

Hardware Installation Manual

for the

DataPump-2 / 4

Programmable Communication Controllers

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Radio Frequency Interference (RFI)

The TCL range of multiport adapter cards have been verified to comply with the following international standards on RFI emissions:-

FCC PART 15 LIMIT A
VDE 0871 LIMIT A
BS 6527 (EN 55022) LIMIT A
CSA C108.8 M1983 LIMIT A

WARRANTY

TCL provides a 12-month (from date of purchase) return to base warranty, to cover the DataPump, DataServer and TwinSync range of equipment against defective materials or workmanship.

This warranty does not apply if the adapter has been damaged by neglect, improper handling or by any other causes not arising directly from defective materials or workmanship.

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Quick Installation Guide

Pre-Flight Checks

Check that any adapter cards already installed in the computer will not clash with the factory set D6000h memory address of the TCL adapter card. (Such as an ISA Network or ISA SCSI Controller cards.)

Check that the PC ROM BIOS shadowing is DISABLED in the address area used by the TCL Controller card. (Typically D4000h...D7FFFh).

Some PCI Mother boards require that the user must enable the ISA Shared Memory Region (C8000h...EFFFFh). Examine the PCI ROM Bios setup for the computer to determine if this is the case. ENABLE the ISA memory where the TCL Controller card is to reside (Typically D4000h...D7FFFh).

TCL Controller Card Installation

Check the Address switch on the TCL controller card is set for the factory default:

Switch Settings for D6000h base address								
SW1 SWITCH	1	2	3	4	5	6	7	8
POSITION	OF F	OF F	ON	OF F	ON	OF F	OF F	OFF

Check that NO Interrupt IRQ is selected. (Some third party device drivers may require an IRQ to be set - please refer to the suppliers documentation.)

Switch power to the computer OFF and disconnect from the mains power supply.

Remove the cover from the computer.

Insert the TCL Controller card into a free 16-Bit ISA.

Screw TCL Controller card end-plate(s) to computer chassis

Connect (if necessary) the serial expansion cable to the TCL Controller card.

Replace computer cover.

Re-connect mains power supply.

To check the card is operational - boot the computer into DOS and run the TCLDIAG program from the TCL UTILITIES diskette supplied with the TCL Controller card.

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1 Introduction

1.1 Features

The *DataPump* are a range of intelligent serial communications controllers which allows 2 or 4 terminals or other serial devices to be interfaced to a single IBM PC/AT (ISA/EISA/PCI) compatible computer.

The controller cards incorporates an AMD 80C188 or AMD 80C186 Processor with 64K to 1024K bytes of RAM. The controller is responsible for controlling data transfer to and from the attached terminals or serial devices; thus reducing the workload on the PC host processor.

Control software is downloaded to the card at system power up, allowing total flexibility in system application and configuration.

No interrupts are used by TCL supplied device drivers.

1.2 Options

The DataPump-2 and DataPump-4 have on-board surge protection fitted as standard.

2 Configuration

Caution

Components on the board can be permanently damaged by Static Electricity. Extreme care must therefore be taken before handling the board. To avoid the possibility of damaging the components in this way, be sure to touch a grounded object to release any static electricity, or use an earth strap before touching the controller.

2.1 Configuring the TCL Card

2.1.1 Interrupt level

The interrupt level of a TCL ISA bus controller card is selected via a 9 way header on the TCL controller card.

IRQ 3, 4, 5, 7, 9, 10, 11, 12 and 15.

No interrupt is used by the device drivers supplied by TCL and the cards are factory set with no interrupt selected. It should not be necessary to alter this setting when using TCL supplied device drivers.

NOTE: **Device Drivers supplied by third parties may require an IRQ to be set. Please refer to the suppliers documentation for specific information.**

NOTE: The TCL ISA bus adapter card must be placed in a EISA/ISA 16-Bit slot to gain access to IRQs 9, 10, 11, 12, and 15.

2.1.2 Memory Address allocation

The memory address at which the TCL ISA bus Controller card will be installed (the base address of the dual-ported Memory window) is set via an 8- way switch SW1.

TCL ISA Bus cards are factory set with a 4K+4K window at a base address of D6000h. This is compatible with most systems. It is essential, however, to ensure that no other board in the system occupies the same memory address location.

Switch Settings for D6000h base address								
SW1 SWITCH	1	2	3	4	5	6	7	8
POSITION	OFF	OFF	ON	OFF	ON	OFF	OFF	OFF

If more than one **TCL ISA Bus Serial Controller** card is to be installed, the address of one of the other cards must be altered. The alternative recommended address is D8000h.

