Access and Transport Solutions for
Public Telecommunication and Dedicated Networks

KEYMILE
because connectivity matters
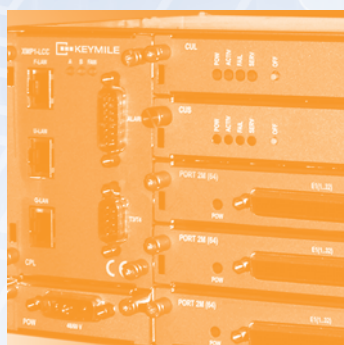
Access Network Solutions

Our Value Proposition

- We offer network equipment having the highest reliability
- We offer extra-long life-cycle on equipment
- We offer ease of operability and maintainability
- We offer top Eco-Balance through very efficient use of ingress energy
- We offer Future-Proof data transmission systems by sustainable system concept
- We offer true seamless legacy asset transformation

What does KEYMILE do?

KEYMILE is a leading manufacturer and supplier of Next Generation Access Systems. Its product spectrum ranges from IP-based Multi-Service Access Platforms to specific transmission systems for dedicated networks as well as for telematics applications via mobile radio networks. KEYMILE offers a wide range of support services beyond to hardware and software for data transmission, to support network operators to operate the products with maximum efficiency. KEYMILE products are employed in access networks of telecommunications network operators in more than 100 countries, as well as in dedicated networks of railways and utility companies and in mobile radio and professional radio networks.

Ultra-reliable solutions

KEYMILE solutions are designed for maximum reliability. Superior MTBFs and long periods of uninterrupted operation are achieved due to careful selection of components. KEYMILE solutions have system architecture which is designed for top availability with extensive protective and redundancy functions. As a result the transmission path can be restored as quickly as possible should a failure occur.

All system components and functions are monitored by a central management system, so that malfunctions can be identified and rectified swiftly.

We implement your Requirements

Our level of expertise turns us into specialists at your side, offering broadband access for residential customers, NGN/IP migration of networks, or reliable transmission of mission-critical data in company networks - and much more. Our products fulfil standards - but are at the same time so flexible that we can quickly and effectively implement your special requirements to deliver a tailor-made solution.

KEYMILE systems support the smooth change-over to Next Generation Networks. This allows you to offer broadband services like Triple Play and high-speed Internet at once. At the same time, you can continue legacy services without exchanging any hardware. KEYMILE provides solutions for indoor and outdoor installations that make new services with optimum flexibility possible.

Future-proof

Network operators have to expand their service portfolio from traditional services towards broadband multimedia Ethernet-based services. This demands smooth migration from wireline networks to broadband packet-oriented networks.

Increase operational efficiency

Cutting OPEX (operational expenditures) is a fundamental concern to any company that provides internal or external telecommunication services.

KEYMILE's solutions enable the optimisation of capital investment and operational costs through integrated Multi-Service solutions. With only one system you offer a multitude of services, interfaces and technologies. As a result, the network complexity will be reduced, the number of error point will be decreased and the availability of the over-all solution will be raised.

Management systems allow further reduction of operational costs through central control and management of every KEYMILE network element, as well as through perfect integration of the access network into the operator's processes.

KEYMILEs Product Portfolio

IP-based Multi-Service Access Platform

MileGate

With its hybrid systems architecture, multi-service access platform MileGate combines highly modern Ethernet functions with native TDM services.

MileGate public network operators can deliver carrier-grade broadband access (Ethernet, VDSL2 with vectoring, ADSL2plus, SHDSL), as well as POTS, ISDN, VoIP telephony and data interfaces from one single compact Next-Generation access platform. MileGate provides highest port density and is ideal for all FTTx network architectures.

MileGate offers a modular chassis switch architecture for operators of dedicated networks. Due to the variable usage of Ethernet cards, the number of optical and electrical Ethernet interfaces can be modified to suit requirements. There is also a variety of different TDM interfaces and TDM protective and redundancy functions to choose from. Also fanless operation is possible.

For smooth integration of services, MileGate provides EoS (Ethernet-over-SDH) and CEoP functions (Circuit Emulation over Packet Networks). As a result, both Ethernet and TDM applications can be delivered using one joint transmission network.

With its extended temperature range, MileGate is outdoor capable. With its high port density and different subrack types it is flexibly scalable and ideal for setting up new or expanding existing networks.

Multi-Service Access Systems

UMUX

Flexible Multi-Service Access Multiplexer for dedicated networks with PDH, SDH, and Ethernet support. The system provides cross-connect, voice and conferencing functions. A wide range of different data and voice interfaces and outdoor capability with an extended temperature range make UMUX a universal access system.
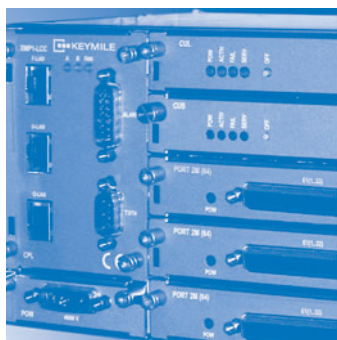
LineRunner SCADA NG

The broadband multi-drop Ethernet transmission system provides economical and reliable transmission for telecontrol and SCADA systems and supports industrial Ethernet solutions. LineRunner SCADA NG combines SHDSL and optical fibre transmission and is ideal for use alongside railroads, oil and gas pipelines, or motorways.

XMP1

XMP1 is a modular, flexible and highly integrated multi-service access system, that cross-connects a multitude of signals in one network element. The XMP1 provides a wide range of PDH, SDH, and Ethernet interfaces.

XMP1-LCC

XMP1-LCC (Large Cross-Connect) expands the XMP1 product family. The compact SDH/PDH/Ethernet cross-connect multiplexer that combines a high cross-connect capacity with a high port-density in a compact subrack.

Wireline Transmission Units

LineRunner IS

The LineRunner IS is used in traditional telecontrol applications and automation engineering, for transmitting process data in industrial machinery and for specialised communication in smart grids.

