

EureCard PICOLO
PICOLO, PICOLO Pro 2,
PICOLO Pro 3E, PICOLO Pro 3I, MIO

Manual



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This book is part of the documentation
provided with MultiCam

For more information,
refer to the documentation provided
in the latest MultiCam release.

EureCard PicoLO series Manual
Tome 1
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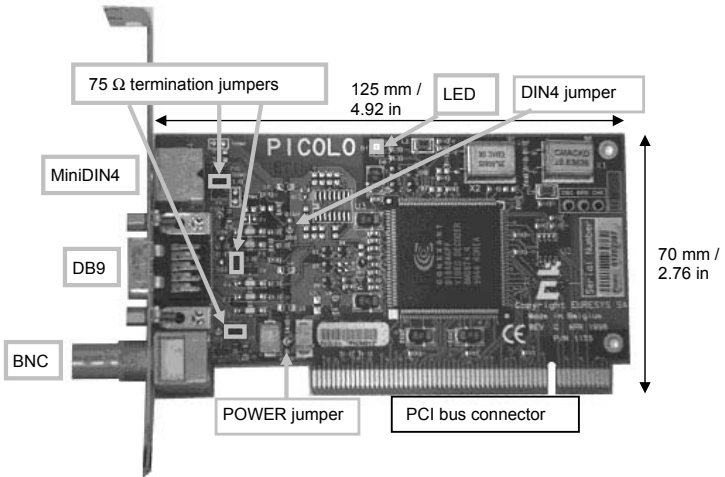
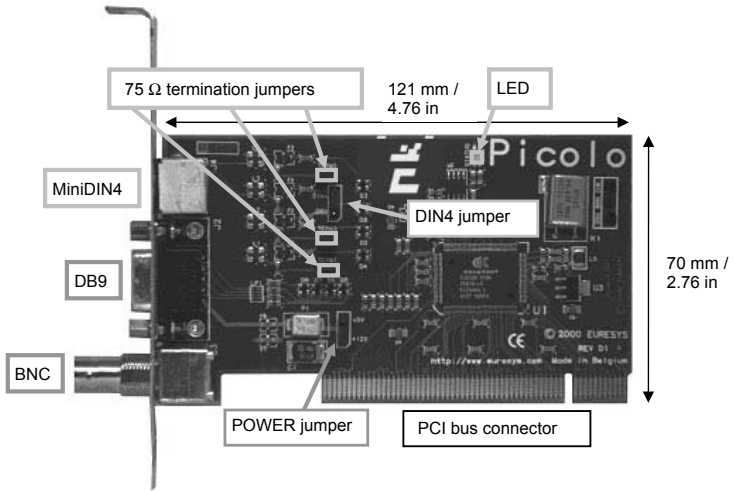
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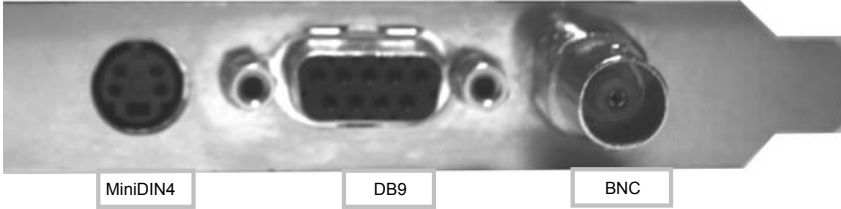
Part I. PicoLO Product Description

1. Product appearance

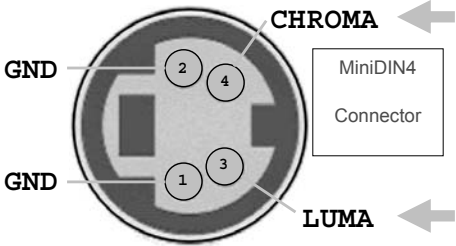
The PicoLO boards can have these two appearances, depending on their PCB version:



2. Connectors



2.1. "MiniDIN4" connector



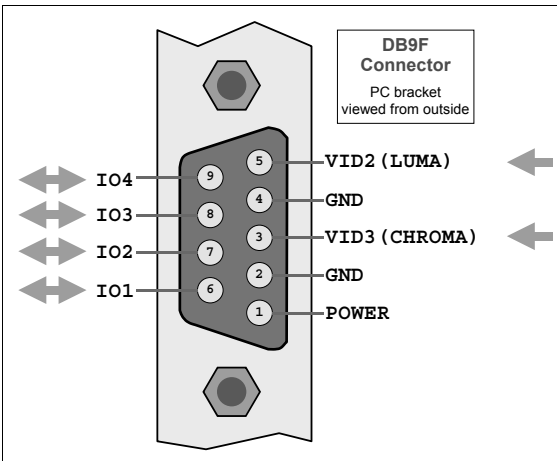
In the default factory setting "DIN4", LUMA and CHROMA are the luma and chroma inputs for a video composite color signal with the S-Video format.

