

3.5G Mobile Broadband solutions for Large Corporations and SMEs



“Get 3.5G communication services in your corporate offices thus providing maximum reliability, security and intelligence for Data and Voice applications, all seamlessly integrated in your current VPN service”

The rate at which the Wireless-WAN (WWAN) networks have evolved means that cellular communications can now be offered at speeds comparable to those provided by landlines together with a low transmission delay (link latency at around 60ms in commercial HSUPA networks) and enormous stability that satisfies even the most demanding corporate applications (voice and video streaming traffic and business critical data applications).

Today WWAN technology is emerging as a valid alternative to landline technologies (xDSL, Optic Fiber, TDM, Frame Relay, SDH, etc) for the latest generation of Broadband VPN services in remote or temporary corporate branches (those who have no possibility of accessing over landlines). Due to the very nature of wireless communications, WWAN access offers the perfect complement to a branch’s landline access for backup services and load balancing as these are completely free from the problems that landline networks experience. WWAN backup services for landlines mean that communication availability in a company is literally doubled.

OVERVIEW

The Teldat H1+ has evolved from the Teldat H1/HSUPA model. It incorporates the latest generation high performance processor in a Hardware platform with a mechanical and electrical design similar to its predecessor, but which also has a much wider range of communication interfaces compared to the Teldat H1/HSUPA.

- **3.5G integrated** interface (7,2Mbps UL / 5,76Mbps DL). **Double SIM** tray supported (internal and external) and a double external antenna port for **Rx diversity**.
- 4-port **Fast-Ethernet** (10/100) **switch** and a Gigabit-Ethernet port (10/100/1000M, RJ-45 connector).
- The Gigabit-Ethernet port can be used as a WAN-Ethernet line (optional).
- Embedded **WLAN** IEEE 802.11b/g/n interface (MIMO, double port for external WiFi antennas), with professional security (IEEE 802.11i).
- **USB Host** 2.0 port, in which the most varied range of external USB/3G modems can be inserted.
- Local console port.
- External power supply (90-240Vac adaptor) or via Ethernet (PoE client integrated).
- Desktop format and ready for wall installation.
- Hardware encryption, optimizing transmission of encrypted traffic.

