

**SMARTCO**

SOLUTIONS BY NICOMATIC

FAULT DETECTION  
& LOCATION

IN ELECTRICAL WIRING



NICOMATIC



CREATIVE  
INTERCONNECT  
SOLUTIONS

# COMPANY KEY FIGURES

42

years of  
experience

100

family  
group

100

Integrated

%

EN910

Certificate

newall

in 2017

87%

of export

300

Employees

10%

worktime  
dedicated  
to the creativity  
& continuous  
improvement

0

types of solutions:

- Harsh environment
- High value-added solutions
- Innovative projects

90%

of deliveries are  
made  
in one week

+5

millions of product  
references

48H

answer for  
customization  
request

2

active  
clients

0

35

million of revenue

15%

operating income

10

years of double digits  
continuing growth



11

Subs



Easy design  
Modularity  
Customer  
service  
Product quality

# NICOMATIC

## Markets with our technology



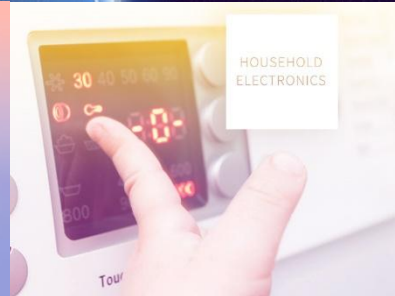
CIVIL  
AVIATION



SPATIAL



TELECOM



HOUSEHOLD  
ELECTRONICS



DEFENSE



MEDICAL

CMM- OMM-  
MICROFLEX



In box  
Multifunctional

OPTIMUS



I/O the box  
IP 68



DMM

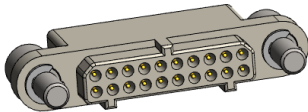


Inside/Panel  
EMI protection

SmartCo



EMM $\mu$ 1.27  
& AMM 1mm



High speed  
Size & Weight

# GOAL

Worldwide  
reference in  
Interconnect  
solutions for  
harsh  
environment

MIL-AERO offer  
OSS solution:

