

# RangeMaster2 Solution For RFID Tag Readers

Anadigm's RangeMaster2™ is the second in a family of RFID reader solutions for Universal UHF RFID Tag Reader Systems. The RangeMaster™ chipset family provides the industry's first solution that allows system vendors to design and maintain a single "universal" reader that can be customized to read different radio frequency identification (RFID) tag types, with different modulation schemes and frequencies. RangeMaster2™ fully supports EPC Global Gen 1 and Gen 2 (class 0, 1, 2) and ISO18000-6, 14443, 15693 standards.

RangeMaster2™ is a 3.3volt two-chip solution that uses a customized Field Programmable Analog Array (FPAA) in conjunction with an RFID State Machine, enabling system designers to develop a universal RFID tag reader that can support multiple protocols and frequencies for Universal Fixed Readers, Portable/Handheld Readers, Combination Bar Code and RFID Reader/Scanners. By allowing standardization around a single printed circuit board to support multiple end products and markets, RangeMaster2™ simplifies and improves product development. This allows customers building RFID tag readers to greatly reduce their time to market, and offer a lower total cost of ownership.

## RangeMaster2™ Features

- Complete solution for a Universal RFID tag reader system
- Full support for EPC Global Gen 1/Gen 2 (Class 0, 1, 2) and ISO 18000-6, 14443, 15693 protocols
- Selectable sub-carrier frequency
- Read range and sensitivity optimization with variable gain
- Ability to calibrate reader to filter out background interference (i.e. fluorescent lighting)
- Programmable Standby Power Mode
- User-customizable signal processing:
- Choice of four different baseband analog signal processing circuits, Universal, EPC Gen 2 (twin or Triple) or Class 0.
- Select from 3 predefined background frequency filter values
- Select the gain of the analog circuit to optimize the range and sensitivity of your reader
- Select from 16 predefined values of the upper and the lower sub-carrier frequencies
- Digital or analog output

## System-Level Overview

### RangeMaster2™ Benefits

Design and maintain ONE reader that can be customized to read different tag types, with different modulation schemes and frequencies

Standardize around a single PCB to support multiple end products and markets

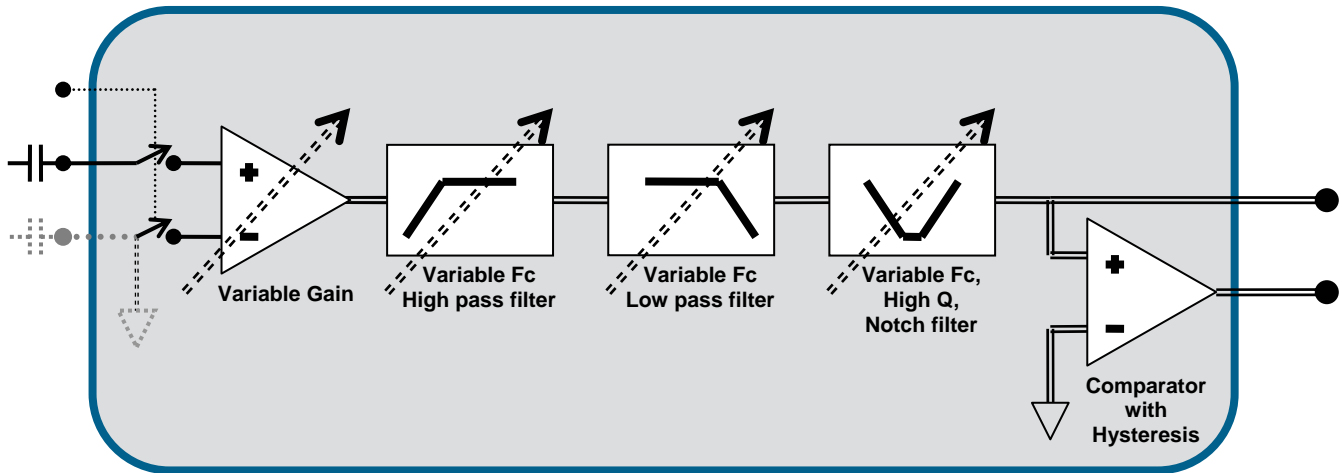
Chipset can be dynamically controlled to produce a truly intelligent and fully flexible card reader

