Hardware Installation Manual

for the

DataServer-16

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.

Notice

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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	OFF	OFF	ON	OFF	ON	OFF	OFF	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.

Table of Contents

1 Introduction

1.1 Features

The ***DataServer*** are a range of intelligent serial communications controllers which allows 16 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 DataServer-16 has 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. TCL PCI bus cards require no user configuration.

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. A TCL PCI card should be fitted in an available PCI slot. 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 DataServer-16 Expansion Cable

The ***DataServer*** adapter card will have different expansion cable depending upon the number of ports the card supports. However all the expansion cables attach to the DataServer adapter card in the same manner.

- Install the ***DataServer*** card as described in 3.2.

- The 68-way connector at the end of the expansion cable should be carefully but firmly inserted into the connector on the end-plate of the ***DataServer*** card. The connector has a self locking latch which operates automatically.

- A slight tug on the connector should be enough to show whether the connector is locked on to the card or not.

  NOTE: To disconnect the 68-way expansion cable press in the two release catches on either side of the connector, then gently pull the connector away from the card end-plate.

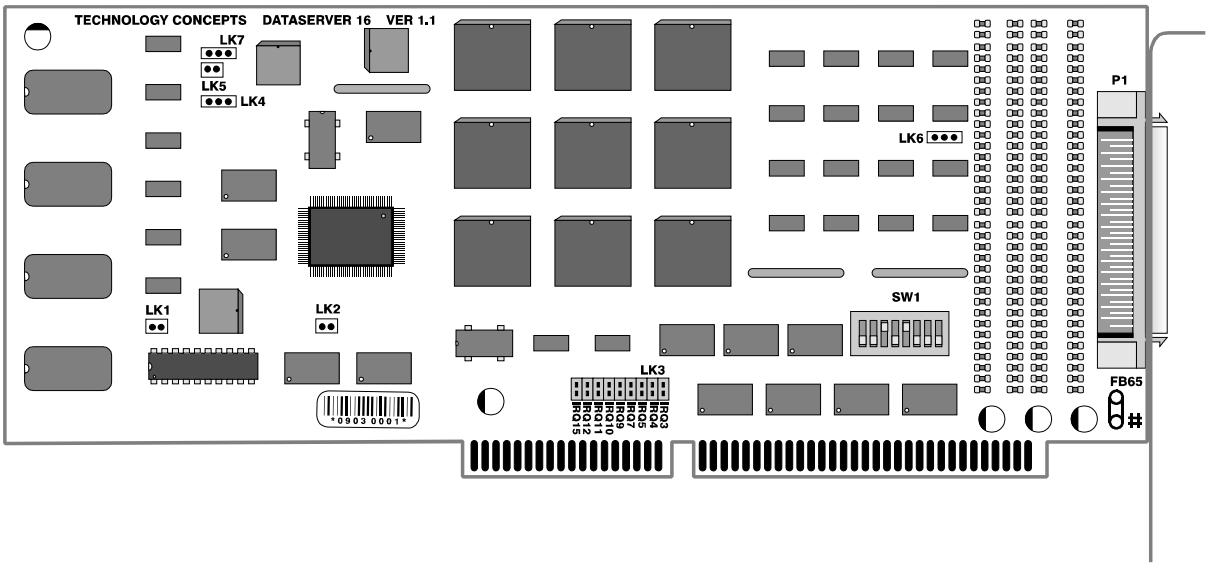
4 DataServer-16

4.1 Features

The ***DataServer-16*** (Product Code 220) controller card provides sixteen RS232 Serial ports controlled by an on board 80c186 CPU with 512K bytes of program and data buffering memory.