Integrated solution for Data and Voice convergency in Wireless-WAN access

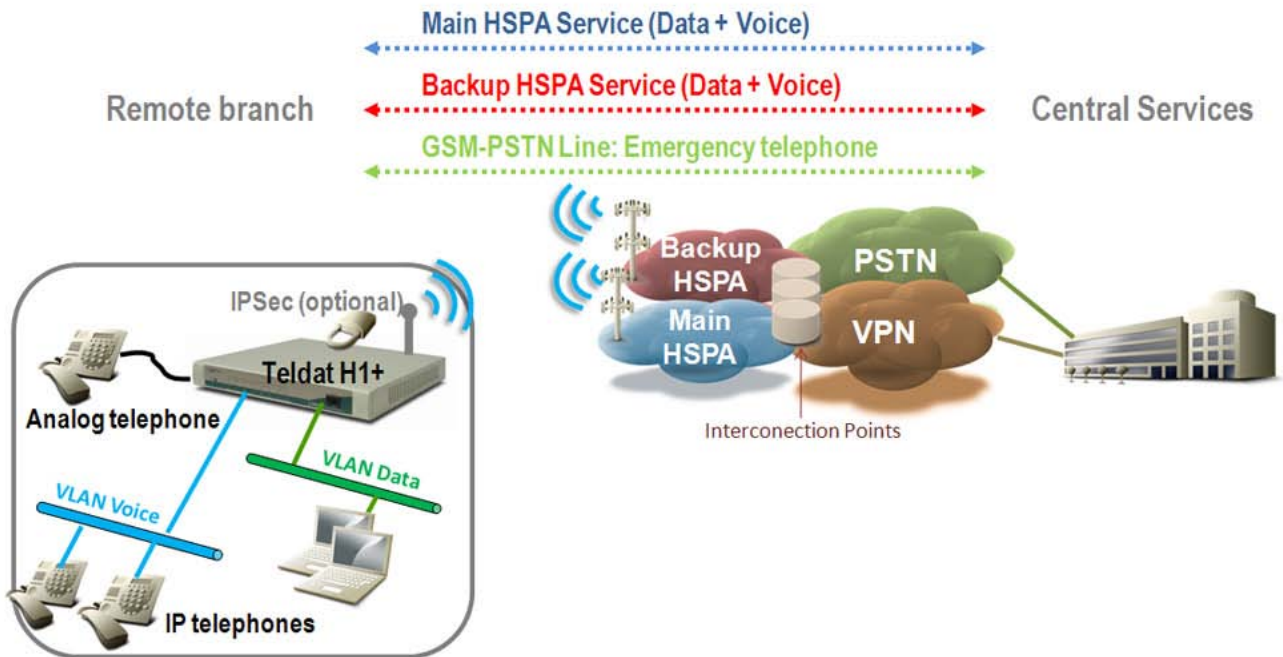


Figure 1. Wireless-WAN communications solution for Data and Voice with the Teldat H1+

As shown in Figure 1, the Teldat H1+ interconnects VoIP and Data applications from the Service Centers through a WWAN, either permanent or on demand. This can be backed up through the alternative WWAN access switching automatically either to its secondary SIM card or to an inserted USB/3G modem.

The ToIP/Universal-MediaGW license means that the Teldat H1+ delivers top quality IP Telephony services to the IP extensions (SIP telephones). Should the IP connection drop or suffer excessive degradation (unacceptable latency, jitter or error rate for real-time voice traffic) the Teldat H1+ router activates its GSM mobile telephony line supplying an emergency telephony service for the company. The router’s VoIP features are fully interoperable with Teldat’s Unified Communications and those from third parties (Alcatel, Aastra, Cisco, etc).

IP connectivity between the headquarters and the Central Services is fully transparent. The connectivity solution displayed in Figure 1 is fully compatible with any IP application deployed in the company.

With minimum performance impact, the device can transmit all or determined encrypted branch traffic flows, while maintaining maximum security levels in the communications. The router also has a “stateful” access list system (Firewalling based on states) and an Application Layer Gateway (ALG) function thus providing the maximum level of perimeter protection.

Teldat’s hierarchic QoS System (Teldat BRS) allows priority, modeling and independent labeling in each traffic flow (VoIP, Data with priority 1, Data with priority 2, etc.), so it is appropriately handled in the transport network, simplifying the service level policy definitions (SLA) which are adapted to each of the branch applications.

The Teldat H1+ has a command interface (CLI) fully adapted for professional use. Additionally the router possesses all the functions and features needed in the corporate sector for efficient, detailed and centralized management over the TeldaGES management platform.

