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# WELCOME TO TELEDYNE FLIR

MATS HENRIKSSON & KATRIN STRANDEMAR

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# PROGRAM



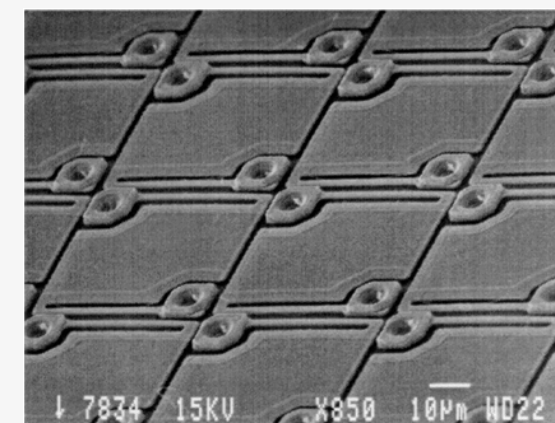
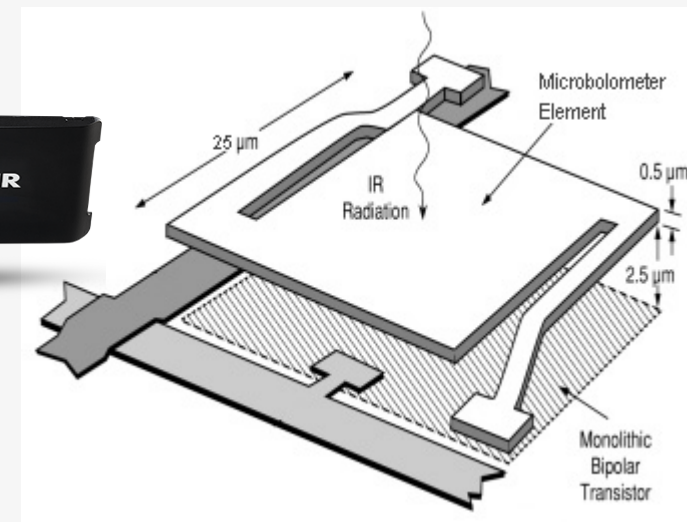
## Program

<b>08.30 – 09.00</b>	Registration
<b>09.00 – 09.30</b>	Teledyne FLIR presentation by Katrin Strandemar – VP Innovation & Technology and Mats Henriksson – Director Product Management, Digital Solutions
<b>09.30 – 11.30</b>	Conversation and co-creation with selected parts from Business Model Canvas around a future digital business model facilitated by Teledyne FLIR + Coffe
<b>11.30 – 12.30</b>	Presentation and learnings
<b>12.30 – 13.00</b>	Lunch mingle



# OUR CORE PRODUCTS

The detector has micro bolometer pixels  
 The micro bolometer change resistance when it  
 changes temperature  
 The readout measures resistance



