



SOFTWARE AND ARCHITECTURE

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RESPONSIBILITIES

MICROCONTROLLER

Serial communications:

USART Interface

Data handling

Receiving (data requests)

Processing (AD conversions)

Transmission (ADC values)

COMPUTER

Serial communications:

COM port interaction

Data handling

Receiving (ADC values)

Processing (converting, logging)

Transmission (data requests)

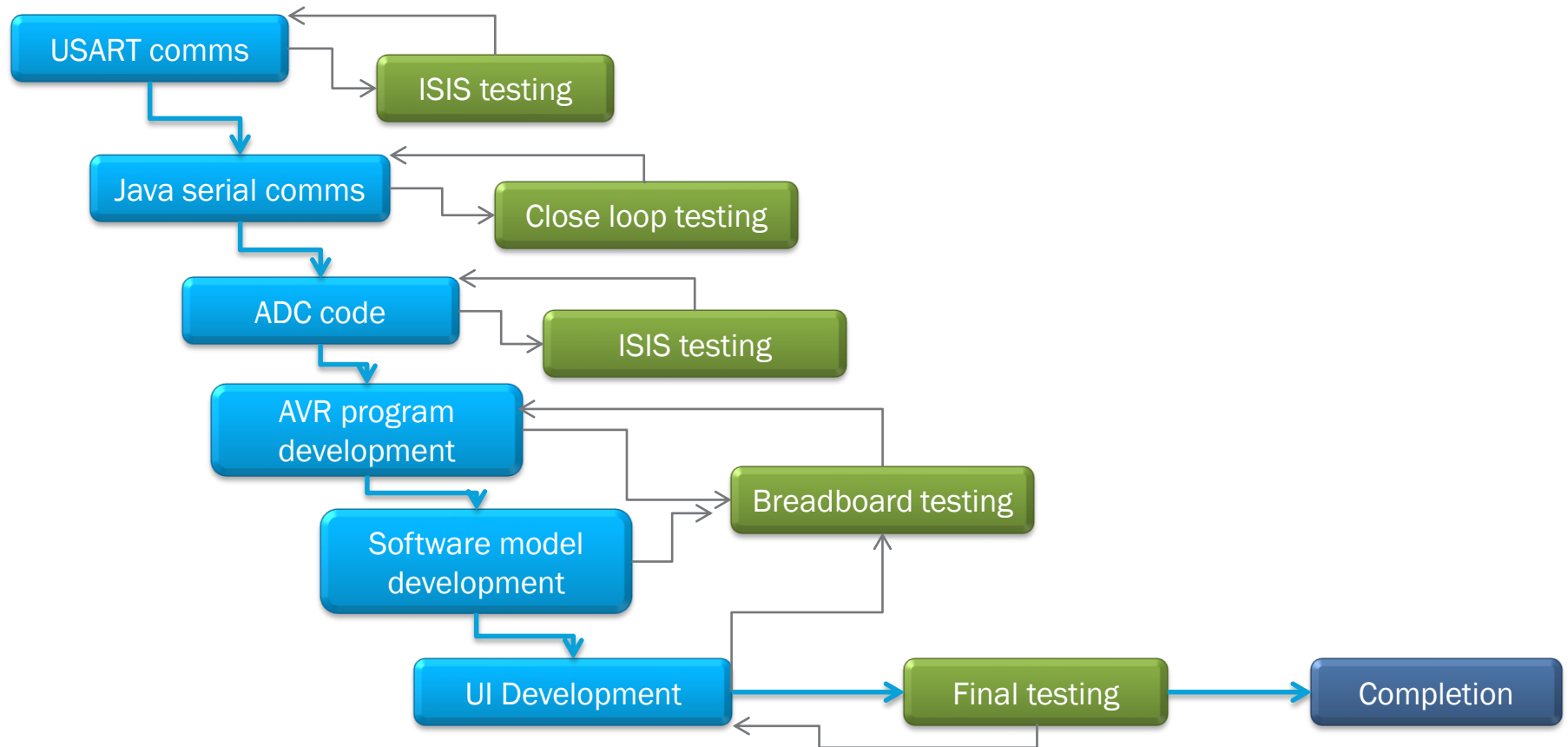
User Interaction

GUI (Graphic User Interface)

