Title: MACHINING PROCESS MONITOR

Abstract: The invention concerns a manufacturing process monitor, in particular a machining process, and a method of multi-parameter data acquisition and analysis for process diagnostics. Multiple sensors (14, 16, 18, 20, 22) are attached to a machine tool (2) to monitor a plurality of machining parameters including machine power consumption, acoustic emissions, vibration, power and force. During each operation the sensor outputs (24, 26, 28, 30, 32, 34, 38, 40) are repeatedly sampled (36) and processed (46) to provide a signature (54) characteristic of the operation. The data is analysed to determine the limits of a normal machining operation, including the condition and status of the tools (6) and equipment (2). By storing the signatures (50) for a large number of operations of known "normal" and "abnormal" outcomes a data population is created with which new signatures can be compared and a diagnostic indication (54) produced. Warnings of abnormalities and abnormal events, such as tool damage, may be produced automatically and in real-time.