N-AFE SOFTWARE-CONFIGURABLE ANALOG FRONT END FAMILY WITH UNIVERSAL ANALOG INPUTS

Software-defined factory is enabled by NXP's N-AFE analog front end. Beyond Industry 4.0

Manufacturing today is facing a significant transformation called Industry 4.0. Market demands such as increased product variability is changing the way traditional production is set. In order to meet these demands, a way to reconfigure production lines to a new run in a timely manner is needed to maintain profit margins. The ability of smart factories to reconfigure is key.

NXP's N-AFE analog front end targeting factory automation applications can be configured for different types of inputs such as voltage, current, resistance, RTD and more to enable a software-defined factory. Also, improved product quality is expected, and this is possible thanks to enhanced accuracy and precision. In addition, predictive maintenance is making it possible to identify issues before they occur to avoid downtime. NXP's N-AFE advanced diagnostics and anomaly detection features enable predictive maintenance for a successful smart factory.

RECONFIGURABILITY

RECONFIGURE A SMART FACTORY AND ADJUST SETTINGS BASED ON SHIFTING MARKET NEEDS
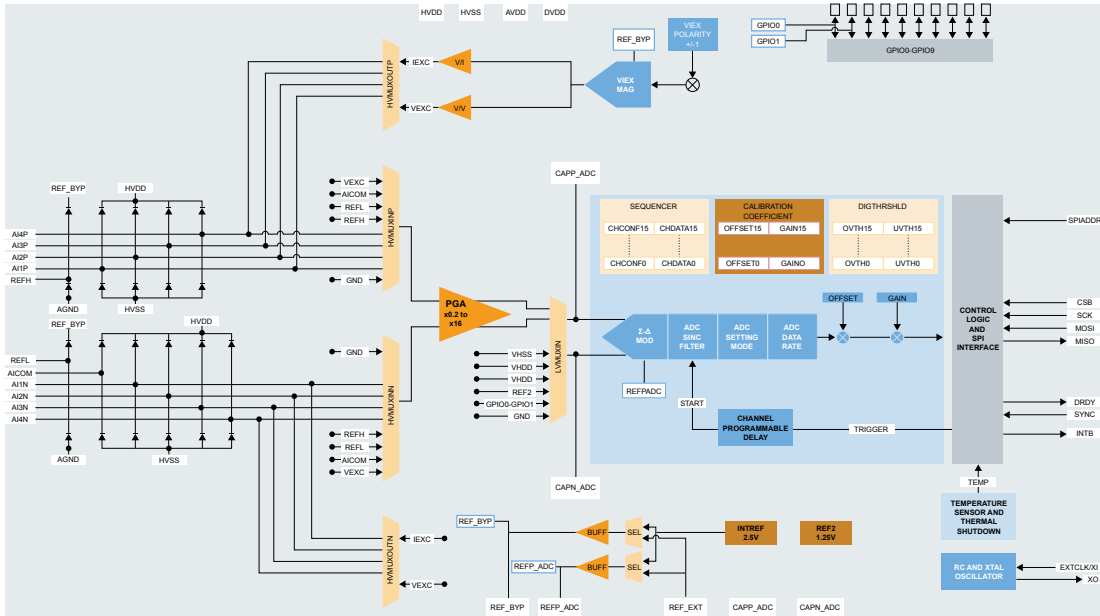
ACCURACY AND PRECISION

IMPROVED PRODUCT QUALITY THANKS TO ENHANCED ACCURACY AND PRECISION

PREDICTIVE MAINTENANCE

DIAGNOSTICS AND ANOMALY DETECTION TO IDENTIFY ISSUES BEFORE THEY OCCUR

N-AFE BLOCK DIAGRAM
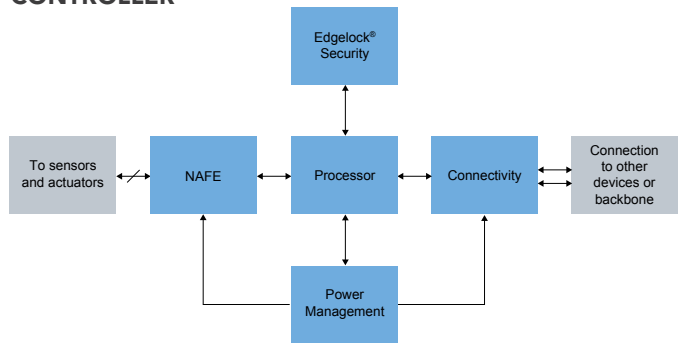

FAMILY PRODUCT FEATURES

- Up to 8 software-configurable channels
  - Voltage, current, RTD, thermocouple
  - +/-0.15 to +/-12.5 ranges for single-ended signals
  - ±40 V protection to miswiring
- High accuracy
  - 0.002% system accuracy at room
  - 0.05% system accuracy over temperature
  - 10 ppm max system level non-linearity
- High precision, 180 dB dynamic range
  - 17-bit ENOB at 7 us/reading for single input
  - 17-bit ENOB at 36 us/reading for multi-input
  - 1.0 uVrms noise at 2.25 ksps
  - 0.2 uVrms noise at 60 sps and 50 sps
- Fast and flexible data acquisition
  - 20 us/reading for multi-inputs
  - Fast and configurable sequencer to offload EP
  - Fast and flexible reading modes
- Digital factory calibration and self-calibration
  - 24-bit wide x 48-word deep NVM for calibration coefficients
  - Internal sources for system self-calibration

- Advanced protection and diagnostic
  - Supplies monitoring, UVLO, OVD on signal path
  - Redundant voltage reference and temp sensor
  - BIST for complete signal path monitoring and for failure and aging prediction

Part Number	Description
NAFE11388 / NAFE71388	Low Power / High Speed Universal 8-input ± 25 V AFE
NAFE13388 / NAFE73388	Low Power / High Speed Universal ±25 V 8-Input AFE with excitation sources
KITNAFE11388 / KITNAFE13388	8 Channels Universal Input AFE Evaluation Board
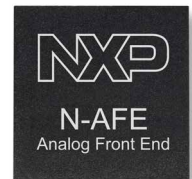
SYSTEM SOLUTION FACTORY AUTOMATION CONTROLLER