- In
- Panel
- Out

the box

**SMARTCO**  
SOLUTIONS BY NICOMATIC

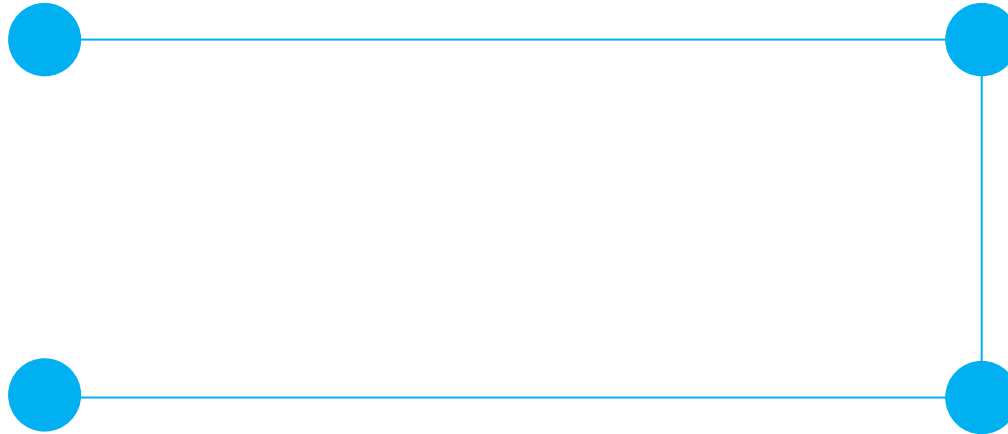
*FAULT DETECTION  
& LOCATION*  
IN ELECTRICAL WIRING

# CONTEXT

Embedded electrical network

**43 % of the electrical faults  
=  
wire & connector damages**

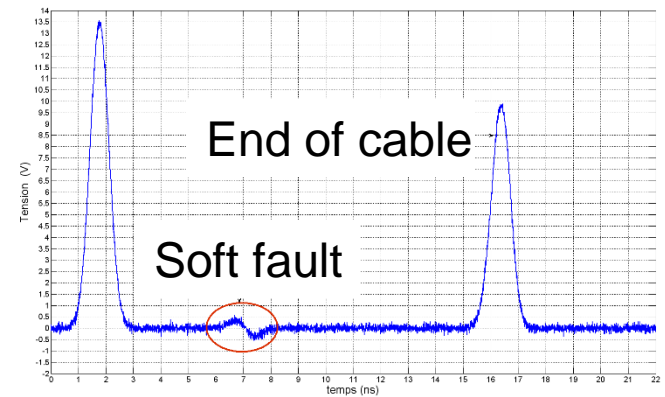
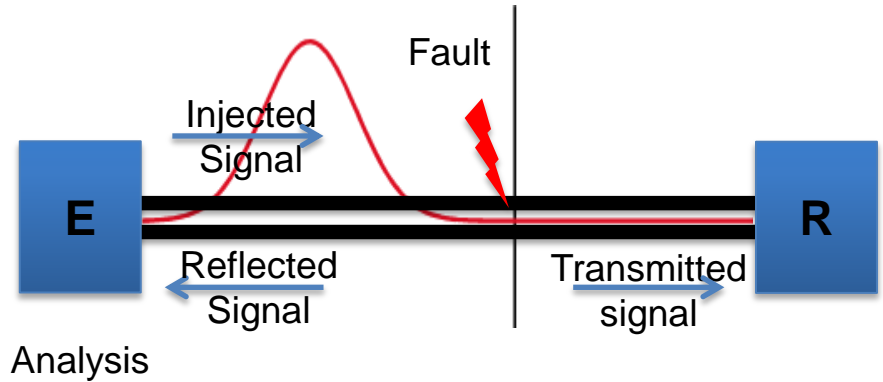
**Human & economical  
issues**



**Detect & locate  
incipient faults**

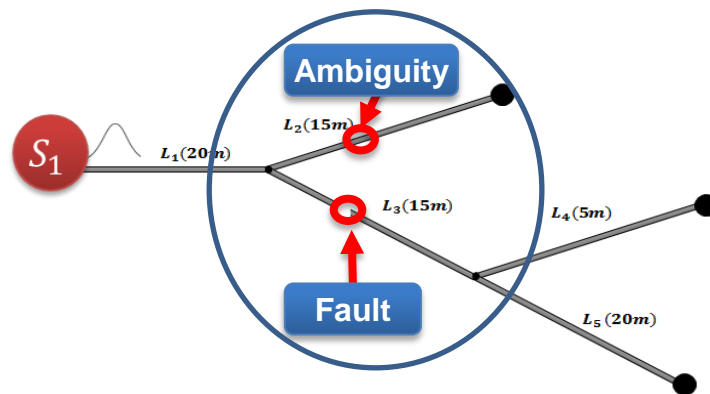
**Prevent  
failures**

## Time Domain Reflectometry



**Time Domain Reflectometry (TDR) method can not locate faults in a very complex electrical network**

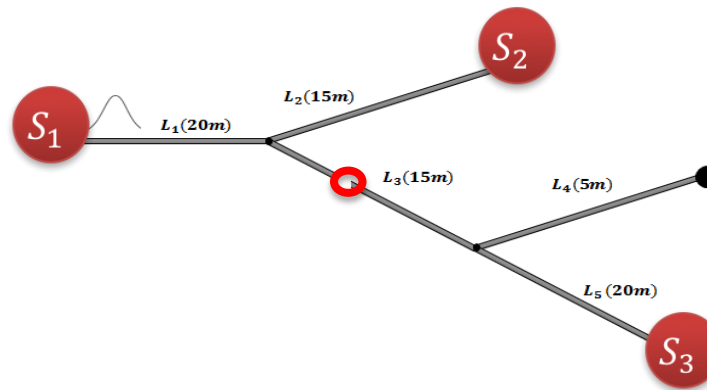
**Where is located the fault ?**



**Complex electrical network**

## OMTDR technology :

- ✓ Can be embedded,
- ✓ Detects & locates hard and soft faults,
- ✓ Does not interfere with the equipment,
- ✓ The sensors communicate through the analysing signal