Electron Microscope Image  
 of microbolometer FPA

# THERMAL CAMERA STRENGTHS

To Develop Imaging Solutions That Enhance Peoples' Perception and Awareness

See in Total Darkness



See Through  
Obscurants



Measure Temperature



Enhanced Long Range  
Imaging



Accurately Detect  
People & Animals

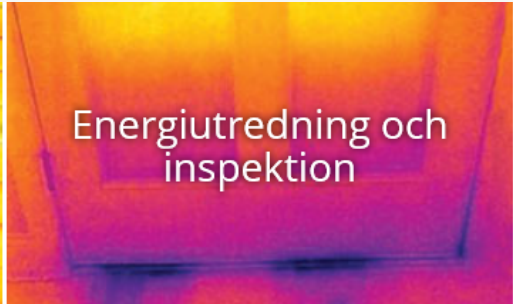




# APPLICATIONS




Byggdagnostik



Energiutredning och inspektion



Fastighets- och anläggningshantering



HVAC och VVS



Fuktskador och restaurering



Samhällsnytta



Tillverkningsindustrier




Serviceföretag




Elföretag




Olja och petrokemi




Detektering av naturgas




Tillverkningsindustri




Elkraftsindustri



Inspektion av ugnar och pannor



Kemikaliedetektering




Automatiserad inspektion




Processkontroll



Tillståndsovervakning

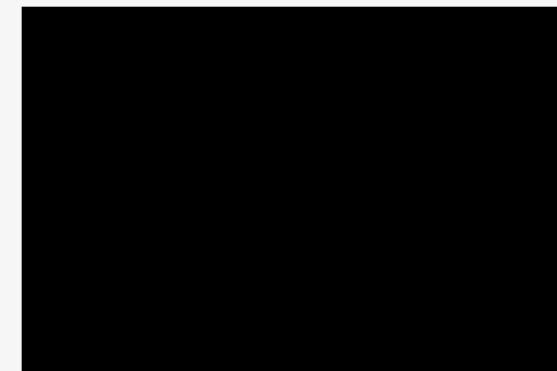
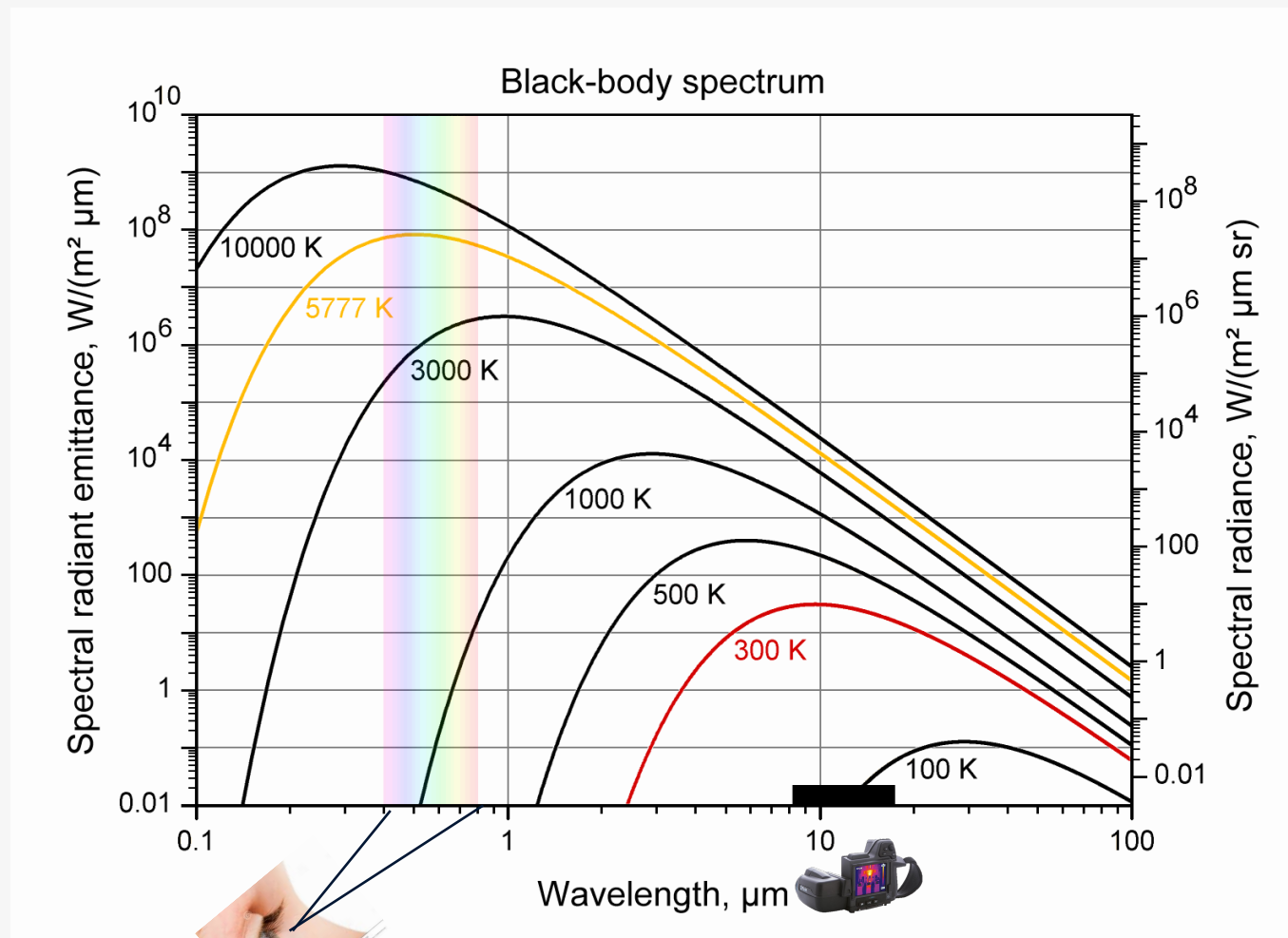


Branddetektering och förebyggande brandskydd



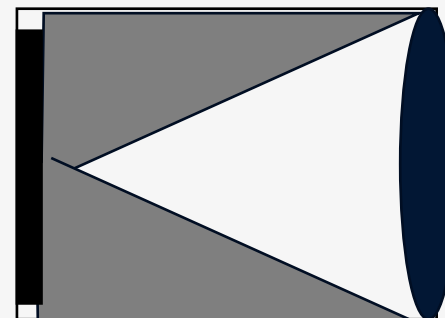
Kontinuerlig gasdetektering (OGI, Optical Gas Imaging)