Mobile Communication Transmission Units

LineRunner Wireless Telematics

The units from the LineRunner WT product line were developed for connecting local and/or mobile components via mobile phone networks. The units are ideal for implementing new applications and service concepts in the most diverse of areas where wireline transmission is not practical.

These include office equipment management or GPS tracking of mobile units.

Network Management Systems

All KEYMILE products have extensive network management functions that guarantee optimum operation of the products from the moment they are used.

Win with KEYMILE

KEY Benefits of KEYMILE Products

Future-proof your investment

KEYMILE invests constantly in the development of system platforms to guarantee maximum product lifetimes and that customers have minimum initial costs as a result. Therefore, by using new plug-in boards, our customers have the latest technologies and functions. Your investments are future-proof and guarantee a maximum return on investment.

Save operational costs

Maximum reliability is a pivotal feature of all products from the KEYMILE portfolio – minimum downtimes in the network reduces your costs and provides customer satisfaction. All KEYMILE products come with extensive network management systems that cut the costs for provisioning, control and management of the networks.

Maximise your revenues – minimise your investment

With KEYMILE's product portfolio you can roll out new services on existing infrastructure, whether it's a copper wire or optical fibre network.

KEYMILE's Service Portfolio

Project support

KEYMILE can provide support during each phase of a network rollout:

- Project planning and management
- Homologation and FAT (Factory Acceptance Test)
- Installation and commissioning
- Support during network activation
- Support during network operation and expansion

Training

KEYMILE offers a broad range of training courses for its entire product portfolio. Three training centres in Switzerland, Germany and the UK are equipped with test and demonstration networks. Our trainers and a modern infrastructure guarantee top level training.

Support services

- Technical support 24/7
- Emergency recovery service
- Customer information service
- Online extranet access
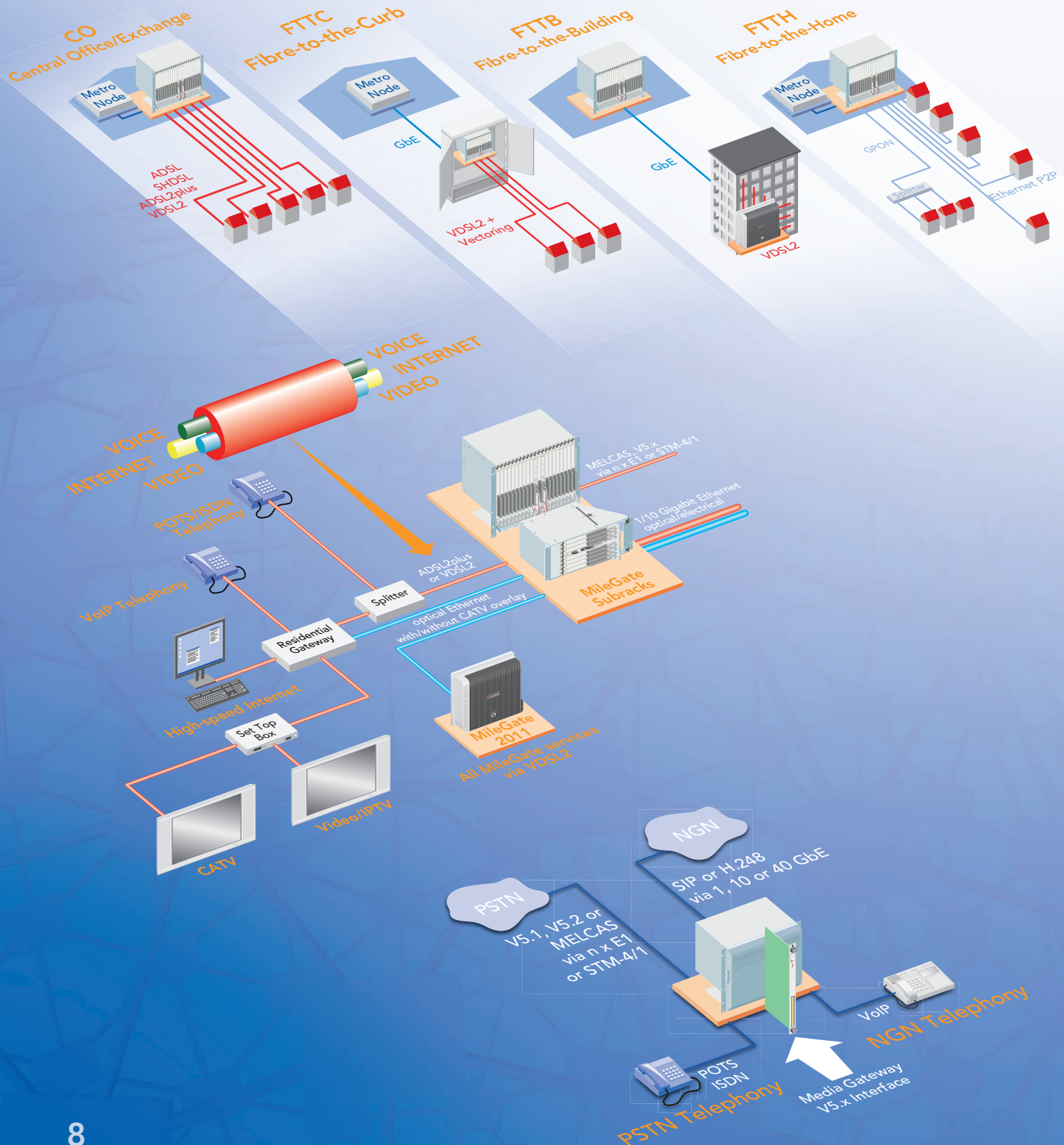
EMC testing

KEYMILE operates its own accredited EMC laboratory that is specialised in telecommunications equipment to guarantee high quality standards. Our EMC specialists also offer measurements to third parties.