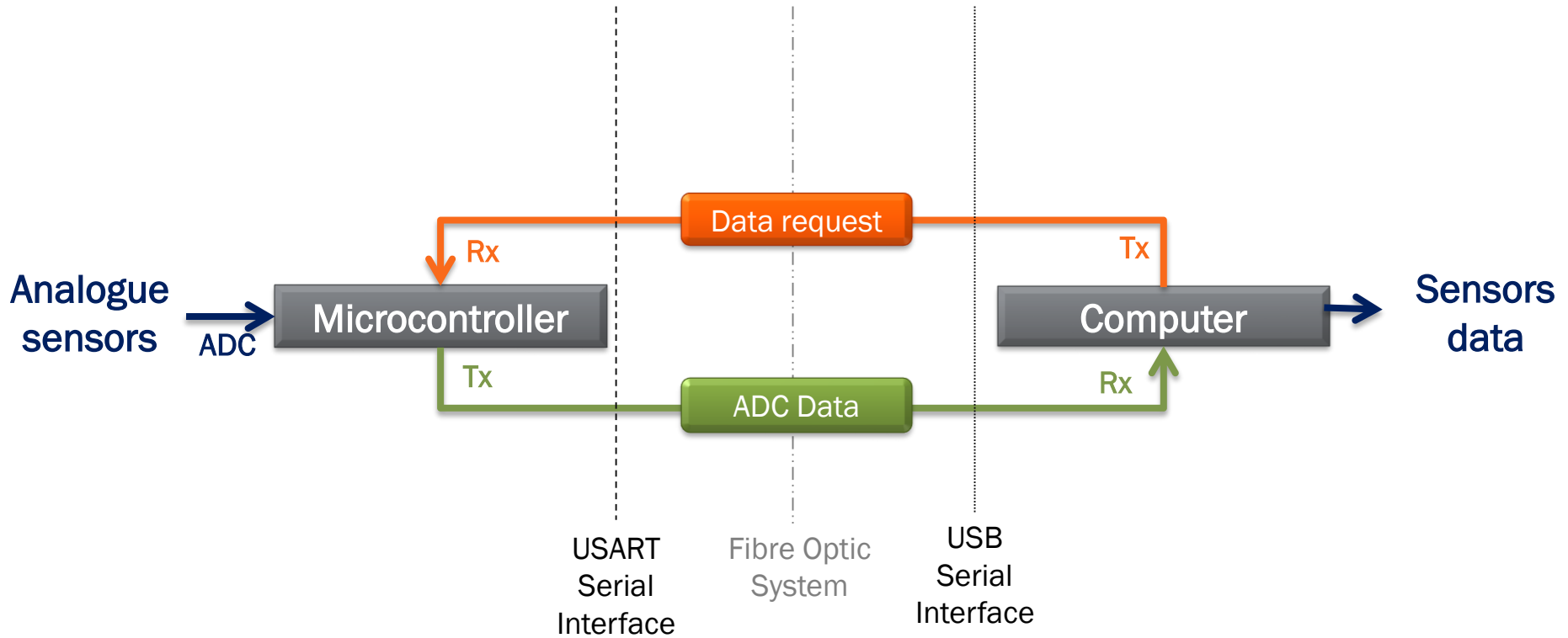
Logging data to file



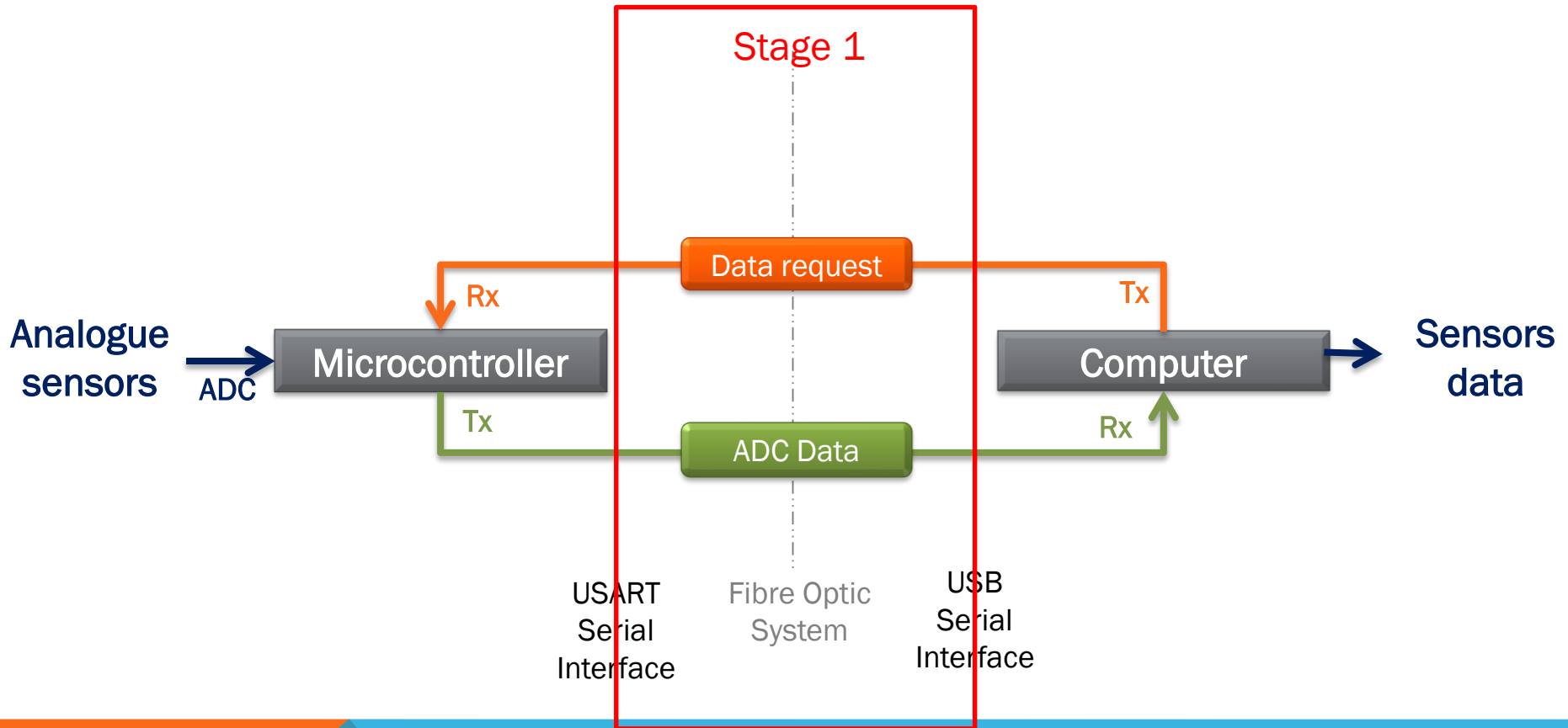
