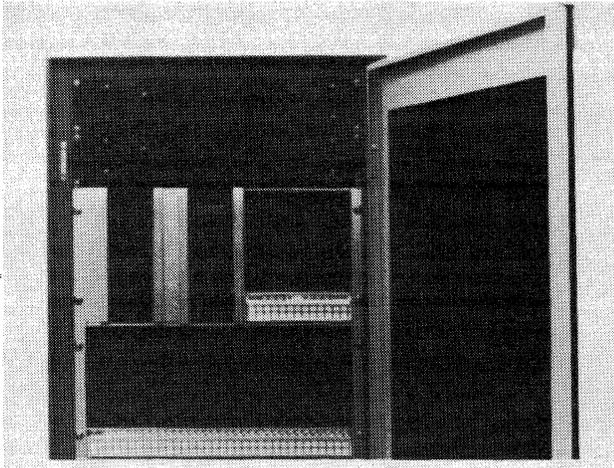


# Micom 610 Intelligent Port Selector



## MANAGEMENT SUMMARY

The Model 610 is an electronic switch that performs a function similar to the rotary supplied by the telephone company. The 610 forces incoming lines to contend for available front end ports and can delay or even preclude the need to expand front end hardware. The machine acts as a traffic director by allowing line-side connected devices to bid for port-side resources. It can also be used as a fail-safe switch that will provide immediate switchover to a back-up system in the event of a failure.

The 610 is capable of 64 different classes of service, which could be particular speeds, CPU resources, applications programs, etc. Physically, the unit is generally colocated with the front end device(s) but the port side connection could be routed to another location via communications facilities. The line-side and the port-side cards are identical with the interface function selected by a thumbwheel switch. The 610 handles only asynchronous data at up to 9600 bps in half- or full-duplex. Eight-level ASCII code is standard and the machine is capable of automatic speed detection and setup in the range from 110 to 4800 bps. The sign-on character for speed detection is normally a Carriage Return but other characters can also be accommodated. Each of the interface cards is equipped to handle four line or port connections. All the interfaces are DCE (Data Communications Equipment); when a DTE (Data Terminal Equipment) interface is required, appropriate cross-over cables are provided.

The Model 610 can be supplied in configurations as small as 4 lines by 4 ports and as large as 922 port and/or line connections. The larger machines can be equipped with redundant power and common logic for reliability. The 610 is a time division switch that operates under control of a microprocessor, which causes the various system connections and disconnections to take place. The connection conventions are in accordance with EIA Standard RS-232-C. Lineside connections can be via dial-up data ➤

An electronic switch operating with time division principles. In addition to providing contention, the units provide for up to 64 different classes of service. These can be different front ends, host application programs, etc. The switch can be programmed to restrict access to particular resources by certain users.

A statistics option provides complete listings of all successful and unsuccessful connections with a time/date stamp. This allows managers to gauge the effectiveness of the communications and processing resources and make the necessary adjustments to level traffic and/or reduce costs.

The 610 is available in configurations as large as 992 connected devices (combination of line and port sides). A maximum of 248 simultaneous connections is possible. A small unit equipped to handle a total of 60 line or port devices costs less than \$10,000.

## CHARACTERISTICS

**VENDOR:** Micom Systems, Inc., 9551 Irondale Avenue, Chatsworth, CA 91311. Telephone (213) 882-6890.

**DATE OF ANNOUNCEMENT:** 1978.

**DATE OF FIRST DELIVERY:** 1978.

**NUMBER DELIVERED TO DATE:** Approximately 50.

**SERVICED BY:** Micom Systems, Inc.

## MODELS AND FUNCTION

The Model 610/1 is a table top version capable of accommodating up to 60 line/port interfaces in any combination. Model 610/2 is a floor-mount model housed in a 6-foot high relay rack. The basic configuration of the 610/2 is equipped to interface 120 line/port combinations; when equipped with the maximum number of expansion nests, a 610/2 rack can accommodate up to 496 line/port interfaces. Two 610/2 cabinets can be interconnected to achieve the system maximum of 992 line/port connections; however, only 248 line-to-port connections can be simultaneously serviced.

The 610 equipment acts as a contention device to force subscribers (terminals) to compete for available CPU ports. A contention ratio of 4 lines by two ports is not uncommon but 1.5 x 1 is more likely. Use of these devices can substantially delay the addition of front end hardware to support an increasing user population, particularly if the base is geographically dispersed. This allows time zone differences to be taken advantage of for traffic leveling without dedicating front end ports to each region serviced.

