

Datel 2412 Service



## Description

The Datel 2412 Service enables data to be transmitted synchronously at 2400 bits per second (bit/s). As both private circuits and the public switched telephone network (PSTN) can be used maximum advantage can be obtained from the flexibility of the system. The hardware for the Service is provided by a modulator/demodulator unit (modem unit) and a line switching unit. The modem unit translates information received from Data Terminal Equipment into signals that are suitable for transmission over telephone circuits; the line switching unit provides the means of associating the modem with either private circuits and/or exchange lines, it also supplies a power source for the modem unit. The modem has been specially designed to meet the needs of both single and multiple installations. For 'table top' situations the modem is housed in a low profile case and a flip down front cover gives easy access to controls. For multiple installations the modules of the modem can be readily installed in a standard Post Office Control System offering economic use of floor space.

The Service is available with either 4-wire private circuits, which enable data to be transmitted in a duplex mode or with the PSTN which is used for half duplex transmissions. The 4-wire private circuits can be part of a network consisting of either point to point or multipoint circuits and can have PSTN standby facilities.

Other features and options of the Service include –

Fallback speed of 1200 bit/s available on both private circuit and PSTN operation.

Automatic answering on PSTN conforming to CCITT recommendation V.25.

Test facilities to assist in fault diagnostic routines.

150 bit/s asynchronous supervisory or backward channel.

Alternate speech and signalling facilities on the private circuit.

Conforms to CCITT V.26 and V.26 bis recommendations.

Variable 'ready for sending' delay periods to meet Inland and International standards.

Maintenance charges are included in the tariff and apply nationally.

The modem is fitted with a standard 25 way D type socket which provides the interface between the modem and those terminals which have been cleared by the Post Office for connection to the Datel 2412 service.

## How it operates

Before data transmission can take place it is necessary to connect the modem to line, there are three standard methods of achieving this connection.

a By push buttons on the telephone(s)

b By control from the Data Terminal Equipment

c By a combination of the previous two methods

The Post Office has evolved a switching method that is designed to meet the requirements of most terminal operating systems. Its advantages include –

Control of transmission system at 2400 bit/s exclusively on telephones.

Standby switching from private circuit to PSTN controlled from telephones.

Handsets are independent of data control buttons.

Status lamps on telephones to indicate modem connected to private circuit or PSTN.

For private circuit operation the modem is directly connected to line as soon as the power is switched on; where the PSTN is used a satisfactory speech connection is initially established and then the modem is switched to line. When connection has been established the system will be operational.

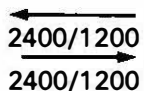
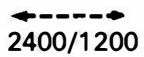
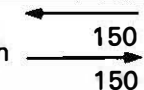
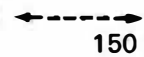
### Notes:

1 Where both private circuit and PSTN use is required a combination of two switching methods may be employed.

2 Terminal equipment suppliers will advise on the method of connection most suitable for their equipment.

3 The Post Office will supply an Operating Handbook with each installation which will detail call set up and call termination procedures.

## Combination of facility options

	Code 31	Code 32	Code 41	Code 42	Code 51	Code 52	Code 53
2400/1200 on private circuit both ways simultaneously 	●	●	●	●			
2400/1200 on PSTN both ways not simultaneously 			●	●	●	●	●
Unattended answering on PSTN			●	●	●	●	●
150 on private circuit backward channel both ways simultaneously 	●		●				
150 on PSTN backward channel both ways not simultaneously 			●		●		
Automatic calling							●

Key to options

**Private circuit 4-wire**   
**Public Switched Telephone Network**   
 Speed in bits per second  
 2400  
 1200  
 150

Automatic calling facility requires the provision of additional equipment



## Facilities

The Datel 2412 Service has been designed to provide a range of facilities to meet system requirements on both private circuit and PSTN operation. The options chart details the combinations that are available with this Service; the two digit numbers relate to specific facilities.

It is recommended that exchange lines are rented with private circuit systems so that, in the event of private circuit failure, standby procedures may be implemented in order that the system remains operational. When using the PSTN a transmission rate of 1200 bit/s on all connections should be achieved, 2400 bit/s will be possible on the majority of calls attempted. The exchange line can also be used to provide remote test access to the modem from the Post Office Datel Test Centre to assist in fault diagnostic procedures. To help in the localisation of faults a number of test functions have been built into the modem. On a 4-wire private circuit local, remote and end to end tests can be performed. The PSTN can be tested in local and end to end conditions.

The 150 bit/s asynchronous supervisory or backward channel is optional; if required, it can be used on both private circuits and the PSTN.

**Important:** The transmission system employed in the Datel 2412 Service complies with the latest CCITT recommendation; it is *not* compatible with either the Datel 2400 Service or the Datel 2400 Dial Up Service.

## Technical information

### Dimensions and weights

Modem unit (maximum size)  
Width 300mm (12")  
Length 440mm (17½")  
Height 100mm (4")  
Weight 8.7kg (19¼lb)

Line switching unit  
Width 225mm (9")  
Length 400mm (15¾")  
Height 75mm (3")  
Weight 5.9kg (13lb)

### Environmental conditions

Ambient temperature range +5°C to +45°C.  
Relative humidity range from 40% to 90%.

### Power

240 volts AC ±6%, 50Hz single phase ±10%.  
Power consumption 26 watts maximum.

