



Customer Interface Publication: CIP025

KCOM GROUP PLC IPLINE ACCESS SERVICE DESCRIPTION AND TECHNICAL CHARACTERISTICS

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The information in this document is provided in accordance with the requirements of the Radio Equipment and Telecommunications Terminal Equipment Regulations 2000 (Statutory Instrument 2000 No. 730) to publish (in accordance with the EC Radio and Telecommunications Terminal Equipment Directive 99/05/EC) technical characteristics of interfaces to the public fixed telephone network.

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CONTENTS

1. INTRODUCTION	3
2. SERVICE DESCRIPTION	4
3. INTERFACES	5
Service Provider/Server Access Interface	5
4. SERVICE DATA RATES	6
5. ATM LAYER ASPECTS	6
PVC	6
Traffic Shaping	6
6. IP SERVICE FEATURES	7
Transport	7
RADIUS	7
IP Addresses	8
Domain Names	8
7. POSSIBLE END USER TERMINAL EQUIPMENT	8
8. SAFETY & EMC INFORMATION	9
Safety	9
EMC	9
9. CUSTOMER BASE	9
10. AVAILABILITY	9
11. INTERCONNECTION ARRANGEMENTS	10
12. GLOSSARY	11
13. REFERENCES	12
14. HISTORY	13

1. INTRODUCTION

Kingston Communications, the Consumer Business and Internet Services division of KCOM Group PLC, provides the IPLine broadband IP network infrastructure service to Electronic Communication Service Providers (ECSPs), enabling delivery of their IP services between the Service Platform and the service specific equipment in a customer premise over single copper analogue lines. The network is capable of delivering high speed Internet services.

This document sets out the scope and detail of the network access service. This service will only be delivered on a single KCOM provided PSTN line.

Changes to the technical architecture and network interfaces that affect the correct working of the service will be published by KCOM Group PLC in documents made available from the address below. If the changes impact on this document then it will be updated.

Enquiries relating to the technical content of this document and the availability of other publications should be directed to:

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2. SERVICE DESCRIPTION

The service is shown in concept form below in Figure 1. There are 2 fundamental access interfaces available to the ECSP; an Ethernet interface to the SP Head End and a customer delivery End User access interface (ADSL).

The network equipment employed by KCOM provides services for multiple ECSPs. Dynamic ECSP selection is enabled through multiple context management within the Broadband Remote Access Server.