Data and Voice WWAN backup through an autonomous device

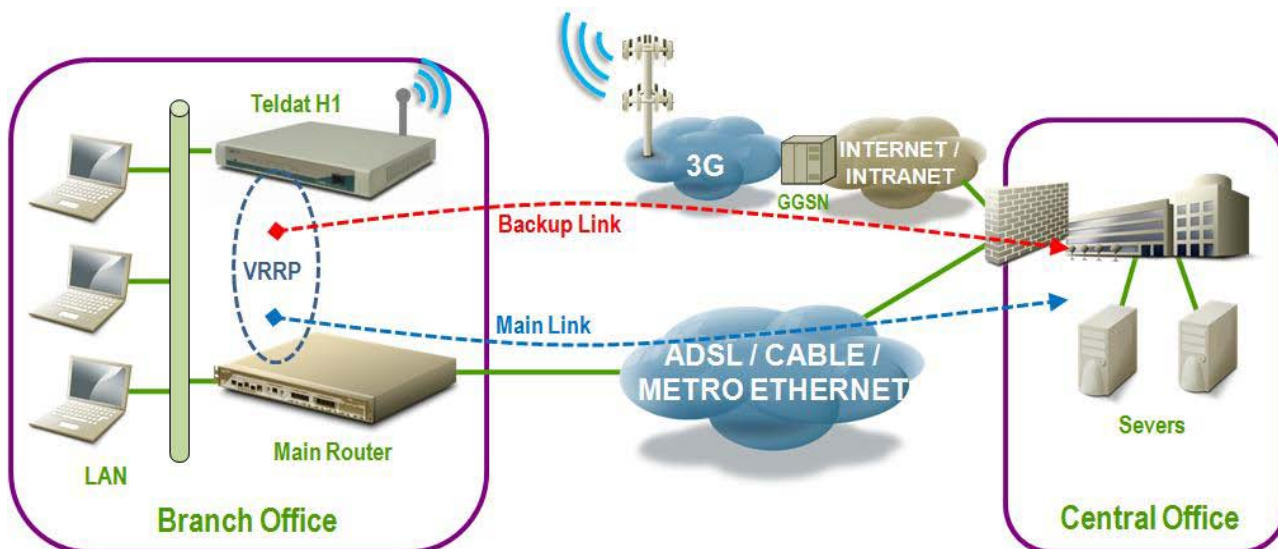


Figure 2. WWAN communications backup for Data and Voice using the Teldat H1+

Figure 2 shows the backup solution. The Teldat H1+ is integrated in a WAN access platform already residing in a corporate office backing up their communications through a WWAN VPN service.

The Teldat H1+ synchronizes with the main access router through TVRRP (a Teldat protocol that's 100% compatible with HSRP) or through standard VRRP. There is no need to reconfigure the applications in the branch as the Teldat H1+ provides these with a VPN access to the Central Services through its WWAN link should the ADSL router fail, or if problems are detected in the ADSL link (in cases where it fails completely or degradation is excessive).

Thanks to the Teldat H1+ ToIP/Universal-MediaGW license shown in the above application scenario, the Teldat H1+ not only supplies ToIP service to the branch IP telephones but also activates its GSM telephony line thus offering an emergency telephony service should the VoIP service drop or degrade over the ADSL line.

Corporate management features are fully supported (SNMPv1/2/3 fully parameterized complying with MIB-2 and Teldat's MIB, FTP, TFTP, RADIUS, Syslog, etc), simplifying seamless integration in the company's existing communications management platform.

KEY CHARACTERISTICS

■ Professional WWAN communications Service

- Embedded 3G interface, permanently monitored by the router's management motor.
- Fully managed router motor: Teldat 3G interface commands and the interface are integrated in the generic network management platforms (SNMP management through the 3G interface Teldat-MIB.)
- 3G interface fully integrated in the router's Internetworking protocol architecture (CIT features) thus providing high quality and efficient 3G/VPN services.
- Three backup options for the main 3G service: Through the secondary SIM card, the external USB/3G modem and by connecting to an alternative APN (double PDP context).
- Protected against malicious attacks on the SIM card (internal SIM tray).
- Improved 3G signal stability in areas with poor WWAN coverage: Two SMA ports for external 3G antennas (Rx Diversity).
- Passive WWAN monitoring mechanisms (unnecessary to transmit polling traffic): Thanks to the constant monitoring the router carries out over the signal coverage, the connection to the mobile network, the IP connection and the detailed monitoring of the branch traffic transmitted and received over the WWAN link, the router can accurately and dynamically detect incidences in device performance and take the appropriate actions (WWAN backup, trap reports, etc) minimizing the time the communications service is unavailable.
- Active WWAN monitoring mechanisms (polling traffic): The router is also capable of detecting excessive degradation in the WWAN service using established parameters (delay, jitter and error rate) in order to execute the appropriate actions.
- Advanced WWAN diagnostics: In addition to the instant diagnostics from the radio interface, the router can capture relevant WWAN parameters such as signal coverage, offering reports on this evolution over time either on the device console or in the Teldat central network management platform (TeldaGES).
- Audio GSM calls supported, simultaneously with 3G data transmission for emergency telephony services.
- AT commands interface to complement the Teldat 3G interface commands for low level embedded communications module customization (SIM lock/unlock, etc).

■ High performance WLAN module

- Embedded WLAN module (IEEE 802.11b/g/n) with double external antenna connector (2x2 MIMO), activated by license.
- Professional security (IEEE 802.11i/WPA-2).
- Configurable "Access-Point" and "Client" operation mode, either to reroute from the WiFi terminals to the mobile network (access to Internet or to corporate VPN, depending on the service specifications, operating as "Access-Point"), or to connect the router to the branch WiFi network to access certain applications in the branch ("Client" mode).