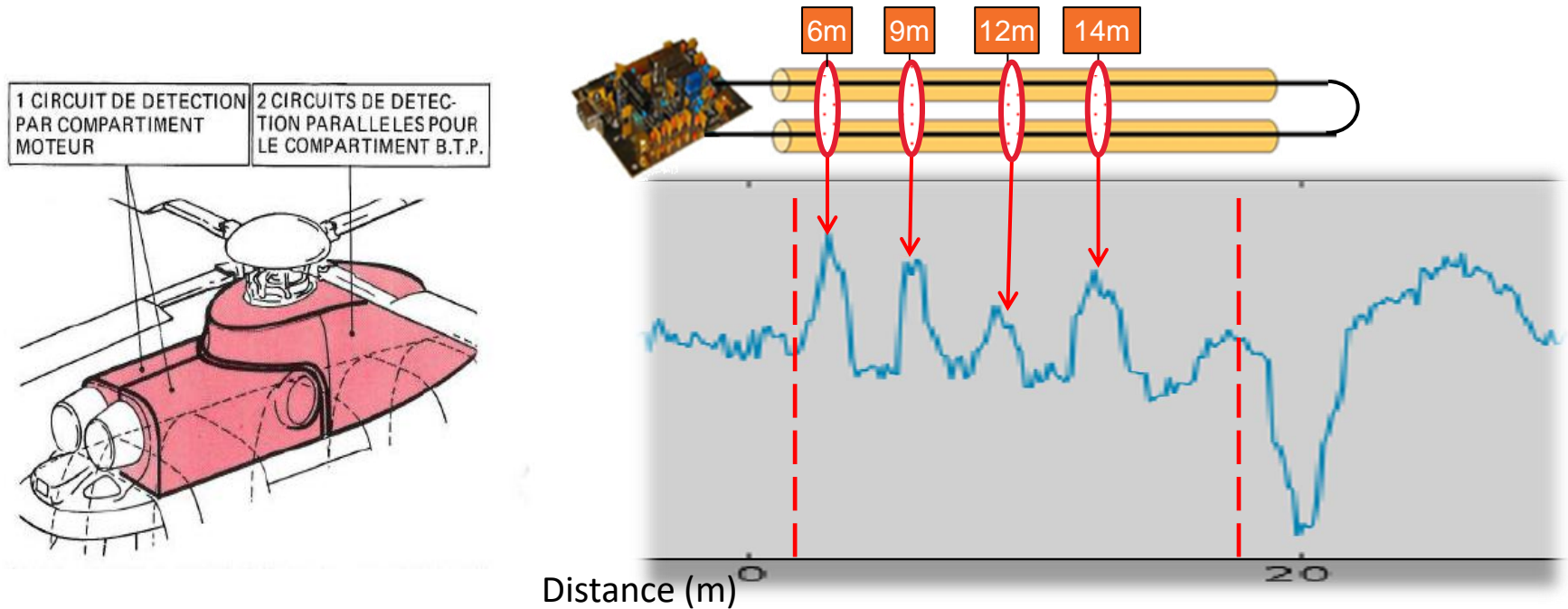
“ OMTDR based integrated cable health monitoring system SmartCo: An embedded reflectometry system to ensure harness auto-test ”, IEEE ICIEA, 2015.

