

DISTRIBUTED INPUT/OUTPUT SYSTEM

Low-cost, Multiple-device Interface System

FEATURES

- Compatible with all computers in the LSI Family
- Supports up to eight separate interfaces on a single half-card
- Supports any mix of peripherals and special devices
- Simplified cabling and programming for I/O interface systems
- Two individually vectored interrupts for each Intelligent Cable
- High noise immunity
- Concurrent input and output data transfers in any mix
- Concurrent serial and parallel data transfers in any mix
- Parity-bit standardization and automatic Carriage Return character detection
- Jumper selectable baud rates from 75 to 19.2K baud
- Automatic I/O data transfers directly to/from memory under interrupt control

The Distributed I/O System provides a low-cost, high performance, and extremely flexible input/output system for interfacing a wide variety of standard peripherals or special purpose devices to any computer in the LSI Family. The Distributed I/O System is a total system solution to the problems of peripheral interfacing.

The Distributed I/O System consists of a half-card I/O Distributor to which one to eight Intelligent Cables can be connected. Intelligent Cables are ribbon cables which include a microprogrammed PICOPROCESSOR imbedded in the cable. Standard PICOPROCESSORS are available for most common peripheral devices and standard I/O disciplines. Because each individual PICOPROCESSOR interface is a small computer which performs the detailed management of data flow and error checking, the software for all I/O devices interfaced with the Distributed I/O System is essentially identical.

One I/O Distributor can support up to eight Intelligent Cables interfaced to any combination of input or output, serial or parallel peripherals, all transferring data directly to or from memory concurrently.

High throughput and simplified programming is achieved with minimum overhead because of the unique interrupt driven direct to and from memory mode of I/O used by the Distributed I/O System. High density packaging minimizes the need for large chassis.

In addition to Intelligent Cables for most popular low and medium speed peripheral devices, General-purpose Intelligent Cables make it possible for the OEM user to interface to virtually any TTL parallel interface device without the need to design and build custom interfaces.

DISTRIBUTED INPUT/OUTPUT SYSTEM

SPECIFICATIONS

Operational

Throughput:

32K bytes/second to 86K bytes/second
depending upon CPU and memory used

Operating Modes:

Interrupt driven Automatic Input/Output transferring data directly to and from memory. Separate status input and command outputs for each channel.

Devices Supported:

Individual cables for standard peripheral devices and General-purpose Intelligent Cables for TTL parallel interfaces with 8 data outputs, 16 data inputs and control lines for strobed or handshaking interfaces

Electrical

+ 5Vdc
+ 12Vdc
-12Vdc

Refer to individual I/O Distributor and Intelligent Cable data sheets for specific current requirements

Mechanical

Dimensions:

I/O Distributor

Half card, 7.480 inches wide and 16.886 inches long

Intelligent Cables

6 to 16 feet long from I/O Distributor to peripheral

PICOPROCESSOR

1 x 3 x 8 inches molded plastic case imbedded in Intelligent Cable

Environmental

Temperature:

0°C to + 50°C, operating
-20°C to + 100°C, nonoperating

Humidity:

5% to 95%, noncondensing

CONFIGURATIONS

Up to four I/O Distributors per computer. Up to eight Intelligent Cables per I/O Distributor. No limitation on mixture of types of devices interfaced with an I/O Distributor.

ORDER INFORMATION

System Components (see individual data sheets):

I/O Distributors

4-channel — Model 14629-14
8-channel — Model 14629-18

Intelligent Cables

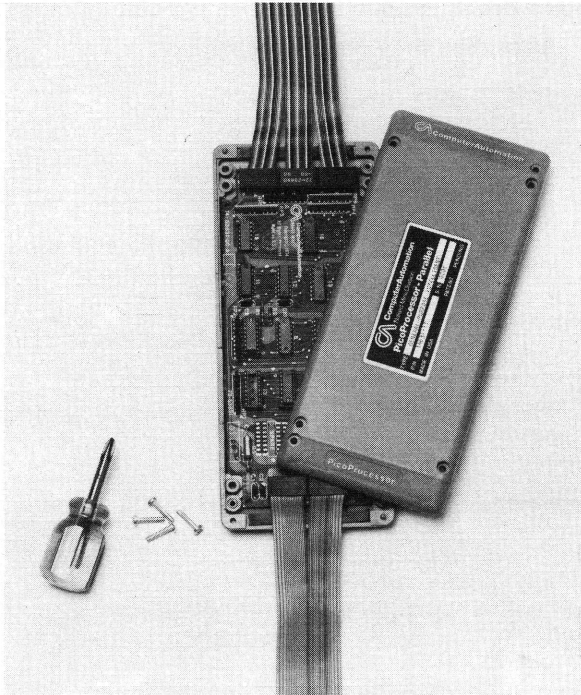
General-purpose Intelligent Cable —
Model 14631-11
Line Printer Intelligent Cable —
Model 14631-01
Card Reader Intelligent Cable —
Model 14631-02
Paper Tape Reader Intelligent Cable —
Model 14631-03
Paper Tape Punch Intelligent Cable —
Model 14631-04
Current-loop Intelligent Cable —
Model 14632-01
CRT Serial Intelligent Cable —
Model 14630-01
Modem Serial Intelligent Cable —
Model 14630-02
(Consult factory for other cable types)

