

The background features a city skyline at dusk or dawn, with a prominent bridge on the left. The scene is overlaid with a blue and purple gradient and abstract light trails and dots, suggesting a digital or fiber optic theme.

Comment j'utilise la fibre optique pour détecter les problèmes de sécurité

Olivier Daire
Solutions Engineer
26 avril 2024

VIAVI Solutions par les chiffres

Over 1,600,000

INSTRUMENTS IN USE
AROUND THE WORLD



\$1.2B

ANNUAL REVENUE
(FY21)



100,000

DATA CENTERS
RELY ON VIAVI



3600+

EMPLOYEES



2359

PATENTS
ISSUED



+ de 10 000 produits par an
fabriqués à Saint-Etienne



3 millions de km de fibre optique supervisés
(75 fois le tour de la terre)

VIAMI propose des solutions pour construire, déployer et surveiller les réseaux



Réseau telco



Hyperscale / Entreprise



400G / Sync / Private 5G



Tester la fibre et la surveiller



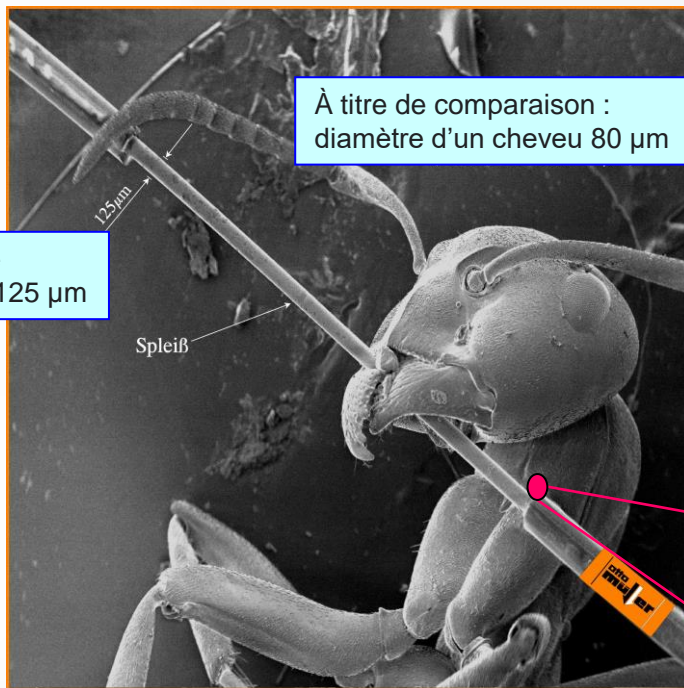
Network Performance and Threat Solutions