DEVELOPMENT CYCLE



OVERVIEW

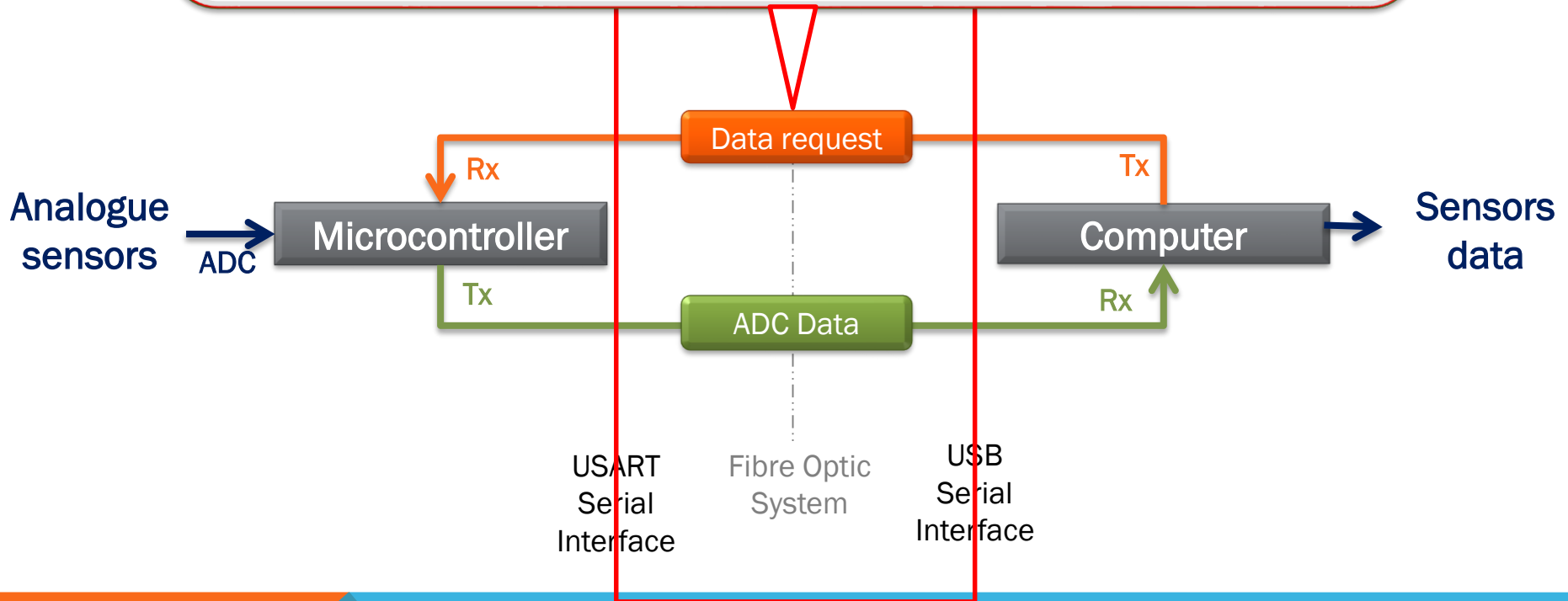


OVERVIEW