Prerequisites:

Any computer in the LSI Family

Related Software:

Distributed I/O System Software and
Documentation Package (Order 20629-0X)
including Distributed I/O System User's
Manual (Order 91-53629-00)



GENERAL-PURPOSE INTELLIGENT CABLE

Model 14631-11

Standard Low-cost General-purpose I/O Interface

Features

- TTL-compatible negative-true logic
- Low-power Schottky design
- High noise immunity
- Hand-shaking or Strobed I/O discipline
- Controls multiple devices
- Half-duplex or Simplex
- Microprogrammed interface control
- Automatic Error Detection
- Two Standard I/O programming modes
- Two Individually vectored interrupts
- Standard Ribbon cabling
- Simplified mounting

Applications

- General purpose peripherals
- Special user devices
- Non-standard peripherals
- Computer/computer interfaces
- DAC or ADC interfaces
- Switch and indicator panel interfaces

General-purpose Intelligent Cables are standard, low-cost parallel interfaces for any computer in the LSI Family employing a Distributed I/O System. This System frees the OEM system designer from the complex problems and costly development time usually associated with peripherals interfacing. Many low to medium-speed peripherals and special-purpose devices can be directly attached to a General-purpose Intelligent Cable, completely eliminating the need for higher-cost special-purpose interfaces.

An important feature of the General-purpose Intelligent Cable is the PICOPROCESSOR--a self-contained, high-speed miniature digital processor, microprogrammed to provide standard controller functions such as data transfer, device control signalling, device status monitoring and host computer interrupt generation. The Intelligent Cable is used in conjunction with an I/O Distributor half card which provides clocking, buffering and interrupt processing in the host computer.

Standard software control with both Programmed I/O and Automatic I/O instructions simplifies programming of short procedures and permits block transfers with no program intervention until data transfers are terminated. Each Intelligent Cable generates individually vectored interrupts and transfers data in 8-bit bytes with automatic packing and unpacking.

The PICOPROCESSOR is embedded in the Intelligent Cable near the controlled device and, because of its small size, can usually be screw-mounted to the device. Alternatively, the PICOPROCESSOR can be mounted on any flat surface by means of a standard adhesive fastener mounted on its back.

GENERAL-PURPOSE INTELLIGENT CABLE Model 14631-11

SPECIFICATIONS

Operational

Microinstruction Cycle:

250 nanoseconds

Maximum Bandwidth: (Auto I/O)

82.6 KHZ Bytes with LSI-2/60
82.6 KHZ Bytes with LSI- 2/20
40.4 KHZ Bytes with LSI-2/10
31.25 KHZ Bytes with LSI-3/05

Interface Lines:

Output control	6 lines
Input status	6 lines
Output data	8 lines
Input data	16 lines
Ground	12 lines

Operating Modes:

Simplex and Half Duplex using Automatic or Programmed I/O instructions

I/O Disciplines:

Handshaking and Strobe; additional lines provided for data modes, power monitor, end-of-transfer indicator, reset, device-stop and busy status

Data Modes:

Data output	8 bits
Data input	8 or 16 bits
Command output	8 bits
Extended status input	8 or 16 bits

Programming Modes:

Automatic start, status check and data transfer directly to memory under interrupt control followed by termination interrupt using Automatic I/O instructions

Command, data and interface tag sequencing using Programmed I/O instructions

Electrical

Power Requirements:

Less than 0.85 Amps @ +5 VDC

Interface Logic:

Input Lines

Logical 0 = +5 VDC
Logical 1 = 0 volts
One TTL load plus a 2K pull-up resistor to +5 VDC

Output Lines

Logical 0 = +5 to +15 VDC
Logical 1 = 0 volts
Open-collector TTL drivers capable of sinking up to 32 mA @ 15 VDC

Mechanical

Cable Length:

12-1/2 feet overall
10-1/2 feet from IOD to PICOPROCESSOR
1-1/2 feet from PICOPROCESSOR to device

PICOPROCESSOR Size:

1/2 x 3 x 8 inches, molded plastic case

Environmental

Humidity:

90% RH Maximum non-condensing

Temperature:

0°C to 50°C Ambient Air

ORDER INFORMATION

Equipment supplied:

I/O Distributor Cable
PICOPROCESSOR
Device

Prerequisites:

Any LSI-3/05, LSI-2/10, LSI-2/20 or LSI-2/60 computer

Any I/O Distributor (Order 14629-XX)

Related Products:

Distributed I/O System Software and Documentation Package (Order 20629-0X)

Distributed I/O System User's Manual (Order 91-53629-00)