# SPECTRAL RADIANT EMITTANCE



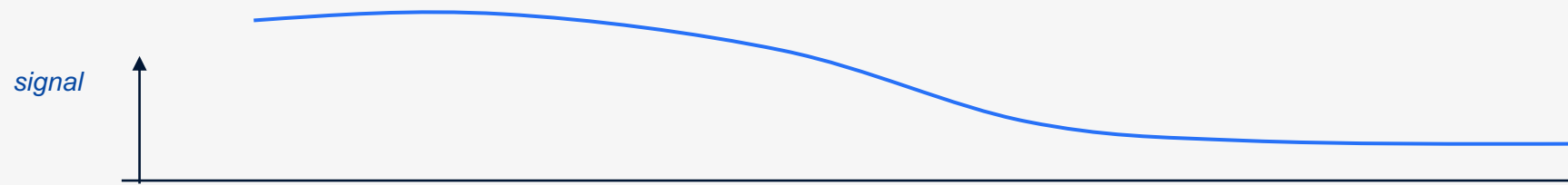
OPTICAL SYSTEM DESIGN

**70-90% OF  
SIGNAL COMES  
FROM THE  
CAMERA ITSELF**





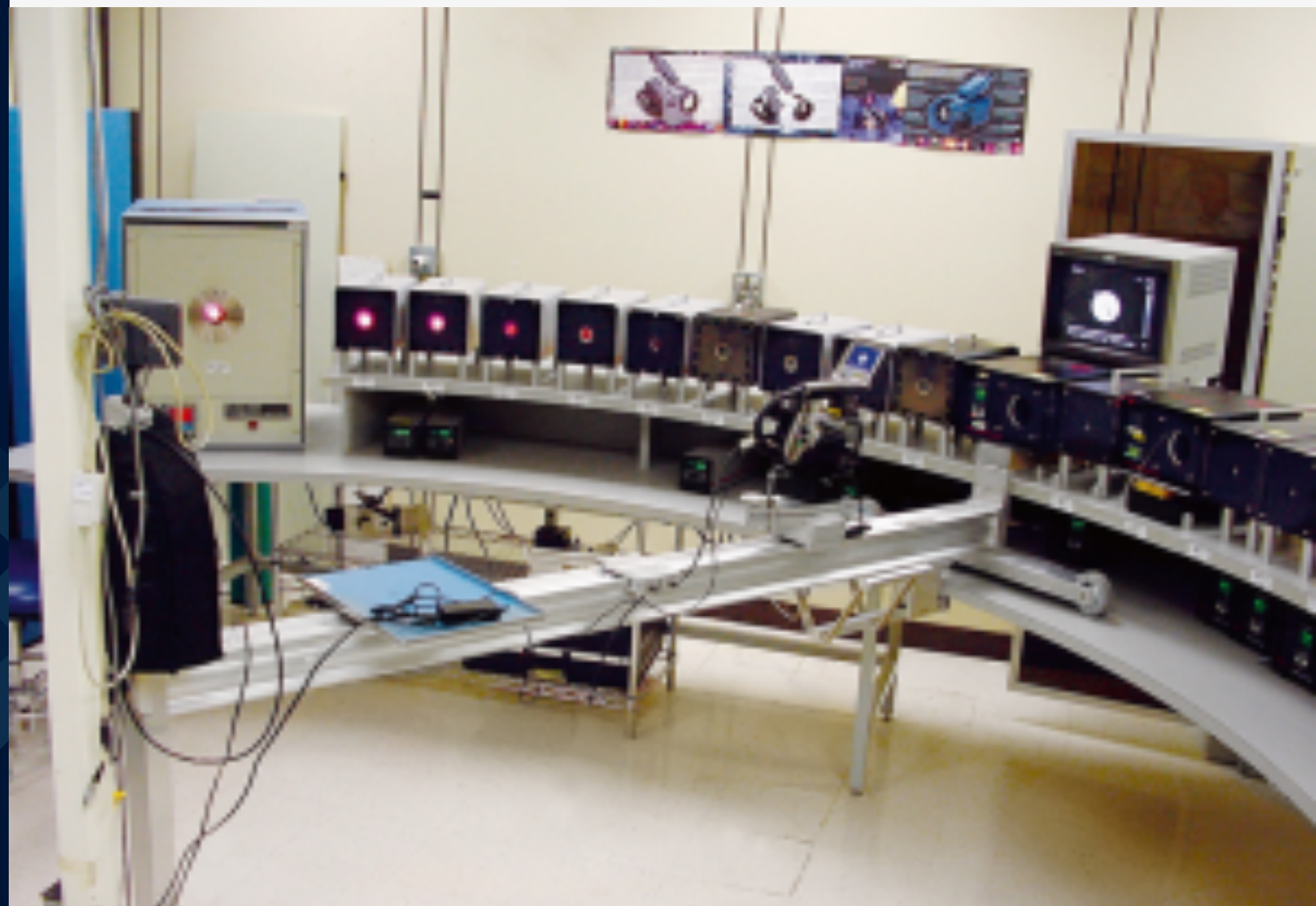
# Temperature Stability





CALIBRATION COST AND  
ACCURACY

# CALIBRATION



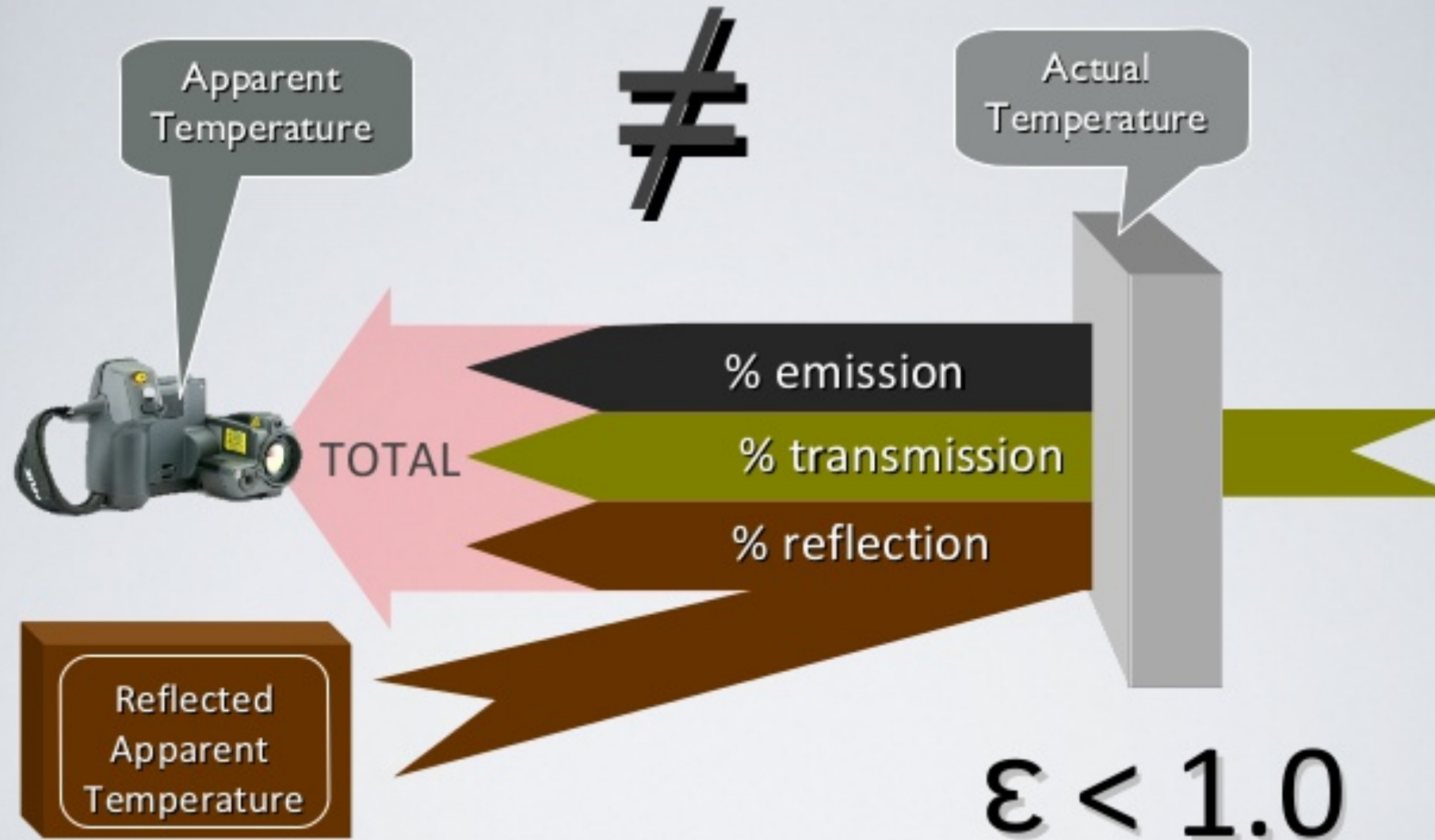
AN INSTRUMENTS THAT MEASURE  
**EVERY PIXEL IS  
A  
TEMPERATURE  
MEASUREMENT**



MEASURE TEMPERATURE  
CORRECTLY

## A DIFFICULT TASK

### INFRARED THEORY REVIEW





INSULATED ROOF?

