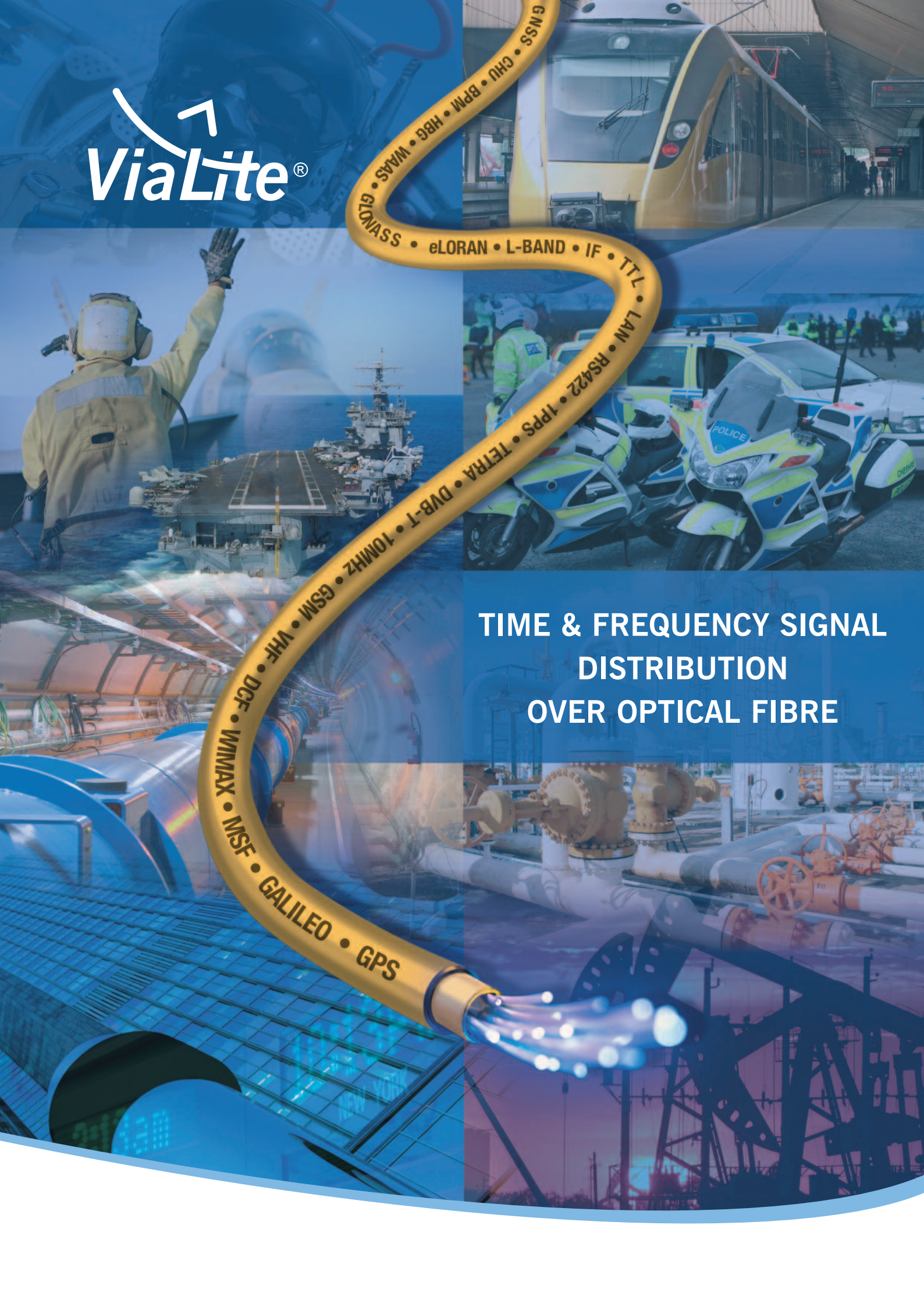


ViaLite®



**TIME & FREQUENCY SIGNAL
DISTRIBUTION
OVER OPTICAL FIBRE**



TIME & FREQUENCY SIGNAL DISTRIBUTION OVER OPTICAL FIBRE

