

MIRACLE TECHNOLOGY



CATALOGUE

DATA
COMMUNICATIONS
EQUIPMENT

Miracle Technology (UK) Ltd is one of Britain's foremost manufacturers of data communications equipment. In a rapidly expanding and competitive market, the company has established a high reputation, based on imaginative and innovative design, top quality standards of production and commitment to its customers.

Miracle Technology is able to maintain these standards and keep its reputation because every stage of its operation, from Research and Development through production and marketing, to Customer Service, is carried out in-house. Not only does this mean absolute quality control, it also means substantial savings in costs which can be passed on to the customer.

The customer is a priority with Miracle Technology. All the company's products are designed for ease of use, and its Customer Service Department's telephone hot lines are manned by a team of technical experts who are always happy to help.

So, when you buy data communications equipment from Miracle Technology, you'll get the high quality product you want, with the ease of use you need, at the price you can afford, and with the service to back it. In fact, you'll be buying British data communications equipment at its best.

Contents

<i>page</i>
4 An Introduction to data communications
6 WS2000
8 WS3000
10 WS4000
12 64 Multimodem
14 Software
16 Packages
18 Accessories

What's it all about?

Necessity has always been the mother of invention. The need to communicate brought the development of the written word. The need for fast communication brought us the telephone, the telegram, the telex. The need for instant communication has brought us the computer, the modem, and the entirely new science of data communications.

The potential of electronic data communication as a powerful business and social tool is virtually limitless. For example, it can efficiently replace present systems of communications. Take the letter. By using an electronic mail service, such as Telecom Gold, a letter can be 'posted' by a computer and modem to a computer mailbox anywhere in the world. In seconds. And, by using the Packet Switch Stream facility, for no more than the cost of a phone call.

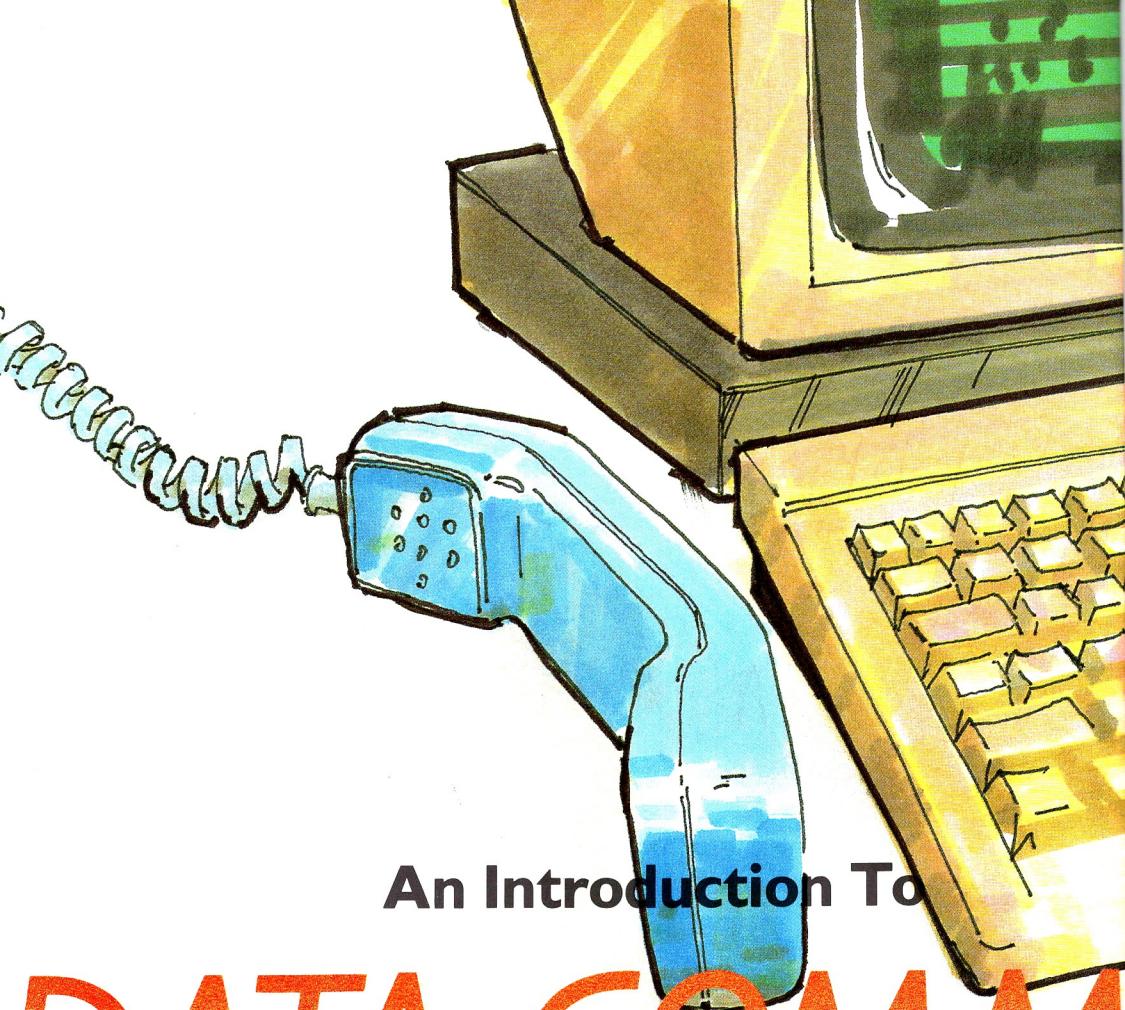
Then there's telex. A modem can convert your computer to a telex terminal, doing away with the need for a costly telex machine and dedicated phone line.

For the engineer, computers and modems open up the whole area of process control. A system set up in an area which might be difficult to get to, or dangerous to work in, can monitor processes and report automatically to a central control point.

It is also possible to access hundreds of information databases around the world via computer. For the business user, this could mean the availability of constantly updated reports on changes in the world's stock markets, or in political situations.

For schools, it means the availability of a wide variety of teaching aids, and information on every subject on the curriculum.

For us all it provides the means to find out what we want to know, when we want to know it — quickly, easily, at the press of a button.