**METAL ROOFS  
TYPICALLY  
REFLECT THE  
SKY**

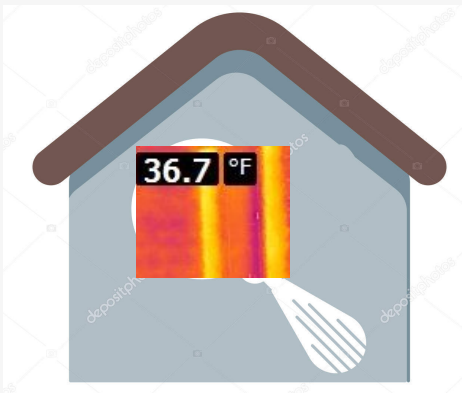


# INSPECTION DIFFICULTIES – HOME EXAMPLE

What most want to  
know:



What you get :



**Is this a problem?**



# TELEDYNE OVERVIEW

Employees: 16 000  
Revenue: \$5B



## Instrumentation

Monitoring and control instruments for marine, environmental, scientific, industrial, and defense applications as well as harsh environment interconnect products



## Digital Imaging

Research laboratories for a range of new technologies, as well as development and production efforts in digital imaging products for government applications. Included are infrared detectors, cameras, and opto-mechanical assemblies.



## Aerospace & Defense Electronics

Complex electronic components and subsystems for communication products, including defense electronics, data acquisition and communications equipment for air transport and business aircraft.



## Engineered Systems

Systems engineering and integration, advanced technology application, software development, and manufacturing solutions to space, military, environmental, energy, chemical, biological and nuclear systems, and missile defense requirements

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**TELEDYNE FLIR SOLUTIONS**

Employees: 1400  
Revenue: \$800M



# SOLUTIONS

2020 Revenue:~ \$800M

## PRODUCTS

Handheld UC &  
Cooled  
(Premium | Volume | OGI)



Fix Mount UC &  
Cooled  
(Science | Automation | ITS)



Test &  
Measurement  
(FLIR | Extech)



After Market  
Services  
(ITS | Service | Acc.)



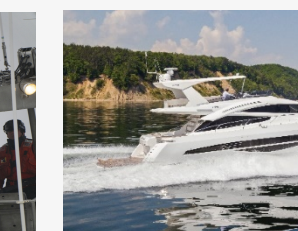
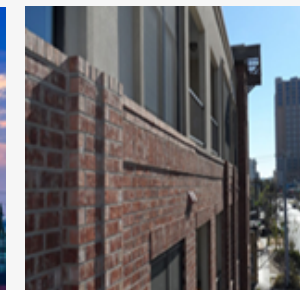
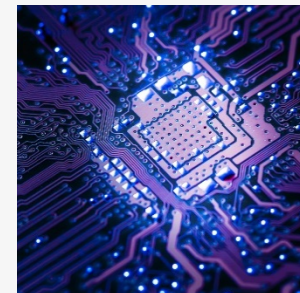
Marine Electronics &  
Thermal