TWAMP based IP monitoring

La fibre optique

La fibre optique

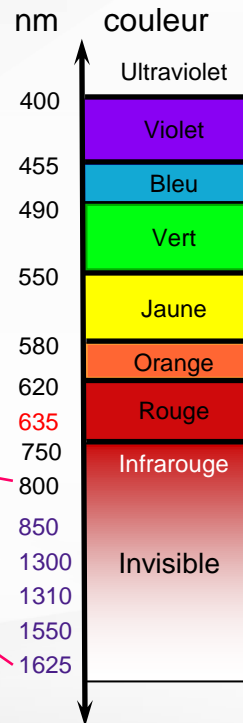


diamètre d'une fibre optique : 125 μm

À titre de comparaison :
diamètre d'un cheveu 80 μm

Spleiß

Longueur d'onde en nm



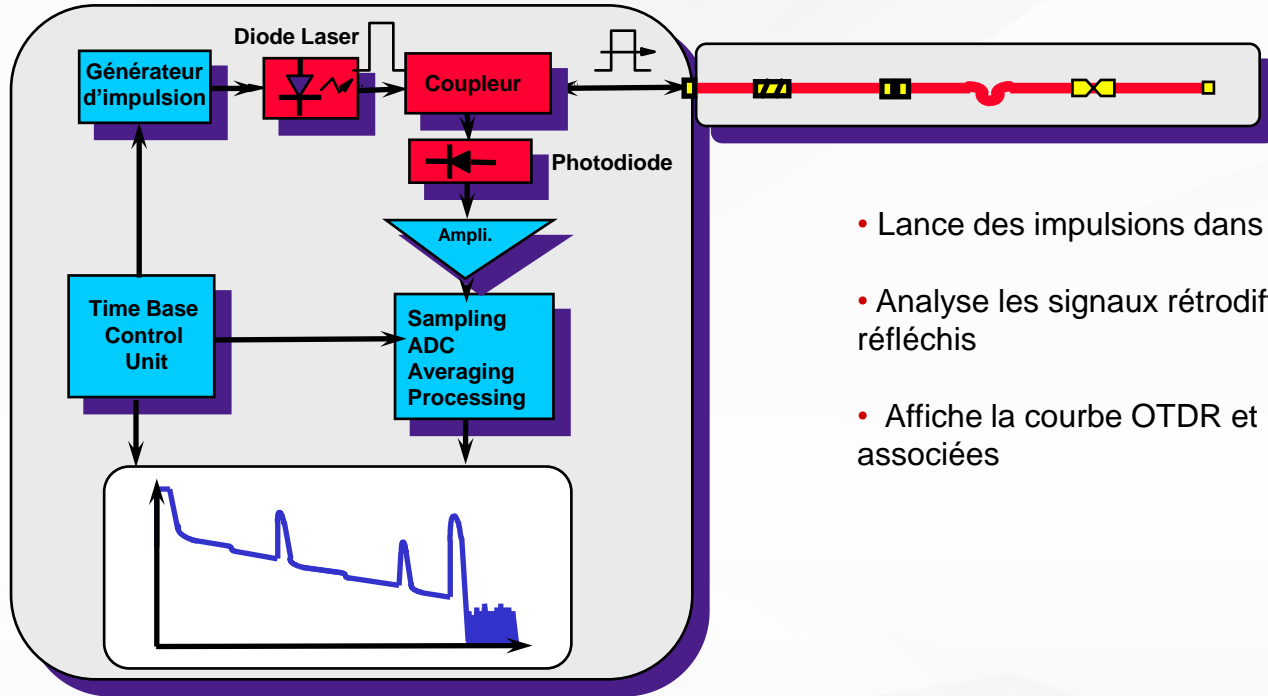
Pointeur laser

Spéctre optique pour
les communications

La mesure de réflectométrie

OTDR : Optical Time Domain Reflectometry

