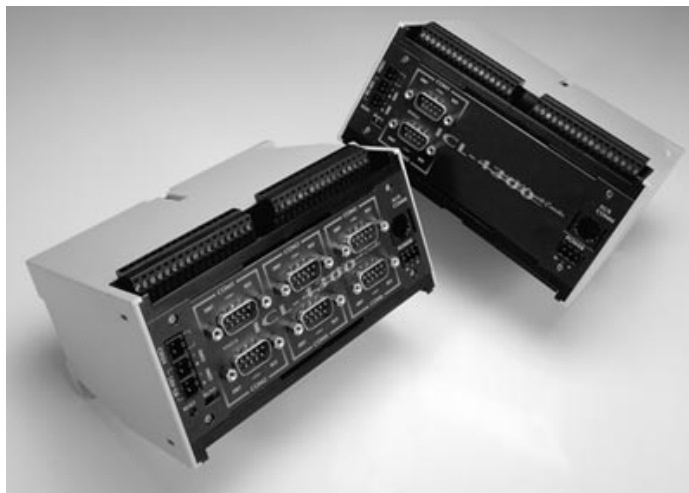


ICL-4300 *Modular PC Compatible Controller*

Utilities Reference Manual



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U T I L I T I E S

This manual documents the ICL-4300 Utilities Software. The utilities include test and configuration programs, as well as the ROM-DOS command shell and programs. The ICL-4300 standard configuration includes a ROM-DOS license and some of these files pre-installed. A brief listing of supported ROM-DOS commands is included in this document. The full ROM-DOS User's Guide is included on the Installation Diskette.

► INSTALLATION

To install the utility software on your development PC, run the INSTALL.EXE program from the distribution diskette. The installer will create a directory on your PC (default C:\ICL4300) and expand/copy the files to that directory. The following subdirectories are created:

```
C:\ICL4300
├── ROMDOS
│   ├── APPS (ROM-DOS application programs)
│   ├── DOC (ROM-DOS User's Guide)
│   └── SYS (ROM-DOS System Files)
└── UTIL (ICL utility programs)
```

The RSZ utility comes preloaded on the ICL-4300 flash file system so that files may be transferred between your development PC and the ICL-4300.

WARNING:

Do not delete RSZ.EXE from the ICL-4300 (it is set as read-only from the factory to make this more difficult) or you will not be able to transfer any files. If this happens by accident, you must send the ICL-4300 back to the factory for reprogramming.

▶ RUNNING COMMANDS

To run commands on the ICL-4300, you need to connect a terminal or terminal emulator to the ICL-4300 console port. This is normally set to COM1, 9600 baud, 8 data bits, no parity, 1 stop bit when the ICL-4300 leaves the factory. A "null modem" cable (available from ICL) is required to connect your PC terminal to the ICL-4300.

▶ CHKCOM

The CHKCOM program performs diagnostic tests on one or more ICL-4300 onboard serial ports (COM1-COM6). The syntax for executing the CHKCOM program is:

CHKCOM [/?] [/T[portlist]]

/? display help information

/T specifies which port to test (default is all but the console port)

portlist list of ports to test

1 COM1

2 COM2

3 COM3

4 COM4

5 COM5

6 COM6

Example:

CHKCOM /T56

Tests COM5 and COM6.

► CHKLED

The CHKLED program simply toggles the ICL-4300 Status LED on and off at a rate of 1.0 second per complete cycle. This provides you with a simple test program to see if your ICL-4300 is properly executing application code. When the ICL-4300 is shipped from the factory, CHKLED.EXE is installed on the ICL-4300 file system and set so that it runs automatically on power up when the mode switch is set to RUN. This also illustrates the method of booting to an application program. To terminate CHKLED, simply press any key at the ICL-4300 console.

► CHKRAM

The CHKRAM program performs a test on the static RAM that is built-in to the ICL-4300. It can only perform a thorough test on the RAM that DOS is not already using. However, since the RAM that DOS has allocated is being used to perform critical functions, there is also, by default, some testing of that RAM. The syntax for CHKRAM is shown below:

CHKRAM [/?] [/min]

/? display help information

min minimum RAM (in Kbytes) required for success (default 300k)

Since CHKRAM must dynamically allocate RAM from DOS, there is a command switch that allows you to specify the minimum amount of dynamically allocated RAM that must be available in order for the test to proceed. Several tests are performed. CHKRAM performs an addressing test by writing an increasing sequence of numbers to the block of RAM and verifying that they can be read back. CHKRAM then performs a bit test by writing a bit pattern to each memory location and reading it back. Then the complement of the pattern is written and read back.

Example:

CHKRAM /200

Performs RAM test, making sure that a minimum of 200 Kbytes of SRAM are available.

