



SITAL  
TECHNOLOGY

 **Company Profile**

# Mission **and Vision**



## Safe and Secure **Databus Connectivity**

Robust and reliable communication has been the foundation of every technological system. Today more than ever, we depend on machines to work securely and reliably.

Sital Technology makes **smarter** high reality data bus communications.

# AeroSpace Solutions

A background image showing a pilot in a green camouflage uniform and helmet looking out over a blue sky with white clouds. In the distance, a blue fighter jet is visible on the tarmac.

## /// Databus Interfaces

Next generation hardware and software products for avionics databuses

## /// Test Equipment

Advanced testers, couplers and software for test bench and field testing requirements

## /// Network Security and Reliability

Cutting edge cyber security and physical network health monitoring for spaceborne, airborne and automotive platforms

# TRUSTED PARTNER

**60+** **15,000+** **100+**

Customers

Product Shipments

Projects

**20**

YEARS

OF

EXPERIENCE

ISO CERTIFIED

DO-254

ITAR

# Customer Focused



## NASA LRO

Sital hardware IP  
radiation hardened  
communication  
lines



## F-16

Sital hardware IP  
for mission  
computer and  
weapons bus  
communication  
lines



## F-15

Sital hardware IP  
for mission  
computer and  
weapons bus  
communication  
lines