In the "DB9" setting, the CHROMA input is not used and the LUMA input can receive a color or monochrome composite signal.

To modify this setting, see paragraph "Picolo hardware installation".

LUMA is terminated with a removable 75 Ω load. LUMA is connected to VID2 on the DB9 connector.

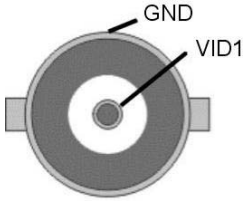
2.2. "DB9" connector



IO1, IO2, IO3 and IO4 are TTL I/O that can be read or written by software.

IO1 can be configured by software as a TRIGGER line for acquisitions.

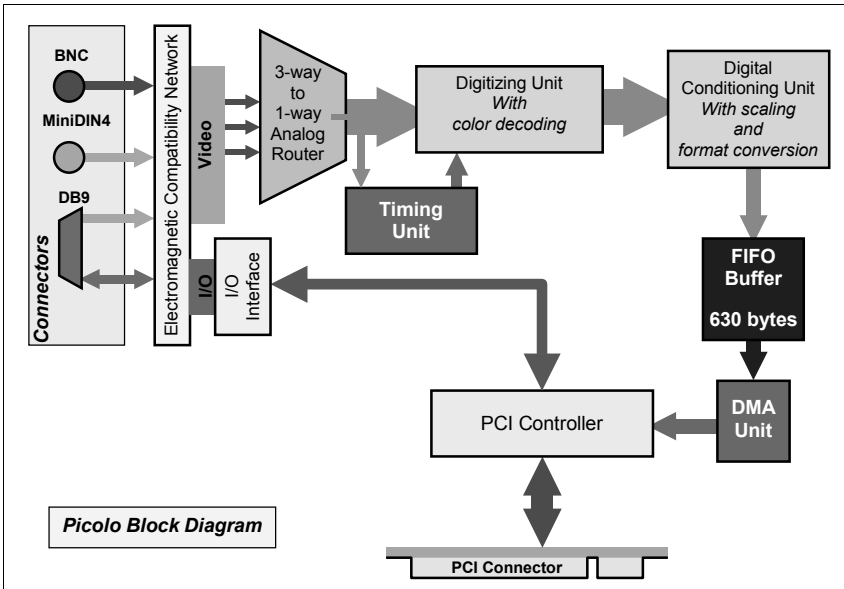
2.3. "BNC" connector



VID1 is a selectable color or monochrome composite input. It is terminated with a removable 75 Ω load.

To modify the 75 Ω termination setting, see paragraph "PicoLO hardware installation".

3. PicoLO block diagram



4. Picolo standard compliance



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- Consult the dealer or an experienced radio/TV technician for help.



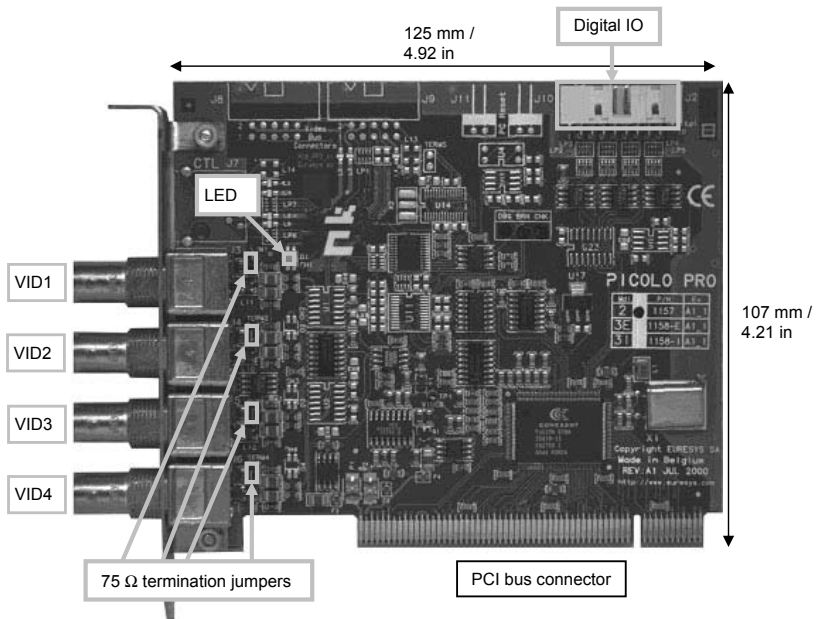
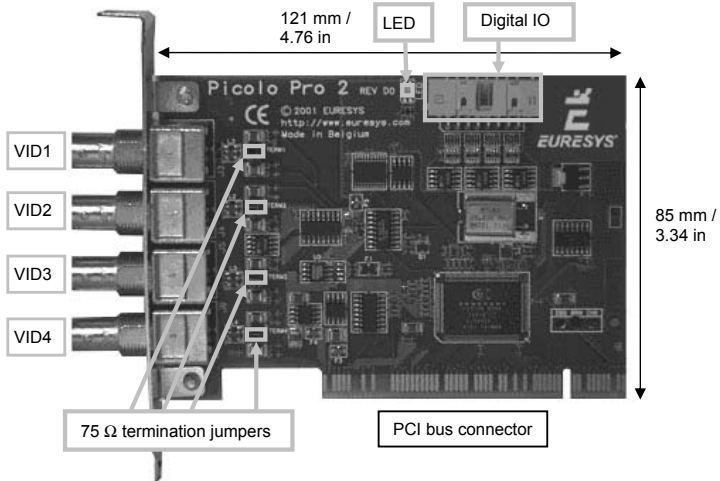
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This equipment has been tested and found to comply with EN55022/CISPR22 and EN55024/CISPR24. To meet EC requirements, shielded cables must be used to connect a peripheral to the card. This product has been tested in a typical class B compliant host system. It is assumed that this product will also achieve compliance in any class B compliant unit.

