

INTERFACE CONVERTER



2E1 over Packet

TDM over IP

2E1 Port FE Version

ST-2101-FA

Overview

Spiktel's '2101-FA' E1 over Packet (2 E1 Port FE Version) TDM over IP equipment supports transmission of up to 2 x E1 links over IP/ Ethernet, MEF or MPLS networks.

The '2101-FA' E1 over Packet (2 E1 Port FE Version) TDM over IP equipment, equipped with a powerful ARM-Cortex Processor which provides a highly reliable clock recovery mechanism for low jitter and wander control, even under variable network conditions.

2 x E1 Port E1oP (E1 over Packet) TDM over IP equipment is available with various Electrical (10/100BaseT) and Optical (100BaseFX) Ethernet port options which allow the users to implement 1+1 add-drop (Drop-Insert), Ethernet link redundancy (using Port Trunking / Port Bonding) and 802.1p based QoS mechanisms for network optimization

The '2101-FA' E1 over Packet (2 E1 Port FE Version) TDM over IP equipment also optimizes on the network usage, such that the bandwidth used by the E1oP equipment on the packet network is limited to the corresponding to the number of E1 ports and the time-slots that are being transported over the Ethernet / packet network.

Key Features- E1 and E1oP Interface

- * Supports 2 independent E1 interfaces.
- * Internal, External, Adaptive, Recovered clock and Asymmetrical (One-Clock and Two-Clock) options for the E1 TDM port synchronization. Automatic clock priority selection with fall back.
- * Absolute and Differential times tamps.
- * Jitter and Wander conforms to G.823 / G.824 and G.8261 and TDM specifications.
- * Supports three E1 framing modes - Framed, Unframed and Multi-framed with CAS signaling.
- * Supports IETF-PWE3 (pseudo-wire), SAToP and CESoPSN transport mechanisms.
- * Supports CESoPSN payload mechanism to support the fractional E1 with data rate of 64Kbps to 2.048Mbps (DS0 timeslot level). User configurable data rate from 64kbps to 2048kbps, in steps of 64kbps.
- * CESoPSN payload mechanism feature allows the user to optimize the packet switched network by limiting its usage to the corresponding number of timeslots carried by an E1 channel.
- * Supports SAToP payload mechanism to transport full E1 (transparent to the structure of the TDM frame useful for transporting framed / unframed E1 channels).
- * Supports network latency / packet delay variation / jitter buffer of up to 512ms.
- * Supports IP, MPLS and MEF8 (Metro Ethernet) addressing.
- * 120 ohms balanced E1 interfaces. Optional 75 Ohms BNC interface (120 Ohms to 75 Ohms cables provided).
- * E1 Loopback facility for testing and diagnostics.

Key Features

OAM: Operation and Management Ports

- * RS232 (DB9) Serial Port.
- * 10/100BaseT Ethernet Management for In-band remote access.

System Access, Control and Management Options

- * Telnet.
- * CLI Control Interface (HyperTerminal or Vt100).
- * SNMPV2 Traps (MIB File provided).
- * Windows based GUI (Graphical User Interface) for easy configuration, management and access. Ability to monitor multiple units from a single NMS.
- * Password Protection.

E1oP Specifications

- * **Max number of E1 Ports**
 - > Number of Ports 2
- * **Max number of logical links**
 - > Up to 32
- * **Synchronization clock recovery**
 - > Adaptive Clock Recovery recovery (ACLK) Options
 - > Recovered Clock (RCLK) / Loop-Timed Clock
 - > Asymmetrical (One-Clock and Two-Clock) Clock
 - > Synchronization to an External Clock (ECLK) and an Internal Clock
 - > Automatic fall back
- * **Max number of Ethernet Ports**
 - > 2 x FE (100BaseFX) Optical Ethernet (SFP) Ports
 - > 2 x 10/100Base-T Electrical Ethernet Ports Or
 - > 4 x 10/100Base-T Electrical Ethernet Ports
- * **Supported Transport Mechanisms**
 - > ETF-PWE3, SAToP and CESoPSN
- * **Supported PSN (Packet Switched Networks) type**
 - > UDP, IP, MPLS and MEF
- * **QoS**
 - > 802.1p packet priority