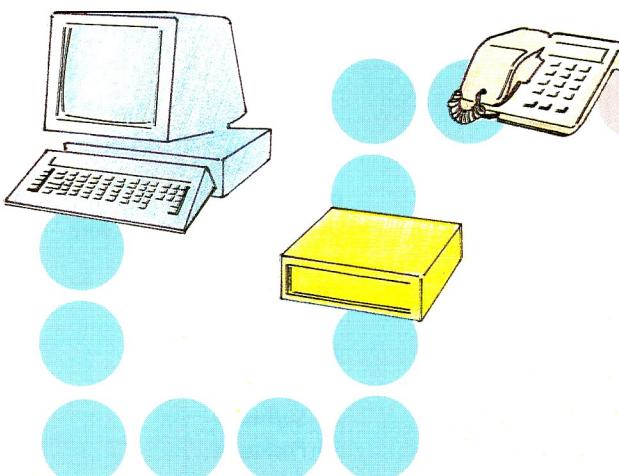


An Introduction To

DATA COMM

Here we see how a modem provides the vital link between the computer and the telephone in the data communications chain.

That's where the modem comes in. The computer data is broken down into a series of BITS which are sent to the modem. As the information passes through the modem it modulates a carrier wave. The phone accepts this as it would a voice . . .



A telephone is designed to carry the human voice, but a computer doesn't talk in the same way. To send the computer's information over the phone line, the telephone has to 'think' it's hearing a human voice.

and passes the information over the phone line to its destination . . .

The diagram here illustrates the basic principles of data communications using a modem, computer and telephone line.

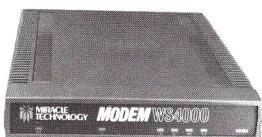
In This Catalogue

WS2000



The original Miracle Technology modem, still the best manual-dial modem on the market. See page 6.

WS4000

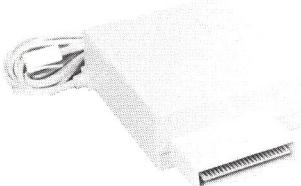


A revolutionary advance in bringing an intelligent Hayes compatible modem within everyone's price range. See page 10.

WS3000



A range of fully intelligent, Hayes compatible, upgradeable modems, named Peripheral of the Year in the 1986 British Microcomputing Awards. See page 8.



The only multi-standard 'Plug-in-and-go' modem available for the Commodore 64 & 128. See page 12.

64 Multimodem

PLUS software packages, interfaces and accessories for a wide range of business and home computers. See pages 14-18.



What does it all mean?

Newcomers to the world of data communications may be confused by 'dataspeak' — the language used by those in the know. Below you will find a brief explanation of some of the more commonly used words and phrases.

MODEM: An acronym for M^Odulate-D^EM^Odulate. A device which converts computer data into a form which can be sent over ordinary telephone lines, then reconverts it for reception by another computer.

INTERFACE: The gateway for data transfer between a computer and a modem.

Miracle Technology modems have interfaces complying with the RS232C standard, and expect to be linked to a compatible interface.

BAUD RATE: the speed at which data can be transmitted between modems. Also commonly seen expressed in terms of the number of bits transmitted per second (bps).

BIT: An acronym for BInary digiT. Transmitted characters are sent as a series of BITS in the form of electrical pulses.

FULL DUPLEX: the ability of a modem to transmit and receive data at the same time.

HALF DUPLEX: the ability of a modem to transmit and receive data alternately, but not at the same time.

CCITT: an international data communications standard, to which the UK and Europe conform.

BELL: the data communications standard to which the USA conforms.

V21: CCITT terminology for 300bps full duplex

V22: CCITT terminology for 1200bps full duplex

V22bis: CCITT terminology for 2400bps full duplex

V23: CCITT terminology for 75/1200 full duplex (sending and receiving data at different speeds).

HAYES: HAYES PROTOCOLS are an industry standard set of software commands devised by the American Hayes Corporation. Most business software with US origins conform to these commands, so a HAYES COMPATIBLE modem has the advantage of being able to use any of this software without difficulty.

PSS: Packet Switch Stream. A British Telecom service that transfers data throughout the world in high-speed "packages".

Gives access locally to very high speed continental data links.

E-MAIL: Electronic Mail. A service in which letters can be sent via computer and modem to a subscriber's computer 'mailbox'.

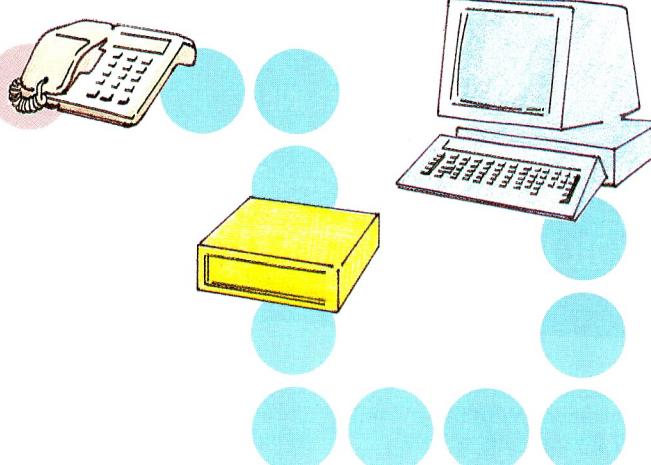
PRESTEL: one of a number of public information databases accessible with a computer and modem.

UNICATIONS

which could be anywhere in the world.

The receiving telephone line passes the information to another modem, which demodulates it

and passes it to the waiting computer in its original form.



However, it's not necessary to have a deep technical knowledge of the electronic processes involved in order to be able to use the equipment.

Hence the name modem, from MOdulate — DEModulate.

Information can be passed in both directions using this system, either simultaneously or alternately, depending on the type of modem used.

This is Europe's favourite manual-dial modem. Its established reputation, versatility and low price make it unrivalled in its field for home, small business and educational use.

Multi-standard and multi-speed, WS2000, when used with the appropriate comms software, allows world-wide communications and offers a wider choice of operating speeds than any other comparable modem.

Modem WS2000 can transmit and receive data at 300/300 bps, 600bps, 1200bps, 1200/75 and 75/1200 bps. These speeds allow the use not only of huge public information databases such as Prestel, but also of services such as Telecom Gold's advanced business mailbox system, telex, and specialist bulletin boards.

