

TEL DAT H1

Enterprise routers with embedded 3G

“Provide your branch offices with highly intelligent and manageable communication services through the ultimate Wireless WAN access technologies”



The Teldat H1 HSDPA/HSUPA/EV-DO router family permits the enterprise to complement their branch office land-line connectivity with a redundant link over a truly independent network, the cellular network. Teldat H1 routers are also suitable to interconnect remote locations where land-line network coverage is not available or not convenient to deploy, such as remote Teller Machine services, temporal Teller Machine deployments and teleworker mobile offices. Its embedded WWAN interface not only overrides the need for external peripherals for the 3G access (USB and PCMCIA modems), but also guarantees an outstanding performance for a 24h365d use.

Teldat H1 routers come with the standard hardware features present in the Teldat modular router platforms and the Business graded Teldat Internetworking Software (CIT), offering a vast suite of protocol standards and advanced functionalities, a powerful CLI engine and full suite of network management features ready for the carrier-class management.

PRODUCT OVERVIEW

The Teldat H1 router delivers the WWAN access link to the branch office in a record time. The router is quickly installed and connected to the cellular network without the need of land-line network coverage (xDSL, cable, etc) guaranteeing a fast return of the investment.

Depending on the type of WWAN interface equipped, there are two Teldat H1 variants:

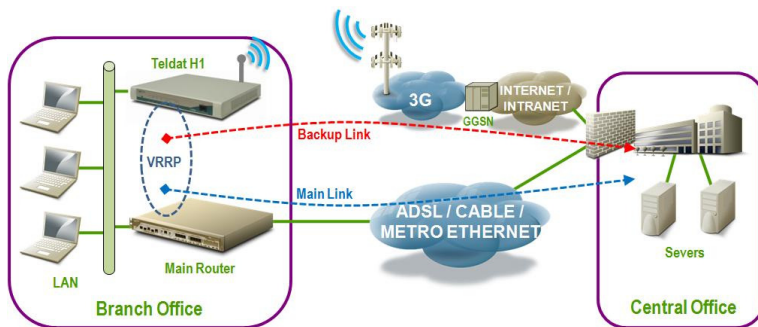
- The **Teldat H1/HSUPA** complies with the 3GPP cellular technology standard suite. Its WWAN interface supports HSUPA and it is backwards compatible with HSDPA, UMTS, EDGE and GPRS.
- The **Teldat H1/EVDO** complies with the 3GPP2 cellular technology standard suite. Its WWAN interface supports EV-DO and is backwards compatible with CDMA2000 1xRTT.

Two SIM card trays are equipped in Teldat H1/HSUPA routers with automatic SIM card switch over based on the IP link quality (Round-Trip Time delay, frame error rate and UDP jitter). This important feature duplicates the WWAN service availability in the branch office; the Teldat H1 router can automatically switch to an alternative mobile provider when the data transmission through the main service provider is degraded, when there is no 3G coverage with the main provider in that specific location or simply when the main WWAN service is lost.

Thanks to the dual PDP context support, two different data services of the same mobile provider (if supported on SIM) can share the radio interface. The router can hence be remotely managed “out-of-band”, by having the management operators can access the router through a different mobile network without disrupting the data service.

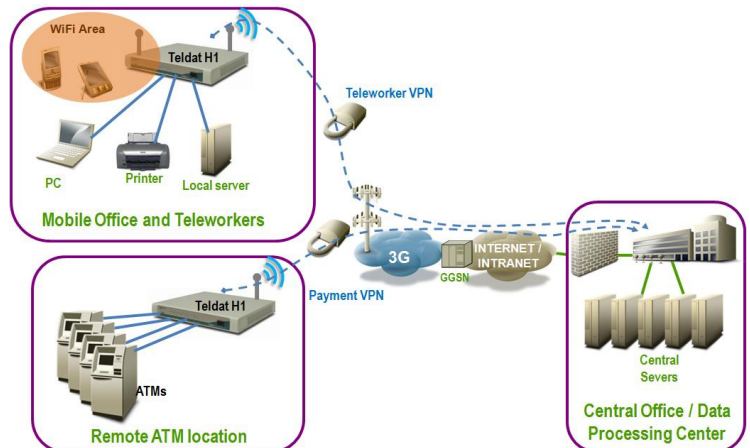
In addition to the WWAN interface Teldat H1 routers include a four port Fast-Ethernet switch with full VLAN and SNMP management support for its use in WAN access services. These routers also incorporate a crypto-processor for “wire-speed” performance in VPN scenarios and an internal mini-PCI slot for the Wireless LAN Access Point support.