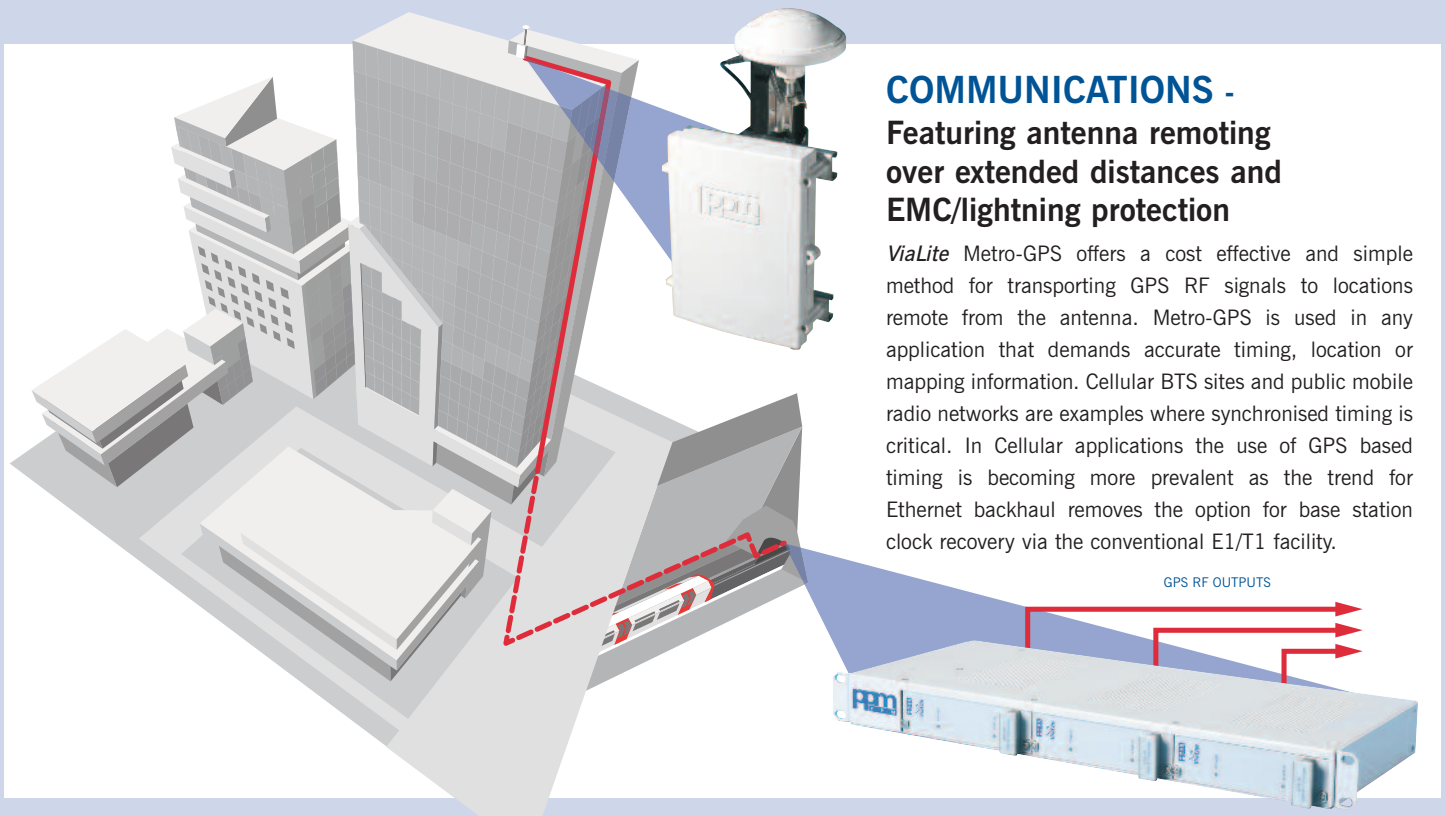
PPM's *ViaLite* range of RF-Over-Fibre and Serial Digital Links allow a wide range of timing and frequency signals to be transmitted and distributed over fibre optic cable.