# SMARTCO

## Engine fire detection

### Project with Airbus Helicopters

The system was able to detect the fire ( soft fault) in four zones



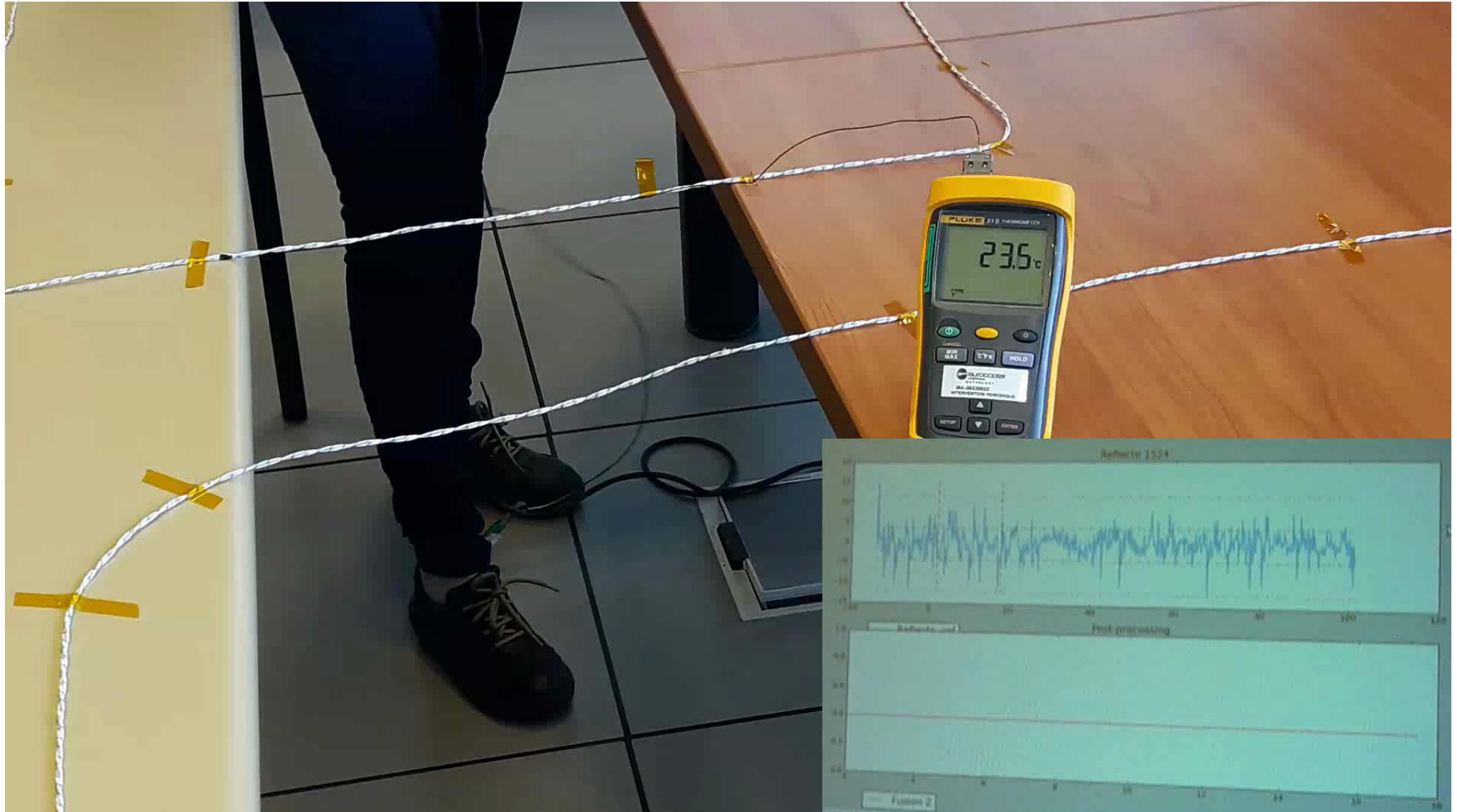
## SMARTCO STRATEGY

# SMARTCO

## Engine fire detection

### Project with Airbus Helicopters

The system was able to detect the fire ( soft fault) in four zones



## SMARTCO STRATEGY

# High measurement reliability Detection & location by several sensors

Bending  
radius at 29 m

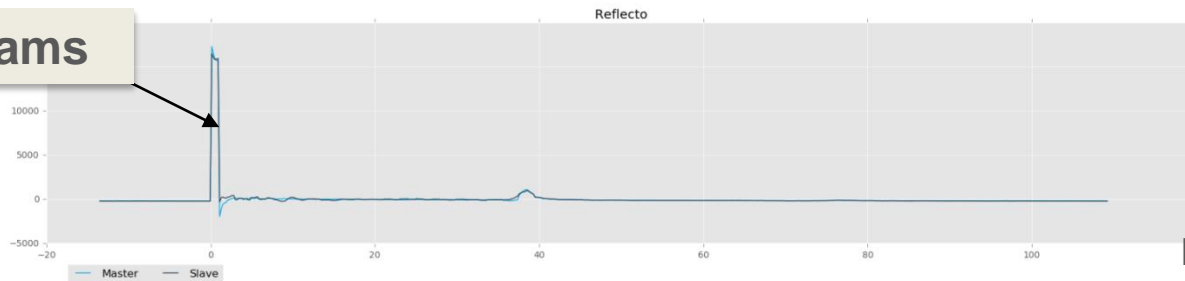


Sensor  
(Master)