Applications for Public Telecommunications Network Operators

CO
Central Office/Exchange

Metro Node

ADSL
SHDSL
ADSL2plus
VDSL2

FTTC
Fibre-to-the-Curb

Metro Node

GbE

VDSL2 + Vectoring

FTTB
Fibre-to-the-Building

GbE

VDSL2

FTTH
Fibre-to-the-Home

Metro Node

GPON

Splitter

Ethernet P2P

VOICE
INTERNET
VIDEO

VOICE
INTERNET
VIDEO

POTS/ISDN Telephony

VoIP Telephony

Splitter

ADSL2plus or VDSL2

MELCAS V5.x
via n x E1 or STM-4/1

1/10 Gigabit Ethernet optical/electrical

optical Ethernet with/without CATV overlay

MileGate Subracks

Residential Gateway

High-speed Internet

Set Top Box

MileGate 2011

All MileGate Services via VDSL2

CATV

Video/IPTV

NGN

SIP or H.248
via 1, 10 or 40 GbE

PSTN

V5.1, V5.2 or MELCAS
via n x E1
or STM-4/1

VoIP

NGN Telephony

POTS ISDN

Media Gateway
V5.x Interface

PSTN Telephony

8

All-IP with up to 1000 Mbps in your Next Generation Network

The requirements of a modern telecommunications network are manifold. Whether you're providing conventional telephony, business services or Triple Play – KEYMILE IP-based multi-service access platform MileGate supports you. MileGate is used as access platform for residential and business services and allows all services in one network element.

MileGate is a future-proof solution for the broadband deployment for example as the technical foundation of an open access network thanks to its innovative Ethernet technology for the optical fibre connection.

Over a variety of interfaces, from legacy data services up to Gigabit Ethernet, the single NGN platform enables you to migrate your
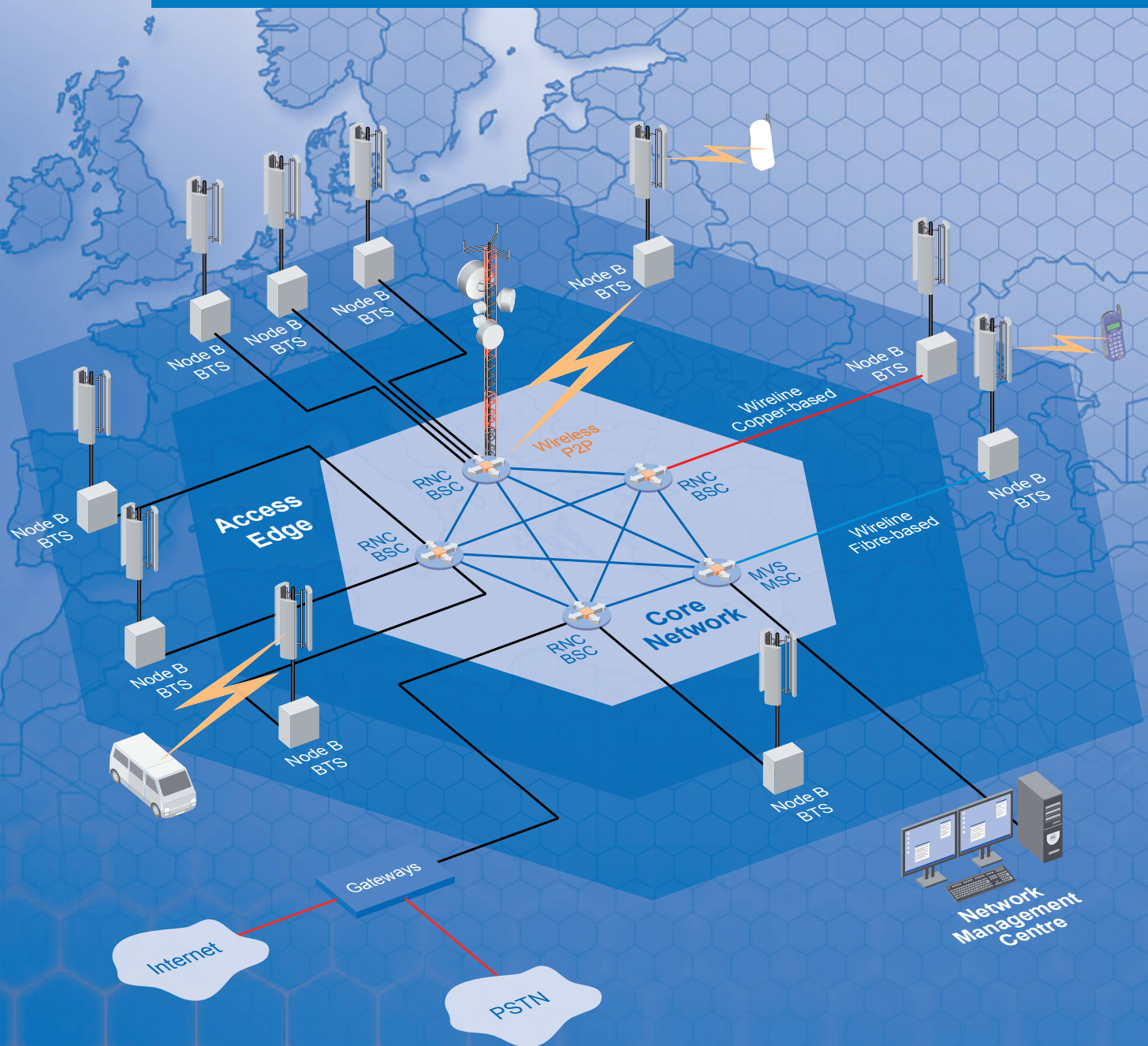
Combine carrier-grade broadband access, telephony and data interfaces in a single compact Next Generation Access Platform with effective IP-DSLAM functionality.

Implement a Fibre-to-the-x network architecture with highest port density. Offer your customers services at 1000 Mbps via optical P2P connections or up to 100 Mbps via VDSL2 with vectoring. MileGate provides also a integrated solution for passive optical networks (GPON).

network infrastructure smoothly and promptly to an All-IP network infrastructure. Compact subracks and the high port-density guarantees for maximum efficiency in minimum space.

