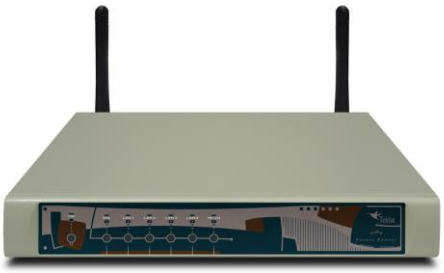
Teldat C1+L

ADSL2+ / 3.5G integrated router



"The Teldat C1+L gives answer to connectivity needs for small corporate sites by integrating ADSL2+/3.5G redundant accesses in a single device"

SMALL OFFICES, GREAT SOLUTIONS

The Teldat C1+L versatility in LAN and WAN interfaces means that smaller companies can achieve a connectivity level normally reserved for much bigger enterprises, who can justify a greater outlay on infrastructure.
Teldat C1+L gives answer to the most demanded communication needs for corporate offices, not just regarding interfaces to local and corporate networks, but also regarding advanced software features, thanks to the CIT (Teldat Internetworking Code) shared by all the Teldat routers, and which incorporate advanced routing protocols, hereditary protocols support, user-friendly installation, modern remote diagnostic tools and a demanding management level orientated towards corporations and carriers.

OVERVIEW

The Teldat C1+L router simply and efficiently solves connectivity to corporate network or Internet with broadband through ADSL/ADSL2+ accesses and optionally over 3.5G networks.
There are two alternatives for 3.5G connections, the simplest being orientated to home or SME/SOHO where 3.5G external modems connected to the USB interface are used. This simply requires a license in the Teldat C1+L router and connection to the external modem. The second option is installing internal modems for 3.5G connectivity, this latter being the most demanded in corporate environments as it allows for better 3.5G module management and the option to connect 3.5G external antennas.
In both cases 3.5G connectivity includes all the mobile connectivity technologies currently in use (HSPA, UMTS, EDGE, GPRS, GSM, CDMA and TD-SCDMA).
A typical office scenario is usually ADSL2+ connectivity with 3.5G backup in cases where the ADSL access drops, or else both accesses can be simultaneous connections to balance the load or just 3.5G access in mobile offices or for example, the possibility of providing immediate broadband communication while processing the ADSL line.
The Teldat C1+L also has a 4-port 10/1000 switch and a WiFi option which fully satisfies the connectivity needs of small companies.
And as regards software, the range of features can easily stand up to higher cost routers as this router is equipped with all the Teldat software characteristics such as security, quality of service, routing management, diagnostic tools etc.
Characteristics: A brief summary:

Model	C1+L
ADSL/ADSL2+	Yes
4 x 10/100 Switch	Yes
USB (3.5G)	Optional
WiFi 802.11 b/g	Optional
3.5G Internal Module	Optional

ADVANTAGES

- Latest generation multi-DSL chipset thus ensuring maximum compatibility with the main DSLAMS and carriers, in any ADSL/ADSL2+ variant.
- Optional managed 3.5G internal module.
- Optional USB 2.0 port for external 3.5G modules. Or the possibility of using this as a storage server.
- Optional Integrated switch and WiFi access. To adapt to different office scenarios.
- Advanced software features. To adapt to any requirement in more complex environments.

SCENARIOS

Generally speaking it's the small and medium sized offices that require guaranteed high connectivity, e.g.:

- Branches with ADSL2+ connectivity
- Branches with ADSL2+ connectivity and 3.5G backup
- Offices with ADSL2+ connectivity simultaneously with 3.5G for balance

The ADSL/ADSL2+ connection scenario is the entry point for those branches where link redundancy is not required. Figure 1 shows this scenario:

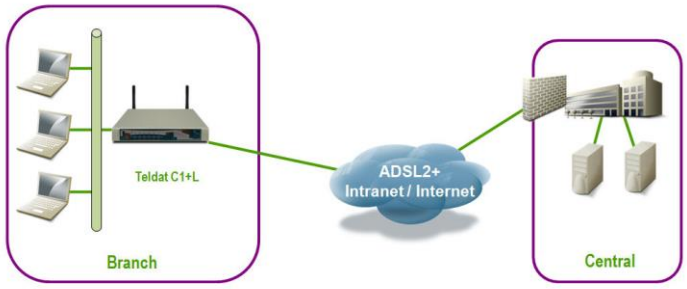


Figure 1: ADSL2+ Connectivity

Figure 2 represents what is probably the most common scenario for remote offices: ADSL2+ connectivity with backup through 3.5G access. The Teldat C1+L manages connectivity to one network or another and executes connection to backup and return from backup in such a short period of time that the process can literally be transparent for the applications.

