OMRON

Sysmac Library for NJ/NX/NY Controller

SYSMAC-XR016

High-Speed Analog Inspection Library

Use PLC systems for high-speed analog inspections without special devices or PC

Issue 1 It is difficult to convert data collection and inspection programs for systems using special measuring devices and PC to those for PLC systems.

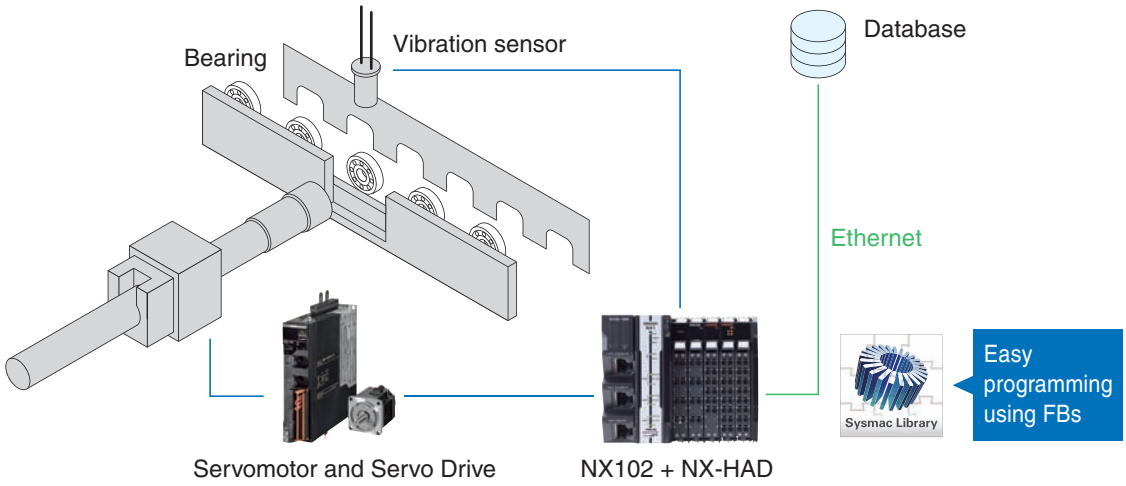
Issue 2 There is no knowledge of how to make judgments based on acquired analog waveforms in addition to feature values such as maximum values.

High-Speed Analog Inspection Library offers solution!

This library includes Function Blocks (FBs) that perform calculations for analog inspections, reducing PLC programming time and allowing PLC systems to be used for analog inspection machines.

System configuration

●Characteristic inspection of rotator



sysmac always in control

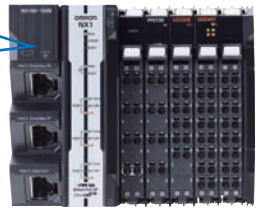
FBs in the High-Speed Analog Inspection Library reduce programming time and allow PLC systems to be used for analog inspection machines

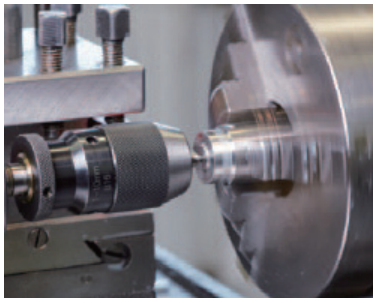
Collect: Data Recorder FB

Joins acquired analog data into a single array variable and creates log data in chronological order.

TimeStamp		CH1	CH2	CH3
375539985418	0	24	36	3
375540005418	20	21	14	0
375540025418	40	30	34	10
375540045418	60	12	8	-4
375540065418	80	8	0	-6
375540085418	100	6	18	-3
375540105418	120	0	30	-2
375540125418	140	1	35	6
375540145418	160	-4	13	4
375540165418	180	-6	23	1
375540185418	200	-1	18	9
375540205418	220	-10	2	-1
375540225418	240	-12	13	-3
375540245418	260	-8	30	0

Measured data

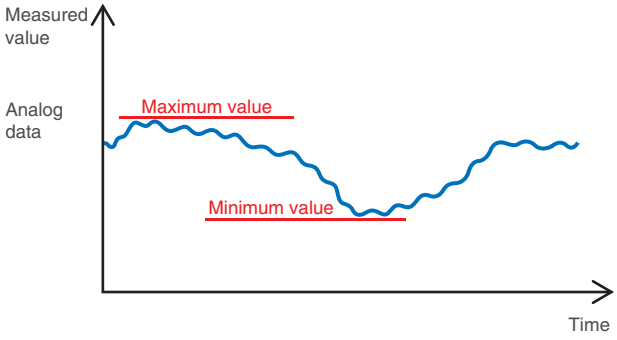




<Machine condition inspection>
In order to perform predictive maintenance of a machine, all control data is acquired, and data during normal operation is compared with data during abnormal operation.