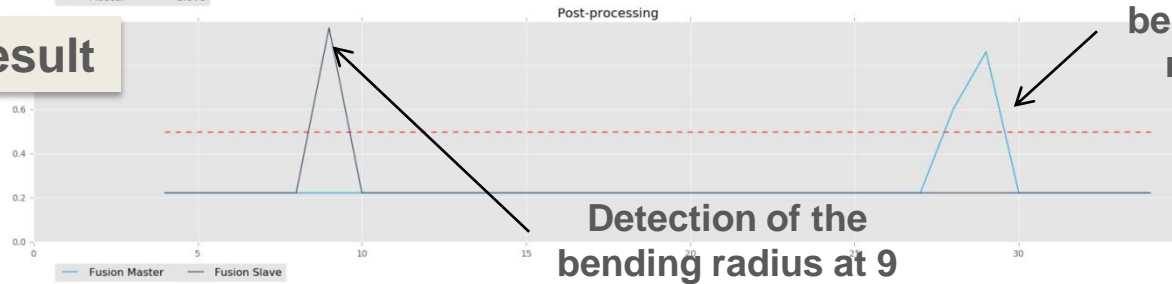
Sensor  
(Slave)

Cable length: 38 m

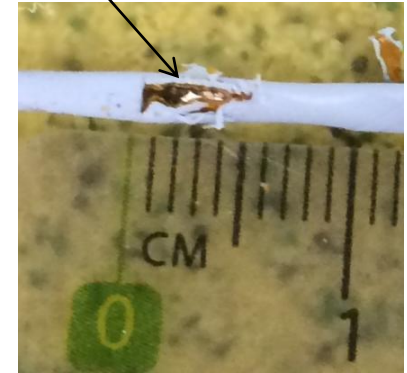
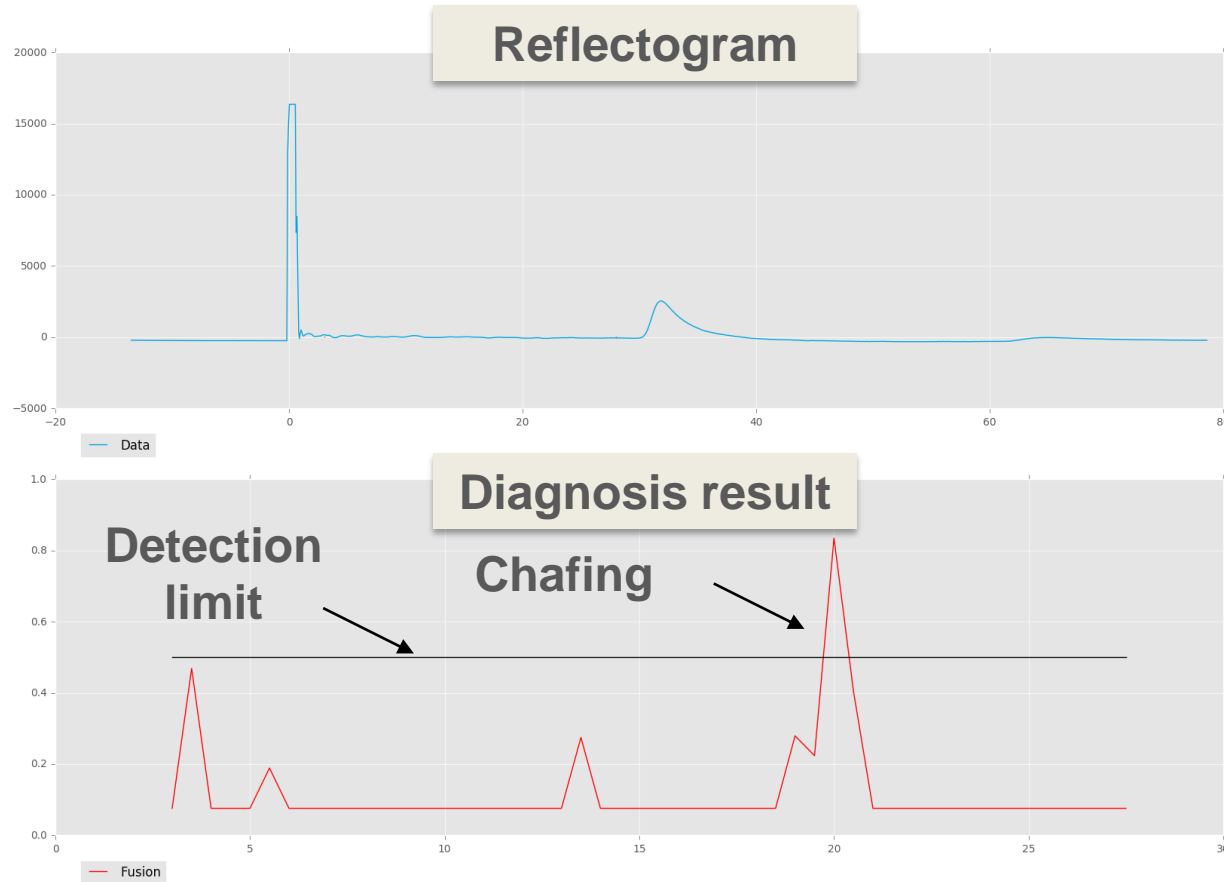
## Reflectograms



