

OVERVIEW

Hughes Electronics Ltd. is a primary supplier of passive interface and wiring solutions to the UK communications industry. Established in 1988 to bring innovative connectivity solutions to an infant Data Networking Industry, Hughes have evolved to become a centre of excellence in seamless passive communication channel design and a world class market leader in **Passive Intermodulation (P.I.M)**. The Hughes ambition is to become the reference point for seamless P.I.M cross media connection and integration.



OUR CORE COMPETENCIES

Include extensive expertise in the physical and electronic characteristics of passive communication channels, these core competencies provide a business stream that combines a full design, manufacturing and interface supply capability including research, development and rapid prototyping with rapid response manufacturing and turnkey integration services.



Hughes also supply a full range of standard wiring systems and interface solutions from standard **coaxial, Unshielded twisted pair (UTP) Shielded twisted pair (STP) and Shielded, foil shielded pairs (SFTP) Telecom and Data cables and connectors**, through to **cross media baluns, powersplitters** and performance demanding products deployed in the most bandwidth hungry terrestrial and satellite communication applications.

We are currently involved in cutting edge research and development of a more sustainable energy and communications superstructure “e.power” and continue our research into noise elimination in multi pair connectors.

OUR TALENT

Often passive transmission channels were designed many years ago. Simply by reviewing your channel and applying the latest technology Hughes Electronics can improve P.I.M, providing you with better performance and cost efficiency.

HUGHES DESIGN, MANUFACTURE AND SUPPLY

- Cables,
- Connectors,
- Pre terminated channels, cross connects & Kits
- Cross media baluns
- Power Splitters
- Passive communication channels
- Turnkey integration

AT HUGHES ELECTRONICS

WE:

provide **expert advice**, we can help in achieving maximum value from your product and budget or help in the design and manufacture of a whole new connectivity system - **if you can imagine it we can create it.**

HUGHES PROVIDE PRODUCTS AND SERVICES TO:

- Telcos
- Voice and Data Integrators
- System Manufacturers
- Civil Engineers
- I.T. companies
- Data Centres
- Local Government
- Satellite communications

OUR TEAM

Our business puts a glittering array of talented technicians and professionals at your disposal including expert engineers who provide you with a wide variety of design and production skillsets within minutes of your call to keep you downtime to a minimum.

Our Head Office and local manufacturing is located on the Southside of Southwark Bridge, only 5 minutes walking distance from the City of London providing unparalleled rapid response support to our nations largest networks and communications infrastructure.

Our Hughes Ningbo office based in the Shanghai area of China harnesses the best and most cost effective infrastructure and talent for large volume manufacturing.



Our quality control staff are consummate professionals with total commitment to a Zero defect policy and our quality manuals and procedures go well beyond those required by ISO and other standards bodies.

Our sales personnel are the most technically experienced in the industry, the keyword for all is 'Listen'. Listening to our clients and responding quickly to their requirements for virtually any communication need has ensured that our product profile remains innovative and

our customers remain leaders in their field.

HUGHES PHILOSOPHY

Glyn Hughes our founder and CEO of Hughes Electronics was born in a small mining village in South Yorkshire.

The People of South Yorkshire are well known for their honest and gritty, down to earth approach. The harsh Industrial environment has made South Yorkshire people adept at creating something out of nothing, and taking care of each other.

These are the qualities and principles that Hughes Electronics have built upon and take great pride in.

We have the ability to redefine connection devices on reasonable budgets to best meet the needs of the intended application, we operate a seamless supply chain and we take care of our clients and suppliers just like our own family.

SUSTAINABILITY

Our company strives to create a supply chain of partners who share our vision of giving back to our planet some of the resources we humans have availed ourselves of.

In addition to our commitment of developing more environmentally sustainable products Hughes Electronics are continually working to improve our working practices in regard to the protection of our ecology.



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Data

Structured wiring is the integration of different connectivity systems into one wiring system or network.

Hughes Electronics' UTP/FTP, FIBRE and COAXIAL systems exceed all the generic performance standards for their types and can be seamlessly integrated into Lans and Wans to provide flexible connectivity performance, environmental and cost requirements.

Hughes Electronics offer our customers a design and installation service.

Our robust modular systems are designed to provide excellence in functionality and performance.

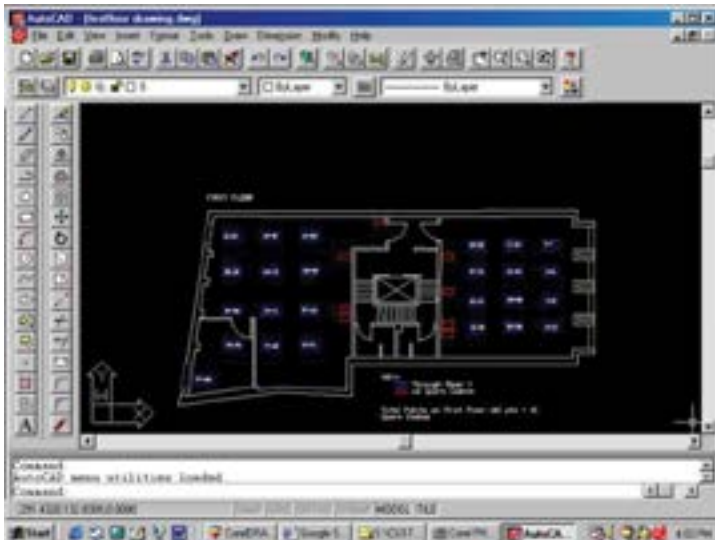


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Data

System Design & Warranty

Hughes Electronics offer our customers an installation design service and every system installed by an accredited installer is backed by our 15 year performance warranty.



PLEASE CALL OUR SALES TEAM
ON 020 7378 1400
For FURTHER INFORMATION



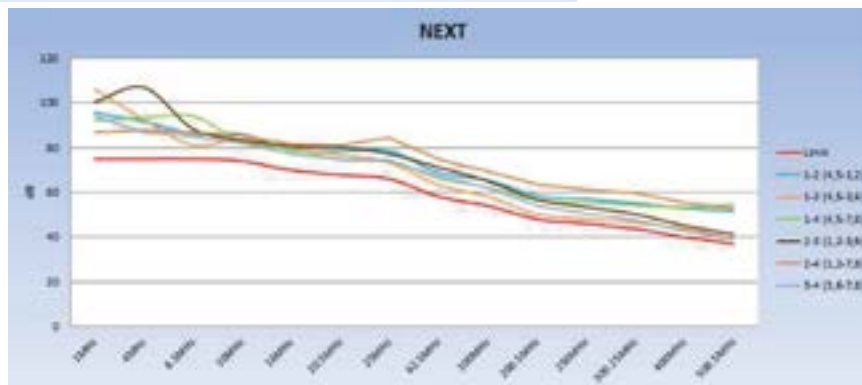
CAT6A Connecting Hardware

Key to the superior performance of our products is a unique offset contact array designed into the mating face of our 8 pole connectors, and solderless PCB technology. These key features improve NEXT (near end crosstalk) and FEXT (far end crosstalk) performance and when combined with Hughes high signal to noise ratio PCB design, provides superlative performance.

Products are tested and approved at component level, please take a moment to review a summary of the performance statistics of our Cat 6a guaranteed hardware;

CAT6a Connecting Hardware Performance Test

Equipment; RHODE&SCHWARZ ZVB 8 Vector Network Analyser
Swept frequency 1 MHz to 601 MHz



SFTP CAT6A Jack & Panels

The Hughes Swift-Term is a fully shielded re-usable toolless Keystone Jack that provides a high performance, simple, reliable speedy termination suitable for LAN cables up to Cat 6a. Simply strip the oversheath, position the pairs according to the colour coded guide, snap shut and the termination provides a retention force of 50 newtons (11lbf) – nothing could be simpler or more time efficient.



- **Component level compliant to TIA/EIA 568c2 and ISO 11801 ed.2c**
- **Sturdy Zinc-alloy construction**
- **Cat 6a component level compliant**
- **Simple, fast and reliable termination every time**
- **Re-usable (750 cycles minimum)**
- **Also available in Cat 6 and Cat 5e variants**
- **Full instructions provided**

SFTP CAT6A Jack & Panels

Hughes Ref.	Description
39-773635953	CAT6A Keystone Jack 180 degree
37-151242111	24 port CAT6A Keystone Patch Panel



Hughes Panels can be used as standard Patch panels or Coupler panels.

SFTP CAT6A Couplers

Our CAT6a super couplers deploy all Hughes Electronics design and development technology bringing superior class performance that can be deployed with confidence in patch panels and transition point applications within the permanent link or telecoms closet.

Robust stainless steel case design delivers outstanding internal and alien crosstalk parameters with a minimum mating cycle of 750 times at a retention force of 11lbf minimum.

- ***P.O.E. compliant***
- ***FCC part 68.5***
- ***ANSI/TIA-568-B.2-1.-10channel compliant***
- ***Subpart F compliant***
- ***ISO/IEC 11801 Class EA channel compliant***
- ***UL1893***



SFTP CAT6A Couplers & Cables

Hughes Ref.	Description
39-763435952	CAT6A In Line Coupler
39-763635952	CAT6A Panel Mount Coupler
37-151248111	24 port CAT6A Coupler Panel
23-43221A2	CAT6A Solid Cable LSOH
23-3321122	CAT6A Stranded Cable LSOH*



*Available in red, green, grey, orange, yellow and violet

SFTP CAT6A Cables

Designed to prevent alien cross talk and provide immunity to external emissions in addition to cross coupling of pairs, the unique lay-up and pitching of the pairs provides outstanding component-level plus performance.

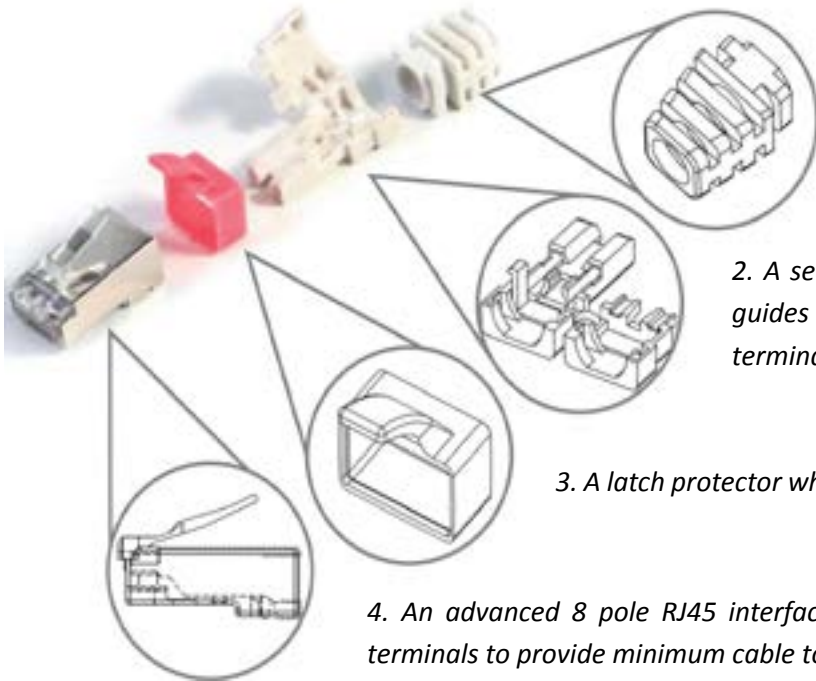
- ***TIA/EIA 567c2 and ISO 11801 ed.2 compliant***
- ***Suitable for 10gBase-T (10 gigabit applications)***
- ***Individual and overall A/poly foil shields***
- ***LSOH sheath (I.E.C. 60322-1 compliant)***
- ***Supports P.O.E. (Power Over Ethernet)***



A copy of full Test reports can be obtained from www.hugheselectronics.co.uk/Cat6aCable

SFTP CAT6A Plug and Boots

Hughes Electronics Cat 6a copper alloy shielded plugs are ergonomically designed to provide the absolute ultimate in performance. Successful Cat 6a terminations are guaranteed with our unique four part design.



1. A strain relief boot designed to ensure critical bending radii are not exceeded.

2. A second strain relief boot with integral channel guides that separates the four pairs prior to termination.

3. A latch protector which safeguards the RJ45 latching mechanism.

4. An advanced 8 pole RJ45 interface with enhanced performance copper alloy terminals to provide minimum cable to plug pulling torsions of 20lbs.

- **Insulation resistance of 1M ohm and termination resistance of only 200M ohm.**
- **Suitable for UL applications up to 250 volts AC@2 amperes.**
- **Minimum 200 mating cycles.**
- **The cutting edge design technology takes RJ45 plug connectivity to the next level.**



SFTP CAT6A Plug and Boots

Hughes Ref.	Description
39-33225652	CAT6A RJ45 4 piece plug for Stranded Cable
39-33225552	CAT6A RJ45 2 piece plug for Solid Cable
07-3D03303441	CAT6A RJ45 Boots *

* Available in Red, Green, Blue, Grey, Yellow, Black and Violet



Cat6a Pre-terminated Leads

Hughes Electronics make your Cat 6a installation child's play - simply give us your required lengths and termination preferences (eg jack to jack or jack to patch panel) and we will do the rest – a guaranteed installation in a box* delivered direct to your site. Our pre-terminated horizontal cables are factory tested and guaranteed to meet permanent link TIA.EIA 568c2 and ISO 11801 ed.2 standards criteria with 3db headroom.

Cat6a Cross-connects

Hughes guaranteed cross connect cables are designed for the desktop coalition unit industry where cross connects from permanent link transition points to the desktop or simple closet based cross connects are necessary.

Constructed from Hughes High performance LAN products the factory configured cross connects come packaged with Fluke 1800 linkware certification and Hughes guarantee of performance*

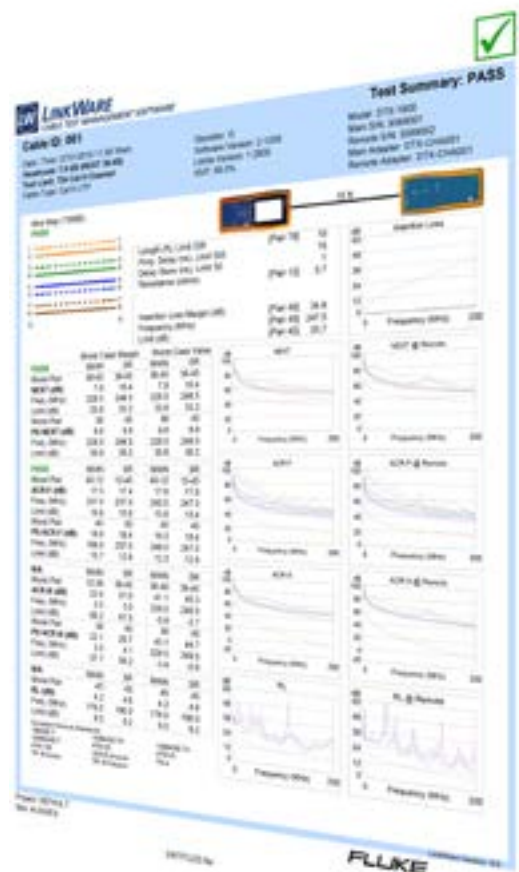
*cross connects must be installed in a permanent link with no less than 3db headroom.



CAT6A Cross Connects

Hughes Ref.	Description
25-2931339361	XX UTP CAT6A Plug to Socket LSOH Booted
25-393133361	XX SFTP CAT6A Plug to Socket LSOH Booted

Substitute XX of length of cable required



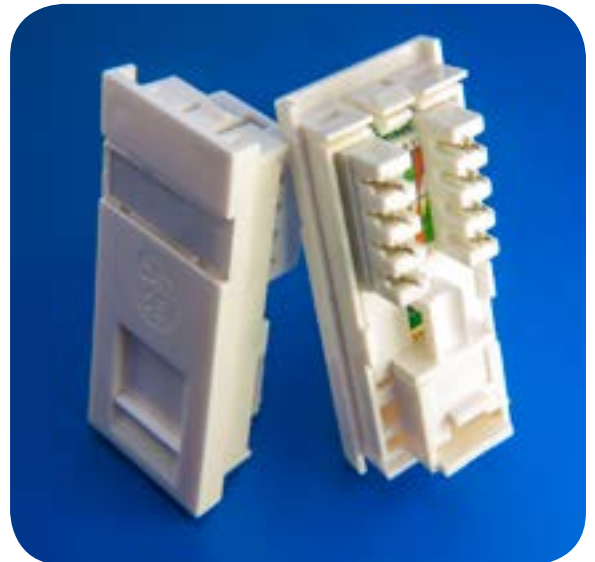


Component-Level Cat 6

Hughes Component-level Cat 6 range is the premium-performance option, where speed and reliability really matter. Guaranteed to perform at or above TIA-568-C.2 Cat 6 component-level standard, these components are perfect for high-bandwidth multimedia environments.

Channel-Level Cat 6

Pick our Channel-level Cat 6 range for a balance of performance and cost effectiveness.



Cat5e

Choose our Cat 5e legacy range for more basic, budget applications where value for money is the overriding concern.

