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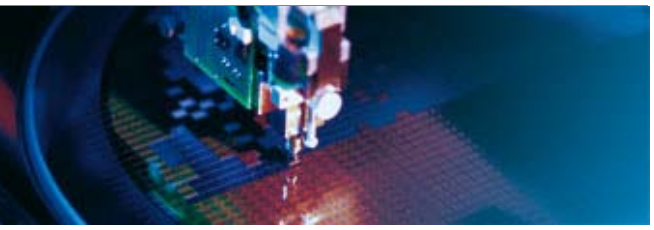
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USER MANUAL





COM-1274

PC/104 module with 8 RS232/422/485 serial ports and up to 2 TTL CAN ports

Rev 2.0 – March 2011 – COM-1274_UserMan_En_2.0

www.eurotech.com

EUROTECH

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Revision history

REVISION	DESCRIPTION	DATE
1.0	First release	December 2006
1.1	Added CAN Ports	January 2007
1.2	Added info about "How to set-up Eurotech CPU modules with "ISA Bus BIOS page" to see the COM-1274"	September 2007
2.0	Complete manual review	March 2011

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Important user information

Please carefully read and understand the instructions in this manual before using the COM-1274.

Whenever you have any doubt regarding the operation of this device, consult this manual or contact the Eurotech Technical Support Team.

Keep this manual for future reference.

In order to lower the risk of personal injury, electric shock, fire or damage to equipment, you must observe the following precautions, as well as using good technical judgment, whenever installing or using the device.

Eurotech Spa. (Eurotech) has made every effort to ensure the accuracy of this document; however, Eurotech assumes no liability resulting from any error/omission in this document, or from the use of the information contained herein.

Eurotech reserves the right to revise this document or to make changes to its content at any time without any obligation to notify any person of such revision or changes.

Alerts that can be found throughout this manual

The following alerts indicate potentially dangerous situations:

SYMBOL	MEANING
	**DANGER!** Information highlighting potential electrical shock hazards: • Personal injury or death could occur. • Damage to the system, connected peripheral devices, or software could occur. Appropriate safety precautions should always be used; these should meet the requirements set out for the environment that the equipment will be deployed in.
	**WARNING!** Information highlighting potential hazards: • Personal injury or death could occur. • Damage to the system, connected peripheral devices, or software could occur. Appropriate safety precautions should always be used; these should meet the requirements set out for the environment that the equipment will be deployed in.
	**NOTE** These will highlight important features or instructions.

Safety notices and warnings

Observe the following safety precautions during all phases of operation, service, and repair of the device. Failure to comply with these precautions or with specific warnings elsewhere in this manual violates safety standards of design, manufacture, and intended use of the device.

Eurotech assumes no liability for the customer's failure to comply with these requirements.

The safety precautions listed below represent warnings of certain dangers of which Eurotech is aware. You, as the user of the device, should follow these warnings and all other safety precautions necessary for the safe operation of the device in your operating environment.

Do not operate in an explosive atmosphere



WARNING!
Do not operate the equipment in the presence of flammable gases or fumes. Operation of any electrical equipment in such an environment constitutes a definite safety hazard.

Antistatic precautions



WARNING!
To avoid ESD (Electro Static Discharge) damage, always use appropriate antistatic precautions when handing any electronic equipment.

Connection to power supply or other devices



DANGER!
Before applying power to the system, thoroughly review all installation, operation, and safety instructions.
Failure to install the system power supply correctly or to follow all operating instructions correctly may create an electrical shock hazard, which can result in personal injury or loss of life, and/or damage to equipment or other property

- To avoid injuries, always disconnect power and discharge circuits before touching them.
- Only start the device with a power supply that meets the requirements stated on the voltage label. In case of uncertainties about the required power supply, please contact the Eurotech Technical Support Team or the electricity authority
- Before connecting other equipment carefully read any supplied instructions
- Always disconnect the power before connecting or disconnecting cables
- Do not perform connections with wet hands
- Check any power cords for damage before use
- Use certified power cables. The power cable must meet the requirements (voltage and current) of the device.
- Position cables with care. Avoid positioning cables in places where they may be trampled on or compressed by objects placed on them. Take particular care of the plug, power-point and outlet of power cable
- Avoid overcharging any power outlets
- Only apply power to the device or connected equipment after checking that all the above conditions have been met

Installation



WARNING!

- Verify that the mounting location can withstand the added loads caused by the addition of the device, it should be firmly secured so that it will not cause any potentially hazardous situations (e.g. falling down due to vibration or shock)
- Do not operate the device near heat sources or flames.



NOTE:
If the device must be moved from one place to another with different ambient temperatures, ensure sufficient time for the temperature of the device to stabilize before repowering.

Ventilation



WARNING!
Ensure adequate ventilation to avoid overheating, Eurotech suggests the following steps:

- When installing the device within a cabinet, rack or other enclosed space, be sure to leave sufficient space to allow adequate air circulation
- Do not block any ventilation openings

Maintenance



DANGER!

- Never open, dismantle or repair the device!
- For your maintenance or repair requirement please contact a qualified Eurotech engineer.

If the device does not function correctly and you are unable to find a solution, feel free to contact the Eurotech Technical Support Team.

If the equipment does not work properly, especially if smells unusual, unplug it immediately and contact Technical Support Eurotech (see third and fourth cover of this manual for details).

Cleaning



WARNING!
When cleaning the device, remember to:

- Ensure sufficient ESD protection during the cleaning process.
- Remove any power from the device.
- When cleaning an enclosed system or peripheral use a dry cloth on the external casing.
- With single boards, use only a low power air brush or soft bristled paintbrush.
- Do not use detergents, aerosol sprays, solvents or abrasive sponges.