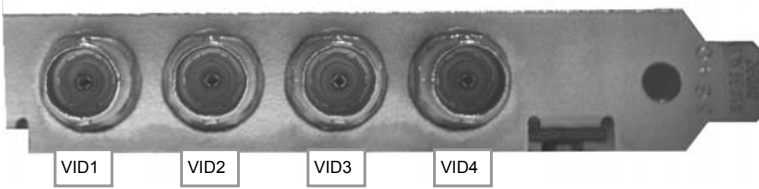
Part II. Pico Pro 2 Product Description

1. Product appearance

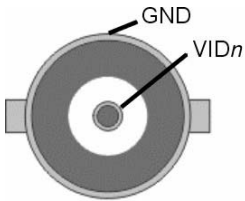
The Pico Pro 2 boards can have these two appearances, depending on their PCB version :



2. Connectors



VID_n connector

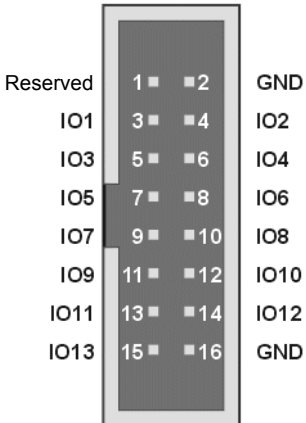


VID1, VID2, VID3 and VID4 are selectable color or monochrome composite inputs. They are terminated with removable 75 Ω loads.

To modify the 75 Ω termination setting, see paragraph "Pico Pro 2 hardware installation".

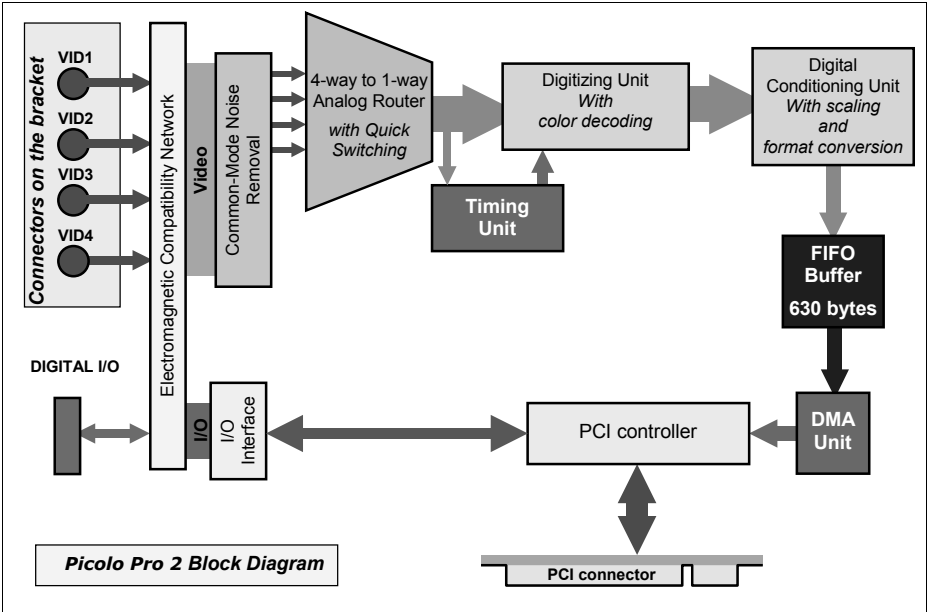
3. Pico Pro 2 I/O lines

"Digital IO" connector



The "Digital IO" internal connector on the Pico Pro 2 has 13 TTL I/O lines that can be used by the MultiCam software driver as inputs, outputs or trigger lines.