## India Nuclear Power

Sital hardware IP for  
high bandwidth  
reactor  
communication



## Iron Dome (MDS)

Sital hardware IP for  
high bandwidth  
mission computer  
communication



## Magic Wand

Raytheon / IAI  
advanced Long  
Distance  
Interception  
System



## Radar System

High bandwidth  
interception radars



## SPICE

GPS guided  
tactical warheads  
communication bus



## Tactical Helmet

Helicopter tactical  
helmet  
communication bus



## Airborne Sensor Unit

High Frequency I/O  
for military and  
industrial

# Proud **to Serve**



GE Aviation



GARMIN

NASA



Honeywell

Raytheon



BAE SYSTEMS

Orbital

THALES



aselsan

Elbit  
SYSTEMS Ltd

RAFAEL



# ▸ Databus Interfaces

## Communication Products



### Protocols :

MIL-STD-1553 | EBR1553 | ARINC825 | ARINC 429

### Solutions :

FPGA IP Cores

PCI, PCIe, USB, VME, PC104 Interface Cards

Transceiver Design IP

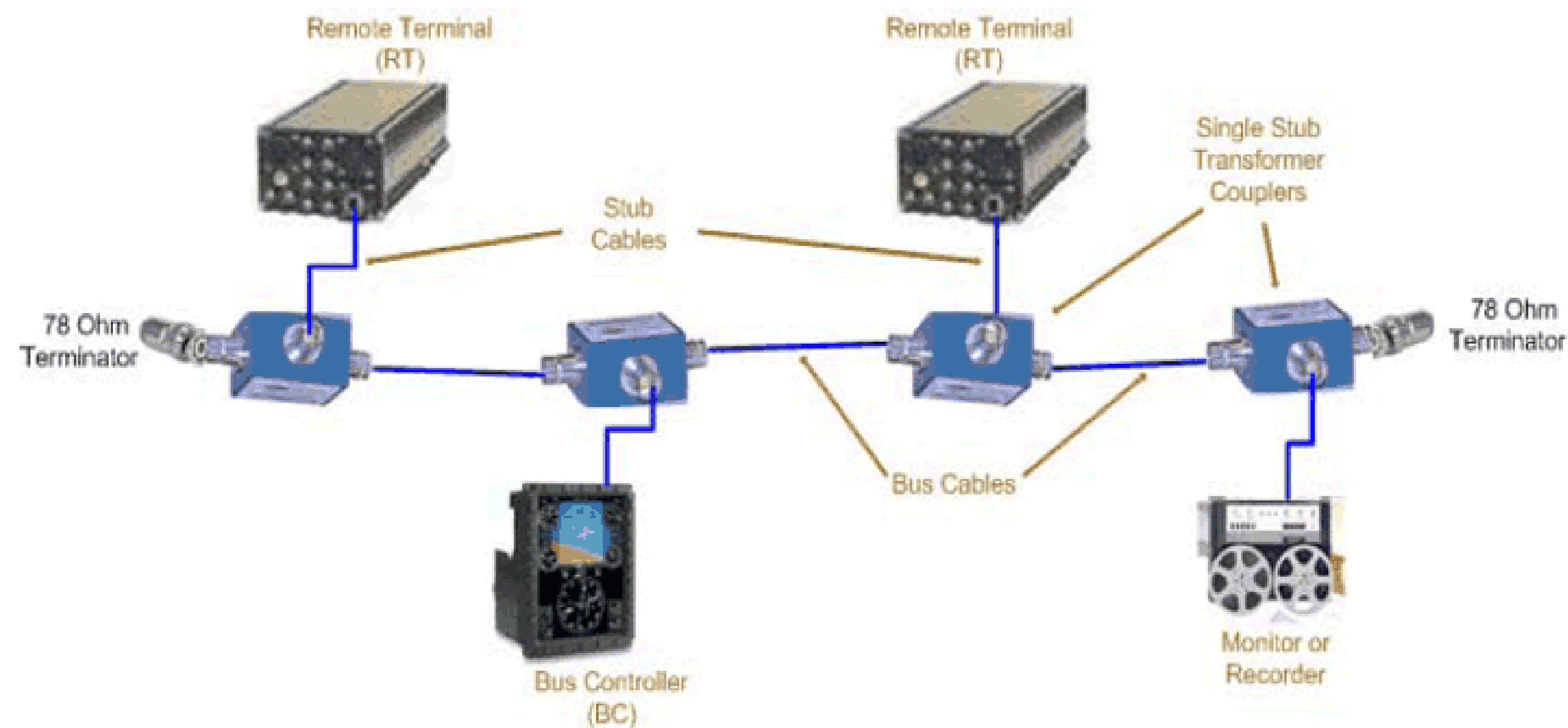
Transformers

RTOS Drivers and Software



# MIL-STD-1553 ?

## MIL-STD-1553B Network topology



### Spec :

- 1 Mega hertz speed (1Mega Bit)
- Real-time (fully deterministic)
- Multi Drop bus topology (less copper wiring)
- Dual –redundant bus A + bus B

### Players/Roles :

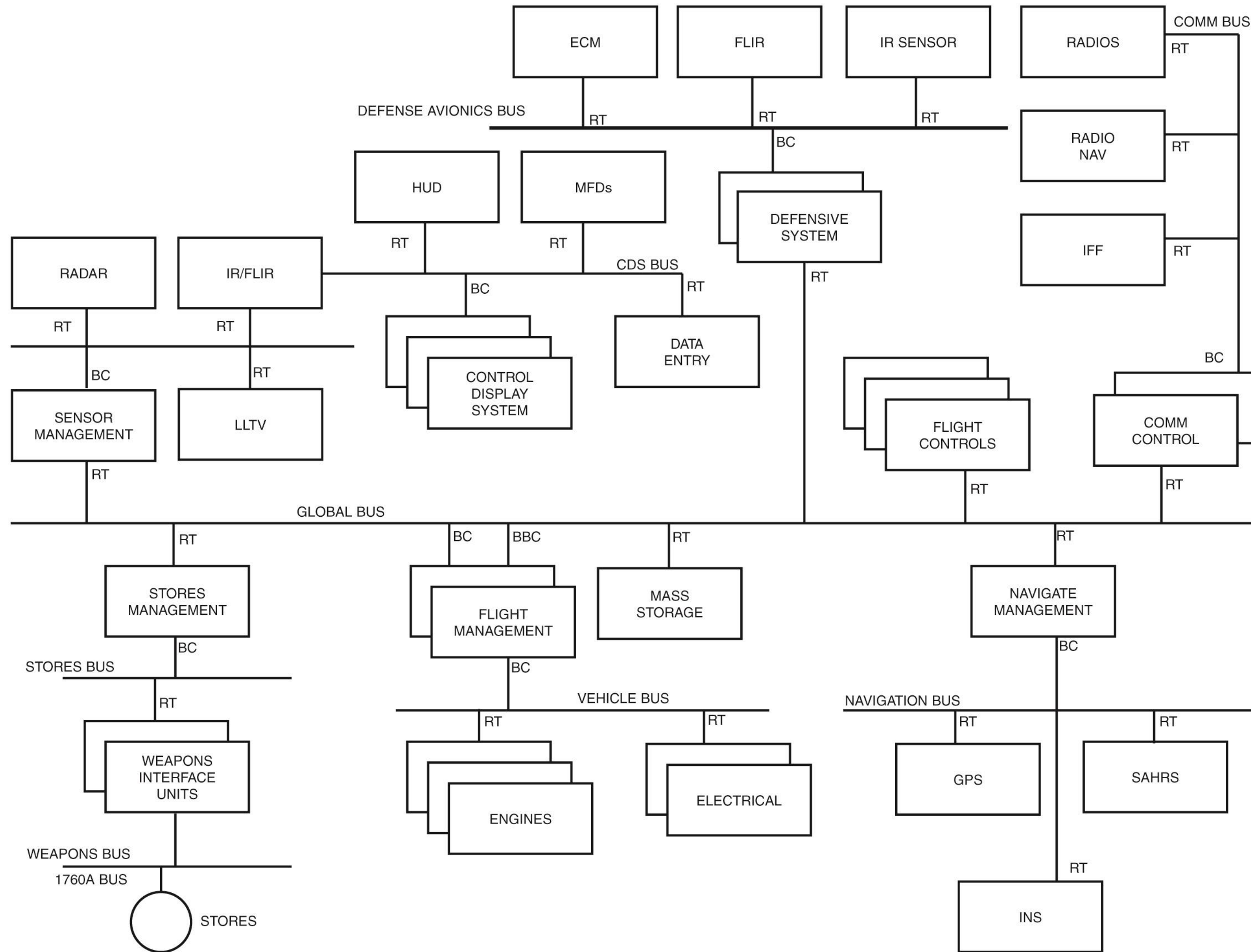
- Bus Controller (BC) – the “brains” / Master
- Remote Controller (RT) – the slave, acts on the BC commands
- Monitor (MT) – the listener