Life support policy



WARNING!
Do not use Eurotech products as critical components of life support devices or systems without the express written approval of Eurotech Spa.

Warranty

Please contact your local Eurotech Sales Office for detailed warranty terms and conditions.
Refer to the back covers of this manual for full contact details.

CE notice

This product has the CE labelling in accordance with the 1999/5/EC regulations.
Eurotech shall not be liable for use of its products with equipment (i.e. power supplies, personal computers, etc.) that are not CE marked.

WEEE

The information below complies with the regulations set out in the 2002/96/EC directive, subsequently superseded by 2003/108/EC. It refers electrical and electronic equipment and the waste management of such products.
When disposing of a device, including all of its components, subassemblies and materials that are an integral part of the product, you should consider the WEEE directive.

The use of the following symbol, attached to the equipment, packaging, instruction literature, or the guarantee sheet, states that the device has been marketed after August 13th 2005, and implies that you must separate all of its components when possible, and dispose of them in accordance withal waste disposal legislations:



- Because of the substances present in the equipment, improper use or disposal of the refuse can cause damage to human health and the environment.
- With reference to WEEE, it is compulsory not to dispose of the equipment with normal urban refuse; an arrangement for separate collection and disposal is essential.
- To avoid any possible legal implications contact the local waste collection body for full recycling information.

RoHS

This device, including all the components, subassemblies and the consumable materials that are an integral part of the product, have been manufactured in compliance with the European directive 2002/95/EC known as the RoHS directive (Restrictions of the use of certain Hazardous Substances). This directive targets the reduction of certain hazardous substances previously used in electrical and electronic equipment (EEE).

Technical assistance

For any technical questions, or if you cannot isolate a problem with your device, or for any enquiry about repair and returns policies, feel free to contact your local Eurotech Technical Support Team.
See the back cover for full contact details.

Transportation

When transporting any module or system, for any reason, it should be packed using anti-static material and placed in a sturdy box with enough packing material to adequately cushion it.

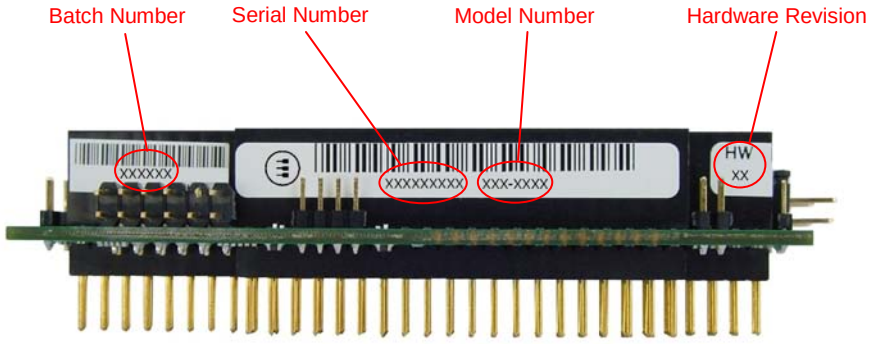
Warning:
Any product returned to Eurotech that is damaged due to inappropriate packaging will not be covered by the warranty!

Product labelling

On the external side of the ISA Bus connector, you will find several labels displaying the following:

- Batch Number
- Serial Number
- Model Number
- Hardware Revision

NOTE:
The actual location of these labels may vary depending on the product purchased.
For example: If no ISA bus is present, the PCI bus may be used instead.
However, the labelling formats will remain the same



Product overview

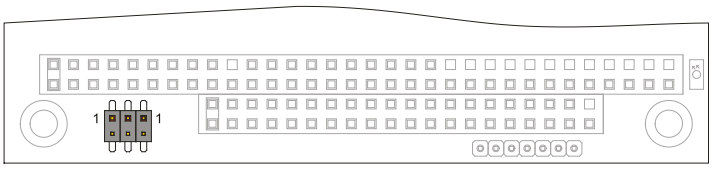
The Eurotech COM-1274 is a fully RoHS compliant PC/104 module and features 8 independent asynchronous multimode serial channels and up to 2 Control Area Network (CAN) ports.

Product definition

FEATURE	DESCRIPTION
Interfaces	**Serial:** • 8 asynchronous software-configurable RS232, RS422 or RS485 serial ports • Maximum programmable speed: 115 Kbaud • I/O controller: 16C554C • Connector type: 5x2 pin DIL 2.54mm pin-strip **CAN:** • Up to 2 CAN ports: • CAN controller: Intel 82527 / Bosch CC770 • Onboard Interface: TTL • Connector type: 5x2 pin DIL 2.54mm pin-strip • Physical interface: External CAN transceiver
Architecture	PC/104 compliant
Bus	16-bit PC/104 (ISA bus)
Dimensions	Compliant with the PC/104 standard
Power Supply	Nominal: 5.00 V (with tolerance +/-5%) @ 100 mA typical
Supported Operating Systems:	• Windows CE® • Windows XP Embedded® • Linux®
Options	• Conformal coating • Custom Connectors
RoHS	Fully RoHS (2002/95/CE) compliant

Jumpers layout and configuration

In the figure below, Jumpers are indicated as **JP** followed by its reference number, a red square pad indicates pin 1 of each jumper.