UTP RJ45 Keystone Jacks

Hughes Ref.	Description
39-7336341-C	CAT6 Keystone Jack Component-level (white*)
39-7336341	CAT6 Keystone Jack Channel level (white*)
39-7336335	CAT5E Keystone Jack (white*)

*Shielding and colour options available



RJ45 Wall Modules (25x50mm)

Hughes Ref.	Description
38-7512	CAT6 Jack (white)*
38-75111	CAT6 Jack (black)*
38-7112	CAT5E Jack (white)*
38-7111	CAT5E Jack (black)*

*Shielding options available

RJ45 Floor Modules (22x37mm)

Hughes Ref.	Description
38-7712-C	CAT6 Floor Module Component-level(white)*
38-7711-C	CAT6 Floor Module Component-level(black)*
38-77112	CAT6 Floor Module (white)*
38-77111	CAT6 Floor Module (black)*
38-7312	CAT5E Floor Module (white)*
38-73111	CAT5E Floor Module (black)*

*Shielding options available



STP RJ45 Data Jacks

Hughes Ref.	Description
39-7336345	STP CAT5E Keystone Jack White
39-7336346	STP CAT5E Keystone Jack Black
39-7336347	STP CAT5E Keystone Jack Black
39-8336345	STP CAT6 Keystone Jack White
39-8336346	STP CAT6 Keystone Jack Black
39-8336347	STP CAT6 Keystone Jack Black



UTP RJ11 Data Jack

Hughes Ref.	Description
39-5336335	UTP Keystone Jack White
39-5336336	UTP Keystone Jack Black
39-5336337	UTP Keystone Jack

Adaptors

Hughes Ref.	Description
39-7624331	RJ11 Through Couplers
39-7634331/E	RJ45 CAT5E Through Coupler
39-76343314	RJ45 CAT6 Through Coupler
39-A33050	RJ45 Doubler
39-A33060	RJ45 4Way Splitter
39-A33070	RJ45 8Way Splitters



Bevelled Bezels



Flat Bezels



Outlet Hardware

Hughes Ref.	Description
38-10220a	Bezel Including Ident Labels
38-20220a	Double Flat Bezel
38-10220e	Single Faceplate
38-20220e	Double Faceplate
38-50225	RJ45 25mm Single Shutter
38-50226	RJ45 50mm Single Shutter
38-5022p	RJ45 6C Floor Shutter
38-5022g	Quarter blank (12.5x50mm) White
38-5022gb	Quarter blank (12.5x50mm) Black
38-5022h	Half blank (25x50mm) White
38-5022hb	Half blank (25x50mm) Black
38-5022i	Double blanks (50x50mm) White
38-5022q	LJ6 blank (22x37mm) White
38-5022qb	LJ6 blank (22.37mm) Black
38-50223	BNC/TNC Module
38-50227	F Type Module
38-50228	Fibre ST Module
38-5022e	D25 Module
38-5022f	D9 Module

Data and Power GOP Boxes

Hughes Ref.	Description
Hughes manufactures a wide range of underdesk and desktop units. See PDU section for our complete range	

Modular Patch panels

19" modular patch panels are available from 16 to 96 ports in 1 to 6u panel sizes. Channel signals are delivered by our versatile low profile Euro-snap jacks, each port simply clicks into the patch panel frame offering single, port based PCB's and therefore increased power-sum performance at extended frequencies and channel lengths. Modular patch panels are available in a range of performance levels up to and including 250 Mghz category 6

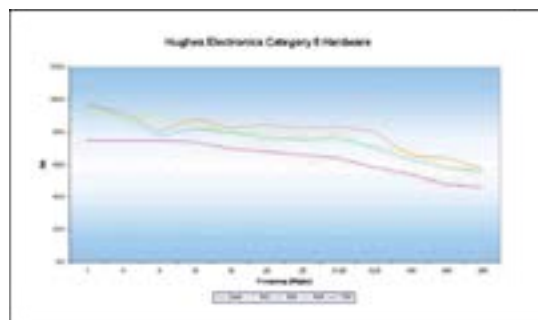
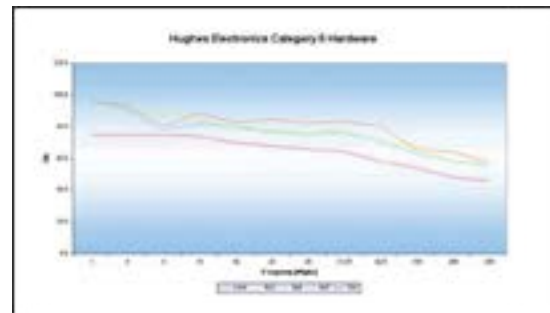
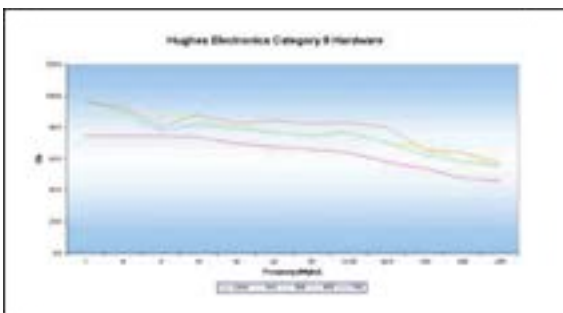
CAT5e Modular Panels

Hughes Ref.	Description
37-311043102	16 port modular
37-721043102	32 port modular
37-931043102	48 port modular



CAT6 Modular Panels

Hughes Ref.	Description
37-311043102/6	16 port modular
37-721043102/6	32 port modular
37-931043102/6	48 port modular



High Density Patch panels

High density patch Panels are available as 16 or 24 way(1u) in a variety of styles all with self contained cable management and client configuration port identification systems, in addition to pre-numbered ports. High density patch panels are configured in 4x6 port modules each six ports are mounted on a PCB designed by Hughes Electronics to exceed EIA/TIA/ISO standards up to a frequency of 100Mghz, and will satisfy any enhanced Category 5 requirements.

Connections are available via 50 way telco connectors or Krone/AT&T compatible Insulation Displacement contacts ready equipped with 568A or B wiring schemes for ease of reference in use.

High Density Panels

Hughes Ref.	Description
37-132241112	24w CAT5e high density patch panel
37-132481112	48w CAT5e high density patch panel
37-132961112	96w CAT5e high density patch panel
37-142241112	24w CAT6 high density patch panel
37-142481112	48w CAT6 high density patch panel



90 Degree High Density Panels

Hughes Ref.	Description
39-c131248111	24w CAT5e 90 degree high density patch panel
39-c131488111	48w CAT5e 90 degree high density patch panel
37-c231248111	24w CAT6 90 degree high density patch panel
37-c231488111	48w CAT6 90 degree high density patch panel



Coupler Patch panels

19" modular coupler patch panels are available from 24 & 48 ports in 1 and 2U panel sizes. Channel signals are delivered by our panel mount couplers, each port simply clicks into the patch panel frame. 4 Different coupler styles are available, RJ11, RJ12, RJ45, Cat3 and RJ45 Cat5e.



Coupler Panels

Hughes Ref.	Description
37-13116811	CAT5e 16 port 1U
37-13124811	CAT5e 24 port 1U
37-13148811	CAT5e 48 port 2U
37-13216811	CAT6 16 port 1U
37-13224811	CAT6 24 port 1U
37-13248811	CAT6 48 port 2U



Bulkhead Couplers

Hughes Ref.	Description
01-84284857	RJ11 Female Bulkhead
39-7636301	RJ45 CAT3 Female Bulkhead
39-7636301/5c	RJ45 CAT5e Female Bulkhead Compact
39-7636301/e	RJ45 CAT5e Female Bulkhead
39-7636301/6	RJ45 CaT6 Female Bulkhead



Shielded Patch panels

Shielded patch panels are available as 16 port or 24 port in a 1U height. Colour options are Black or Grey and each panel comes complete with cable management clips and ties. Insulation Displacement contacts are Krone/AT&T compatible with 568A or B wiring schemes for ease of reference in use.

Shielded Panels

Hughes Ref.	Description
37-6201343101e /S	16w Patch Panel
37-a201343101e /S	24w Patch Panel



Telecom Panels

Hughes Ref.	Description
37-111244112/1	Voice Telco Panel
37-111240112/ic	Voice RJ45 Splitter Panel

Telecom Patch panels



Please see Telecoms section for more details and Options



Category6 RJ45 Plugs

UTP Plugs

Hughes Ref.	Description
39-233239/1	UTP CAT5e RJ45 plug 3U
39-223239/5	UTP CAT5e RJ45 plug 50U
39-233239/5/colour	UTP CAT5e RJ45 plug 50U coloured
39-233239/5s	UTP CAT5e RJ45 plug solid conductor
39-333239/c5	UTP CAT5 RJ48 10 pole plug
39-233239/6	UTP CAT6 RJ45 plug



STP Plugs

Hughes Ref.	Description
39-223239/5	STP CAT5e RJ45 plug 50U
39-223239/5	STP CAT5e RJ45 plug 50U with clamp
39-233240/c6s	STP CAT6 RJ45 plug 50U



Modular Plugs

Hughes Ref.	Description
39-113009	RJ11 plug 6p4c
39-123009	RJ11 plug 6p6c
39-52009	Dec Mmp 6p6c

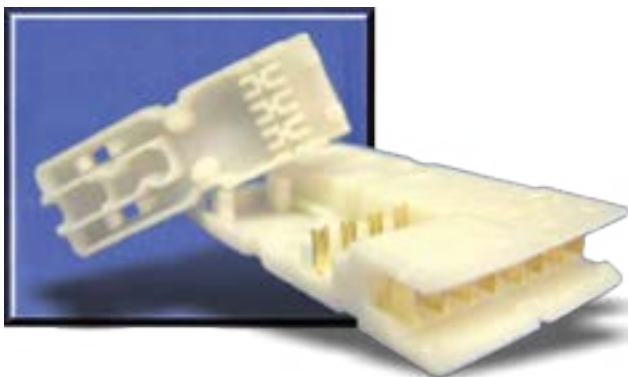


Snap Fit Boots

Hughes Ref.	Description
07-3f03303411	RJ45 snap fit boots grey
07-3f03303412	RJ45 snap fit boots red
07-3f03303413	RJ45 snap fit boots green
07-3f03303414	RJ45 snap fit boots blue
07-3f03303415	RJ45 snap fit boots yellow

Rubber Boots

Hughes Ref.	Description
07-3c03303441	RJ45 Rubber Boots grey
07-3c03303442	RJ45 Rubber Boots red
07-3c03303443	RJ45 Rubber Boots green
07-3c03303444	RJ45 Rubber Boots blue
07-3c03303445	RJ45 Rubber Boots yellow
07-3c03303446	RJ45 Rubber Boots violet
07-3c03303447	RJ45 Rubber Boots orange
07-3c03303448	RJ45 Rubber Boots black
07-3c03303449	RJ45 Rubber Boots white



AT&T Data Plugs

Hughes Ref.	Description
39-c03039511	AT&T 1pair
39-c03039512	AT&T 2pair
39-c13039512	AT&T 4pair

RELATED PRODUCTS



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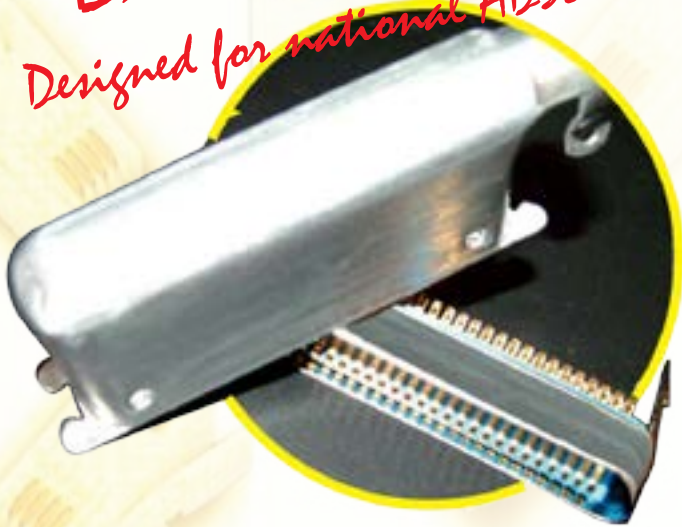
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Telecoms

Hughes Electronics telecommunication products are designed to meet the most exacting telecoms applications up to and including latest digital and wideband technologies.

Our design and development team can re-design traditionally low bandwidth interfaces to match new bandwidth or design criteria, and solve your connectivity problems as demand for bandwidth plus interoperability grows. Hughes Electronics' modified connectors can be found at the heart of the latest digital developments. Most products are held as stock in central London allowing fast response and delivery.

*Exclusive product
Designed for national ADSL rollout*

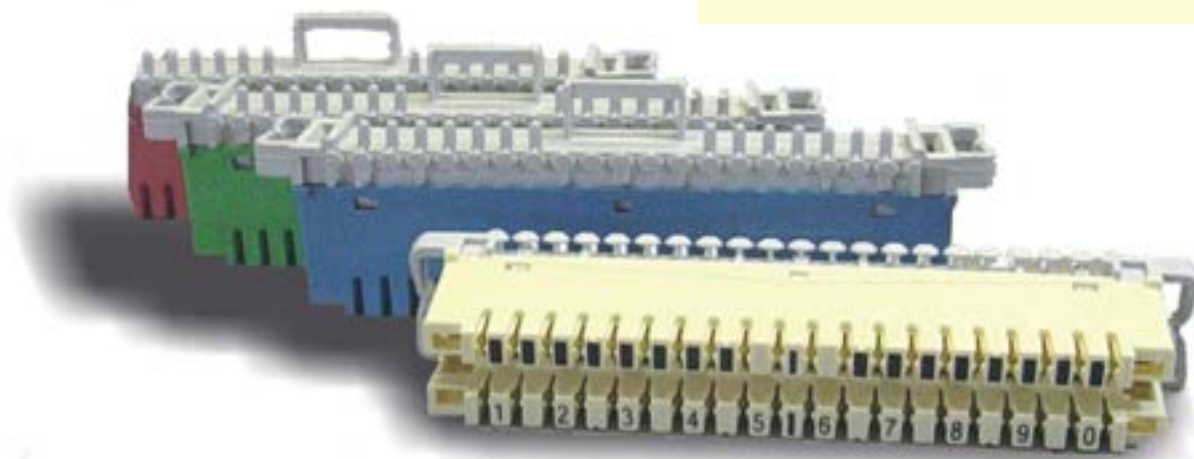


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Wiring Blocks & Accessories

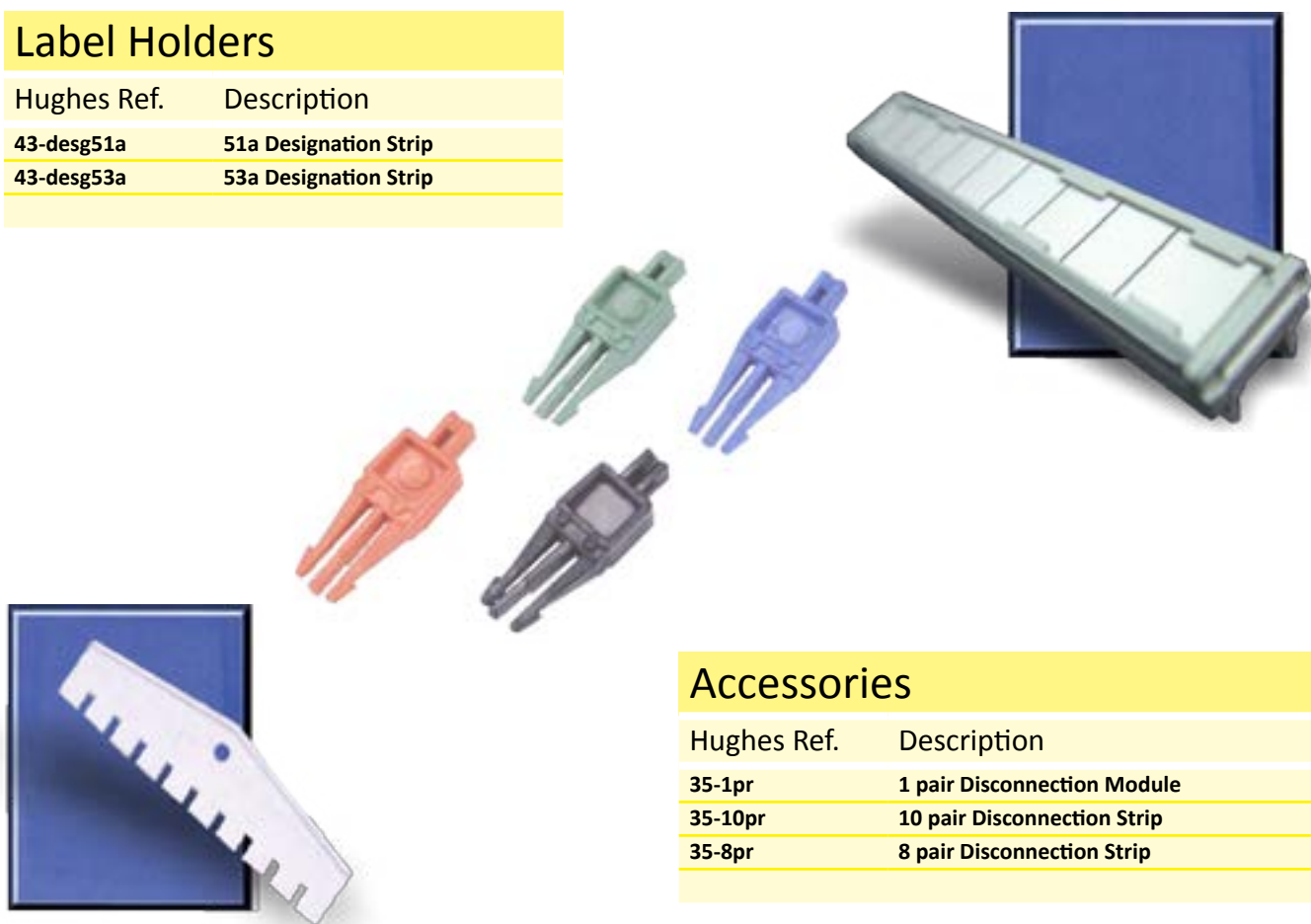
Dis/Connection Strips

Hughes Ref.	Description
43-H7160	237b Connection Strip grey
43-H7060	237a Disconnection Strip cream
43-h7010	237a Disconnection Strip red
43-h7020	237a Disconnection Strip blue
43-h7030	237a Disconnection Strip green



Label Holders

Hughes Ref.	Description
43-desg51a	51a Designation Strip
43-desg53a	53a Designation Strip



Accessories

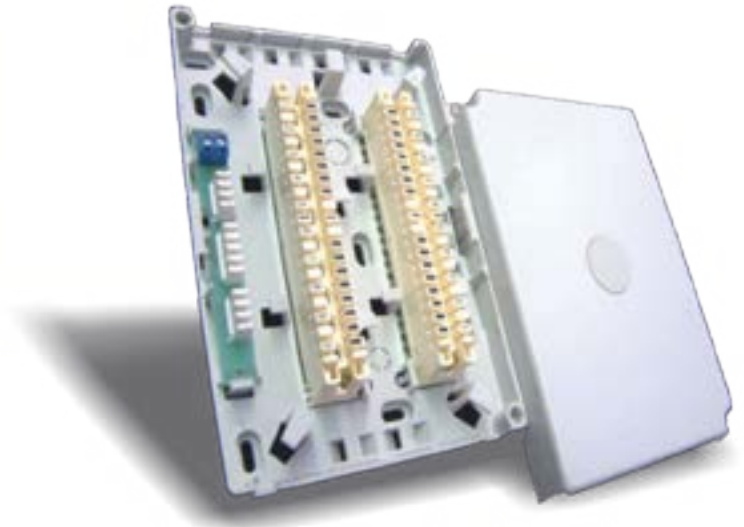
Hughes Ref.	Description
35-1pr	1 pair Disconnection Module
35-10pr	10 pair Disconnection Strip
35-8pr	8 pair Disconnection Strip

Distribution Boxes

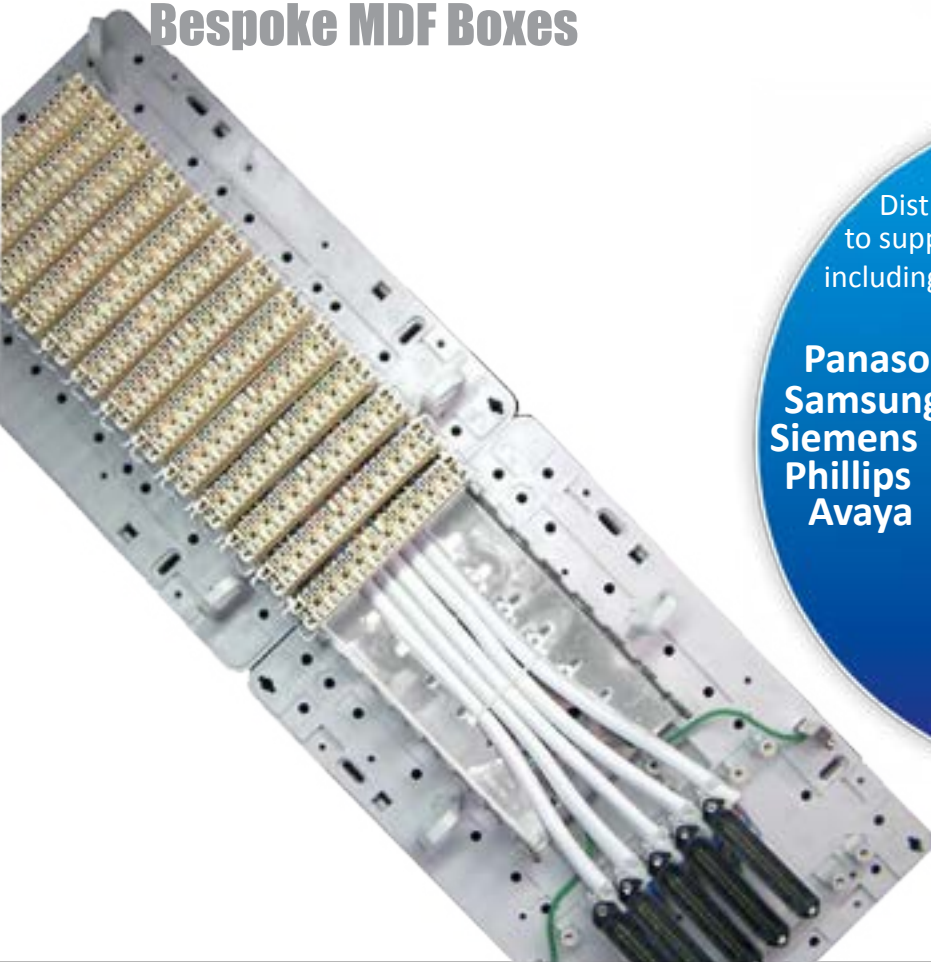


Connection Boxes

Hughes Ref.	Description
29-15000203	201 Box Connection 20 pairs
29-18000203	251 Box Connection 50 pairs
29-1b000203	301 Box Connection 100 pairs
29-1d00020	501 Box Connection 340 pairs