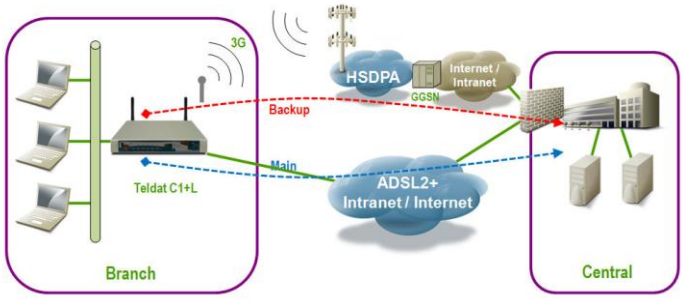


Figure 2: ADSL2+ connectivity and 3.5G backup

Sometimes temporary or permanent simultaneous use of ADSL2+ and 3.5G connections are necessary for greater broadband. The Teldat C1+L can manage both connections depending on different criteria. E.g. establishing a permanent sessions balance or classifying the types of traffic and depending on this decide which line is going to be used; or activate the 3.5G line only when the ADSL line is nearing saturation point.

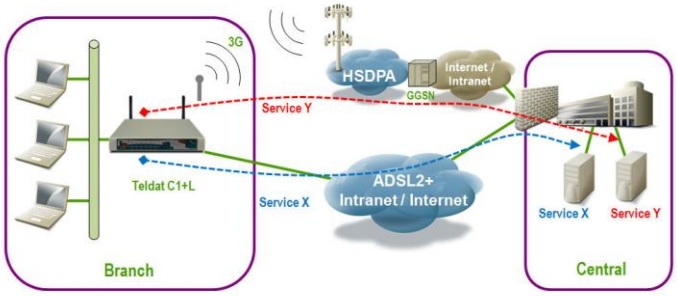


Figure 3: ADSL2+ / 3.5G Balance

KEY FEATURES

Advanced routing functions and Quality of Service

Given that the purpose of the Teldat C1+L is to provide service for a large number of small and not so small branches, the device is capable of offering advanced features all of which can be necessary to a corporate environment, for example:

- Advanced routing features orientated to complex networks, such as route balancing, routing protocols orientated to corporations, routing based on policies, multiple instant routing or routing depending on real time measured quality on the line.
- Device redundancy functions in the local network through standard protocols to integrate with other devices offering alternative connectivity.
- Advanced VLANs support integrated with routing between VLANs.
- Complete Quality of Service (QoS) schema with traffic flow classification depending on any layer 3 and 4 parameter or type of traffic (voice over IP, peer-to-peer, etc), and the different queue management policies (simple through weights, associated to classes, throughput limitation, overflow, etc).
- Bridging between switch ports, and VLANs routed towards the WAN.

Powerful Security mechanisms

The Teldat C1+L incorporates security elements that are vital in corporate offices such as a firewall based on the sessions state and the most advanced virtual private network mechanisms:

- Advanced Firewall System integrating traffic classification based on session state (Stateful firewall), and packet filtering, queuing and marking (Diffserv).
- Virtual Private Networks, through different standard protocols and with advanced mechanisms to adapt to other environments such as meshed networks via dynamic tunnels, security policies based on certificates or virtual private network mechanisms with multicast support.
- This also incorporates security mechanisms related to management, such as safe authenticated access to the console or secure standard management protocols (SNMPv3).

Choosing between professional 3.5G modules or USB/3.5G external modems

Both options are orientated to different environments (corporate and SME/SOHO respectively) meaning a single device can give response to both needs.

The internal modules are enriched with advanced management of the radio interface state (signal and noise level, interference from neighboring cells, etc.) while the external USB modules provide connectivity for less demanding environments.

In both cases, the 3.5G modules are controlled by the Teldat C1+L, which integrates advanced mechanisms to guarantee connectivity as well as managing them:

- The 3.5G modem is controlled from the commands line interface (CLI)
- Simultaneous data and management services in 3.5G access.
- Connectivity drop detection techniques based on the observation of traffic patterns.

Corporate level management

The Teldat routers are orientated to the corporate segment; therefore management is a key aspect. The C1+L routers, like the rest of the Teldat routers, permit management at a carrier or large corporation level:

- Secure access management complying with the RADIUS standard, different SNMP versions (1, 2 and 3), debug information dumping such as Syslog, etc.
- Powerful traffic reporting systems based on standards (Netflow v5 and v9).
- WireShark compatible packet analysis
- Powerful commands line interface (CLI)

IP Telephony

IP telephony integrated server capable of managing up to 100 telephones with SIP, H323, Alcatel NOE or SCCP (Skinny) protocols.