Switch Settings for D8000h base address								
SW1 SWITCH	1	2	3	4	5	6	7	8
POSITION	ON	ON	OFF	OFF	ON	OFF	OFF	OFF

Full details of all valid switch settings and their corresponding addresses are listed below. If more than one TCL ISA Bus controller card is to be installed, a note of the card's respective addresses should be made.

SW1 switch bit assignments								
SWITCH SW1	1	2	3	4	5	6	7	8
ADDRESS BIT	SA13	SA14	SA15	SA16	SA17	SA18	SA19	---

ADDRESS	1	2	3	4	5	6	7	8
A0000..A1FFF	ON	ON	ON	ON	OFF	ON	OFF	OFF
A2000..A3FFF	OFF	ON	ON	ON	OFF	ON	OFF	OFF
A4000..A5FFF	ON	OFF	ON	ON	OFF	ON	OFF	OFF
A6000..A7FFF	OFF	OFF	ON	ON	OFF	ON	OFF	OFF
A8000..A9FFF	ON	ON	OFF	ON	OFF	ON	OFF	OFF
AA000..ABFFF	OFF	ON	OFF	ON	OFF	ON	OFF	OFF
AC000..ADFFF	ON	OFF	OFF	ON	OFF	ON	OFF	OFF
AE000..AFFFF	OFF	OFF	OFF	ON	OFF	ON	OFF	OFF
B0000..B1FFF	ON	ON	ON	OFF	OFF	ON	OFF	OFF
B2000..B3FFF	OFF	ON	ON	OFF	OFF	ON	OFF	OFF

ADDRESS	1	2	3	4	5	6	7	8
B4000..B5FFF	ON	OFF	ON	OFF	OFF	ON	OFF	OFF
B6000..B7FFF	OFF	OFF	ON	OFF	OFF	ON	OFF	OFF
B8000..B9FFF	ON	ON	OFF	OFF	OFF	ON	OFF	OFF
BA000..BBFFF	OFF	ON	OFF	OFF	OFF	ON	OFF	OFF
BC000..BDFFF	ON	OFF	OFF	OFF	OFF	ON	OFF	OFF
BE000..BFFFF	OFF	OFF	OFF	OFF	OFF	ON	OFF	OFF
C0000..C1FFF	ON	ON	ON	ON	ON	OFF	OFF	OFF
C2000..C3FFF	OFF	ON	ON	ON	ON	OFF	OFF	OFF
C4000..C5FFF	ON	OFF	ON	ON	ON	OFF	OFF	OFF
C6000..C7FFF	OFF	OFF	ON	ON	ON	OFF	OFF	OFF
C8000..C9FFF	ON	ON	OFF	ON	ON	OFF	OFF	OFF
CA000..CBFFF	OFF	ON	OFF	ON	ON	OFF	OFF	OFF
CC000..CDFFF	ON	OFF	OFF	ON	ON	OFF	OFF	OFF
CE000..CFFFF	OFF	OFF	OFF	ON	ON	OFF	OFF	OFF
D0000..D1FFF	ON	ON	ON	OFF	ON	OFF	OFF	OFF
D2000..D3FFF	OFF	ON	ON	OFF	ON	OFF	OFF	OFF
D4000..D5FFF	ON	OFF	ON	OFF	ON	OFF	OFF	OFF
D6000..D7FFF	OFF	OFF	ON	OFF	ON	OFF	OFF	OFF
D8000..D9FFF	ON	ON	OFF	OFF	ON	OFF	OFF	OFF
DA000..DBFFF	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF
DC000..DDFFF	ON	OFF	OFF	OFF	ON	OFF	OFF	OFF
DE000..DFFFF	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF
E0000..E1FFF	ON	ON	ON	ON	OFF	OFF	OFF	OFF
E2000..E3FFF	OFF	ON	ON	ON	OFF	OFF	OFF	OFF
E4000..E5FFF	ON	OFF	ON	ON	OFF	OFF	OFF	OFF
E6000..E7FFF	OFF	OFF	ON	ON	OFF	OFF	OFF	OFF
E8000..E9FFF	ON	ON	OFF	ON	OFF	OFF	OFF	OFF
EA000..EBFFF	OFF	ON	OFF	ON	OFF	OFF	OFF	OFF
EC000..EDFFF	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF
EE000..EFFFF	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF

3 Installation

3.1 General instructions

Always ensure that the mains supply is disconnected before attempting to connect or disconnect any kind of equipment.

All electronic components are extremely susceptible to damage from an electro-static charge. Always touch a grounded object before handling the controller.