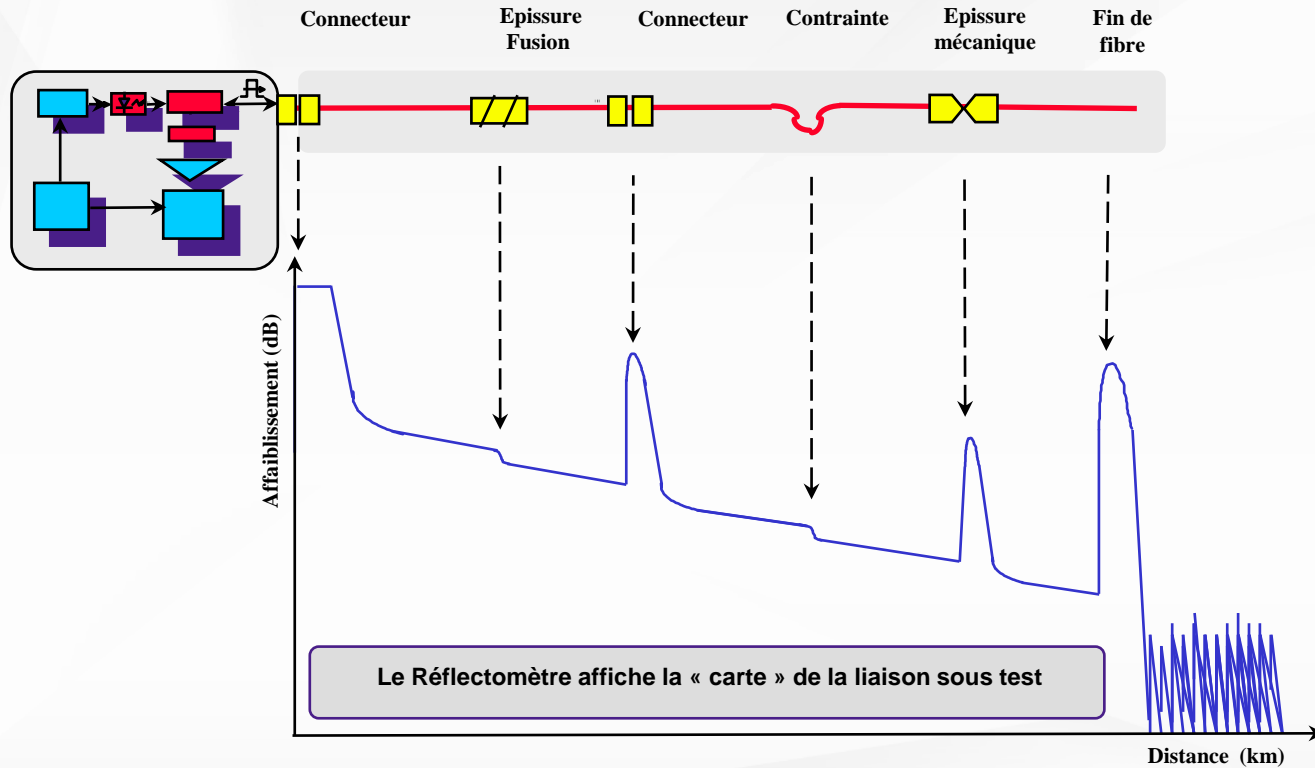
Fonctionnement d'un réflectomètre (ou OTDR)



- Lance des impulsions dans la fibre
- Analyse les signaux rétrodiffusés et réfléchis
- Affiche la courbe OTDR et les mesures associées

Un accès à une extrémité de la fibre permet de mesurer la fibre

Fonctionnement d'un réflectomètre (ou OTDR)



OTDR / Applications « telecom »

