Equipment operation monitoring and data analysis
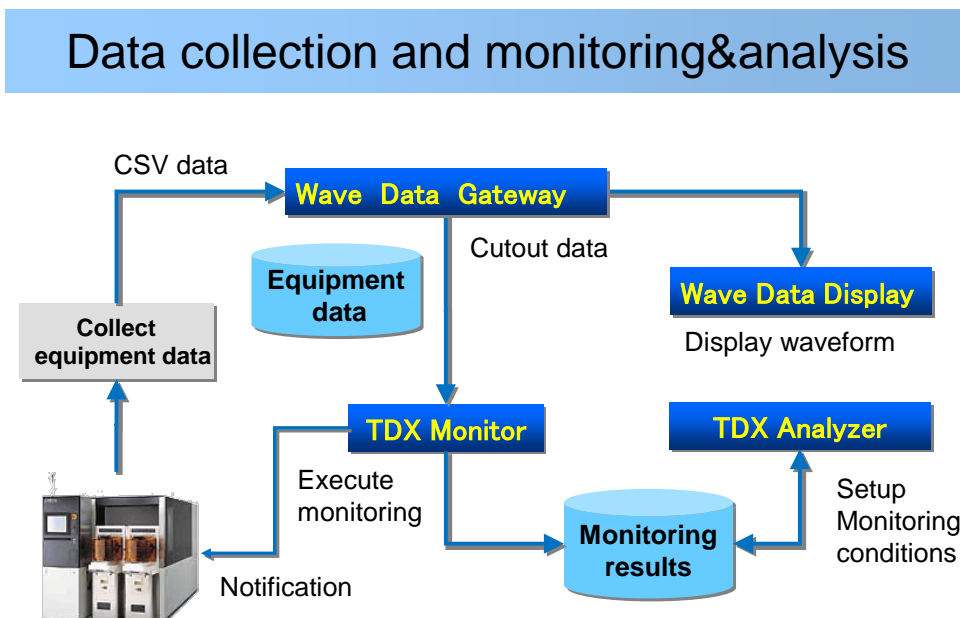
Tool Data eXplorer(TDX)

TDX is an equipment operation monitoring / data analysis tool for production lines.
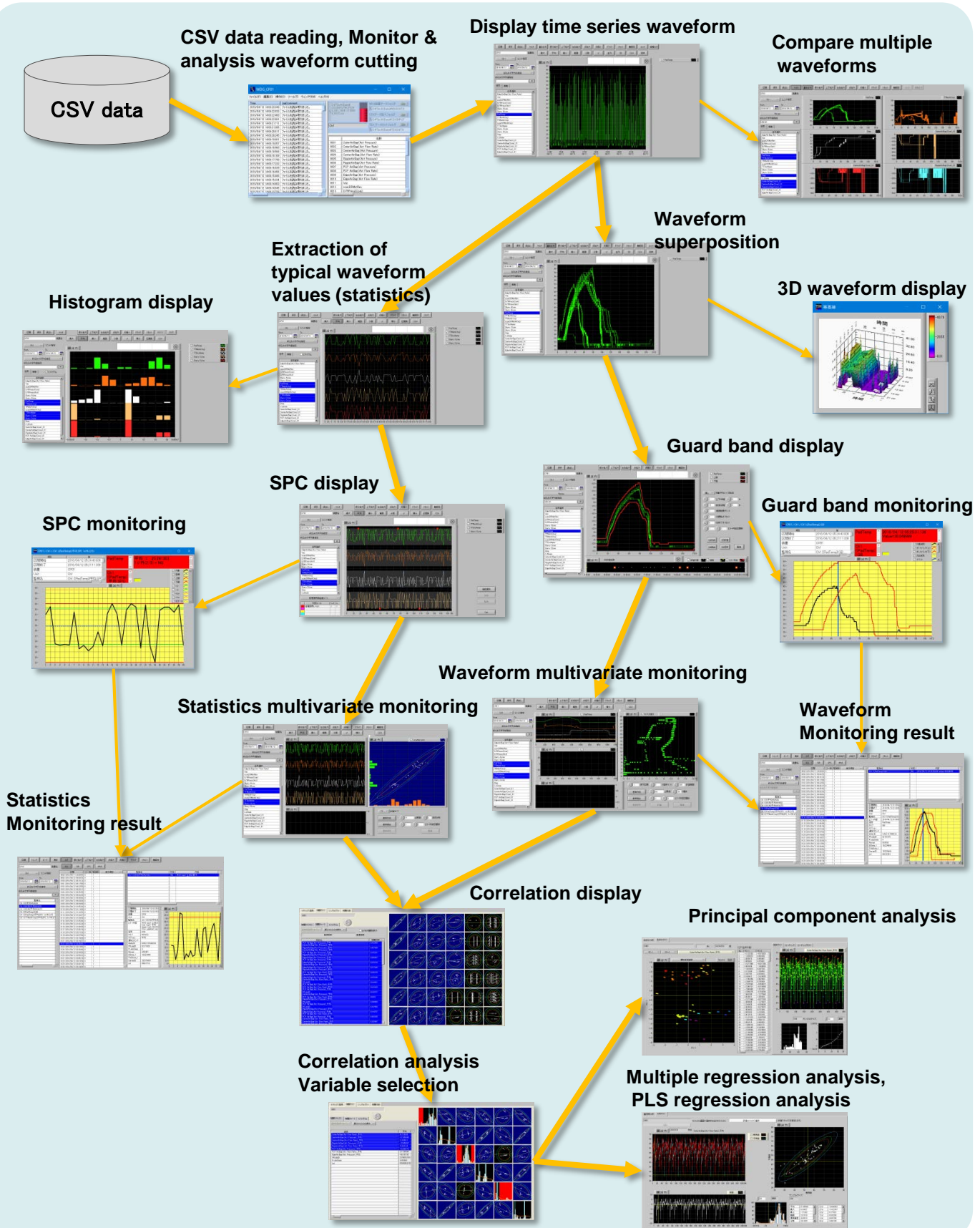
Application ・ Stable operation of manufacturing equipment
・ Failure prediction, production line quality assurance
・ Efficient equipment maintenance
・ Cause analysis of equipment-related quality defects