Modem WS2000 combines sophistication of design with simplicity in use. The clear front panel layout and comprehensive user manual make operation easy and straightforward. And to minimise the possibility of problems, WS2000 also incorporates features like telephone line noise filtering and self-testing diagnostic facilities.

MODEM

WS



And of course in user-to-user communications, WS2000 can link virtually any computer or data terminal with any other, over public telephone lines.

Suitable for use with any computer having an RS232 or RS423 interface — and most do — WS2000 is also able to switch between the European CCITT communications standards and the American BELL* standards, enabling communication in almost every country in the world.

Over 20,000 WS2000s are already in use around the world, tangible proof of the modem's quality and reliability.

Modem WS2000 comes with all you need to start communicating using a suitable computer or terminal, except for a computer connecting lead and comms software. Many computers are already equipped with these accessories, but if not, we can supply them for most.

TECHNICAL SPECIFICATION

Dimensions and weight

Width 155mm (6.00")
Depth 160mm (6.75") overall
Height 70mm (2.60") overall
Footprint 155x160mm
Weight 1.0Kg approx.

Case type

High impact ABS wipe-clean with textured finish

Power requirements

Nominal 240 V 50/60Hz
single phase +10% -8%.
<15 watts. 110V~ conversion available.
Positive and negative power rails internally fused.

Environmental requirements

Operational ambient temperature range
+5°C to +30°C

Modulation method

Voiceband Serial Asynchronous Frequency Shift Keying

Transmission path

2 or 3-wire Public Switched Telephone Network

Line termination characteristics

Terminating impedance 600 ohms

Line termination type

British Telecom Series 600 modular plug (plug type 431A) on lead 405/2 supplied

Transmit level

-9dBm, maximum level (ref. 600 ohms)
300/300 bit/s, 600 bit/s, 1200 bit/s, 1200/75
bit/s, 75/1200 bit/s

Standards available

CCITT V21, CCITT V23, BELL 103, BELL 108, BELL 113, BELL 202
(available where PSTN regulations allow)

Word length/Parity

WS2000 is transparent to data word length and parity; no modem settings required

Mode selection

By front panel switching or by full computer control through rear-panel User Port (note 003)

Modem interfaces

EIA RS232c and CCITT V24 compatible DTE port. TTL level User Port

Modem (DTE) Interface Connector

25-pin male D-type plug required, female socket fitted at modem

FEATURES:

- Worldwide communication
- Wide range of operating speeds
- Ease of operation
- Thousands already in use
- Low price

2000

Control signals available at Modem RS232c port:

Pin no.	Input to Modem/ Output from Modem	Function
1	-	Protective Ground (chassis)
2	I	Transmitted Data
3	O	Received Data
4	I	Request to Send
5	O	Clear to Send
6	O	Data Set Ready
7	-	Signal Ground
8	O	Data Carrier Detect
20	I	Data Terminal Ready
22	O	Ring Indicator

Internal pull-up resistors enable DTR and RTS if these control signals are not available from the terminal equipment in use.

Control signal interaction timings

Request to Send ON to Clear to Send ON
timings (nominal):

CCITT V21 400msec
CCITT V23 209msec
BELL 202 184msec
BELL 103 209msec

Request to Send OFF to Clear to Send OFF
timings (nominal):

All ranges 0.50msec

Control signal indicators

Front-panel separate LED indicators for:
POWER ON
TX DATA
RX DATA
CARRIER DETECT
ON LINE

Safety

Modem WS2000 is designed and has been constructed to comply with the relevant requirements of the following standards: BS 415, BS 6301, BS 6305, BS 6320 and has been tested for compliance with these standards by the British Approvals Board for Telecommunications and by test laboratories of British Telecommunications. Power interface components are manufactured to meet IEC 65 Class 2 and VDE 0550 Class 2.

Part No.
100-340

Jeff Ashurst
Acorn User

'...obvious thought and attention to detail
in this design...'

'In use, the WS2000 lived up to the
expectations that the casing and manual had
generated.'

'Altogether an excellent modem, the
WS2000.'

Barry Thomas
What Micro?

'The Miracle Technology World Standard
2000 modem. That's quite a name, but then
it's quite a product.'

'At such a low price, with such a full
specification, the only wonder is that the
other modems sell at all.'

'If one manufacturer can produce a product
like the WS2000 at such a ridiculously low
price then so can the others.'

NOTE

* The WS2000 modem has not been
approved for the use of BELL
standards on the UK public switched
telephone network. All WS2000's sold

for use in the UK are therefore fitted
with a BELL standards disabling
device, removable if the modem is for
export, or for use on telephone lines
outside PSTN control.

**These are the modems
with everything. Including
the title PERIPHERAL
OF THE YEAR, won at
the 1986 British
Microcomputing Awards
— the 'Oscars' of the
computing industry.**

These fully intelligent modems are indeed the stars of the data communications world, with their state-of-the-art technology and their host of features and facilities, many unavailable elsewhere.

The WS3000 range employs the HAYES software command protocols, now accepted as the industry standard. Since most business comms software of US origin uses these protocols, a huge range of well-proven software is immediately available for use off-the-shelf — an enormous advantage over the problems of obtaining specialist software.

The WS3000 is uniquely upgradeable, and its wide range of possible data transmission speeds make it one of the most powerful multi-speed modems on the market.

The mid-range model, the V22 Professional, adds 1200bps full duplex to these speeds, while top-of-the-range V22bis Professional adds 2400bps full duplex to the speeds of the V22 model.

The V22 model may be upgraded to the V22bis model, and the V2123 model may be upgraded to either of the faster models at any time, without sacrificing any of the features offered with the lower models in the range. Thus, after upgrade to V22bis for example, all the features of the WS3000 V22 and V2123 modems are retained, giving a single compact modem unit capable of data rates from 75bps to 2400bps.

Everything about the WS3000 Professional range is designed to assist the non-technically minded user.

databases such as Prestel and Telecom Gold, in cases where the user's computer has only full duplex facilities. This brings these major information services within the capability of nearly every computer.

Another standard feature of the range is a control port, which is configured as a parallel printer port that may be used to print the internal number store and user commands. The port is custom configurable to allow a wide variety of process control applications involving direct sensor inputs and remote data logging by modem link.