### Status :

Highly adopted in military, aerospace, marine and land systems due to it's superior robustness and topology spec



# MIL-STD-1553 Aircraft Network Domains



## Logic :

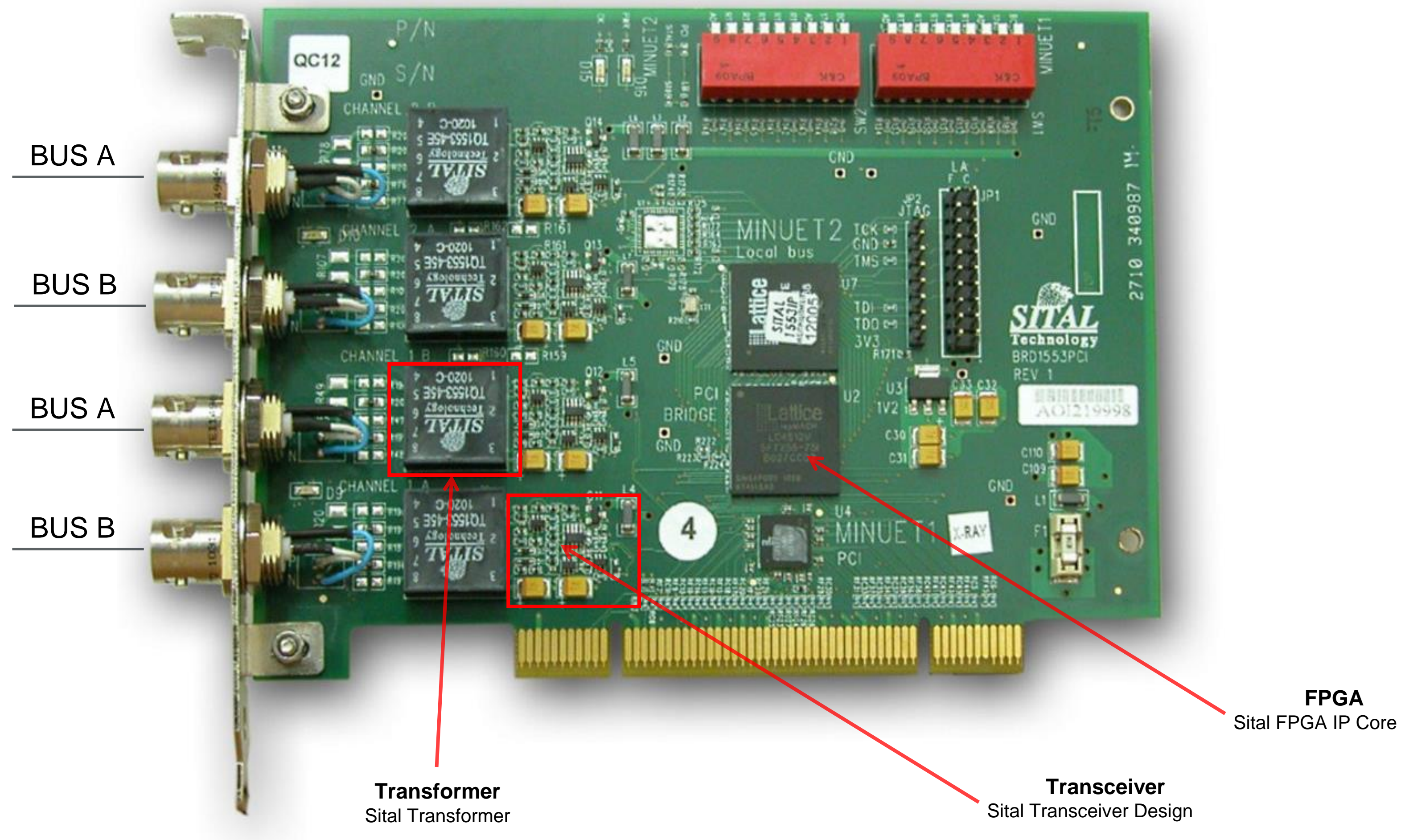
- Multiple Domains based on functionality
- Each domain has only one BC
- A domain can hold up to 31 RT and MT
- Each aircraft is loaded with tens of 1553 “nodes”