Ethernet / IP Network Interface

- * Optical SFP based (100Base-FX) and Electrical (100Base-T) Ethernet port and PoE options
 - > 4 x 10/100BaseTCopper Ports.
 - > 2 x 10/100BaseT Copper Ports, 2 x 10/100BaseTPorts with PoE.
 - > 2 x 100BaseFX Optical Fiber Ports, 2 x 10/100BaseTCopper Ports.
 - > 2 x 100BaseFX Optical Fiber Ports, 2 x 10/100BaseTPorts with PoE.
- * Power over Ethernet (PoE) (available options as above). Meets and exceeds the Telcordia GR-1089-CORE Lighting and Power Contact Protection requirements.
- * VTC Virtual Cable tester on all PHY (Electrical Ethernet) Ports.
- * Point-to-point and point-to-multipoint applications based on IPaddressing.
- * Supports drop and insert applications.
- * 1+1 Ethernet Link Redundancy (Hitless) Redundant Link Protection.

Ethernet / IP Network Interface Continued....

- * Supports QoS, 802.1p based packet priority.
- * Port Control Egress Mode (Tagged/ Un-Tagged/ UnModified) 802.1Q Mode.
- * Q-in-Q Tagging.
- * User configurable MTU (E1oP payload) packet size. May be configured from 1 to 1800 Bytes.
- * Switch supports jumbo frame sizes of up to 2048 Bytes.
- * Port based and Tag based VLANs Supports 1-4095 VLAN Ids.
- * Supports Ethernet rate limiting on each port.
- * Supports Packet priority assignment (IPDiffserv / DSCP).

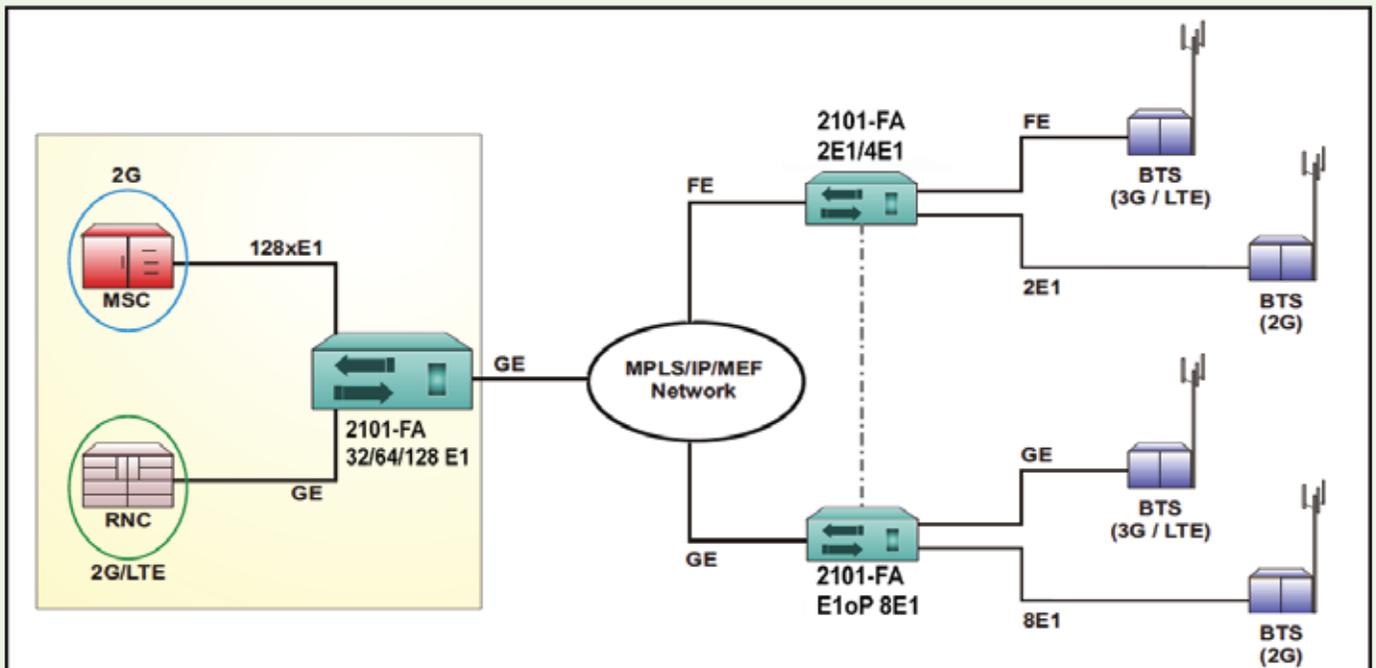
System Management, Monitoring and Alarm Interfaces