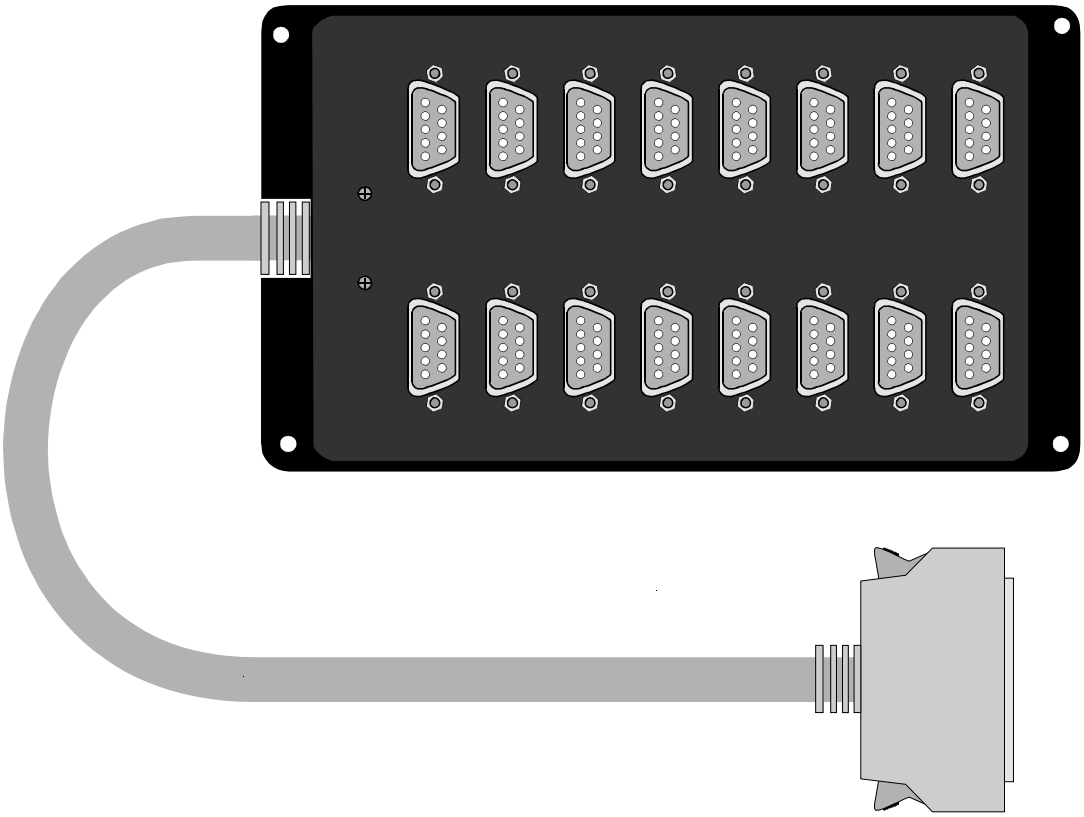
4.2 Options

The On-Board memory may be upgraded to support 1024K Bytes or RAM



DataServer-16 Controller Card (Product Code 220)

4.3 DataServer-16 Distribution Cables



DataServer-16 RS232 Distribution Cable 9-Way D-Type Male (Part No. 9514)
DataServer-16 RS232 Dist. Cable 9-Way D-Type Male (Part No. 9514-IMS)

4.4 DataServer-16 Serial Connector Pin-Outs

TCL RS232 9-Way D-Type Male Pin Out (9514)					
Pin	**Signal**	**I/O**	**Pin**	**Signal**	**I/O**
1	Carrier Detect	I/P(1)	6	Data Set Ready	I/P(1)
2	Receive Data	I/P	7	Request to Send	O/P(2)
3	Transmit Data	O/P	8	Clear to Send	I/P
4	Terminal Ready	O/P	9		
5	Signal Ground				

RS232 Pin out for Distribution Cables: Part No. 9514

NOTE-1 These Signals are NOT available on Port 5 to 16 for the DataServer-16 and are effectively pulled to an active state on the input to the Serial Communication Controller.

NOTE-2 These Signals are not available on Ports 5 to 16 on the DataServer-16. They are effectively driven active. (Connected to +12V via a 120 Ohm resistor on the DataServer-16 PCB).

TCL RS232 9-Way D-Type Male Pin Out (9514-IMS)					
Pin	**Signal**	**I/O**	**Pin**	**Signal**	**I/O**
1	Carrier Detect	I/P(3)	6	Data Set Ready	I/P(5)
2	Receive Data	I/P	7	Request to Send	O/P(4)
3	Transmit Data	O/P	8	Clear to Send	I/P(3)
4	Terminal Ready	O/P(4)	9		
5	Signal Ground				

RS232 Pin out for Distribution Cables: Part No. 9514-IMS

NOTE-3 These Signals are NOT available on Port 5 to 16 for the DataServer-16 and are effectively pulled to an active state on the input to the Serial Communication Controller.

NOTE-4 These Signals are NOT available on Ports 5 to 16 on the DataServer-16. They are effectively driven active. (Connected to +12V via a 120 Ohm resistor on the DataServer-16 PCB).

NOTE-5 The DSR Signal on Ports 5 to 16 are internally connected through to the CTS input of the Serail Communication controller.

4.5 DataServer-16 Technical Details

Processor: AMD 80C186 20MHz or 32MHz or 40MHz CPU

Memory: 512K Bytes Onboard Private Memory with
1024K Bytes Option.

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: 68 Way SCSI-II Type connector (for attachment of expansion cable.)

Serial I/O Controllers: Eight 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, 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: Modem handshaking signals on Ports 1 to 4.

DTR, RTS	(Outputs RS232)
DSR, CTS, DCD	(Inputs RS232)

Modem handshaking signals on Ports 5 to 16.

CTS	(Input RS232)

The RS232 input control lines (CTS,DCD,DSR) may be biassed high (ON), low (OFF), or left floating. Standard production units are biassed high (ON).

Serial I/O Interface: V.24/RS-232 Serial drivers on all ports. All serial RS232 I/O signal and control lines protected by 600W transorbs.

Serial I/O Connectors: 9-Way D-Type Male

Power: [5v, @ 1000mA] [+12v, @200mA] [-12v, @200mA] Typical.

Size: 276mm x 128mm X 18mm Overall Dimensions
262mm x 106.5mm x 13mm PCB Dimensions

Weight: 175g

4.5.1 DataServer-16 Jumper Settings

The DataServer-16 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.

LK-1	Open*	2KB+2KB	Dual-port memory size
	Closed	4KB+4KB	Dual-port memory size
LK-2	Open*	4KB+4KB	Dual-port memory size
	Closed	2KB+2KB	Dual-port memory size
LK-3	IRQ Jumpers 3, 4, 5, 7, 9, 10, 11, 12, 15		
LK-4	AB*	1MB SRAM installed U21 & U23	
	BC	4MB SRAM installed U21 & U23	
LK-5	Open*	1MB SRAM installed U21 & U23	
	Closed	4MB SRAM installed U21 & U23	
LK-6	AB*	RS232 inputs biassed on	
	BC	RS232 inputs biassed off	
LK-7	AB*	512KB memory size	
	BC	1024KB memory size	

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.

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