APPLICATION SCENARIOS



In the left figure the Teldat H1 router is the branch office 3G backup router. It is synchronized with the Main access router using the VRRP or the HSRP protocol. In normal operation, the Main router is the active default gateway and the Teldat H1 is kept in standby. When the Main router detects a Main Link failure, the VRRP or HSRP activates the Teldat H1 so it is the default gateway and the Main router goes on standby, until the Main link is recovered. The active default gateway switchover is automatic and fully transparent to the LAN PCs and Hosts.

The right figure combines two remote access scenarios through Teldat H1 routers. On the left bottom corner the Teldat H1 can serve up to four IP ATMs without an additional switch. The router transmits the ATM transactions over the 3G network to the Data Processing Center. The transactional traffic is placed inside an IPSec encrypted tunnel for the communication security.



On the top left figure, a remote teleworker office is depicted. The Teldat H1 router serves a local PC, printer and other devices including WiFi ones. The router establishes a VPN connection to the Central Office so the teleworker can have transparent access to the Central Servers.

KEY FEATURES

Advanced WWAN technology for the utmost reliability

- Embedded WWAN interface, fully integrated into the router engine. All the Teldat intelligent network features are available through the WWAN interface.
- Dual SIM card tray with automatic SIM switchover based on the link performance.
- Dual PDP context. Two services from the same carrier can share the radio access (if supported on SIM).
- Dual 3G antenna support (SMA ports) for RF diversity on reception. The RF diversity increases the received signal performance in 15% at locations with no obstacles between the router and the Base Station.
- Detailed WWAN diagnostics for SLA audition and accounting. Information such as serving and neighbor cell received signal power, the perative frequency band, the WWAN technology used and the instant bitrate is available both in the router CLI and in its cellular interface MIB, so it can be retrieved by the SNMP management station at any time. Furthermore, a history report of the received signal power evolution in the past hour is also available.
- AT command Line interface for low-level RF module management (sim-lock, WWAN carrier customization, etc).

■ **Ready for WAN Ethernet services.** The full VLAN support, the state of the art in routing and bridging features, QoS and VRF-Lite features addresses this router for Metro-Ethernet services. Furthermore, the Standard and Private Ethernet MIB support in these routers allows for the SNMP remote management.

■ **100% Wireless solution.** An embedded WLAN Access Point (IEEE 802.11a/b/g) with dual external WiFi antennas can be equipped inside the router, providing cellular connectivity to local WiFi equipments. The suport for IEEE 802.11 security guarantees the communication privacy and confidentiality in the Wireless LAN segment.

Best in class performance in mobile VPNs.

- Crypto-processor incorporated for “wire-speed” data encryption in VPN scenarios.
- Fully parameterized IPsec Client/Server. Advanced IPsec features such as PKI encryption (Digital Certificates), Extended authentication, Reverse-Route Injection guarantees the compatibility with third party VPN solutions.
- DMVPNs and GET-VPNs.
- L2TP/IPsec
- IP filtering, MAC filtering and SPI firewall protects the router against DoS attacks.

Teldat’s Internetworking Intelligence

- Dynamic routing protocol conversion and policy-based routing favors the implementation of enterprise converged services that combine Wireless and fixed WAN access.