## The opportunity :

- Significant, few players in the market
- FPGA are widely adopted
- Eliminate single source vendor dilemma

# MIL-STD-1553 Components at play

## MIL-STD-1553B components



### Digital Engine :

FPGA IP Core – Read/Write electrical signals from/to the transceiver based on MIL-STD-1553 protocol in real-time.

Sital product – BRM1553 FE/D/PCI , BRM1760

### Transceiver :

Prepare the transmission of the electrical signal to the transformer according to the specification/bus speed etc'.

### Transformer :

Direct interface to the bus. Responsible to reliably transform the signal for transmission

# MIL-STD-1553 Node Optimization

## MIL-STD-1553B components

Software	Digital Core	Transceiver	Transformers
BRM1553	DES1553XVR	TRA1553SIT	
<ul style="list-style-type: none"> <li>ANSI C API library</li> <li>Test and Simulation on Windows and Linux</li> <li>Production device driver availability for VxWorks or Linux</li> <li>Full compatibility with DDC MiniACE API</li> <li>Optional Support for DO-178 Certification</li> </ul>	<ul style="list-style-type: none"> <li>Multi Role Support for Bus Controller, Remote Terminal and Monitor</li> <li>VHDL Netlist delivery</li> <li>Support for ANY FPGA family</li> <li>Special Edition for Space Grade requirements</li> <li>Support for DO-254 Certification</li> <li>Compact in Size</li> <li>Provided with Full Validation and Simulation Capabilities</li> <li>IP add-ons for Physical Wiring Fault detection (P-TDR) and cyber security fingerprinting</li> </ul>	<ul style="list-style-type: none"> <li>1553 Transceiver Design IP from discrete COTS components</li> <li>Eliminate single source dependency</li> <li>Significant cost reduction compared to transceiver chips</li> <li>Validated for Remote Terminal functionality by 3<sup>rd</sup> parties</li> <li>Improved power utilization</li> <li>Improved heat dispersion</li> </ul>	<ul style="list-style-type: none"> <li>1553 Transformer 1:1.79 or 1:2.5 ratios</li> <li>Singe or Dual transformer packaging</li> <li>Reduced pins for improved reliability</li> <li>Airborne and tested</li> <li>Enables massive cost reduction</li> </ul>