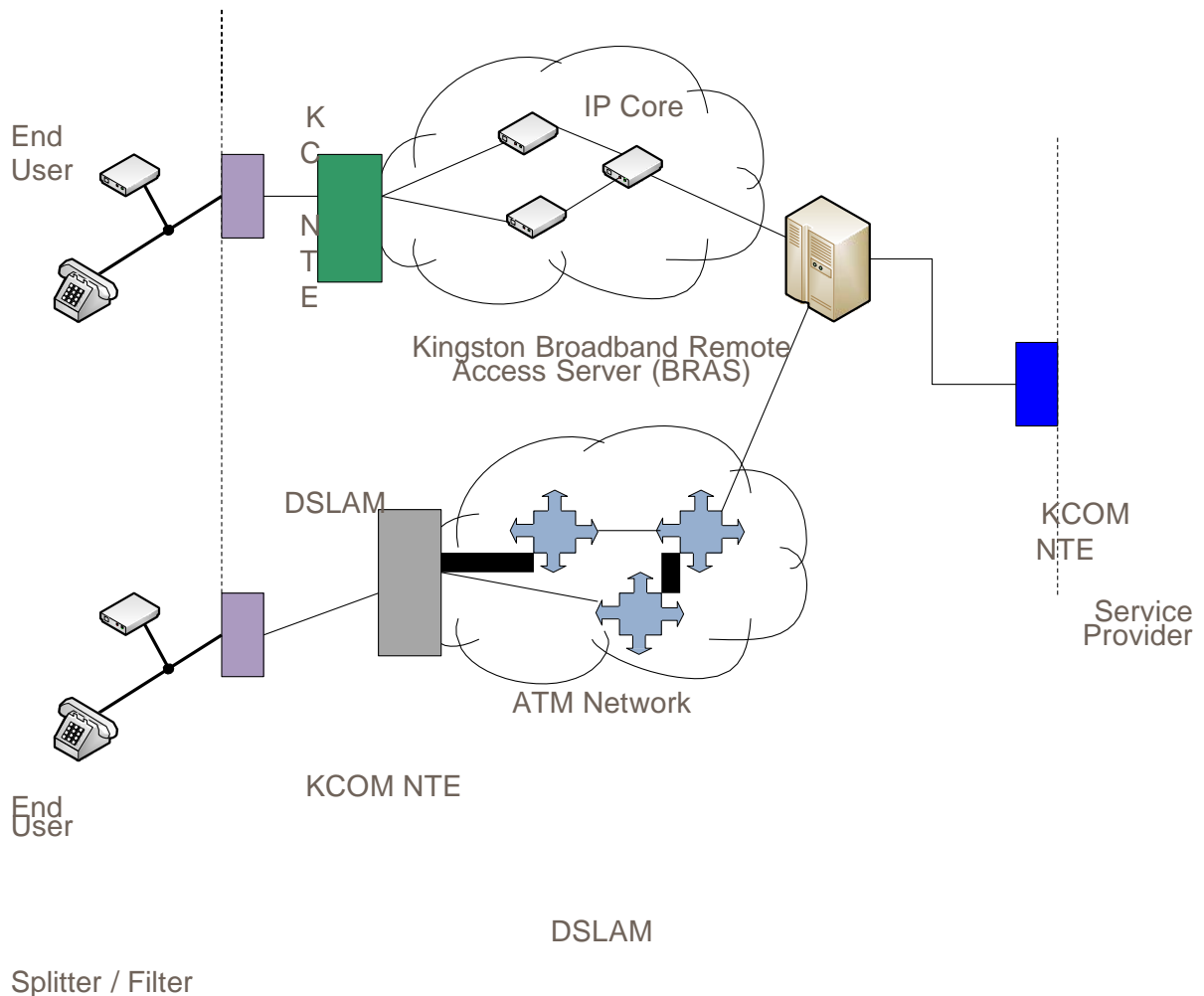


Figure 1

The service connections are terminated by Network Termination Equipment (NTE) installed on the customer and End User premises. The Network Termination Point (NTP) is the customer/end user side of the NTE.

The ADSL service operates in the frequency spectrum above the standard PSTN service and so both services can operate simultaneously. However, the ADSL element of the service is subject to bit-rate and distance limitations.

3. INTERFACES

Service Provider/Server Access Interface and Data Rates

The following ECSP Customer Access interfaces are available: 10Mbps and 100Mbps.

The interface is located on an NTE.sited on the customer premises. The NTP is a port on the KCOM Group PLC equipment presented as an RJ45 socket[1]. The NTE will be wall mounted or an alternative mounting such as in customer racking may be agreed. The NTE will require customer supplied 240vac (Nominal 5A) supply to be available within 3m of the NTE location. Connection between the NTP and the customer equipment is the responsibility of the customer.

The Ethernet interface characteristics are in accordance with the KCOM Customer Interface Publication KCH CIP 016 [2](available from http://www.kcom.com/regulatory/access_info.shtml). Other interfaces may be available by negotiation.

The IP is presented according to the following IETF specifications

RFC 791[3]	IETF document : Internet Protocol DARPA Internet Program Protocol Specification
RFC 826[4]	IETF document : An Ethernet Address Resolution Protocol -- or -- Converting Network Protocol Addresses to 48.bit Ethernet Address for Transmission on Ethernet Hardware
RFC 1042[5]	IETF document : A Standard for the Transmission of IP Datagrams over IEEE 802 Networks

Connection to the interfaces is the responsibility of the ECSP. End User Access Interface

The EU interface is presented either via an integral splitter or as a "wires only" service.