■ Secure Communications.

- Encryption processor incorporated; optimizes device performance in scenarios with IPSec tunnels.
- Fully parameterized IPSec Client/Server. Advanced IPSec features such as PKI encryption (Digital Certificates), extended authentication and Reverse-Route Injection guaranteeing compatibility with other commercial VPN solutions.
- Latest generation meshed topology VPN networks (Dynamic Multipoint VPN technology).
- IP filtering, MAC filtering and the SPI firewall protect the router from DoS attacks.

■ Corporate Services

- Border router for different dynamic routing domains (RIP, OSPF, BGP), administrative distance in IP routes, route filtering based on maps and policy-based routing (PBR) favor the implementation of corporate convergent services which combine Wireless WAN and landline access.
- Multi-HSRP and Multi-VRRP for network resilience and load balance applications
- Link quality monitoring through the Teldat NSM/NSLA system. Routing policy based on link quality (RTT, erroneous frame rate and UDP jitter).
- Teldat's hierarchic QoS system. Flexible application for flow priority, tagging and traffic classification means that efficient use is made of the network resources and an accurate definition of the service level agreements (SLAs).

■ WAN Ethernet Services

- Independent Gigabit-Ethernet 10/100/1000M port for connecting to WAN-Ethernet lines (requires a license).
- Full independent SNMP management per Ethernet port.
- High processing capacity for maximum performance for Ethernet transmission.
- Full VLAN support in the Gigabit-Ethernet port and Fast-Ethernet ports (trunking, filtering, QinQ, etc.)
- State of the art routing and bridging features.

- **Integrated VoIP solution. Universal VoIP MediaGW (currently being developed)**

- Call rerouting over the main VoIP link or through the GSM telephony line enabled in the router's 3G interface.
- Universal B2B-UA SIP Server, compatible with Teldat, Alcatel-Lucent, Aastra and Cisco Unified Communications and with survival functionality residing in the router itself (does not require IP terminals with survival).
- Service provided for up to 10 IP telephones in the branch.
- IP switchboard features (IP-PABX): Ring groups, hunt groups, capture groups, double dialing, local message recording, blind and attended transfers, etc.

- **Simple to install and deploy, suitable for massive deployments**

- Power through Ethernet (integrated PoE client): Removes the need for an external power source near the router.
- The box can be adapted for wall installation, which together with the Ethernet power means the router can be installed in the best 3G coverage position.
- Router configuration in a single text file (Teldat commands file), easily replicated.
- The Teldat H1+ routers can be configured with a personalized default configuration for the service.
- Graphic configurators can be implemented for installers/operators, and customized depending on the specific needs of each service implemented with the Teldat H1+.

- **Efficient communications management**

- Powerful Teldat command console, suitable for professionally managing the device.
- A Syslog client reports any events detected by the Teldat Events Logging System.
- SNMPv3 agent provides the ability to send traps and read MIB2 and Teldat-MIB depending on the defined management communities. The Teldat H1+ can easily be integrated in the existing network management platform.
- Network clock synchronization (NTP Client).
- Intuitive and efficient management of Teldat H1+ routers through the Teldat network management platform (TeldaGES).
- Telnet, SSH2, FTP, TFTP and RADIUS Client.

TECHNICAL SPECIFICATIONS

General

Interfaces and Connectors

1 x embedded interface HSPA/UMTS/EDGE/GPRS
Double SIM tray (internal & external)
Double connector for external 3.5G antenna (SMA connectors)
4 x 10/100M Fast Ethernet Switch, RJ-45F + 1 x 10/100/1000M
Interface Gigabit Ethernet, RJ-45F
Ethernet WAN 10/100/1000M Gigabit Ethernet, RJ-45F (requires
license)
1 x WLAN Interface with two external antenna ports (req. license)
1 x USB Host 2.0 interface for USB/3G for modems
1 x Console Port, RJ-45F
1 x Power switch