- Recette des réseaux



- Maintenance /
Coupure



- Surveillance



Respect des règles de l'art / cahier des charges



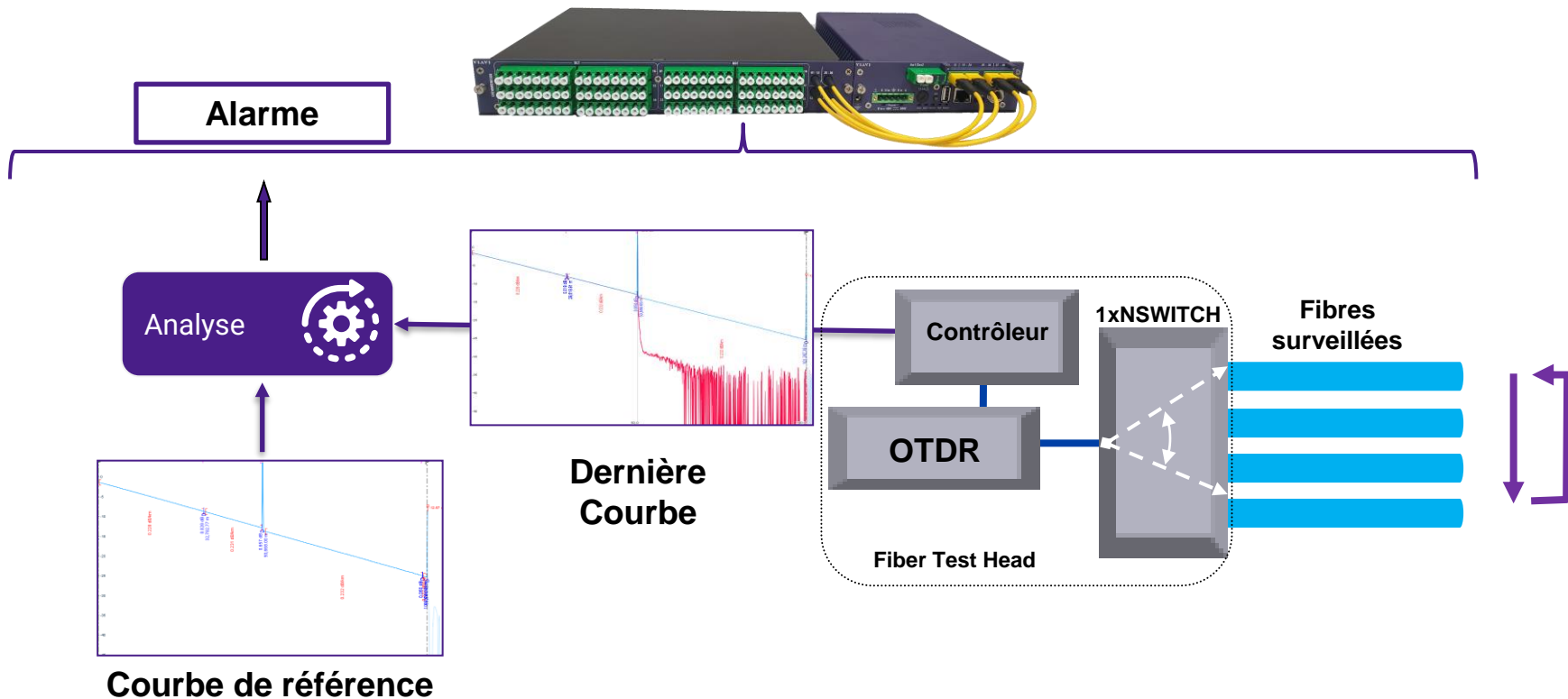
Localisation des défauts / coupures en vie de réseau

Détection proactive des défauts / coupures
& du « tapping »