Calibrate the reader at customer site to account for background interference

Adjust the gain of the analog front-end to optimize for read range

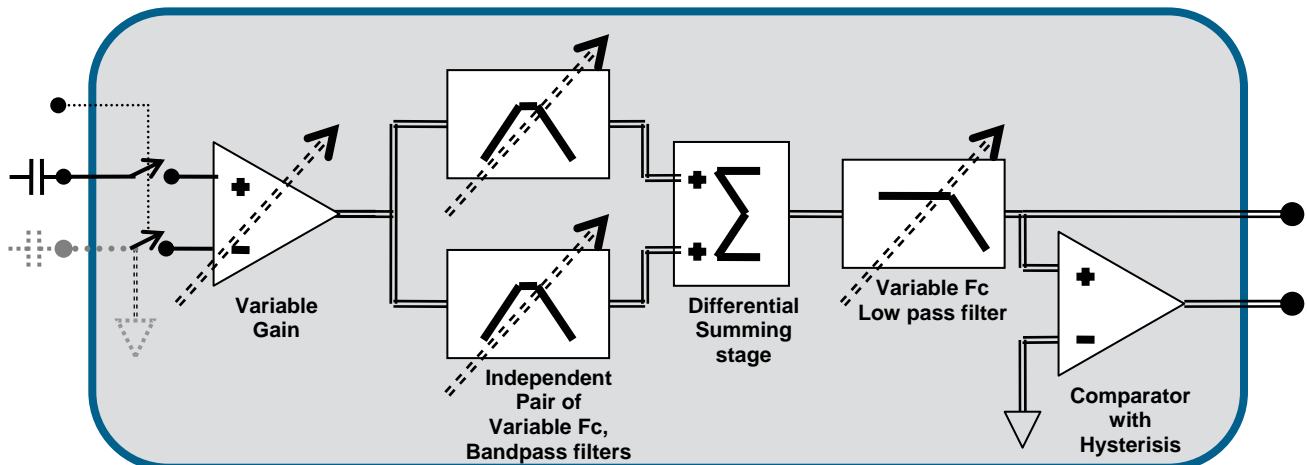
Reduce the total number of system components and lower your bill of materials

## Universal Baseband Analog Signal Processing Circuit



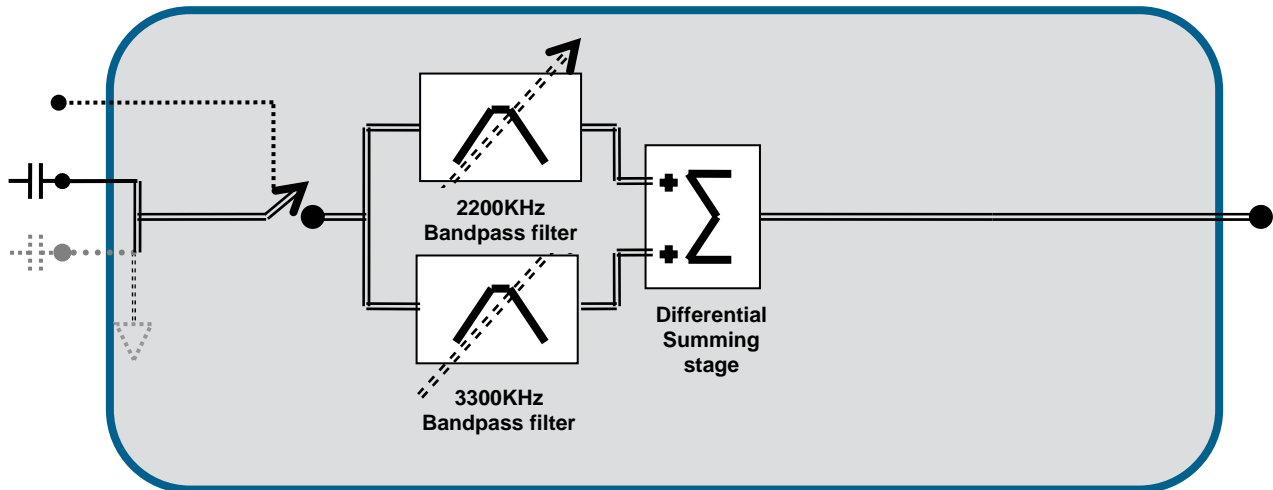
- Enables extraction of all data frequencies (DC to 848KHz)
- User-selectable notch filter for rejecting background interference (i.e. fluorescent lighting)
- Variable gain to adjust for reader range/sensitivity
- User-selectable analog or digital output
- Differential input allows easy interface to 900MHz down converter
- Input signal to control (anti-saturation) switch