► CHKRTC

The CHKRTC program verifies that the ICL-4300 Real Time Clock chip is working properly. In order to do this, it reads the current date/time, waits 2 seconds, reads the RTC and verifies that the time has advanced. Then it does a short interval test to see that the RTC advances at the proper rate compared to the 386EX hardware timer. A century rollover test is performed to see that each of the registers roll over properly. Finally, the original date/time is restored. Another part of the RTC system that CHKRTC cannot directly test is the battery that allows the RTC to retain the date/time when power is removed from the ICL-4300. In order to test the battery, you should set a value in the RTC, remove power from the ICL-4300, reapply power, and verify that the RTC has retained the value.

► CHKSW

The CHKSW utility tests the Run Mode switch on the ICL-4300. Simply type CHKSW to run the program. The current state of the switch is displayed on the console. The display is updated continuously, so you can change the switch as it is running and see the result. To terminate the program, press any key at the console.

► NOCON

The NOCON utility allows you to suspend the use of the console port for command input/output and run an application program via a batch file. When the batch file terminates, NOCON will restore the console port. The syntax for NOCON is:

NOCON [cmd]

cmd the command or program to run

Example:

NOCON MYPROG

Turns off console I/O and runs the program MYPROG. When MYPROG is done, NOCON restores console operation.

One common way to use NOCON is to allow you to run the Borland Remote Turbo Debugger (TDREMOTE) without using more than one serial port. Normally, TDREMOTE sends output to the console during a debug session to indicate download and other status. A separate serial port is used to actually download the file to be debugged and to control debug operation. This takes up two serial ports on the ICL-4300. If you wish to use only one serial port for TDREMOTE, you need to use NOCON.

Example:

```
NOCON TDREMOTE -rp1 -rs4
```

This would cause console I/O to be suspended and tell TDREMOTE to use COM1 at 115200 baud for communication with host PC.

► **RUNMODE**

The RUNMODE utility is used to read the RUN switch on the ICL-4300. The intention of the RUN switch is to allow you to select whether the ICL-4300 runs an application program or boots to the DOS command prompt on power up. When the switch is in RUN position, the RUNMODE program will execute a user supplied batch file. Otherwise, RUNMODE simply falls through without executing the user batch file. The syntax of RUNMODE is:

```
RUNMODE [batch]
```

batch the DOS batch file to run if the switch is set to RUN

Example:

```
RUNMODE USER.BAT
```

Runs USER.BAT if the switch is set to RUN mode.

RUNMODE is intended to be placed in the AUTOEXEC.BAT file, so that on

startup the ICL-4300 will either execute your application program (which you can put in USER.BAT), or provide a DOS command prompt at the console for debugging (or whatever you want to use the prompt for).

Especially during program development, it is helpful to be able to break out of an application program back to the DOS command prompt, in case the application program "locks up." For this reason, it is a good idea to always have the ICL-4300 boot to a command prompt when not set to Run mode, as opposed to running another program. If you did have the ICL-4300 execute a program in both switch positions, or if you boot directly to your application program without reading the switch using RUNMODE, then you might not be able to recover if your program locks up (because each time you boot the program would run automatically and lock up again).

The AUTOEXEC.BAT comes preconfigured from the factory to call RUNMODE with USER.BAT. It is recommended that you do not change AUTOEXEC.BAT, but simply add what you need into USER.BAT.

► SYSCFG

The SYSCFG program is used to read serial number and date of manufacture information from the ICL-4300 and to read and write configuration information that is stored in the 256-byte area reserved by ICL in the ICL-4300 flash memory. If SYSCFG is run with no command line switches, it will display the serial number/date of manufacture information and the current values for all the settings.

```
SYSCFG    [/RF=filename] [/WIPE] [/CNPT=port] [/CNBD=baud] [/CNPA=cparm]
          [/Pcoml=irq] [/NVRAM=size]
```

```
    /?    display help information
```

```
    /RF    read SYSCFG switch flags from a file. (No quotes)
```

```
filename  file to read flags from
```

```
    /WIPE  default ALL parameters first, then update as specified
```

```
    /CNPT  set console com port
```

port	1	COM1
	2	COM2
	3	COM3
	4	COM4
	5	COM5
	6	COM6
/CNBD	set console baud rate	
baud	300	300 baud
	600	600 baud
	1200	1200 baud
	2400	2400 baud
	4800	4800 baud
	9600	9600 baud
	19200	19200 baud
	38400	38400 baud
	57600	57600 baud
	115200	115200 baud
/CNPA	set console com port params	
cparm	8n1	8 data bits/no parity/1 stop bit
	8e1	8 data bits/even parity/1 stop bit
	8o1	8 data bits/odd parity/1 stop bit
	7n1	7 data bits/no parity/1 stop bit
	7e1	7 data bits/even parity/1 stop bit
	7o1	7 data bits/odd parity/1 stop bit
/NVRAM	allocates non-volatile RAM block	
	The allocated size must allow for a minimum 256k of conventional RAM.	
size	in Kbytes	

If no command switches or parameters are used, SYSCFG simply displays the current information to the console. Changes to the console port do not take effect until the ICL-4300 is reset or power is cycled.