- * External Alarm - Dry contact relay alarms are also available at rear of the system to connect the system to an external alarm.
- * NMS (Network Management System) to monitor multiple units from single Central Location.
- * Port Trunking.
- * Supports system temperature monitoring with High Temperature and Low Temperature alarms and SNMP Traps.
- * Supports SNMPV2 Monitoring and Traps.
- * UDP-specific "Special" Ethernet type.
- * In band VCCV ARP.
- * Broadcast DA.
- * Self-test for checking system errors upon system bootup.
- * Clock Performance Alarms.
- * Network Performance Monitoring and Diagnostics.

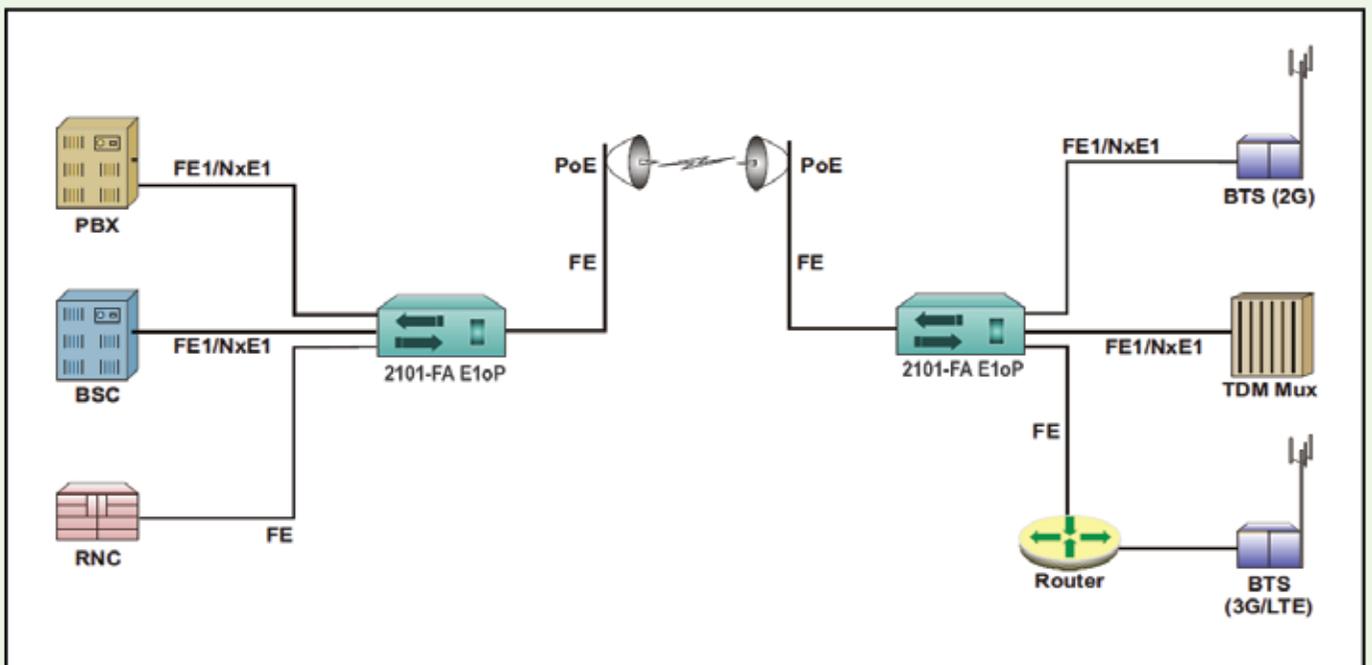
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Application Diagram