Bespoke MDF Boxes



Turnkey Mini Distribution Frames are available to support all types of PBX Equipment including:-

Panasonic
Samsung
Siemens
Phillips
Avaya



Distribution Boxes

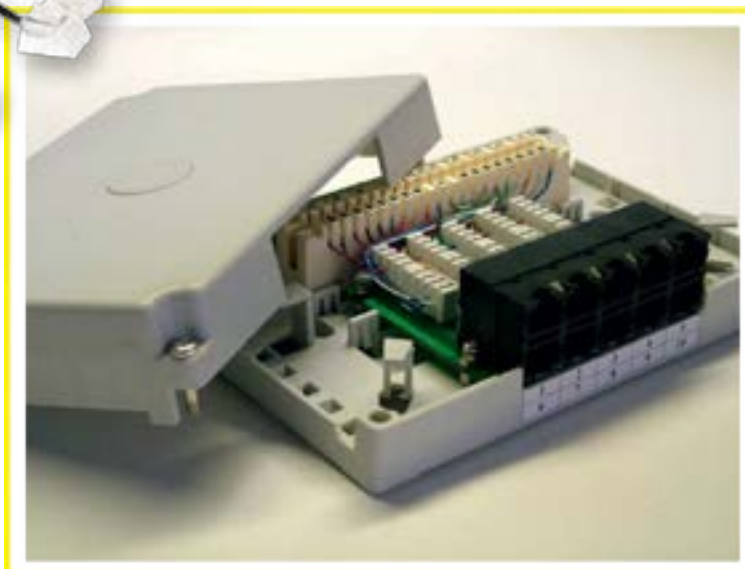
Voice Distribution Made Easy

New Products



Bespoke Connection Boxes

Hughes Ref.	Description
29-15000203-1	201 Connection with Telco
29-15000203-2	201 Connection with RJ45



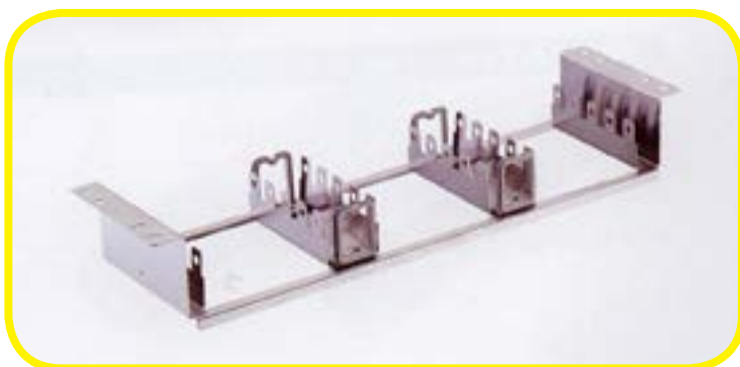
Ideas for SME's, Hughes Bespoke boxes are supplied pre-terminated. Designed to reduce engineer's time and provide a neat, flexible and professional system for the end user.

Just tell us the system and we will provide your solution.

Distribution Frames

Connection Frames

Hughes Ref.	Description
29-3-108a	Single Vert Connection frame 690prs
29-3-108a-2	Double Vert Connection frame 1280prs
29-2-150	150pr 19" 3U Flush Mounting frame
29-2-150r	150pr 19" 3U Recessed Mounting frame



Type 71 100pr MDF

Hughes Ref.	Description
29-7100a	100pr type Terminal Block
29-7100b	5pr Protection Magazine

Distribution Panels

Voice Patch Panels

Hughes Ref.	Description
37-132252112	25 port Krone IDC Voice Panel
37-132502112	50 port Krone IDC Voice Panel



Bespoke Voice Panels

Voice Patching Made Easy

New Products



Compatible systems

include:-

Mitel

Avaya

Siemens

Shoretel

Samsung

Vertical Wave

Altigen

**..... you name it and we
have the solution**

Bespoke Voice Patch Panels

Hughes Ref.	Description
37-111244112/1	24 port Telco Panel
37-111240112	24 port to 6 port RJ45 Patch Panel

Hughes Bespoke systems are designed to save precious termination time and eliminate the need for troubleshooting. Our Plug and Play system can be supplied with any type of cable assembly for any system, tell us the System and we'll provide the whole solution.

Just Plug in and Go

**Bespoke Logo printing is also available,
please call our sales team for more information.**

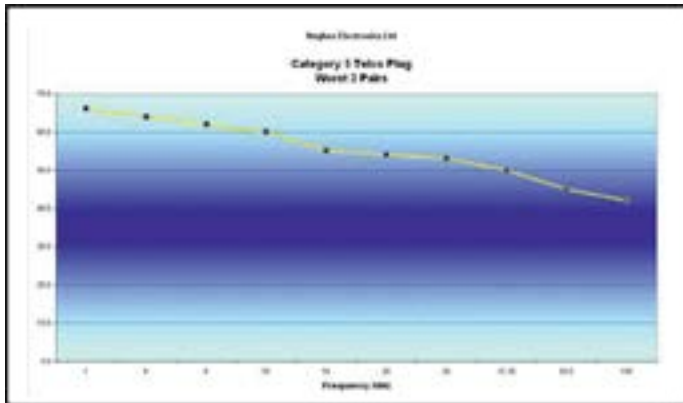
Telco Panels & Connectors

CAT5 Telco Patch Panels

Hughes Ref.	Description
37-611260102/2	24 port RJ45 to 2 port Telco
37-621260102/4	48 port RJ45 to 4 port Telco



A new generation of Telco connectors designed operate above Cat5 performance criteria. The products are intended for use in ADSL, telecoms and data applications. They are available in 25pr and 32pr variants.



A removable PCB provides the basis for the incredible performance yet the PCB can be removed to provide an economical Cat3 connector that can be updated at a later date as and when performance is required.

CAT5 Telco Connectors

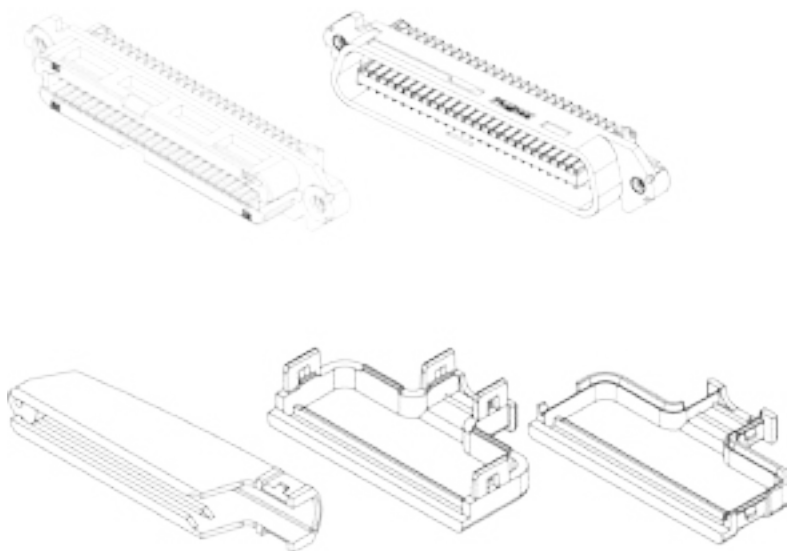
Hughes Ref.	Description
02-2t25m	50w Plug
02-2t25f	50w Socket
02-3t25rb	50w Right angle hood blue
02-3t25rbk	50w Right angle hood black
02-3t25sb	50w Straight hood blue
02-3t25sbk	50w Straight hood black
02-2t35m	64w Plug
02-2t35f	64w Socket
02-3t35rb	64w Right angle hood blue
02-3t35rbk	64w Right angle hood black
02-3t35sb	64w Straight hood blue
02-3t35sbk	64w Straight hood black



Telco Connectors

Hughes Ref.

Male	Female	Description
02-2t614100	29-2t624100	24 Way Telco Connector
02-2t924100	29-2t914100	36 Way Telco Connector
02-2tc24000	02-2tc14000	50 Way Telco Connector
02-2td24000	02-2td14000	64 Way Telco Connector



Telco Hoods

Hughes Ref.	Description
02-3130111	24 Way Hood 180 degree black
02-3130211	24 Way Hood 90 degree black
02-319111	36 Way Hood 90 degree black
02-319211	36 Way Hood 180 degree black
02-31c111	50 Way Hood 180 degree black
02-31c211	50 Way Hood 90 degree black
02-31c511	50 Way Hood 120 degree black
02-31d111	64 Way Hood 180 degree black
02-31d211	64 Way Hood 90 degree black



BT Connectors



BT Plugs

Hughes Ref.	Description
39-a13309	4 pole BT Plug right-hand
39-a133091	4 pole BT Plug left-hand
39-a23009	6 pole BT Plug right-hand
39-a230091	6 pole BT Plug left-hand
29-810007	6 pole BT Socket right-hand
29-810008	6 pole BT Socket left-hand
29-910001	6 way BT Socket housing



RJ11 Plugs

Hughes Ref.	Description
39-112009	RJ22 Plug 4p4c
39-113009	RJ11 Plug 6p4c
39-123009	RJ12 Plug 6p6c
39-520009	Dec mmp 6p6c

RJ11 Connectors



RJ11 Jacks

Hughes Ref.	Description
39-5336335	UTP Keystone Jack White
39-5226226	UTP Keystone Jack Black

Line Jack Units

Line Jack Units

Hughes Ref.	Description
29-40211201	2/1a LJU Master
29-40221201	2/2a LJU Pabx
29-40231201	2/3a LJU Secondary
29-40311201	3/1a LJU Flush Master
29-40312201	3/2a LJU Flush Pabx
29-40313201	3/3a LJU Flush Secondary
29-40321201	4/1a LJU Dual Flush Master
29-40323201	4/2a LJU Dual Flush Pabx
29-40333201	4/3a LJU Dual Flush Secondary

series 2 - 68mm x 68mm x 29mm

series 3 - 86mm x 80mm

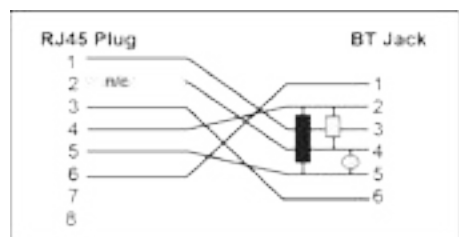
series 4 - 80mm x 80mm



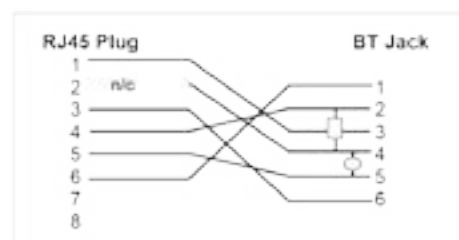
Line Jack Adaptors

Line Jack Adaptors

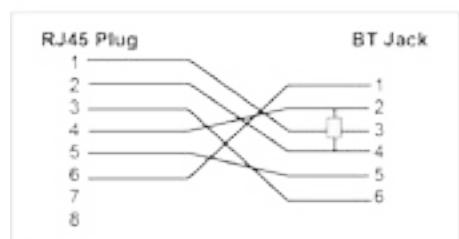
Hughes Ref.	Description
29-40011611	BT Socket to RJ45 Fly Lead Pstn
29-40021611	BT Socket to RJ45 Fly Lead Pabx
29-40031611	BT Socket to RJ45 Fly Lead Secondary
29-40041611	BT Socket to RJ45 Fly Lead ISDN



PSTN Full Master





PABX



Secondary

KEY

 Resistor
(1/4W, 470KΩ)

 Capacitor
(1µ8M250)

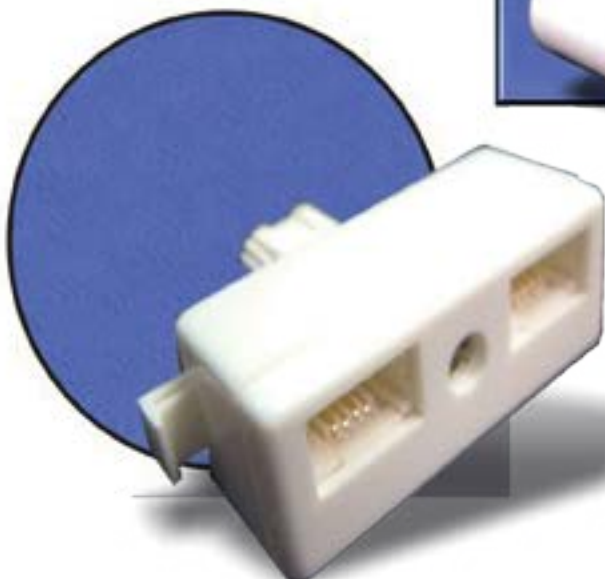
 Surge
Arrester



Adaptors

Adaptors

Hughes Ref.	Description
29-6000041	2way BT Splitter Compact Vertical
29-6000041/l	2way BT Splitter 6 pin
29-6000042	BT Coupler
29-6000043	BT Plug to BT Socket & RJ11 Socket
29-6100042	BT Single Cable Caddy 15m
29-6100043	BT Double Cable Caddy 15m
29-6000051	RJ11 Splitter
29-6000052	RJ11 Coupler
29-60047589	RJ45 to RJ11 Converter
29-6000060	Handset un-Twister



RJ45 Economisers

Hughes Ref.	Description
39-A33050	RJ45 2Way Splitter Data/Data 1,2,3&6
39-A33050A	RJ45 2Way Splitter CAT5E, 1-8
39-A33050B	RJ45 2Way Splitter Voice/Voice, 3,4,5&6
39-A33050C	RJ45 2Way Splitter Data/Voice, 1,2,3,6 / 3,4,5,6



ADSL

Hughes Ref.	Description
29-A001	ADSL Splitter/Filter Tailed
29-A002	ADSL Splitter/Filter Non Tailed

Line Cords

Hughes Ref.	Description
25-M62121064/XX	RJ11 Line Cord XXM White
25-M62121064/XXB	RJ11 Line Cord XXM Black

Substitute XX of length of cable required



Curly Cords

Hughes Ref.	Description
25-M61010165/XX	RJ10 Curly Cord XXM white
25-M61010165/XXB	RJ10 Curly Cord XXM black

Substitute XX of length of cable required

Baluns

Hughes Electronics are proud to announce a new performance standard in 75 ohm to 120 ohm individual impedance matching baluns and balun cable harnesses which supplement our extensive range of G703 dual balun's and dual balun panels.

Hughes individual balun connectors and cable harnesses have been developed specifically for LTE advanced (e.utra) and Wimax advanced (IEEE 802.16m) applications.



Performance testing has been improved too; by incorporating the analysis of NEXT (Near End Crosstalk) and FEXT (Far End Crosstalk) in our impedance matching cable assemblies Hughes Electronics set a new performance benchmark compared to the rest of the industry, who deploy only standard ITU-T prescribed pulse testing.

Hughes Electronics lead the industry in understanding the major impact of 'noise' factor losses resulting from poor NEXT and FEXT performance at channel level. Every impedance matching balun assembly that leaves the Hughes production line is tested and guaranteed to provide E.1 maximum losses of 48.6db at 8mghz through to 25db at 140Mghz for E3. Clients deploying Hughes Electronics balun products can now confidently meet Cat5 and Cat6 data bandwidth standards in these critical areas of performance.



Connection Balun

New Shape



G703 Mini Baluns

Hughes Ref. Description

40-164570/e2	IDC Mini Balun BNC male
40-2120	IDC Mini Balun BNC female
40-174570	IDC Mini Balun Type43 male
40-2220	IDC Mini Balun Type43 female
40-2310	IDC Mini Balun HDC Type43 male
40-2320	IDC Mini Balun HDC Type43 female
40-2410	IDC Mini Balun 1.0/2.3 male
40-2420	IDC Mini Balun 1.0/2.3 female
20-2510	IDC Mini Balun 1.6/5.6 male
40-186570/e2	IDC Mini Balun 1.6/5.6 female

Hughes new baluns deploy brand new IDC connections that ensure a gas tight fit for stranded cables, reducing insertion losses at the connection point, plus innovatively designed ferule that stabilises pitching on twisted pair cable and decreases core tolerances to help provide unprecedented performance.

G703 Dual Baluns

Hughes Ref. Description

40-1112	Dual Bnc male to RJ45
40-1122	Dual Bnc female to RJ45
40-1132/e2	Dual Bnc b/h female to RJ45 dual mount
40-1212	Dual Type43 male to RJ45
40-1222	Dual Hdc type43 female to RJ45
40-1222/ddf	Dual Hdc type43 male to RJ45 ddf mount
40-1312	Dual Type43 female to RJ45
40-1322	Dual Hdc type43 female to RJ45
40-1421	Dual 1.6/5.6 male to RJ45
40-1422	Dual 1.6/5.6 female to RJ45

Dual Mount



DDF Mount



Hughes G703 Balun panels perfectly match impedance match up to 24 dual 75ohm Coax to 120ohm twisted pair connections. Individual balun support data streams of 2-8 Mbits/s (for E1/T1, E2/T2), 2-8-34 Mbits (for E1/T1 to E3), 34 to 155 Mbits/s for E3 oand higher. Hughes Balun Panels bi-directionally match signal impedance and pulse shapes of the signals according to CCITT G703 standards.

G703 Balun Panels

Hughes Ref.	Description
37-g81001321	G703 16 port Modular Balun panel 2mps
37-g81001322	G703 16 port Modular Balun Panel 34mps
37-ga1001321	G703 16 port Reversible Balun Panel 2mps
37-ga1001322	G703 16 port Reversible Balun Panel 34mps
37-g91001321	G703 24 port 2U Balun Panel 2mps

Reversible Balun Panels



Features:

- Connects 75 ohm Dual coax to 120 ohm Twisted pair
- Bi-directional signal conversion according to CCITT G.703
- Low Profile design
- Mounts in standard 19" rack



2U Balun Panels



Modular Balun Panels



Related Products



Cable

page 51



Cable Assemblies

page 79



Type 43

page 63



Tools

page 101

Cellular Telecom

Hughes Electronics are a centre of excellence in passive communication product design and manufacture.

Our business stream includes the seamless design and development process and the J.I.T. supply of cables, connectors, pre-terminated channels, cross connects, jumper leads, looms and kits including passive inter-media modulation products, we can also provide turnkey integration. A small example of our range of cellular products are listed below.