Features & Applications:

- GPS, MSF, DCF & GALILEO
- Time stamping provision of remote equipment
- e-LORAN 10MHz and 1PPS
- DVB-T, GSM & TETRA, & WIMAX antenna remoting
- INFOSEC, EMC, EMP & Tempest
- UTC & PRC/S for time servers
- Particle physics synchronisation

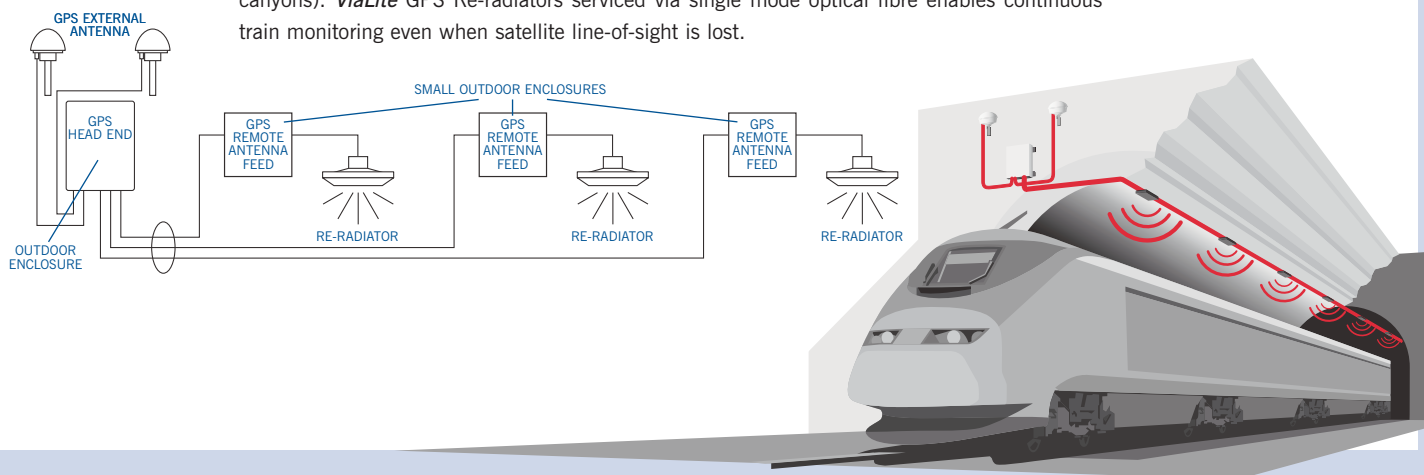
Benefits:

- Long distance transmission without signal loss
- Interference immunity & electrical isolation
- Simple plug and play installation
- Lightweight & space saving optical cable increases signal density & bandwidth
- Allows point to multipoint distribution & service scalability



TRANSPORTATION - Featuring re-radiating antennae

Successful implementation of the ETCS (European Train Control System) will rely on next generation network management of rolling stock utilising Galileo to deliver precise train location across the entire rail network (including tunnels and urban canyons). *ViaLite* GPS Re-radiators serviced via single mode optical fibre enables continuous train monitoring even when satellite line-of-sight is lost.