E1oP in Cellular Backhaul



Typical Application Diagram in Wireless Network



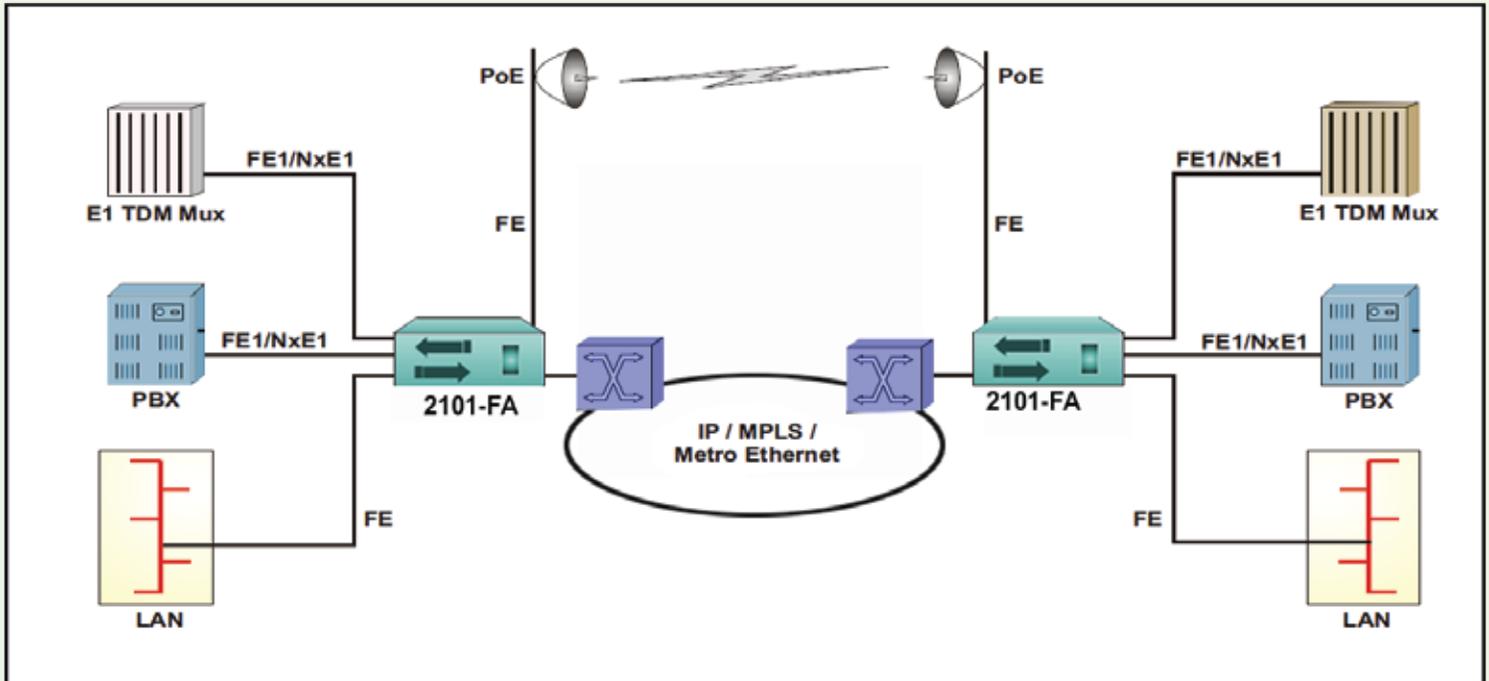
- * BTS : Base Trans-receiver Station
- * MSC : Master Switching Center
- * RNC :Radio Network Controller
- * LTE : Long Term Evolution