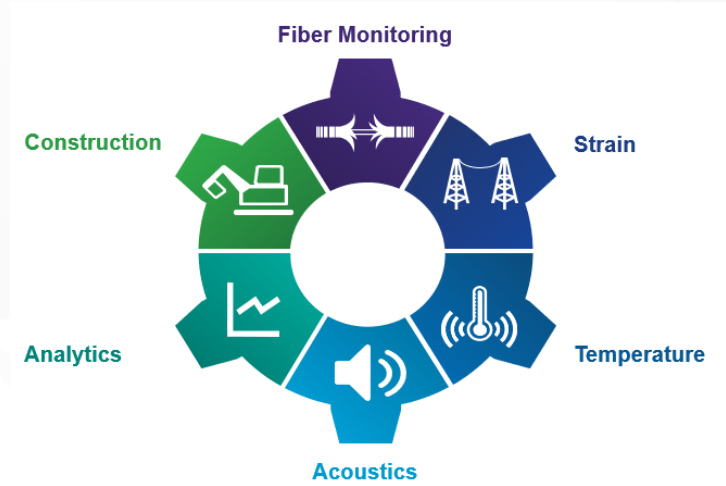
Supervision des réseaux optiques

Système de test de fibre à distance - Fonctionnement

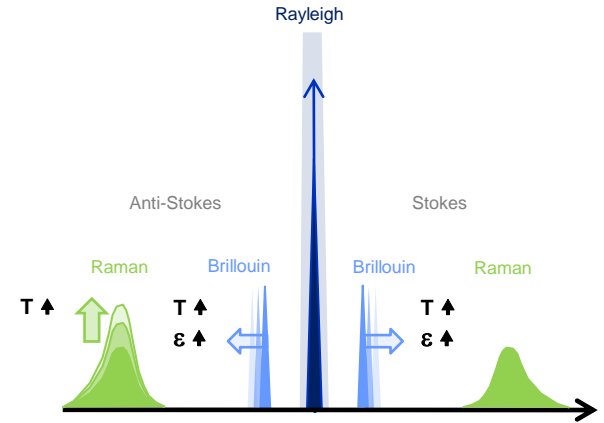
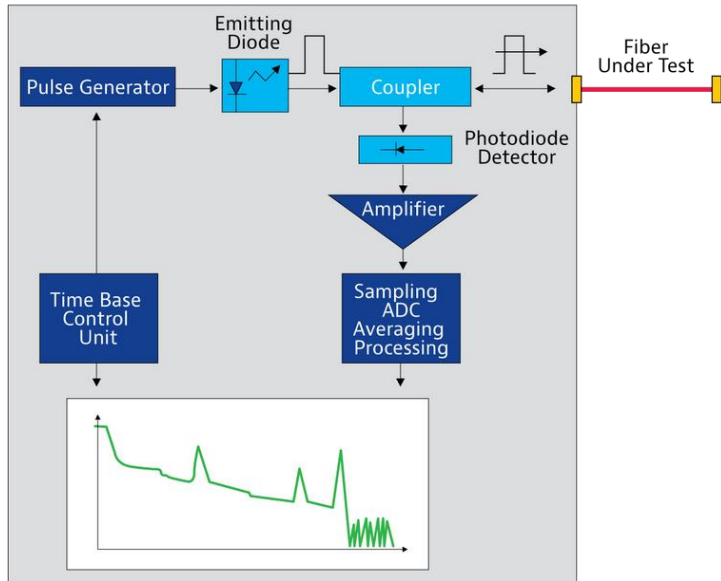


Fiber Sensing

La fibre comme capteur



Les différents types de mesures OTDR



OTDR Rayleigh

OTDR Raman

OTDR Brillouin

OTDR Coherent Rayleigh

→ Fiber Monitoring – Loss, Reflections & Failures

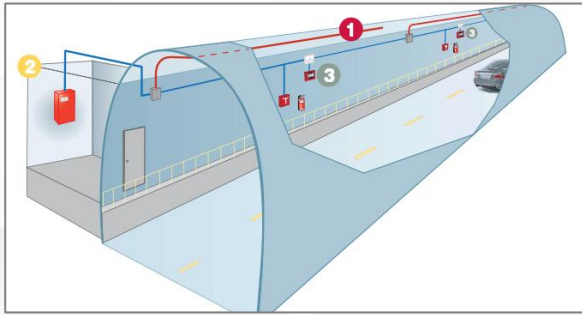
→ Distributed **Temperature** Sensing (**DTS**)

→ Distributed **Temperature & Strain** Sensing (**DTSS**)

→ Distributed **Acoustic** Sensing (**DAS**)

