



# FFT Aura Ai-2

## ADVANCED PIPELINE PROTECTION

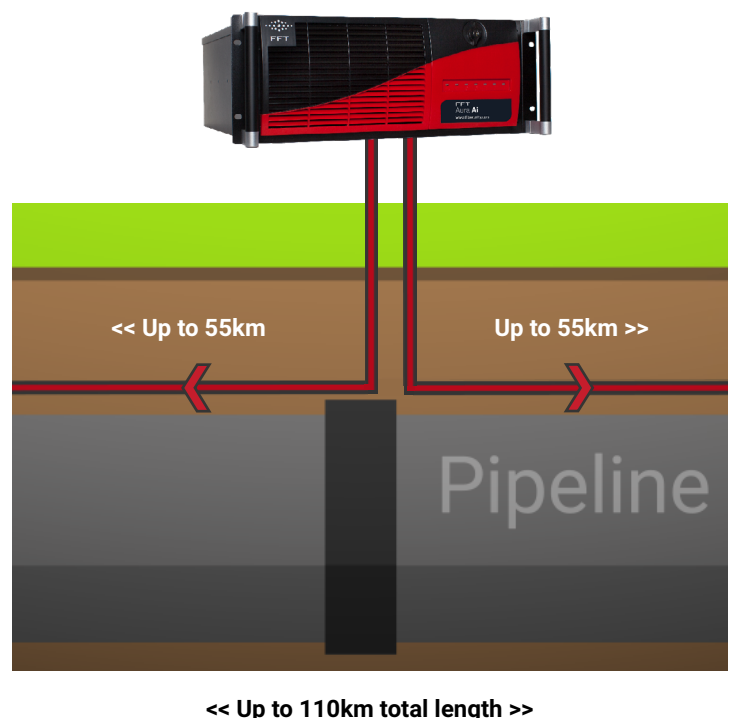
**Aura Ai-2 is the next generation controller from FFT, and offers superior detection of walking, manual and mechanical digging and vehicle movement. With a maximum length of up to 55km (35 miles) per channel (total 110km), the Aura Ai-2 can detect, locate and report disturbances to within  $\pm 5\text{m}$  (17ft) of the event.**

The Aura Ai-2 controller pulses laser light down optical fibres connected to each of its two detection channels. Optical fibres are housed inside cable laid adjacent to the pipe. Ground disturbances cause vibrations and changes in the reflected laser light. The Aura Ai-2 controller automatically analyses the reflected light to detect, locate and report disturbances.

Aura Ai-2 uses the latest advanced optical signal processing algorithms, combined with artificial intelligence, to discriminate between intrusions and other causes of ground disturbance. Aura Ai-2's decision making software intelligently analyses fibre optic laser measurements and automatically adjusts controller settings to optimize sensitivity for reduced nuisance alarms and increased probability of detection.

### HOW IT WORKS

1. Where compatible, existing cables are utilised
2. A single optical fibre inside the cable connects to each channel
3. Aura Ai-2 simultaneously pulses laser light down the optical fibres connected to both channels and laser light reflections are disrupted by any disturbances/vibrations
4. FFT Aura Ai-2 analyses light reflections and applies artificial intelligence algorithms to discriminate between intrusions and other disturbance causes
5. FFT CAMS monitoring software communicates intrusion detection and location to security management staff



### RESISTANCE TO NUISANCE ALARMS

Aura Ai-2's artificial intelligence and advanced signal discrimination reduces nuisance alarms while maintaining maximum sensitivity to intrusion events which makes this solution suitable for a wide range of applications including: high risk oil & gas pipelines, chemical pipelines and water pipelines.

### CYBERSECURITY ASSURANCE

Aura Ai-2 is tested to Cybersecurity standards based upon National Institute of Standards & Technology (NIST) cybersecurity framework combined with Underwriters Laboratories (UL) 2900 cybersecurity standards.