CORRUGATED LOW LOSS CABLES	40
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Corrugated Low Loss Cables

Hughes corrugated waveguide cables are high performing low loss cables mainly used in cellular telecom and Broadcast applications. benefits of corrugated cables over smooth walled cables are:

- **Extremely flexible**
- **Low Passive intermodulation (PIM)**
- **managed thermal expansion**



Hughes Part Number		Description
Standard PVC	LSZH	
19-RF301401	19-RF301402	1/4 inch Superflex
19-RF303801	19-RF303802	3/8 inch Superflex
19-RF301201	19-RF301202	1/2 inch Superflex
19-RF307801	19-RF307802	7/8 inch Flex
19-RF311401	19-RF311402	1 1/4 inch Flex

Available in many sizes with standard polyethylene PE sheath or flame retardant Low

Jumper Cables

Hughes super flexible low PIM jumper cables are specially designed for GSM and CDMA base stations, manufactured to critical standards of excellence and adopting the best mechanical principles for radio frequency and reliability performance each assembly undergoes two VSWR test processes during manufacture to ensure outstanding PIM performance:

- **Excellent VSWR and PIM performance (-162dBc typical)**
- **Low stable IM3 distortion**
- **Designed for outdoor application**
- **IP68 water immersion tested transversely and longitudinally**



Hughes Part Number			Description
1/4"	3/8"	1/2"	
25-RF507M7M14/XX	25-RF507M7M38/XX	25-RF507M7M12/XX	7/16 Straight Male to Male
25-RF507R7R14/XX	25-RF507R7R38/XX	25-RF507R7R12/XX	7/16 Right Angle Male to Right Angle Male
25-RF507M7F14/XX	25-RF507M7F38/XX	25-RF507M7F12/XX	7/16 Straight Male to Female
25-RF50NMNM14/XX	25-RF50NMNM38/XX	25-RF50NMNM12/XX	N Type Male to Male
25-RF50NRNR14/XX	25-RF50NRNR38/XX	25-RF50NRNR12/XX	N Type Right Angle Male to Right Angle Male
25-RF50NMNF14/XX	25-RF50NMNF38/XX	25-RF50NMNF12/XX	N Type Straight Male to Female

replace XX with length required. i.e 02 for 2M

7/16

Your channel or system performance is almost always limited by the performance of the connector/product deployed. Hughes 7/16ths connector design benefit from our unique work in physics and signal processing and GSM/CDMA applications to deliver optimum performance for type. Inter-modulation distortion is consistently low, - 168 dBC typical



- **Low IMD and low VSWR provides improved system performance.**
- **Designed for ease of installation with standard hand tool.**
- **IEC 169 dust(P68) and water(IP68) proof.**
- **reduced assembly reduces resistance, reflections and sources of IMD.**
- **White bronze-plated bodies deliver a high conductivity and corrosion resistance.**

Hughes Part Number			Description
Male	Female	Right Angle Male	
08-RF21301	08-RF21302	08-RF21303	7/16 connector to suit RG213
08-RF01401	08-RF01402	08-RF01403	7/16 connector to suit 1/4 inch Superflex
08-RF03801	08-RF03802	08-RF03803	7/16 connector to suit 3/8 inch Superflex
08-RF01201	08-RF01202	08-RF01203	7/16 connector to suit 1/2 inch Superflex
08-RF07801	08-RF07802	08-RF07803	7/16 connector to suit 7/8 inch flex
08-RF11401	08-RF11402	08-RF11403	7/16 connector to suit 1 1/4 inch flex

Hughes design the best performing connectors in the industry, our research and Development programme in physics, electronics and signal processing allows Hughes to understand the effects of conector design on IMD and PIM generation. Our exclusive knowledge base and mission goal to simply `make things better` are the foundation stones for our next generation Ultra Low PIM connector series;

- **Zero Harmonics**
- **Vibration dampening**
- **Ultra low PIM**
- **Ultra low torquing**
- **Lightweight**
- **Non Corrodible**
- **IP 68**
- **Zero Magnetics**
- **Single forward and return pathway**
- **Waveguide electromagnetics screen**
- **Innate Lightning protection**
- **Easy field termination**
- **Legacy compatible to 7/16ths**
- **Unparalleled performance**

Connectors

N Type

N Series coaxial connectors are medium-sized, threaded coupling connectors designed for use from DC to 12.4 Ghz. Their consistently low broadband VSWR have made them popular over the years. Applications include: Antenna, Base Stations, Microwave Components, Transmitters, Broadcast, Receivers, Radar, Test Measurement, Instrumentation and LANs.



Hughes Part Number		Description
Male	Female	
13-RF01201	13-RF01202	N Type to suit RG213
13-RF01401	13-RF01402	N Type to suit 1/4 inch Superflex
13-RF03801	13-RF03802	N Type to suit 3/8 inch Superflex
13-RF01201	13-RF01202	N Type to suit 1/2 inch Superflex

Hughes Electronics stock a large number of different types on N Type Connectors for many various cable types. Please call our sales team if your requirement is not listed above.

Power Cable

Hughes offers a full range of power cables including Armoured cable, Panel cable, SY Control Cable, YY Control Cable, 3183 Flexible cable, Tri-Rated cable, Double Insulated cable and Rubber Flex cable. All power cables supplied by Hughes are independently tested and conform to the relevant BS standards. Most cable types are available from 0.75mm to 50mm conductor both in single and multiple cores with the option of PVC or LSZH sheaths and in various colour options. Listed below are the most popular options but please call our sales team if your requirement is not listed below.



Hughes Part Number			Description Conductor size mm ²
Tri-Rated 6381Y	Double Insulated 6381Y	3Core SWA BS6724	
21-41015XX	21-31015XX	21-SWA-3X1.5	1.50
21-41025XX	21-31025XX	21-SWA-3X2.5	2.50
21-4104XX	21-3104XX	21-SWA-3X4.0	4.00
21-4106XX	21-3106XX	21-SWA-3X6.0	6.00
21-4110XX	21-3110XX	21-SWA-3X10.0	10.00
21-4116XX	21-3116XX	21-SWA-3X16.0	16.00
21-4125XX	21-3125XX		25.00
21-4135XX	21-3135XX		35.00
21-4150XX	21-3150XX		50.00

Breakers

Hughes distribute the Acti 9 range of products manufactured by Schneider Electric.

Acti 9 helps you meet developing energy efficiency and environmental certifications or requirements, now and in the future. It minimises impact from the design stage, through the installation's lifetime of use and eventual recycling. Through both design and technology, Acti 9 provides you with the key combination of less impact and more efficiency that is necessary for the environment today. The full range of Acti 9 products are available to view at:-

<http://www.schneider-electric.co.uk/documents/electrical-distribution/en/local/acti-9/Acti--Launch-catalogue.pdf>



Antennas

Hughes offers a full range of Antennas from indoor domed ceiling mount to external high gain pole mount. All antennas undergo comprehensive environmental and performance test to ensure that they meet the all relevant standards.

Please contact our sales team with your requirement.

Hughes Part Number	Description
35-AT-0727XDF	Indoor, Mexican Hat, 3dB gain Antenna
35-AT-1007KBO	Antenna - Indoor panel 7dB gain, H:90 V:65
35-AT-1008KBO	Antenna - Outdoor panel 7dB gain H:85 V:5



Power Dividers/Splitters

Power dividers/splitters are used in a wide variety of applications and can satisfy almost any requirement where a signal needs to be distributed or combined.

- **Minimal insertion loss**
- **High isolation between output ports**
- **Exceptional phase and amplitude balance**

Hughes Part Number		Description
2 Way	3 Way	
35-PS2W01	35-PS3W01	N Type 700-2700 MHz Power Splitter
35-PS2W02	35-PS3W02	N Type 800-2700 MHz Power Splitter
35-PS2W03	35-PS2W03	N Type 700-3500 MHz Power Splitter



Directional Couplers

Directional Couplers are passive devices used in the field of radio technology. They couple a defined amount of the electromagnetic power in a transmission line and provide it to an ancillary port where it can be deployed in another circuit. An essential feature of directional couplers is that they only couple power flowing in one direction.

Hughes Part Number	Description
35-CDS1	N Type 700-2700 MHz 5dB Directional Coupler
35-CDS61	N Type 700-2700 MHz 6dB Directional Coupler
35-CDS101	N Type 700-2700 MHz 10dB Directional Coupler
35-CDS151	N Type 700-2700 MHz 15dB Directional Coupler
35-CDS201	N Type 700-2700 MHz 20dB Directional Coupler



Attenuators

Hughes high grade fixed RF Attenuators help lower voltage, dissipates power and improves impedance matching. Available in various wattage and attenuation, Hughes low VSWR attenuators provides excellent efficiency.

- **Low Insertion Loss**
- **Low DC power Consumption**
- **Accurate Attenuation**

Hughes Part Number		Description
2 Watt	5 Watt	
35-RF2W01	35-RF5W01	N Type Male to Female Attenuator 3dB
35-RF2W02	35-RF5W02	N Type Male to Female Attenuator 6dB
35-RF2W03	35-RF5W03	N Type Male to Female Attenuator 10dB



Cables

Hughes Electronics has built solid relationships over many years with cable factories in the Far East, Europe and the USA. Our many partnerships provide the flexibility to manufacture cable to your specific design, budget and time frame.

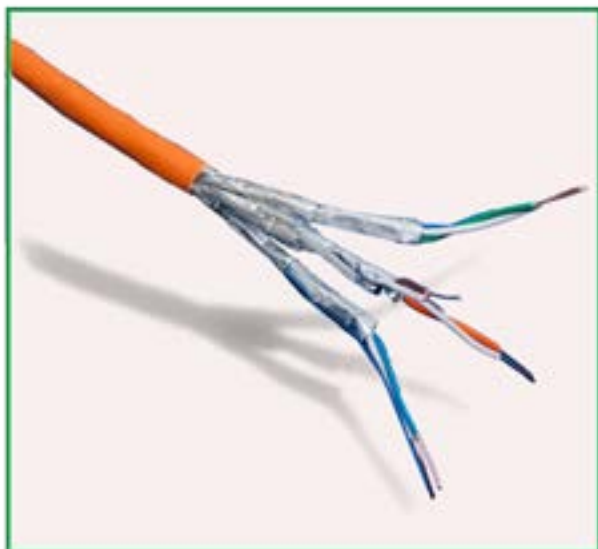
Our approved cable factories employ state of the art technology in manufacturing, testing and quality control.

Hughes Electronics holds a comprehensive range of cables in our central London warehouse and our sophisticated logistics systems ensure that you receive your cable on time, every time or Just In Time.

CAT6A CABLE	48
CAT6 CABLE	48
CAT5E CABLE	48
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COAXIAL - CT CABLES	49
MULTICORE	50
MULTIPAIR	50
CW1311	51
FLAT CABLE	51
CW1308	51

Cables - Structured Wiring

Structured Wiring Cables



CAT6A Cable

Hughes Ref.	Description
23-13221X2	UTP CAT6A Solid LSOH
23-43221X2	SFTP CAT6A Solid LSOH
23-33221X2	SFTP CAT6A Stranded LSOH

Substitute X for the following colour code

2-Grey, 3-Black, 8-Yellow, 9-Orange, A-Blue, B-Green, C-Red, D-Violet,

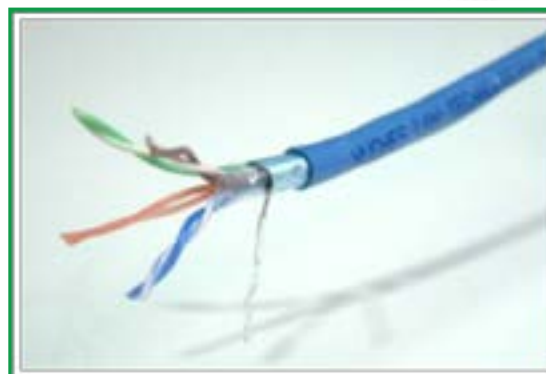


CAT6 Cable

Hughes Ref.	Description
23-1222121	UTP 4PR Solid CAT6 Grey
23-1222122	UTP 4PR Solid CAT6 Grey LSOH
23-22221D2	STP 4PR Solid CAT6 Grey LSOH
23-12211X1	UTP 4PR CAT6 Stranded
23-2221121	STP 4PR CAT6 Stranded

Substitute X for the following colour code

2-Grey, 8-Yellow, A-Blue, B-Green, C-Red



Unique Product

Under-carpet
CAT5e



CAT5e Cable

Hughes Ref.	Description
23-1122121	UTP 4PR Solid CAT5e Grey
23-11221D2	UTP 4PR Solid CAT5e Grey LSOH
23-1122121U	UTP 4PR Cat5e Grey Undercarpet
23-21221X2	STP 4PR Solid CAT5e Grey LSOH
23-1152181	UTP 25PR CAT5e Solid LSOH
23-11211X1	UTP 4PR CAT5e Stranded
23-21211X2	STP 4PR CAT5e Stranded

Substitute X for the following colour code

2-Grey, 8-Yellow, A-Blue, B-Green, C-Red

Premium Super-Highway cables are available as 305m (1000ft) boxes.

Cables - Coaxial

Coaxial Cables

8 core BT3002

Coaxial - BT Cables

Hughes Ref.	Description
19-112040	BT2002 single core
19-122040	BT2003 single core
19-122040/4	BT2003 4 core
19-142020	BT3002 single core
19-142020/8	BT3002 8 core
19-142040/16	BT3002 16 core
19-172020	RA7000 single core
19-172020/4	RA7000 4 Core (HE7000)



Approved RGB cable for Reuters Systems. Available in 3, 5 and 12 cores.



Coaxial - RG Cables

Hughes Ref.	Description
19-1j030	RG58 c/u
19-1d2030	RG59 b/u
19-2d2030	RG59 shotgun
19-1g2030	RG62 b/u
19-1m2020	RG179
19-3m2020	Triple coaxial RG179
19-5m2020	5 core coaxial RG179
19-bm2020	12 core coaxial RG179
19-3m2025	Triax 2pr & 1 core screened

Coaxial - CT Cables

Hughes Ref.	Description
19-110034	CT100 black
19-110044	CT100 white
19-150034	CT125 black
19-1171030	CT167

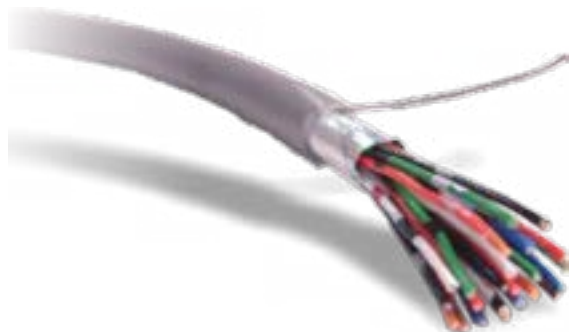


Cables - Multiconductor - Data

Data Multiconductor Cables

Multicore

Hughes Ref.	Description
20-2100030	2 core Braid Screen
20-4010030	4 core Braid Screen
20-6010030	6 core Braid Screen
20-8010030	8 core Braid Screen
20-b010030	12 core Braid Screen
20-c010030	15 core Braid Screen
20-c310030	18 core Braid Screen
20-d210030	20 core Braid Screen
20-e010030	25 core Braid Screen



Multipair

Hughes Ref.	Description
20-g260024	2 pair Foil & Braid screen + Drain
20-h910020	3 pair Foil & Braid screen + Drain
20-i260024	4 pair Foil & Braid screen + Drain
20-j260024	5 pair Foil & Braid screen + Drain
20-k260014	6 pair Foil & Braid screen + Drain
20-l260024	12 pair Foil & Braid screen + Drain
20-g360024	2 pair individually shielded
20-h360024	3 pair individually shielded
20-k360024	6 pair individually shielded
20-l360024	12 pair individually shielded



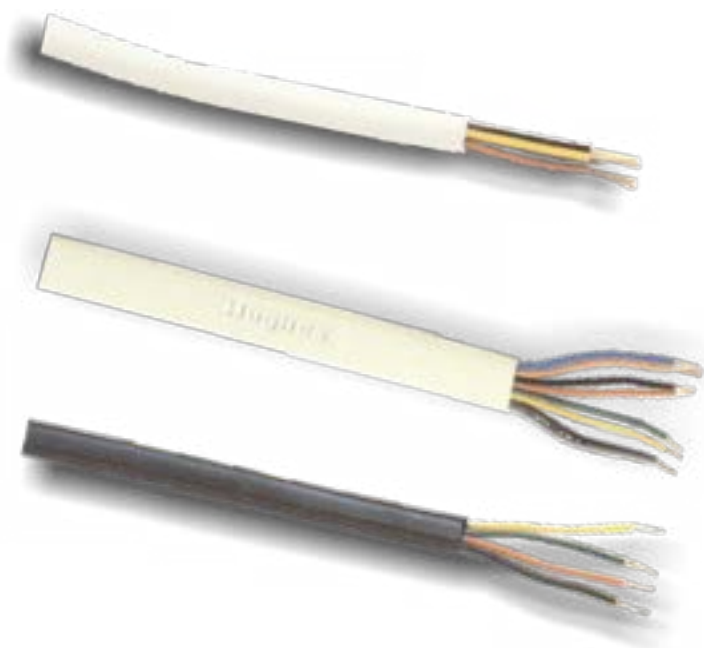
Hughes Electronics can supply most belden equivalent cables. Please call our sales team with your exact requirements.

Cables - Multiconductor - Telecom

Telecom Multiconductor Cables

CW1311

Hughes Ref.	Description
22-4000060	CW1311 4 core
22-6000060	CW1311 6 core



CW1308

Hughes Ref.	Description
22-g000040	CW1308 2pr
22-h000040	CW1308 3pr
22-i000040	CW1308 4pr
22-k000040	CW1308 6pr
22-n000040	CW1308 10pr
22-p000040	CW1308 15pr
22-q000040	CW1308 20pr
22-r000040	CW1308 25pr
22-t000040	CW1308 35pr
22-n800040	CW1308 10pr + earth
22-q800040	CW1308 20pr + earth
22-t800040	CW1308 32pr + earth
22-v800040	CW1308 50pr + earth
22-x800040	CW1308 100pr + earth

Flat Cable

Hughes Ref.	Description
22-4d03030	4 core Flat Cable
22-6d03030	6 core Flat Cable
22-8d03030	8 core Flat Cable



Related Products



Data connectors page 12



Coaxial connectors page 61



Tools page 99



Telecom connectors page 31



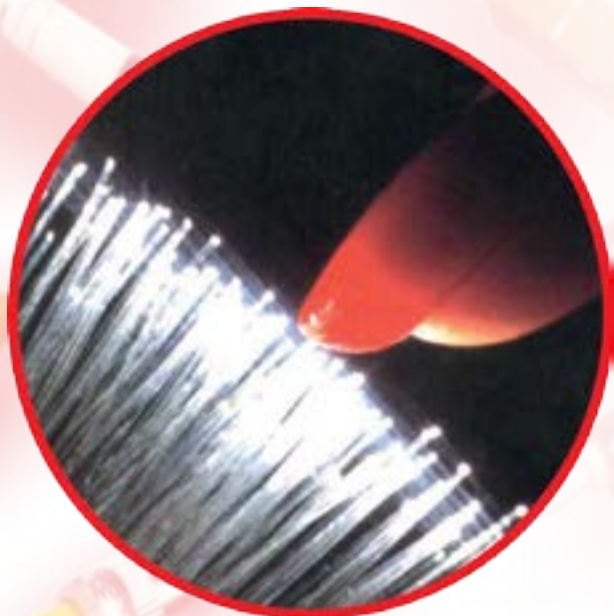
D type connectors page 73

Fibre Products

Hughes Electronics is committed to providing the highest quality fibre and to keep ahead of technological developments and innovations.

All fibre products have been designed to meet the transmission-critical standards of local and wide area networks.

Our large warehouse located in central London stocks a comprehensive range of fibre products that address nearly all communication applications including Data, LANs, Telecoms, Video transmission, Cable TV & military tactical communications.



