BROCHURE
The Essential Telemetry (ETM) ASIC

The ETM ASIC autonomously performs the following tasks as soon as power is supplied:

- Sequential scanning and sampling of discrete analog (voltage or temperature) & digital inputs.
- Convert the analog inputs to digital values.
- Format the sampled data into space packets.
- Sampling time reference included in packet (optional).
- Output the sampled formatted data either through CAN or PacketWire IF.
- Operating modes: Stand-alone (STD); Cascaded (CSC) or Remote Terminal (RTU).

Product Highlights

- Internal Clock Oscillator (Optional)
- 12-bit monotonic digitally autozeroed ADC.
- Up to 32 differential analog inputs (4, 8, 16 or 32 selectable) - (4 groups) independently configurable for voltage or temperature measurements.
- Both PRTs & NTCs temperature sensors supported.
- 16 differential digital inputs.
- Synchronous/Asynchronous (event driven) sampling.
- Various sampling frequencies supported (20 mHz - 4 KHz).

Key Characteristics

- 0.25µm IHP SiGe Fabrication Technology.
- Single power supply 3.3V (internal voltage regulator).
- Low power consumption (**15 mW**).
- Wide Temperature Operating range (-55 to 125 deg C).
- Rad-hard up to 1 Mrad.
- Immune to SELs at 67 MeV/mg/cm^2.
- No SEFIs up to 67 MeV/mg/cm^2.
- SEU LET threshold between 32 and 40 MeV/mg/cm^2.
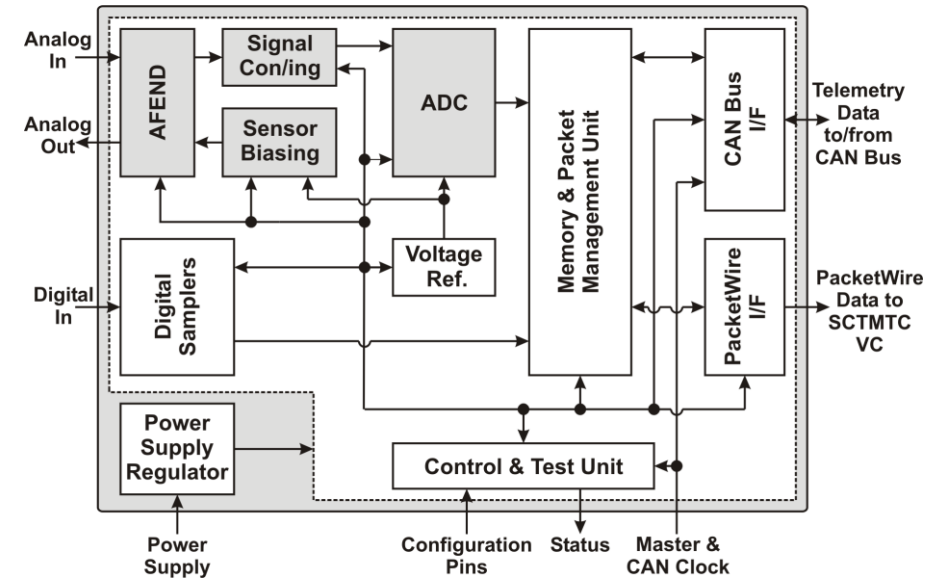
Applications

- Essential Telemetry Collection without software support for on-board computers/instruments control units.
- Spacecraft autonomous analogue to digital conversion and data collection.
- Remote Terminal Unit (RTU) in space data acquisition systems.