Embedded 3.5G interface: Features

Technologies	HSUPA, HSDPA, UMTS, EDGE, GPRS, GSM
Band freq. (MHz)	GSM/GPRS/EDGE: 850/900/1800/1900 MHz UMTS/HSDPA/HSUPA: - 850/1900/2100 MHz (Universal-DV version) - 900/2100 MHz (EU-DV version)
Rx diversity	Yes. Optimized for 800/850/1900/2100 MHz band frequencies
Data Services (PS)	<u>GPRS/EDGE class B</u> . Multislot Class 12 (CS1-4 & MCS1-9) <u>HSDPA Cat. 6/8/12</u> . Speeds: DL 3.6/7.2/1.8 Mbps, respectively <u>HSUPA Cat. 3/5/6</u> . Speeds: UL 1.45/2.0/5.76 Mbps, respectively

Automatic handover
Passive detection of WWAN network failure based on monitoring IP traffic in progress
Active detection of IP/WWAN service degradation, based on IP traffic poll (monitoring delay, jitter and packet error rate)
Real time monitoring on radio parameters
Local storing of radio statistics for WWAN service evolution reports on console
Automatic management of operating SIM tray, with multiple selection criteria:

- Signal level
- WWAN technology available in cell (EGPRS, WCDMA)
- Link quality (availability, latency, jitter, error rate)
- Based on time schedule

Dual PDP context (optional)
3G Firmware remote upgrading (FTP transfer)

Switch 4 x FastEthernet + 1 x Gigabit Ethernet

10/100/1000-BaseT automatic detection
Duplex/half 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 802.11b/g/n
Two detachable external antennas (SMA ports)

Console

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

Power options

AC external adapter: 90 – 240 Vac (by default)
DC external adapter: 18 – 75 Vdc (optional)

Consumption

11 watts

Environmental conditions

Operating temperature: -10°C to 45 °C
Relative humidity: 5% to 90%
Barometric pressure: 700 mbar to 1060 mbar

Dimensions and weight

Length x Width x Height: 220 x 220 x 32 mm
Approximate weight: 0.8 Kg

Protocols and features

IP Protocol

IP, ARP, Proxy ARP
Static IP Routing, RIP I, RIP II, OSPFv2, BGP-4 & Policy Routing
BFD Protocol
Compatible with HSRP
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*
DHCP client, server & relay
DNS client & proxy. DNS cache. Dynamic upgrades in DNS (RFC 2136)
SNAT/DNAT/NAPT. Visible subnets, Port Mapping
PAT fire-walling
Multiple addresses per interface
Loopback interfaces

Protocols PPP & PPPoE

PPP (RFC 1661), PAP/CHAP, IPCP
Multilink PPP
Multi-Class Extension a Multi-Link PPP (RFC 2686)
PPPoEoE, PPPoE Bridge + routing (PPPoE pass-through)
Multilink PPP over PPPoE
Renegotiation based on PADT

Quality of service (QoS)

Packet labeling (DiffServ) depending on the interface, subinterface, protocol, port and MAC and size
Congestion control: FIFO, queuing priority, BRS proprietary system, WFQ
Low Latency Queuing (LLQ)
Traffic Shaping: proprietior (over BRS), ATM traffic shaping, Frame Relay traffic shaping
Fragmentation in FR (FRF.12), PPP & MPPP

Data compression

X.25 & PPP compression
IPHC compression
Van Jacobson & STA LZS compression algorithms

Wireless LAN specific features

Selectable transmission power
Automatically selected speed
802.11i, WPA, WPA2
EAP, EAPOL
Authentication (open, shared, WPA)
Encryption (AES, TKIP, WEP)
ESSID
MAC Filtering
Quality of Service (QoS) AIFS, CWmin, CWmax

Security and VPNs

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
TED Protocol
IPSec PMTU Discovery
GRE & multi-GRE encryption. GRE RC4
NHRP Protocol
Dynamic Multipoint IPSec VPNs (DMVPN)
Gateway Encryption Transport VPN (GET VPN - GDOI) RFC 3547
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

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")*
Source Routing, MAC filtering & NetBIOS

Management

Command line interface on console, telnet & SSH
SNMP: MIB-2, Teldat-MIB
Events Logging System
Netflow V5 and V9
Syslog Client
NTP protocol
DynDNS Client
FTP & TFTP Software, BIOS & configuration upgrading
Internal Protocol Analyzer, compatible with Ethereal /WireShark
Default configuration reset knob
Radius Accounting (RFC 2139)
Integrated in Teldages (Teldat professional management platform)