## EPC Gen 2 Baseband Analog Signal Processing Circuit



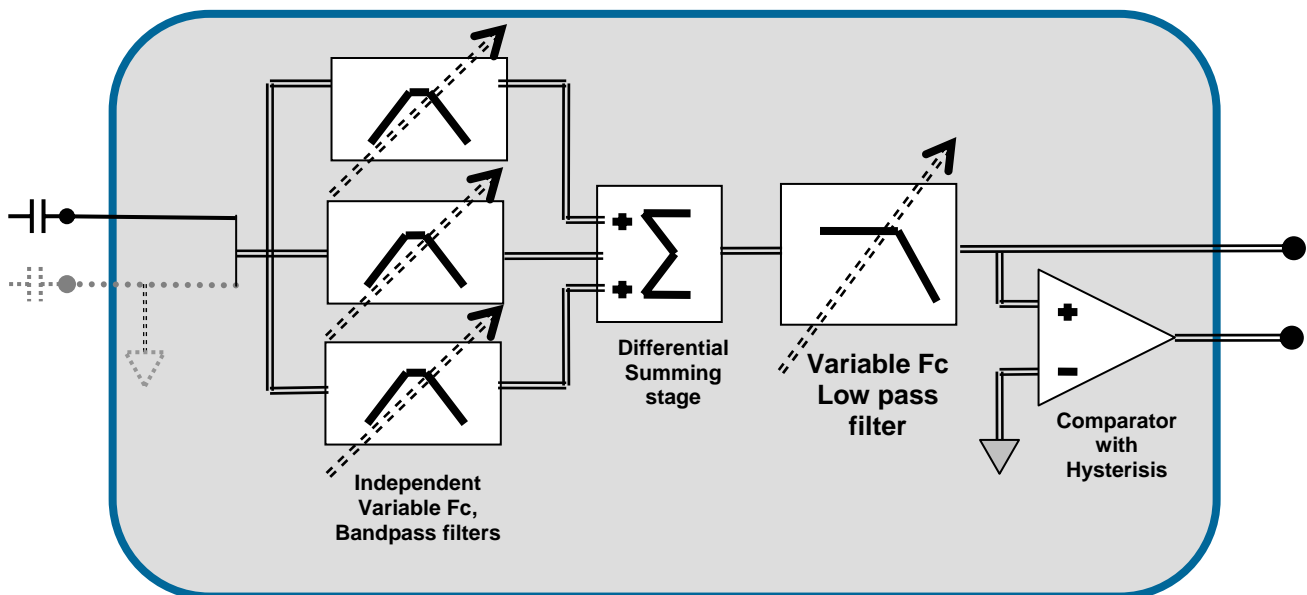
- Enables extraction of all data frequency pairs - e.g. 2KHz & 4KHz, 32KHz & 64KHz, 312KHz & 625KHz (All other frequency pairs possible)
- Variable gain to adjust for reader range/sensitivity,
- Variable gain within the summing stage to balance amplitude between extracted frequencies
- User-selectable analog or digital output
- Differential input allows easy interface to 900MHz down converter
- Input signal to control (anti-saturation) switch