All models in the range may be factory fitted with an optional high-security data access protection system — PROTECT3000. This caters for the rapidly increasing number of professional computer users to whom security is a top



Not only multi-speed, but multi-standard, since the WS3000 Professional range is approved for use not only on the European CCITT standard, but also on the American BELL standard — one of the first modems to gain such approval — allowing direct communication with the US.

The basic model, the V2123 Professional, offers data transmission speeds of 300bps, 75/1200bps and 1200/75bps full duplex, 600bps and 1200bps half duplex operating on the CCITT standard, plus the BELL standard for 300bps full duplex.

Controlled by 'plain English' commands entered from the computer or terminal keyboard, it is simple to operate. Full autodial and autoanswer facilities are standard, and the modem is so sophisticated that it will automatically select the correct speed at which data is received and sent, will make calls and answer the telephone with the minimum of human intervention, and will hold a 60 number directory of phone numbers for voice or data calls.

The WS3000 also offers speed buffering. This means that it can make intelligent decisions on creating 'split' data rates for use with

priority. PROTECT3000 uses not only passwords but also a ring-back system, to limit computer access only to those inquirers who enter the correct codeword from the correct telephone number.

The WS3000 range is designed and manufactured in our own factory to the highest standards of technology and engineering. No effort has been spared to ensure that the range offers every possible answer to the needs of the professional data comms user.

TECHNICAL SPECIFICATION

Dimensions

Width 182mm (7.2")
Depth 245mm (9.6")
Height 38mm (1.5")
Footprint .044 sq m (0.48 sq ft)

Weights

modem 0.86Kg (30oz)
power adaptor 0.73Kg (26oz)

Case type

High impact ABS, wipe-clean with textured finish

Power requirements

240 V~50/60Hz single phase +2% -8% 15 watts. Separate power adaptor

Environmental conditions

Operational ambient temperature range +5C to +30C

Modulation method

WS3000 V2123

Asynchronous Frequency Shift Keying

WS3000 V22

4 point synchronous DPSK at V22. Other standards asynchronous Frequency Shift Keying

WS3000 V22bis

16 point synchronous DPSK at V22bis. 4 point synchronous DPSK at V22. Other standards asynchronous Frequency Shift Keying

Transmission path

2 or 3-wire public switched telephone network, or Private circuit. Leased line suffix LL

Line terminating characteristics

Terminating impedance 600 ohms

Standards

WS3000 V2123
CCITT V21, V23, BELL 103
WS3000 V22
CCITT V21, V22, V23, BELL 103
WS3000 V22bis
CCITT V21, V22, V22bis, V23, BELL 103

Data format

WS3000 V2123
Asynchronous 7 or 8 bits, odd, even or no parity. Software configured, no modem settings required

WS3000 V22

V22 mode: Asynchronous start-stop with 8-11 bits per character. V21 & V23 modes: asynchronous 7 or 8 bits, odd, even or no parity

WS3000 V22bis

V22bis and V22 modes:
Asynchronous start-stop with 8-11 bits per character. V21 & V23 modes asynchronous 7 or 8 bits, odd, even or no parity

Guard tone

WS3000 V22 & V22bis

1800Hz

Mode selection

Operating modes software selectable by Hayes-compatible command strings entered from the DTE. Command set broadly compatible with Hayes protocols, except where UK regulations or enhanced modem operations require differences

Modem DTE interface

EIA RS232C/CCITT V24 compatible DTE interface

Modem DTE interface connector

DB-25 female 25-pin socket

Modem DTE interface speed capability

Intelligent speed buffering allows DTE operation as follows:-

WS3000 V2123

at 1200bps full duplex for modem operation at 1200/75, 75/1200, 1200bps. DTE may also operate at 300bps full duplex for 300/300bps or 600bps for 600bps modem operation. DTE may also operate at split baud rates

WS3000 V22

at 1200bps full duplex for modem operation at 1200/75, 75/1200, 1200, 1200/1200bps. DTE may also operate at 300bps full duplex for 300/300bps, 600bps for 600bps modem operation. DTE may also operate at split baud rates

WS3000 V22bis

at 1200bps full duplex for modem operation at 1200/75, 75/1200, 1200, 1200/1200bps. DTE may also operate at 300bps full duplex for 300/300bps, 600bps for 600bps or 2400bps for 2400/2400bps modem operation. DTE may also operate at split baud rates

Dick Pountain

BYTE

'In 1984 the British firm Miracle Technology Ltd. produced a multistandard (i.e., 300 and 1200/75 bps) modem ... at what was then a very competitive price of just over £100. In 1985 the firm followed up on the success of this model with a new family of WS3000 modems that, in their various configurations, are just about state of the art in personal computer modems.'

Micrognome

Micronet Review

'...have found it to be the nicest modem they've ever used'

'Construction and presentation are exemplary...'

'There's always embarrassingly little you can say about a modem that works properly — erm, it works!'

FEATURES:

- Fully intelligent
- Hayes compatible
- Upgradeable
- CCITT and BELL standards
- Autoanswer/Autodial
- Internal phone directory
- Speed buffered
- Control port
- Data security option

3000

PROFESSIONAL RANGE

Line termination type

British Telecom Series 600 modular plug type 431A. Modem rear-panel 600 series telephone socket, paralleled with PSTN line.

Line connection mode

Manual or autodial by open-loop pulse dial, or by DTMF touch-tone. Internal modem store for 60 names and telephone numbers in battery-backed memory. Manual or autoanswer to CCITT V25

Line disconnection on:

Loss of DTR

Loss of Carrier

Loss of Data Activity

Transmitted signal level

-9dBm maximum into 600 ohms

Received signal minimum level

-43dBm

Data signalling rates

WS3000 V2123

300/300bps, 600bps, 1200bps, 1200/75bps, 75/1200bps

WS3000 V22

300/300bps, 600bps, 1200bps, 1200/75bps, 75/1200bps, 1200/1200bps

WS3000 V22bis

300/300bps, 600bps, 1200bps, 1200/75bps, 75/1200bps, 1200/1200bps, 2400/2400bps

Line noise filtering

WS3000 V2123

Selectable fixed amplitude equalisation in V23 mode

WS3000 V22

Automatic adaptive equalizer in V22 mode. Selectable fixed amplitude equalisation in V23 mode

