PRACTICAL DESIGN TECHNIQUES FOR SENSOR SIGNAL CONDITIONING

SENSOR OVERVIEW

- **Sensors:**
  Convert a Signal or Stimulus (Representing a Physical Property) into an Electrical Output

- **Transducers:**
  Convert One Type of Energy into Another

- **The Terms are often Interchanged**

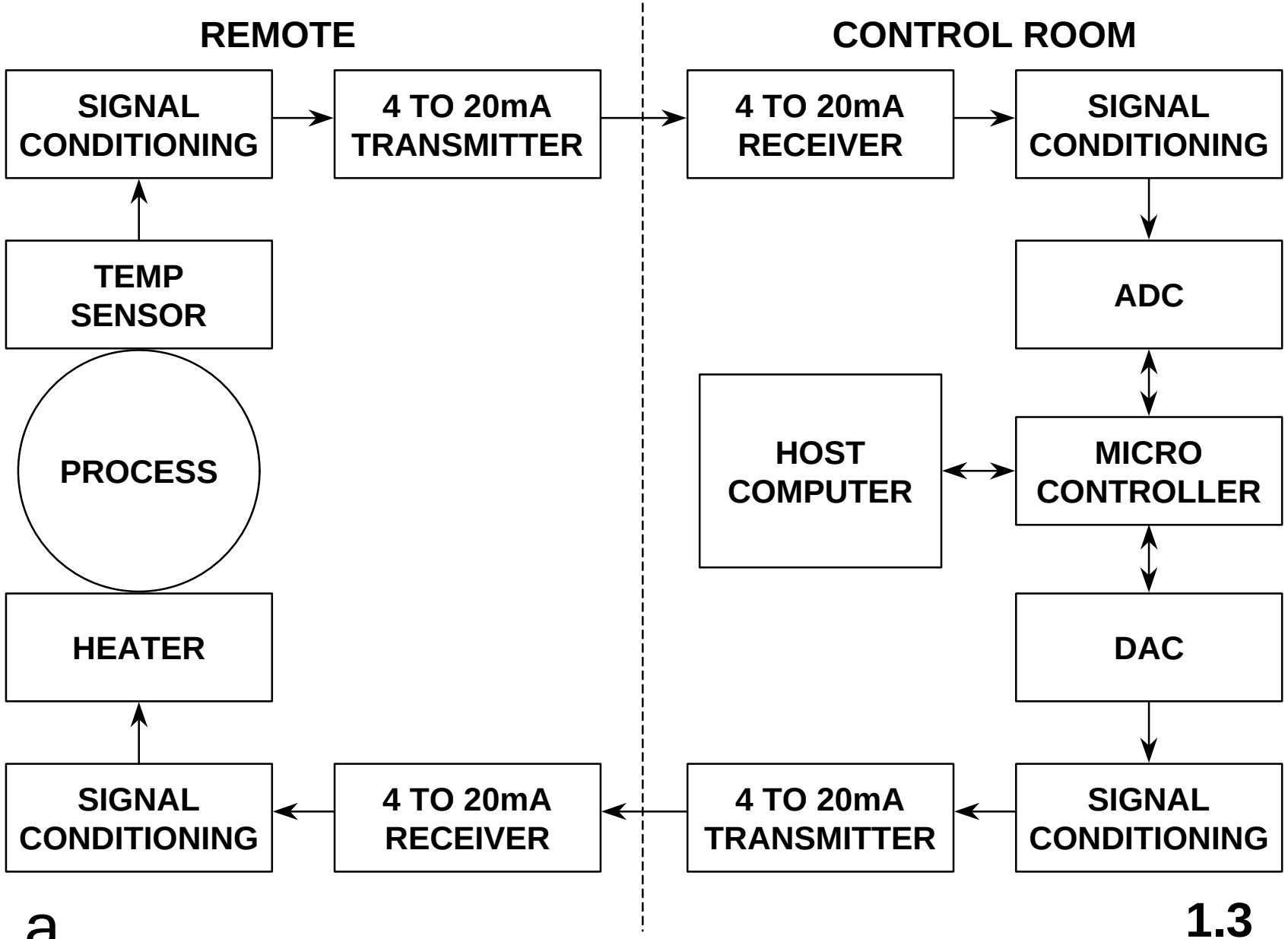
- ***Active* Sensors Require an External Source of Excitation:**
  RTDs, Strain-Gages