Please refer also to manufacturer's guide supplied with the computer system for instructions on installing an expansion card.

3.2 Installing the TCL controller card

See section 2. to ensure that a TCL ISA bus card is configured correctly. The TCL ISA bus card occupies 8K bytes of memory address space so it is important that it does not clash with other I/O adapters such as network and disk (SCSI) controller cards.

If other adapter cards are fitted in the computer check that their installed addresses do not conflict with the TCL controller card, if they do, adjust the TCL Controller card base address so there is no conflict.

Switch off the mains supply at the wall socket, then disconnect the mains cable from the system unit.

Disconnect the keyboard and any peripheral devices. Remove the system-unit cover with reference to the manufacturer's instructions.

A TCL ISA controller card can then be fitted in an available 16-bit ISA slot by first aligning, then pressing the card firmly into the connector. The end bracket of the TCL controller card should be screwed to the computer chassis. The system-unit cover should then be replaced.

NOTE: TCL ISA Controller cards may also be used in an ISA 8-Bit slot. Only IRQs 3, 4, 5, and 7 will be available to the adapter card if used in an ISA 8-Bit slot.

3.3 Connecting the DataPump-4 Expansion Cable

Two expansion cables are available for the **DataPump-4**. As standard an end-plate with two male 9-Way D-Types will be supplied, attached to which is a ribbon cable terminated with two 10-Way Dual-in-Line (DIL) headers. An optional expansion cable is available for use in a synchronous mode. This consists of an end-plate with a 25-Way Female D-Type, attached to which is a ribbon cable terminated in a 26-Way DIL header.

3.3.1 Connecting DataPump-4 Async Expansion Cable

- Install the **DataPump-4** card as described in 3.2. Screw the end-plate with the two 9-Way D-Types attached into a free slot next to the **DataPump-4** card.
- Connect the 10-Way DIL header associated with the Top 9-Way D-Type to the header on the top edge of the **DataPump-4** card labelled "PORT3".
- Connect the 10-Way DIL header associated with the Lower 9-Way D-Type to the header on the top edge of the **DataPump-4** card labelled "PORT4".

NOTE-1: The DIL header has a key on one side to ensure it is inserted the correct way round into the on board connector.

3.3.2 Connecting DataPump-4 Sync Expansion Cable

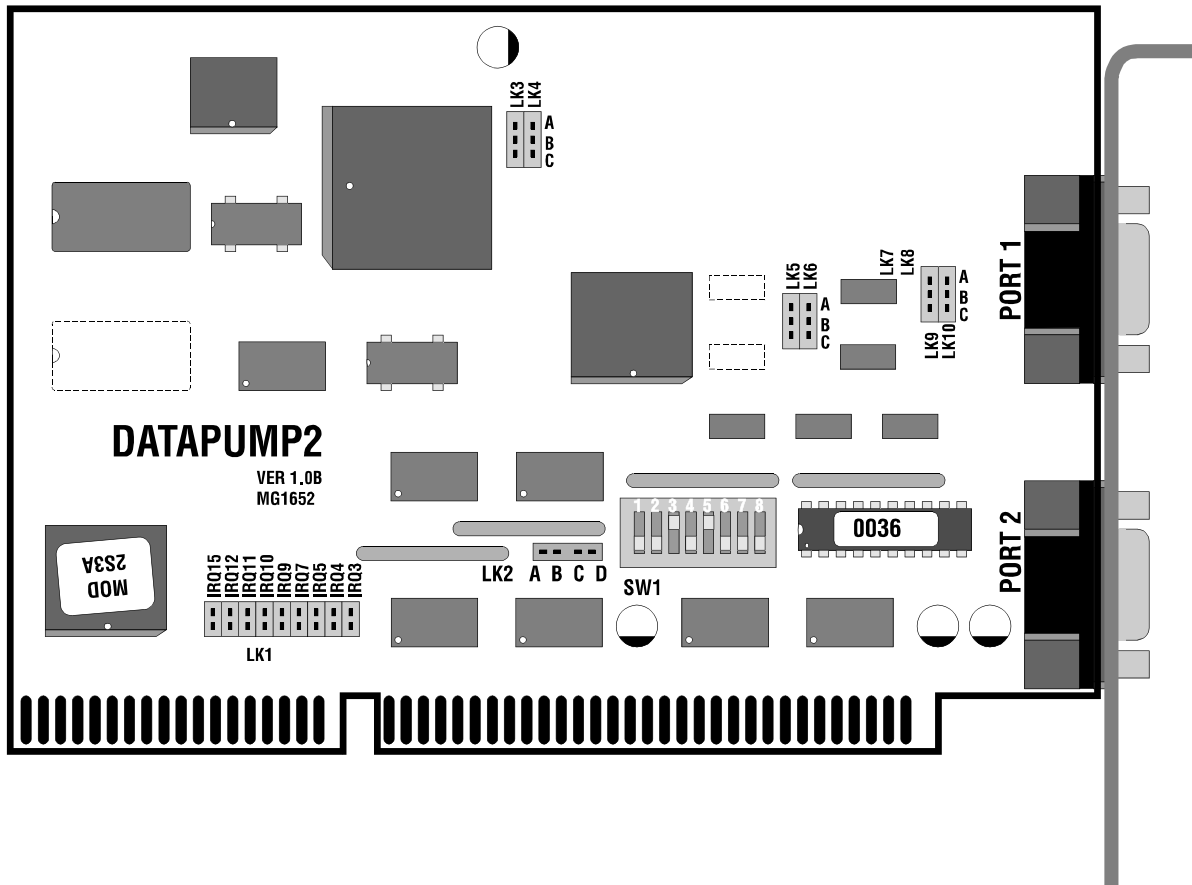
- Install the **DataPump-4** card as described in 3.2. Screw the end-plate with the 25-Way D-Type attached into a free slot next to the **DataPump-4** card.
- Connect the 26-Way DIL header to the header on the top edge of the **DataPump-4** card labelled "PORT3 SYNC".