## Diagnosis result



The shielding is not  
damaged





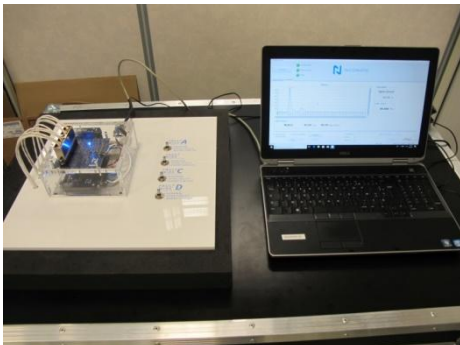
### **Features:**

- Detection and localisation
- Hard default
- Integrated in connector
- communication between sensor



### **Features:**

- Detection and localisation
- Hard default
- Fire detection



### **Features:**

- Multiplexing
- Hard default
- Resistance measurement

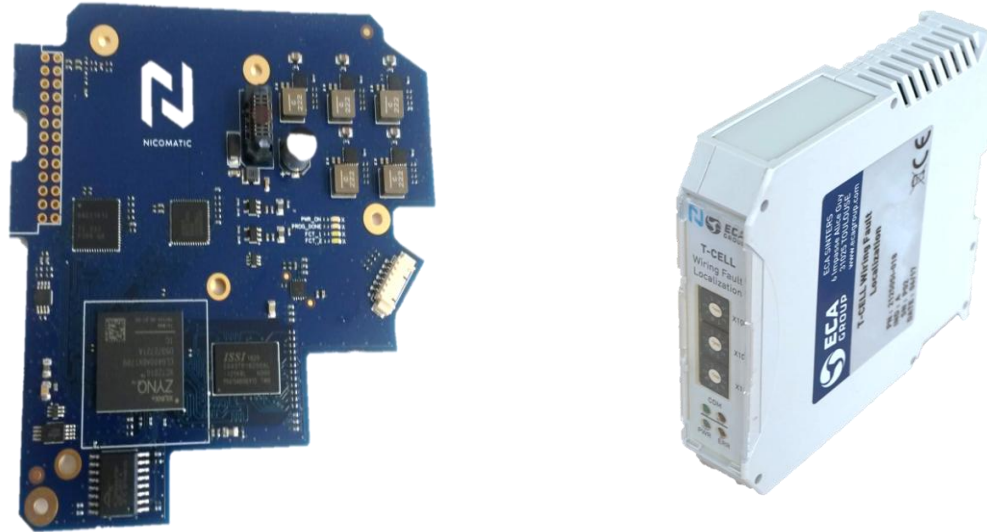


### **Features:**

- Hard default
- High voltage
- Detection and localisation

# ECA / NICOMATIC PARTNERSHIP

## Nicomatic added value



Integrate the OMTDR electronic in the Tcell

SMARTCO

# ECA / NICOMATIC PARTNERSHIP

## A flexible technology



### DESIGN, TESTING LAB AND SIMULATION

LAB QUALIFICATION TOOL



$$e_{\theta}(t) = N \frac{d\theta(t)}{dt} \sin(\theta + \phi)$$

447.04m/s  
900hp x 68 blades