JP3, JP2, JP1

JUMPER	TYPE	FUNCTION	DEFAULT
JP1	2 pin jumper	I/O address selection (*)	Open
JP2	2 pin jumper	I/O address selection (*)	Closed
JP3	2 pin jumper	Reserved	Open

(*) see JP1 and JP2: I/O Address Selection below

JP1 and JP2: I/O Address Selection

The following table shows how to set JP1 and JP2 to select the I/O address:

JP1	JP2	I/O ADDRESS
Closed	Closed	110H
Open	Closed	150H (Default configuration)
Closed	Open	1A0H
Open	Open	1E0H

WARNING!
Some Eurotech CPU modules (CPU-1421, CPU-1433, CPU-1233…) use address 110h, for this reason, when you are using the COM-1274 with these modules ensure to select another free I/O address. Otherwise your COM-1274 module will not work.

JP3: Reserved

This jumper is Eurotech reserved and must be left open.

Important Note

Certain Eurotech CPU modules that have an ISA Bridge installed (CPU-1x33, CPU-145x and CPU-146x etc), require users to open IO spaces within the CPU BIOS. This board requires the following windows to be opened:

1. Board Base Address: 4 Bytes
2. Serial Base Address: 64 Bytes (8 Ports x 8 Bytes)
3. Serial IRQ Vector: 1 Byte

Therefore if the I/O address is 150h (JP1 Open and JP2 Closed), the Serial Base address is set to 280h and the Serial IRQ Vector is set to 2C0h, the ISA Bus tab in the CPU BIOS should include the following:

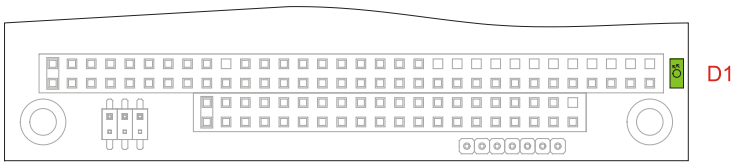
- I/O Space 1 : Enabled Addr : 150h Size : 4 Bytes
- I/O Space 2 : Enabled Addr : 280h Size : 64 Bytes
- I/O Space 3 : Enabled Addr : 2C0h Size : 1 Bytes

  Memory at 0D0000 .. 0D7FFF : ISA Bus (for the CAN interface, if required)

NOTE:
The “I/O space 1” above is only required to access the COM-1274 configuration software, and can therefore be removed in a final system if access is not required

The D1 LED indicator

A green LED indicator is located near the ISA bus.

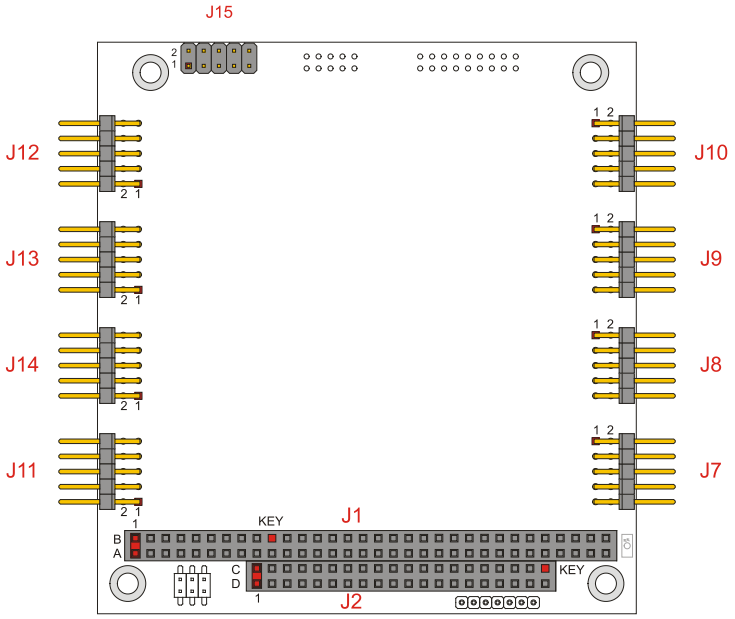


The LED meaning is the following:

LD1 STATUS	MEANING
OFF	The COM-1274 is turned off
ON	The COM-1274 is turned on

Connectors layout and configuration

This chapter provides a brief description of the connectors, with their position and function.

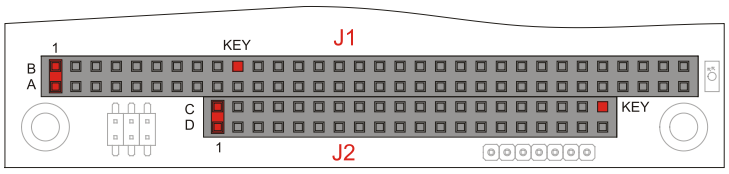


CONN #	USAGE	TYPE	PINS	FORMAT	PITCH	MANUFACTURER	PART NUMBER
J1	ISA Bus	Strip	64	32x2	2.54	Ept	962-61323-12
J2	ISA Bus	Strip	40	20x2	2.54	Ept	962-61203-12
J7	Serial Port 1	Strip	10	5x2	2.54	Adimpex	ISO08880-R
J8	Serial Port 2	Strip	10	5x2	2.54	Adimpex	ISO08880-R
J9	Serial Port 3	Strip	10	5x2	2.54	Adimpex	ISO08880-R
J10	Serial Port 4	Strip	10	5x2	2.54	Adimpex	ISO08880-R
J11	Serial Port 5	Strip	10	5x2	2.54	Adimpex	ISO08880-R
J12	Serial Port 8	Strip	10	5x2	2.54	Adimpex	ISO08880-R
J13	Serial Port 7	Strip	10	5x2	2.54	Adimpex	ISO08880-R
J14	Serial Port 6	Strip	10	5x2	2.54	Adimpex	ISO08880-R
J15	CAN Interfaces 1 and 2	Strip	10	5x2	2.54	Adimpex	IS008280-R

J1 and J2: ISA Bus for PC/104 connectivity

The ISA Bus, J1 and J2 connectors are designed to allow the connection of the COM-1274 according to the PC/104 specifications.