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Fibre - Cable

Fibre Specification

CORE/CLADDING ATTENUATION	SINGLEMODE			MULTIMODE		
		9/125		50/125	62.5/125	
	@1310NM	0.35dB/KM (MAX)		@850NM	2.8dB/KM (MAX)	3.0dB/KM (MAX)
	@1550NM	0.22dB/KM (MAX)		@1300NM	0.9dB/KM (MAX)	1.0dB/KM (MAX)
DISPERSION	@1310NM	3.5PS/NM.KM		@850NM	600MHZ.KM (MIN)	200MHZ.KM (MIN)
	@1550NM	18PS/NM.KM		@1300NM	800MHZ.KM (MIN)	500MHZ.KM (MIN)
REFRACTIVE INDEX	@1310NM	1.4675 TYPICAL		@850NM	1.490 TYPICAL	1.496 TYPICAL
	@1550NM	1.4681 TYPICAL		@1300NM	1.486 TYPICAL	1.487 TYPICAL
NUMERICAL APERTURE					0.2 (NOMINAL)	0.275 (NOMINAL)

Cable Specification

	LOOSE TUBE			TIGHT BUFFERED	
	INTERNAL	UNIVERSAL	ARMoured	INTERNAL	UNIVERSAL
COLOUR - 9/125 50/125 62.5/125	YELLOW ORANGE GREY	GREEN GREEN GREEN	GREEN GREEN GREEN	YELLOW ORANGE GREY	GREY GREY GREY
MATERIAL - OUTER STRENGTH	HFFR ARAMIND YARN	HFFR ARAMIND YARN	HFFR ARAMIND YARN	HFFR ARAMIND YARN	HFFR ARAMIND YARN
DIMENSIONS - OUTER	6.5MM	8.0MM	11.0MM	-	-
WEIGHT	45KG/KM	55KG/KM	110KG/KM	-	-
MIN BEND RADIUS	65MM	80MM	220MM	-	-
TENSION	350N	350N	350N	1000N	-
CRUSH RESISTANCE	3500N	3500N	3500N	2000N/10CM	18000N/10CM
TEMPERATURE RANGE	-10c TO +40c	-50c TO +70c	-50c TO +70c	-20c TO +70c	-55c TO +85c

Hughes fibre cable incorporates the following attributes. We constantly strive to improve the functionality of this exciting media.

- **Excellent Fibre Protection**
- **Excellent Handling**
- **Flame retardant & UL listed**
- **Indoor/outdoor versatility**

Loose Tube Fibre Cable

The construction of this cable allows the tube material to expand and contract due to temperature changes without damaging the fibres. The tubes are filled with a gel like material which provides moisture protection.

Loose tube cables are generally recommended for outdoor applications or for premise use where there may be significant changes in temperature.

Due to its construction loose tube cable is not recommended for riser or any vertical applications.



Loose Tube Fibre Cable			
9/125	Hughes Ref. 50/125	62.5/125	Description
15-109125lt1/**	15-150125lt1/**	15-62125lt1/**	Loose Tube Internal
15-109125lt2/**	15-150125lt2/**	15-62125lt2/**	Loose Tube Universal
15-109125lt3/**	15-150125lt3/**	15-62125lt3/**	Loose Tube Armoured

** Enter number of cores
Cores available as 02, 04, 06, 08, 10, 12, 16, 18, 24, 32, 48

Tight Buffered Fibre Cable

Tight jacket cables contain buffered fibres stranded with Kevlar strengthening yarn within a fire retardant polyolefin outer jacket.

These cables are small, flexible, rugged and easily terminated with our range of stranded connectors.

Designed for patchcords, pigtails, short point to point data links and riser applications.



Tight Buffered Fibre Cable			
9/125	Hughes Ref. 50/125	62.5/125	Description3
15-109125tb1/**	15-150125tb1/**	15-62125tb1/**	Tight Buffered Internal
15-109125tb2/**	15-150125tb2/**	15-62125tb2/**	Tight Buffered Universal

** Enter number of Cores
Cores available as 02, 04, 06, 08, 10, 12, 16, 18, 24, 32, 48

Fibre - Connectors

Fibre Connectors



- ST** – An AT&T designed connector whose ease of use and very high mating performance (normally 5000 mate-demate cycles) makes this connector ideal for most patch panel applications. This connector should not be used in hostile environments where it is open to dust, moisture or significant vibrations.
- SC** – This connector was designed to mitigate problems found associated with the ST connector. Its compact push-pull plastic body improves upon the ST and is more reliable, self-shrouding and easier to use.
- FC-PC** – This connector was specifically designed for telecommunication applications where the very highest performance is required, Used almost exclusively in the single mode fibre market. Its anti-rotation key prevents fibre end face damage and eliminates rotational sensitivity. The internally spring loaded ferrule resists shock, vibration and temperature stress.
- FDDI** – Also referred to as Fixed Shroud Duplex (FSD) or the Media Interface Connector (MIC). This connector, based on proven ceramic ferrule technology is a two channel snap-fit connector that combines low loss with positive side latch mating, polarisation, easy to use keying and bend limiting strain relief. A rigid protective shroud guards the connector ferrules against damage from mishandling.
- MT-RJ** – The latest fibre connector on the market. Borne to work alongside RJ type components, fitting into standard RJ-45 type faceplates and modular patch panels. Small in design and features the simplicity of easy push-pull connections. The MT-RJ connector incorporates all the optical performance benefits that are found in standard singlemode and multimode connectivity.

Fibre - Connectors

Fibre Connectors

	Connector Part	
Mode Type	Singlemode	Multimode
Typical Insertion Loss, dB	0.15	0.3
Typical Return Loss(*), dB	-50	-
Operating Temperature, °C	-40 to +75	
Storage Temperature, °C	-55 to +85	

FEATURES

- *Low Insertion Loss*
- *Low back-reflection Loss*
- *Custom-Defined Specifications*
- *Easy Installation*
- *Environmentally Stable*



Fibre Connectors - Singlemode

Hughes Ref.		
Straight	Angled	Description
15-sm011125	15-sm111125	ST Connector
15-sm021125	15-sm121125	SC Connector
15-sm031125	15-sm131125	FC Connector
15-sm041125	-	FDDI Connector
15-sm051125	-	MTRJ Connector

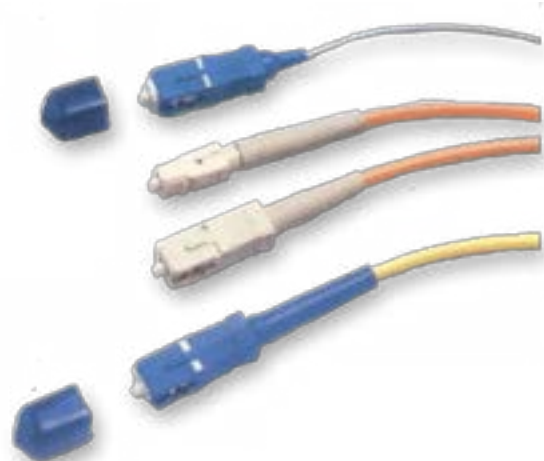
Fibre Connectors - Multimode

Hughes Ref.		
Straight	Angled	Description
15-mm011125	15-mm111125	ST Connector
15-mm021125	15-mm121125	SC Connector
15-mm031125	15-mm131125	FC Connector
15-mm041125	-	FDDI Connector
15-mm051125	-	MTRJ Connector

Fibre - Pigtailed/Patchcords

Features

- Low Insertion Loss
- Low back-reflection Loss
- Custom-Defined Specifications
- Easy Installation
- Environmentally Stable



Pigtail / Patchcord - Singlemode

Hughes Ref.				
Pigtail straight	Pigtail angled	Patchcord straight	Patchcord angled	Description
25-01sm1011/**	-	25-02sm1011/**	-	ST - ST simplex
25-01sm1012/**	-	25-02sm1012/**	-	ST - ST duplex
25-01sm2021/**	25-01sm2121/**	25-02sm2021/**	25-02sm2121/**	SC - SC simplex
25-01sm2022/**	25-01sm2122/**	25-02sm2022/**	25-02sm2122/**	SC - SC duplex
25-01sm3031/**	25-01sm3131/**	25-02sm3031/**	25-02sm3131/**	FC - FC simplex
25-01sm3032/**	25-01sm3132/**	25-02sm3032/**	25-02sm3132/**	FC - FC duplex
25-01sm4041/**	-	25-02sm4041/**	-	FDDI - FDDI simplex
25-01sm4042/**	-	25-02sm4042/**	-	FDDI - FDDI duplex
25-01sm50541/**	-	25-02sm5051/**	-	MTRJ - MTRJ simplex
25-01sm5052/**	-	25-02sm5052/**	-	MTRJ - MTRJ duplex

** enter length i.e. 01 For 1m

Pigtail / Patchcord - Multimode

Hughes Ref.				
Pigtail straight	Pigtail angled	Patchcord straight	Patchcord angled	Description
25-01mm1011/**	-	25-02mm1011/**	-	ST - ST simplex
25-01mm1012/**	-	25-02mm1012/**	-	ST - ST duplex
25-01mm2021/**	25-01mm2121/**	25-02mm2021/**	25-02mm2121/**	SC - SC simplex
25-01mm2022/**	25-01mm2122/**	25-02mm2022/**	25-02mm2122/**	SC - SC duplex
25-01mm3031/**	25-01mm3131/**	25-02mm3031/**	25-02mm3131/**	FC - FC simplex
25-01mm3032/**	25-01mm3132/**	25-02mm3032/**	25-02mm3132/**	FC - FC duplex
25-01mm4041/**	-	25-02mm4041/**	-	FDDI - FDDI simplex
25-01mm4042/**	-	25-02mm4042/**	-	FDDI - FDDI duplex
25-01mm50541/**	-	25-02mm5051/**	-	MTRJ - MTRJ simplex
25-01mm5052/**	-	25-02mm5052/**	-	MTRJ - MTRJ duplex

** enter length i.e. 01 for 1m

Fibre Rack Mount Panels

Fibre Panels Rack Mount

Hughes Ref.	Description
-------------	-------------

37-0121125	4 port duplex
37-0141125	8 port duplex
37-0151125	12 port duplex
37-0161125	16 port duplex
37-0171125	24 port duplex

SC Type

37-0211125	2 port duplex
37-0221125	4 port duplex
37-0231125	6 port duplex
37-0241125	8 port duplex
37-0251125	12 port duplex



Fibre Wall Mount Panels



Fibre Panels Wall Mount

Hughes Ref.	Description
-------------	-------------

37-0112125	2 port duplex
37-0122125	4 port duplex
37-0142125	8 port duplex
37-0152125	12 port duplex
37-0162125	16 port duplex

SC Type

37-0202125	1 port duplex
37-0212125	2 port duplex
37-0222125	4 port duplex
37-0232125	6 port duplex
37-0242125	8 port duplex

Fibre - Couplers

Fibre Couplers

Hughes Ref.	Description
15-3011125	ST Inline Coupler
15-3021125	SC Inline Coupler
15-3031125	FC Inline Coupler
15-3041125	FDDI Inline Coupler
15-3061125	Escon Inline Coupler



Related Products



Cabinets

page 85

Coaxial Connectors

Hughes Electronics coaxial connections are designed and manufactured using state of the art CAD and CNC technology. Strict In Process and 0 defect quality control procedures ensures consistent high performance, reliability and impedance matched connectors that will meet your demand for the most exacting applications.

Most connectors are held as stock in central London allowing fast response and delivery. We also offer a design, and development service for any type of coaxial connector.

The following pages show a small sample of our most popular connectors. Further products not shown in this catalogue, are:-

TNC, F Type, UHF, SMA, SMB, SMC, PAL, MMX, MCX and Twinnax.

Call our sales team with your requirements.



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Coaxial - BNCs

BNC Connectors

G703 Panel mount

BNC Connectors

Hughes Ref. male	Hughes Ref. female	Hughes Ref. b/h female	Description
06-60004	06-60034	06-60038	BNC Crimp rg58
06-60018	06-60035	06-60039	BNC Crimp rg59
06-60029v	06-60034v	06-60038v	BNC Crimp Triple Coax Cable
06-60061	-	-	BNC Crimp BT 2001
06-60062	06-60067	-	BNC Crimp BT 2002
06-60063	06-60065	06-60064	BNC Crimp BT 2003
06-60060	06-12382	06-2d382	BNC Crimp BT 3002
06-60072	-	-	BNC Crimp Plug RG179
06-60080	06-60083	-	BNC Crimp RA7000
06-60074	06-60084	-	BNC Crimp RA8000
06-60000	-	-	BNC Solder Clamp RG58
06-60001	-	-	BNC Solder Clamp RG59
06-60002	-	-	BNC Solder Clamp RG213/214



BNC Adaptors

Hughes Ref.	Description
06-60012	BNC female-female inline
06-60013	BNC male-male inline
06-60014	BNC male-female right angle
06-60015	BNC f-m-f t adaptor
06-60015y	BNC f-m-f y adaptor
06-60044	BNC female-female bulkhead
06-60045	BNC fully insulated f-f bulkhead

BNC Terminators

Hughes Ref. Male	Hughes Ref. Female	Description
06-60031	06-0027	BNC 50 ohm Termination Plug
06-60032	06-60028	BNC 75 ohm Termination Plug



Coaxial - Type 43 BT

Type 43 Connectors



Type 43 Plugs & Sockets

Hughes Ref. Male b/h	Hughes Ref. Female straight	Description
09-11211	09-21111	Type 43 for BT 2002
09-11212	09-21112	Type 43 for BT 2002
09-11213	09-21113	Type 43 for BT 3002
09-11214	09-21114	Type 43 for rg179

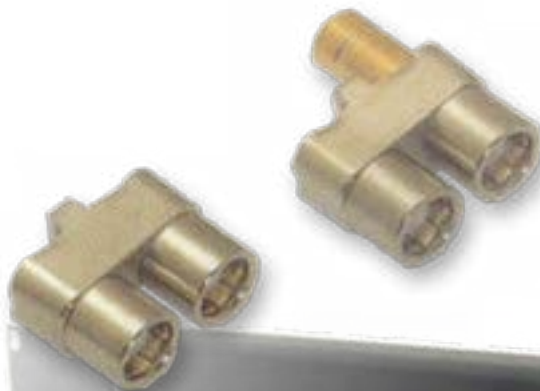
Type 43 HDC Plugs & Sockets

Hughes Ref. Male b/h	Hughes Ref. Female straight	Description
09-12211	09-22111	Type 43 hdc for BT 2002
09-12212	09-22112	Type 43 hdc for bt 2003
09-12213	09-22113	Type 43 hdc for BT 3002
09-12214	09-22114	Type 43 hdc for BT rg179



Type 43 U Links

Hughes Ref.	Description
09-41100	Type 43 u link
09-41700	Type 43 u link test port
09-42100	Type 43 u link hdc
09-42700	Type 43 u link hdc test port



Bespoke DDF Panels

Coaxial - N Types

N Type Connectors



*Silver on Nickel
Plating*

N Type Crimp Plugs & Jacks

Hughes Ref. Male	Hughes Ref. Female	Description
13-60922	13-60936	N Type Crimp RG58
13-60921	13-60935	N Type Crimp RG59
13-60932	13-2137261	N Type Crimp RA519/RG213/RG214
13-60924	13-60925	N Type Crimp RG223
13-60062	13-60063	N Type Crimp BT2002
13-60923	13-60926	N Type Crimp RG6/CT100
13-60937	13-60938	N Type Crimp Bulkhead RG223



N Type Clamp solder Plugs & Jacks

Hughes Ref. Male	Hughes Ref. Female	Description
13-60902	13-60903	N Type Clamp Solder RG58
13-609061	13-60907	N Type Clamp Solder RG59
13-60900	13-60905	N Type Clamp Solder RA519/RG213/RG214
13-60155	13-60156	N Type Clamp Solder R/Angle RG214/9913



N Type Adaptors & Terminators

Hughes Ref.	Description
13-35000	N Type Male to Female R/Angle
13-60911	N Type Female to Female Adaptor
13-60944	N Type Female to Female Bulkhead
13-60930	N Type Terminator 50Ohm Male
13-60931	N Type Terminator 50Ohm Female
13-60913	N Type Male to Male Adaptor

Hughes also supply N-Types for corrugated feeder cables. Please see the Cellular Telecoms section for details.

Coaxial - 7/16 TH

7/16 Connectors

Low-PIM Connectors



Specification

-PIM	<-160dBc
-VSWR Straight	<1.15(0.8-2.5GHz)
-Insertion Loss, typical	0.08dB
-Shielding Effectiveness	110dB
-RF Operating Voltage, max. (vrms)	707.00V
-Outer Contact Resistance, max.	0.30 mOhm
-Inner Contact Resistance, max.	2.00 ,Ohm
-Insulation Resistance, min.	5000 MOhm

7/16th Plugs & Jacks

Hughes Ref. Male	Hughes Ref. Female	Hughes Ref. Male R/A	Hughes Ref. Female R/A	Description
15-00001	15-10001	15-00001R	15-10001R	7/16th Crimp RJ58/RG59
15-00002	15-10002	15-00002R	15-10002R	7/16th Crimp RA519
15-00020	15-10020	15-00020R	15-10020R	7/16th Crimp/Solder 1 1/4"
15-00021	15-10021	15-00021R	15-10021R	7/16th Crimp/Solder 7/8"
15-00022	15-10022	15-00022R	15-10022R	7/16th Crimp/Solder 3/4"
15-00023	15-10023	15-00023R	15-10023R	7/16th Crimp/Solder 5/8"
15-00024	15-10024	15-00024R	15-10024R	7/16th Crimp/Solder 1/2"
15-00025	15-10025	15-00025R	15-10025R	7/16th Crimp/Solder 3/8"



7/16th Adaptors

Hughes Ref.	Description
15-30001	7/16th Male to Male
15-30002	7/16th Female to Female

Ultra-Low-PIM...



- **Zero Magnetics**
- **Zero Harmonics**
- **Ultra - Low PIM**
- **Ultra - low VSWR**
- **Proprietary composite materials**
- **Backwards compatible with legacy 7/16 connectors**
- **IP68 Rating**

...Coming Soon

Coaxial - 1.0/2.3

1.0/2.3 Connectors



1.0/2.3 Crimp Plugs & Jacks

Hughes Ref. Male	Hughes Ref. Female	Description
14-6004	14-60034	SMA Crimp Socket rg58
14-60018	14-60035	1.0/2.3 right angled Crimp rg174

1.0/2.3 PCB Jacks

Hughes Ref. Female	Description
14-60001	1.0/2.3 pcb 6.35
14-60002	1.0/2.3 pcb right angle 6.35



Coaxial-1.6/5.6

1.6/5.6 Connectors



1.6/5.6 Crimp Plugs & Jacks

Hughes Ref. Male	Hughes Ref. Female	Description
14-70004	14-70034	1.6/5.6 Crimp rg59/179
14-70018	14-70035	1.6/5.6 right angled Crimp rg59/179

1.6/5.6 Clamp Plugs & Jacks

Hughes Ref. Male	Hughes Ref. Female	Description
14-70022	14-70024	1.6/5.6 Clamp rg59/179
14-70023	14-70025	1.6/5.6 Clamp right angled rg59/179



Coaxial - Interseries Adaptors

Interseries Adaptors

Interseries Adaptors

Hughes Ref.	Description
01-61164210	BNC male to f type female
01-61164211	BNC male to f type male
01-61168110	BNC male to rca male
01-68161210	BNC male to rca female
01-61169210	BNC male to uhf female
01-62164210	BNC female to f type female
01-62164211	BNC female to f type male
01-6216311	BNC female to n type male
01-61118712	BNC to double binding post
01-6216411	BNC to single binding post
01-63164210	N type male to f type female
01-64164211	N type male to f type male
01-64164311	N type male to bnc male
01-64264210	N type female to f type female
01-64264211	N type female to f type male

Please call our sales team if your adaptor requirement is not listed above



Accessories

Hughes Ref.	Description
31-170015	Panel washer with pip
31-170016	Panel washer without pip
31-170018	Solder tag
07-605XX	RG58/BT2002 boots
07-607XX	RG59/62 boots
07-609XX	RG59/62 boots
07-604XX	CT100 boots
07-608XX	Coaxial insert boots

Substitute XX for the following colour code:
31-Black, 32-Red, 33-Blue, 34-Yellow, 35-Green

Related Products



Coaxial Frames and Panels page 81



Coaxial Tools & Testers page 92



Coaxial Cable Assemblies page 74



Coaxial Cable page 41

Mixed Layouts

Hughes Electronics Mixed Layouts are designed and manufactured on the Swiss/French border. using world famous micro-precision engineering skills honed from years of watch and clock making.