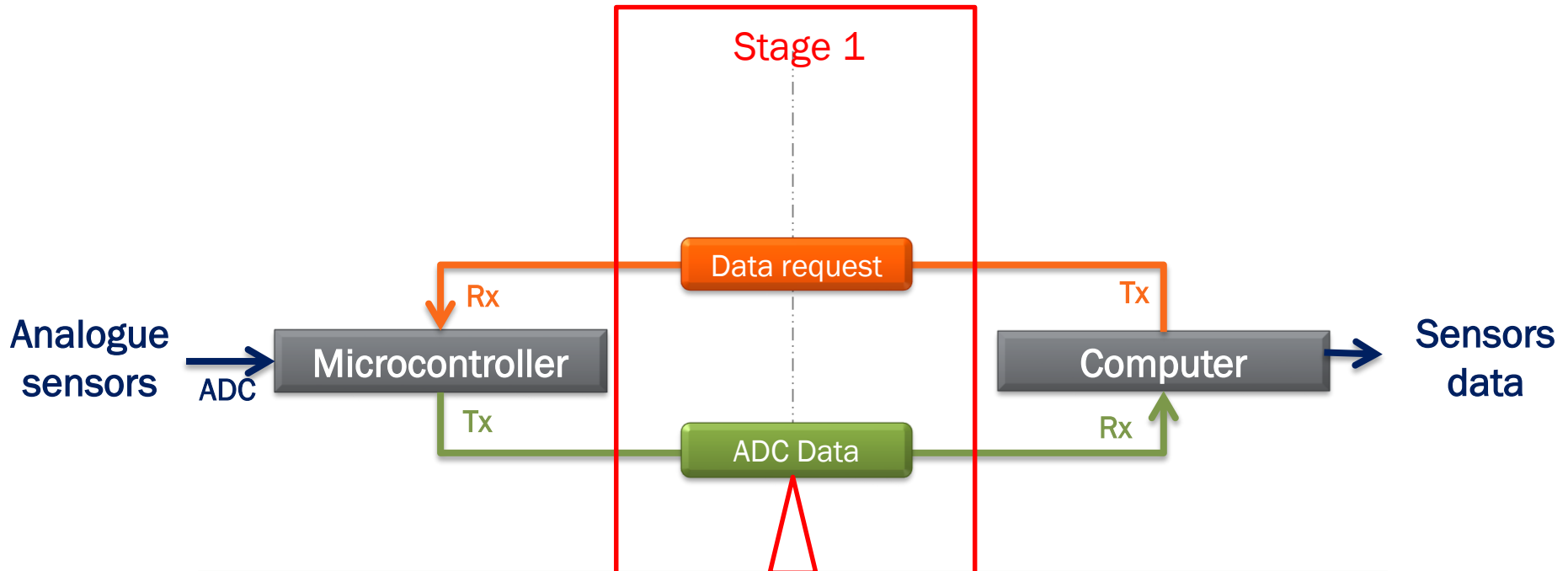


10-bit data packets at 38.4 kHz.
Bits 3-9 correspond to ADC channels.