NVRAM is battery-backed static RAM that is set aside by the BIOS, and not reported to DOS, so that an application program may use the area for non-volatile data storage. If you change the NVRAM setting, you must reboot in order for the change to take effect.

Warning:

When you execute SYSCFG, it replaces critical system parameters on the ICL-4300. During this process, it must erase the sectors of flash memory that store the files, and then reprogram them. If the process is interrupted by a loss of power or reset after the flash has been erased, but before it has been reprogrammed, then you will no longer be able to boot from the ICL-4300 flash memory. The only way to recover is to send the ICL-4300 back to have ICL reprogram the flash.

Example:

```
SYSCFG
```

Displays current configuration.

Example:

```
SYSCFG /CNPT=2 /CNBD=19200
```

Sets the console port to COM2, at 19200 baud. The change will not take effect until the ICL-4300 is reset or power is cycled.

► SYSLOAD

The SYSLOAD program is used to load or update BIOS/DOS boot code into the flash memory on the ICL-4300. In addition, it can be used to load boot code to support other operating systems (or no operating system, if you want to boot directly into your application). SYSLOAD can be executed either from the ICL-4300 UTILITIES REFERENCE MANUAL 4300 flash memory (if BIOS/DOS is already present), or can be executed from the ROM socket on the ICL-4300 Evaluation Board (which is necessary if BIOS/DOS is not already loaded in the ICL-4300 flash memory). To execute from the Evaluation Board ROM socket, you must have a bootable ROM to plug into the socket that contains BIOS/DOS and SYSLOAD. This ROM can be obtained from Industrial Control Links. Whether you are executing from flash memory on the ICL-4300, or from the Evaluation Board ROM, SYSLOAD is run in the same fashion:

SYSLOAD [/?] file

/? display help information

file the name of an Intel Hex format file, including file extension

SYSLOAD loads the upper two flash sectors only (upper 128 Kbytes).

Warning:

When you execute SYSLOAD, it replaces critical system boot code on the ICL-4300. During this process, it must erase the sectors of flash memory that store the files, and then reprogram them. If the process is interrupted by a loss of power or reset after the flash has been erased, but before it has been reprogrammed, then you will no longer be able to boot from the ICL-4300 flash memory. The only way to recover is to have ICL reprogram the flash.

► RSZ

The purpose of this program is to allow you to transfer files between the ICL-4300 and your host PC. RSZ is intended to be executed on the ICL-4300. The RSZ program sends and receives files using the Z-MODEM protocol. In order to transfer a file, first start RSZ on the ICL-4300, then begin the Z-MODEM transfer on the host PC using your terminal emulation program. The syntax for running RSZ is:

RSZ [/?] [/Pn] [/Bn] [/Hn] [/Fn] [/R] [/S fileName]

/? display help information

/P port number:

PORT	1	COM1
	2	COM2
	3	COM3
	4	COM4
	5	COM5
	6	COM6

/B baudrate, if not specified uses current port parameters.

BAUD	300	300 baud
	600	600 baud
	1200	1200 baud
	2400	2400 baud
	4800	4800 baud
	9600	9600 baud
	19200	19200 baud
	38400	38400 baud
	57600	57600 baud
	115200	115200 baud

/H handshaking options, both sides must use the same one of:
0= none (default), 1= software, 2= hardware

/F file management options (all files are "binary"), one of:
0= skip, 1= resume, 2= make duplicate, 3= replace (default)

-
- /R receive files specified by sender using Z-MODEM protocol
 - /S send the specified files using Z-MODEM protocol, wild-cards allowed.

Example:

At the ICL-4300 prompt type:

```
RSZ /R
```

This command sets up the ICL-4300 to receive a file using the console port and store it in the current directory. The second step is to use the menus on your terminal emulator to send the file to the ICL-4300.

Example:

At the ICL-4300 prompt type:

```
RSZ /S LOG.TXT
```

This command sets up the ICL-4300 to send the file LOG.TXT using the console port. You must then set your terminal emulation software to receive the file using Z-MODEM protocol. The file will be copied to the directory specified in your terminal emulation program.

Normally you do not need to use the /B /H /F or /P switches, because RSZ will use default values if none are provided.