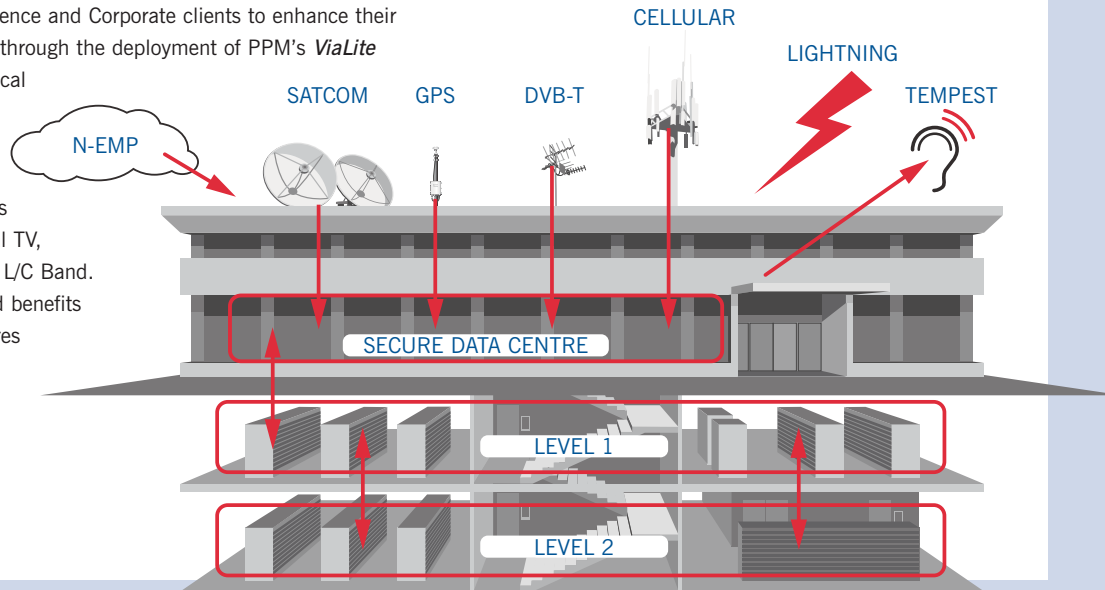


SECURE COMMUNICATION LINKS - Network Data Centre

PPM is working with Government, Defence and Corporate clients to enhance their data security and operational integrity through the deployment of PPM's *ViaLite* Timing & Synchronisation RF over optical fibre transmission equipment.

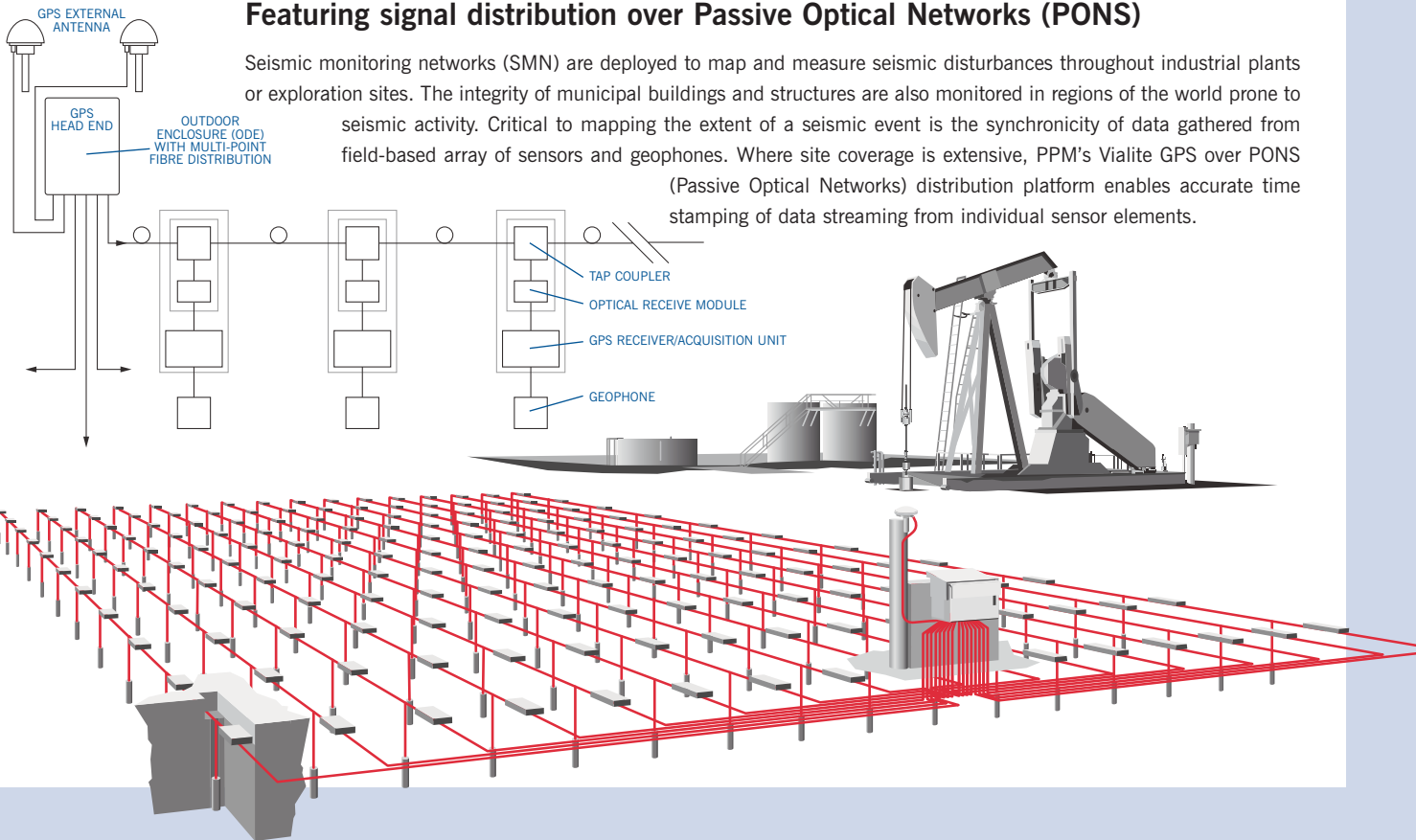
ViaLite products are INFOSEC, EMSEC and TEMPEST compliant, so guaranteeing the delivery of services such as GPS/MSF Time Signals, Digital TV, VHF/UHF Radio, Cellular and Satellite L/C Band.