- ***Passive* (Self-Generating) Sensors do not:**
  Thermocouples, Photodiodes

TYPICAL SENSORS AND THEIR OUTPUTS

PROPERTY	SENSOR	ACTIVE/ PASSIVE	OUTPUT
Temperature	Thermocouple	Passive	Voltage
	Silicon	Active	Voltage/Current
	RTD	Active	Resistance
	Thermistor	Active	Resistance
Force / Pressure	Strain Gage	Active	Resistance
	Piezoelectric	Passive	Voltage
Acceleration	Accelerometer	Active	Capacitance
Position	LVDT	Active	AC Voltage
Light Intensity	Photodiode	Passive	Current

TYPICAL INDUSTRIAL PROCESS CONTROL LOOP



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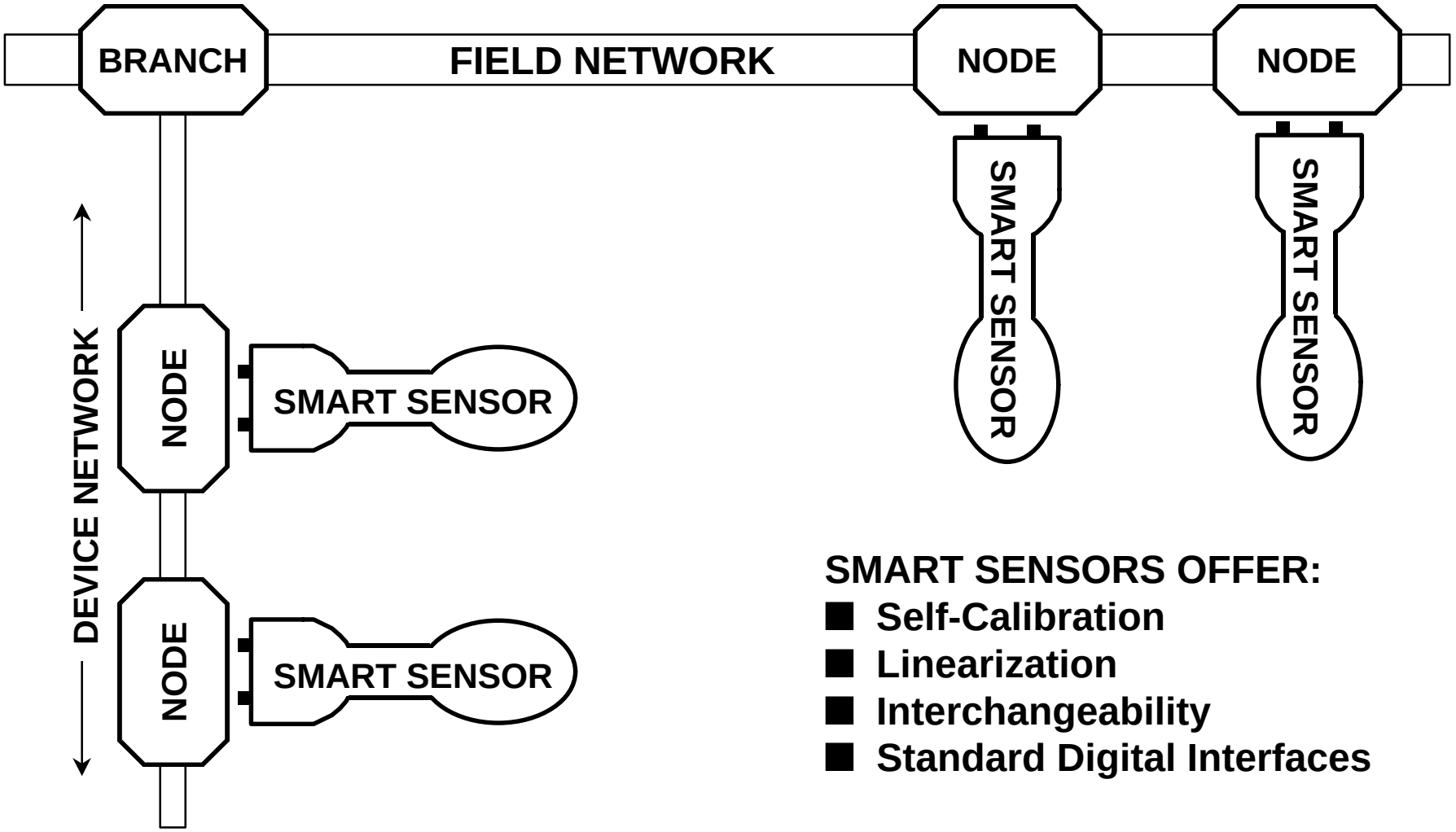
STANDARDIZATION AT THE DIGITAL INTERFACE USING SMART SENSORS