## Sital's 1553 Approach

### Components :

- Digital FPGA Agnostic IP Core
- MIL-STD-1553 Transceiver Design IP
- High Reliability Transformers
- Cross Platform Software API libraries and Support

### Advantages :

- Reduce Single Source Dependency
- Reuse Software Assets
- Optimize space, power and heat disposal
- Significantly Improve Costs

### Smart :

- Native detection of wiring circuit failures
- Message authentication cyber security



# Full Turnkey 1553 Solution



## MIL STD 1553 Transceiver IP

Validated 1553 Transceiver design IP, for use with COTS components

[Product Brief and Documentation Click Here!](#)

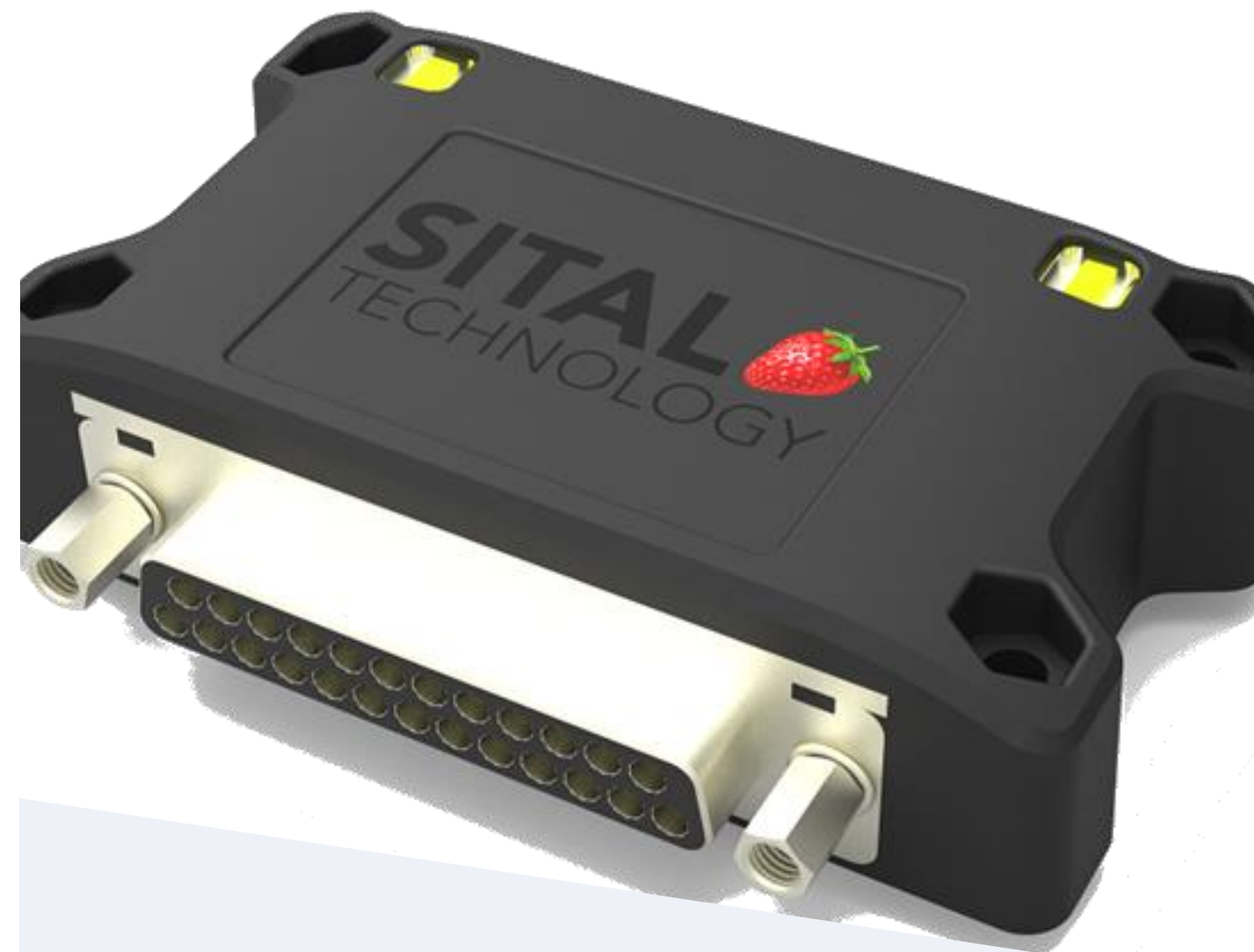
## 1553 Single/Dual Transformers

Lowest Cost Transformers  
1.79 or 2.5 transformation ratios

[Product Brief and Documentation Click Here!](#)