S U P P O R T E D R O M - D O S C O M M A N D S

Following are brief descriptions of all ROM-DOS commands that are supported on the ICL-4300, including batch file commands. For a more detailed description, see the ROM-DOS 6.22 User's Guide.

Type code: *E*=External Command, *I*=Internal Command, *C*=Config.Sys Command.

<i>Command</i>	<i>Type</i>	<i>Description</i>
?	<i>I</i>	CONFIG.SYS command. It directs ROM-DOS to pause for confirmation before processing a command.
@	<i>I</i>	Is used to suppress the display of a single batch file command line.
;	<i>I</i>	The same as the REMark command. Identifies non-executing lines.
ATTRIB	<i>E</i>	Display or modify the attributes associated with a file.
BREAK	<i>I</i>	Turns on or off the ability to stop program execution at a non-I/O point.
BUFFERS	<i>C</i>	Sets the number of internal data buffers.
CALL	<i>I</i>	Batch subcommand. Invokes execution of a secondary batch file.
CHDIR	<i>I</i>	CHange DIRectory (also CD). Changes the default directory.
CHKDSK	<i>E</i>	CHeck DiSK. Checks integrity of data on a disk. Displays information.
COMMAND	<i>E</i>	Spawns a second DOS command processor.
COPY	<i>I</i>	Copies files from one storage location to another.

CTTY	<i>/</i>	Change TeleTYpe. Changes the default terminal interacting with ROM-DOS.
DATE	<i>/</i>	Displays the date from the system's internal calendar. Allows revision.
DEL	<i>/</i>	DELeTe. Deletes specified files.
DEVICE	<i>C</i>	Installs a device driver into ROM-DOS.
DIR	<i>/</i>	DIRectory. Lists contents of a specified directory.
ECHO	<i>/</i>	Batch subcommand. Turns on or off display of batch execution on the monitor.
ERASE	<i>/</i>	Erases specified files (same as DEL).
FCBS	<i>C</i>	Specifies the number of File Control Blocks (FCBS) open at one time.
FILES	<i>C</i>	Sets the maximum number of files that can be open at one time on the system.
FIND	<i>E</i>	Works as a filter to display only lines that contain a specified string.
FOR	<i>/</i>	Batch subcommand. Performs one DOS command on a set of files.
GOTO	<i>/</i>	Batch subcommand. Moves control to a specified line in the batch file.
HELP	<i>/</i>	Lists all available ROM-DOS commands along with brief descriptions.

IF	<i>I</i>	Batch subcommand. Performs a command based on a specified condition.
INCLUDE	<i>C</i>	CONFIG.SYS menu configuration command. Allows instructions in one configuration block to be included with instructions in another configuration block.
INSTALL	<i>C</i>	Loads terminate and Stay Resident (TSR) programs during CONFIG.SYS processing.
LABEL	<i>E</i>	Will create, change or delete a disk volume label.
MKDIR	<i>I</i>	MaKe DIRectory (also MD). Creates a new subdirectory.
MODE	<i>E</i>	Modifies the operation of the printer, serial port and active video display.
MORE	<i>E</i>	Displays a text file one screen at a time.
NEWFILE	<i>C</i>	Allows continuation of CONFIG.SYS processing from a new file.
PATH	<i>I</i>	Displays current command search path(s). A new path line can be specified.
PAUSE	<i>I</i>	Batch subcommand. Causes execution to halt until a key is pressed.
PROMPT	<i>I</i>	Resets the appearance of the system prompt line.
REM	<i>I</i>	REMark. A batch subcommand for identifying non-executing lines.
REN	<i>I</i>	REName. Renames files.

RMDIR	<i>I</i>	ReMove DIRectory (also RD).Deletes a specified subdirectory.
SET	<i>I</i>	Sets environment variables and command processor strings.
SHELL	<i>C</i>	Allows selections of an alternate boot program other than the default COMMAND.COM command processor.
SHIFT	<i>I</i>	Batch subcommand. Shifts replaceable parameters one position "to the left."
SORT	<i>E</i>	Sorts a text file and displays the output to the standard device.
STACKS	<i>C</i>	Allows for the use of dynamic data stacks to handle interrupts. Note: ROM-DOS does not utilize this command.
TIME	<i>I</i>	Displays current time from the system's internal clock. Allows revision.
TREE	<i>E</i>	Displays the path of each directory on specified drive.
TYPE	<i>I</i>	Displays the contents of a text file on the monitor.
VDISK	<i>C</i>	Set up virtual disk (RAM disk)
VER	<i>I</i>	Displays current version of ROM-DOS on the monitor.
VERIFY	<i>I</i>	Displays the current VERIFY state or sets the VERIFY state to on or off.
VOL	<i>I</i>	Displays the VOLume label on a disk.
XCOPY	<i>E</i>	Copy multiple files and optionally, subdirectories.