Integral Splitter Presentation

The ADSL interface is presented via an RJ 11 socket with the following pin connections:

Pin	Signal
1	Not
2	Not
3	ADSL
4	ADSL
5	Not
6	Not

The RJ 11 socket will be provided as part of a replacement telephone line box master socket which will include the standard telephone socket, ADSL RJ 11 socket and integral splitter circuit which separates the ADSL signals from the analogue PSTN telephony signals. The physical plug for connection should conform to ETS 300 001 § 8.2 (GB) [6]

The characteristics of the KCOM Group PLC installed NTE incorporating a line filter are given in paragraphs 3 and 4 of KCH CIP021 Technical Characteristics of the ADSL Interface [7].

Connection to the end user access interface is the responsibility of the SP

Wires Only

The End User NTP may be a wires only service. The detail of the "wires only" standard NTP is given in paragraph 2 of KCH CIP001 [8] Technical characteristics of the Single Analogue Line Interface.

For the protection of the telephony service, a filter conforming to or exceeding the requirements of the line filter described in KCH CIP021 [7] must be employed by the End User.

Connection to the end user access interface is the responsibility of the ECSP

4. SERVICE DATA RATES

Service is provided to the EU over DSL technology conforming to the KCOM Customer Interface

Publication KCH CIP021 [7], Technical Characteristics of the ADSL interface, Paragraph 5.

Service data rate prediction based on Post Code will be made available to the ECSP.

Residential and business services are available only on lines where the appropriate KCOM Group PLC PSTN service is also provided.

The broadband network path is shared and so the service will be contended to the maxima determined by the SP. Lower service data rates may on occasion result due to deployment conditions such as fault related congestion within the KCOM Group PLC network, and, as noted above, the nature of ADSL technology which is subject to distance limitations. KCOM will take all reasonable steps to minimize such occurrences.

5. ATM LAYER ASPECTS

PVC

The service provides a single ATM PVC between the SP and the EU and the Broadband Remote Access Server for ATM connected DSLAMs. These are under phased replacement for IP connected DSLAMs. All new supply will be on this technology where available. For these, the ATM PVC is between the End User modem and the DSLAM. The end user interface will be presented with a VP with VPI1. The data channel within the VP is presented to the end user on VCI 50.

Traffic Shaping

Traffic shaping is applied to downstream traffic and the end user modem must shape the upstream traffic to ensure effective service operation. The requirements for this are set out in KCH CIP021.[7].

6. IP SERVICE FEATURES

Transport

IP is transported from SP to end user via PPPoA using LLC/SNAP as defined in RFC 2364 [9] or via PPPoE using LLC/SNAP as defined in RFC 2364 and RFC 2516 [10].

The KCOM EYD BRAS can provide both LAC & LNS functionality. In this case, the PPP session is terminated on the KCOM EYD BRAS. Should the ECSP require the PPP session to be terminated on their own LNS, the KCOM EYD BRAS can act solely as a LAC, using L2TP pass-through via the LAN SP access interface.

RADIUS

RADIUS (Remote Authentication Dial In User Service) servers must be provided, configured and managed by the SP. RADIUS servers must comply with relevant IETF standards for interconnection purposes.

RADIUS information is presented to the SP via the LAN SP access interface over PPPoE. RADIUS attribute support is in accordance with IETF documents RFC 2865 [11], RFC 2866 [12] (formerly RFC 2138 & 2139). The ECSP RADIUS servers must comply with these standards in order to successfully interconnect.

The ECSP must provide details of RADIUS host IP addresses (and back-up where applicable), Authentication and Accounting server UDP ports and shared secrets.

It is recommended that the ECSP has a back-up RADIUS server so that forwarded access request packets are dealt with. Failure to do so will mean that calls associated with incoming EU authentication requests will be disconnected in the event of a lack of response by the primary server. If a back-up server is successfully accessed then this will be used for future requests for a configurable period.