Hughes mixed layout series deliver up to 40A power, in combination with coaxial and d.type data connections in a standard sub shell.

Hughes Electronics hold a comprehensive and flexible range of coaxial and power inserts in our Central London Warehouse.

We also offer a design and development service for your special applications.



STRAIGHT COAXIAL INSERTS	70
RIGHT ANGLE COAXIAL INSERTS	70
PCB MOUNT COAXIAL INSERTS	70
STRAIGHT POWER INSERTS	71
PCB MOUNT POWER INSERTS	71
HOUSING	72

Mixed Layouts

Coaxial Inserts

Straight Coaxial Inserts

Hughes Ref. male	Hughes Ref. female	Description
11-60055	11-60056	Solder/Crimp for rg179 Cable
11-60057	11-60058	Solder/Crimp for mini rg59 Cable
11-60065	11-60066	Crimp/Crimp for rg179 Cable
11-60067	11-60068	Crimp/Crimp for mini rg59 Cable



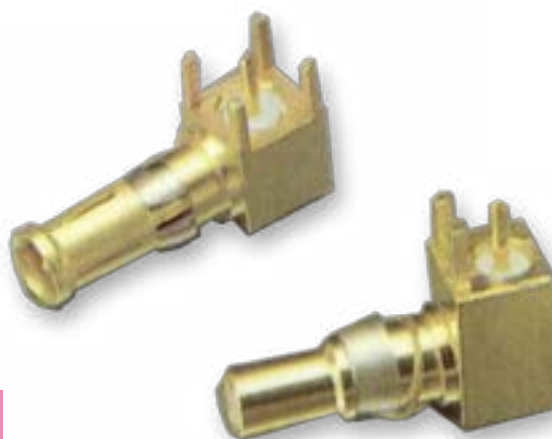
Right Angle Coaxial Inserts

Hughes Ref. male	Hughes Ref. female	Description
11-60075	11-60076	Crimp for rg179 Cable
11-60077	11-60078	Crimp for rg58 Cable



PCB Mount Coaxial Inserts

Hughes Ref. male	Hughes Ref. female	Description
11-60095	11-60096	PCB mount 4 pole
11-60097	11-60098	PCB mount 2 pole

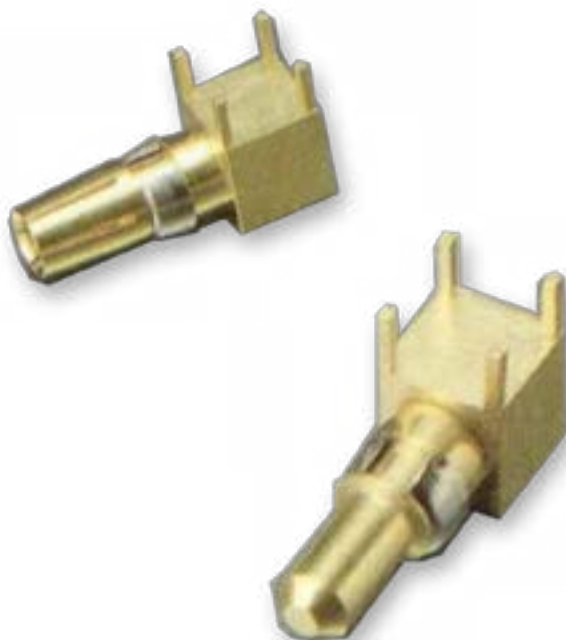


Mixed Layouts

Power Inserts

Straight Power Inserts

Hughes Ref. male	Hughes Ref. female	Description
11-70051	11-70052	Solder 10a
11-70053	11-70054	Solder 20a
11-70055	11-70056	Solder 40a
11-70061	11-70062	Crimp 10a
11-70063	11-70064	Crimp 20a
11-70065	11-70066	Crimp 40a



PCB Mount Power Inserts

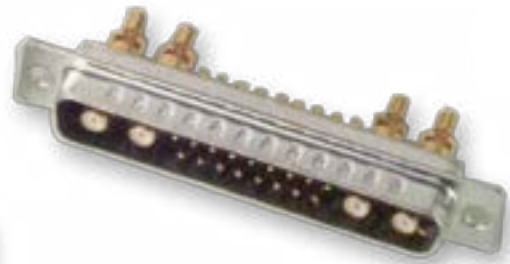
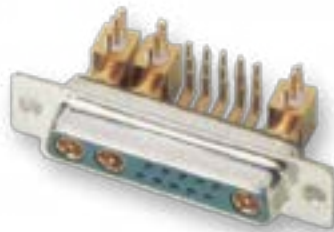
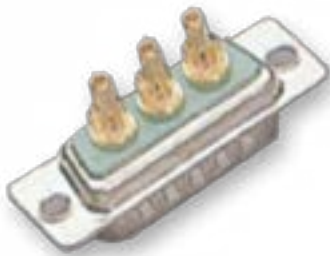
Hughes Ref. male	Hughes Ref. female	Description
11-70021	11-70022	Straight 1 leg pcb Mount
11-70025	11-70026	Right angle 1 leg pcb Mount
11-70031	11-70032	Straight 4 legs pcb Mount
11-70035	11-40036	Right angle 4 legs pcb Mount

Mixed Layouts

D-Type Mixed layout housing

Housing

Hughes Ref. male	Hughes Ref. female	Description
11-3w3p	11-3w3s	3w3 Shell (3 cavities)
11-5w5p	11-5w5s	5w5 Shell (5 cavities)
11-8w8p	11-8w8s	8w8 Shell (8 cavities)
11-7w2p	11-7w2s	7w2 Shell (2 cavities + 2 solder contacts)
11-13w3p	11-13w3s	13w3 Shell (3 cavities + 10 solder contacts)
11-27w2p	11-27w2s	27w2 Shell (2 cavities +25 solder contacts)



Related Products



Hoods

page 76



Cable

page 47

D Type Connectors

Hughes Electronics Subminiature D Type connectors have been designed and developed for high performance applications, particularly in the field of telecommunications, data transmission and private automated branch switching.

Most connectors are held as stock in our extensive Central London warehouse allowing fast response and delivery.

In addition to our standard range, we also offer a design, development and custom built service for any type of D connector.

CRIMP D TYPES	74
CRIMP D TYPE PINS & CONTACTS	74
SOLDER ST&F D TYPES	74
SOLDER MACHINED D TYPES	74
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D-Types

D Type Connectors

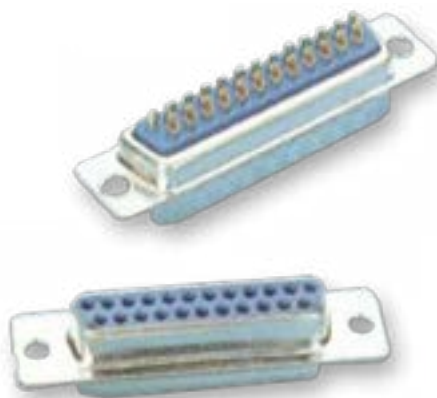


Crimp Style

Hughes Ref. male	Hughes Ref. female	Description
02-20400	02-20401	9way Crimp
02-20410	02-20411	15way Crimp
02-20420	02-20421	25way Crimp
02-20431	02-20432	37way Crimp
02-23250	02-23451	h/d 15way Crimp
02-20441	02-20442	h/d 26way Crimp

Pins & Contacts

Hughes Ref. male	Hughes Ref. female	Description
02-10010	02-10011	ST&F
02-10000	02-10001	Machined Turned
02-20251	02-20252	H/D ST&F



Solder ST&F Pin

Hughes Ref. male	Hughes Ref. female	Description
02-20300	02-20301	9way solder
02-20310	02-20311	15way solder
02-20340	02-20342	25way solder
02-20350	02-20351	37way solder
02-20000	02-20001	h/d 15way solder
02-28232	02-2b8132	n/d 26way solder
02-2bb231	02-2bb102	h/d 44way solder
02-2bc231	02-20361	h/d 50way solder

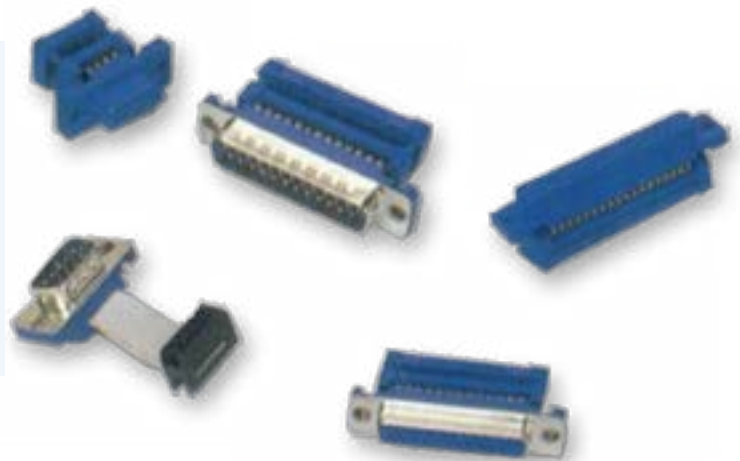
Solder Machined Pin

Hughes Ref. male	Hughes Ref. female	Description
02-21300	02-21301	9way Solder
02-21310	02-21311	15way Solder
02-21340	02-21341	25way Solder
02-20352	02-20353	37way Solder



IDC Flat Cable Type

Hughes Ref. Male	Hughes Ref. Female	Description
02-11141	02-11241	9way idc
02-13141	02-13241	15way idc
02-17141	02-17241	25way idc



Centronics

Hughes Ref. Male	Hughes Ref. Female	Description
02-2c2231031	02-2c2132031	14way centronics inc metal hood
02-2c6231031	02-2c6132031	24way centronics inc metal hood
02-2c9231031	02-2c9132031	36way centronics inc metal hood
02-2cc231031	02-2cc132031	50way centronics inc metal hood
02-2c223104	02-2c213204	14way centronics inc r/a plastic hood
02-2c623104	02-2c613204	24way centronics inc r/a plastic hood
02-2c923104	02-2c913204	36way centronics inc r/a plastic hood
02-2cc231031	02-2CC132031	50way centronics inc r/a plastic hood

Gender Changers

Hughes Ref.	Description
01-27127110	9way male-male
01-27127210	9way male-female
01-27227210	9way female-female
01-28128110	15way male-male
01-28128210	15way male-female
01-28228210	15way female-female
01-29129110	25way male-male
01-29129210	25way male-female
01-29229210	25-way female-female
01-27129210	9way male-25way female
01-38128111	h/d 15way male-male
01-38228211	h/d 15way female-female



D-Types



Hoods - Snap-Fit

Hughes Ref.	Description
02-30011	9way black
02-30012	15way black
02-30013	25way black

Also available in: grey, red, green, blue and yellow.

Hoods - Long Body

Hughes Ref. plastic	Hughes Ref. chrome	Hughes Ref. metal	Description
02-30043	02-30015	02-30029	9way thumb screws
02-30046	02-30017	02-30030	15way thumb screws
02-30051	02-30018	02-30032	25way thumb screws
02-30053	02-30020	02-30083	37way thumb screws

A variety of hood styles are available.

Please call our sales team for more information.



D-Types



Modular Adaptors

Hughes Ref. male	Hughes Ref. female	Description
01-14227117	01-14227217	9way d to rj45 black
01-14228119	01-14228217	15way d to rj45 black
01-14229117	01-14229217	25way d to rj45 black

Also available in: Grey, Red, Green, Blue & Yellow



Accessories

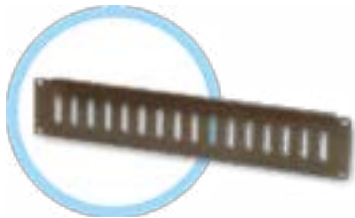
Hughes Ref. male	Description
02-40002	25w Screwlock Assembly
02-40003	Side screw for Telco Connector
02-40006	Post cover for 9wd plug
02-40007	Female mounting post long
02-40008	Hex nuts 4-40
02-40009	M2 68mm screw posidrive
02-40001	15way slide lock assembly
02-40002	25way slide lock assembly
02-40021	9 way dust cover
02-40010	15 way dust cover
02-40023	25 way dust cover



Related Products



Cable Assemblies page 79



Frames and Panels page 89



Tools & Testers page 100



Cable page 50



Faceplates & Modules page 15

Cable Assemblies

Cable Assemblies

Hughes Electronics cable assemblies are manufactured with meticulous attention to detail in both mechanical and automated assembly lines.

Rigorous work in progress and final inspection testing assures only the highest quality assemblies are despatched to our customers.

Our warehouse in central London stocks a wide and flexible range of cable assemblies to meet most applications.

Our Inhouse production facilities and Asian partnerships provides unparalleled service designed to meet any budget, time frame or quantity requirement.

UTP/STP PATCH LEADS	80
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POWER LEADS	80
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FIBRE LEADS	81
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CABLE ASSEMBLIES - MADE TO ORDER	82
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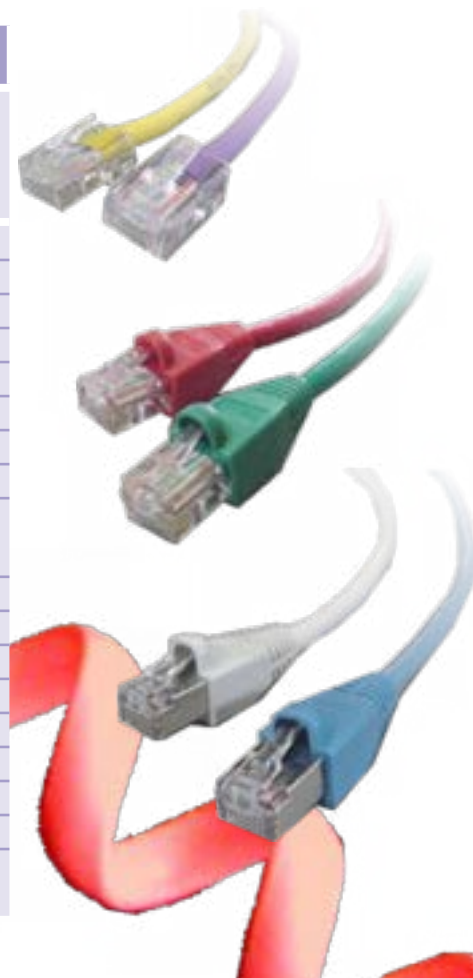
CUSTOM CABLE CONFIGURATION SHEET	84
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Cable Assemblies



Patch Leads

Hughes Ref.		Description
Unbooted	Booted	
UTP		
25-223131014	25-223131114	Red
25-223131024	25-223131224	Green
25-223131034	25-223131334	Blue
25-223131044	25-223131444	Yellow
25-223131054	25-223131554	Black
25-223131064	25-223131664	White
25-223131074	25-223131884	Grey
25-223131094	25-223131994	Orange
STP		
Add length of cable to end of ref. number. I.E. 2m red unbooted patch lead 25-223131014/02		
-	25-323131114	Red
-	25-323131224	Green
-	25-323131334	Blue
-	25-323131444	Yellow
-	25-323131554	Black
-	25-323131664	White
-	25-323131774	Violet
-	25-323131884	Grey
-	25-323131994	Orange



Power Leads

Hughes Ref.	Description
25-81124321	IEC male to female
25-821251121	5amp uk mains to 3pin iec
25-831251121	13amp uk mains to 3pin iec
25-82125152	5amp uk mains to r/a 3pin iec
25-84190121	3amp uk mains to 2pin iec
25-8619011	euro mains to 2pin iec
25-8619012	euro mains to 3pin iec

Cable Assemblies

Pigtail / Patchcord - Singlemode

Hughes Ref.				
Pigtail straight	Pigtail angled	Patchcord straight	Patchcord angled	Description
25-01sm1011/**	-	25-02sm1011/**	-	ST - ST simplex
25-01sm1012/**	-	25-02sm1012/**	-	ST - ST duplex
25-01sm2021/**	25-01sm2121/**	25-02sm2021/**	25-02sm2121/**	SC - SC simplex
25-01sm2022/**	25-01sm2122/**	25-02sm2022/**	25-02sm2122/**	SC - SC duplex
25-01sm3031/**	25-01sm3131/**	25-02sm3031/**	25-023131/**	FC - FC simplex
25-01sm3032/**	25-01sm3132/**	25-02sm3032/**	25-02sm3132/**	FC - FC duplex
25-01sm4041/**	02-2c213204	25-02sm4041/**	-	FDDI - FDDI simplex
25-01sm4042/**	02-2c613204	25-02sm4042/**	-	FDDI - FDDI duplex
25-01sm50541/**	02-2c913204	25-02sm5051/**	-	MTRJ - MTRJ simplex
25-01sm5052/**	02-2CC132031	25-02sm5052/**	-	MTRJ - MTRJ duplex

** enter length i.e 01 for 1m

Pigtail / Patchcord - Multimode

Hughes Ref.				
Pigtail straight	Pigtail angled	Patchcord straight	Patchcord angled	Description
25-01sm1011/**	-	25-02sm1011/**	-	ST - ST simplex
25-01sm1012/**	-	25-02sm1012/**	-	ST - ST duplex
25-01sm2021/**	25-01sm2121/**	25-02sm2021/**	25-02sm2323/**	SC - SC simplex
25-01sm2022/**	25-01sm2122/**	25-02sm2022/**	25-02sm2122/**	SC - SC duplex
25-01sm3031/**	25-01sm3131/**	25-02sm3031/**	25-023131/**	FC - FC simplex
25-01sm3032/**	25-01sm3132/**	25-02sm3032/**	25-02sm3132/**	FC - FC duplex
25-01sm4041/**	02-2c213204	25-02sm4041/**	-	FDDI - FDDI simplex
25-01sm4042/**	02-2c613204	25-02sm4042/**	-	FDDI - FDDI duplex
25-01sm50541/**	02-2c913204	25-02sm50541/**	-	MTRJ - MTRJ simplex
25-01sm5052/**	02-2CC132031	25-02sm5052/**	-	MTRJ - MTRJ duplex

** enter length i.e 01 for 1m



Cable Assemblies

Design Your OWN Cable Assemblies

Wherever your imagination takes you

No Limits



*Telecom
Applications*

*CATS Teleso's
Performance
Guaranteed*

100MHz
GUARANTEED
CAT5

Cable Assemblies

G703 Applications

ADSL Applications

OEM & ODM

- Connector Development
- Mold Development
- Industry Design
- Cable Design

Nothing is Impossible

Cable Assemblies

YOUR CABLE ASSEMBLY DESIGN

COMPANY NAME.....CONTACT NAME.....

COMPANY ADDRESS.....

ACCOUNT NO. (IF APPLICABLE).....TEL No.....FAX NO.....