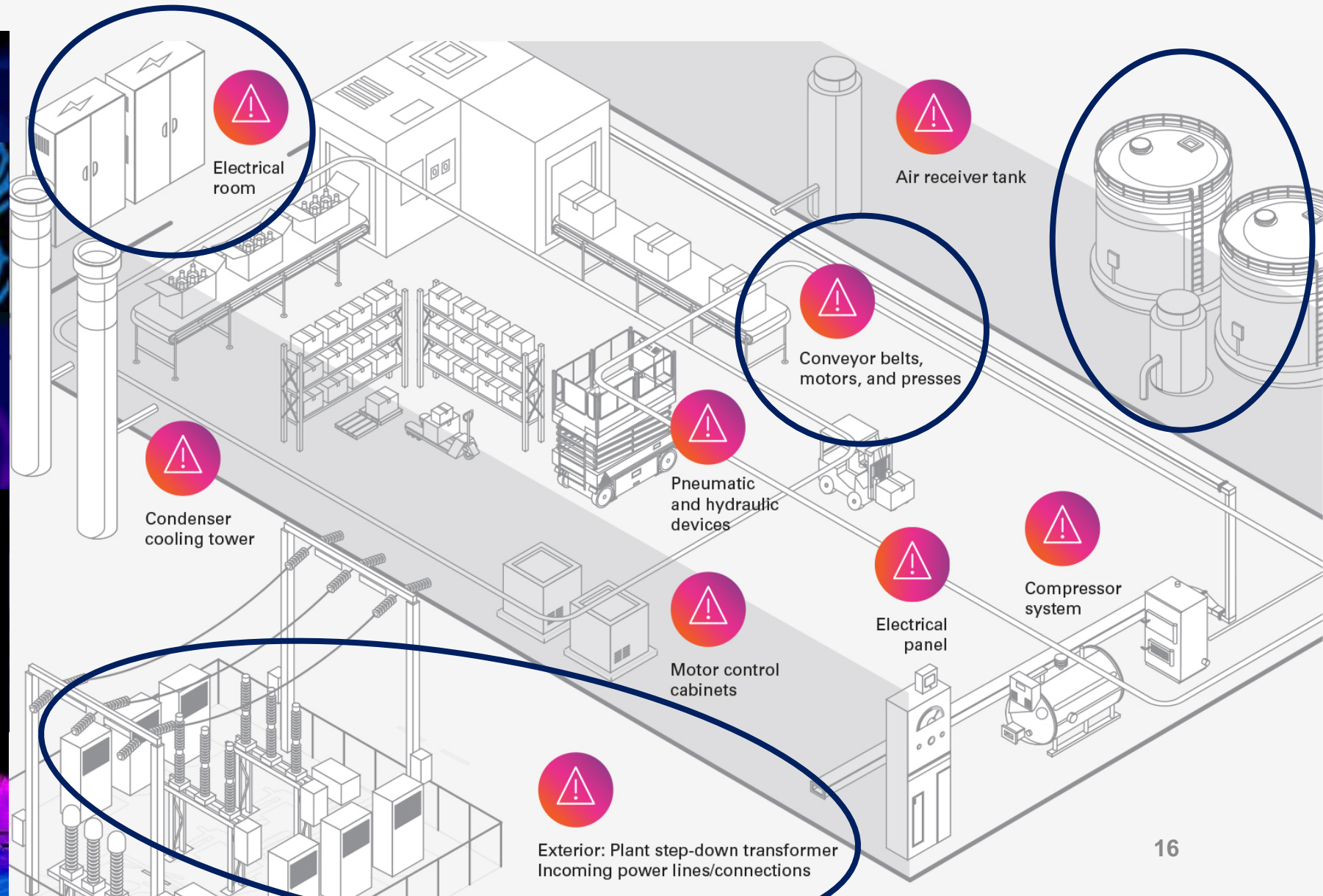
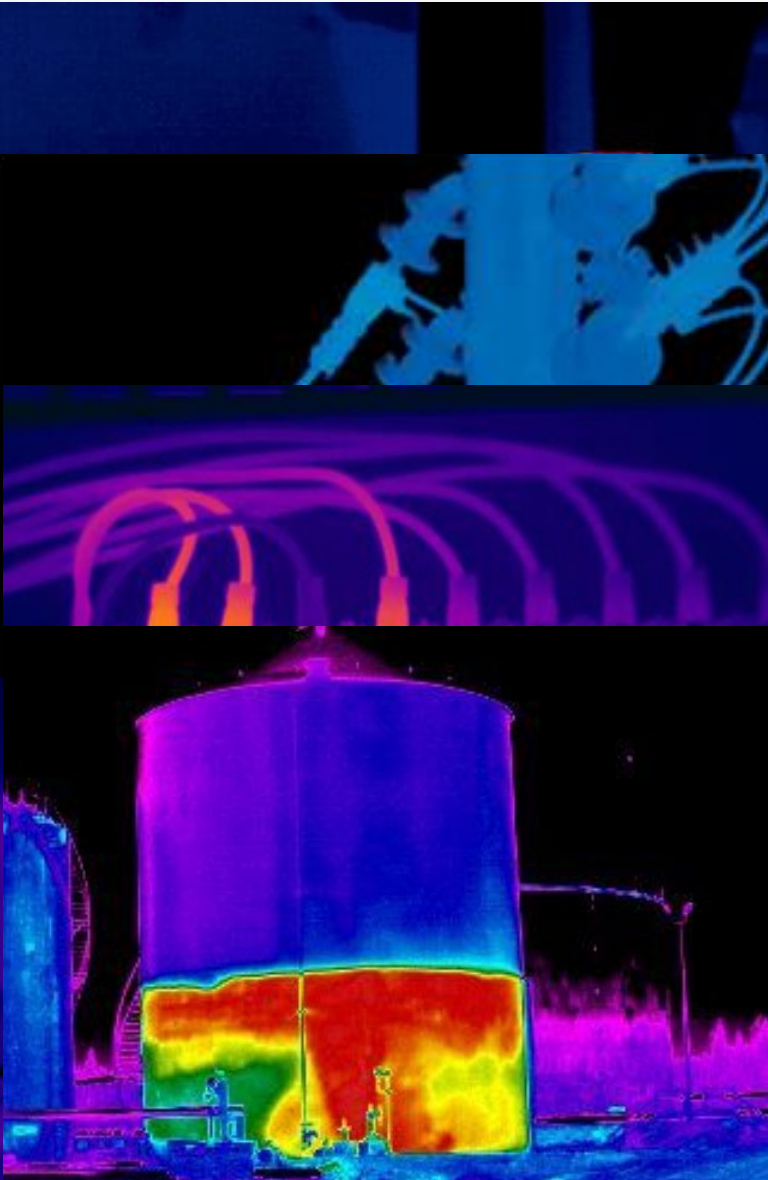
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## MARKET VERTICALS

- Condition Monitoring  
(Machine Condition Monitoring | Facility Maintenance | Building)
- Public Safety  
(First Responder | ITS)
- Security
- Optical Gas Imaging
- R&D / Science
- Leisure marine and Law enforcement

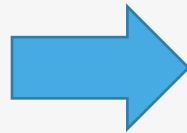
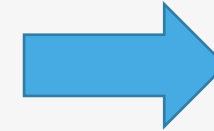
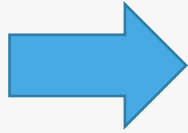