NOTE-1: The DIL header has a key on one side to ensure it is inserted the correct way round into the on board connector.

4 DataPump-2

4.1 Features

The **DataPump-2** controller card provides two RS232 Serail ports controlled by an on board 80c188 16MHz CPU with 128K bytes of program and data buffering memory.



DataPump-2 Controller Card

4.2 DataPump-2 Technical Details

Processor:	AMD 80C188 16MHz		
Memory:	128K Bytes Onboard Private Memory.		
Interface:	8K Byte Dual Ported Window interface to Host PC. Switch Selectable in the Host Computer address range A0000h...EFFFFh. Requires one 8-Bit or 16-Bit ISA bus slot.		
Interrupts:	Jumper selectable for IRQs 3, 4, 5, 7, (9, 10, 11, 12, and 15 on 16-Bit ISA Bus).		
External Interface:	Channel-1 & 2 9-Pin D-Type male IBM standard (Mounted on card end-plate)		
Serial I/O Controllers:	One AMD 85c30 Dual channel Asynchronous Serial Communication Controllers. System P-Clock 7.3728MHz.		
Baud Rates:	50, 62.5, 75, 110, 134.5, 150, 200, 300, 600, 1200, 1800, 2000, 2400, 3600, 4800, 7200, 9600, 19200, 38400, 57600, 76800, 115200. Other baud rates are programmable subject to the maximum value of 115200.		
Parity:	None, Odd, Even.		
Data Bits:	5, 6, 7, 8.		
Stop Bits:	1, 1.5, 2		
Handshake Signals:	DTR, RTS	(Outputs RS232)	
	DSR, CTS, DCD, RI	(Inputs RS232)	
	The RS232 input control lines (CTS,DCD,DSR,RI) may be biased high (ON), low (OFF), or left floating. Standard production units are biased high (ON).		
Serial I/O Interface:	V.24/RS-232 Serial drivers on both ports. All serial RS232 I/O signals and control lines are protected by 600W AVX-TransGuard Surge Protectors (Protects lines from noise transients.)		
Power:	[5v @ 550mA]	[+12v, @ 100mA]	[-12v, @ 100mA] Typical.
Size:	172mm x 128mm X 22mm Overall Dimensions 157mm x 107mm x 12.5mm PCB Dimensions		
Weight:	120g		

4.2.1 DataPump-2 Jumper Settings

LK-1 IRQ Jumpers 3, 4, 5, 7, 9, 10, 11, 12, 15

LK-2 AB Closed*, CD Open* 4KB+4KB Dual-port memory size
 AB Open, CD Closed 2KB+2KB Dual-port memory size

LK-9 AB Port-1 RS232 inputs biased on
 BC Port-1 RS232 inputs biased off

LK-10 AB Port-2 RS232 inputs biased on
 BC Port-2 RS232 inputs biased off

4.3 DataPump-2 Connector Pin Outs

TCL RS232 9-Way D-Type Male Pin Out					
Pin	Signal	I/O	Pin	Signal	I/O
1	Carrier Detect	I/P	6	Data Set Ready	I/P
2	Receive Data	I/P	7	Request to Send	O/P
3	Transmit Data	O/P	8	Clear to Send	I/P
4	Terminal Ready	O/P	9	Ring Indicate	I/P
5	Signal Ground				