Bit:	1	2	3	4	5	6	7	8	9	10
Purpose:	Start Bit	SIB	ADC 0x01	ADC 0x02	ADC 0x03	ADC 0x04	ADC 0x05	ADC 0x06	ADC 0x07	Stop Bit
UDR Reg:		0	1	2	3	4	5	6	7	



OVERVIEW



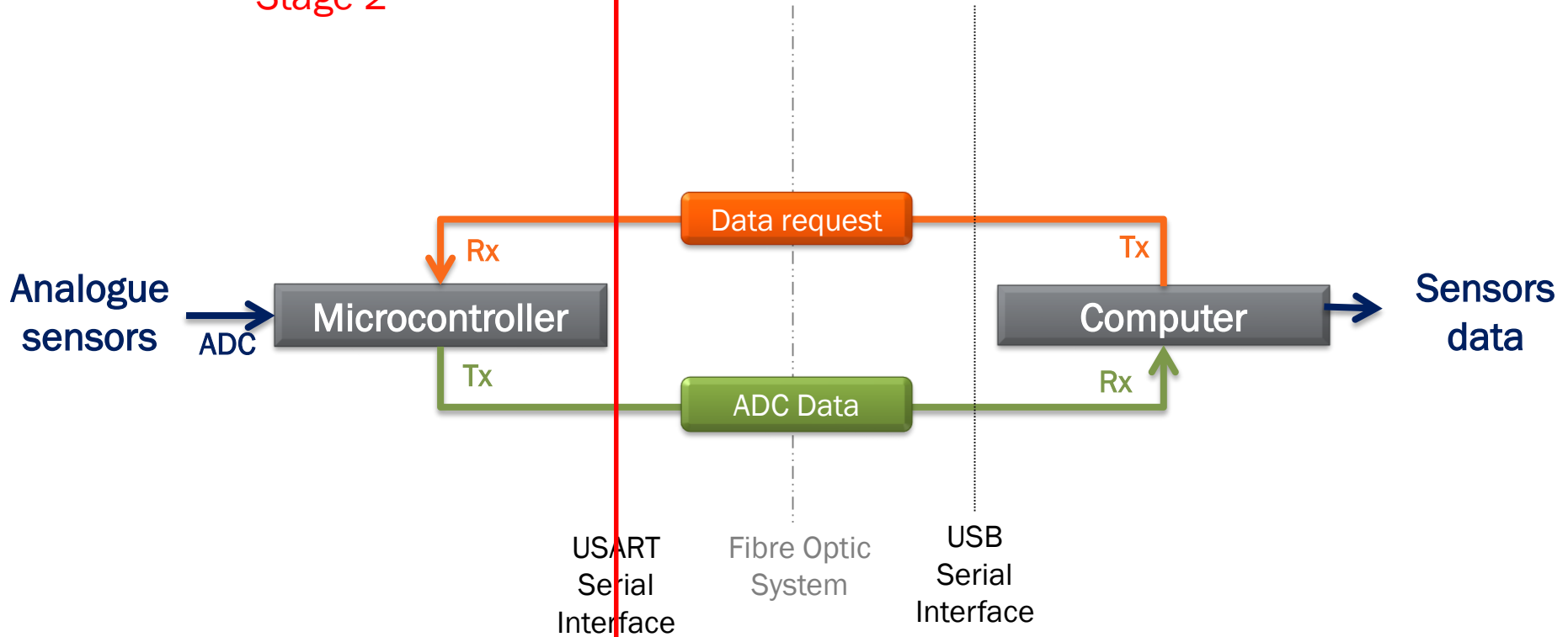
Decimal ADC values separated by ',' delimiter, suffixed with CR.

e.g.