WS3000 V22bis

Automatic adaptive equalizer in V22bis and V22 modes. Selectable fixed amplitude equalisation in V23 mode

Signals at DTE interface

Pin	Input to Modem/ no.	Output from Modem	Function	CCITT circuit
All WS3000 modems				
1	—		Modem frame ground	101
2	1		Send Data (SD)	103
3	0		Received Data (RD)	104
4	1		Request to Send (RS)	105
5	0		Clear to Send (CS)	106
6	0		Data Set Ready (DR)	107
7	—		Signal Ground	102
8	0		Data Carrier Detect (CD)	109
9	0		Test (+5Vdc)	—
10	0		Test (-12Vdc)	—
WS3000 V22 & V22bis only				
15	0		Transmit clock	114
17	0		Receive clock	115
All WS3000 modems				
20	1		Data Terminal Ready	108
22	0		Ring Indicator	125
23	0		Data Signalling Rate	111
25	0		Test (+12Vdc)	142

Internal pull-up resistors enable DTR and RTS if these control signals are not available from the DTE.

Activity indicators

Front-panel LED indicators for:

Power	(ON)
On line	(OL)
Terminal Ready	(TR)
Request to Send	(RS)
Clear to Send	(CS)
Carrier Detect	(CD)
Send Data	(SD)
Receive Data	(RD)
Auto Answer	(AA)
Speed	(HS)

Control port

26 way 2 row 0.1" male polarised socket, configured as a parallel printer port. May be custom configured for process control applications.

Safety

WS3000 modems are designed and constructed to comply with the relevant requirements of the following British Standards: BS 415, BS 6301, BS 6305, BS 6320

Part Nos

	Protect 3000
WS3000 V2123	100-400 100-405
WS3000 V22	100-410 100-415
WS3000 V22bis	100-420 100-425
WS3022	100-370
WS3024	100-380

**The WS4000 modem
brings intelligent, Hayes
compatible V21/23 data
communications within
the price range of every
computer owner.**

As a modem designed to suit the needs — and the pocket — of the serious home user and business man alike, the WS4000 has no equal. It offers the very latest in data comms technology — Hayes compatibility, autodial, autoanswer, speed buffering and much, much more — at a price others just can't match.

The wide range of available data rates make this a very powerful multi-speed modem indeed. It operates at the CCITT standards for 300 bps, 75/1200 bps and 1200/75 bps full duplex, 600bps and 1200bps half duplex. These speeds give access to a host of information databases and bulletin boards, electronic mail, telex, and user-user communications.

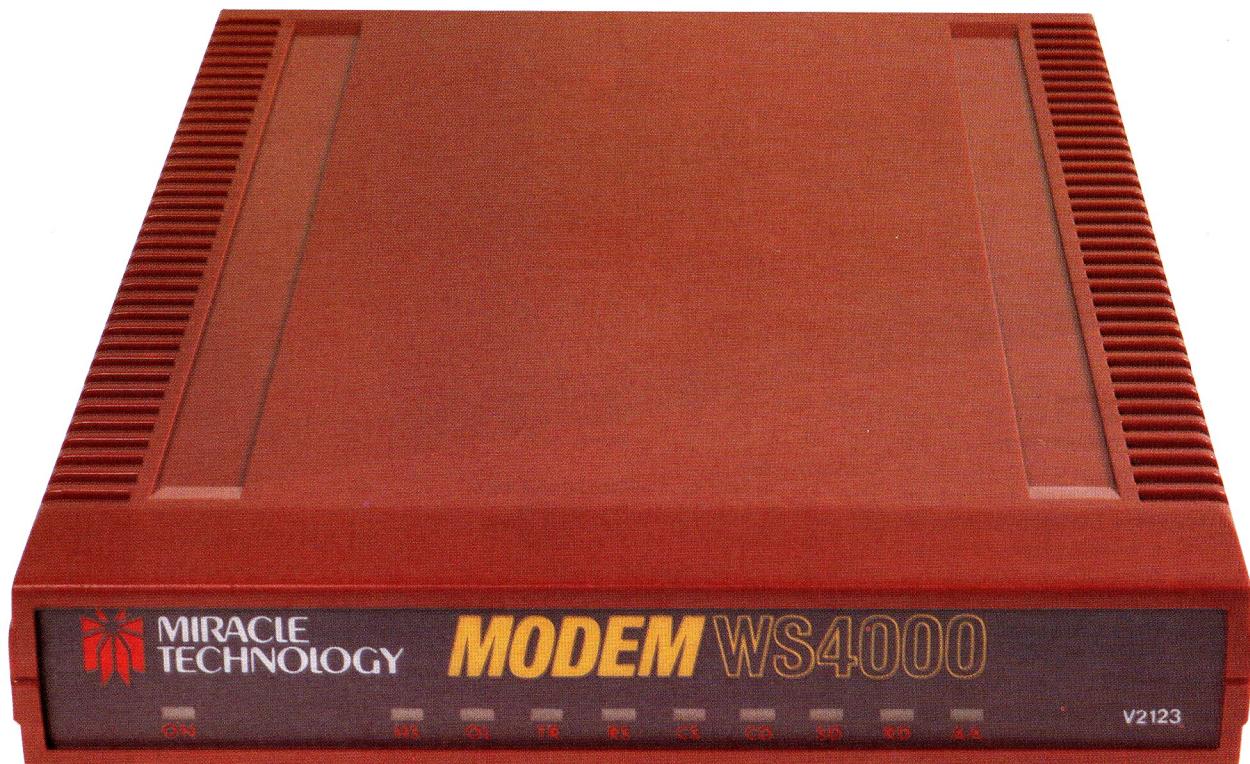
The speed buffered RS232 port allows even those computers with full duplex only facilities to access services such as Prestel or Telecom Gold, which operate on a 'split' data rate system. So major information services are now within the capability of most computers.

computer or terminal keyboard, the WS4000 is simple to operate, helped by the logical command structures and a comprehensive step-by-step instruction manual. The full autodial and autoanswer facilities also contribute to making this modem ideal for those users who have little technical knowledge.

The WS4000 modem is unique in offering a very wide variety of optional upgrades and extras, including the 1200bps and 2400bps full duplex CCITT V22 and V22bis standards, and the American 300bps BELL 103 standard.