Applications for Operators of Mobile and Professional Radio Networks

Node B BTS

Node B BTS

Node B BTS

Node B BTS

Node B BTS

Node B BTS

Node B BTS

Node B BTS

Node B BTS

Node B BTS

Node B BTS

Access Edge

Core Network

RNC BSC

RNC BSC

RNC BSC

RNC BSC

MVS MSC

Wireless P2P

Wireline Copper-based

Wireline Fibre-based

Gateways

Internet

PSTN

Network Management Centre

Efficient and flexible Data Transmission in Mobile Networks

KEYMILE provides ideal support in networking your base stations. UMTS, GSM, GSM-R, or LTE with network elements that can be scaled flexibly, allow a cost-effective adaptation of the network infrastructure to increased data traffic in indoor and outdoor operation. For decentralised connection of single Node B and BTS locations, KEYMILE has network solutions that are ideal for the requirements of mobile networks.

You can implement TDM (from E1 to STM-16) as well as ATM and Ethernet services on copper and optical fibre via a single network element. Intuitive network management minimises activities on site and reduces costs for leased lines in the backbone.
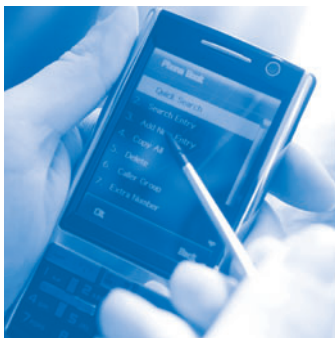
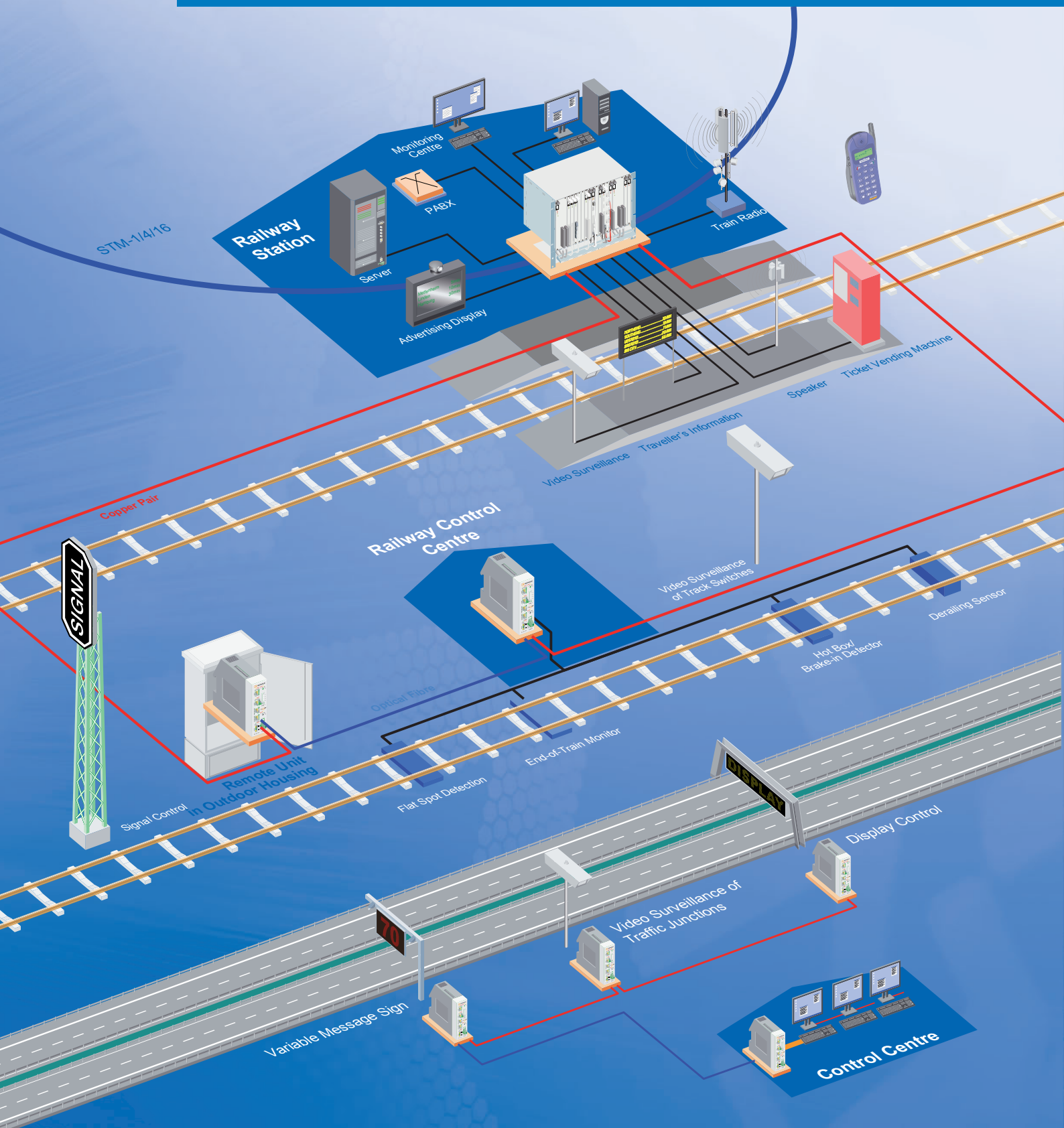## TETRA – Safe Data Transmission of mission-critical Information

Transmitting highly-sensitive data on a telecommunications network at high levels of availability and with a variety of protection functions is one of our core competencies. In addition to a wide range of interfaces and a comprehensive management system, our systems also provide optical fibre and copper transmission in a single compact network element.

Therefore you can connect large-scale professional radio networks and capture data from individual video surveillance systems in a case-hardened system with highest availability.

Implement flexible network architectures for your TETRA network and integrate existing transmission routes quickly and cost-effectively in your future network architecture.