Features ・ Equipment CSV data reading
・ Extracting and overlaying high-resolution waveform data
・ Monitoring and notification, Numerical processing of wave data
・ Correlation analysis, multivariate monitoring
・ Commercial database not used

Configuration • Wave Data Gateway (WDG): Reads device CSV data.
・ Wave Data Display (WDD): Refreshes the waveform data.
・TDX Analyzer： Analyzes waveforms and setup monitoring conditions
・TDX monitor: Executes a monitoring analysis model and notifies an abnormality.
・ Equipment data collection system: Out of our support range.

Data collection and monitoring&analysis

Anomaly detection & failure prediction flow

CSV data

CSV data reading, Monitor & analysis waveform cutting

Display time series waveform

Compare multiple waveforms

Extraction of typical waveform values (statistics)

Waveform superposition

3D waveform display

Histogram display

SPC display

Guard band display

Guard band monitoring

SPC monitoring

Waveform multivariate monitoring

Statistics multivariate monitoring

Waveform Monitoring result

Statistics Monitoring result

Correlation display

Principal component analysis

Correlation analysis Variable selection

Multiple regression analysis, PLS regression analysis

Basic functions of TDX

Function	Description
Waveform refresh display	・Multiple waveforms are refreshed each time CSV data is read. ・Monitor the upper and lower limit values of the waveform.
Waveform cut and save	・Waveform extraction from CSV data. Specify multiple cutout conditions. ・Waveform interpolation, binary conversion, saving and automatic deletion.
Waveform display	・Waveform time series, overlay, parallel display, string specification narrowing. ・Waveform scaling, conversion, noise cut, 3D display, rise time synchronization. ・Machine difference display by overlapping different device and unit waveforms. ・ Automatic CSV output of waveform data. ・Text specified waveform narrowing display.
Waveform monitoring	・ Wave guard band monitoring. ・Guard band automatic creation & monitoring. ・ Specify noise cut, bandwidth, offset, and error detection conditions. ・ Evaluation of guard band performance in the past section.
Trend display	・Extract arbitrary statistics (maximum, average, minimum, range, σ, integral etc.) from the waveform. ・ Statistic trend display, histogram display, machine difference display. ・Statistical data automatic CSV output.
SPC monitoring	・ Statistics SPC display, WECO and JIS SPC rule support, Cpk trend display. ・ SPC monitoring. Batch SPC setting for multiple statistics. Multiple SPC monitoring rule settings. ・ Automatic SPC standard value creation & monitoring. ・Automatic standard value adjustment & standard value re-creation.
Multivariate display	・Correlation matrix display and correlation chart display. Multi-scatter plot / histogram display. ・Principal component analysis, multiple regression analysis, MTS (Mahalanobis Taguchi) analysis, Hotelling T2 / Q statistics analysis, PLS regression analysis, K-nearest neighbor analysis.
Multivariate monitoring	・ Statistics MTS monitoring, Hotelling T2 / Q statistics monitoring, K-nearest neighbor method monitoring. ・Waveform hoteling T2 / Q statistics monitoring, K neighborhood method monitoring.
Frequency display	・ Frequency filter, wavelet transform・ 3D display. Short-time Fourier transform. ・ Wavelet 3D waveform guard band analysis.
Abnormality notification	・E-mail transmission, FTP transmission, file output.

TDX operating environment
- ・ Windows 8 and 10 and compatible Windows Server and Tablet PC are not supported.
- ・ Server PC: Memory 16G or higher, Corei5, i7 equivalent or higher.
- ・ Storage is recommended for 3.5-inch SSD.
- ・ Client PC: Memory 4G or above, Corei5 equivalent
- ・ Display 1280x1024 or more
- ・ Data amount used: 20 to 30 bytes per device data point

Business

Development and sales of equipment monitoring analysis software and support for construction of process monitoring system

Main products: ・Tool Data eXplorer (TDX)

Business description: ・Sales and introduction support of TDX

Delivery record: ・ Semiconductor manufacturers, semiconductor equipment manufacturers, wafer manufacturers, steel manufacturers, food manufacturers
Automobile and auto parts manufacturer, functional material manufacturer, rubber product manufacturer

Sales agent： ・ Hitachi High-Tech Solutions Corporation
・ Mitsubishi Electric System & Service Co., Ltd.
・ Mitsubishi Electric Control Software Corporation
・ Ryoden Corporation
・ Canaden Corporation

Company Profile

Company name: Dura Systems Corporation
Established: September 18, 2003
Capital: 20 million yen
CEO: Kensuke Uriga
URL: www.dura.jp

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