IMS Reconfigurable Watchdog Agent™ Prognostics Hardware Platform
Outline

• Background
• Hardware Platform
• System Architecture
• Hardware Specifications
• Application
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IMS Approach on Rapid Prognostics Prototyping

Problem definition & constraints

Tool selection

Prototyping & testing

Accepted?
Yes
Deployment
No

Parameter & tool determination

Program development

Evaluation

Yes
No
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Hardware Platform

How can companies work with IMS rapidly to develop a customized Watchdog Agent™ prognostics tools and system?

<table>
<thead>
<tr>
<th>Conditions and needs</th>
<th>Tool selection</th>
<th>Prototyping &amp; testing</th>
<th>Yes</th>
<th>Deployment</th>
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</thead>
</table>

No
Hardware Platform

How can companies work with IMS rapidly to develop a customized Watchdog Agent™ prognostics tools and system?

Conditions and needs → Tool selection → Prototyping & testing → Deployment

General purpose hardware
Hardware Platform

How can companies work with IMS rapidly to develop a customized Watchdog Agent™ prognostic tools and system?

Conditions and needs → Tool selection → Prototyping & testing → ? → Deployment

No

- Prototype hardware
- General purpose hardware

Yes
Hardware Platform

How can companies work with IMS rapidly to develop a customized Watchdog Agent™ prognostics tools and system?

- Conditions and needs
- Tool selection
- Prototyping & testing

No

Yes

Deployment

Commercialized hardware
Hardware Platform

How can companies work with IMS rapidly to develop a customized Watchdog Agent™ prognostics tools and system?

- Conditions and needs
- Tool selection
- Prototyping & testing

General purpose hardware
Prototype hardware
Commercialized hardware
Objectives

- Build reconfigurable prototype hardware platform
  - Test Watchdog Agent™ tools
  - Further understand how to customize for a specific application
- Evaluate potential commercially available system
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System Architecture

Sensor signals:
- Vibration
- Temperature
- Pressure
- Current
- Voltage
- On/Off
- ...

Embedded software:
- Watchdog Agent™ tools
- Database
- Web server

Embedded OS

I/O cards

Embedded computer

Remote PC

Client software
Outline

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Hardware Requirements

- Signal type
- Tools selected
- Working environment

- Analog input
- Digital input
- Second Ethernet port
- RS-232/485/422

- CPU
- System memory
- Storage

- Temperature range
- Water proof
- Fanless design
Reconfigurable Prototype Hardware

- PC104 architecture
- VIA Eden 400 CPU, 128MB MEM
- DAQ features
  - 16-channel, 16 bit 100KHz analog input
  - 4-channel analog output
  - 24 DI/DO, 2 counter/timers
- Dual network interface
- Spindle-free storage (no HDD)
- Fanless design
- Extended temperature range
Reconfigurable Prototype Hardware

Expansion capacity
Applications....

Expansion capacity
Commerically Available System

- Rockwell Automation
- Advantech
- Omron
- Siemens
- ETAS
- National Instruments
- Yokogawa
- etc.
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Application on Smart Machine Tool
Application on Smart Machine Tool
Automated Tool Changer (ATC) Signals

1 tool changing process
Remote Monitoring and Health Performance Assessment

Demo for Smart Machine Tools

To plan specific tasks for the embedded intelligence.
Questions?
Thank You!

For More Information
Please visit:
http://www.imscenter.net