J1 and J2 include KEY pins; these are filled holes in the upper side and missing pins in the lower side of the bus. KEY pins avoid the incorrect connection with other modules.

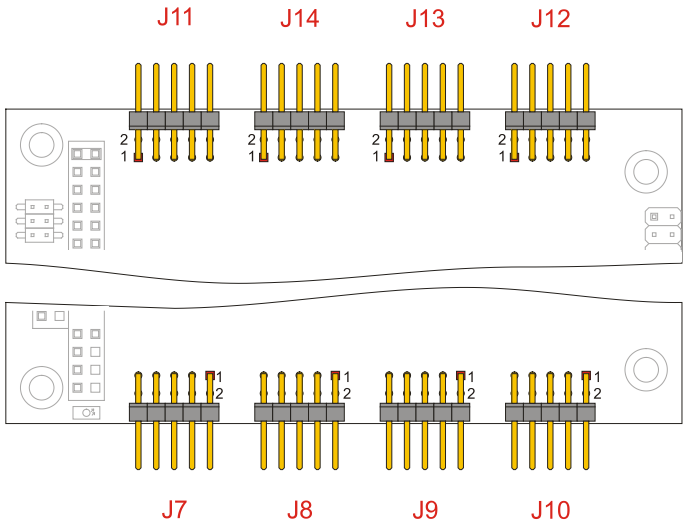


J2			
PIN #	SIGNAL	PIN #	SIGNAL
D1	GND	**C1**	GND
D2	MEMCS16#	**C2**	SBHE#
D3	IOCS16#	**C3**	LA23
D4	IRQ10	**C4**	LA22
D5	IRQ11	**C5**	LA21
D6	IRQ12	**C6**	LA20
D7	IRQ15	**C7**	LA19
D8	IRQ14/ROMCS#	**C8**	LA18
D9	DACK0#	**C9**	LA17
D10	DRQ0	**C10**	MEMR#
D11	DACK5#	**C11**	MEMW#
D12	DRQ5	**C12**	SD8
D13	DACK6#	**C13**	SD9
D14	DRQ6	**C14**	SD10
D15	DACK7#	**C15**	SD11
D16	DRQ7	**C16**	SD12
D17	VDD	**C17**	SD13
D18	MASTER#	**C18**	SD14
D19	GND	**C19**	SD15
D20	GND	**C20**	GND/KEY

J1			
PIN #	SIGNAL	PIN #	SIGNAL
A1	GND	**B1**	IOCHK#
A2	RSTDRV	**B2**	SD7
A3	VDD	**B3**	SD6
A4	IRQ9	**B4**	SD5
A5	-5V	**B5**	SD4
A6	DRQ2	**B6**	SD3
A7	-12V	**B7**	SD2
A8	ZEROWS#	**B8**	SD1
A9	+12V	**B9**	SD0
A10	GND/KEY	**B10**	IOCHRDY
A11	SMEMW#	**B11**	AEN
A12	SMEMR#	**B12**	SA19
A13	IOW#	**B13**	SA18
A14	IOR#	**B14**	SA17
A15	DACK3#	**B15**	SA16
A16	DRQ3	**B16**	SA15
A17	DACK1#	**B17**	SA14
A18	DRQ1	**B18**	SA13
A19	REFRESH#	**B19**	SA12
A20	SYSCLK	**B20**	SA11
A21	IRQ7	**B21**	SA10
A22	IRQ6	**B22**	SA9
A23	IRQ5	**B23**	SA8
A24	IRQ4	**B24**	SA7
A25	IRQ3	**B25**	SA6
A26	DACK2#	**B26**	SA5
A27	TC	**B27**	SA4
A28	BALE	**B28**	SA3
A29	VDD	**B29**	SA2
A30	OSC	**B30**	SA1
A31	GND	**B31**	SA0
A32	GND	**B32**	GND

J7 to J14: Serial Ports

Eight software selectable RS232/RS422/RS485 serial ports are available on the COM-1274.
Run the Setup Utility (see Configure the COM-1274: the Setup Utility on page 19) to configure them.



CONNECTOR #	FUNCTION
J7	Serial Port 1
J8	Serial Port 2
J9	Serial Port 3
J10	Serial Port 4
J11	Serial Port 5
J12	Serial Port 8
J13	Serial Port 7
J14	Serial Port 6

Connector pinout when serial port is used in RS232 mode

PIN #	SIGNAL	FUNCTION	IN/OUT	DB25	DB9
1	DCD	Data Carrier Detect	In	8	1
2	DSR	Data Set Ready	In	6	6
3	RX	Receive Data	In	3	2
4	RTS	Request To Send	Out	4	7
5	TX	Transmit Data	Out	2	3
6	CTS	Clear To Send	In	5	8
7	DTR	Data Terminal Ready	Out	20	4
8	RI	Ring Indicator	In	22	9
9,10	GND	Signal Ground	--	7	5

Connector pinout when serial port is used in RS422 mode

PIN #	SIGNAL	FUNCTION	IN/OUT
1	-TX	Transmit Data	Out
2	--	Not connected	--
3	+TX	Transmit Data	Out
4	--	Not connected	--
5	-RX	Receive Data	In
6	--	Not connected	--
7	+RX	Receive Data	In
8	--	Not connected	--
9,10	GND	Signal ground	--