4. Pico Pro 2 block diagram



5. Picolo Pro 2 standard compliance



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- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.



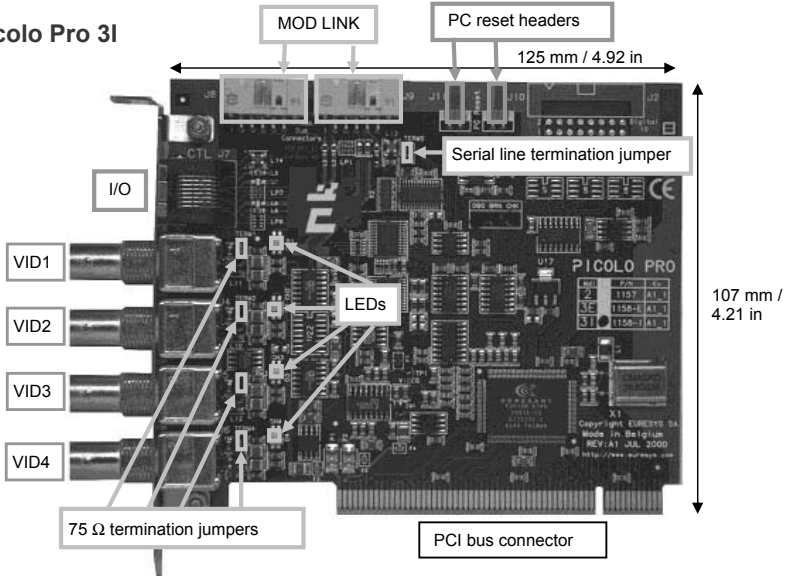
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Part III. Pico Pro 3I Product Description

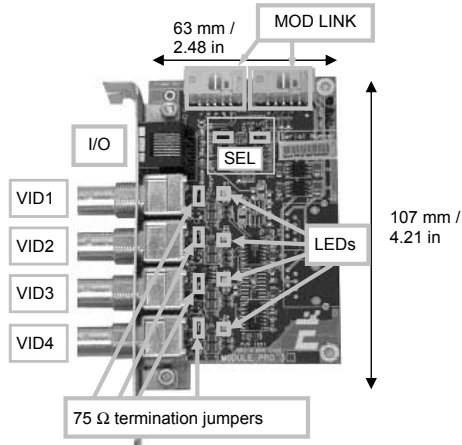
1. Product appearance

1.1. Pico Pro 3I



1.2. Module Pro 3I – 4 additional video inputs

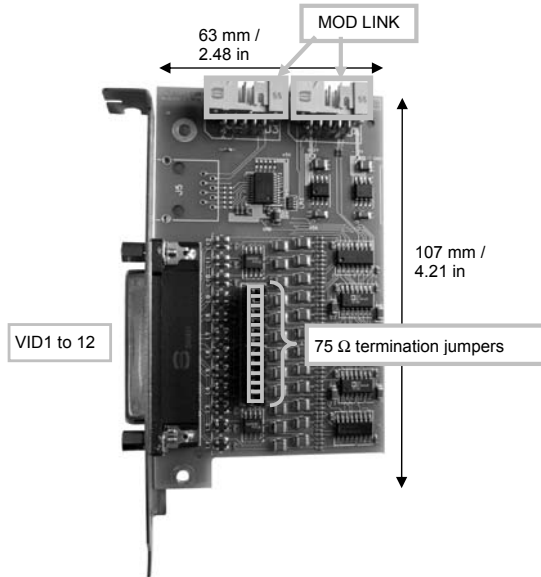
The Module Pro 3I allows to connect 4 video inputs to a Pico Pro 3I.



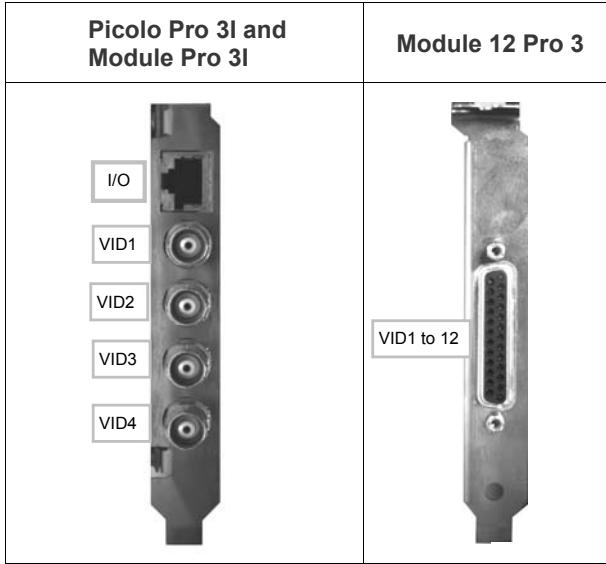
1.3. Module 12 Pro 3 – 12 additional video inputs

The Module 12 Pro 3 allows to connect 12 video inputs to a Pico Pro 3I using only one blind slot. With regard to video inputs, this board replaces 3 Modules Pro 3I.