5 DataPump-4

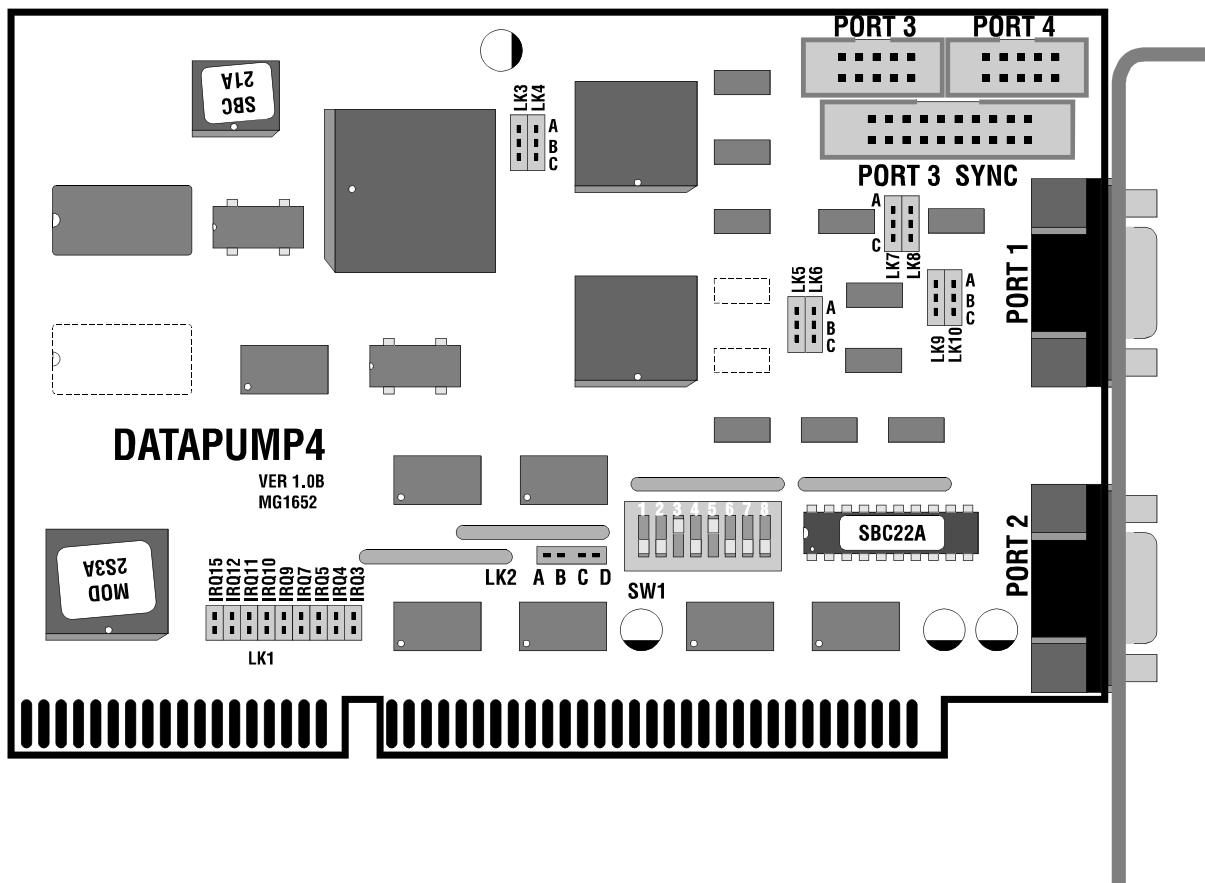
5.1 Features

The **DataPump-4** controller card provides for RS232 Serial ports controlled by an on board 80c188 16MHz CPU with 128K bytes of program and data buffering memory. There is also circuitry to support RS232 synchronous communications on channel-3 of the DataPump-4 controller card.