MODEM

WS



The HAYES software command protocols used by the WS4000 allow the use of an enormous range of well-proven communications software. Controlled by 'plain English' commands entered from the

After upgrade, all features of the basic model are retained, giving a multi-standard modem in a single compact unit, capable of data transmission speeds from 75bps to 1200bps or 2400bps.

A free option for the Amstrad PCW 8256 and 8512 is a built-in serial interface. The WS4000 is the first modem dedicated to the PCW range.

TECHNICAL SPECIFICATION

Dimensions

Width 182mm (7.2")
 Depth 245mm (9.6")
 Height 38mm (1.5")
 Footprint .044 sq m (0.48 sq ft)

Weights

modem 0.79Kg (27oz)
 power adaptor 0.34Kg (12oz)

Case type

High impact ABS, wipe-clean textured surface

Power requirements

240 V~ 50/60Hz single phase +2% -8% less than 15 watts. Separate power adaptor

Environmental conditions

Operational ambient temperature range +5C to +30C

Modulation method

Asynchronous Frequency Shift Keying

Transmission path

2 or 3-wire public switched telephone network. Leased line model WS4000LL

Line terminating characteristics

Terminating impedance 600 ohms

Line termination type

British Telecom Series 600 modular plug type 431A. Modem rear-panel 600 series telephone socket, paralleled with PSTN line

Line connection mode

Manual or autodial by open-loop pulse dial, or by optional DTMF touch-tone. Manual or autoanswer to CCITT V25

Line disconnection on:

Loss of DTR
 Loss of Carrier
 Loss of Data Activity

Transmitted signal level

-9dBm maximum into 600 ohms

Received signal minimum level

-43dBm

Data signalling rates

300/300bps, 600bps, 1200bps, 1200/75bps, 75/1200bps

Standards

CCITT V21, V23, BELL 103 option

Data format

Asynchronous 7 or 8 bits, odd, even or no parity. Software configured, no modem settings required

Mode selection

Operating modes software selectable by HAYES-compatible command strings entered from the DTE. Command set broadly compatible with HAYES protocols, except where UK regulations or enhanced modem operations require differences

Modem DTE interface

EIA RS232C/CCITT V24 compatible DTE interface

Modem DTE interface connector

DB-25 female 25-pin socket

FEATURES:

- Fully intelligent
- Hayes compatible
- Upgradeable
- Autoanswer/Autodial
- Speed buffered
- Host of optional extras
- Low price

4000

Optional facilities available are:

- DTMF tone dialling
- Audio call progress monitor
- Battery backed name and number store
- Control port
- V22
- V22 bis
- BELL 103

All or any of the optional upgrades and extras are available factory-fitted either at the time of original purchase or at any time thereafter, to make the WS4000 the ultimate in modem flexibility!

Modem DTE interface speed capability

Intelligent speed buffering allows DTE operation at 1200bps full duplex for modem operation at 1200/75, 75/1200, 1200bps. DTE may also operate at 300bps full duplex for 300/300bps or 600bps for 600bps modem operation. DTE may also operate at split baud rates

Signals at DTE interface

Pin no.	Input to Modem/ no.	Function	CCITT circuit
1	—	Modem frame ground	101
2	I	Send Data (SD)	103
3	O	Received Data (RD)	104
4	I	Request to Send (RS)	105
5	O	Clear to Send (CS)	106
6	O	Data Set Ready (DR)	107
7	—	Signal Ground	102
8	O	Data Carrier Detect (CD)	109
9	O	Test (+5Vdc)	—
10	O	Test (-12Vdc)	—
20	I	Data Terminal Ready	108
22	O	Ring Indicator	125
23	O	Data Signalling Rate	111
25	O	Test (+12Vdc)	142

Internal pull-up resistors enable DTR and RTS if these control signals are not available from the DTE.

Control port option

26 way 2 row, 0.1" male polarised socket, configured as a parallel printer port. May be custom configured for process control applications.

Line noise filtering

Selectable fixed amplitude equalisation in V23 mode

Activity indicators

Front-panel LED indicators for:

(ON)
 Power
 On line
 Carrier Detect
 Send Data
 Receive Data
 Auto Answer
 (OL)
 (CD)
 (SD)
 (RD)
 (AA)

Safety

WS4000 is designed and constructed to comply with the relevant requirements of the following British Standards:
 BS 415, BS 6301, BS 6305, BS 6320

Part No.
 100-350

**The 64 MULTIMODEM is the
only plug-in multi-standard
modem in Britain for the
Commodore 64 or 128.**

Fully software controlled and menu-driven, it carries all necessary software on-board in ROM. This neat little modem simply fits into the computer's cartridge port, with the telephone lead being the only external connection.

The 64 Multimodem operates at 300/300bps, 1200/75 and 75/1200bps on the CCITT standard, and 300bps on the American BELL standard. These speeds and standards give the Commodore user access to databases all over the world, and the opportunity for user-user communications.

The on-board software handles Prestel and similar databases, and private Bulletin Boards, and also offers the facilities for creating your own Bulletin Board, using the modem's powerful autoanswer facilities.

Autoanswer and autodial are just two of the features which make this modem spectacularly easy to use.

Everything is controlled from the computer keyboard. This ease of operation makes the 64 Multimodem suitable for every user, from the classroom to the office.

Its software features include save and print frame, automailbox with edit and save, and telesoftware downloading. The powerful Telesoftware Downloader is written to the very latest Mustang Terminal Specification to ensure full Prestel compatibility.

One of the most exciting functions of the 64 Multimodem's software is its Bulletin Board capability. Now you can set up your own Bulletin Board. Set the modem to autoanswer and it will detect an incoming caller, send out your own personal banner heading and take and automatically save messages to disc, cassette, (not CBM128) or direct to a printer.

Made to the same exacting standards as all Miracle Technology's products, the 64 Multimodem conforms to our usual requirements of the highest possible quality. To ensure that this is the best Commodore modem you can buy, we contracted the writers of the software for Commodore's own single standard modem to produce the state-of-the-art software you will find here.

64 MU



There is no better way for the Commodore user to get into data communications — the 64 Multimodem will give you all you need.

When the caller rings off, the modem resets itself ready for the next call.

Once plugged in, the modem's software is automatically loaded onto the computer. Easy-to-read screen menus then guide the user through the modem's operation.