With the seamless implementation of new technologies and network hierarchies, your system is in a position to be constantly upgraded. This protects your investments and ensures a state-of-the-art telecommunications network at all times.

Applications for Telecommunication Networks at Transport Infrastructures

Railway Station

Monitoring Centre

PABX

Server

Advertising Display

Train Radio

STM-1/4/16

Video Surveillance

Traveller's Information

Speaker

Ticket Vending Machine

Copper Pair

Railway Control Centre

Video Surveillance of Track Switches

Derailing Sensor

Hot Box/ Brake-in Detector

Optical Fibre

End-of-Train Monitor

SIGNAL

Signal Control

Remote Unit in Outdoor Housing

Flat Spot Detection

DISPLAY

Display Control

Video Surveillance of Traffic Junctions

70

Variable Message Sign

Control Centre

Multi-Service and Transport via one rugged System

KEYMILE products are developed for safe data transmission with excellent protection features even in harsh ambient conditions. The robust design and the optional fanless operation make it ideal for data transmission in tunnels or airports, alongside railroads, motorways and waterways.

Transmit all your data via one system. From traditional E&M transmission over VoIP to Gigabit Ethernet (GbE) – all via one single network element.

gate monitoring, display controls, variable message signs, or applications requiring a lot of bandwidth like video surveillance.

With subscriber interfaces from RS-232 up to GbE, all requirements of a comprehensive transmission system are fulfilled.
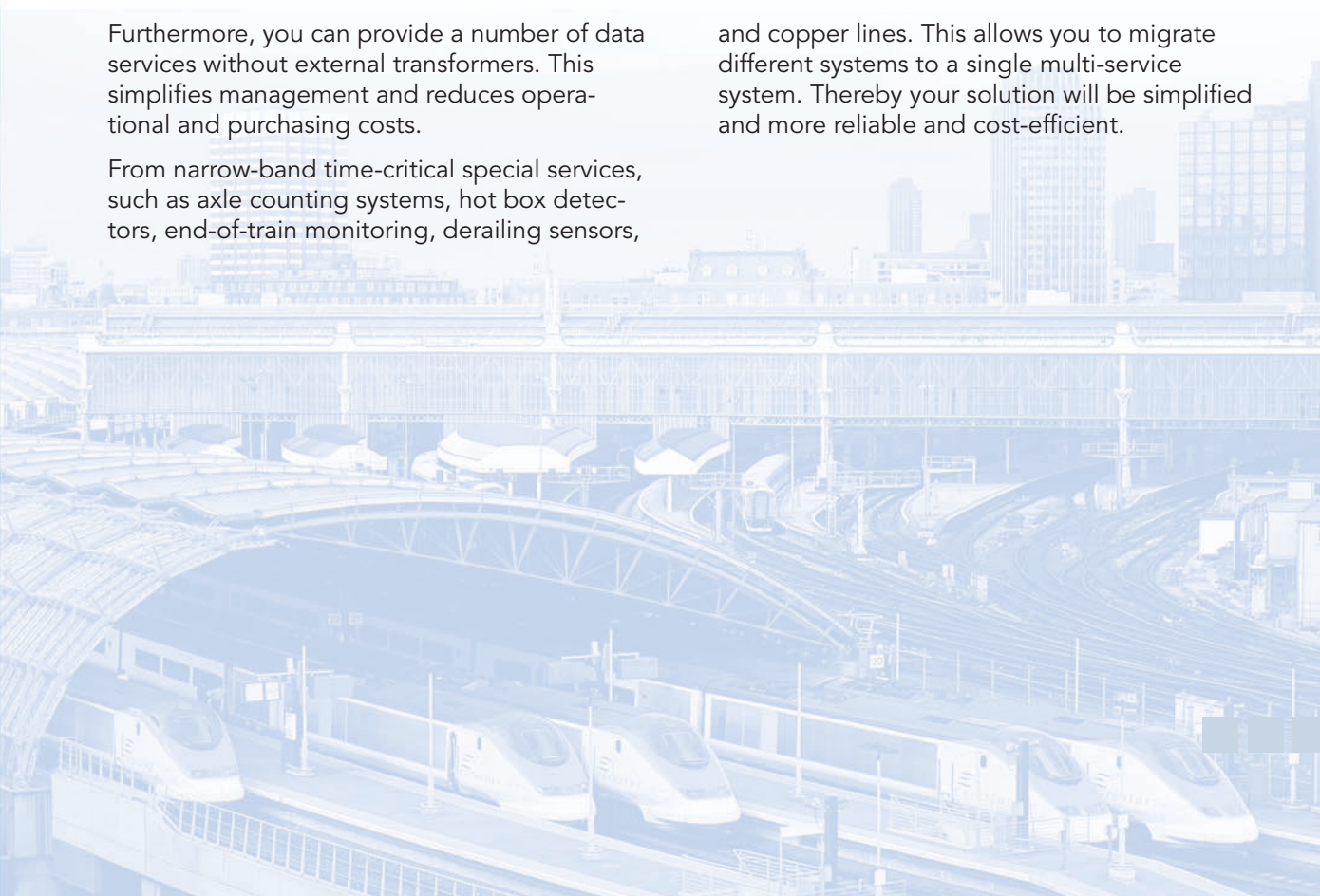
For the connection to the transport network either 10GbE, 1GbE, or STM-1 to STM-16 are available. As a result, you can rely on the existing infrastructure and re-use optical fibres
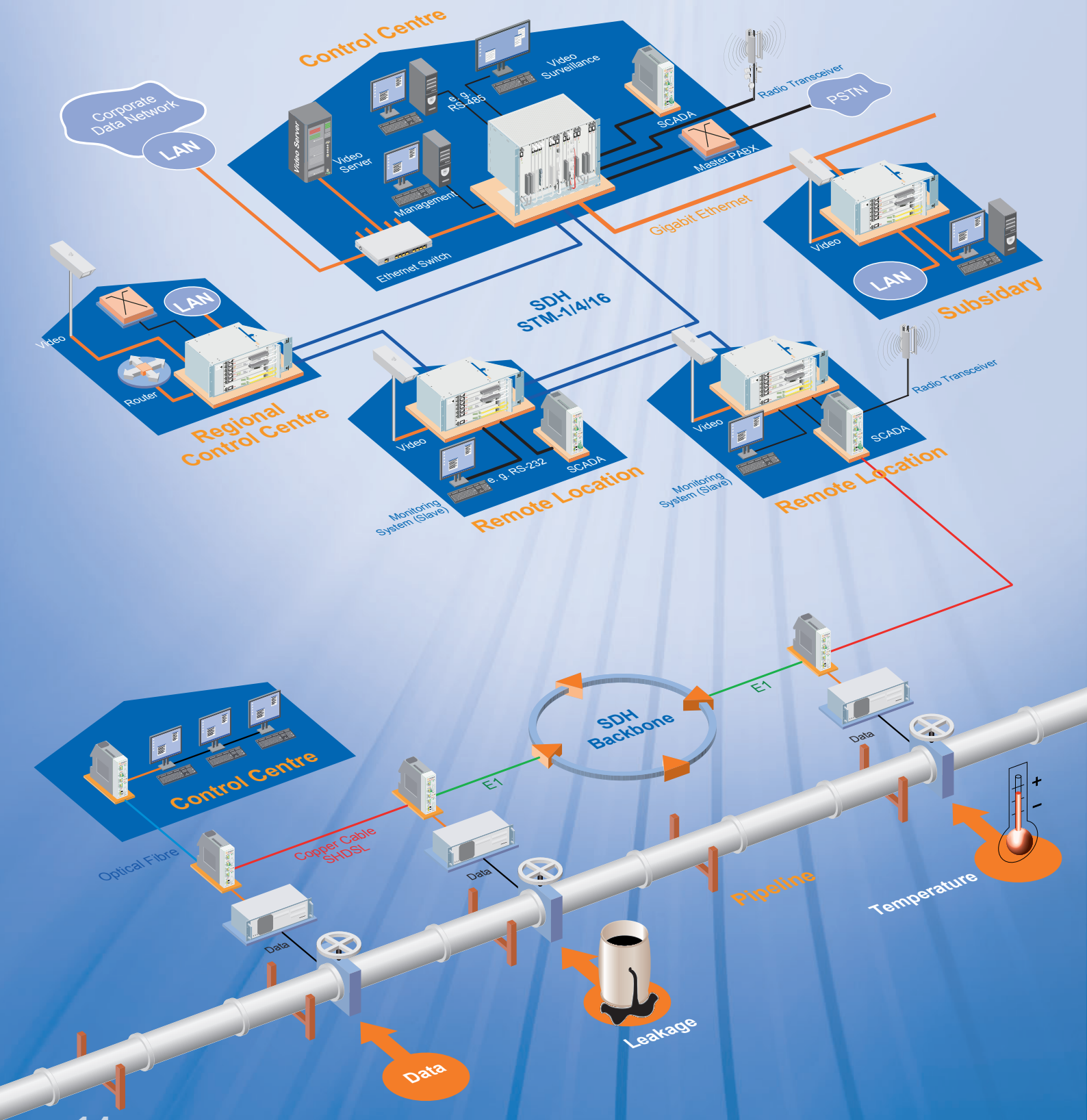
Furthermore, you can provide a number of data services without external transformers. This simplifies management and reduces operational and purchasing costs.