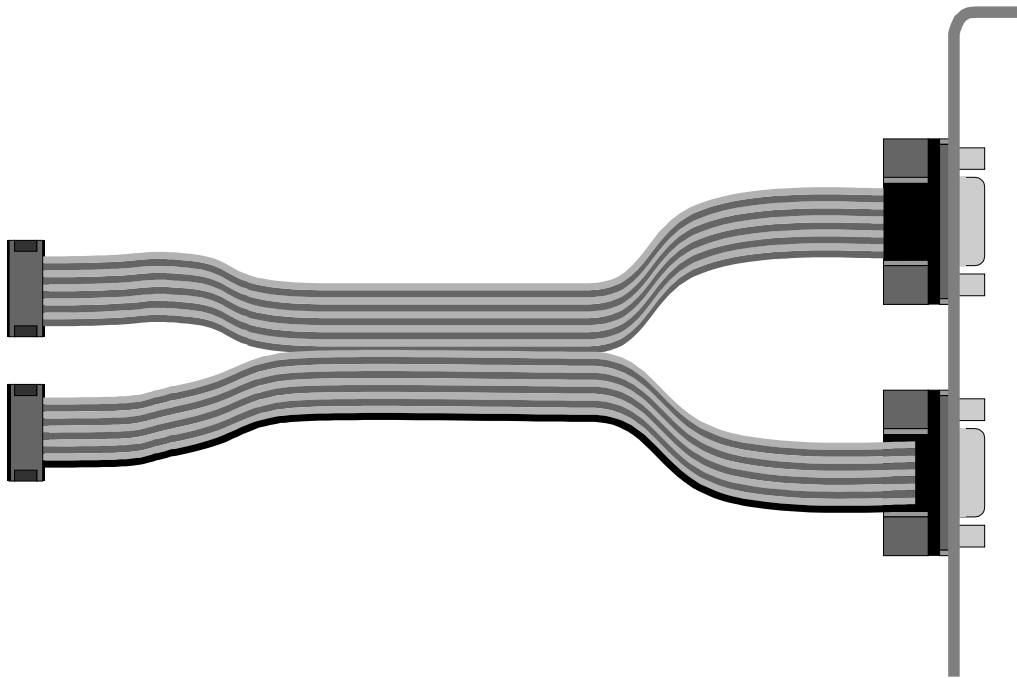
5.2 Options

The **DataPump-4** controller card is available with a RS232 synchronous port option. In this mode, Port-1 and Port-2 operate in Asynchronous mode and Port-3 operates in Synchronous mode. (Port-4 is not available when DataPump-4 is used in Synchronous mode).

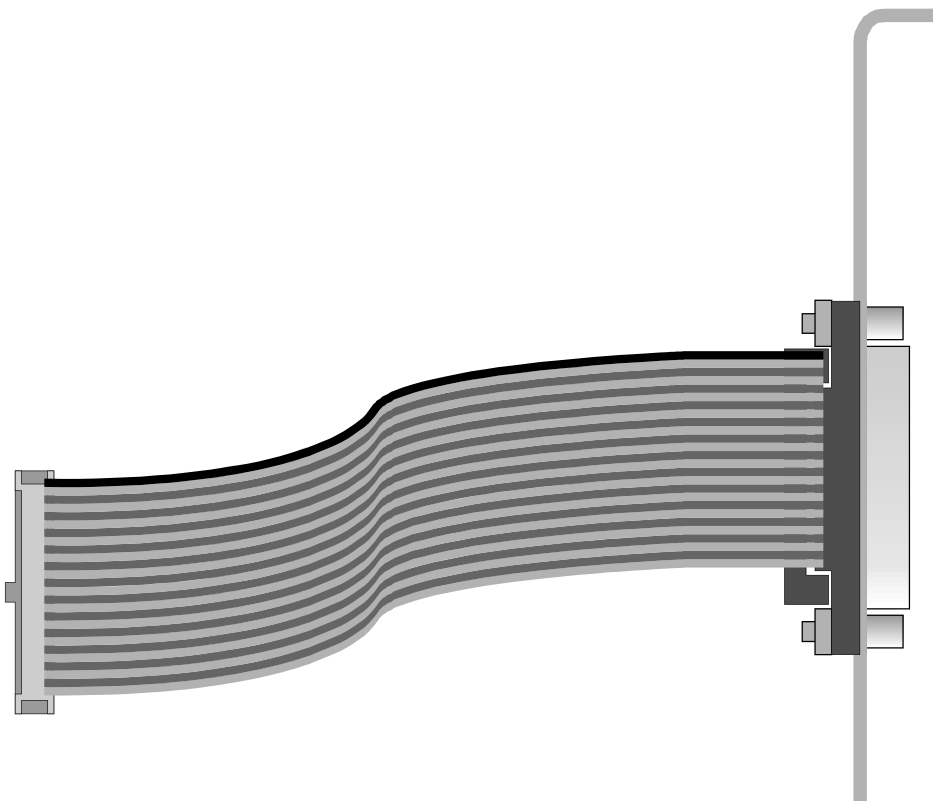
On-Board memory may be upgraded to support 256K Bytes of RAM.