Both CBM printers and others with suitable interfaces for the CBM 64 or 128 are supported by the modem software. This allows the user not only to print out incoming messages, but even some of the Prestel-type screens.

TECHNICAL SPECIFICATION

Dimensions

Width 112mm (4.4")
Depth 165mm (6.5") inc. nose
Height 45mm (1.8") inc. feet

Weight

340g (12oz)

Case type

High impact Polystyrene

Power requirements

Entirely powered from host computer

Modulation method

Asynchronous Frequency Shift Keying (FSK)

Transmission path

2-wire public switched telephone network

Line terminating characteristics

Terminating Impedance 600 ohms

Line termination type

British Telecom Series 600 modular plug type 431A

Line connection mode

Software controlled autodial or autoanswer

Line disconnection on:

Loss of carrier

Manual key press

Transmitted signal level

-9dBm maximum into 600 ohms

Received signal minimum level

-43dBm

Data signalling rates

300/300 baud, 1200/75 baud, 75/1200 baud

Standards

CCITT V21, V23, BELL 103

Data format

Asynchronous 7 or 8 bits, odd, even or no parity

Mode selection

Selection from computer menu display

Modem/computer interface

CBM cartridge port

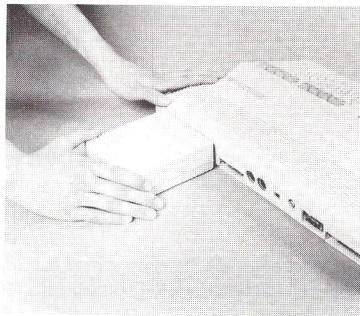
Safety

The 64 Multimodem has been designed to comply with the relevant requirements of British Standards BS415, BS6301, BS6305 and BS6320, though no liability is accepted for any errors or omissions in such design, or for the consequences thereof.

FEATURES:

- Computer controlled
- Menu-driven
- Autodial/Autoanswer
- ROM-based software
- Access to Prestel & Bulletin Boards

● Plug in and go!



Ken McMahon

Commodore User

'Probably the biggest advantage of this over any other comms package is that all the software you are likely to need is included on ROM, thus obviating the need to load extra programs from disc as and when you need them. With the Multimodem plugged in you're set up for just about anything.'

'For adventurous types the Multimodem also has auto answer which means you can set up your own BB. This has to be the most exciting development yet in 64 comms.'

'Anyone considering making the move into comms couldn't have picked a better time. At the price, the 64 Multimodem offers more than any previously available Commodore modem. Now that it has received BART approval it will undoubtedly rank high, if not top of any self respecting Commodore user's shopping list.'

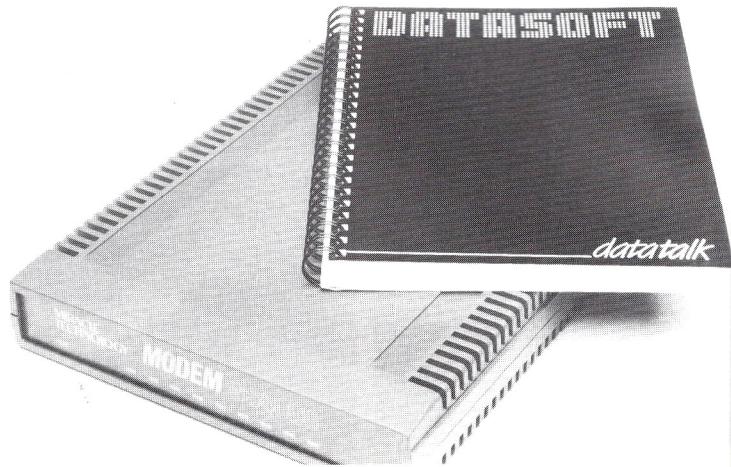
Part No.
100-510

Buying a complete data communications package from Miracle Technology offers many advantages.

With a Miracle

Technology package, you can be sure that hardware and software are perfectly suited to each other, to your computer and to your needs, because we design our packages with the users in mind.

Also it means no wasted time in shopping around for the right combination of equipment — instead, you can be up and running immediately. And, not least, buying in package form usually means paying less.



BUSINESS PACKAGES

For the businessman, buying data communications equipment as a package is both efficient and cost effective. It means ease of choice,

speed of installation, trouble-free operation and real financial benefits.

DATATALK

A sophisticated datacomms package for the business user, combined with any Miracle Technology modem, for use in conjunction with IBM PC's, Apricot and clones.

HOME USER PACKAGES

For the home-user starting out in data communications, trying to match the right hardware with the right software can be a problem.

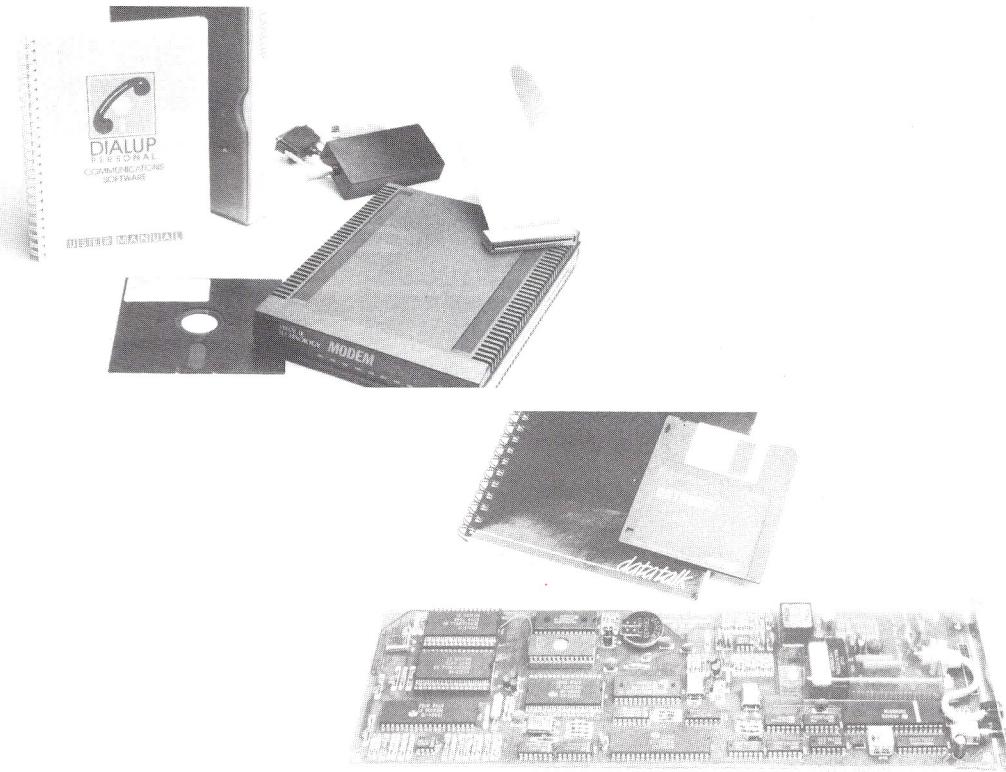
With so many products to choose from, it's all too easy to make an expensive mistake. So, what a relief it is to be able to buy a complete, well-designed package, knowing that