TECHNICAL SPECIFICATIONS

General

Description

1 x ADSL2+, RJ11 H
1 x USB for 3.5G (optional)
4 x Fast-Ethernet 10/100 Switch, RJ-45 H
1 x Wireless-LAN 802.11 b/g (optional)
1 x internal slot for the 3.5G HSPA/CDMA/TD-SDCMA module
1 x Console, RJ-45 H

ADSL2+ Interface

Selected through configuring the following standards:

- ANSI T1.413 Issue 2
- ITU G.992.1 (G.DMT) - Annex A
- ITU G.992.2 (G.Lite) "LiteADSL over POTS"
- ITU G.992.3 (ADSL2) - Annex A, L and M
- ITU G.992.5 (ADSL2+) - Annex A and M

Downstream rates: up to 27Mbps (ADSL2+ Annex A)
Upstream rates: up to 3Mbps (ADSL2+ Annex M)
SELT diagnostics ("Single Ended Line Testing")
DyingGasp
Annex B, needs to be ordered; please contact your distributor.

USB Interface

USB 2.0 host interface
3.5G functionalities:

- Passive interface fall detection (analyzing the received traffic)
- Active interface fall detection (poll)
- Automatic handover

Internal 3.5G interface

Passive interface fall detection (analyzing the received traffic)
Active interface fall detection (poll)
Management protocol via SMS*
Advanced monitoring in the Radio Frequency interface
Simultaneous context for dual APN (dual PDP)
Remote upgrading for module firmware over the air
Automatic handover
Internal SIM tray

Switch Fast-Ethernet

10/100-BaseT detection
Semiduplex/duplex automatic negotiation
MDI /MDI-X detection ("crossover detection")
Ethernet V2 / IEEE 802.3
LLC (802.2), ARP
IEEE 802.1Q (VLAN) up to 16 VLANs
Manageable switch:

- EtherLike-MIB (RFC 2665)
- SNMP-REPEATER-MIB (RFC 2108)
- MAU-MIB (RFC 2668)

2 status and activity per port LEDs

Wireless LAN

802.11 b/g
Detachable Antenna (SMA connector)

Console

RS-232 to 9600 bps (max. 115200 bps)
8 parity bits and one stop bit (8N1)

Power

90 – 240v, 50/60Hz
External power supply

Dimensions and weight

Length x Width x Height: 220 x 220 x 32 mm
Approximate weight: 450 gr.
Format: desktop

Environmental specifications

Temperature: -10ºC to 45 ºC
Relative Humidity: 5% to 90%
Barometric pressure: 700 mbar to 1060 mbar

Expansion modules

MTC-1 External Telecontrol Module (Módulo de Telecontrol Externo)

Protocols and functionalities

IP Protocol

IP, ARP, Proxy ARP
Static IP Routing
RIP I, RIP II, OSPFv2 and BGP-4
"Bidirectional Forwarding Detection" (BFD) Protocol
Compatible with HSRP
RFC 2281 VRRP – Virtual Router Protocol
Policy Routing
Multi-VRF
Quality of Backup: Routing based measuring the network quality
Multi-path per IP packet (with static and dynamic routing)
Balancing per TCP/IP session
Multicast: IGMP, IGMP-proxy, and MOSPF
DHCP client, server and relay
NTP Client
Client and DNS proxy. DNS Cache. DynDNS, DNS dynamic updates (RFC 2136)
NAT/PAT/Port Mapping/NAT Exceptions
PAT fire-walling
Multiple addresses per interface
Loopback Interfaces
“Circuitless” internal address

ATM

SAR AAL5
7 PVCs, with a range of complete VPIs and VCIs
Traffic Shaping: CBR, UBR, VBR-nrt, VBR-rt

OAM F4/F5

Encapsulation over ATM

IP routing RFC 1483 LLC and VC based
PPPoA RFC 2364 LLC and VC based
PPPoE RFC 2516 LLC and VC based
RFC 2225, Classical IP over ATM
Ethernet Bridged RFC 1483 LLC and VC based

Wireless LAN specific features

Selectable transmission power
Manual or automatic selectable speed
Turbo Mode (108 Mbps)
802.11i, WPA, WPA2
EAP, EAPOL
Authentication (open, shared, WPA)
Encryption (AES, TKIP, WEP)
ESSID
MAC Filtering
Quality of Service (QoS) AIFS, CWmin, CWma