- * FE1 :Fractional E1
- * FE :Fast Ethernet
- * GE : Gigabit Ethernet
- * PoE : Power over Ethernet

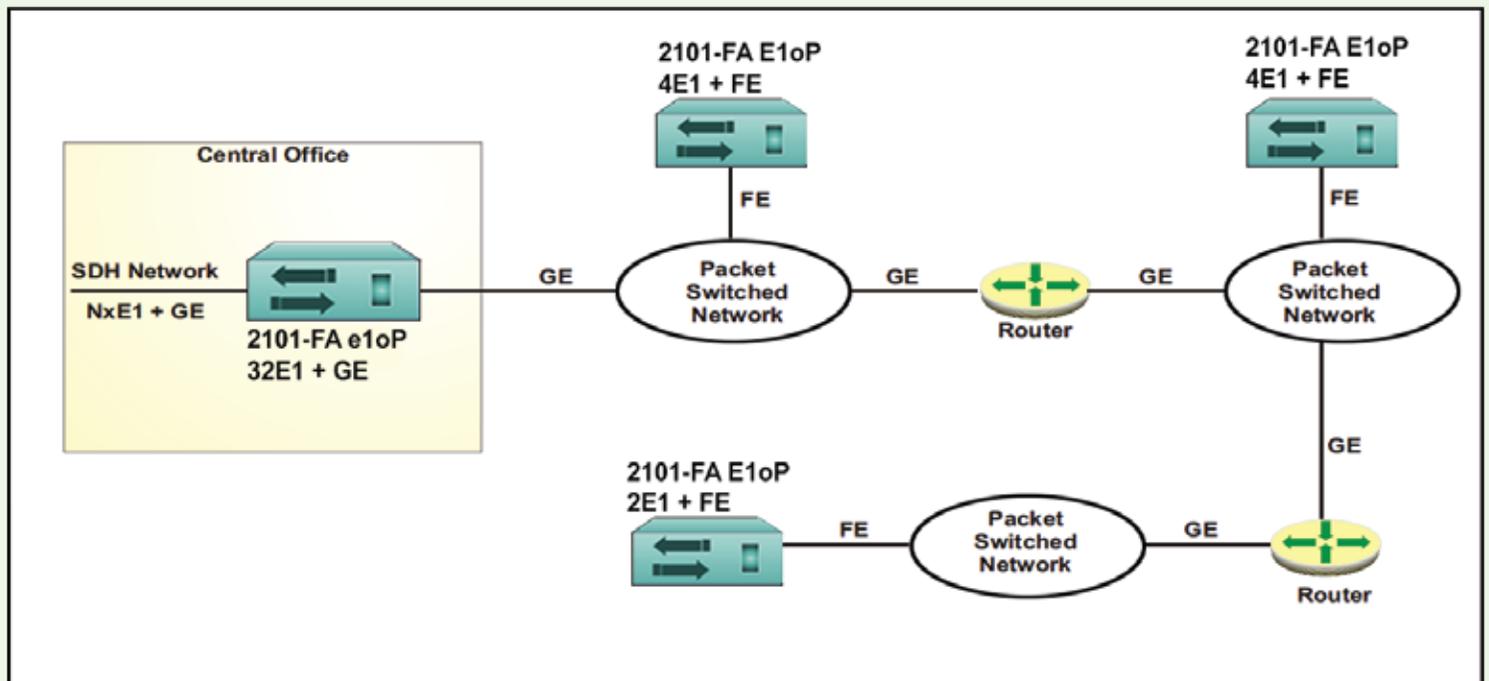
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Application Diagram

Typical Application in Wireless/Wired Network - 1+1 Link Redundancy



E1s and Gigabit Ethernet Traffic over a Packet Switched Network



- * BTS : Base Trans-receiver Station
- * MSC : Master Switching Center
- * RNC :Radio Network Controller
- * LTE : Long Term Evolution