Les applications de la fibre comme capteur

Distributed **Temperature** Sensing



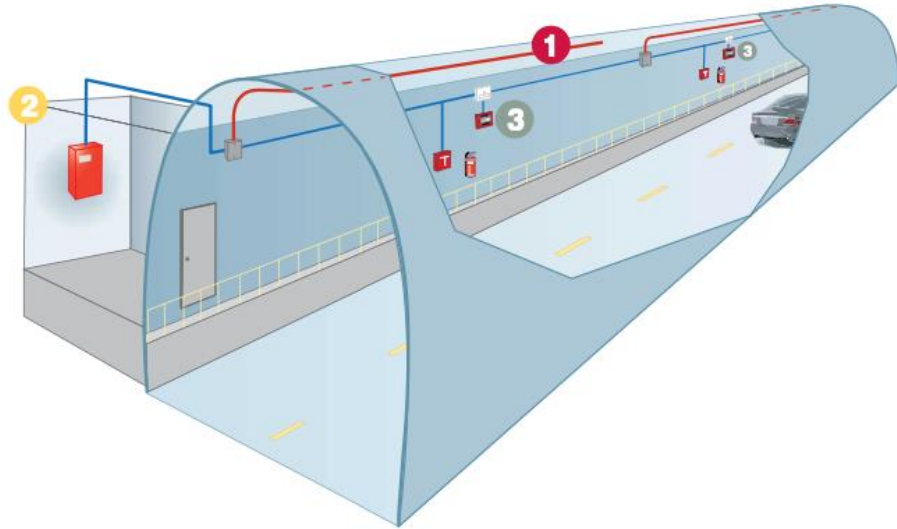
Distributed **Strain** Sensing



Distributed **Acoustic** Sensing



Fire Safety Use Case: Tunnels, Buildings & Cable Tray



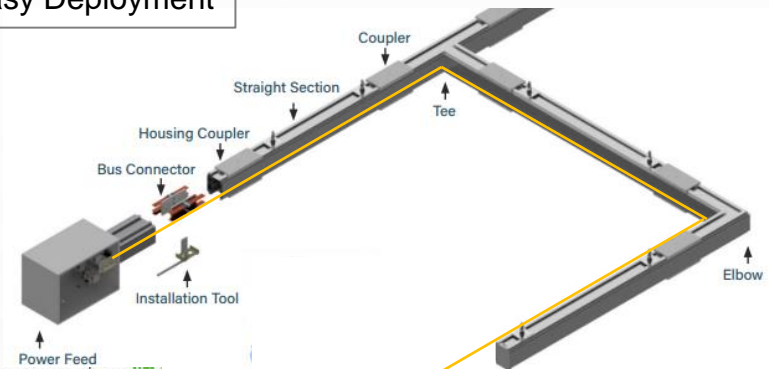
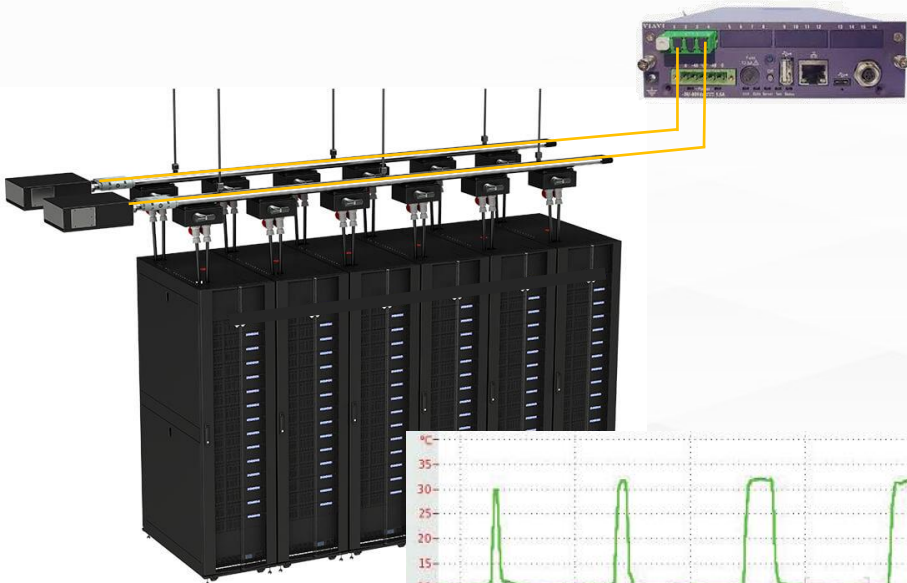
DTS Solution vs Conventional Fire Detection