SMART SENSORS OFFER:

- **Self-Calibration**
- **Linearization**
- **Interchangeability**
- **Standard Digital Interfaces**

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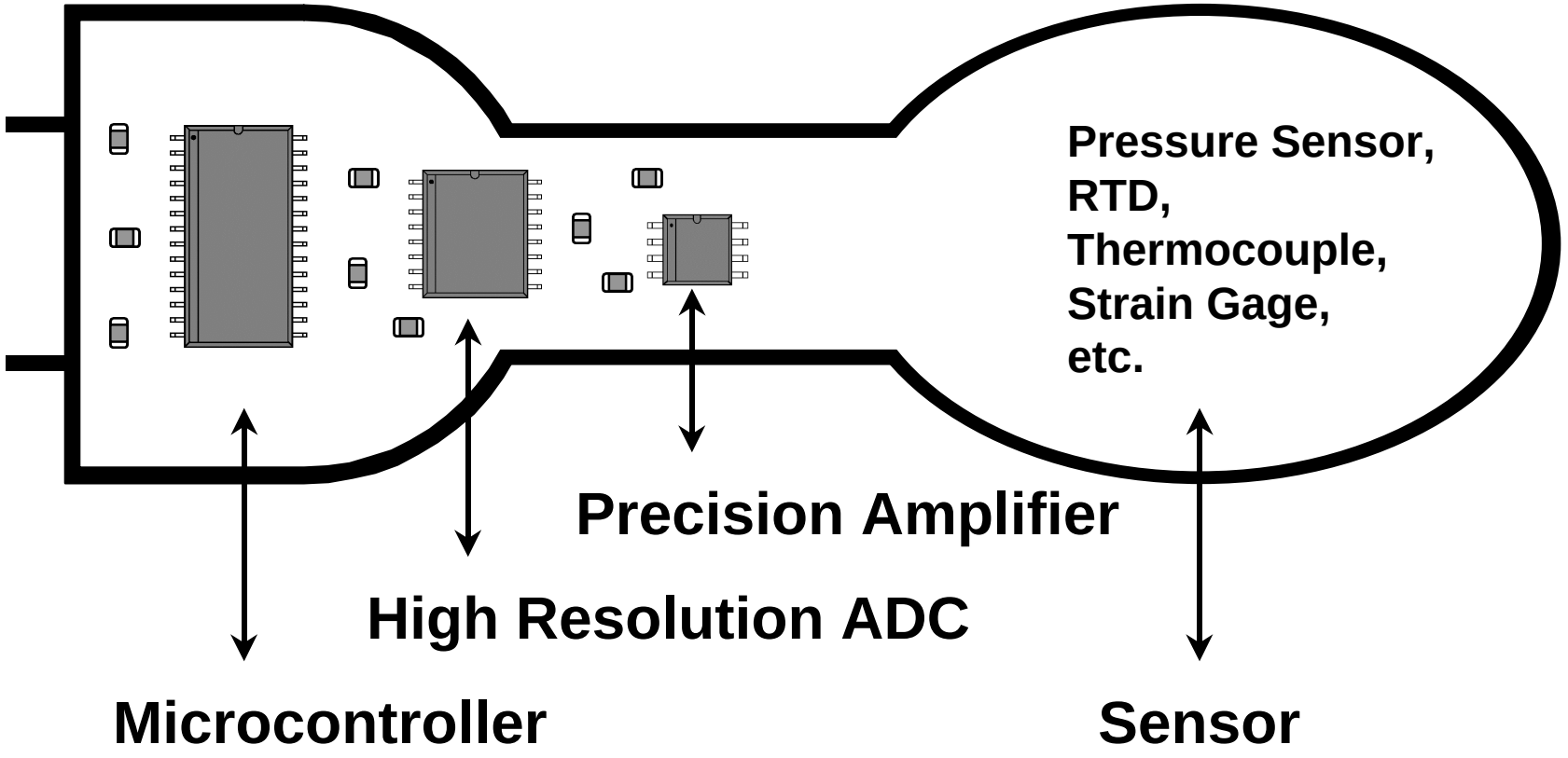
BASIC ELEMENTS IN A "SMART" SENSOR