Connector pinout when serial port is used in RS485 mode

PIN #	SIGNAL	FUNCTION	IN/OUT
1	-TX/-RX	Transmit/Receive Data	Out/In
2	--	Not connected	--
3	+TX/+RX	Transmit/Receive Data	Out/In
4	--	Not connected	--
5	--	Not connected	--
6	--	Not connected	--
7	--	Not connected	--
8	--	Not connected	--
9,10	GND	Signal ground	--

NOTE:
If the serial port is used in RS485 mode, the bi-directional line must be controlled via software, using the Data Terminal Ready (DTR) signal of the serial controller.
This signal is defined by bit 0 of the UART Modem Control Register (MCR) and the bi-directional line is controlled as follows:

- - bit 0 of the MCR register = 0 means RS485 line receiving
- - bit 0 of the MCR register = 1 means RS485 line transmitting

The I/O address of the MCR is "Serial port Base address"+4H

NOTE:
When you switch from transmitting to receiving mode, the serial port may receive an invalid spurious data byte, thus it may be necessary to empty the serial port receive buffer immediately after setting the serial port in receive mode.

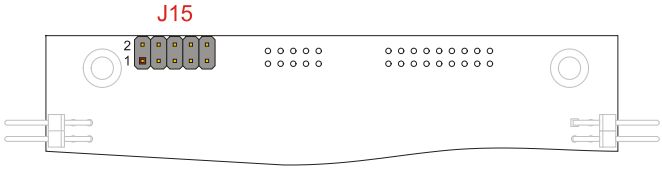
The Eurotech ACS-3904-00 Cable kit

Optionally the Eurotech ACS-3904-00 Cable kit is available to simplify the connection of serial ports.

For further information about the ACS-3904-00 Cable kit please refer to the Technical Datasheet Td0035 (http://www.eurotech.com/DLA/AN/Td0035.pdf).

J15 CAN Interfaces

Up to two CAN interfaces are available on the J15 connector.



PIN #	SIGNAL	FUNCTION	IN/OUT
1	GND	Ground	-
2	+5V	+5 Volt	-
3	GND	Ground	-
4	CAN1T	CAN1 Transmit	Out
5	GND	Ground	-
6	CAN2T	CAN2 Transmit	Out
7	GND	Ground	-
8	CAN1R	CAN1 Receive	In
9	+12V	+12 Volt	-
10	CAN2R	CAN2 Receive	In

NOTES:

- The on-board clock frequency of the CAN section is 8 MHz. For further information we recommend contacting to the CAN controller manufacturer.
- For correct operation it is recommended to use the Eurotech CAN adapter

The Eurotech ACS-9094-00 CAN adaptor

Optionally the Eurotech ACS-9094-00 CAN adaptor is available to simplify the connection of CAN peripherals.

For further information about the Eurotech ACS-9094-00 CAN adaptor please refer to the Technical Datasheet Td0003 (http://www.eurotech.com/DLA/AN/Td0003.pdf).

Installing the COM-1274

Stacking the COM-1274 with other PC/104 devices.

The ISA bus connectors on the module are designed to allow the module to be connected with other PC/104 and/or PC/104Plus devices.

We recommend following the procedure below to ensure that stacking of the modules does not damage connectors or components.

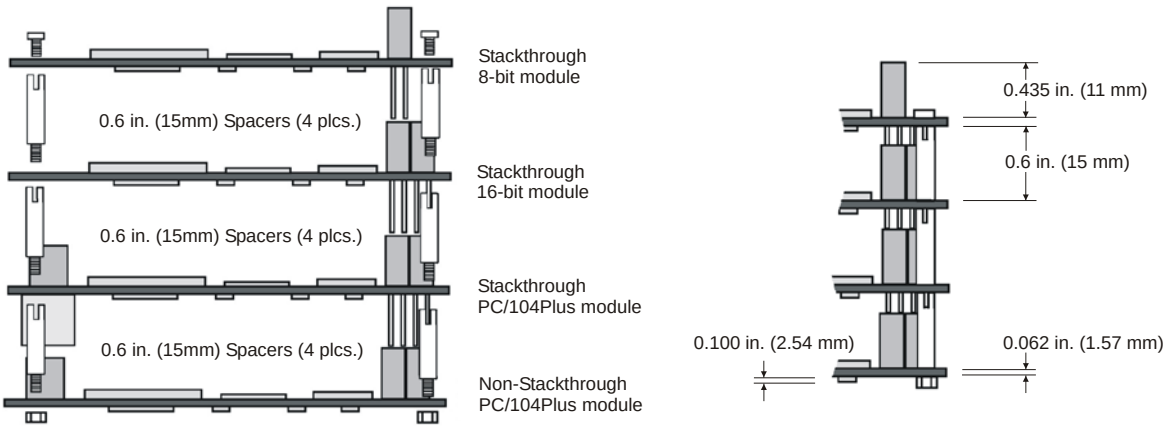
WARNING!
Always use appropriate antistatic precautions when handling the boards.

1. Turn off all power to the PC/104 computer and its peripheral devices.
2. Select and install standoffs to properly position the module on the PC/104 stack.
3. Remove the module from its antistatic bag.
4. Check that keying pins in the bus connector are properly positioned.
5. Check the stacking order; make sure an XT bus card are not placed between two AT bus cards as this will interrupt the AT bus signals.
6. Hold the module by its edges and orient it so that the bus connector pins line up with the matching connector on the stack.
7. Using even pressure press the module onto the PC/104 stack.

The figure below shows a typical module stack with two PC/104 modules, one PC/104 16-BIT module, and one PC/104 8-BIT module.

The maximum number of modules is 4 in addition to the Host Board.