- Cheaper in Supply & Installation
- Longer lifetime in Harsh Environment

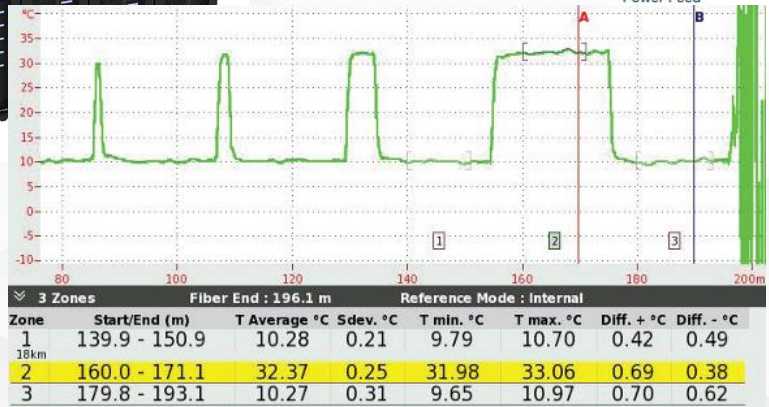


Data Centers Use Case: Bus Bars Hot Spots Detection

DTS
 Compact
 Low Power
 Easy Deployment



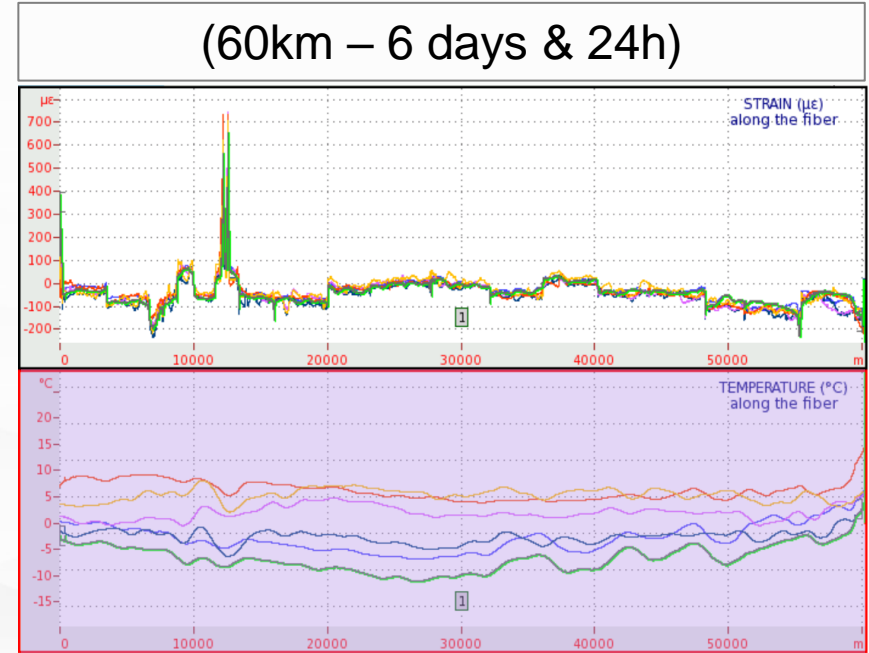
Fiber Sensing Cable



Electrical Power Use Case: Cable Structural Health



- Installation & Commissioning
- Environmental Effects
 - Objects on cables
 - Ice & wind loads
 - Ground & towers movements
 - Seasonal thermal loads



OPGW cable

Not secure | 10.10.0.90/protected

Admin

Crowe Farm

Outstanding Alarms

System Health
Crowe Farm 🌿

rtsp://10.10.0.85 - VLC media player

Athens Demo Site

50 m
100 ft

Not secure | 10.10.0.90/protected

200
150
100
80
0

Zones: Test Road -> White Fence | White Fence -> Lake

18:11:51
18:11:40
18:11:30
18:11:20
18:11:00

2700m 2775m 2850m 2925m 3000m

System Health ● Processing ● Logging ● Display ●

CPU Temperature: 44°C	Signal: OK	Load: <input type="text"/> 0%	Dropped shots: <input type="text"/> 0%
GPU Temperature: 56°C	Load: <input type="text"/> 0.01%	Write speed: 0.0 MB/s	Dropped alarms: <input type="text"/> 0%
System Drive: <input type="text"/> 21%	Backlog: 0.0 s	Backlog: 0.0 MB	

Health Details Mean backscatter: 5574.41 (17%) Last FDEL start: 2020-07-23 13:38:58 Updated: 18:11:51 CDT

Admin

Currently Viewing

Display:

Time:
Dist.:
Mag.:
Zone:
Type:

Data Logging

Status: Not Logging

Raw: /dev/sdb1

Acoustic: /dev/sdb1

Phase: Default Drive

Directory: July_23_2020

Filename: Explosion_1

Format: FDS

Helios Controls

Running

Laser On



VI.AVI Solutions

viavisolutions.com