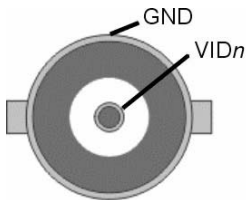
Up to five MIO can be added to a Pico Pro 3I with one Module 12 Pro 3.



2. Connectors



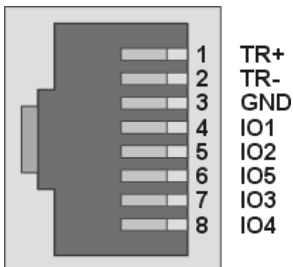
2.1. “VID n ” connector



VID1, VID2, VID3 and VID4 are selectable color or monochrome composite inputs. They are terminated with removable 75 Ω loads.

To modify the 75 Ω termination setting, see paragraph "Pico Pro 3I hardware installation".

2.2. “I/O” connector



The “I/O” connector has 5 TTL I/O lines that can be used by the MultiCam software driver as inputs, outputs or trigger lines (see I/O lines control and channel trigger parameters in MultiCam documentation).

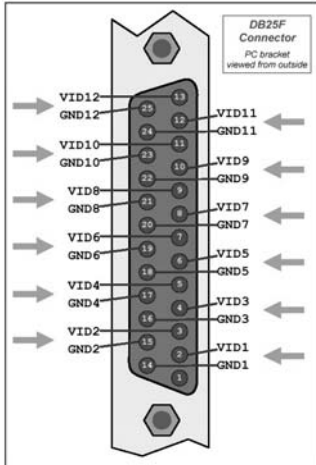
It also holds one RS-485 half-duplex serial communication line.

2.3. “MOD LINK” connectors

Using flat cables, these 10-pin header connectors allow to interconnect Modules Pro 3I to a Pico Pro 3I directly or indirectly through other modules.

Module 12 Pro 3 must be attached to a Pico Pro 3I directly. When using the Module 12 Pro 3, other Modules Pro 3I cannot be used.

2.4. “VID1 to 12” connector on the Module 12 Pro 3



The “VID1 to 12” connector is composed of 12 video inputs and their respective ground. VID1, VID2, ... up to VID12 are color or monochrome composite inputs. They are terminated with removable 75 Ω loads.

To modify the 75 Ω termination setting, see paragraph “Pico Pro 3I hardware installation”.

3. Linking cable

Module Pro 3I and Module 12 Pro 3 are delivered with a linking cable.

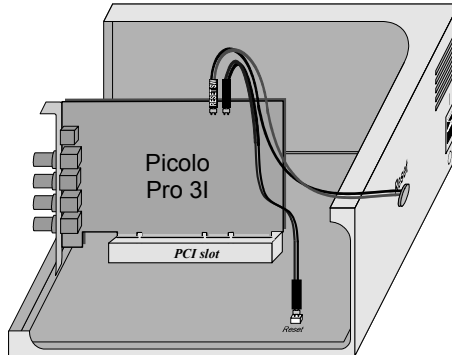
All cables are identical and may be interchanged. The flat cables should be as short as possible.



4. Features

4.1. PC reset headers

A reset cable can be connected directly to a "PC reset header". The watchdog uses a static switch with an ON resistance of about 35 ohms. The polarity at the switch input doesn't matter.



In the drawing is illustrated the control of PC reset by button or by the Pico Pro 3I. The switch can also be used for other purposes than resetting the computer : for example, it can activate an alarm.

The two "PC reset headers" are equivalent.

See also topic "Using the watchdog" in the electronic documentation.