The use of optical fibre provides added benefits in securing information gathering centres against Lightning & EMP strikes, as well as preventing attempts to eavesdrop or corrupt critical operational and sensitive data.



SEISMIC NETWORK AND STRUCTURAL MONITORING - Featuring signal distribution over Passive Optical Networks (PONS)

Seismic monitoring networks (SMN) are deployed to map and measure seismic disturbances throughout industrial plants or exploration sites. The integrity of municipal buildings and structures are also monitored in regions of the world prone to seismic activity. Critical to mapping the extent of a seismic event is the synchronicity of data gathered from field-based array of sensors and geophones. Where site coverage is extensive, PPM's *Vialite* GPS over PONS (Passive Optical Networks) distribution platform enables accurate time stamping of data streaming from individual sensor elements.

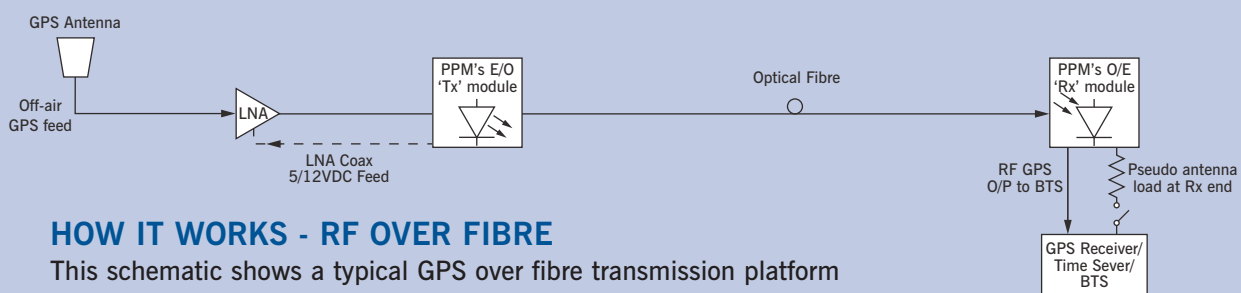


Typical Markets	Typical Applications
Defence	Government secure networks
MoD	Military GPS synchronisation & mapping
Communications	Cellular BTS timing in tunnels
Industry	Communication network synchronisation
Exploration, geodesy, seismology	Meteorological station
Off-shore	Towed buoys
Mining	GPS remoting
Tunnels	GPS re-radiators
Public safety & security	TETRA, GPS mapping & location