PPP Protocol

PPP (RFC 1661), PAP/CHAP, IPCP
Dynamic assignment of IP addresses (own or end)
Multilink PPP
Multi-Class Extension to Multi-Link PPP (RFC 2686)

PPPoE Protocol

PPPoE over Ethernet and over ATM
PPPoE Bridge + routing (PPPoE pass-through)
PPP Multilink over PPPoE
Renegotiation based on PADT

Quality of Service (QoS)

Traffic classification at layer 2 (port, MAC, packet size), 3 (all the header fields), or 4 (session status).
Congestion control policies: Best Effort, PQ, WFQ, CBWFQ, PQ, etc.
Traffic-limiting in queues, with overflow in lower priority queues. Standard limitation over ATM
Fragmenting in PPP and MPPP

Security and VPNs

IPSec client and server, compatible with third party IPSec ends
IPSec security services: ESP and AH
IPSec operation modes: Tunnel and transport
Encoding: RC4, DES, 3DES y AES
Authentication: SHA-1 and MD5
IKE Protocol
ISAKMP Configuration methods. Oakley groups 1, 2, 5 and 15
NAT-Traversal
Reverse Route Injection (RRI)
Digital certificates X.509v3, LDAP and PKIX
SCEP Protocol
Tunnel End-point Discovery (TED) Protocol
IPSec PMTU Discovery
GRE and multi-GRE Protocol. GRE encryption RC4
Next hop routing protocol (NHRP)
Dynamic Multipoint IPSec VPNs (DMVPN)
Gateway Encryption Transport VPN (GET VPN - GDOI) RFC 3547
Radius Access Control (RFC 2138)
L2TP (LAC) client, L2TP and L2TP server (LNS) initiation
L2TP/IPSec server, compatible with Microsoft clients
Telnet, SSH and FTP console access protected with user and password
Permission and user levels
IP advanced filters
Firewall functions

- Static and dynamic access controls (Stateful Packet Inspection)
- Intrusion detection and Denial of service (Deep Packet Inspection)*

Data compression

IPHC compression
Van Jacobson and STA LZS compression algorithms

Bridge

STP "Spanning Tree Protocol" (IEEE 802.1d)
RSTP "Rapid Convergence Spanning Tree Protocol"(IEEE 802.1w)
Multiple bridge domains
Simultaneous Bridging and routing
BPDUs filtering
IEEE 802.1p CoS ("Class of Service")
PVST ("Per VLAN Spanning Tree Protocol") *[*]
Source Routing, MAC y NetBIOS filtering

Telephony over IP (ToIP)

Signaling:

- SIP: RFC 3261, RFC 3262, RFC 3264, RFC 3265
- SIP transport over UDP, TCP and TLS
- X509 over TLS authentication
- SIP SDP: RFC2327
- SIP SDES: RFC4568
- H.323, H.245, H.225
- RAS
- UA-NOE (Alcaltel) (server function)
- SCCP (skinny) (server function)
- SIP and H323 modified AASTRA (server function)

Simultaneous telephone survival for SIP/H323/SCCP/UA-NOE/SIP (AASTRA)/ H323(ASTRA) terminals
Emergency switchboard functionality
PBX Features

- Supervised and blind transfers
- Simultaneous ringing in multiple terminals
- Hunt groups
- Call groups
- Overflow
- Forward if busy, no answer or unconditional
- Music on hold in streaming mode from the file

RTP, RTCP, SRTP
Data fragmentation FRF.12
Header compression CRTP
Numeric expansion and compression

Management

Command line interface on consol**e**, telnet and ssh
Access/execution user levels (local or RADIUS authentication)
SNMPv3: MIB-2, Teldat private MIB
Events Logging System
Network/link quality assurance agent (Cisco's "Service Assurance Agent" functionality)
Netflow V5 and V9
Syslog Client
NTP Protocol
DynDNS Client

FTP & TFTP, BIOS & configuration Software Upgrading
Integrated protocol analyzer, compatible with Ethereal/Wireshark
Default configuration switch
Partial CDP support (Cisco Discovery Protocol)
Radius Accounting (RFC 2139)
Integrated in TeldaGES (Teldat professional management platform)
Interoperable with third party management platforms such as Openview, Tivoli Netcool, InfoVista, etc.

PRODUCT PHOTOS

Figure 4: Teldat C1+L: front panel.

Figure 5: Teldat C1+L: rear panel.

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