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Ballbar Trace user guide

F-8014-9029-01

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Ballbar help

General help and information for QC20-W ballbar can be found in the Ballbar 20 online help. This user guide is provided in addition to the Ballbar 20 online help to give information on Ballbar Trace software only.

Safety Information

The ballbar system is used to test machine tools. As such, the user will need to prepare and run a part program which moves the machine as required. It is assumed therefore that the user is thoroughly familiar with the operation of the machine tool and its controller and knows the location of all emergency stop switches. Also, if it is necessary to operate the machine with the guards or any safety feature removed or disabled, it is the responsibility of the operator to ensure that alternative safety measures are taken in line with the machine manufacturer's operating instructions or relevant codes of practice. Safety procedures should be in accordance with the user's risk assessment.

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Introduction

Ballbar Trace is a time based data capture software package for the Renishaw QC20-W ballbar which is used to verify the positioning performance of CNC machine tools. The software is free of charge to existing QC20-W users and opens up many new applications including static monitoring and data capture for ISO 10791-6.

ISO standard 10791 specifies the test conditions for machining centres with 4 or 5 axes. Part 6 of ISO 10791 documents kinematic verification tests for machines with a tool centre point option, which can be completed using a ballbar.

XCal-View release 2.3 software will provide users with the ability to examine and interrogate captured Ballbar Trace data. It also allows instant reporting to the ISO 10791-6 format.

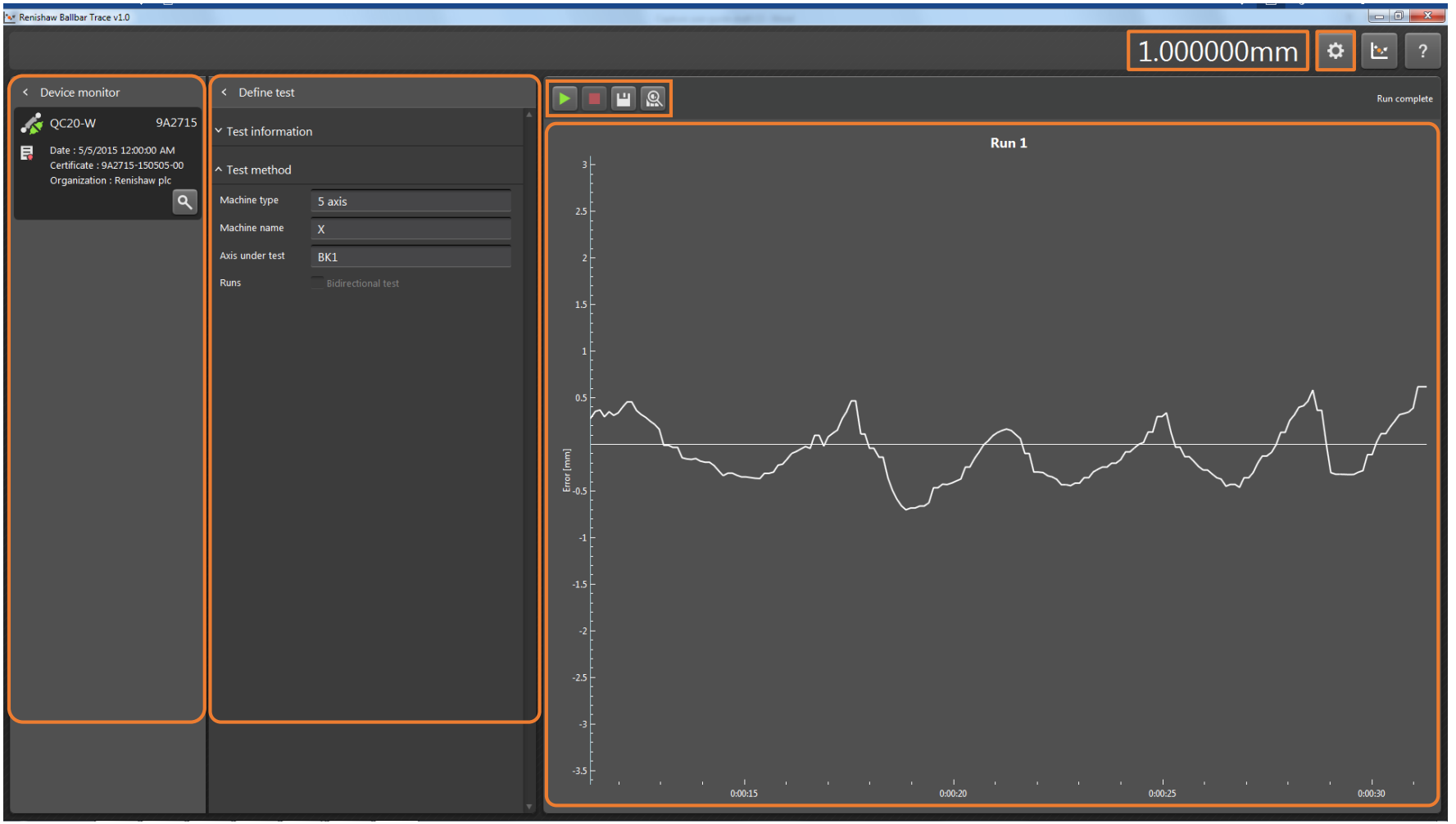
Further development of Ballbar Trace will follow to extend functionality further.