DataPump-4 Controller Card



DataPump-4 Asynchronous Expansion Cable. (Part No. 9502)



DataPump-4 Synchronous Expansion Cable. (Part No. 9527)

5.3 DataPump-4 Technical Details

Processor: AMD 80C188 16MHz

Memory: 128K Bytes Onboard Private Memory with
256K Bytes Option.

Interface: 8K Byte Dual Ported Window interface to Host PC. Switch Selectable in the Host Computer address range A0000h...FFFFFFh. Requires one 8-Bit or 16-Bit ISA bus slot.

Interrupts: Jumper selectable for IRQs 3, 4, 5, 7, (9, 10, 11, 12, and 15 on 16-Bit ISA Bus).

External

Interface:	Port-1	RS-232	Asynchronous. 9-Pin D-Type (Mounted on end bracket).
	Port-2	RS-232	Asynchronous. 9-Pin D-Type (Mounted on end bracket).
	Port-3	RS-232	Synchronous. 26-pin DIL onboard Header (Note-1).
		RS-232	Asynchronous. 10-pin DIL onboard Header (Note-2).
	Port-4	RS-232	Asynchronous. 10-pin DIL onboard Header (Note-2).

Note-1 Port-3 may be selected either for Asynchronous or Synchronous operation, depending upon the software loaded on to the DATAPUMP-4 card. When used in Synchronous mode a flying lead is provided which converts the 26-Way DIL header connections to a 25-Way D-Type Female connector (Port-3) attached to a bus slot end bracket. **(Ch-4 is not supported when Ch-3 is used in Synchronous mode).**

Note-2 When used in Asynchronous mode the flying lead converts the two 10 way DIL headers to two 9-Way D-Type Male connectors attached to an end bracket.

Serial I/O

Controllers: Two AMD 85c30 Dual channel Asynchronous/Synchronous Serial Communication Controllers. System P-Clock 7.3728MHz.

Baud Rates: 50, 62.5, 75, 110, 134.5, 150, 200, 300, 600, 1200, 1800, 2000, 2400, 3600, 4800, 7200, 9600, 19200, 38400, 57600, 76800, 115200.
Other baud rates are programmable subject to the maximum value of 115200.

Sync Rates: External RXClk, TXClk inputs Pins 15, 17 D-25 Connector.
TRX Clock Output pin 24, D-25 Connector

Parity: None, Odd, Even.

Data Bits: 5, 6, 7, 8.

Stop Bits: 1, 1.5, 2

Handshake

Signals: Full Modem handshaking signals.
DTR, RTS (Outputs RS232)
DSR, CTS, DCD, RI (Inputs RS232)
The RS232 input control lines (CTS,DCD,DSR,RI) may be biased high (ON), low (OFF), or left floating. Standard production units are biased high (ON).

Serial I/O

Interface: V.24/RS-232 Serial drivers on all ports. All serial RS232 I/O signals and control lines are protected by 600W AVX-TransGuard Surge Protectors (Protects lines from noise transients.)

Serial I/O

Connectors: RS232 9-pin D-type male IBM standard.

Power: [5v @ 750mA] [+12v, @ 150mA] [-12v, @ 150mA] Typical.

Size: 172mm x 128mm X 22mm Overall Dimensions
157mm x 107mm x 12.5mm PCB Dimensions

Weight: 128g

5.3.1 DataPump-4 Jumper Settings

DMA DRQ0 of 80c188 CPU is connected to W//Req-A of SCC-1 Chan-A.
 DRQ1 of 80c188 CPU is jumper selectable via LK-3

DTR Chan-3 The DTR output control signal for Port-3 can be selected wither to be driven from the DTR/Req-A output or the DTR/Req-B output. (Allowing DTR control on Port-3 even if LK-3 BC is made).

The DataPump-4 Contains various jumper settings which are set at manufacturing time. The user does not need to modify these settings. The information given here is for reference purposes only. Default settings are denoted by an '*'.