103,79,1023,456,\r

OVERVIEW

Stage 2



OVERVIEW

Stage 2

Analogue
sensors

ADC

Microcontroller

Rx

Tx

USART
Serial
Interface

ATmega164PA

USART0 – Master tx/rx

USART1 – Slave tx/rx

Interrupt driven

Waits to receive data requests

Stores slave tx/rx data in buffers

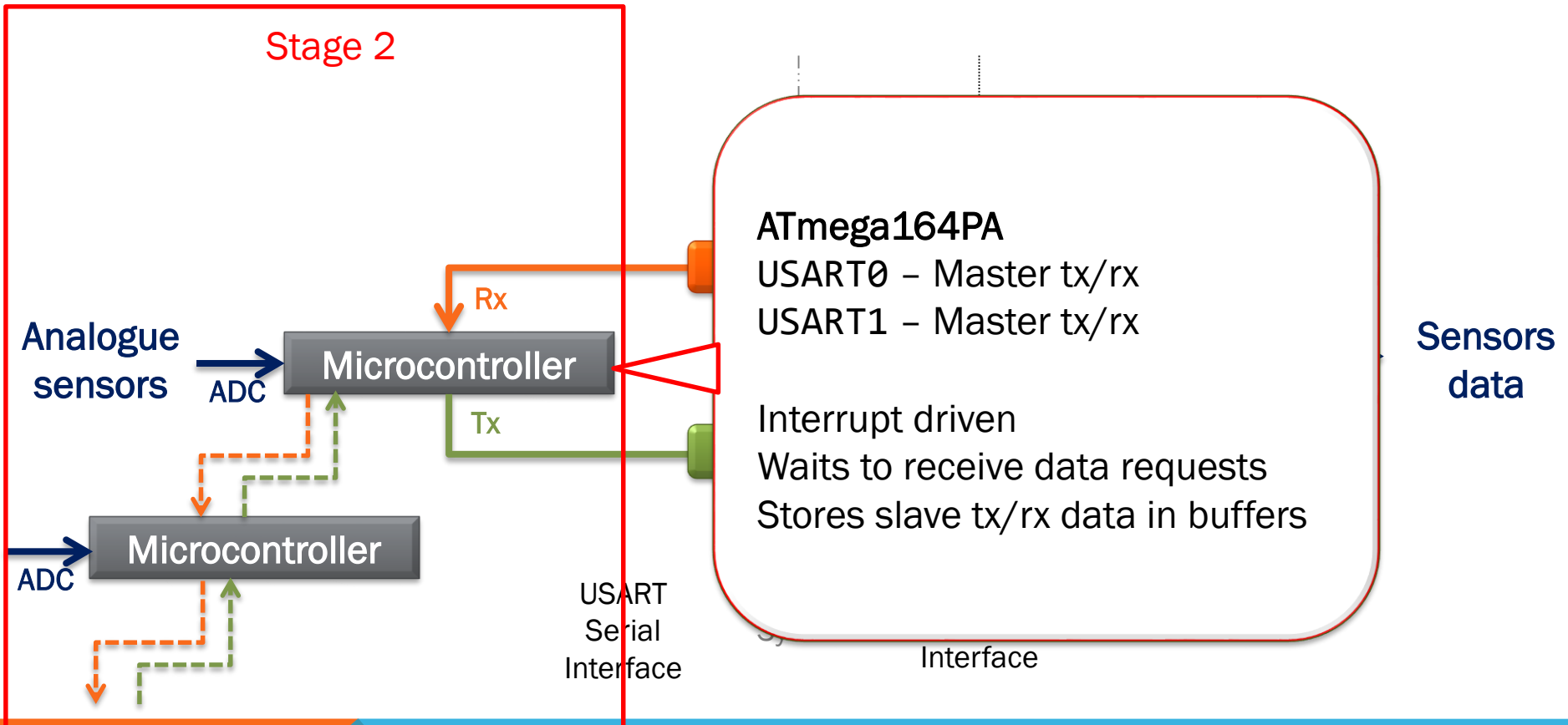
Interface

Sensors
data



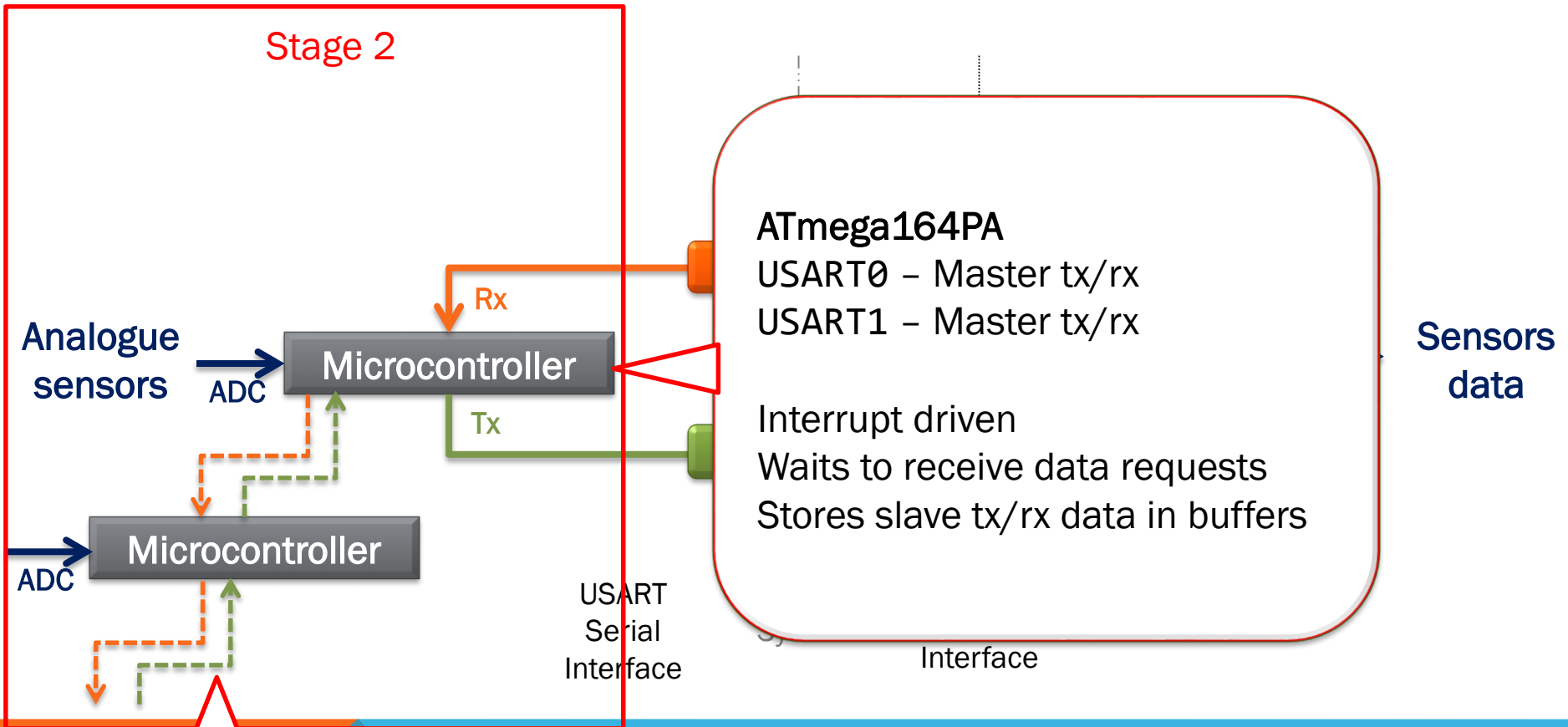
OVERVIEW

Stage 2



OVERVIEW

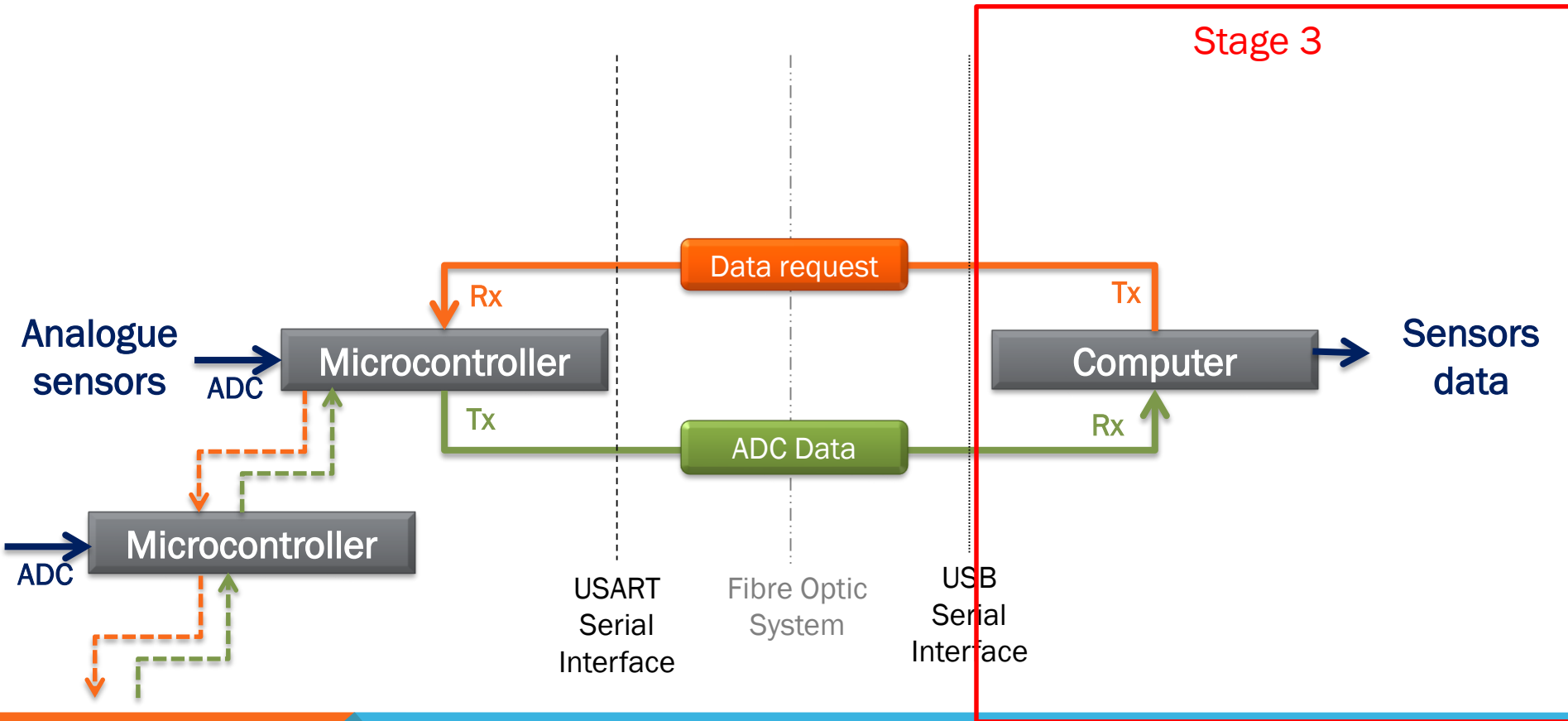