- * FE1 :Fractional E1
- * FE :Fast Ethernet
- * GE : Gigabit Ethernet
- * PoE : Power over Ethernet

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Technical Specifications

100BaseFX (Optical) Ethernet Specifications

Type	SFP
Compliance	- MSACompliant - RoHS - EMI - ESD - DDM
Safety	Class 1 Laser Safety/ IEC-60825 Compliant
Bit Rate	100 Mbps
Wavelength	1310 / 1550 nm
Distance	550m to 120Kms, as per order
Optical Connector	LC

Ethernet Interface

Number of Ports	- 2 x FE (100BaseFX) Optical Ethernet (SFP) Ports - 2 x 10/100Base-TElectrical Ethernet Ports Or - 4 x 10/100Base-TElectrical Ethernet Ports
Electrical	10/100 Auto-negotiation/MDI-X (Auto-sensing), Full-Half Duplex, RJ45 Electrical Connector, PoE (Power of Ethernet) option on 2 x 10/100BaseTPorts
Protection	ESD protection
Optical	100Base-FX (Fast Ethernet), SFP
Power over Ethernet (PoE)	40 Watts per port
PoE Protection	Complies with Telcordia GR-1089-CORE Issue 6 Specifications and ITU-TK.44 (2012*) specifications
Maximum Frame Size	2048 Bytes (Jumbo Frames)

E1 Interface

Number of Ports	Number of Ports 2 (supporting 64Kbps upto 2.048Mbps on each port)
Framing Formats	Unframed, framed and Multi-frame (with or without CRC-4)
Line Coding	HDB3
Compliance	ITU-T G.703, G.704, G.706 and G.732
Jitter and Wander	Complies to ITU-T G.823, G.824
Line Impedance	120 Ohms balanced - Optional 75 Ohms
Protection	- Optional Metallic and Longitudinal Protection - ESD protection

Power Consumption

Power Consumption	<15 Watts (without PoE) PoE 40 Watts per channel
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Power Supply Options

- * Dual Redundant
- * 1+1 AC power (100 to 240V AC, 50/60 Hz)
- * 1+1 DC (-48V) power (40 to 72V DC)
- * 1+1 DC (-24V) power (18 to 40V DC)
- * AC plus DC (AC + DC)
- * EMI/EMC compliant.

Command Language

- * Windows based GUI (Graphical User Interface).
- * Command Line Interface (English text commands).

AC Power Supply Specifications

Input AC Voltage	110 / 220 Volts AC
Range of input AC Voltage	100 V to 240 V AC, 50Hz/60Hz
AC Input Connector	IEC Connector

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Technical Specifications

Management and Control Interfaces

- * COM Port (RS232 Serial Port).
- * 10/100BaseT Ethernet Port (each multiplexer may be assigned an IP address and connected to a LAN / IP network for remote access and management through the 10/100BaseT Ethernet Port for out-of-band configuration, management and access).
- * Telnet.
- * SNMP, V2.
- * Additionally, a Windows based GUI (Graphical User Interface) for easy configuration, management and access

24V DC Power Supply Specifications

Power Supply	24V DC
Range of input	18V to 40V DC
Input voltage reversal protection	Provided
Under voltage protection	< 4.85V
Over voltage protection	> 5.15V
Efficiency at full load	> 90% @ 5V/4A (when input voltage-24V)
Ripple at full load	< 5mVrms
Spike at full load	< 50mV

48V DC Power Supply Specifications

Power Supply	-48V DC
Range of input	-40V DC to -72V DC
Under voltage protection	< 4.85V
Over voltage protection	> 5.15V
Efficiency at full load	> 91% @ 5V/2A (when input voltage -48V)
Ripple at full load	< 5mVrms
Spike at full load	< 50mV

Environment

Temperature	-20 C ~ +60 C for Operation
Humidity	5% to 95% (at 35 C) Non-condensing

