Nidec Motor Corporation

Cybersecurity in Motors and IIoT
Nidec Corporation

A Leading Global Manufacturer of Electric Motors and Controls

- Founded in 1973
- HQ: Kyoto
- $14.8B (2017 GROUP TURNOVER)
- $46.7B (Market Capitalization as of 4/1/2018)
Competing in "Everything that spins and moves"
Common Principles For All Products

• Detailed Design Process
  • 5-stage Gate process
  • Detailed business and technical feasibility study
  • Product safety and reliability plan
  • Supply chain plan
  • Manufacturing process flow chart
  • Rigorous design / code / safety reviews
  • Failure Mode Effect and Analysis (Design and Production)
  • Prototypes and pilot run
Common Principles For All Products

- Agency Approvals
- Quality Control Plan
- Cybersecurity review (where applicable)
- Software and hardware configuration management
- Externally accessible non-volatile data storage is encrypted (where applicable)
- Electronic component purchase only from authorized sources
- Rigorous vetting process in place for parts qualification and new supplier onboarding
Electronically Controlled Motors

- Provided as subsystem to downstream entities
- Modbus protocol used for local control – no internet access
- Bluetooth based smart phone app available
- Comprehensive security including time-limited access and multiple passwords for programming
FORECYTE™ Remote Asset Condition Monitoring (IIoT)
• System consists of sensors, gateway and cloud platform

• Sensor to gateway communications – IEEE 802.15.4 based protocol, AES-128 encryption

• Gateway to cloud communication – encrypted with TLS, using MQTT and HTTPS

• Cloud platform hosted on Microsoft Azure

• Data Privacy considerations
  • GDPR – ongoing compliance evaluation and assurance
  • CA Senate Bill 327 – effective 1/1/2020
Thank You

Pranesh Rao (pranesh.rao@nidec-motor.com)