Calculate: Feature Values Calculation FB

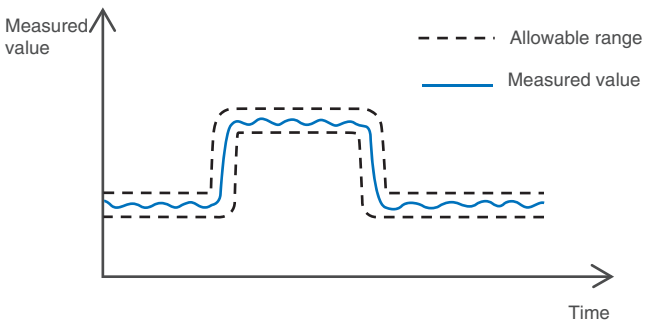
Calculates not only maximum values, minimum values, and other feature values but also standard deviations used for analog inspections.

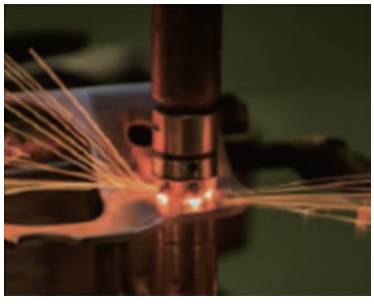


<Characteristic inspection of rotator>
Rotators (e.g., motors and bearings) are inspected whether future values including maximum and minimum rotation speeds satisfy the specifications.

Judge: Upper and Lower Limit Test FB

Checks whether measured values are within the allowable range of the test standard data. The measurement data of good products can be set as test standard data, and the allowable range can be set as desired.





<Welding quality inspection>
Welding voltage and current values are measured, and the waveforms are monitored to check if welding failure occurred.

Compatible Models

Name	Model	Version
Machine Automation Controller NJ/NX CPU Unit	NX701-□□□□/ NJ101-□□□□	Version 1.18 or later
	NJ501-□□□□/ NJ301-□□□□	
	NX1P2-□□□□□□(1)	
	NX102-□□□□	Version 1.30 or later
Industrial PC Platform NY IPC Machine Controller	NY5□□-1	Version 1.18 or later
Automation Software Sysmac Studio	SYSMAC-SE2□□□	Version 1.23 or higher
NX High-speed Analog Input Unit	NX-HAD□□□	Version 1.0 or later

Function Block (FB) Specifications

Name	FB name	Description
Device Output Data Binding	DeviceVariableToArray_***	Reads analog input values of one task period from the NX High-speed Analog Input Unit, and joins them into a single array variable.
Scale Transformation for NX-series High-speed Analog Input Unit	ScaleTrans_HAD	Performs scale transformation of data from the NX High-speed Analog Input Unit.
Upper/lower Alarm for NX-series High-speed Analog Input Unit	LimitAlarm_HAD	Monitors input data from the NX-series High-speed Analog Input Unit and issues alarms in terms of the top upper limit, upper limit, lower limit, and bottom lower limit.
Trigger Control	TrigControl	Generates trigger information, which allows the DataRecorder FB to start data logging.
Data Recorder	DataRecorder	Joins specified elements of array data into a single array variable every task period, and creates log data in chronological order.
Upper and Lower Limit Test	LimitTest	Checks whether each element value in the data array is within the allowable range of the test standard data.
Feature Values Calculation	CalcFeatureValues	Calculates the mean, standard deviation, skewness, kurtosis, maximum value, and minimum value for the test target data array.
Log Data CSV File Write	LogDataToCSV	Outputs the log data created in the DataRecorder FB as a CSV file (*.csv) to an SD memory card.
Log Data CSV File Read-Out	CSVToLogData	Reads out the log data recorded in the SD memory card from a CSV file to the LogData[] array variables as the test standard data for the LimitTest FB.

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