- Multi-HSRP and Multi-VRRP support for network resiliency and traffic load balancing.
- Link quality supervision through the Teldat NSM/NSLA system, adapts the router IP forwarding policy based on the link quality (RTT, frame error rate and UDP jitter).
- Teldat QoS system. The flexible application traffic flow prioritization, labeling and shaping permits an efficient use of network resources and an accurate SLA definition.

Carrier-class management

- Powerful CLI, adapted for a professional router management.
- Human readable configuration files.
- Syslog client allows for the report of any event detected by the Teldat Event Logging System.
- SNMP agent with MIB2 and Private MIB support. Teldat H1 routers can be easily integrated into the Centralized Management System.
- Remote router management through the Teldat Management System (TeldaGES).
- Telnet, SSH2, FTP, TFTP and RADIUS Client (AAA Accounting).

TECHNICAL SPECIFICATIONS

General Hardware & Mechanical features

Hardware architecture

Microprocessor: Motorola MPC8272
 Cache L1 16 Kbytes instructions / 16 Kbytes data
 SDRAM memory: 64 Mbytes
 FLASH memory: 16 Mbytes
 NVRAM memory: 128 Kbytes
 Embedded crypto-processor
 1 x Mini-PCI internal expansion for WiFi AP
 7 LEDs state indicators located on front panel
 1 Reset Button

Interfaces & Connectors

4 x 10/100 Fast Ethernet, RJ-45F
 1 x 3G/3.5G Interface (HSPA or EVDO depending on the model)
 2 x SIM tray (HSPA models)
 2 x SMA connectors for 3G antennas
 1 x Wireless LAN AP (Optional)
 1 x Local Console port, RJ-45F

Console

RS-232 at 9600 bps (max 115200 bps)
 8 bits without parity with 1 stop bit (8N1)

Power Supply

AC external: 90v – 240v; 50/60Hz
 DC external -48V (Optional)

Switch 4 x FastEthernet

10/100-BaseT automatic detection
 Half/full duplex automatic negotiation
 MDI / MDI-X crossover detection
 Ethernet V2 / IEEE 802.3
 LLC (802.2), ARP
 IEEE 802.1Q (VLAN)
 IEEE 802.1X
 Managed Switch:

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

 2 status LEDs per port

Wireless LAN Interface

IEEE 802.11n Draft 2.0
 IEEE 802.11a/b/g
 Two detachable external antennas (SMA ports)

Environmental specifications

Operating Temperature: 0°C to 55 °C
 Relative Humidity: 5% to 85%
 Barometric pressure: 860 mbar to 1060 mbar

Dimensions and weight

Length x Width x Height: 220 x 220 x 30 mm
 Approximate weight: 0.8 Kg

3G wireless-WAN Interface

	Teldat H1/HSUPA	Teldat H1/EV-DO
Technologies	GSM, GPRS, EDGE, UMTS, HSDPA, HSUPA	CDMA 2000 1xRTT, EV-DO rev 0, EV-DO rev A
Frequency Bands (MHz)	GSM/GPRS/EDGE: 850/900/1800/1900 UMTS/HSDPA/HSUPA: 850/1900/2100	CDMA: 800/1900
Diversity	2100/850 MHz	N/A
Baseband processor	Qualcomm MSM7200™	Qualcomm MSM6800™
Data services (PS)	<u>GPRS/EDGE:</u> Multi-slot class 12 CS1-CS4, MCS1-MCS9 <u>HSDPA Cat 8:</u> 7.2 Mbps DL, 384 kbps UL <u>HSUPA Cat 4:</u> 2.0 Mbps UL	<u>CDMA 1xEV-DO Rev A (IS-856-A)</u> DL up to 3.1 Mbps / UL up to 1.8 Mbps <u>CDMA 1xEV-DO Rev 0 (IS-856)</u> DL up to 2.4 Mbps / UL up to 153.6 Kbps <u>CDMA 1xRTT (IS-2000):</u> DL and UL up to 153.6Kbps
HSCSD	64 Kbps DL and UL	N/A