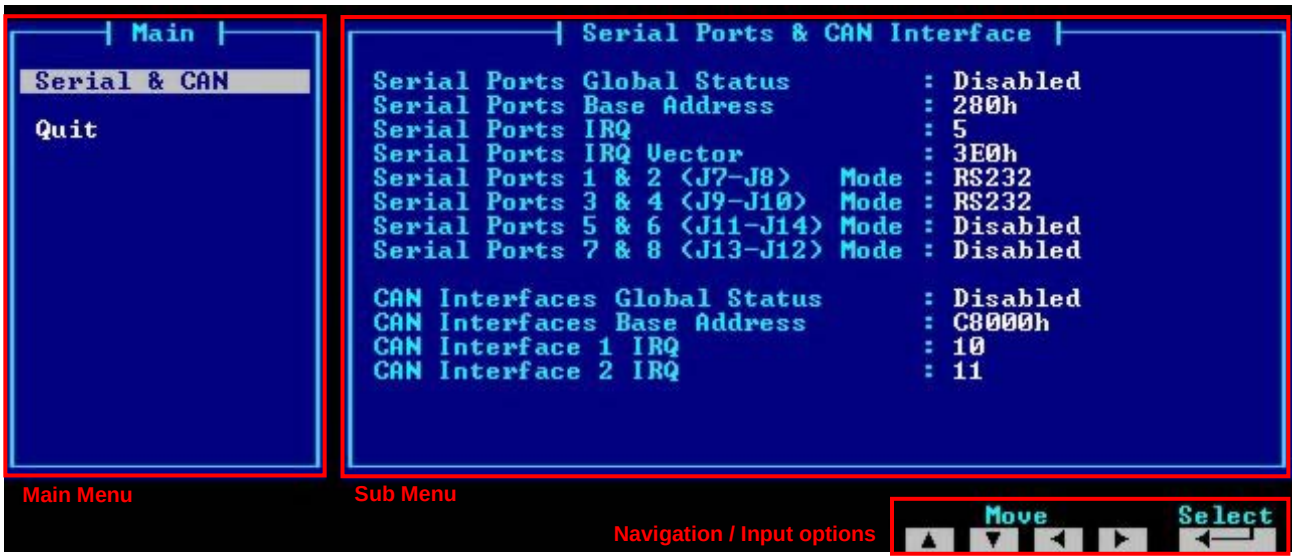
If standard PC/104 peripheral modules are used in a stack that includes a PC/104-Plus CPU module and PC/104-Plus peripherals, standard PC/104 modules must be the top modules because they will normally not include the PCI bus, while PC/104-Plus modules do.



Configure the COM-1274: the Setup Utility

This paragraph refers to the Setup Utility revision 2.0.1; other versions may differ.
This utility is available for the COM-1274 module, and is backwardly compatible with the COM-1270.

The Setup Utility is an exe program (*setup.exe*) that needs to be launched from DOS (not a DOS window) and allows the configuration of the Serial and CAN ports.



Once the Setup Utility is running the display will appear as separated into 3 areas:

- Main Menu
- Sub Menu
- Navigation / Input options

Main Menu

The Main menu shows a list with the available *Sub Menus*.

Sub Menu

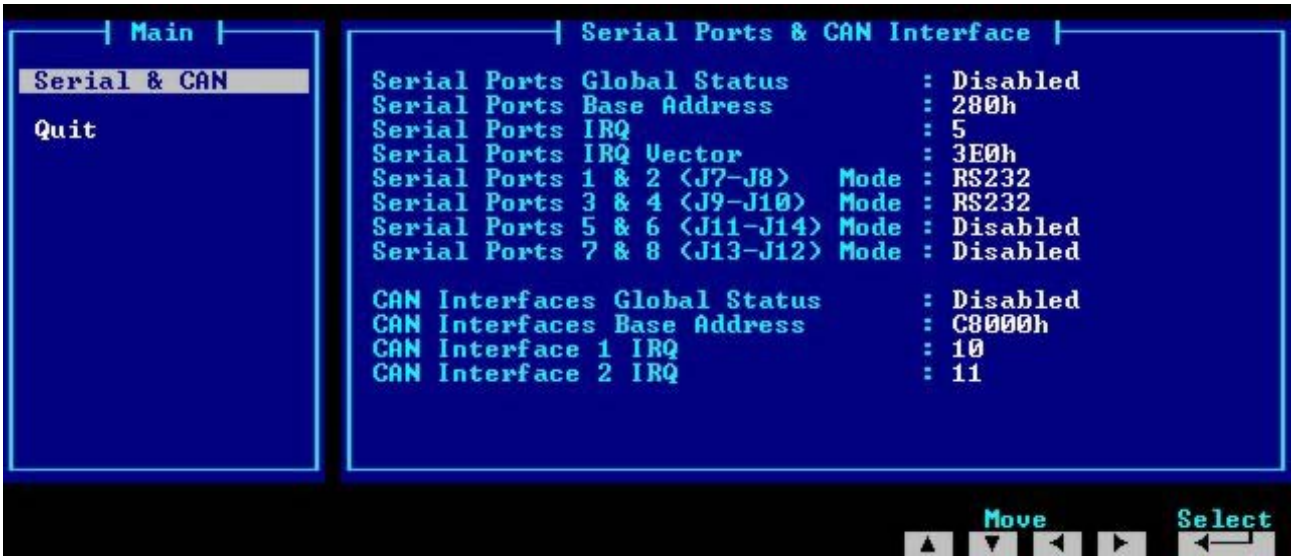
A Sub Menu contains a list with the possible parameters you can set.

Navigation / Input options

The Navigation/Input options show you the possible actions you can perform with the currently selected parameter/Sub Menu.