* Under development

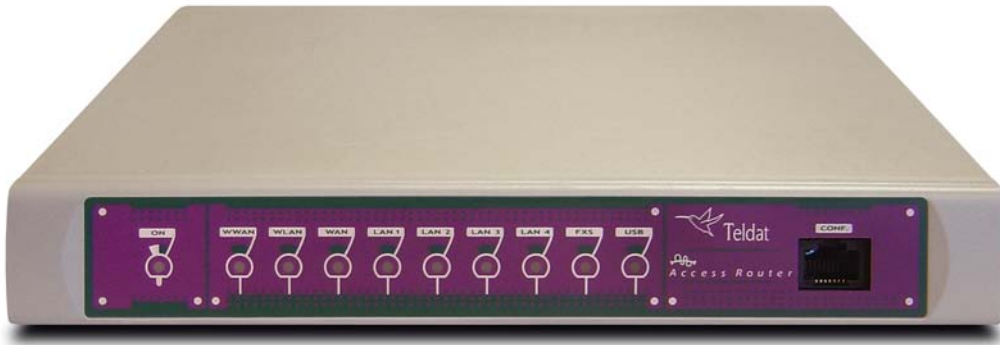


Figure 3: Teldat H1+ router: Front panel



Figure 4: Teldat H1+ router: Rear panel

ORDERING INFORMATION

Part No.	Product Description
Teldat H1+ Routers	
RPHPH001	TELDAT H1+: 1 HSUPA 900/2100MHZ + SWITCH 1GE + 4FE + WIFI(OPC) + USB(OPC) + METRO ETH(OPC)
RPHPH002	TELDAT H1+: 1 HSUPA 850/1900/2100MHZ + SW. 1GE + 4FE + WIFI(OPC) + USB (OPC) + METRO ETH(OPC)
Software for H1+ routers	
RPHPS001-REC	TELDAT H1+/H1+GE APPLICATION SOFTWARE. INCLUDES SNA, IPSEC AND TOIP
RPHPS001-NF	TELDAT H1+/H1+GE APPLICATION SOFTWARE. INCLUDES SNA, IPSEC AND TOIP
Licenses	
RPHPSGE1	METRO ETHERNET ACTIVATION LICENSE FOR TELDAT H1+
RPHPSUSB	USB ACTIVATION LICENSE FOR 3G LINK FOR TELDAT H1+
RPHPSWIF	WIFI 802.11 B/G/N ACTIVATION LICENSE FOR TELDAT H1+

3G Antennas

RWTHAAM1	3G MULTI-BAND 900-1800-2100 DIPOLE ANTENNA 90 DEGREES MOUNT
RWTHAAM2	3G MULTI-BAND 900-1800-2100 DIPOLE ANTENNA MAGNETIC BASE, 1.5M CABLE
RWTHAAM3	3G MULTI-BAND 900-1800-2100 ANTENNA, CEILING MOUNT
RWTHAAM5	3G MULTI-BAND 900-1800-2100 ANTENNA FOR OUTDOOR WALL MOUNT, 5M CABLE
RWTHAAM6	3G MULTI-BAND 900-1800-2100 ANTENNA FOR OUTDOOR WALL MOUNT, 10M CABLE
RWTHAAM7	3G MULTI-BAND 900-1800-1900-2100 ANTENNA FOR PRE-DRILLED OUTDOOR SURFACE, 2,5M CABLE, SMA CONNECTOR
RWTHAEM1	EXTENSION BASE FOR 3G MULTI-BAND 900-1800-2100 ANTENNA, SMA CONNECTOR

3G Cables

RCATAAC1	LMR400 LOW LOSS COAXIAL CABLE, SMA CONNECTOR, 6M
RCATAAC2	LMR400 LOW LOSS COAXIAL CABLE, SMA CONNECTOR, 15M
RCATAAC3	RF-7MM LOW LOSS COAXIAL CABLE, SMA CONNECTOR, 10M
RCATAAC4	ONE METER PIGTAIL CABLE FOR ANTENNAS (SMA CONNECTOR)

TEL DAT DOCUMENTATION

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