## “Class 0” Analog Signal Processing Circuit



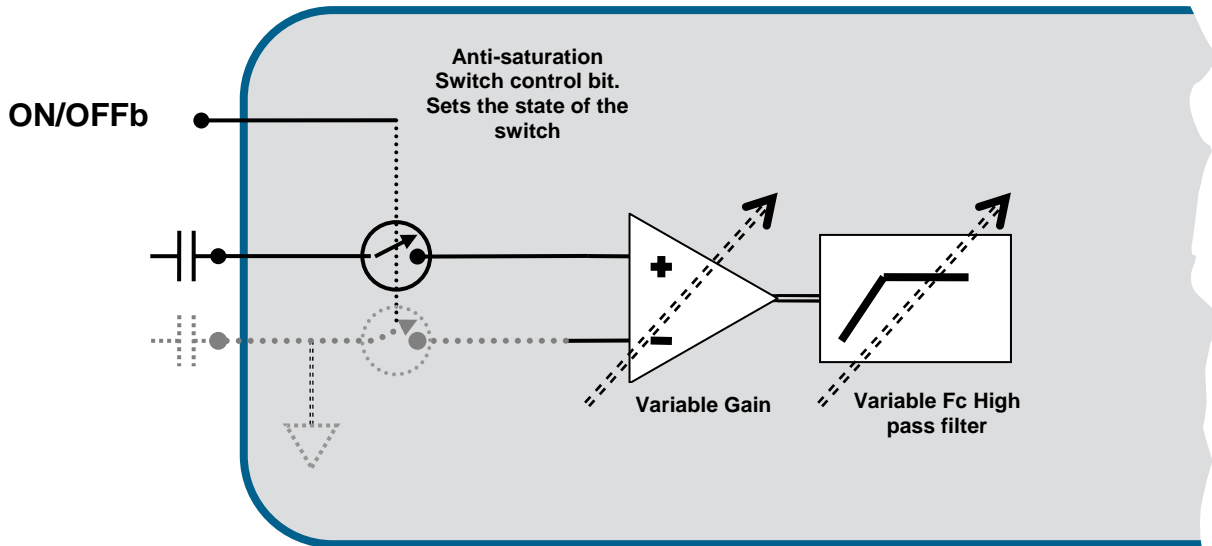
- Enables direct extraction of 2.2MHz and 3.3MHz sub-carrier signals
- User-selectable analog or digital output
- Differential input allows easy interface to 900MHz down converter
- Input signal to control (anti-saturation) switch

## Triple band Analog Signal Processing Circuit



- Enables extraction of three parallel sub-carrier signals without circuit modification - e.g. Synchronization frequency and data frequency pair - 42KHz & 64KHz, 128KHz (Many other frequency combinations possible)
- User-selectable analog or digital output
- Differential input allows easy interface to 900MHz down converter
- No control or anti-saturation switch

## Anti-Saturation Analog Signal Processing Circuit



- Anti-saturation feature enables isolation of the RFID FPAA filter input stage from the input signal while maintaining all circuit bias points.
- Improved faster performance by direct hardware control of the anti-saturation switch through the ON/OFFb pin. Software pre-load of an execution trigger no longer required.



### RangeMaster2™ User-Selectable Parameters<sup>1</sup>

Center frequency of the notch filter (in KHz):	0, 48, 50, 52
Variable gain settings:	0dB, 6dB, 12dB, 18dB, 24dB, 30dB
Balance Variable gain (either branch):	0dB, +3dB, +6dB, +12dB
Lower sub-carrier frequency (in KHz):	2, 4, 8, 16, 20, 32, 40, 64, 80, 106, 128, 160, 212, 256, 320, 424
Upper sub-carrier frequency (in KHz):	4, 8, 16, 20, 32, 40, 64, 80, 106, 128, 160, 212, 256, 320, 640, 848