INTEGRATION TEST BENCH

### MANUFACTURING

FINAL VALIDATION SYSTEM



MASS PRODUCTION TEST BENCH

SUB-ASSEMBLY TESTING TOOL



### MAINTENANCE



PORTABLE BUS READER/TRANSMITTER

MULTI-PURPOSE GROUND SUPPORT EQUIPMENT



CABIN GROUND SUPPORT EQUIPMENT



# SMARTCO

# ECA / NICOMATIC PARTNERSHIP

## Expert in electrical testing

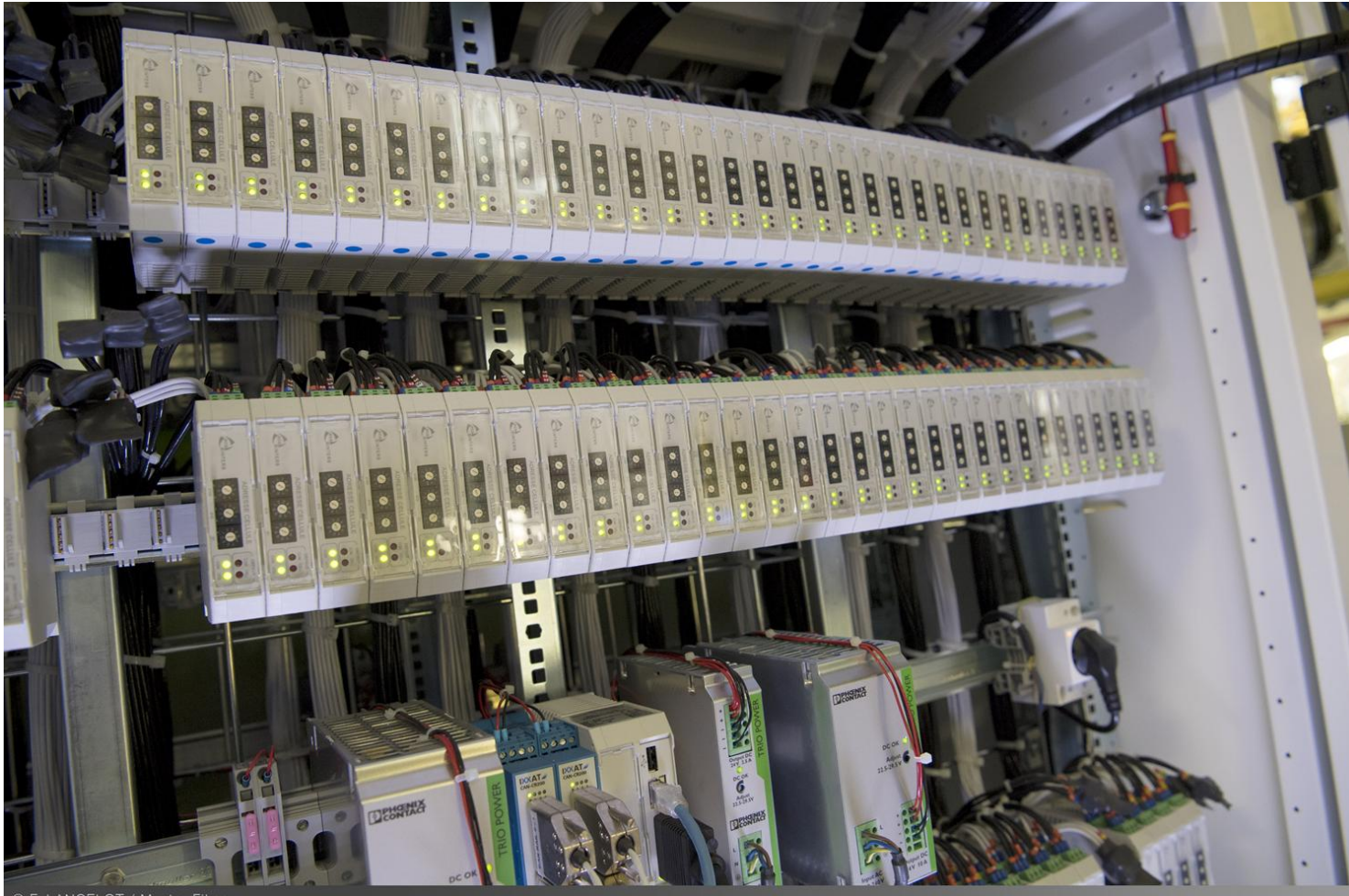


© F. LANGELOT / Master Films

# SMARTCO

# ECA / NICOMATIC PARTNERSHIP

## A flexible technology: Tcell



SMARTCO

# New TC50-eTOOL E-GSE

In partnership with  **ECA  
GROUP**  
make sure



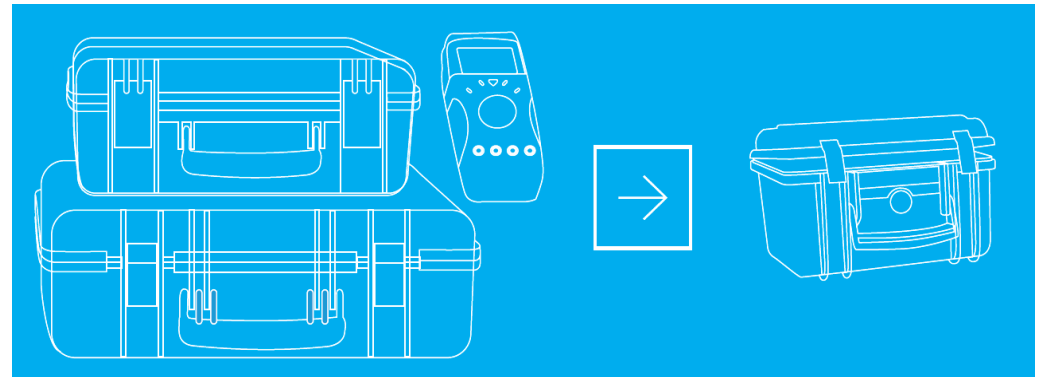
ALL-IN-ONE TROUBLESHOOTING PORTABLE TOOL

# ALL-IN-ONE TOOLBOX



Battery powered

**ALL-IN-ONE**  
**AIRCRAFT ELECTRICAL TROUBLESHOOTING TOOLBOX**  
**REDUCE AIRCRAFT ON GROUND DURATION**  
*(Exclusive Distance to Fault functionality inside)*  