### Modulation method

Main mode: 4 phase differential modulation (CCITT V26 type B and V26 bis recommendations)  
Fallback mode: 2 phase differential modulation (CCITT V26 bis recommendation)  
Backward Channel: Frequency Shift Keying up to 150 bit/s

### Data signalling rate

Main mode: 2400 bit/s synchronous  
Fallback mode: 1200 bit/s synchronous  
Backward Channel: 150 bit/s asynchronous

### Transmission path

– 4-wire private circuit only  
– PSTN only  
– 4-wire private circuit with PSTN standby

### Method of operation

4-wire private circuit – duplex and half duplex  
PSTN – half duplex  
Note: Asymmetric duplex is available on the PSTN with the backward channel.

### 'Ready for Sending' Delays

– 4-wire private circuits – 12 ms  
– (point to point and multipoint)  
– PSTN (within UK) – 80 ms  
– PSTN (International) – 235 ms

### Equalisation

Equalisation is provided when necessary by means of a compromise equaliser (this type does not require any manual adjustment). The equaliser has been designed specifically to meet the average line conditions that can be expected on the United Kingdom telephone network.

### Interface connection

Connection of Data Terminal Equipment to the modem is effected by means of a 25 pin D type connector. The specification for the connector is available on request.

### Interface circuits

All circuits conform to CCITT V24 and V28 recommendations.

### Test facilities

To assist in first line diagnostic procedures the modem contains a number of test functions. These are controlled from switches and lamps behind the front cover of the modem.

Functions – 4-wire private circuit – local loop, remote loop and end to end tests.

PSTN – local loop and end to end tests.

When the modem is associated with the PSTN remote tests can be carried out from a Datel Test Centre by experienced Post Office maintenance staff.

### General

The tariff for the modem, which consists of a connection charge and annual rental includes all normal maintenance charges. Maintenance support for Datel Services is, generally, available anywhere within the United Kingdom both during and outside normal business hours.



## Datel Sales Enquiry Points: Telephone Numbers

### **Aberdeen**

Aberdeen (0224) 24009

### **Bedford**

Bedford (0234) 52241

### **Belfast**

Belfast (0232) 33576

### **Birmingham**

021-262 2757

### **Blackburn**

Blackburn (0254) 666387

### **Bournemouth**

Bournemouth (0202) 24990

### **Bradford**

Bradford (0274) 20974

### **Brighton**

Brighton (0273) 202090

### **Bristol**

Bristol (0272) 296507

### **Cambridge**

Cambridge (0223) 61816

### **Canterbury**

Canterbury (0227) 60034

### **Cardiff**

Cardiff (0222) 24749

### **Chester**

Chester (0244) 20192

### **Colchester**

Colchester (0206) 41331

### **Coventry**

Coventry (0203) 22905

### **Dundee**

Dundee (0382) 302201

### **Edinburgh**

031-345 4480

### **Exeter**

Exeter (0392) 75030

### **Glasgow**

041-220 2899

### **Gloucester**

Gloucester (0452) 25451

### **Guildford**

Aldershot (0252) 27546

### **International**

01-432 5407

### **Lancaster**

Lancaster (0524) 88207

### **Leeds**

Leeds (0532) 37893

### **Leicester**

Leicester (0533) 534111

### **Lincoln**

Lincoln (0522) 26651

### **Liverpool**

051-229 3961

### **LONDON**

#### **Centre**

01-437 8060 Ext 352

#### **City**

01-921 8754

#### **East**

01-553 7228

#### **North**

01-340 8060 Ext 7143

#### **North Central**

01-829 4405

#### **North West**

01-864 4347

#### **South**

01-760 7400

#### **South Central**

01-261 4622

#### **South East**

01-290 2494

#### **South West**

01-879 2444

#### **West**

01-579 8771

### **MANCHESTER**

#### **Central**

061-863 6438

#### **North**

061-863 8261

#### **South**

061-863 5478

#### **Middlesbrough**

Middlesbrough (0642) 248636

### **Newcastle upon Tyne**

Newcastle (0632) 613364

### **Norwich**

Norwich (0603) 25282

### **Northampton**

Northampton (0604) 39171

### **Nottingham**

Nottingham (0602) 56869

### **Oxford**

Oxford (0865) 812312

### **Peterborough**

Peterborough (0733) 69664

### **Plymouth**

Truro (0872) 4224 Ext 230

### **Portsmouth**

Portsmouth (0705) 813411

### **Preston**

Preston (0772) 55989

### **Reading**

Reading (0734) 52598

### **Scotland West**

041-242 2068

### **Sheffield**

Sheffield (0742) 732377

### **Shrewsbury**

Shrewsbury (0743) 3388

### **Southampton**

Southampton (0703) 33270

### **Southend**

Southend (0702) 47099

### **Stoke-on-Trent**

Stoke (0782) 28296

### **Swansea**

Swansea (0792) 52870

### **Taunton**

Taunton (0823) 87172

### **Tunbridge Wells**

Tunbridge Wells (0892) 24511

### **West Midland**

021-262 2609

### **York**

York (0904) 57220

Your local Sales Office will be pleased to give you the Postal address of any of our area offices.

#### **Please note**

We do our best to supply our customers with the apparatus they ask for but we may have to provide apparatus which does not accord exactly with the descriptions and illustrations in this leaflet.

**For further or up-to-date information please contact the special services representative of your Local Telephone Sales Office. The telephone number is shown above.**

If you have difficulty obtaining information from the numbers listed please call Freephone 2170 or 01-432 1813