QUANTITY OF ASSEMBLIES

SAMPLE WILL BE SUPPLIED BY CUSTOMER

YES/NO

DATE ASSEMBLIES REQUIRED BY

CUSTOMER REQUIRES SAMPLE OF ASSEMBLY

YES/NO

CONNECTOR A		CABLE	CONNECTOR B		
DESCRIPTION			LENGTH OF CABLE	DESCRIPTION	
				COLOUR OF CABLE	
M	F	TYPE OF CABLE	M		F
R/A	STRAIGHT		R/A	STRAIGHT	

CONNECTOR A PIN No.	CONNECTOR B PIN No.	CONNECTOR A PIN No.	CONNECTOR B PIN No.	CONNECTOR A PIN No.	CONNECTOR B PIN No.	CONNECTOR A PIN No.	CONNECTOR B PIN No.
1		15		29		43	
2		16		30		44	
3		17		31		45	
4		18		32		46	
5		19		33		47	
6		20		34		48	
7		21		35		49	
8		22		36		50	
9		23		37			
10		24		38			
11		25		39			
12		26		40			
13		27		41			
14		28		42			

PLEASE PHOTOCOPY AND FILL OUT THIS FORM AND THEN FAX TO US ON (44) 02073781434
 PLEASE CHECK TO SEE IF YOU HAVE COMPLETED ALL PARTS WHERE NECESSARY
 PLEASE TICK HERE IF THERE ARE ANY ADDITIONAL SHEETS ACCOMPANYING THIS SHEET

Cabinets & Accessories

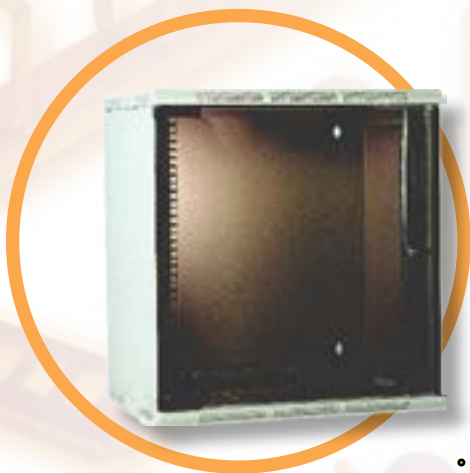
Cabinets & Accessories

Hughes Electronics cabinets and accessories are manufactured with advanced RCT metal pre-treatment, combined with both powder coating and wet paint finish.

All floor standing cabinets incorporates ventilation in the side panels and roof to assist with thermal management.

Hughes Electronics stock a comprehensive and flexible range of cabinets and accessories to meet most design requirements.

Most accessories are held as stock in central London allowing fast response and next day delivery to any UK site or same day delivery to any London site.



FLOOR STANDING CABINETS	86
WALL MOUNT CABINETS	86
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FAN UNITS	87
ACCESSORIES	87
BRUSH PANELS	88
CABLE MANAGEMENT PANELS	88
BLANKING PANELS	88
UNLOADED PANELS	89
SOHO SYSTEM	90

Cabinets & Accessories

Floor standing cabinets

Floor Standing Cabinets

Hughes Ref. Cabinet Size			Description
600x600	600x800	800x800	
44-177d011	44-177f011	44-1a7f011	12u Floor standing
44-17ad011	44-17af011	44-1aaf011	18u Floor standing
44-17dd011	44-17df011	44-1adf011	24u Floor standing
44-17ed011	44-17e011	44-1aef011	27u Floor standing
44-171d011	44-17if011	44-1aif011	36u Floor standing
44-17kd011	44-17kf011	44-1akf011	39u Floor standing
44-17nd011	44-17nf011	44-1anf011	42u Floor standing
44-17od011	44-17of011	44-1aof011	45u Floor standing
44-17pd011	44-17pf011	44-1apf011	47u Floor standing

Optional Extras:

Vented Side Panels
 Vented Front / Rear Doors
 Digital lock doors
 1000mm depth
 1200mm depth

Please call our sales team for more information



Wall Mount Cabinets

Wall Mount Cabinets

Hughes Ref. depth			Swing frame	Description
300mm	400mm	500mm		
44-3137011	44-3138011	44-313b011	44-3a138011	6u Wall Mount
44-3157011	44-3158011	44-315b011	44-3a158011	9u Wall Mount
44-3177011	44-3178011	44-317b011	44-3a178011	12u Wall Mount
44-3187011	44-3188011	44-318b011	44-3a188011	15u Wall Mount
44-31a7011	44-31a8011	44-31ab011	44-3a1a8011	18u Wall Mount

Cabinets & Accessories

Shelves

Shelves

Hughes Ref.		Description
Fixed	Telescopic	
44-4000001169	44-4000001369	Ventilated Shelf 600x450
44-400000116b	44-400000136b	Ventilated Shelf 600x500
44-400000116d	44-400000136d	Ventilated Shelf 600x600
44-4000001199	44-4000001399	Ventilated Shelf 800x450
44-400000119b	44-400000139b	Ventilated Shelf 800x550
44-400000119d	44-400000139d	Ventilated Shelf 800x600



Fan Units



Fan Units

Hughes Ref.	Description
44-4002	2way roof mounted fan unit
44-4004	4way roof mounted fan unit
44-4006	6way roof mounted fan unit

Accessories

Accessories

Hughes Ref.	Description
44-4000000054	Cage nut (set of 50)
44-4000064	Baying kit
44-4000024	Standard castors (set of 4)
44-4000034	Heavy duty castors (set of 4)
44-4000014	Jacking feet



Cabinets & Accessories

Cable Management Panels



Cable Management Panels

Hughes Ref.	Description
44-00002	1u Brush Panel
44-00003	1u Brush Panel with letterbox
44-00004	1u Brush Panel with letterbox) 5 rings
44-00005	1u 4 ring 65mm Cable Management Panel
44-00005e	1u 4 ring 100mm Cable Management Panel
44-00006	1u 5 ring 65mm Cable Management Panel
44-00006e	1u 5 ring 100mm Cable Management Panel
44-011f4	2u 4 ring 65mm Cable Management Panel
44-011f5	2U 5 ring 65mm Cable Management Panel



Blanking Panels

Blanking Panels

Hughes Ref.	Description
44-00081	1u Blanking Panel
44-00082	2u Blanking Panel
44-00083	3u Blanking Panel
44-00084	4u Blanking Panel
44-000 8X	Please substitute X with no. of u required



Cabinets & Accessories

Unloaded Panels

Unloaded Panels

Hughes Ref.	Description
37-201160112/1	16 port Unloaded bnc Panel
37-201240112/1	24 port Unloaded bnc Panel
37-201320112/1	32 port Unloaded bnc Panel
37-311000102	16 port Unloaded RJ45 Panel
37-511000102	24 port Unloaded RJ45 Panel
37-102240111	24 port Unloaded RJ45 Panel with cable management
37-721000102	32 port Unloaded RJ45 Panel
37-31c000102	16 port Unloaded D15 Panel
37-42c000402	18 port Unloaded D15 Panel
37-72c000102	32 port Unloaded D15 Panel
37-93c000102	48 port Unloaded D15 Panel
37-g213070162	32 port type 43 Panel
37-g243070162	64 port type 43 Panel
37-g253070162	96 port type 43 Panel
09-91132	32 port type 43 Connector block



Cabinets & Accessories

Soho Systems

Soho Systems

Hughes Ref. Description

44-s00001 6u Cabinet

44-s00002 9u Cabinet

44-s00005 1u Cable Management Panel

44-s00008 1u Brush Panel

44-s00009 Shelf

44-s00010 12 port CAT5e Patch Panel

44-s00011 12 port Voice Panel

44-s00012 12 port ISDN panel

44-s00013 12 port unloaded BNC panel

44-s00014 12 port unloaded RJ45 panel

44-s00015 12 port unloaded D15 panel



NETWORK TWO
COMPUTERS USING A
BASIC LINK

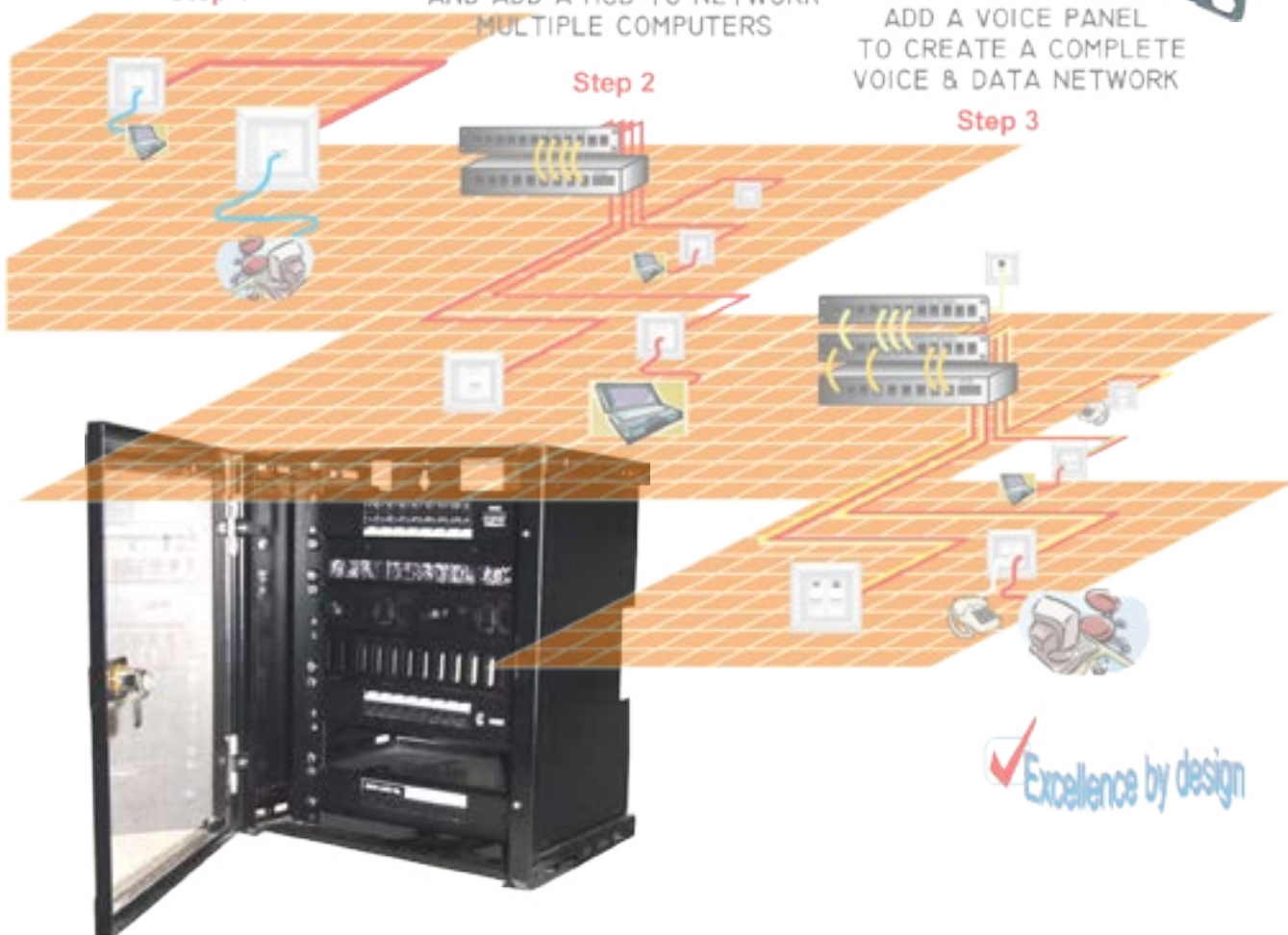
Step 1

CREATE MULTIPLE BASIC
LINKS USING A PATCH PANEL
AND ADD A HUB TO NETWORK
MULTIPLE COMPUTERS

Step 2

ADD A VOICE PANEL
TO CREATE A COMPLETE
VOICE & DATA NETWORK

Step 3



 Excellence by design

Cabinets & Accessories

Related Products



Keystone Jacks

page 12



Coaxial Connectors

page 61



D Type Connectors

page 73



RJ45 Couplers

page 18

Cabinets & Accessories

Power Distribution Units

Hughes Electronics PDUs offers a wide range of features including:-

- Unique, ultra safe Bus Bar design provides wire free system for optimum safety
- Modular system design provides multi-outlet configurations
- Safety protection and metering modules (Optional)
- Horizontal or Vertical mounting options
- Powder coated or lightweight, rugged, anodised aluminium construction
- Single or two wire inputs
- 1U or 1.5U options available

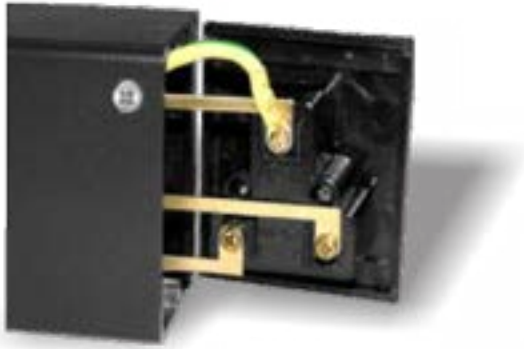
Hughes electronics stock a comprehensive and flexible range of PDUs and accessories to meet most design requirements.



BESPOKE MODULAR PDUS	94
1U UK SOCKET PDU - HORIZONTAL	95
1.5U UK SOCKET PDU - HORIZONTAL	95
1.5U UK SOCKET PDU - VERTICAL	96
1U IEC SOCKET - HORIZONTAL	97
1U IEC SOCKET - VERTICAL	97
DESK MODULES	98

PDU's

Bespoke Modular PDU's



Specifications

- 240/250 VAC
- 50/60Hz
- Aluminium alloy shell (ho5vv-f3gx1.5mm2)
- 13, 16, 20 or 32 amp current rating
- C.E and ROHS compliant



Outlet and modules available:



90 Degree
UK Socket



45 Degree
UK Socket



Schuko
Socket



IEC C13
Socket



IEC C19
Socket



RJ45 Data
Socket



Blank



Neon Switch

Protection and sensing/metering modules available:



Temperature module



Master/Slave module



Voltage and current module



Overload Detection & protection module
(with auto-shutdown and reset button)



Leakage Detection &
Protection Module
(with auto-shutdown and reset)



Surge Detection & protection module
(with LED indicators for power, surge and ground)

1U UK Socket PDU - Horizontal

Hughes Ref.	Description
48-21721/03	1u 4 way 13amp uk 90 degree horizontal
48-25511	1u 6 way 13amp uk 90 degree horizontal

All units are fitted with a 13a UK plug as standard.
IEC C14, IEC C19 or 16a Commando plugs are available upon request.



1.5U UK Socket PDU - Horizontal

Hughes Ref.	Description
48-12711/03	1.5U 4 way 13amp uk 90 degree horizontal
48-13711/03	1.5U 6 way 13amp uk 90 degree horizontal
48-14711/03	1.5U 7 way 13amp uk 90 degree horizontal
48-12611/03	1.5U 4 way 13amp uk 45 degree horizontal
48-13611/03	1.5U 6 way 13amp uk 45 degree horizontal

All units are fitted with a 13a UK plug as standard.
IEC C14, IEC C19 or 16a Commando plugs are available upon request.





1.5U UK Socket PDU - Vertical

Hughes Ref.	Description
48-13911/03	1.5U 6 way 13amp uk 90 degree vertical
48-14911/03	1.5U 7 way 13amp uk 90 degree vertical
48-15911/03	1.5U 8 way 13amp uk 90 degree vertical
48-16911/03	1.5U 10 way 13amp uk 90 degree vertical
48-17911/03	1.5U 12 way 13amp uk 90 degree vertical
48-13811/03	1.5U 6 way 13amp uk 45 degree vertical
48-14811/03	1.5U 7 way 13amp uk 45 degree vertical
48-15811/03	1.5U 8 way 13amp uk 45 degree vertical
48-16811/03	1.5U 10 way 13amp uk 45 degree vertical
48-17811/03	1.5U 12 way 13amp uk 45 degree vertical
48-19811/03	1.5u 16 way 13amp uk 45 degree vertical

All units are fitted with a 13a UK plug as standard.
IEC C14, IEC C19 or 16a Commando plugs are available upon request.



1U IEC PDU - Horizontal

Hughes Ref.	Description
48-44611	1U 6 way C13 180 degree horizontal
48-45611/03	1U 8 way C13 180 degree horizontal
48-46611	1U 10 way C13 180 degree horizontal
48-47611/03	1U 12 way C13 180 degree horizontal

All units are fitted with a 13a UK plug as standard.
IEC C14, IEC C19 or 16a Commando plugs are available upon request.



1U IEC PDU - Vertical

Hughes Ref.	Description
48-44511/03	1U 6 way C13 180 degree vertical
48-45511/03	1U 8 way C13 180 degree vertical
48-46511/03	1U 10 way C13 180 degree vertical
48-47511/03	1U 12 way C13 180 degree vertical
48-48511/03	1U 14 way C13 180 degree vertical
48-49511/03	1U 16 way C13 180 degree vertical

All units are fitted with a 13a UK plug as standard.
IEC C14, IEC C19 or 16a Commando plugs are available upon request.

Desk Power Solutions

Hughes Desk Power Solutions come in three styles:

Under-Desk, In-Desk and On-Desk.

The units are made to order and can be populated with any of the following modules:

- 13Amp UK Socket
- C13 IEC Socket
- C19 IEC Socket
- Cat5e Data Outlet
- Cat6 Data Outlet
- RJ11 Module
- BT Module
- USB Module
- HDMI Module
- ESATA Module



Tools & Testers

Hughes Electronics tools and testers are designed & manufactured with simplicity and durability in mind ensuring you of a long-life reliable product that you can use over and over again.

All interfaces found on Hughes range of tools and testers are inter-mateable with all leading manufacturers interfaces.

Most tools & testers are help as stock in central London allowing fast response and delivery.