SERVICES MATRIX

Timing Services Supported by PPM Vialite Modules	Signal Frequency	Module Bandwidth	Vialite Module Series or Type
Global Navigation Satellite System (GNSS)			
Galileo - Europe - E5A & E5B - (4MHz BW)	1164-1215MHz	GPS L1/L2	'G' Module
Galileo - Europe - E6 - (4MHz BW)	1215-1300MHz	GPS L1/L2	'G' Module
Galileo - Europe - L1 - (4MHz BW)	1559-1592MHz	GPS L1/L2	'G' Module
EGNOS - Europe - Augmentation overlay		GPS L1/L2	'G' Module
GPS - USA L1 - Civilian	1575MHz (1559 to 1610MHz)	GPS L1/L2	'G' Module
GPS - USA - L2 - Military	1227MHz	GPS L1/L2	'G' Module
GPS - USA - L3 - Nuclear Detection System Payload	1381MHz	GPS L1/L2	'G' Module
GPS - USA - L4 - Ionospheric Correction	1379MHz	GPS L1/L2	'G' Module
GPS - USA - L5 - Augmentation & Civilian Safety of Life	1176MHz	GPS L1/L2	'G' Module
Inmarsat L1 - L5	1176 - 1644 MHz	GPS L1/L2	'G' Module
WAAS - Wide Area Augmentation - USA	1227-1610MHz	GPS L1/L2	'G' Module
GLONASS - Russia - L1 & L2	1240-1260MHz & 1602-1615MHz	GPS L1/L2	'G' Module
Beidou (Compass) - China	1615.68MHz & 2491.75MHz	2kHz-4.2GHz	'U' Module
Radio Time Signals			
JJY - Japan	40 & 60 kHz	10kHz-50MHz	'T' Module
MSF - UK Cumbria	60 kHz	10kHz-50MHz	'T' Module
BPC - China	68.5 kHz	10kHz-50MHz	'T' Module
HBG - Swiss	75 kHz	10kHz-50MHz	'T' Module
DCF77 - Germany	77.5 kHz	10kHz-50MHz	'T' Module
TDF - France	162 kHz	10kHz-50MHz	'T' Module
WWVB - USA	60 kHz	10kHz-50MHz	'T' Module
WWV - NIST - Govt - USA	2.5, 5, 10, 15, 20MHz	10kHz-50MHz	'T' Module
CHU - Canada	3.33, 7.335, 14.67MHz	10kHz-50MHz	'T' Module
RJH69 RJH77, RJH63, RJH99, RJH66, RAB99 - Russia	20.5, 23, 25.1, 25.5 kHz	10kHz-50MHz	'T' Module
RWM - Russia	4.996, 9.996, 14.996MHz	10kHz-50MHz	'T' Module
BPM - China	2.5, 5, 10, 15MHz	10kHz-50MHz	'T' Module
Loran			
Loran-C and eLoran	90-110kHz	10kHz-50MHz	'T' Module
IRIG - Inter Range Instrumentation Group			
IRIG A - H	10kHz		Contact PPM
Time Server RF Outputs			
Symmetricom etc	1, 5, 10, 20MHz*	10kHz-50MHz	'T' Module
Pendulum etc	100kHz -13MHz*	10kHz-50MHz	'T' Module
* Input and Output level compensation may be required.			
Serial Digital Time References			
1PPS, RS232, RS422, RS485 and TTL	DC-115kb/s	Serial Digital	'LSX-K' Module
1PPS, RS232, RS422, RS485 and TTL	DC-500kb/s	Serial Digital	'LSX-L' Module
1PPS, RS232, RS422, RS485 and TTL	DC-10Mb/s	Serial Digital	'LSX-M' Module
Local Area Networks (LAN)			
Ethernet - 100Mb/s	100Mb/s	Ethernet	'LSX-E' Module

Other Services Supported by PPM Vialite Modules	Notes	Module Bandwidth	Vialite Module Series or Type
Digital TV, Satcom and Communications			
IF Frequency Transmission	70/140MHz	10-200MHz	'B' Module
DVB-T		470-860MHz	'D' Module
VHF & UHF		10-1000MHz	'N' Module
L-Band		950-2200MHz	'L' Module
Clock Reference 1, 5 & 10MHz		10kHz-50MHz	'T' module
Cellular & Tetra			
GSM & Tetra		10-1000MHz	'N' Module
GSM & UMTS - Cellular		10-3000MHz	'S' Module
GSM & UMTS - Cellular with Serial Digital link	RF + 20kb/s Digital single fibre	10-4200MHz	'W' Module
Motorola EBTS - GPS over fibre	Digital GPS over Fibre		Contact PPM
Mobile Broadband Wireless Access (802.11, 802.15.4, 802.16, 802.20)			
WiFi, WiMAX, ZigBee, iBurst, WiBRO		10-3000MHz	'S' Module
WiMAX - with Serial Digital Link	RF + 20kb/s Digital single fibre	10-4200MHz	'W' Module
General Wide Bandwidth			
Wideband - General Applications		2kHz-4200MHz	'U' Module
Wideband + Serial Digital - General Applications	RF + 20kb/s Digital single fibre	10-4200MHz	'W' Module