4.2. LEDs

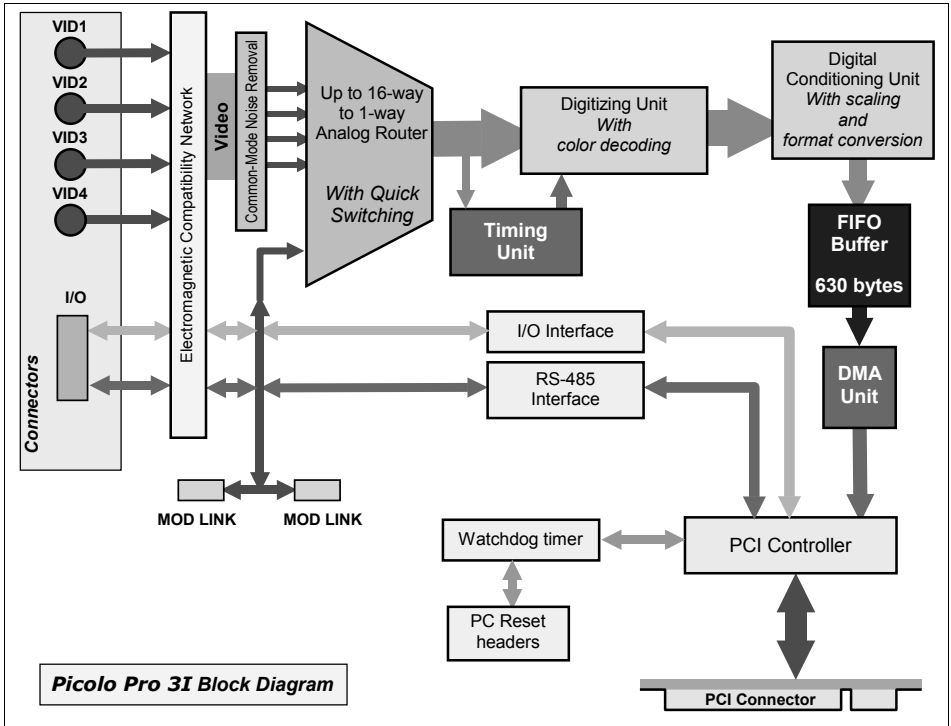
A bi-colour LED is associated with each video input.

Green means acquisition on the video input.

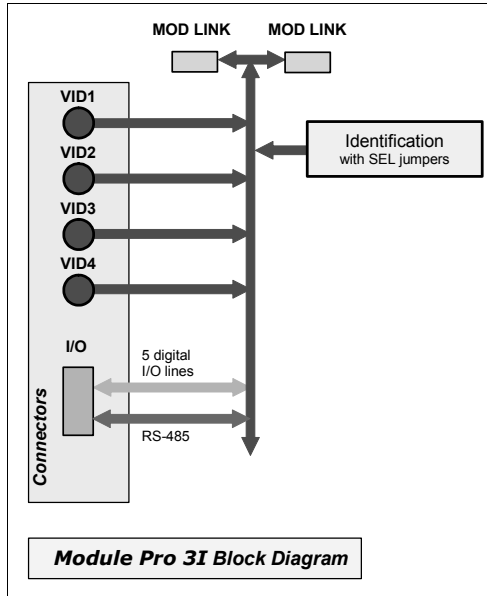
Red indicates video disconnected, it remains red until another acquisition succeeds (video present).

The first LED (LED CH1) also lights green when the driver is started. It remains green until the first acquisition.

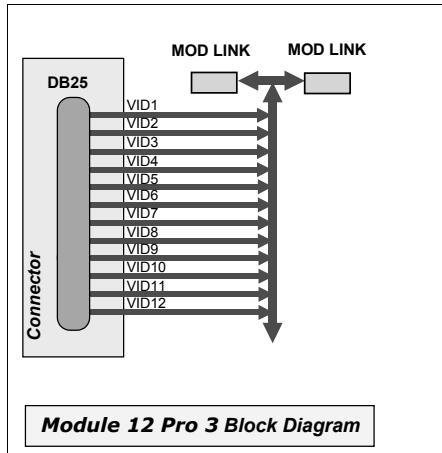
5. Pico Pro 3I block diagram



6. Module Pro 3I block diagram



7. Module 12 Pro 3 block diagram



8. Picolo Pro 3I, Module Pro 3I and Module 12 Pro 3 standard compliance



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- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.



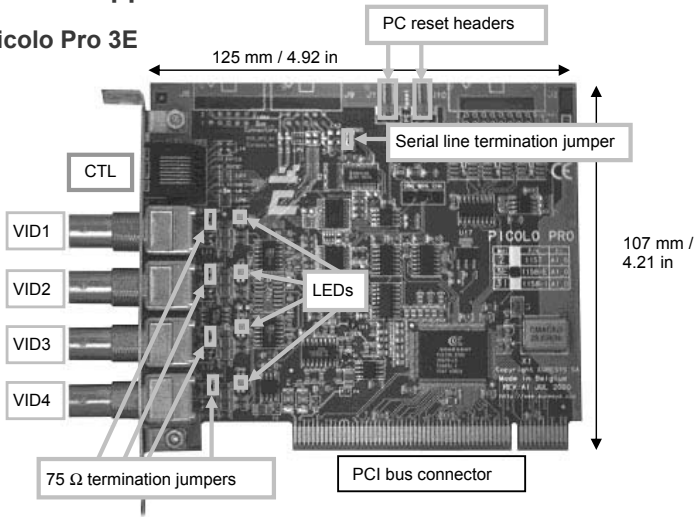
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Part IV. Pico Pro 3E Product Description