Software features

IP protocol

IP, ARP, Proxy ARP

Static IP Routing, RIP I, RIP II, OSPFv2, BGP-4 & Policy Routing

Bidirectional Forwarding Detection (BFD) Protocol

Hot Standby Routing Protocol (HSRP) compatible

RFC 2281 VRRP – Virtual Router Protocol

VRF-Lite

Quality of backup: Routing based on network quality measurements

Multi-path per IP packet (with static & dynamic routing)

Weighted balancing per TCP/IP session

Multicast: IGMP, IGMP-proxy, MOSPF & PIM-SM [1]

DHCP client, server & relay

DNS client & proxy. DNS cache. Dynamic Updates in DNS (RFC 2136)

NAT/PAT/Port Mapping/NAT Exceptions

PAT fire-walling

Multiple addresses per interface

Loopback interfaces

PPP & PPPoE protocol

PPP (RFC 1661), PAP/CHAP, IPCP

PPP Multilink

Multi-Class Extension to Multi-Link PPP (RFC 2686)

PPPoEoE, PPPoE Bridge + routing (PPPoE pass-through)

PPP Multilink over PPPoE

Re-negotiation based on PADT

Quality of service (QoS)

Packet labelling (DiffServ) depending on interface, subinterface, protocol, port, MAC and size

Congestion control: FIFO, queuing priority, BRS proprietary system, WFQ

Low Latency Queuing (LLQ)

Traffic Shaping: proprietary (over BRS), ATM traffic shaping, Frame Relay traffic shaping

Fragmentation in FR (FRF.12), PPP & MPPP

Security and VPNs [2]

IPSec client & server. Fully parameterized, compatible with third party

IPSec peers

IPSec security services: ESP & AH

IPSec operation modes: tunnel & transport

Encryption: RC4, DES, 3DES & AES

Authentication: SHA-1 & MD5

IKE Protocol

ISAKMP Configuration Method. Oakley groups 1, 2, 5, 15

NAT-Traversal

Reverse Route Injection (RRI)

Digital certificates X.509v3, LDAP, PKIX, PEM, DER

SCEP Protocol

Tunnel End-point Discovery Protocol (TED)

IPSec PMTU Discovery

GRE & multi-GRE. GRE RC4 encryption

Next Hop Resolution Protocol (NHRP)

Dynamic Multipoint IPSec VPNs (DMVPN)

Gateway Encryption Transport VPNs (GET VPN)

Radius Access Control (RFC 2138)

L2TP client (LAC), L2TP initiation & L2TP Server (LNS)

L2TP/IPSec Server, compatible with Microsoft clients

Advanced IP filters

Advanced Firewall System (AFS)

- Statefull Firewall

- Advanced packet classification and marking

- URL & content filtering

Data compression

IPComp (RFC 2393)

Compression in X.25, Frame Relay (FRF.9) & PPP

IPHC Compression

Van Jacobson & STA LZS compression algorithms

Bridge

Bridge over PPP (BCP)

STP "Spanning Tree Protocol" (IEEE 802.1d)

RSTP "Rapid Convergence Spanning Tree Protocol"(IEEE 802.1w)

Multiple bridge domains

Simultaneous bridging & routing

IEEE 802.1p CoS ("Class of Service")

PVST ("Per VLAN Spanning Tree Protocol") [1]

Source Routing, MAC filtering & NetBIOS

3G specific functionalities

Automatic handover

Passive detection of interface failure

Active poll-based failure detection

Management protocol via SMS*

Advanced RF interface real-time monitoring

Remote Qualcomm DM interface monitoring over IP

Connected SIM tray management w/ multiple selection criteria:

- Signal level

- Radio technology (GPRS, UMTS, etc)

- IP probes (availability, latency, jitter...)