FIBRE OPTIC SYSTEM CONFIGURATOR

STEP 1. SELECT A SERVICE FROM THE SERVICES MATRIX OVER LEAF OR SPECIFY YOUR RF FREQUENCY (Hz)

STEP 2. SPECIFY THE NUMBER OF RF/ELECTRICAL INPUT CHANNELS

STEP 3. SPECIFY THE SIGNAL SOURCE (FOR DUAL REDUNDANT ANTENNA'S SPECIFY '2DR')

CUSTOMER EQUIPMENT	CUSTOMER ANTENNA	PPM GPS L1 ANTENNA	PPM GPS L1+L2 ANTENNA	PPM MSF/DCF ANTENNA
CE	CA	GPS1	GPS1/2	MSF or DCF

STEP 4. SPECIFY THE HEAD-END OPTICAL EQUIPMENT ENCLOSURE TYPE

OUTDOOR EQUIPMENT		INDOOR EQUIPMENT			
1-3 CHANNELS	4-6+ CHANNELS	1-27 CHANNELS	1 CHANNEL	1-3 CHANNELS	1-8 CHANNELS
ODE-A	ODE-B	ODE-C	CS	1U	3U

STEP 5. SPECIFY THE SUPPLY VOLTAGE FOR THE HEAD END EQUIPMENT ENCLOSURE

SUPPLY VOLTAGE TO HEAD-END EQUIPMENT
M = 100-264VAC 48 = -48VDC 24 = 24VDC

STEP 6. SPECIFY ANY OPTIONS FOR OUTDOOR EQUIPMENT ENCLOSURES
 (FOR INDOOR ENCLOSURE OPTIONS USE CODES FROM STEP 11)

HEATER	SUN-SHIELD	LIGHTNING SUPPRESSION	POLE MOUNT	WALL MOUNT
COLD	HOT	LS	PM	WM

STEP 7. SPECIFY FIBRE OPTIC CABLING OR ANY OPTICAL MULTIPLEXING REQUIREMENTS

CUSTOMER INSTALLED SINGLEMODE FIBRE	PPM PRE-TERMINATED FIBRE LENGTH	OPTICAL MULTIPLEXING OR POINT TO MULTIPOINT DISTRIBUTION
ISM	200M = 200metres	FDP

STEP 8. SPECIFY THE NUMBER OF RF OUTPUT CHANNELS

STEP 9. SPECIFY THE RECEIVE-END OPTICAL EQUIPMENT ENCLOSURE TYPE

INDOOR EQUIPMENT			OUTDOOR EQUIPMENT		
1 CHANNEL	1-3 CHANNELS	1-8 CHANNELS	1-3 CHANNELS	4-6+ CHANNELS	1-27 CHANNELS
CS	1U	3U	ODE-A	ODE-B	ODE-C

STEP 10. SPECIFY THE SUPPLY VOLTAGE FOR THE RECEIVE / BTS END EQUIPMENT

M = 100-264VAC 48 = -48VDC 24 = 24VDC

STEP 11. SPECIFY ANY OPTIONS FOR INDOOR EQUIPMENT ENCLOSURES
 (IF OUTDOOR ENCLOSURE OPTIONS ARE REQUIRED USE CODES FROM STEP 6)