## KEY FEATURES

- Detects walking, digging, mechanical digging and vehicles
- High sensitivity fibre optic sensing up to 110km (70 miles)
- Fibre optic cable length up to 55km (35 miles) per channel
- Intrusion detection to within  $\pm 5\text{m}$  (17ft)
- Real time simultaneous detection on two channels
- Artificial intelligence algorithms
- Improved Probability Of Detection (POD)
- Reduced nuisance alarms
- No electronics or power in the field
- Immune to EMI/RFI and lightning
- Intrinsically Safe
- Compact (4RU) state-of-the-art opto-electronics
- Lower total cost of ownership versus alternative technologies

## SPECIFICATIONS

<b>Fibre Optic Cable</b>	Single fibre for each channel (utilising existing cable where compatible) in black UV stabilized single-mode fibre optic cable
<b>Detection Channels</b>	Two channels of simultaneous real time independent intrusion detection
<b>Sensing Technology</b>	Coherent Optical Time Domain Reflectometer (COTDR)
<b>Operating Life</b>	>10 years (dependent on operating environment and regular maintenance)
<b>Artificial Intelligence (Ai)</b>	Intelligent intrusion detection algorithms optimize sensitivity and probability of detection, reducing nuisance alarms by automatically adapting to changing conditions and dynamically adjusting controller settings
<b>Detection Resolution</b>	0.5 m (1.6 ft) between detection points along sensing fibre (2000 measurements per km of sensing fibre)
<b>Location Accuracy</b>	To within $\pm 5\text{ m}$ (17 ft) dependent on soil condition and event type
<b>Sensor Sections</b>	Independently software configurable sensor sections (detection zones)
<b>Operating Humidity / Temperature Range</b>	FFT Fibre Optic Cables: -55°C to +85°C (-67°F to +185°F) for cable across complete humidity range Controller: +5°C to +45°C (+41°F to +113°F), 5% to 80% RH non-condensing
<b>Maximum Fibre Loss</b>	Buried: < 13.5 dB typical max distance ~ 55km /ch)
<b>System Interface</b>	TCP/IP (Ethernet), relay closures (via FFT CAMS connected PLC or ADAM module)
<b>Inputs and Outputs</b>	2 x E2000/APC single mode optical connectors (back, for sensing cables) 2 x USB2 ports (on back) 3 x USB3 ports (two on front, one on back) 1 x VGA port (on back) 2 x Ethernet ports (10/100/1000 Mbps, on back)
<b>Data Storage</b>	2 x 256GB internal SSD in RAID-1 configuration 1 x 3TB internal 7200 rpm HDD (hard disk drive)
<b>Power Supply</b>	Dual (for redundancy) power supplies. Hot swappable (one power supply can be removed/replaced while controller continues operating) 110 to 240 Vac, 47 to 63 Hz, auto ranging
<b>Power Consumption</b>	280 W typical, 380 W max
<b>Dimensions / Rack Clearance / Weight</b>	4U high in 19" rack module: 175 x 483 x 553 mm (6.9" x 19" x 21.7"), Minimum clearance - 30 mm (1.2") at controller front, 60 mm (2.4") at back, 24 kg (52.9 lb)
<b>Laser Safety Class</b>	Class 1 (IEC 60825-1, 21CFR1040.10), shutoff: key switch on front panel
<b>MTBF</b>	> 50,000 hours
<b>Warranty</b>	2 years, with optional per year warranty extension available
<b>Regulatory Certification</b>	ISO9001 accredited design and manufacturing CE certified (EN60950-1 safety, EC Low Voltage Directive 2006/95/EC, CISPR 22-EN55022 emissions, EN 50130-4 electrostatic, radiated and conducted immunity, EN61000 EMC and RoHS2 2011/65/EU); FCC Part 15B Class B compliant
<b>Cyber Assurance</b>	Cyber penetration tested to National Institute of Standards & Technology (NIST) cybersecurity framework and Underwriters Laboratories (UL) 2900 cybersecurity standards



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