**LOWER NO FAULT FOUND**  
**USER FRIENDLY**  
**PORTABLE & RUGGED DESIGN**

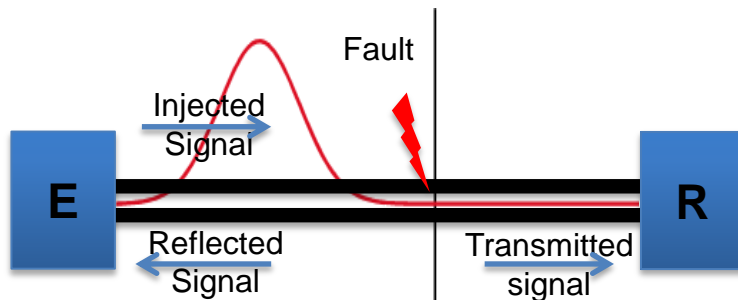


# FOCUS: WIRE FAULT LOCALIZATION



Using the best of **OMTDR (Orthogonal Multi-tone Time Domain Reflectometry)** technology for:

**Detection and localization of Hard faults - Open and Short Circuits**  
**Measurement of Impedance variations**  
**High precision fault localization up to 0.1%**

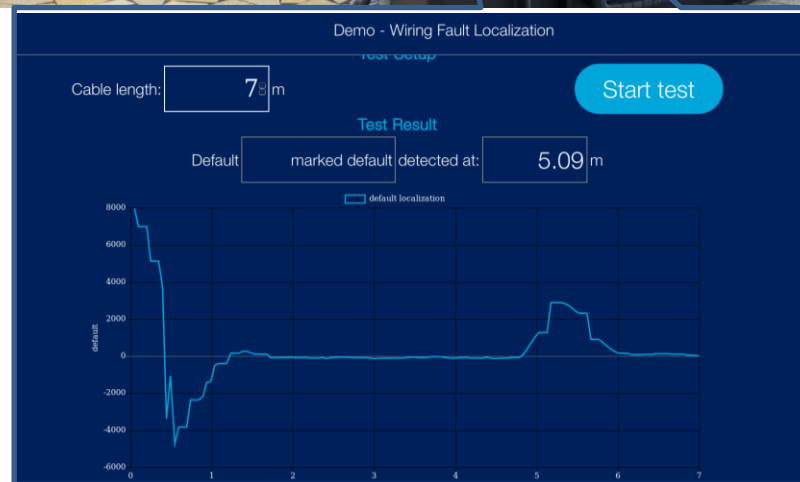


**Suitable for aeronautic applications:**

**Validated on most used aeronautic cable types**  
**Integrated and upgradable cable database**  
**Plug & Test on a wire network with no risk of cable alteration.**

# ECA / NICOMATIC PARTNERSHIP


## The first product



RELEASE



NICOMATIC



For More  
Information visit  
Booth No:B12

THANK YOU