# MIL-STD-1553/EBR 1553 Test Equipment



## Couplers

Substantially improve test bench cost, space and functionality

Product Brief and Documentation  
Click Here!



## MultiComBox

Multi channel and protocol tester for development and test bench systems

Product Brief and Documentation  
Click Here!



## Tester Cards

cPCI, PCI, PCIe, VME and PC104 tester cards

Product Brief and Documentation  
Click Here!

# MULTICOMBOX



1553/EBR USB Tester

## MultiComBox

- Small and lightweight form factor
- MIL-STD-1553, EBR 1553, W009 support
- BC/RT and MultiRT modes
- 12 x RS-485 channels support
- Error injection simulation
- Windows / Linux drivers and APIs
- Complementary Windows GUI software
- EU support
- Wiring fault detection capabilities for shorts, opens and complex intermittent disconnects.

# / Coupler



1553 Coupler

## 1553 Coupler

- Dual , 3 stub, 1553 coupler
- Industries smallest 1553 Coupler
- Internal Termination (no need to add external bus terminators)
- Optional configurations:
  - 3 stubs with termination for bus A and B
  - 6 stubs with termination for a single bus
- Low mechanical profile to fit in PCI or cPCI casing
- All connections and termination via a single D-type connector
- LED indicators when bus termination is engaged

Smallest Profile    Lowest Cost

# Wiring Fault Detection – an expensive Problem



## The Problem

US Navy Reports:

- 1,101 mission aborts / year (401 in-flight aborts)
- Average 2 in flight fires/month
- 7.3 maintenance hours / flight hour due to wiring systems, alone
- During a 10 year period, 6 aircraft LOST due to electrical failure
- Effectively average 78 non-mission capable aircraft / year due to wiring
- This information is known to be underreported