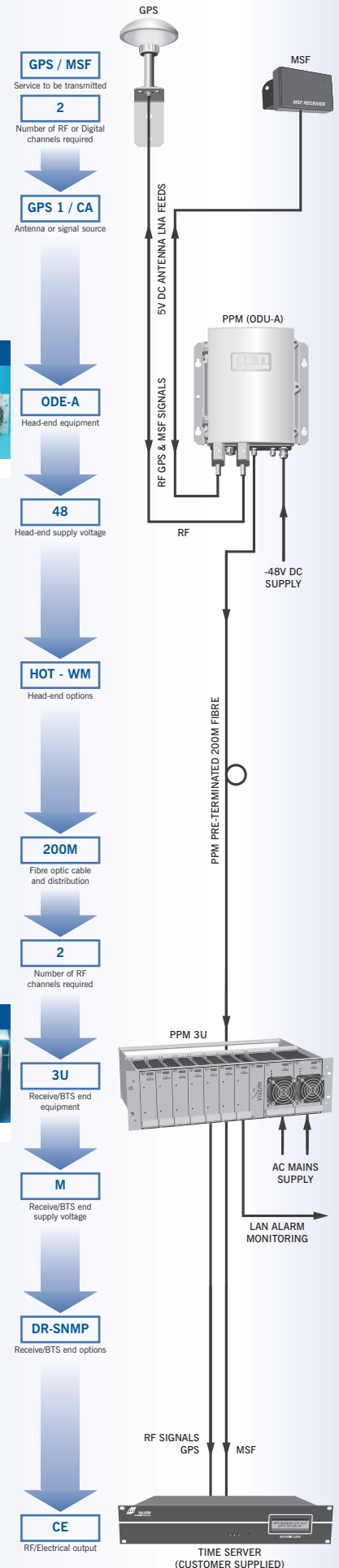
LAN/INTERNET ALARM STATUS	DUAL-REDUNDANT POWER SUPPLIES	REDUNDANCY SWITCH	RF SIGNAL SPLITTER
SNMP	DR	RS	SP

STEP 12. SPECIFY THE TYPE OF ANTENNA OR RECEIVE EQUIPMENT TO BE CONNECTED TO THE PPM OPTICAL RECEIVE MODULE

PPM RE-RADIATING GPS ANTENNA	CUSTOMER EQUIPMENT	CUSTOMER ANTENNA
Re-Rad	CE	CA

STEP 13. PLEASE MAKE NOTES ON ANY SPECIFIC REQUIREMENTS FOR YOUR APPLICATION

STEP 14. EMAIL OR CALL PPM WITH THE PRODUCT CODE: SALES@PPM.CO.UK, +44 (0)1793 784 389



The example shown is for a dual channel GPS & MSF transmission system featuring: PPM supplied GPS Antenna, customer supplied MSF Antenna, Outdoor enclosure with - 48VDC supply, sunshield & wall mount kit, PPM preterminated 200m fibre cable (with protective pulling boots), dual receive channels, 3U - 19" chassis for receive modules with dual redundant mains supplies & SNMP network comms module, feeding customer supplied GPS receiver/time server.

GPS/MSF - 2 - GPS1/CA - ODE-A - 48 - HOT - WM - 200M - 2 - 3U - M - DR - SNMP - CE

CUSTOM & MILITARY COMMUNICATION SOLUTIONS

At PPM we pride ourselves in providing exactly what the customer needs. So when our standard product range just doesn't meet your requirements, our design team can respond with a bespoke solution. PPM provides custom solutions in Commercial, Industrial and Military markets across the globe. Careful design consideration at the outset has enabled PPM to develop future-proof custom solutions that are not only extremely reliable in the field, but provide significant saving in installation costs through high-levels of system integration.

So if you don't see what you need, you should definitely get in contact with PPM!



DATASHEETS

- IF 70-140MHz fibre optic interfacility links ('B' modules)
- Broadcast DVB-T ('D' modules)
- Digital GPS
- GPS RF over fibre ('G' modules)
- Metro-GPS (single, dual or three channel GPS over fibre turnkey solution)
- 100Mbps Ethernet over fibre ('LSX-E' modules)
- Serial digital fibre optic modem ('LSX-K,L,M' modules)
- Satcom L-band ('L' modules)
- VHF, UHF service transmission over fibre ('N' modules)
- Cellular service transmission over fibre ('N, S, W' modules)
- Low frequency timing ('T' modules)
- SNMP network monitoring ('SNMP' modules)
- Wideband (2kHz to 4.2GHz) transmission over fibre ('U' modules)
- Wideband and Digital ('W' modules)
- Accessories, racks, power supplies, cables etc.
- Passive optical network components
- Indoor rack equipment
- Outdoor rack equipment



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