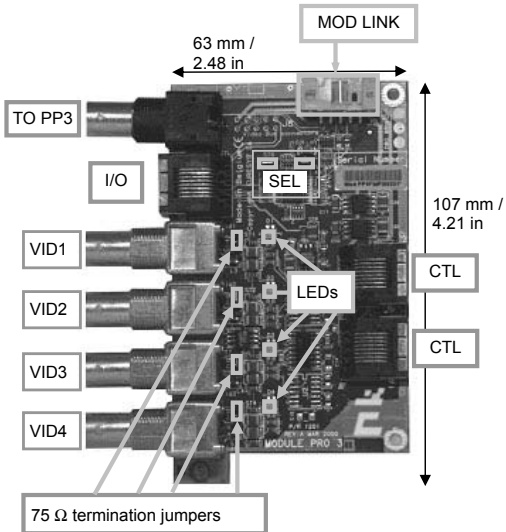
1. Product appearance

1.1. Pico Pro 3E

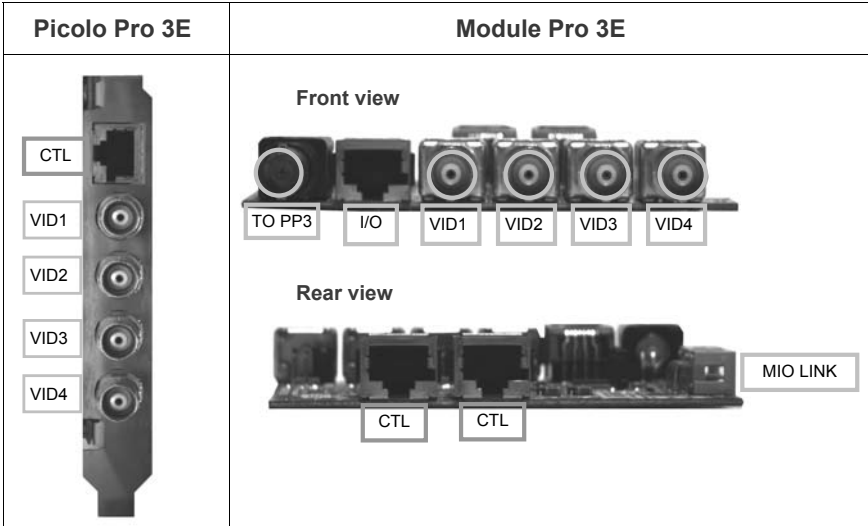


1.2. Module Pro 3E

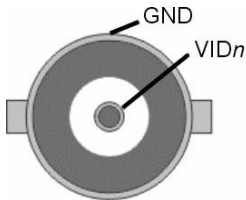
The Module Pro 3E allows to connect 4 video inputs to a Pico Pro 3E.



2. Connectors



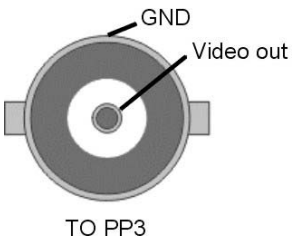
2.3. “VIDn” connector



VID1, VID2, VID3 and VID4 are selectable color or monochrome composite inputs. They are terminated with removable 75 Ω loads.

To modify the 75 Ω termination setting, see “Pico Pro 3E hardware installation”.

2.4. “TO PP3” connector



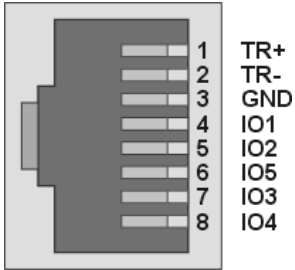
The video is sent from an external Module Pro 3E through a coaxial cable connecting the BNC “TO PP3” of a Module Pro 3E and the first BNC “VIDn” available on the Pico Pro 3E.

For more details, see “Connecting modules”.

2.5. “CTL” connector

The pin out of these connectors are all proprietary signals that allow to power and control Modules Pro 3E. Simply connect these connectors with standard UTP cat. 5 cable.

2.6 “I/O” connector



The “I/O” connector on each module Pro 3E has 5 TTL I/O lines that can be used by the MultiCam software driver as inputs, outputs or trigger lines (see I/O lines control and channel trigger parameters in MultiCam documentation).

It also holds one RS-485 half-duplex serial communication line.