# EXAMPLE USE CASES





# NEW COMPETITIVE LANDSCAPE



# THE NEXT S-CURVE



Cameras being commoditized

## Threat:

- Flat or dropping growth
- Dropping margins
- Losing market share



ASSISTED

PARTIALLY  
AUTOMATED

HIGHLY  
AUTOMATED

AUTONOMOUS

## Differentiators

- Automatization
- Decision support
- Work efficiency
- Sustainability



# LOWER THE HURDLE



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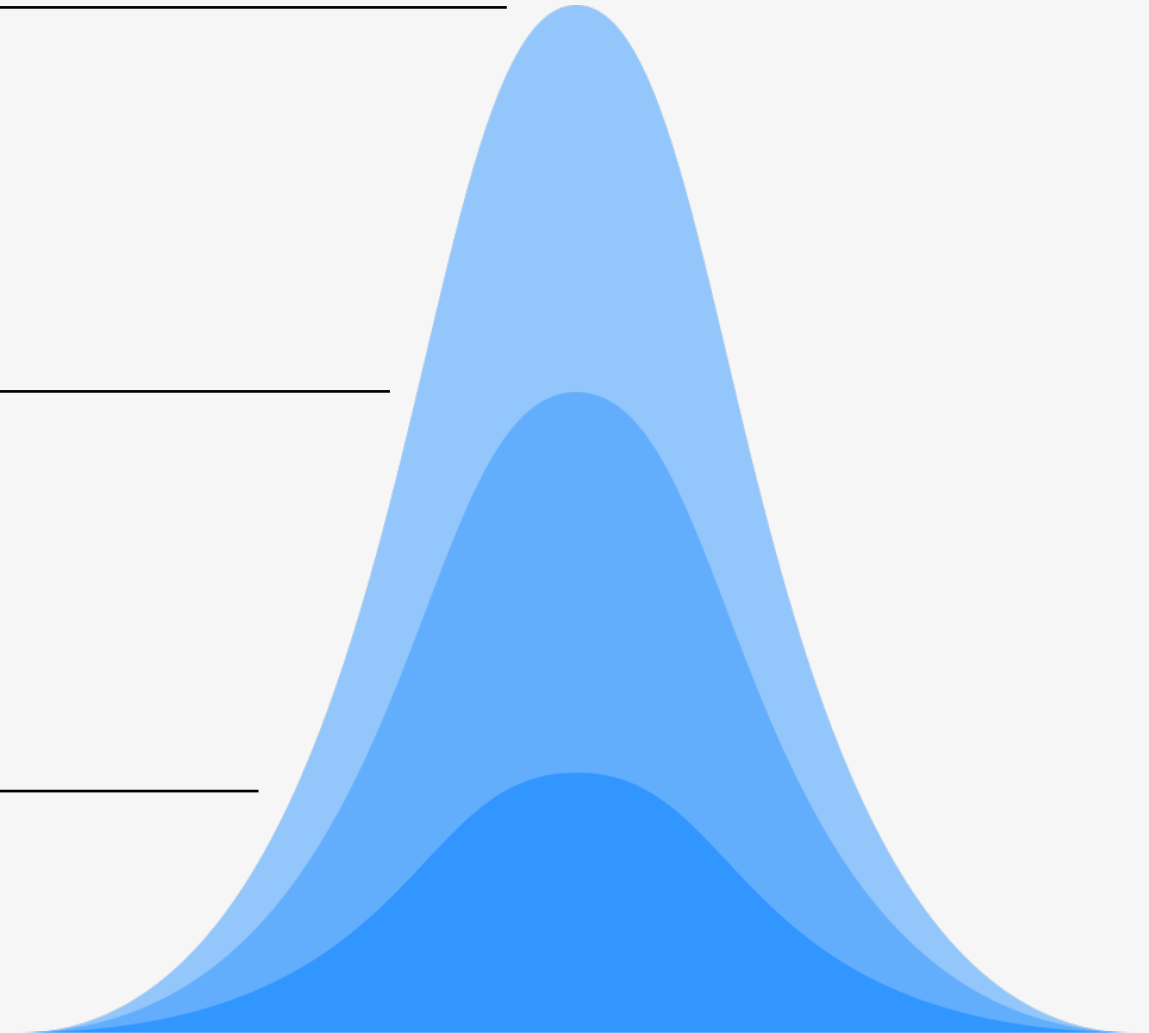
CURRENTLY  
THERMOGRAPHER LEVEL

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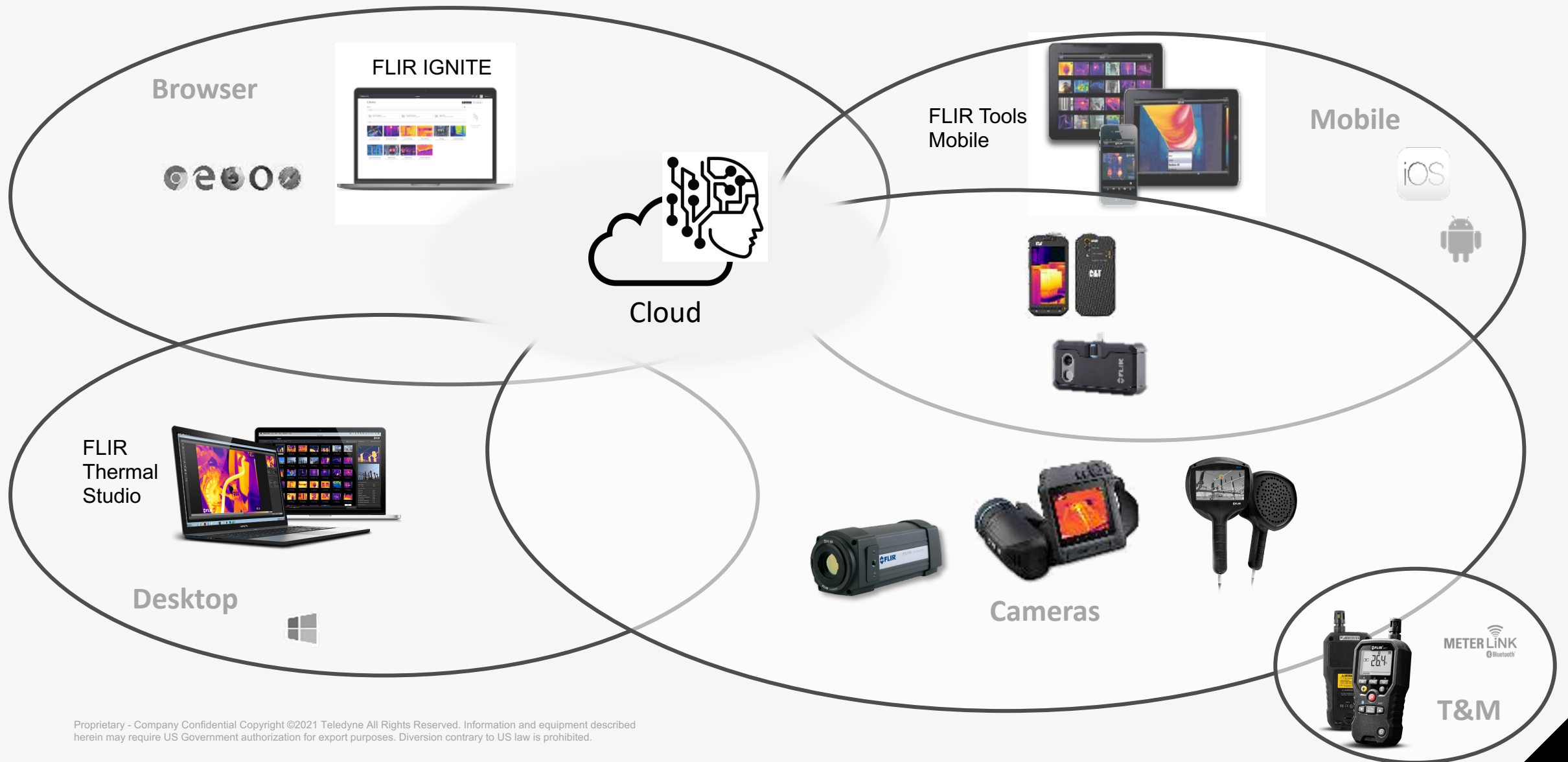
INSTRUCTIVE APPS  
SEMI-PRO LEVEL