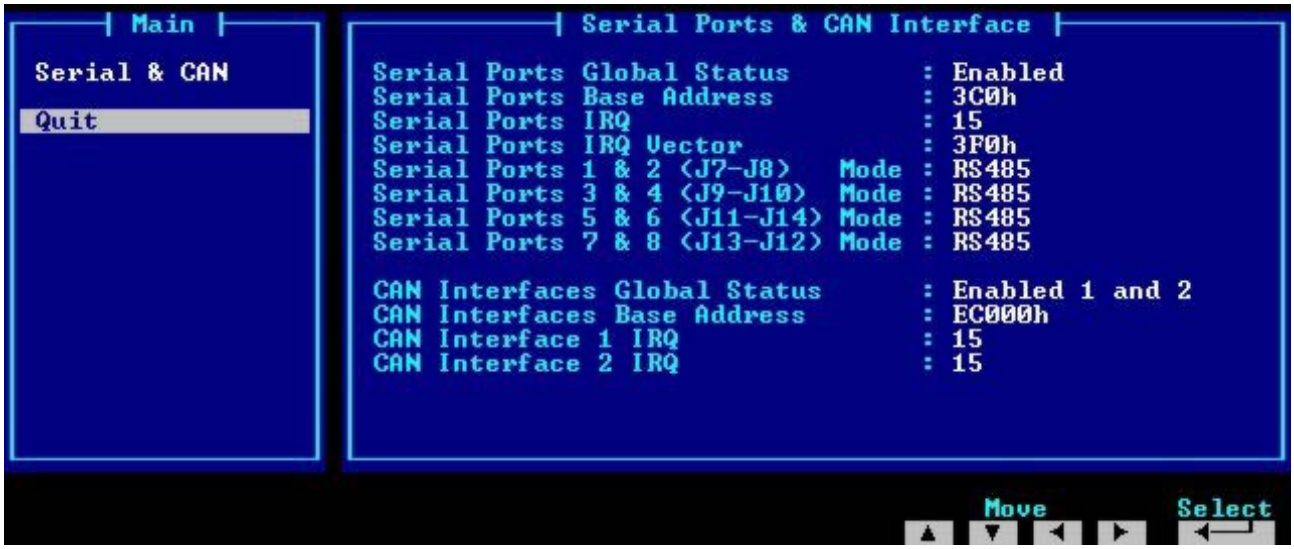
OPTION	KEY(S)	USE
	Up Arrow	Go to the next field above
	Down Arrow	Go to the next field below
	Left Arrow	Go to the next field to the right
	Right Arrow	Go to the next field to the left
	Enter / Return	• Select field to modify • Select an option i.e. “Detect Now” • Accept a value you have entered
	Escape	• Cancel a value you are entering • Go back to the Main menu
	Page Down / +	Select next option in a list
	Page Up / -	Select previous option from a list
	Numbers 0 to 9	Enter a number from 0 to 9
	Backspace	Erase last character entered

Serial & CAN

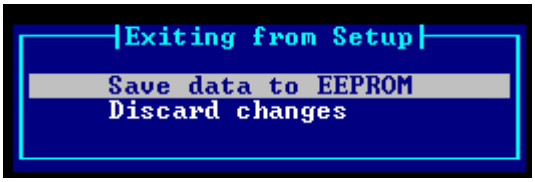


PARAMETER	POSSIBLE SELECTIONS	DEFAULT CONFIGURATION
Serial Ports Global Status	• Disabled • Enabled	Enabled
Serial Ports Base Address	List of available Base Addresses	280h
Serial Ports IRQ	List of available IRQ numbers	10
Serial Ports IRQ Vector	List of available IRQ vectors	2C0h
Serial Ports 1 & 2 (J7-J8) Mode **Serial Ports 3 & 4 (J9-J10) Mode** **Serial Ports 5 & 6 (J11-J14) Mode** **Serial Ports 7 & 8 (J13-J12) Mode**	• Disabled • RS232 • RS422 • RS485	RS232 for all the serial ports
CAN Interfaces Global Status	• Disabled • Enabled 1 • Enabled 1 and 2	Disabled
CAN Interfaces Base Address	List of available Base Addresses	C8000h
CAN Interfaces 1 IRQ	List of available IRQ numbers	11
CAN Interfaces 2 IRQ	List of available IRQ numbers	12

Quit:



While *Quit* is selected, the following message will appear when pressing the *Enter* or *Return* key:



OPTION	EFFECT
Save data to EEPROM	The configuration data will be saved to the EEPROM The Module will then reboot
Discard Changes	Changes made will be discarded The Module will reboot with the original settings

Physical characteristics



WARNING!
Operating the board beyond the following specifications is not recommended.
Stressing the device beyond the maximum ratings may affect device reliability and cause permanent damage and as a consequence will void the warranty.

