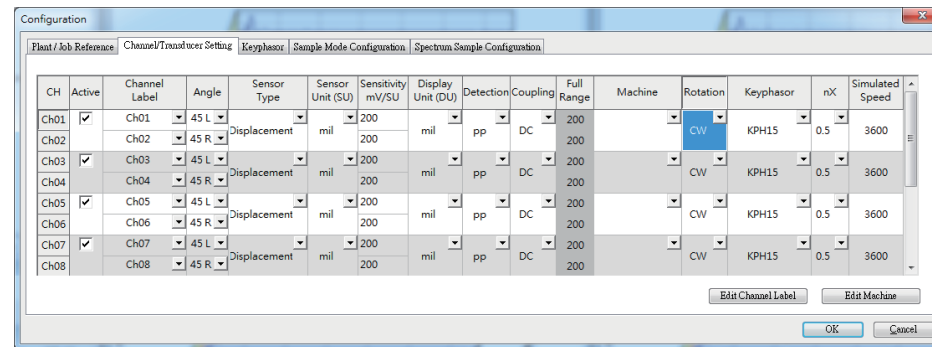
Tel : 651-257-6500 Email : info@benstone.com



## Introduction

TurboStar is built around your need of monitoring and analyzing the health condition of your turbomachines. Choose either 14, 22 or 30 channel systems based on your measurement requirements. TurboStars' powerful software measures many important functions, such as Bode plot, polar plot, orbit, filtered orbit and the shaft centerline (and more), providing necessary information to engineers who conduct analysis on the machines. User interface is simple yet powerful making complicated measurement setups easy and fast.

Example of channel/ transducer Setup display



## Powered by SQL database ( Structured Query Language )

TurboStar uses SQL database for storing measured data. During a measurement, each measured data is automatically saved to the database once measured. This prevents any loss of data due to accidental system shut down. TurboStar and SQL database support long time and large data sizes without slowing down system performance.

## Support up to two tacho signal inputs

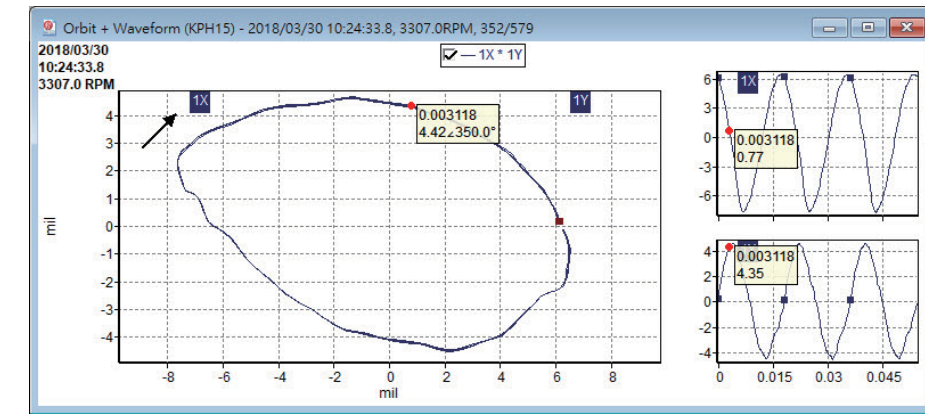
TurboStar allows you to connect up to two independent tacho signals at the same time. Based on the two different tacho signals, TurboStar can conduct two parallel calculations of order tracking and generate two sets of measured data at the same time. This feature is very useful when you need to measure two machines **before and after** their shafts are coupled.

## IEPE power and protection

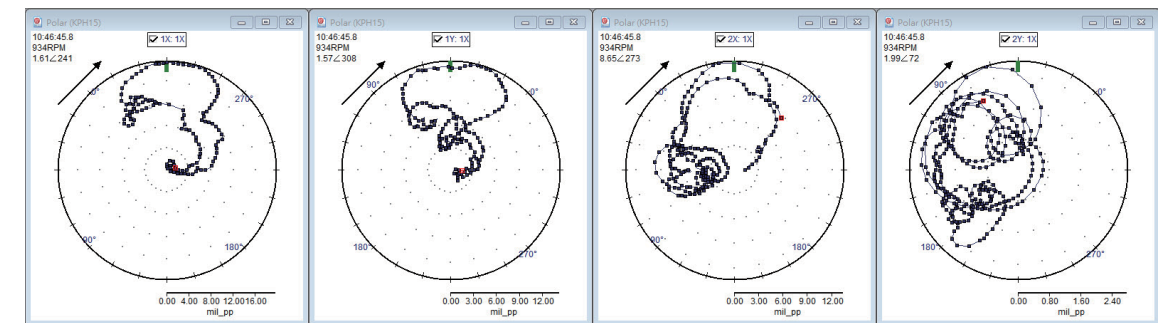
TurboStar provides IEPE power directly to your sensors from each input channel. To turn on the IEPE power, the user is required to enable IEPE power from both software and the IEPE power switch on the instrument. This feature provides additional protection and prevents the risk of tripping your protection system by accident.

## Accurate measured data

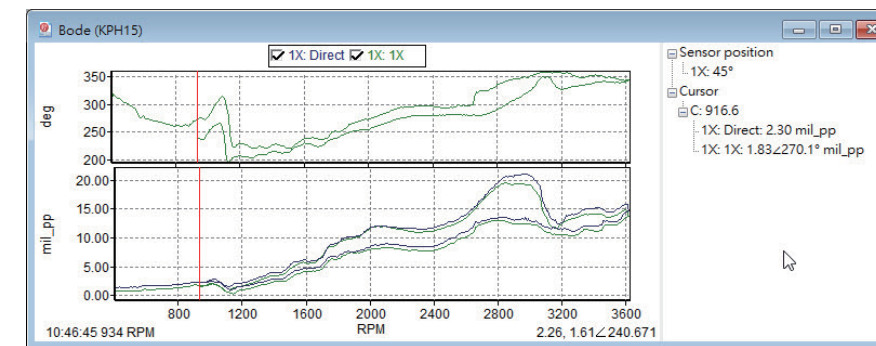
TurboStar is a field proven system providing accurately measured data. It adopts the algorithm of "high-spot absolute phase" for measuring vibration phases, which are identical with the results of other main products in this market. The accuracy of phase measurement is very important for engineers who conduct rotor balancing in the field.



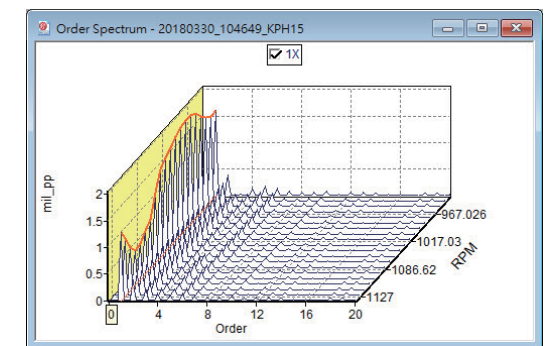
Filtered or unfiltered orbit and waveform plots



Polar plot



Bode plot



Waterfall plot

Tabular (KPH15) - 20180330\_104649\_KPH15

Record: 579/579, 2018/03/30 10:46:45.8, 934 RPM (15.6 Hz)

Channel Name	Gap (V)	Direct	Unit	1X Ampl.	1X Phase	2X Ampl.	2X Phase	nX Ampl.	nX Phase
1X	-8.156	2.26	mil_pp	1.61	240.7	0.39	272.8	0.00	NA
1Y	-9.219	2.27	mil_pp	1.57	308.4	0.33	67.6	0.00	NA
2X	-7.719	9.20	mil_pp	8.65	273.1	0.88	229.3	0.00	NA
2Y	-9.094	2.70	mil_pp	1.99	71.6	0.05	NA	0.00	NA
1A	NA	5.68	mm/s...	5.91	312.9	0.68	272.4	0.00	NA
2A	NA	1.59	mm/s...	1.59	180.3	0.07	NA	0.00	NA

Tabular data