The port selectors also provide an access management capability that forces users to bid for up to 64 different ➤

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sets operating over the public telephone network, line drivers or modems operating over leased facilities, or direct connections to terminals. The user gains access to the system by entering data (usually a Carriage Return) which the 610 uses for speed recognition. Once set up, the 610 sends a prompt message back to the terminal operator in the form of a CLASS statement. This notifies the user to enter the appropriate digits to select one of the 64 classes of service. If a connection is effected, the 610 returns a GO message to the operator. If the requested service is BUSY, the operator is so notified along with the number of service requests that are stacked up or queued in front of him. If the operator prefers to wait, the GO message will be delivered to him as soon as the service is available. Other unsuccessful connection attempts are reported to the user with messages of UNAVAILABLE, UNASSIGNED, or UNAUTHORIZED, as appropriate. A disconnect can be forced by the front end dropping its Data Terminal Ready lead or it can be initiated by the operator transmitting a break. Another forced disconnect situation occurs after a time out with no data activity. This time out is a predefined length of between one and 255 minutes set at the factory.

Once the connection is made, the hardware is completely transparent to the user. Each port-side connection is assigned a service class using a control console, which may be any ASCII terminal operating at up to 9600 bps. The service class of any port can be changed at this terminal at any time. The computer manager can use the service classes to grant or deny access to system resources, including applications programs, to various users. A special statistics option is also available that time/date stamps every connection performed by the port selector. This permits management to analyze usage and to re-allocate resources to ensure an optimum level of service to all terminal users.

### USER REACTION

In May 1979, Datapro telephoned three users of the Model 610 Port Selector. Each user had one device that had an average installation life of 6 months. The users were geographically dispersed and ranged in business environment from educational, to time sharing, to banking. The ratings supplied by these users are as follows:

	Excellent	Good	Fair	Poor	WA*
Overall performance	2	1	0	0	3.7
Ease of installation	2	1	0	0	3.7
Hardware reliability	2	1	0	0	3.7
Promptness of maintenance	3	0	0	0	4.0
Quality of maintenance	2	0	0	0	4.0
Ease of expansion	2	0	0	0	4.0
Quality of documentation	0	1	0	0	3.0

\* Weighted Average based on 4.0 for Excellent.

Those interviewed were all impressed with the cooperation they received from Micom. In two cases, a special application was successfully implemented through the use of custom microcode. The 610 has addressed packet-

classes of service. These classes can be hosts, application programs, speed/protocol combinations, etc. They can be resources that are local to the port selector or they can be remotely located and interconnected through other communications facilities. The 610 allows DP managers to strictly monitor usage and to control access to various resources by users. The 610 is programmable by using a control console. Each port-side connection can be assigned as a different class of service or they can be grouped (up to the system maximum of 64 classes. Subscribers can be authorized to use, or denied access to, various service classes. These authorizations can be changed at any time using the control console.

### CONFIGURATION

The port selector is normally placed between the port-side devices (even though they may be remotely located) and the subscriber terminal network. Electrically, the port selector consists of power, common electronics, scan control boards, and quad line/port interface cards. The common electronics incorporates a Micom Series 40 microcomputer Z80 based, EPROM to house the control program, switch control modules, and RAM of sufficient size to support the system. The common boards are equipped with LED's to display system operation and to assist in diagnostics. The power supply provides voltages of +5, +12, and a -12 VDC. In larger systems, the power supply and the common electronics can be provided in redundant form to enhance reliability.

Beyond the basic system size described in the Models paragraph, the 610/2 can be increased as needed by adding expansion nests to handle additional port/line interface cards. Depending on the location in the system, an expansion shelf can hold either 30 or 32 cards (120 or 128 line or port interfaces). Each expansion nest has a common element called a scan control card, which can also be provided in redundancy.

The line/port adapter cards are electrically identical for speed groups and derive the proper interface from switch settings on the boards. One card type can handle up to 2400 bps; the other type extends to the system limit of 9600 bps. The difference is in sampling technique with the 9600 bps card priced higher. Each card has four separate interface circuits, all of which are set to the same parameters by the common switch on each card. Timing, class access/restriction, and other operational features are established in the control program or can be entered into RAM using the external control console.

A configuration table is established at the factory in accordance with the application and stored in EPROM. This table is read into RAM when the system is powered up. The RAM parameters can be modified from the control console as desired. Anytime the system loses power, the original configuration table takes control on re-start. The configuration table specifies the class number (1-64) of each port; the class, if any, of each line, and any restrictions with regard to access on each line-side device. Where applicable, the speed of the device is also loaded, or the automatic speed option is selected. Within rules, most of these parameters can be modified from the control console.