- Time schedule*

- Manual configuration

Dual PDP context

OTA WWAN module firmware upgrade

Wireless LAN specific functionalities [3]

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, CWmax

Management

Command line interface on console, telnet & SSH

SNMP: MIB-2, Teldat Private MIB

Event Logging System

Netflow V5 and V9

Syslog Client

Network Time Protocol (NTP)

DynDNS Client

FTP & TFTP Software, BIOS & configuration uploading

Internal Protocol Analyzer, compatible with Ethernet/WireShark

Default configuration switch

Radius Accounting (RFC 2139)

Integrated in Teldages (Teldat professional management platform)

[1] Feature under development

[2] IPSec-related functionalities require IPSec software license

[3] WLAN features apply to routers with Wireless-LAN support

ORDERING INFORMATION

Part no.

Teldat H1 router models

RCTHH1U2	TEL DAT H1/HSUPA: IP ROUTER, 1 GSM/GPRS/EDGE/UMTS/HSDPA/HSUPA + 1 SWITCH 4 PORTS ETH 10/100
RCTHH1C1	TEL DAT H1/EV-DO: IP ROUTER, 1 CDMA/EV-DO + 1 SWITCH 4 PORTS ETH 10/100

SW licenses

RCTHS101	BASIC IP SOFTWARE LICENSE FOR TEL DAT H PRODUCT RANGE
RCTHS102	IPSEC SOFTWARE LICENSE FOR TEL DAT H PRODUCT RANGE

Spare parts

RCTHAW01	WIRELESS-LAN ACCESS POINT 802.11A/B/G KIT FOR TEL DAT H (TWO ANTENNAS INCLUDED)
RCTHRFA1	TEL DAT H POWER SUPPLY: 90-240V, OUTPUT 12V, JACK CONNECTOR
RCTHRFD1	TEL DAT H POWER SUPPLY: -48V DC, OUTPUT 12V, JACK CONNECTOR
RCTHCLAN	UTP RJ45M-RJ45M ETHERNET CABLE, 2M

Wireless-WAN external antennas & RF coaxial cables

RCTHAAM1	MULTI BAND 900-1800-2100 3G DIPOLE ANTENNA, 90 DEGREES MOUNT
RCTHAAM2	MULTI BAND 900-1800-2100 3G DIPOLE ANTENNA, MAGNETIC BASE MOUNT, 1.5M CABLE
RCTHAAM3	MULTI BAND 900-1800-2100 3G DIPOLE ANTENNA, CEILING MOUNT
RCTHAAM4	CDMA DUAL BAND 800-1900 DIPOLE ANTENNA, 90 DEGREES MOUNT
RCTHAAM5	MULTI BAND 900-1800-2100 3G DIPOLE ANTENNA, WALL MOUNT, OUTDOORS, 5M CABLE
RCAEAAM6	MULTI BAND 900-1800-2100 3G DIPOLE ANTENNA, WALL MOUNT, OUTDOORS, 10M CABLE
RCTHAEM1	MULTI_BAND 900-1800-2100 EXTENSIN BASE FOR DIPOLE ANTENNA. SMA CONNECTOR
RCTHAAC1	LMR400 ULTRA-LOW LOSS COAXIAL CABLE. SMA CONNECTOR, 6M LENGTH
RCTHAAC2	LMR400 ULTRA-LOW LOSS COAXIAL CABLE. SMA CONNECTOR, 15M LENGTH
RCTHAAC3	RF-7MM ULTRA-LOW LOSS COAXIAL CABLE. SMA CONNECTOR, 10M LENGTH

TEL DAT DOCUMENTATION

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TEL DAT S.A. - Parque Tecnológico de Madrid - 28760 Tres Cantos -
MADRID (Spain) Tel: +34 91 807 65 65 / Fax: +34 91 807 65 66
www.teldat3g.com

TEL DAT CORP/CCS - 670 N. Beers St. Bldg. 4 - Holmdel, NJ 07733 (USA)
Tel: +1 732-739-5600 / Fax: +1 732-739-4148