The Challenges Facing U.S. Navy Aircraft Electrical Wiring Systems,

Jerome Collins, 9<sup>th</sup> Annual Aging Aircraft conference,

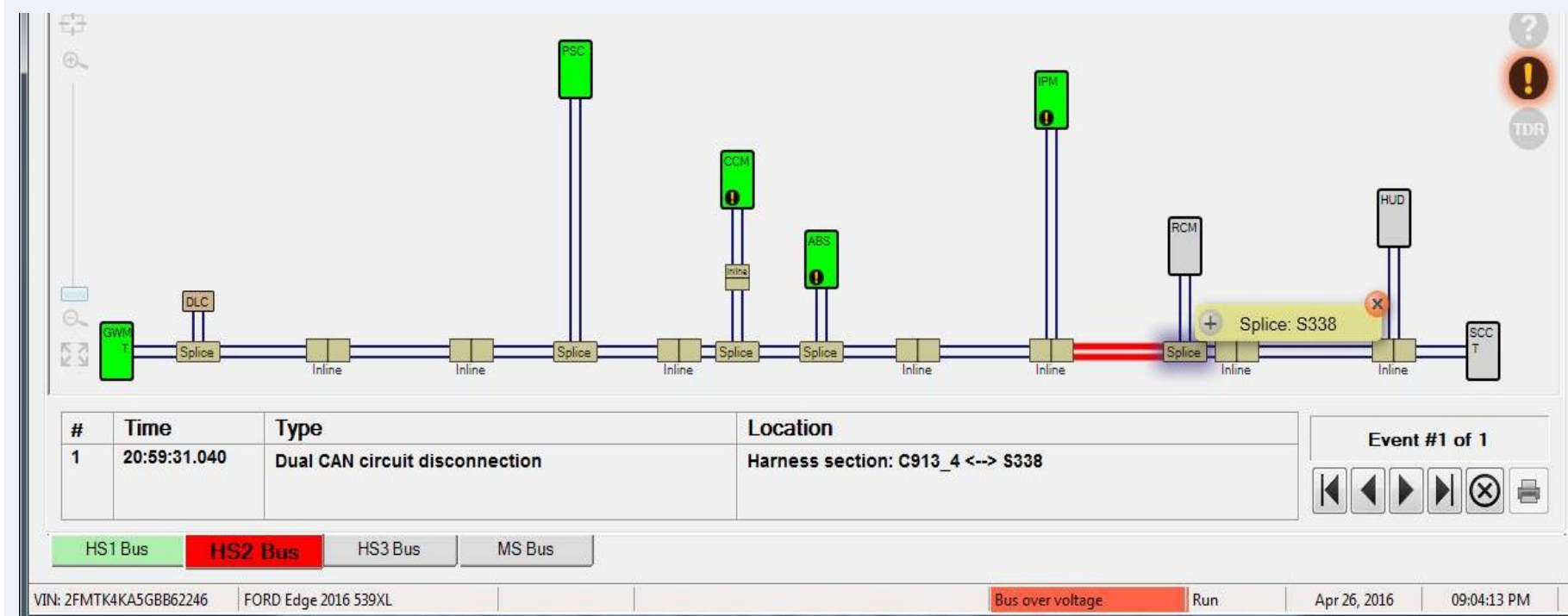
## The Complexity

- Intermittent “come and go” disconnects
- Testing in live systems
- Location and orientation



# Wiring Fault Detection

Advanced Maintenance  
**Passive TDR**



- Intermittent and persistent wire faults, shorts and open
- Reduce “No Trouble Found”
- Proactive maintenance to save massive costs
- Supporting CAN, ARINC825, MIL-STD-1553
- 99% location accuracy with self calibration mode
- Network topology creation software for easy aircraft maintenance
- Multiple form factors:
  - BUFFALO / Grip 2.0
  - Hardware chip
  - FPGA IP



# Wiring Fault Detection Case Studies



## Aerospace

### Networks :

MIL-STD-1553B , ARINC825

### Product :

BUFFALO-I

### Use Case :

Field Engineering

### Results :

Reduce collateral damage,  
shorten repair time, increase  
aircraft worthiness



# Wiring Fault Detection Case Studies



2

## Aerospace and Automotive

### Networks :

MIL-STD-1553B , ARINC825, ARINC429, CAN , CAN-FD

### Product :

FPS – Embedded Module

### Use Case :

Embedded within aircraft avionics unit

### Results :

Intermittent Wiring Disconnect detection, reduce ad-hoc repairs, provide early stage wire prognosis, reduce No-trouble-found scenarios

# Wired Network Communication Lockdown



## The Problem

Legacy Mission Critical data buses are not designed with security in mind

- Modifying RT into BC modes via software
- Man in the middle attacks
- No transmitting source identification
- ARINC825, MIL-STD-1553/EBR 1553 and any other multi-drop bus architecture is vulnerable
- Multiple reports on attacks on commercial and military aircrafts.
- Threats on strategic infrastructures: power plants, airports, railways

## The Complexity

- Supplier governance - multiple Tier-1 Sources for different avionic systems
- Insufficient bits for encryption
- Expensive CPU/RAM resources boost costs for OEMs

# Cyber Protection

## Real-time validation for all messages :

MIL-STD-1553 | EBR1553 | ARINC825 | ARINC 429

Applicable for any multi-drop bus

## Solution :

Detect and Prevent unauthorized transmission

Prevent DoS attacks on critical communication buses

No need for any CPU/RAM resources

Software independent

Seamlessly integrate with any Sital FPGA IP Core

Compact VHDL Netlist securing all nodes on the bus



## Product Video Demo

Fill out an information inquiry form and type "FPS Avionics VIDEO" in the open text area

[Click Here!](#)

# India Sales Bring Up

## Key Steps :

### IT setup:

Email, CRM access

### Training:

Company overview, Technical, Sales,

### Sales Enablement:

Datasheet access, samples, sales presentations, Business cards

### Personal:

Invoice setup

### Ongoing:

Bi-Yearly targets, weekly meetings, sales support , account management, CRM reporting



# Experience More