CRIMP TOOLS 100

WIRE INSERTION TOOLS 101

CABLE STRIPPERS 101

CONTINUITY TESTERS 102

PERFORMANCE TESTERS 102

Tools & Testers

Crimp Tools

Hughes Ref.	Description
26-401000Q	Heavy duty RJ45/RJ11 Ratchet Crimp tool
26-401000QA	Heavy duty Cat6a RJ45 Ratchet Crimp tool
26-40100P	Standard RJ45/RJ11 Non-ratchet Crimp tool
26-40100R	RJ45 component-level Keystone Quick-termination tool
26-901300W	Heavy duty BT Ratchet Crimp tool
26-901300	Standard BT Non-ratchet Crimp tool
26-101311H	Heavy duty BNC Ratchet Crimp tool for RG58/59/62
26-101311J	Heavy duty BNC Ratchet Crimp tool for RG59/174
26-101311K	Heavy duty Coaxial Crimp Tool RG174/223
26-1014110	D Type Crimp Tool for machined pins/contacts
26-10A202V	D Type Crimp Tool for ST&F pins/contacts
26-J01311F	Coaxial Crimp Tool for BT3002
26-J01311G	Coaxial Crimp Tool for BT2002
26-J01311N	Coaxial Crimp Tool for BT2003



*Component-level
Keystone tool*

Dies Available for coaxial Crimp tool

Pt Number								Cable Size
26-1013110-1	0.256" 6.5mm	0.213" 5.41mm			0.068" 1.72mm			58,59,62,140,Belden 8279
26-1013110-2	0.319" 8.1mm	0.213" 5.41mm	0.187" 4.75mm					58,6,174,140,fibre optic
26-1013110-3	0.319" 8.1mm	0.256" 6.5mm	0.213" 5.41mm		0.068" 1.72mm			58,59,62,6,Belden 8279
26-1013110-4	0.350" 8.9mm	0.320" 8.13mm	0.255" 6.48mm					CATV,59,6
26-1013110-5	0.255" 6.48mm	0.213" 5.41mm	0.137" 3.5mm	0.100" 2.54mm	0.068" 1.72mm	0.043" 1.1mm		58,62,59,140,174,fibre optic
26-1013110-6	0.255" 6.48mm	0.213" 5.41mm	0.187" 4.75mm		0.068" 1.72mm			58,59,62,142,174,223
26-1013110-7	0.178" 4.52mm	0.151" 3.84mm	0.128" 3.25mm	0.078" 2.00mm	0.068" 1.72mm	0.042" 1.07mm		174,178,179, fibre optic
26-1013110-8	0.429" 10.9mm		0.128" 3.25mm	0.100" 2.54mm	0.075" 1.9mm			8,9,11,174,136, belden 9913
26-1013110-9	0.187" 4.75mm	0.178" 4.52mm	0.151" 3.84mm	0.137" 3.50mm	0.128" 3.25mm	0.068" 1.72mm	0.042" 1.07mm	58,174,SMA,SMB

Tools & Testers

Wire Insertion Tools

Hughes Ref.	Description
26-0L90101Y	Punchdown Tool - krone IDC
26-50100T	Punchdown Tool - 110 IDC
26-0J1413K	Punchdown Tool - katt IDC
26-0J1413/KE	Punchdown Tool - katt IDC Economy
26-50100T/5	Punchdown Tool - 110 IDC 5 pair



Cable Strippers

Hughes Ref.	Description
26-03100s	UTP/STP Stripping Tool
26-03100i	Coaxial Stripping Tool
26-031002	Wire Stripper



Tools & Testers

Continuity Testers

Hughes Ref.	Description
45-112010	Coaxial Cable Tester
45-132220	UTP/STP/COAX Continuity Tester
45-232220	Multi interface Tester



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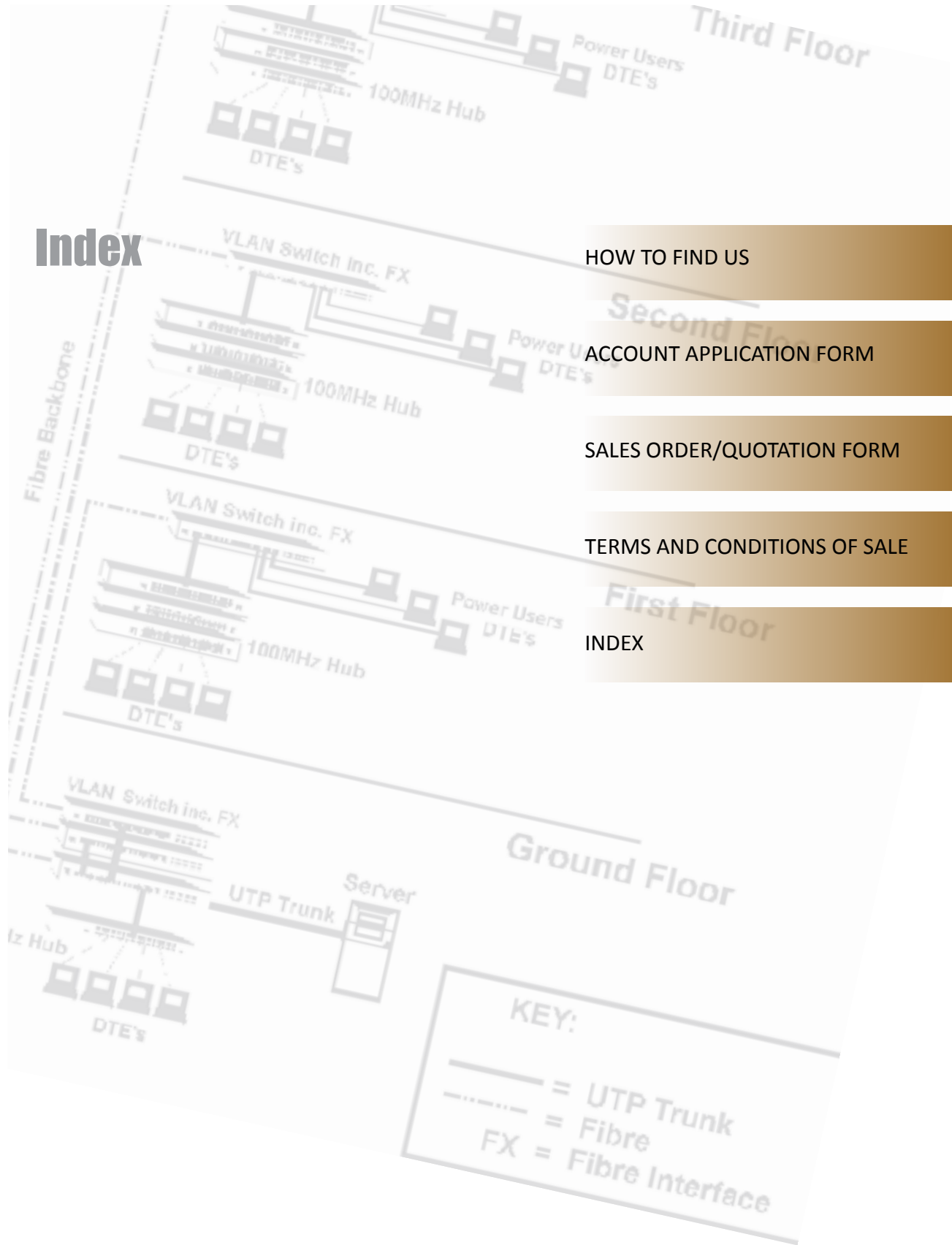
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How To Find Us



Hughes Electronics Limited

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Ayres Street, London SE1 1ES

Tel. (44) 02073781400 Fax (44) 02073781434

sales@hugheselectronics.co.uk

www.hugheselectronics.co.uk



Application for Credit Facilities

Company Name and Address	
1. Full Company Trading Name Company address	Postcode
2. Trade contact Telephone & Fax Number E-mail address	
3. Accounts contact E-mail address where invoices are to be sent: Please indicate if you require Invoices sent by post Invoicing address:	Postcode
4. If limited company Registered Office Address (If same as company address, Please state "As 1")	Postcode
5. If not a limited company Name and Address of Proprietor(s) (If insufficient space, please attach list)	Postcode
6. Company Reg. No.	VAT No.
Trading Information	
7. Nature of Business	No. of Employees How long Established
8. Is your Company a member of a larger group	<input type="checkbox"/> Yes <input type="checkbox"/> No If Yes please state group
* Credit Facility	
Please note that we operate 30 days from date of invoice payment term , see attached terms and conditions for details	
9. Name and address of Banker and your Account Details	A/c No. Sort Code:
10. Please indicate monthly amount of credit required	<input type="checkbox"/> £2,000 <input type="checkbox"/> £5,000 <input type="checkbox"/> £10,000 <input type="checkbox"/> Other amount specify £.....
11. Have you any outstanding county court judgements against you? If Yes, please state the creditor(s) name and the amount(s).	<input type="checkbox"/> Yes <input type="checkbox"/> No £..... £.....
Trade References	
Please give name and address of two Trade References to whom application may be made	
(1)	(2)
Postcode	Postcode
Tel:	Tel:
Fax:	Fax:

I/ We understand that should credit facilities be allowed to me/us that your terms of business require settlement of Accounts thirty days following date of invoice.

I have read your Terms & Conditions of trading (enclosed) and agree to be bound by them. **(Please tick)**

Signature

Print Name

Position _____ Date _____

IMPORTANT
Please attach a
sample of your
current letter
heading

Please supply birthday of

.....

___/___/___ (Optional)

If applicant is a Limited Company this form **must** be signed by a Director or the Secretary,
if a partnership, by one or more Partners. Stating the firm's name.

Terms and Conditions of Sale

Hughes Electronics Ltd Terms and Conditions of Sale

1. DEFINITIONS

The "Company" means Hughes Electronics Limited.

The "Purchaser" means the person, firm or company to be supplied with the Goods by the Company.

The "Goods" means the products, services, materials and/or other items to be supplied pursuant to the Contract.

The "Contract" means the contract for sale and purchase of Goods and/or the supply of Services made between the Company and the Purchaser.

The "Conditions" means the terms, conditions, clauses and provisions herein which all shall apply to the Contract.

The "Purchaser Order" means the Purchaser's request to the Company for Goods and/or Services upon acceptance of which by the Company Acknowledgement the Contract is established.

The "Company Acknowledgement" means the Company's written acceptance of the Purchaser Order in a form entitled "Sales Order Acknowledgement" upon issuance of which the Contract is established.

A "Call off Order" means a Contract for the sale of Goods that are to be held in stock at the Company premises and called for by the Purchaser pursuant to pre-arranged delivery dates stated in the Purchaser Order and accepted by the Company Acknowledgement or on delivery dates notified by the Purchaser in writing to the Company subsequent to the Contract date and accepted by the Company.

The "Services" means the services described in the Contract.

2. SCOPE

These Conditions apply to all sales of Goods (including any Call off Order) and/or Services by the Company and shall prevail over any inconsistent terms or conditions referred to in the Purchaser Order, correspondence, oral agreement or elsewhere unless specifically agreed to in writing by the Company. Any conflicting conditions or stipulations are hereby excluded or extinguished.

3. QUOTATION

A quotation by the Company does not constitute an offer, and the Company reserves the right to withdraw or amend the same at any time prior to the Company's acceptance of the Purchaser Order.

4. PRICES

4.1 Unless the prices quoted are stated to be fixed, the prices payable for the Goods shall be those charged by the Company at the time of despatch, so that the Company shall have the right at any time to review any quoted prices, taking account of increases in costs including (without limitations) costs of raw materials or labour and any variations in exchange rates.

4.2 Quoted prices are "ex-works" and exclusive of value added tax and other duties, levy or tax assessed against the Goods by any government or other authority.

5. TERMS OF PAYMENT

5.1 Terms of payment are strictly net cash with order unless a credit account has been established with the Company. Where a credit account has been established subject to clause 5.5 below, payment of invoices shall, unless otherwise agreed in writing, be made in full without any deduction or set off within 30 days of the date of invoice of Goods and/or Services.

5.2 Any extension of credit allowance to the Purchaser may be changed or withdrawn at any time.

5.3 The Company shall have the right to charge on overdue accounts at the rate of 3.50% above the Barclays Bank PLC base rate from time to time, to run from the due date for payment thereof until receipt by the Company of the full amount whether or not after judgement.

5.4 If in the opinion of the Company the credit worthiness of the Purchaser shall have deteriorated prior to delivery the Company may require full or partial payment of the price prior to delivery or the provision of security for payment by the Purchaser in a form acceptable to the Company.

5.5 In any case where the Purchaser is resident outside the United Kingdom and unless otherwise agreed the price of the Goods shall be secured by an irrevocable letter of credit satisfactory to the Company, established by the Purchaser in favour of the Company and confirmed by a United Kingdom bank acceptable to the Company immediately upon the receipt of the Company Acknowledgement of the Purchaser Order. The letter of credit shall be for the Contract price inclusive of any tax or duty payable by the Purchaser and shall be valid for the period specified by the Company. The Company shall be entitled to payment on presentation to such United Kingdom Bank specified by the Company or as may be agreed to in writing by the Company from time to time.

5.6 If the Purchaser makes default in any payment on the due date (time being the essence) or is otherwise in breach of the Contract or if (being an individual) he commits an act of bankruptcy or enters into voluntary arrangement, or has a receiving order made against him or (being a company) enters into liquidation (whether compulsory or voluntary) or administration or voluntary arrangement or has a receiver or manager appointed to the whole or any part of its business or undertaking or if distress or executions are levied or threatened upon any of the Purchaser's property then in any such case without prejudice to any other rights the Company may have;

a) The Company shall be entitled to repossess and resell the Goods delivered to the Purchaser and for that purpose to enter upon the property in which they are situated.

b) The Company shall be entitled either to suspend Goods in transit and all further deliveries to the Purchaser until the default is made good or to refuse to deliver any further Goods to the Purchaser and to resell any further Goods ordered by the Purchaser whether they are the balance of the Contract order, the whole of the order or a prior or further order and may forthwith determine the Contract without prejudice to the provisions hereof and to any other claims.

c) The Purchaser shall in any event be liable to make good to the Company any loss of profit on all such Goods and all costs and expenses of repossession, storage, insurance and sale and to pay to the Company interest as provided for in clause 5.3 herein until actual payment.

6. DELIVERY

6.1 Any time or date quoted by the Company for delivery is given and intended as an estimate only. Whilst every effort will be made to despatch Goods on time, no liability can be accepted by the Company for failure to deliver within the specified times in the Contract.

6.2 The Company shall not consider or accept any liability for shortages, damage, non-delivery or nonconformity of the Goods unless the Purchaser notifies the Company in writing within seven days of receipt of the Goods.

6.3 If for any reason the Purchaser fails or refuses to accept delivery of the Goods at the time such Goods are due and ready for delivery then the Company may sell or dispose of the Goods without prejudice to the Company's right of legal redress for loss suffered in consequence of the Purchaser's failure to accept delivery of such Goods.

6.4 The Company will allow 10 minutes waiting time from the carrier arrival time at the delivery address for unloading. The Company reserves the right to charge the Customer a waiting time fee in the event of any delays caused to unloading for any reason which shall for the avoidance of doubt include the first 10 minutes.

7. RETURN OF GOODS

7.1 Unspecified, damaged or nonconforming Goods may be returned by the Purchaser carriage pre-paid to arrive at the Company's premises within thirty days of the date of delivery provided and only if the following Conditions are met;

a) The Company are advised within 7 days from the date of delivery of any damages, discrepancy, or shortage.

b) The Goods are authorised for return by the Company.

c) The Goods are returned by the Purchaser within the 30 day period clearly labelled with a Company returns number which the Purchaser must obtain in writing from the Company prior to returning the Goods.

7.2 No Goods will be replaced or credits issued to the Purchaser unless the Goods are accompanied by a bona fide returns number. If the Company does not receive returned Goods within 30 days of issuing to the Purchaser a returns authorisation number the Purchaser will be deemed to have accepted the Goods and the returns authorisation number will become invalid. The Company will cancel the returns number and the Purchaser must then ensure prompt payment for Goods in accordance with the Contract.

8. TITLE

8.1 The Goods shall remain the sole and absolute property of the Company until such time as the Purchaser shall have paid to the Company the agreed price in full.

8.2 Until each payment the Purchaser shall be in possession of the Goods solely as bailee for the Company and in a fiduciary capacity and the Purchaser shall store the Goods in such a way as to enable them to be identified as the property of the Company.

8.3 The Company reserves the immediate right of re-possession of any Goods to which it has retained title as aforesaid and thereafter to re-sell the same and for this purpose the Purchaser hereby grants an irrevocable right and licence to the Company's employees and agents to enter upon all or any of its premises with or without vehicles during normal business hours. The right shall continue to subsist notwithstanding the termination of the Contract for any reason and is without prejudice to any accrued right of the Company hereunder or otherwise.

8.4 The Purchaser agrees immediately upon being so requested by the Company to assign to the Company all rights and claims which the Purchaser may have against its customers arising from sub-sales of Goods until payment is made in full as aforesaid.

9. CANCELLATION

In the event of cancellation of whole or part of any Contract the Company reserves the right without prejudice to charge up to 100% for Goods manufactured, ordered or stored by the Company pursuant to the Contract and up to 50% for the remaining balance or in respect of any Services to be provided. The Company may also impose a further charge for part cancellation of the Contract if the reduction in quantity affects the pricing structure.

10. CALL OFF ORDERS

10.1 If the Purchaser elects to notify the Company of delivery dates subsequent to the Contract date the Purchaser agrees in any event to accept delivery of at least 50% of the Goods within six months of the Contract date and 100% of the Goods within 12 months of the Contract date.

10.2 In the event that the Purchaser has failed to take delivery of 100% of the Goods within 12 months from the Contract date the Company shall have the right to charge the Purchaser for the full value of the Goods whether or not the Purchaser agrees to accept delivery of the Goods, such charges to become payable immediately upon receipt of an invoice from the Company. For the absence of doubt the date on the invoice will become the due date for payment of the Goods and the date from which the Company may charge overdue accounts charges pursuant to clause 5.3 of these Conditions.

10.3 The Company shall have the right to charge such storage fees as are applicable from time to time on all Goods which remain at the Company premises due to the failure of the Purchaser for whatever reason to take delivery of the Goods within 12 months from the Contract date.

11. SPECIFICATIONS BY THE PURCHASER

The Purchaser shall indemnify and keep indemnified the Company against all claims, cost, damages and expenses incurred by or for which the Company may become liable as a direct or indirect result of the carrying out of any work required to be done on or to the Goods and/or in the supply of any Services in accordance with the requirements or specifications of the Purchaser which involve any infringement or claim of infringement of any intellectual property right vested in another person, firm or company.

12. LICENCES AND CONSENTS

12.1 The Contract is conditional upon the obtaining of all and any licences or consents necessary for its performance in which connection the Purchaser shall sign all such forms and documents and render all such other assistance to the Company as may be necessary.

12.2 The Purchaser shall obtain at his own expense any licence or consent required for the sale of the Goods or the supply of the Services by the Company and if necessary or so required shall produce evidence of the same to the Company on demand.

13. FORCE MAJEURE

13.1 The Company shall not be liable to the Purchaser for any loss or damage which may be suffered by the Purchaser as a direct or indirect result of the supply of the Goods and/or Services by the Company being prevented, hindered or delayed by reason of any force majeure circumstances.

13.2 In this condition "Force Majeure Circumstances" shall mean any act of God, riot, strike, lock-out, trade dispute, or labour disturbances, accident breakdown of plant or machinery, fire, flood, difficulty in obtaining workmen, material or transport or other circumstances whatsoever outside the control of the Company affecting the provision of Goods or of raw materials by the Company's usual source of supply or the manufacture of the Goods by the Company's normal route or means of delivery.

14. WAIVER

The failure on the part of either party to the Contract to exercise or enforce any rights conferred by the Contract shall not be deemed to be a waiver of any such right nor operate so as to bar the exercise or enforcement thereof at time or times thereafter.

15. NOTICES

Any notice required to be given hereunder in writing shall be deemed to have been duly given if by pre-paid first-class post, telex or telegraph addressed to the party concerned at its principal place of business or last known address.

16. HEADINGS

Headings to any of these Conditions are included to facilitate references only and shall not affect the construction thereof.

17. GOVERNING LAW

The Contract shall be governed by and construed and interpreted in accordance with the Laws of England and for the purposes of settlement of any disputes arising out of or in connection with the Contract the parties hereby submit themselves to the exclusive jurisdiction of the English Courts.

18. GENERAL

All Goods and/or Services are supplied subject to these Conditions which supersede any earlier sets of Conditions appearing in the Company's catalogues or elsewhere and which shall override any terms or Conditions stipulated, incorporated into any written material or referred to by the Purchaser whether in the Purchaser's Order or in any negotiations. The relaxation or waiver by the Company of any of these Conditions on any occasion shall act merely as a waiver on that occasion and shall not affect the Company's right to enforce any of these Conditions on any subsequent occasion. Any variation of these Conditions must be confirmed in writing by the Company and will not otherwise be valid. No Purchaser Order shall be deemed to have been accepted by the Company unless it is accepted in writing and duly acknowledged by a Company Acknowledgement. Any description given by the Company of the Goods is given by way of identification only and the use of such description shall not constitute Contract by description.

19. SEVERABILITY

If any condition, term or other provision of this agreement is determined to be invalid, illegal or incapable of being enforced by any rule or law, or public policy, all other Conditions and provisions of this agreement shall nevertheless remain in full force and effect so long as the economic or legal substance of the transactions contemplated hereby is not affected in any manner materially adverse to any party. Upon such determination that any term or other provision is invalid, illegal or incapable of being enforced, the parties hereto shall negotiate in good faith to modify this agreement so as to effect the original intent of the parties as closely as possible in an acceptable manner to the extent that transactions contemplated hereby are fulfilled to the extent possible.

20. ERRORS

This agreement or any Contract to which it relates shall not be invalidated because of printing or clerical errors.

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