Ballbar Trace

Visual contents

Use the visual contents below to easily navigate through the Ballbar Trace user guide. Each area of interest is highlighted by an orange box. Left mouse click within a box to jump to the section of the user guide that corresponds to that area.

Return to this page at any point by clicking the Ballbar Trace icon in the top right of each page.



Operating information

Settings

The ‘settings’ window determines the measurement units that data is captured in.

Digital Read Out

The ‘digital read out’ provides a real time display of readings over the measurement range of the Ballbar (1mm to -1mm). The ballbar does not require ‘calibrating’ before a test as it is measuring the relative deviation from the start position, rather than the exact length.

Device monitor

The device monitor displays information about the status of connected ballbars. The connection status symbols are as follows

Device connected and streaming data

Device connected but in sleep mode (please see the General information section for more information)

Device not connected

Define test

Ballbar Trace has the ability to capture two test types, Unidirectional or Bidirectional (when the bidirectional box is checked):

- Unidirectional – Capture data in a single toolpath direction.
- Bidirectional – Capture data in two toolpath directions. Each toolpath is denoted by a feed-in and feed-out of the Ballbar.

Ballbar Trace

Test controls

Run test

To run a test click the green ‘play’ symbol. This only becomes available once the test has been defined (shown by an illuminated play symbol). The test will start only when the ballbar feeds in (please see the Feed in/out Section for more information).

Stop test

To stop a test click on the red ‘stop’ symbol or feed out the device. A test cannot be restarted once it has been stopped.
Once a test has been stopped the ‘Save’ and ‘Analyse’ buttons will illuminate.

Save test

The ‘save’ button will open up a file browser to allow the user to save the data.

Analyse test

The ‘analyse’ button will launch XCal-View (if installed) to analyse the data.

Real-time graphical display

Once a test has been started it will plot the data from the ballbar against time.

General information

Ballbar power saving mode

The ballbar will move into power saving mode if it is connected but remains unused for approximately 2 minutes. Alternatively, power saving mode can be activated by the user by clicking on the digital read out.

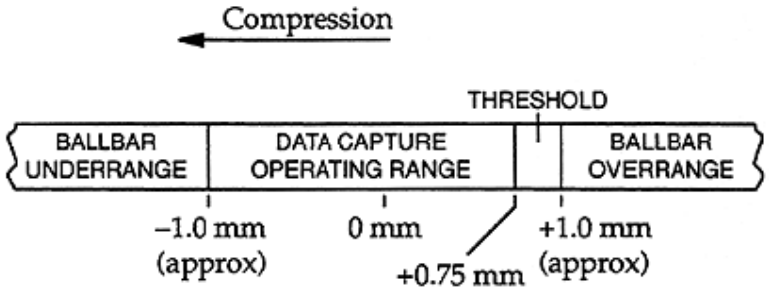
When the ballbar is in power saving mode the digital read out will dim and the unit LED will flash green slowly. Please click on the digital read-out to continue live data streaming.

Feed in/out

Feed in is the linear movement that compresses the Ballbar transducer into its data capture operating range. Feed out is the linear movement that extends the transducer out from its operating range.

The feed in movement is used to trigger the software at the start of a data capture run. As soon as the software sees that the transducer has been compressed into its data capture operating range, the software starts capturing data.

The feed out movement is used by the software to stop capturing data.



Ballbar Trace

The feed in and feed out movements are typically around **1 to 1.5 mm** and should be the same length. Renishaw recommends using a feed in/out value of 1.5mm for all tests using a 100mm or greater ballbar.