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AI SUPPORT  
DIY LEVEL



# CONDITION MONITORING ECO SYSTEM





# SDK - SOFTWARE DEVELOPMENT KIT



Developer Program

MOBILE PLATFORM

DESKTOP PLATFORM

COMPONENT PLATFORM



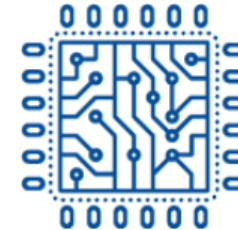
## Mobile

The FLIR Mobile SDK is a development package for creating iOS and Android applications that use FLIR thermography cameras, FLIR ONE and T&M devices



## Desktop

The FLIR Atlas SDK is a development package for creating desktop applications that use FLIR thermography products.



## Components

The Lepton® SDK is a development package for creating hardware / software solutions based on the Lepton thermal imager.



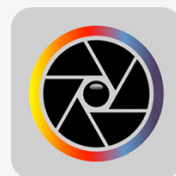
SIGHTPLAN



THERMIFY



THERMAL CAMERA+



THERMOPRO

descr



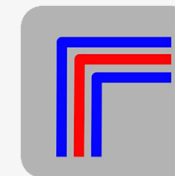
IPDS FOR IPHONE



KAZASU2



MEDIPAC INFRARED



PIPE TRACKER

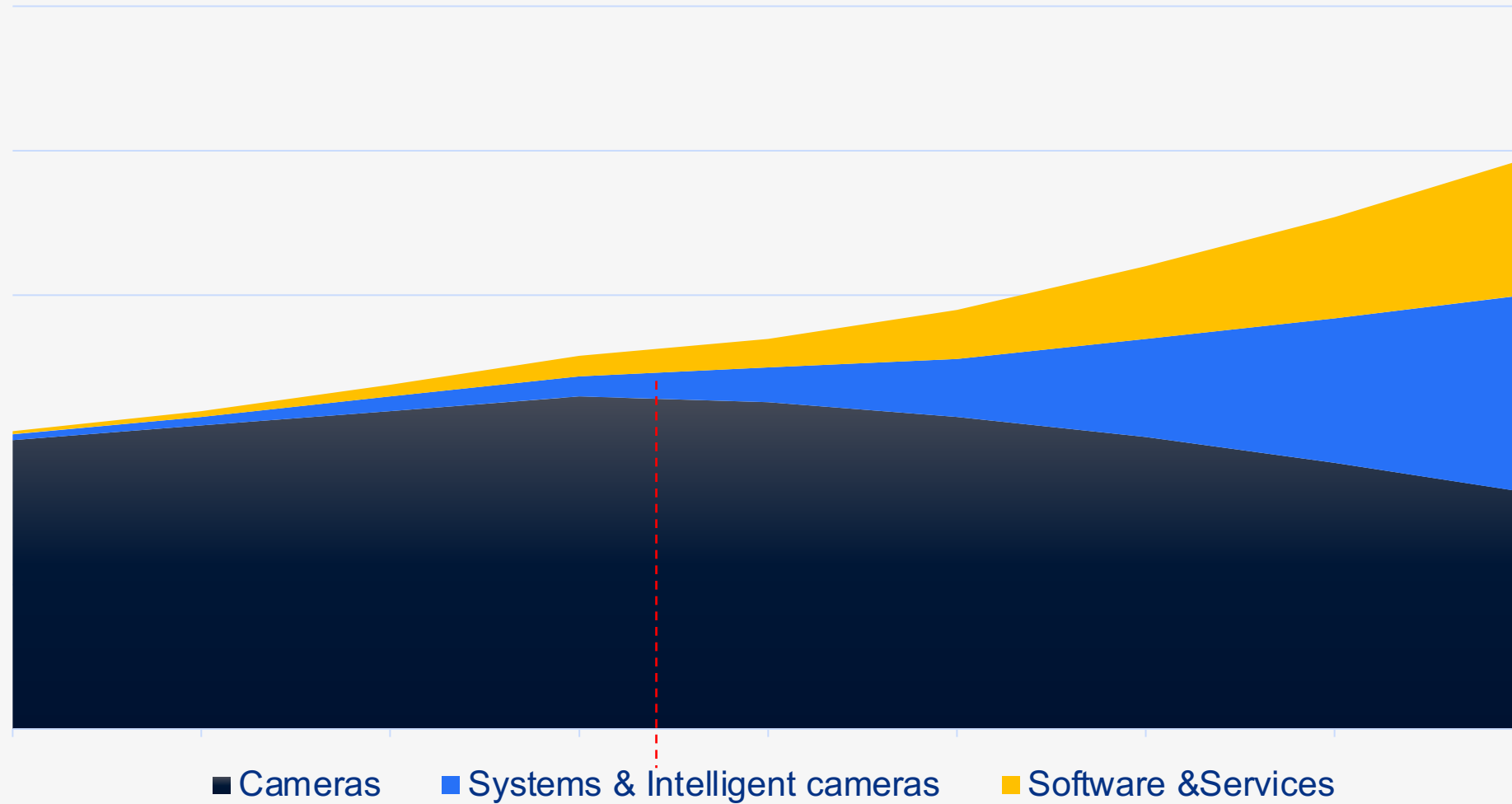


THIN BLUE LINE



TOEZICHTHOUDERS

# REVENUE – SW AND HW



# CREATING THE RIGHT MOMENTUM



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# WORKSHOP – MAIN TOPICS

- Business modeling and non-monetary gains
- Boosting the sales and marketing momentum in the early phases of the digital transformation