Stage 2



Support for up to 15 Microcontroller modules

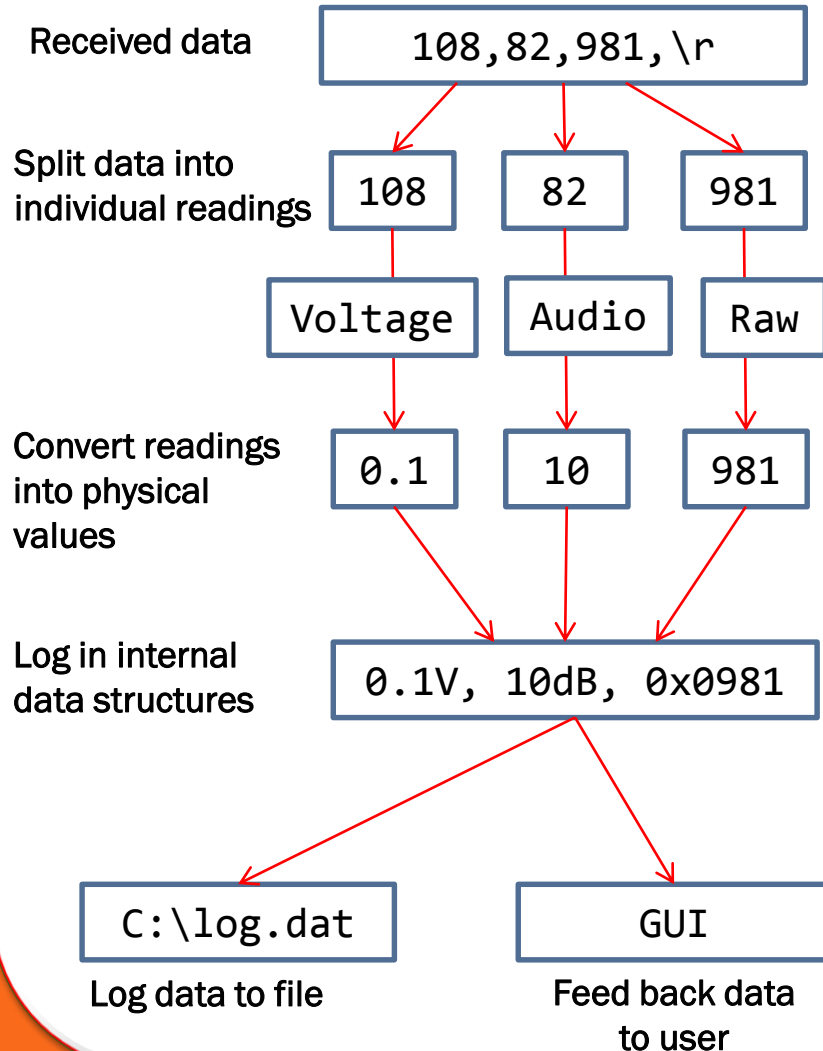
Up to 105 analogue sensors

OVERVIEW



Java desktop application

Directly communicates with serial port



Stage 3