The thumbwheel switch on each card is set to define whether the interface is to be a line-side or a port side, and the convention to be used for connect/disconnect. Options available include emulation of a dial-up modem (with Data Terminal Ready controlling connect/disconnect); emulation of a directly connected device (with data activity controlling connect/disconnect); and the interface to a limited distance line driver, such as the Micom Model 410, which is a two- or four-wire machine with special entrance/exit procedures. Some combinations of these can be used. Other possibilities include line-to-line connections and port-to-port connections; these are valuable when configuring a connection to a device remotely located from the port selector.

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switched applications, dial-up and leased line service, in addition to private-wire situations. All of those interviewed were willing to recommend the hardware and were asked that if they discovered a possible user at a trade show or similar affair, would they suggest the use of the Micom 610. Except for the possibility of competitive advantage, all were willing to recommend the company and the device. Two of the three users surveyed were also using Micom multiplexers. □

### ► CONTROL CONSOLE FUNCTIONS

Some of the features that can be controlled from the console are:

- Set or change line or port class, including restrictions.
- Set or change line speed.
- Force a line/port connection or disconnection.
- Disable or enable either a port or a line.
- Generate a system status message of up to 20 characters.

This is used when a group of ports or possibly a major component such as a front end or computer is undergoing maintenance, etc. For example: SYS DOWN TILL 12:00.

The 610 also has a statistics option that can be used with the console. Under keyboard command, a tabulation of all successful and unsuccessful connection attempts can be printed out by class of service. Full-bore statistics, including every connect, disconnect and connect-fail can also be printed with time and date stamp.

### CONNECTION TO HOST COMPUTER

There are no direct channel connections to the host CPU because the 610 does not function as a front end. Connections are to the various front ends, either directly or via communications facilities to remote locations. All port-side connections from the 610 are DCE (Date Communications Equipment) EIA RS-232-C compatible.

### TRANSMISSION SPECIFICATIONS

Once a connection is made, the port selector is transparent except for a minimal time delay. Representative delays for

worst case switching are: 1.7 milliseconds at rates to 2400 bps; 5.0 milliseconds at 4800 bps; and 2.9 milliseconds at 9600 bps. The port selector handles only eight-level, ASCII, asynchronous data, at standard rates of 110, 150, 300, 600, 1200, 2400, 4800, or 9600 bps. An automatic speed detection feature is also available and can be implemented on specific connections at speeds from 110 to 4800 bps; this is activated by entering a character (usually Carriage Return) to select the proper clock.

### SOFTWARE

The master control program for the port selector is located in EPROM. RAM is also provided and adopts the master control program unless changed by entering the proper codes through the control console. Anytime there is a power-failure, the master program in EPROM is re-loaded upon power-up. The master program can be changed by hardware substitution of the ROM.

### PHYSICAL SPECIFICATIONS

The 610 is available in two cabinet sizes. A table-top unit, which can accommodate up to 60 line/port connections, measures 20 1/2-inches wide by 10 1/4-inches high by 12 1/4-inches deep. A floor-mount unit is 22 1/4-inches wide by 78-inches high by 24 1/2-inches deep. Either is powered by 115/230 VAC, 50/60 Hz commercial power.

The floor-mount unit can be equipped with mounting shelves to hold the number of line/port cards required. Each line and port card is identical and can service up to four interfaces. Depending on the location of the expansion shelf within the rack, either 120 or 128 line/port connections are accommodated per shelf. A fully loaded floor-mount cabinet can handle up to 496 interfaces; two cabinets can be interconnected to achieve the system maximum of 992 line/port interfaces.

### PRICING

The 610 Port Selector is available for purchase only with quantity discounts offered. A one-year warranty is standard and service is performed at the factory. Pricing for the equipment is as follows:

	<u>Purchase Price</u>
Model 610/1 Table-top version with common equipment and mounting for up to 60 lines/ports	\$5,000
Model 610/2 Floor model with common equipment and mounting for up to 120 lines/ports	10,000
Model 1504/2 Redundant common logic for 610/2	3,500
Model 1555/1 Redundant power option for 610/2	1,200
Model 1502 First expansion nest, extra 128 lines/ports	3,900
Model 1503 Second expansion nest, extra 120 lines/ports	5,200
Model 1504 Third expansion nest, extra 128 lines/ports	3,900
Model 1505 Fourth expansion nest, extra 120 lines/ports	7,500
Model 1506 Fifth expansion nest, extra 128 lines/ports	3,900
Model 1507 Sixth expansion nest, extra 120 lines/ports	5,200
Model 1508 Seventh expansion nest, extra 128 lines/ports	3,900
Model 1504/3 Redundant scan module for expansion nests	800
Model 1505/2 Redundant power supply for Models 15003, 1505, or 1507.	1,200
Model 15031/1 Quad. Async. line/port module for up to 2400 bps	300
Model 1531/2 Quad. async line/port module for up to 9600 bps	400
Model 1550 Statistics port option	500■