DATABEEB, DATATARI, DATASPECTRUM

The ideal package for business or home use, sold with the manual-dial WS2000.

DIALUP PERSONAL

A simple to use but powerful software package which can be used to access all major services.



KAGES

the hardware and the software are right for each other, user-friendly and top quality.

EDUCATIONAL PACKAGES

Data Communications are becoming increasingly important in the classroom, with the advent of specialist educational services such as 'Schoollink' and 'TTNS'. Miracle Technology offers complete packages with both hardware and software custom-designed to serve the needs of schools.

The Schools Modem was designed after consultations with the people who most use it — the teachers. Hayes-compatible, intelligent, upgradeable, user-friendly, it's the perfect member of the class. Packaged with 'DIALUP Educational' software, it's the ultimate in educational data communications. We also offer school packages which team the WS2000 modem with software for the BBC and other computers popular in the educational field. Please contact us for details.

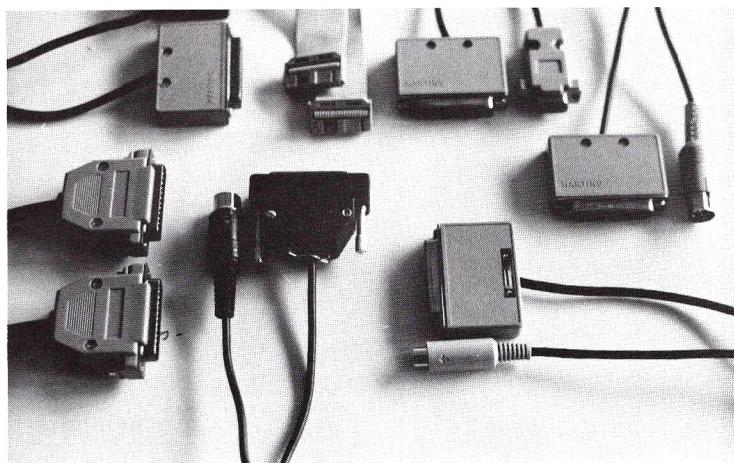
Other special packages are being developed for a variety of machines including Atari and Amstrad.

So that our customers have the luxury of being able to buy all their data communications equipment in a single package, we supply a wide range of accessories, a selection of which can be seen below.

CABLES AND INTERFACES

To connect the modem to your computer you may require either an interface or a cable. If your computer is not fitted with a serial port, then you may need an interface. We can supply these for most popular makes of computers — please contact us for details.

If your computer does have a serial port, then you will require a cable. We list below a selection of the most commonly requested. However, we can also supply cables for most computers and, as with interfaces, if the one you need is not seen here, please contact us with details of your own requirements.

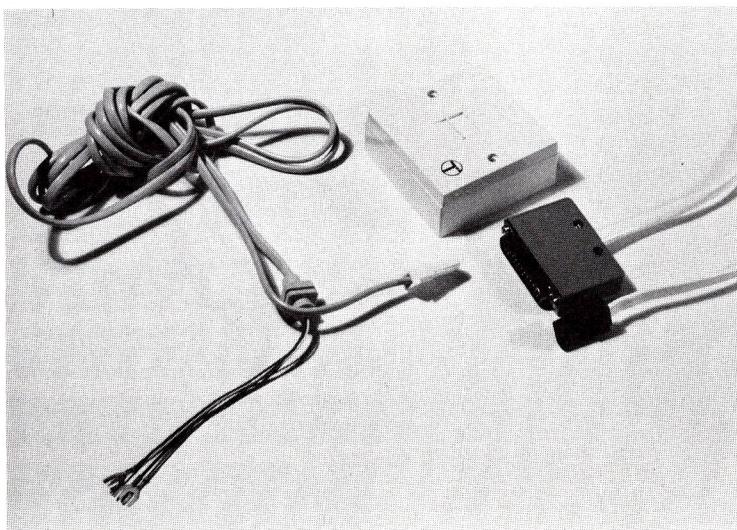


Computer	Part no. for use with WS2000	Part no. for use with WS3000/4000
BBC	100-050	100-045
Apple IIe	100-040	100-095
Apple II+IIc	100-090	100-090
Apple Mac	100-060	100-060
Apple Mac+	100-092	100-092
ACT Apricot	100-040	100-095
IBM PC AT	100-106	100-106
IBM PC XT	100-100	100-085
Amstrad 6128/8256	100-062	100-062
Atari 520/1040 ST	100-100	100-085

ACCESSORIES

TELEPHONE ACCESSORIES

Telephone extension cable kit — 3 metres
Part no. 100-205
Replacement telephone lead — 3 metres
Part no. 100-110
Telephone wall socket, master
Part no. 100-220
Telephone wall socket, secondary
Part no. 100-210



Miracle Technology (UK) Limited reserves the right to alter product specifications in part or all at any time, in the interests of continuing product development. Availability of products is subject to the Company's Terms and Conditions of Sale, a copy of which is available on request. All brand names are registered trade marks of the organisations concerned.

Miracle Technology (UK) Ltd
St Peters Street Ipswich IP1 1XB England
Sales (0473) 216141 6 lines
Customer Service Hot-Line (0473) 50304
Telecom Gold 79: KEY001 (Dealerlink 72:DTB 10135)
946240 CWEASY G 19002985
Prestel Mailbox 919992265