From narrow-band time-critical special services, such as axle counting systems, hot box detectors, end-of-train monitoring, derailing sensors,

and copper lines. This allows you to migrate different systems to a single multi-service system. Thereby your solution will be simplified and more reliable and cost-efficient.

Applications for Telecommunication Networks of Utility Companies

Control Centre

Corporate Data Network

LAN

Video Server

Video Server

Management

Video Surveillance

e. g. RS-485

Ethernet Switch

SCADA

Radio Transceiver

PSTN

Master PABX

Gigabit Ethernet

Video

LAN

Subsidary

SDH STM-1/4/16

Video

LAN

Router

Regional Control Centre

Video

Monitoring System (Slave)

e. g. RS-232

SCADA

Remote Location

Video

Monitoring System (Slave)

SCADA

Radio Transceiver

Remote Location

Control Centre

SDH Backbone

E1

E1

Data

Data

Optical Fibre

Copper Cable SHDSL

Data

Data

Leakage

Pipeline

Temperature

Data

Highest Availability for mission-critical Data

The connection of remote stations alongside oil or gas pipelines, of transformer stations with a central station, or remote wind parks requires solid systems also for telecommunications, as this is a basic prerequisite for seamless operation.

With KEYMILE solutions you can meet all your telecommunications requirements with one single system and minimise your operational costs at the same time.

SCADA applications are supported, as well as services for voice transmission, video surveillance, terminal-server connections and mission-critical telemetric services.