# **BUSINESS MODEL CANVAS EXERCISE EXPLAINED**

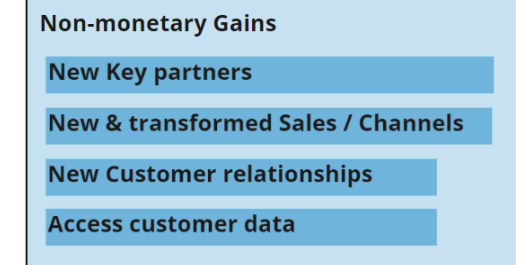
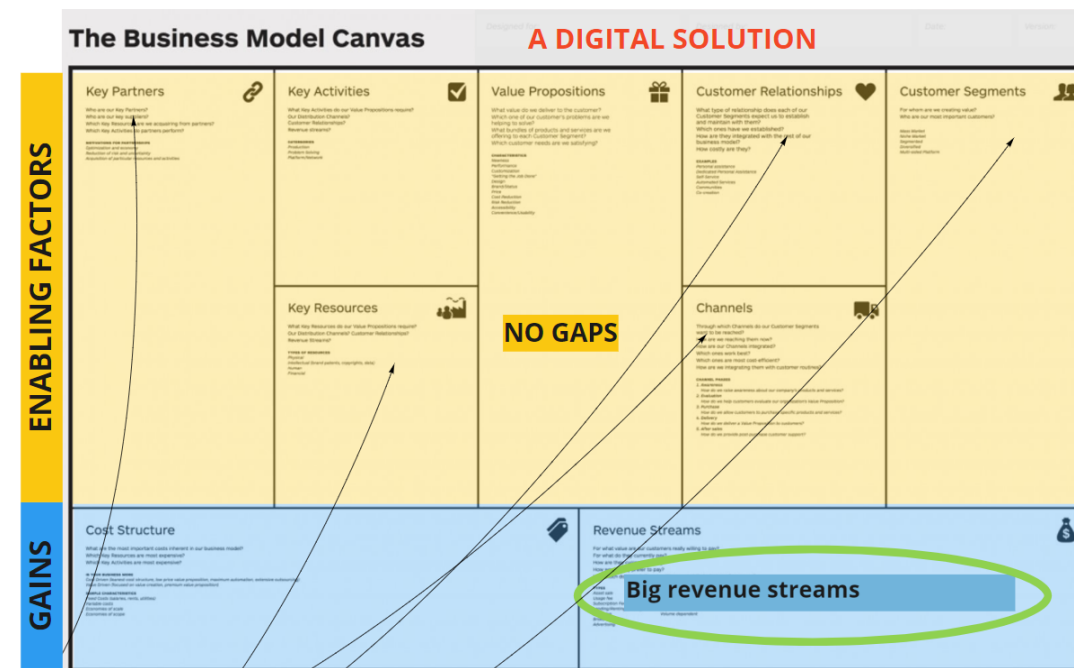
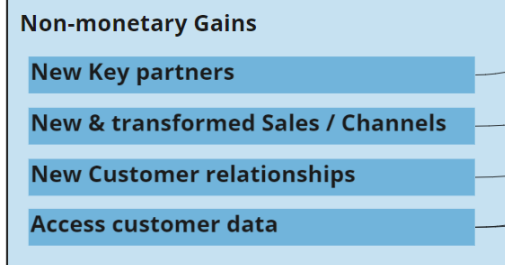
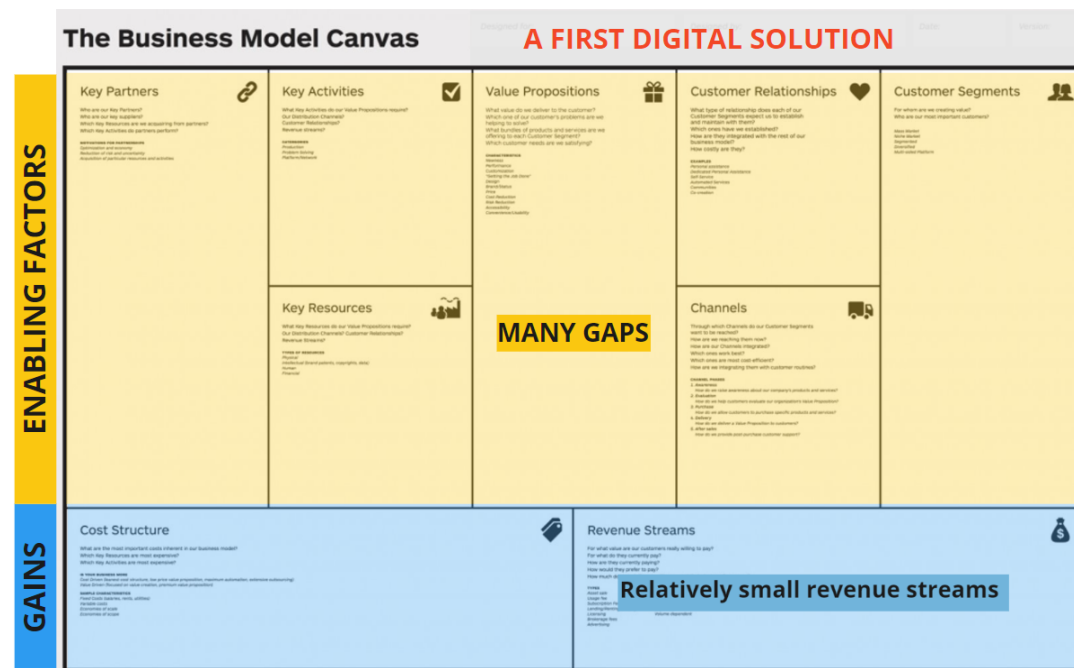
TRANSFORMATION START

DIGITAL TRANSFORMATION

TRANSFORMATION DONE

EARLY OFFERINGS

MATURE OFFERINGS







**TELEDYNE**  
**FLIR**

Everywhere**you**look™

Part of the Teledyne Imaging Group