The access-request packet attributes that will be forwarded to the ECSP are:

Number	Attribute
1	User-name
2	User's PAP password
3	User's CHAP-Password
4	NAS-IP address
5	NAS-Port

The access-accept response must include the following attributes:

Number	Attribute
6	Service-type ("Framed")
7	Framed-Protocol ("PPP")
8	Framed-IP-Address

Refer to IETF document RFC 2865 [11] for a more detailed description of the attributes.

ECSPs requiring specific attribute configuration, or intending to use non-standard RADIUS attributes, must discuss these requirements with KCOM prior to service connection in order to avoid the potential for unexpected operation or service denial.

IP Addresses

IP addresses can be assigned dynamically, statically or consistently to the end user. These addresses must be supplied by the ECSP from their RADIUS servers. Dynamic IP addresses can be hosted by KCOM if required. IP address requirements should be discussed with KCOM prior to service connection.

Domain Names

Several domain name options are available subject to negotiation.

7. POSSIBLE END USER TERMINAL EQUIPMENT

The minimum recommended terminal equipment performance specification is: ITU-T

G.992.1 Annex G [13]

For lines capable of service at ITU-T G.992.5 Annex A [14], terminal equipment must be capable of operation to this specification or optimal stable service delivery rates may not be achieved.

An example of typical end user terminal equipment to enable successful inter-working with the service is an ITU-T G.992.1/ANSI T1.413 compliant ADSL ATU-R modem with a USB interface connected to a personal computer (PC). In this case, the combined PC and CPE must be able to:

establish a PPP session in accordance with RFC 1661 [15]. support PPPoA or PPPoE as defined in section 5 above support Challenge Handshake Authentication Protocol (CHAP) in accordance with RFC 1994 [16]

obtain an IP address use ATM VPI/VCI 1/50 for data transmission/reception carry out upstream traffic shaping to the ATM rate

KCOM are not responsible for the provision or operation of any end user equipment, PC operating systems, drivers and any associated software.

8. SAFETY & EMC INFORMATION

Safety

Where the ECSP Customer Interface is presented in optical presentation this is classified as a class 1 laser product as defined in the laser safety product standards BS EN 60825-1/2 [17].

The 10/100Mbps interfaces are classified as unexposed as defined in CENELEC Reports/ETSI Guide ROBT-002/EG 201 212.[18]

EMC

The network equipment and network terminating equipment related to the provision of the interface comply with the current EMC regulations.

Whilst predominantly intended to be installed in commercial and light industrial environments, this does not preclude the Customer Interface or End User NTEs being installed in other environments e.g. industrial.

9. CUSTOMER BASE

The initial target customer base is intended to be providers of broadband Internet. The KCOM Broadband platform is capable of offering services to ECSPs wishing to provide service to all residential telephony customers and businesses that are served by copper local loop cable. For avoidance of doubt, service will not be provided on Centrex or PABX Group exchange lines.

10. AVAILABILITY

The service will only be available within the area covered by the KCOM PTO licence granted in 1987¹ or as otherwise specifically agreed with the Customer. All ADSL delivery is subject to the caveat over distance related restrictions of service as mentioned above.

¹ Licences granted by the Secretary of State for Trade and Industry to Kingston upon Hull City Council and KCOM Group PLC (formerly Kingston Communications (HULL) PLC) under section 7 of the Telecommunications Act 1984, granted on 30th November 1987

11. INTERCONNECTION ARRANGEMENTS

Interconnect with other networks is not part of this service.

12. GLOSSARY

This Glossary includes terms used in this document.