Many of the systems are located in tough environments – if telecommunications systems are to operate smoothly they must be able to function outdoors.
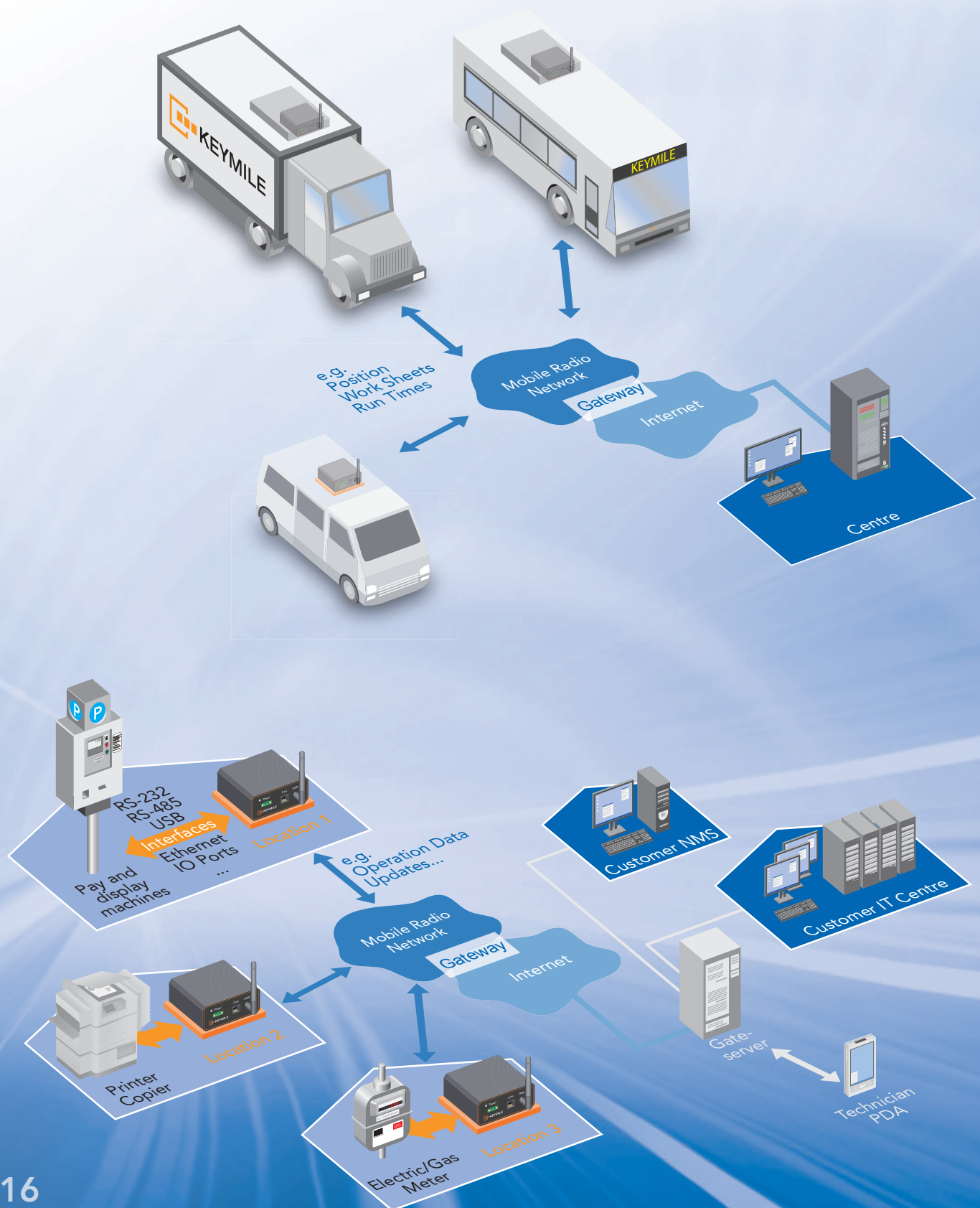
We provide flexibility and safety combined with state-of-the-art access technology.

Connect your transport network via a state-of-the-art system to all applications along the line.

Over very long distances data is transferred from the most varied of interfaces from a variety of field equipment, e.g. from sensors for unit monitoring and actors for monitoring and controlling systems in remote locations.

Application for wireless Communication with local Components

e.g.:
Position
Work Sheets
Run Times

Mobile Radio Network

Gateway

Internet

Centre

RS-232
RS-485
USB

Interfaces

Ethernet
IO Ports
...

Location 1

Pay and display machines

e.g.
Operation Data
Updates...

Customer NMS

Customer IT Centre

Mobile Radio Network

Gateway

Internet

Printer Copier

Location 2

Gate-server

Technician PDA

Electric/Gas Meter

Location 3

Wireless Telematics Solution – Data Transmission via Mobile Radio Networks

Data exchange between local components, or with centralised systems, is becoming increasingly important. Quick response times are vital in order to ensure operations run smoothly with a minimum of downtimes.

In addition to the wireline remote/SCADA applications, KEYMILE offers GSM/GPRS-based transmission solutions. This make business processes more efficient because machines,

Any malfunctions that might occur can be forwarded to a service team. The team can then access the components concerned by remote diagnosis and take action to put faults right.

For this machine-to-machine communication (M2M), small transmission modules are fitted to the decentralised components. On a permanent basis, or as required, these can receive a

devices and vehicles can intelligently communicate via mobile telephony networks in two directions with one another, or with an exchange.