Analog Measurements with the ETM ASIC
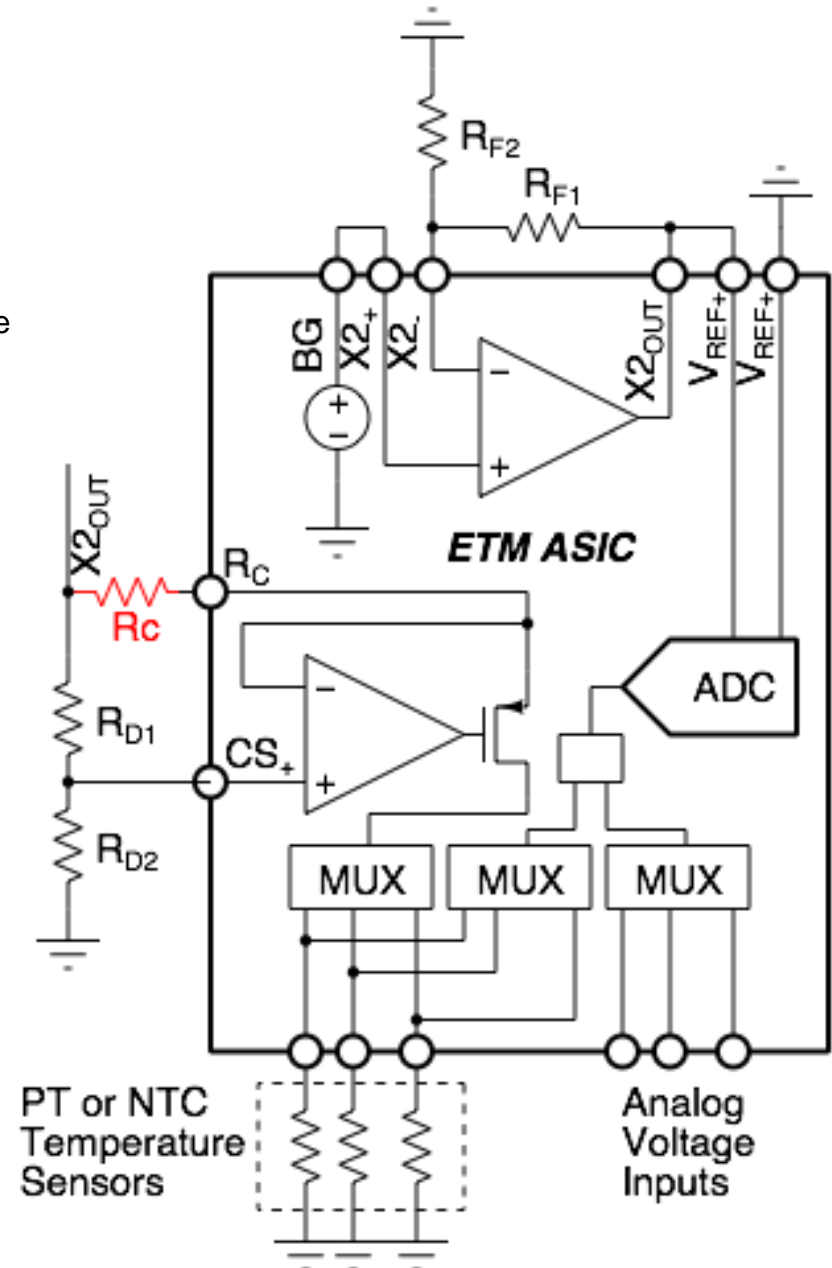
Voltage Measurements

- The ETM ASIC contains internal precision bandgap voltage reference
- The voltage reference is amplified (user defined gain through R_{F1} and R_{F2}) and is applied to the ADC.
- The internal voltage reference can be by passed. In this case the user can provide reference either to the input of the amplifier ($X2+$) or directly to the ADC (V_{REF+}).

INL curve at:
-55, 25 and 125 deg C
with internal voltage reference
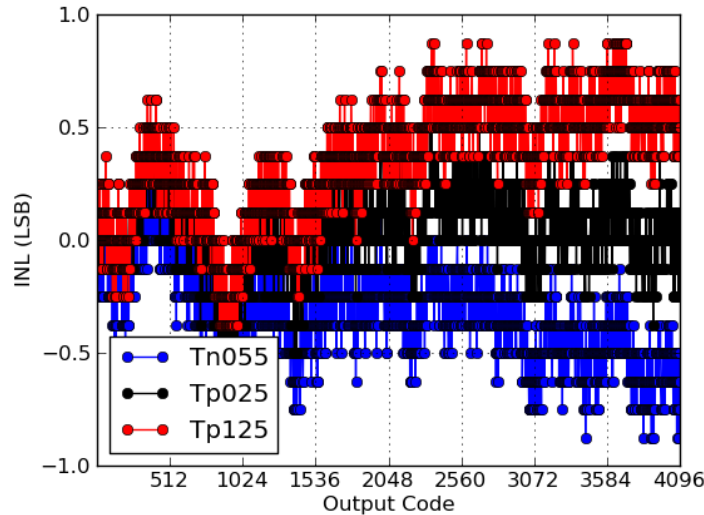
Temperature Measurements