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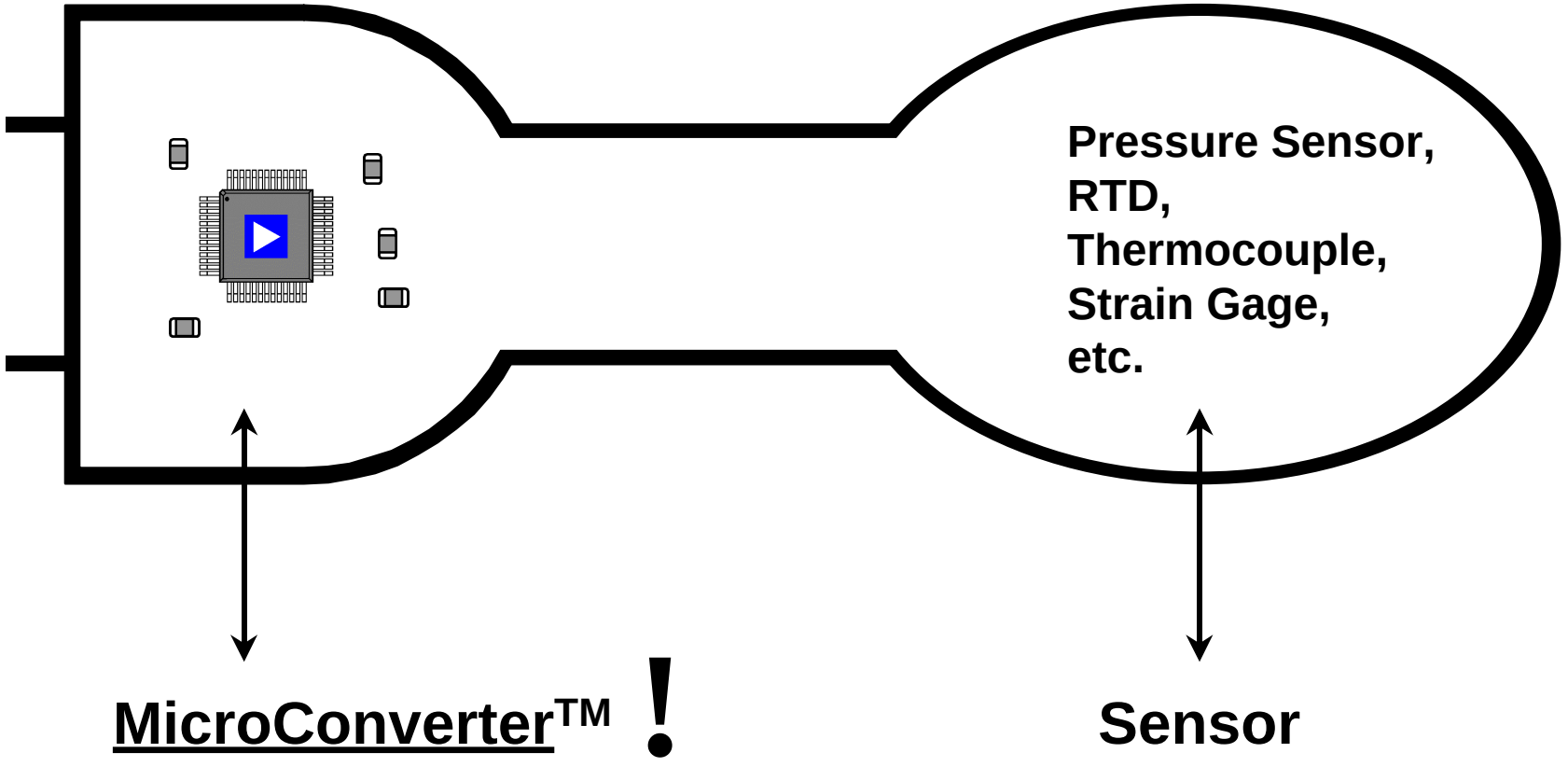
THE EVEN SMARTER SENSOR



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