Regulatory Compliance

- * Safety - IEC 60950 Safety - IEC 60950
- * CE
- * RoHS
- * Complies to ANS/IEC standards
- * Complies with Telecom Part 68, FCC Part 15 and CISPR 22 Class A
- * EMC EN55022: 1998 + A1 and A2
- * EMC EN55024,
- * Operation ETS 300 019 Class 3.2
- * Storage ETS 300 019 Class 1.2
- * Transportation ETS 300 019 Class 2.3

NMS (with Telnet) OAM port Specifications

Network Interface	RJ-45 Ethernet 10BaseT or 100BaseT-TX (auto sensing)
Compatibility	Ethernet Version 2.0 IEEE802.3
Protocols supported	ARP, UDP/IP, TCP/IP, Telnet, SNMP
Management	SNMP, Serial login, Telnet login

External Alarms

- * Dry Contact Relay - 2 Form C
- * Rated upto 72V DC, 1 Amp.

Chassis

- * 1U High (44mm)
- * 19-inch rack-mounting shelf
- * Also available in Desktop / Table Top Version.

Mechanical Specification

Height	44 mm (1U)
Depth	260 mm
Width	480 mm (19 inch rack mountable)
Weight	3 Kgs.

2101-FA (2E1 Port FE Version)

Ordering Information

Product	Descriptions
2101-01	<ul style="list-style-type: none"> * 4 x Ethernet Ports [100Mbps, Electrical RJ45 (F)] * OAM [10/100BaseT Ethernet - RJ45 (SNMP, Telnet) and Serial Port (USB and DB-9 COM Port)]
2101-02	<ul style="list-style-type: none"> * 4 x Ethernet Ports (100Mbps) <ul style="list-style-type: none"> > 2 x Electrical Ethernet Ports [RJ45 (F)] > 2 x Optical Ethernet Ports [100Mbps SFP based / without SFPs] * OAM [10/100BaseT Ethernet - RJ45 (SNMP, Telnet) and Serial Port (USB and DB-9 COM Port)]
2101-03	<ul style="list-style-type: none"> * 4 x Ethernet Ports (100Mbps) <ul style="list-style-type: none"> > 2 x Electrical Ethernet Ports [RJ45 (F)] > 2 x Power over Ethernet (PoE) Ports [RJ45 (F)] * OAM [10/100BaseT Ethernet - RJ45 (SNMP, Telnet) and Serial Port (USB and DB-9 COM Port)] <p>Supports:</p> <ul style="list-style-type: none"> * MPLS, MEF (Metro Ethernet) * CESoPSN, PWE3 (pseudo-wire), SAToP E1oP modes * E1 data rates of 64Kbps to 2.048 Mbps on each E1 port * Point-to-point, point-to-multipoint drop and insert applications * Alternate Route Protection (for 1+1 Ethernet link redundancy on WAN side) * Clocking options: Adaptive / Loop-timed / External / Internal / Asymmetrical (One-Clock and Two Clock)

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* Specs and Pictures of the product can be revised according to R&D

* Products design in UK.

www.spiktel.co.uk

www.spiktel.com

Enquiry: sales@spiktel.com

Corporate Office

UK

SPIKTEL TECHNOLOGIES LLC.
179B Norwood Road Southall Middlesex UK UB2 4JD
Tel:+44-0208-8432233, Fax: +44-0208-5742244

Branches

HongKong

SPIKTEL INTERNATIONAL CO. LTD.
801, 8/F, Opulent Bldg.,
402-406 Hennessy Rd., Wanchai, Hong Kong
Tel: +852- 2893 8228 Fax: +852- 2893 1822

India

SPIKTEL TECHNOLOGIES PVT. LTD.
F-23, Roshanara Complex, Roshanara Road,
Delhi-110007 Tel:- +91-11-23824050, 64704050

Dubai

SPIKTEL TECHNOLOGIES MEA
New Al Kuwaitat, Street 8, Villa 2B, AL AIN , UAE
P.O. Box. 13787, Tel/Fax: +9713-03-7377053