ADSL	Asymmetric Digital Subscriber Line
ATM	Asynchronous Transfer Mode
ATU-R	ADSL Terminal Unit – Remote
DSLAM	Digital Subscriber Lines Access Multiplexor
ECSP	Electronic Communications Service Provider
EU	End User
IETF	Internet Engineering Task Force
IP	Internet Protocol
ISP	Internet Service Provider
ITU-T	International Telecommunications Union – Telecom Standardisation
KCH	KCOM Group PLC, formerly Kingston Communications (UK) PLC
KC	Kingston Communications: the Consumer Business and Internet
L2TP	Layer 2 Tunneling Protocol
LLC	Logical Link Control
NTE	Network Terminating Equipment
NTP	Network Termination Point
PABX	Private Automatic Branch Exchange
PC	Personal Computer
PPPoA	Point to Point Protocol over ATM AAL5 (RFC 2364)
PSTN	Public Switched Telephone Network
PTO	Public Telecommunications Operator
PVC	Permanent Virtual Circuit
RFC	Request For Comment – IETF Publications
RJ11	Registered Jack Type 11
SNAP	SubNetwork Attachment Point
SPN	Service Provider Network
UBR	(ATM) Unspecified Bit Rate
UNI	(ATM) User Network interface
VCI	(ATM) Virtual Channel Identifier
VC Mux	Virtual Channel Multiplexing
VPI	(ATM) Virtual Path Identifier

13. REFERENCES

- | | | | |
|------|------------------------|---|-----------------|
| [1] | IEEE 802.3 | Information technology—Telecommunications and information exchange between systems—Local and metropolitan area networks—Specific requirements— Part 3: Carrier sense multiple access with collision detection (CSMA/CD) access method and physical layer specifications | 1988 |
| [2] | KCH CIP 016 | Technical Characteristics of the 10Mbit/s and 100Mbit/s digital leased line | |
| [3] | RFC 791 | Internet Protocol DARPA Internet Program Protocol | |
| [4] | RFC 826 | An Ethernet Address Resolution Protocol -- or -- Converting Network Protocol Addresses to 48.bit Ethernet Address for Transmission on Ethernet Hardware | |
| [5] | RFC 1042 | A Standard for the Transmission of IP Datagrams | |
| [6] | ETS 300 001 § 8.2 (GB) | Attachments to Public Switched Telephone Network (PSTN); general requirements for equipment connected to an analogue subscriber interface in the PSTN | 1997 |
| [7] | KCH CIP 021 | Technical Characteristics of the ADSL Interface | |
| [8] | KCH CIP 001 | Technical characteristics of the Single Analogue Line | |
| [9] | RFC 2364 | PPP Over AAL5 | |
| [10] | RFC 2516 | A Method for Transmitting PPP Over Ethernet (PPPoE) | |
| [11] | RFC 2865 | Remote Authentication Dial In User Service (RADIUS) | |
| [12] | RFC 2866 | RADIUS Accounting | |
| [13] | ITU-T G.992.1 Annex G | Top of Form Asymmetric digital subscriber line (ADSL) transceivers | 02/07/1999
9 |
| [14] | ITU-T G.992.5 Annex A | Bottom of Form Asymmetric digital subscriber line (ADSL) transceivers – Extended bandwidth ADSL2 (ADSL2plus) | Jan-09 |

[15] RFC 1661 IETF: The Point-to-Point Protocol (PPP)

[16] RFC 1994 IETF: PPP Challenge Handshake Authentication Protocol (CHAP)

BS EN 60825-1/2 Safety of laser products – Part 1: Equipment classification and requirements 2007

[18] ROBT-002/EG Electrical Safety ; Classification of interfaces for equipment to be connected to telecommunications networks 1998
201 212

Reference [1] may be obtained through <http://www.ieee802.org/>

References [13] and [14] may be obtained from: <http://www.itu.int/>

References [2],[7] and [8] may be found at:
http://www.kcom.com/regulatory/access_info.shtml

References [6] and [18] may be found at:
<http://www.etsi.org/WebSite/Standards/Standard.aspx>

References [3], [4], [5], [9], [10], [11], [12], [15] and [16] may be found at:
<http://www.ietf.org/rfc.html> Reference 17 may be obtained through
<http://www.standardsuk.com/>

14. HISTORY

Date	Issue	Comments	Author
8 Nov 2005	1.0		M. D.
August 2007	1.1	Company name change to KCOM Group PLC	M. D. Crowther
March 2008	1.2	Change of End User Data Rates and minor text changes	M.D. Crowther....
November 2010	2.0	Change to DSL technologies and further minor text changes.	M. D. Crowther
April 2016	2.1	Company name change from KC to KCOM and document formatting changes	Amanda Woodard