LK-1 IRQ Jumpers 3, 4, 5, 7, 9, 10, 11, 12, 15

LK-2 AB Closed*, CD Open* 4KB+4KB Dual-port memory size
 AB Open, CD Closed 2KB+2KB Dual-port memory size

LK-3 AB* DRQ1 connected to W/Req-B of SCC-1 Chan-B
 CD DRQ1 connected to DTR/Req-A of SCC-1 Chan-A

LK-4 AB* Port-3 DTR: controlled from DTR/Req-A SCC-1 Chan-A
 BC Port-3 DTR: controlled from DTR/Req-B SCC-1 Chan-B

LK-5 AB* TRxCA SCC-1 Chan-A connected to Pin-24 on 25 D-Type
 BC TRxCA SCC-1 Chan-A connected to Pin-15 on 25 D-Type

LK-6 AB RTxCA SCC-1 Chan-A connected to o/p Timer-0 of CPU
 BC RTxCA SCC-1 Chan-A connected to Pin-17 on 25 D-Type

LK-7 AB Port-4 RS232 inputs biassed on
 BC Port-4 RS232 inputs biassed off

LK-8 AB Port-3 RS232 inputs biassed on
 BC Port-3 RS232 inputs biassed off

LK-9 AB Port-1 RS232 inputs biassed on
 BC Port-1 RS232 inputs biassed off

LK-10 AB Port-2 RS232 inputs biassed on
 BC Port-2 RS232 inputs biassed off

5.4 DataPump-4 Connector Pin Outs

TCL RS232 9-Way D-Type Male Pin Out					
Pin	Signal	I/O	Pin	Signal	I/O
1	Carrier Detect	I/P	6	Data Set Ready	I/P
2	Receive Data	I/P	7	Request to Send	O/P
3	Transmit Data	O/P	8	Clear to Send	I/P
4	Terminal Ready	O/P	9		
5	Signal Ground				

TCL RS232 25-Way D-Type Female Connector Pin Out					
Pin	Signal	I/O	Pin	Signal	I/O
1	Ground		14		
2	Transmit Data	O/P	15	Transmit Clock	I/P
3	Receive Data	I/P	16		
4	Request to Send	O/P	17	Receive Clock	I/P
5	Clear to Send	I/P	18		
6	Data Set Ready	I/P	19		
7	Signal Ground		20	Terminal Ready	O/P
8	Data Carrier Detect	I/P	21		
9			22	Ring Indicate	I/P
10			23	Rate Select	O/P
11			24	Clock Out	O/P
12			25		
13					

Example jumper settings for Bisync mode:

(Using external Rx/Tx clock sources)

LK-5 BC (It may be necessary to cut the PCB track linking AB)
LK-6 BC

Appendices

Appendix 1 Wiring details

Part No. 9603 Standard Terminal to **TCL Serial Port**
5 Metre Length
25D-Type male to 9D-Type female

Part No. 9606 PC COM1/COM2 to **TCL Serial Port** or
NyCE Terminal to **TCL Serial Port**
5 Metre Length
9D-Type female to 9D-Type female

Standard Terminal to TCL Serial Port				
Terminal 25 Way D-Type male (Set for DTR flow control)		TCL 9 Way D-Type Female (Set for CTS flow control)		
TX	2	<----->	2	RX
RX	3	<----->	3	TX
GND	7	<----->	5	GND
DTR	20	<----->	8	CTS

Standard Terminal to **TCL Serial Port** Wiring Details TCL Part No 9603.

PC COM1 or COM2 (25 Way) to TCL Serial Port				
COM1/COM2 25 Way D-Type male (Set for DTR flow control)		TCL Serial Port 9 Way D-Type Female (Set for CTS flow control)		
TX	2	<----->	2	RX
RX	3	<----->	3	TX
GND	7	<----->	5	GND
DTR	20	<----->	8	CTS

PC COM Port (25 Way) to **TCL Serial Port**

PC COM1 or COM2 (9 Way) to TCL Serial Port				
COM1/COM2 9 Way D-Type female (Set for DTR flow control)		TCL Serial Port 9 Way D-Type Female (Set for CTS flow control)		
TX	3	<----->	2	RX
RX	2	<----->	3	TX
GND	5	<----->	5	GND
DTR	4	<----->	8	CTS

PC COM1/COM2 port (9 Way) to **TCL Serial Port** Wiring Details TCL Part No. 9606

Modem to TCL Serial Port				
Modem 25 Way D-Type male		TCL Serial Port 9 Way D-Type Female		
DCD 8		<----->	1	DCD
RX 3		<----->	2	RX
TX 2		<----->	3	TX
DTR 20		<----->	4	DTR
GND 7		<----->	5	GND
DSR 6		<----->	6	DSR
RTS 4		<----->	7	RTS
CTS 5		<----->	8	CTS
RI 22		<----->	9	RI

Modem (25 Way) to **TCL Serial Port**

Note: The Modem wiring details shown in figure 19 represent a general specification for standard DCE to DTE connections. In certain cases various modifications may need to be made, as all the signals shown above are not supported by some modems. Please contact your dealer or modem supplier for details.

NOTES: