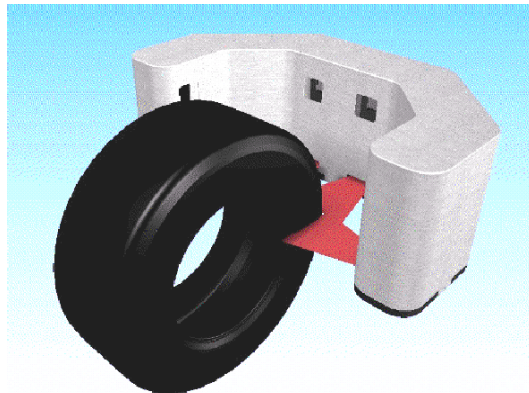




Bead-To-Bead Profile Measurement Using ByteWise Measurement Systems Profile Sensor Technology



ByteWise Bead-to-Bead
Profile Measurement System
Sensor Assembly

ByteWise Measurement Systems USA
1150 Brookstone Centre Parkway
Columbus, Georgia 31904

Dennis Reynolds
330.633.2253 Akron Office
706.593.3091 Mobile
dreynolds@bytewise.com

Bytewise Measurement Systems Bead-to-Bead Measurement Technical Description

Introduction

The Bytewise Sheet-of-Light Technology is implemented in a configuration specialized to acquire precise bead-to-bead profile data and key dimensional values for non-rotating inflated tires.

System Description

The System consists of five sensors with a stainless steel mounting frame, PC, cables, power supply, and software. This multiple-sensor system is for measuring the outside profile of the tire.

Sensors

The system utilizes high-resolution industrial sensors and laser light sources to measure the profile of the tire. These sensors and light sources are assembled into complete assemblies that are calibrated and tested at Bytewise. Multiple sensors are combined to configure systems for wider fields of view. Sensors are 200mm in nominal width.

Tire Size Range

The system is configured in two sizes, one for passenger and LT tires, and a second for passenger, LT, and truck/bus tires.

C-Frame Assembly

Sensors are mounted into a C-Frame Bracket Assembly. The Buyer shall mount the Assembly in a way that it can be positioned to view the inflated tire. This Assembly includes a mounting back plate with sensor alignment screws, and stainless steel cover.

PC

The sensors are wired to a PC. The PC includes an Ethernet port for connection to the network or another PC. The User should also provide a CRT or LCD Display to view the measurement results and configure the system. The PC handles the real-time sensor data acquisition and data reduction.

Cycle Start and Stop

The User will trigger the measurement cycle from the keyboard.

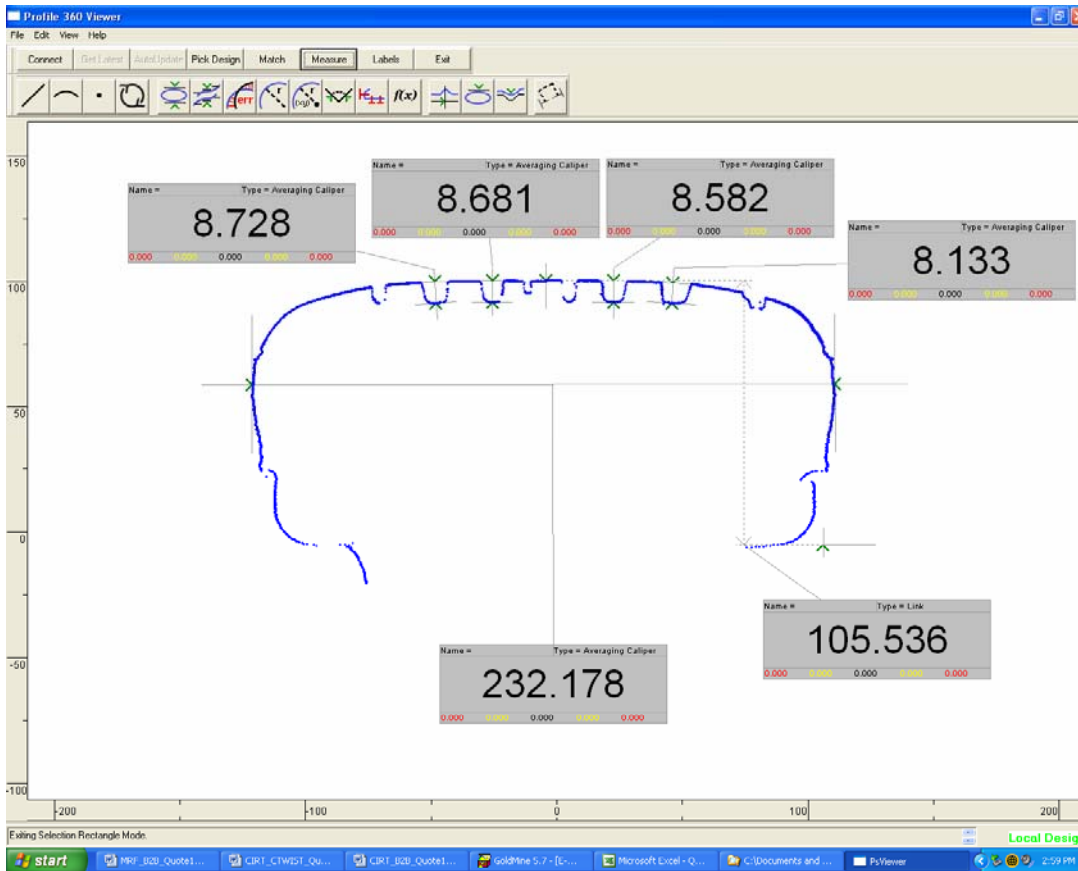
Data Viewer

The Bytewise system includes the standard Profile Viewer software that allows visual display of the profile and the use of measurement calipers.

Bytewise Measurement Systems

Bead-to-Bead Measurement

Technical Description



Data Viewer Example

Data Output

The system supports data output to external PC applications. Profile data can be output via any of three methods:

1. **Export to AutoCAD** – This creates a .dxf file consisting of all measure points. The export command is executed from the Profile Viewer Utility. The User can import the Profile Data into AutoCAD for analysis to extract the desired measurement values and compare the measured profile with the design target.
2. **Export to EXCEL** – This creates a .txt file consisting of tab delimited x and y numbers. The file can be opened in EXCEL, MiniTab, or any other spreadsheet software to display the measure points in rows and columns. The User can import the Measurement Point Data into a spreadsheet for analysis to extract the desired measurement values.
3. **PsServerApi** – Profile Data can be automatically retrieved from the B2B system in real-time via an API call function. PsServerApi provides an easy way to get measurement data from the PsServer in real time, from a C++ program. This permits the User to implement automated schemes with external systems using the real-time B2B data output. The profile data consists of:

Bytewise Measurement Systems Bead-to-Bead Measurement Technical Description

- A count of the number of data points
- An array of X values
- An array of Y values
- A tag number indicating profile sequence

Calibration and Registration

Sensors are factory calibrated. A Registration Fixture is provided to register the sensors into a common coordinate system. The software includes a routine that controls the laser source, collects the profile image, extracts the reference points, and corrects their positions based on registration standards. The Registration Fixture is certified and NIST (National Institute of Standards and Technology) traceable. It is shipped in a protective box. Bytewise uses a regional measurement lab as a contractor for the certification of these devices. Should a re-certification of the Registration Fixture be desired, it can be done by any certified metrology lab.

Specifications

- Accuracy: 0.4 mm
- Laser Class: IIIa
- Sampling rate: 5 Hz