secure mobile radio connection with a centralised component and transfer the data required at low, volume-based communications costs.
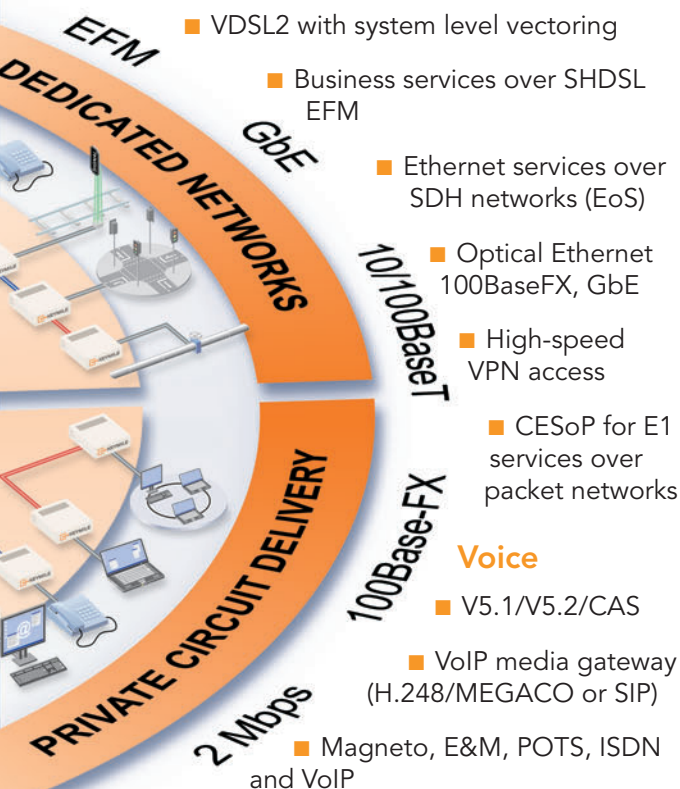
Services and Solutions
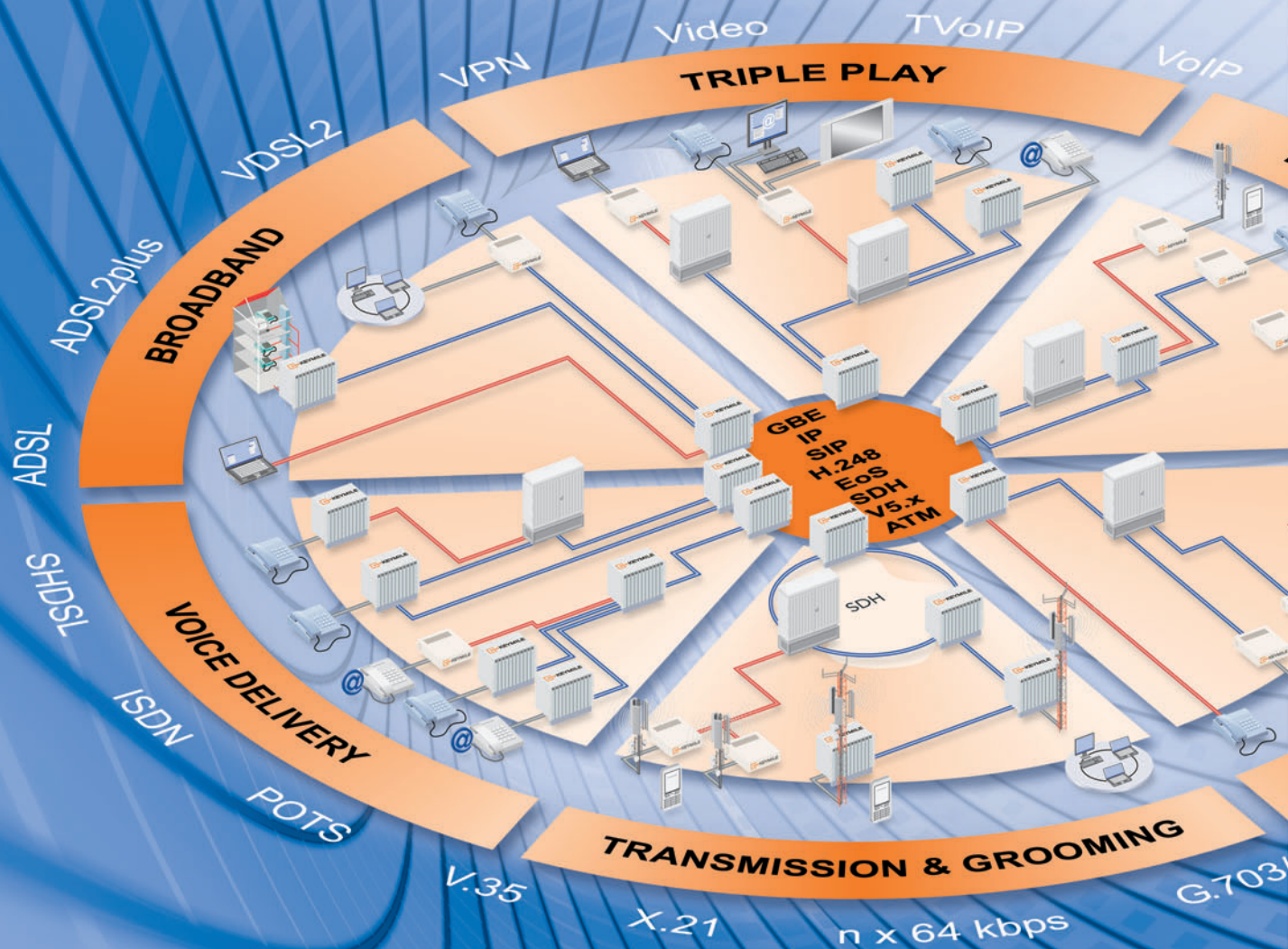
Triple Play Implementation

- Integrated access for voice, data and video applications
- IPTV with multicast functions
- VoIP media gateway
- RF overlay for legacy cable TV

Broadband

- GbE connection via optical fibre (FTTH, FTTB)
- Broadband Internet access (VDSL2, ADSL2plus, ADSL2, ADSL, GPON)
  - VDSL2 with system level vectoring
  - Business services over SHDSL EFM
  - Ethernet services over SDH networks (EoS)
  - Optical Ethernet 100BaseFX, GbE
  - High-speed VPN access
  - CESoP for E1 services over packet networks

Voice

- V5.1/V5.2/CAS
- VoIP media gateway (H.248/MEGACO or SIP)
- Magneto, E&M, POTS, ISDN and VoIP

Transmission & Grooming

- Cross-connect capabilities for mobile access networks and fixed networks
- High-performance and robust transmission technology

Backbone

- n x 2 Mbps
- 40 Gigabit-Ethernet
- STM-1 to STM-16

Private Circuit Delivery

- Supports capacities from 600 bps up to 155 Mbps
- Leased lines via optical fibre or copper lines
- Interfaces for sub-rates, RS-232/RS-485, G.703/G.704, V.35, V.36, X.21, V.24, 10/100BaseT, GbE

Dedicated Networks

- Open chassis switch architecture
- Specialised transmission for telecontrol/SCADA applications
- Connection of teleprotection units via the IEEE C37.94 protocol
- Highest MTBF values
- Machine-to-Machine (M2M) transmission via mobile radio networks

Redundancy Concept

- Extensive redundancy and protection switching for high service availability
- 1:1 equipment protection
- Path protection
- Formation of rings

Operation Support

- Comprehensive end-to-end management functions
- Standardised open interfaces (CLI, SNMP)

With subsidiaries worldwide and a global network of partners, we serve customers in over 100 countries.

For more information please visit www.keymile.com

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