Operating characteristics

Electrical operating characteristics

CHARACTERISTIC	VALUE
Voltage	Nominal: 5.00 V
	Minimum: 4.975 V
	Maximum:5.025 V
Current	Typical: 100 mA

Environmental specifications

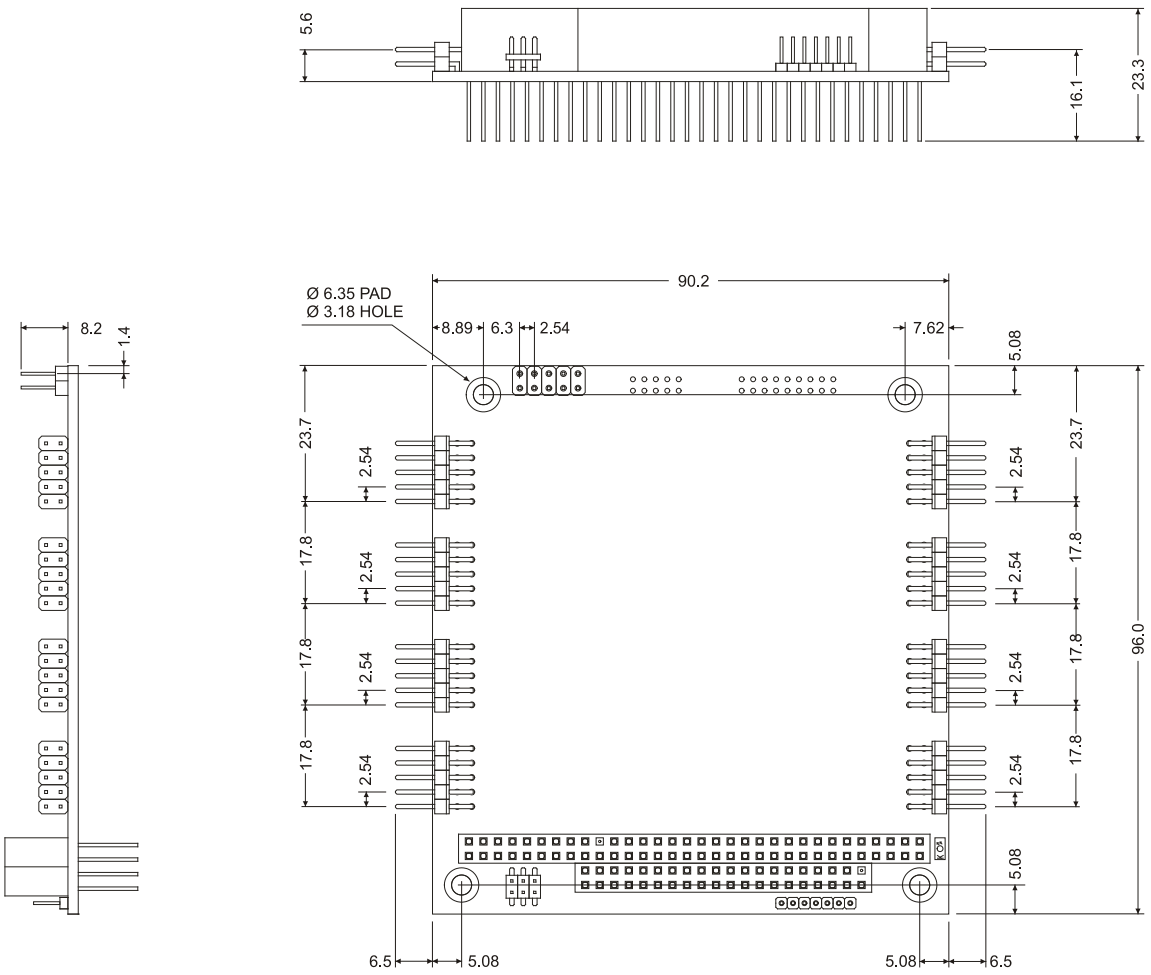
CHARACTERISTIC	MINIMUM	MAXIMUM
Operating temperature range	0 °C	+60 °C
Storage temperature range	-40 °C	+85 °C
Relative Humidity		95% at 40°C non-condensing

MTBF (Mean Time Between Failures)

CHARACTERISTIC	VALUE
Hours	530000
Standard	Ground Benign
Temperature	25.0 °C

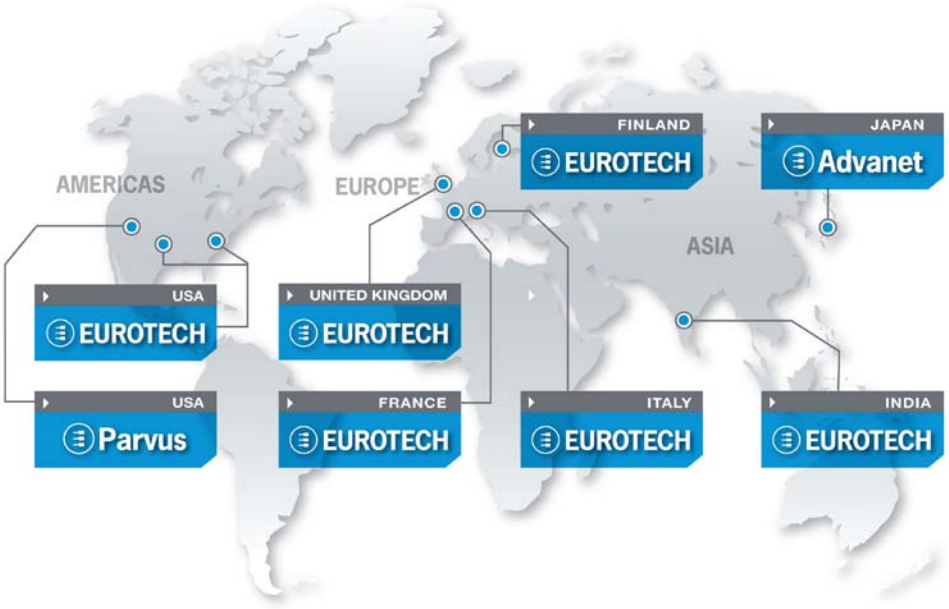
Mechanical characteristics

COM-1274 module dimensions (in millimetres)



NOTE:
The board's mechanical dimensions are compliant with the PC/104 specifications.
For further information please refer to the PC/104 Embedded Consortium: www.pc104.org

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