- Ultra-stable (power supply and temperature independent) current source is used to provide a constant current to either a PRT or NTC temperature sensor.
- The voltage developed on the sensor is quantized by the ADC.
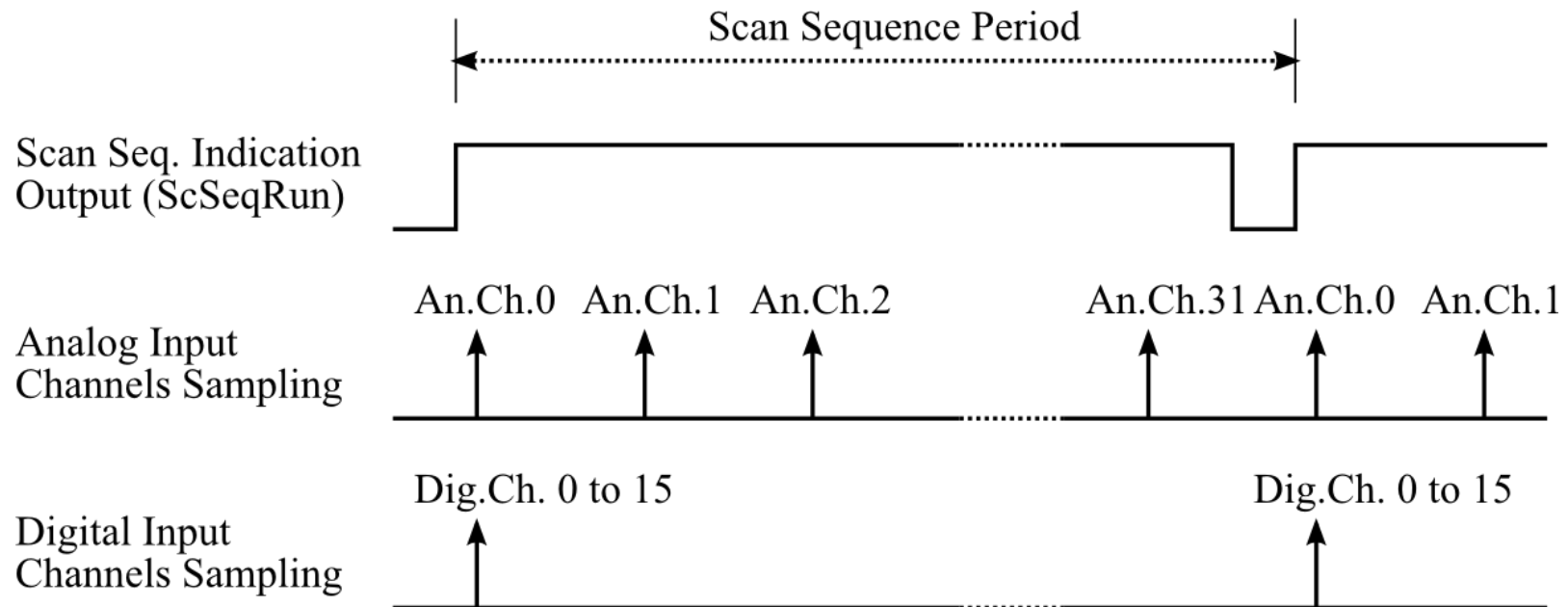- Low temperature coefficient (20-50 ppm/degC) external resistor (Rc) is required.

Sampling Configurations

Temperature Measurements

- Number of sampled channels and sampling period can be independently configured.
- Channels grouped to 4, 8, or 16

Digital Interfaces of the ETM ASIC

CAN Interface

Consists of:
- CAN Controller
- CANopen Module
  - NMT
  - Heartbeat
  - SDO
  - Object Dictionary
- LDUT data unit for space packet transmission

The following parameters can be programmed
- ➢ Scan Sequence Period
- ➢ Synchronous/Asynchronous Sampling
- ➢ Nominal or Event driven Sampling

PW Interface

- Used in essential telemetry applications
- All parameters are set by hard pins