2.7. “MIO LINK” connector

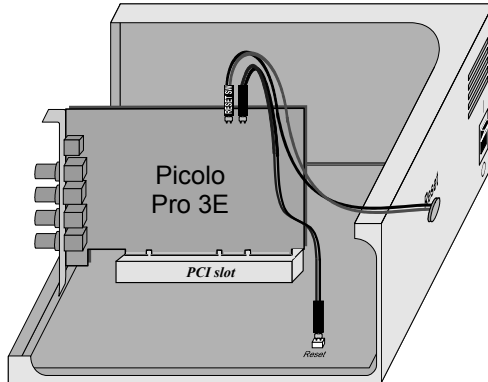
Using flat cable, this 10-pin header connector allows to link MIO with a Module Pro 3E or another MIO. For more details, see “Connecting MIO to a module Pro 3E”.

3. Features

3.1. PC reset headers

A reset cable can be connected directly to the "PC reset headers". The watchdog acts like a static switch. It has an internal resistance of about 35 ohms. The polarity at the switch input doesn't matter.

A reset cable can be connected directly to a "PC reset header". The watchdog uses a static switch with an ON resistance of about 35 ohms. The polarity at the switch input doesn't matter.



The drawing shows the control of PC reset by button or by the Pico Pro 3E. The switch can also be used for other purposes than resetting the computer : for example, it can activate an alarm.

The two "PC reset headers" are equivalent.

See also topic "Using the watchdog" in the electronic documentation.

3.2. LEDs

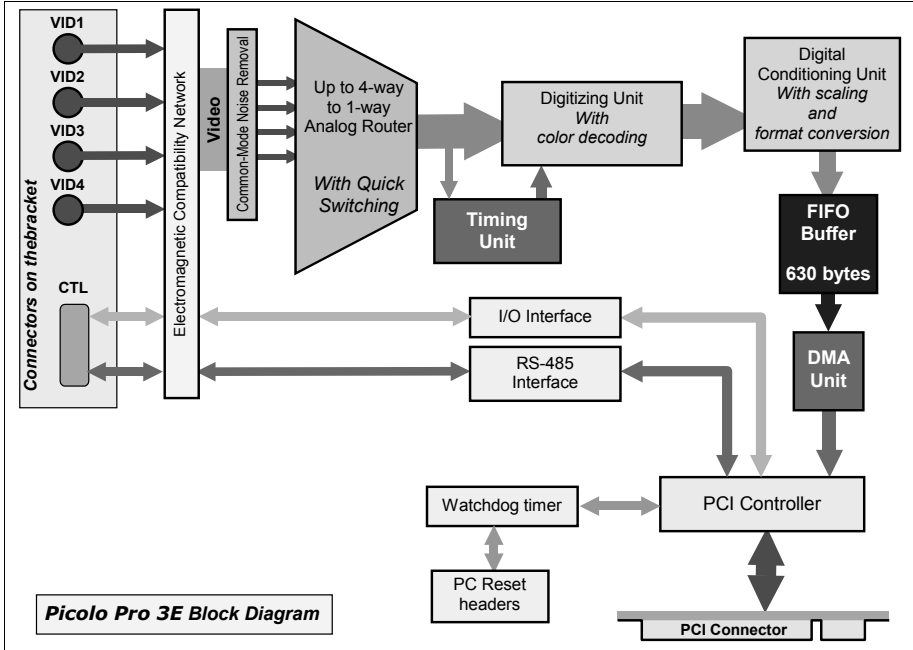
A bi-colour LED is associated with each video input.

Green means acquisition on the video input.

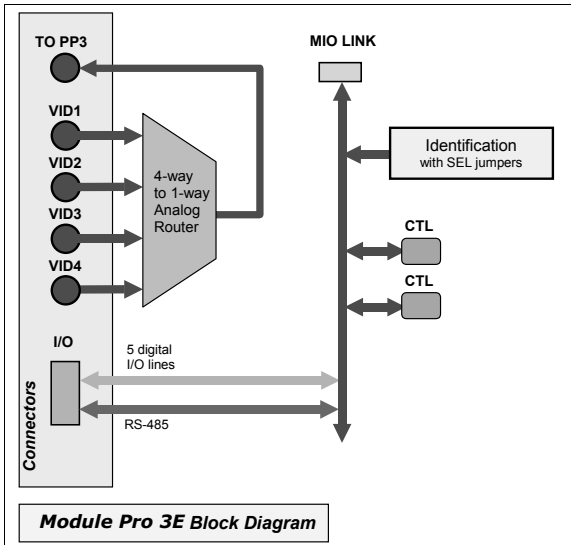
Red indicates video disconnected, it remains red until another acquisition succeeds (video present).

The first LED (LED CH1) also lights green when the driver is started. It remains green until the first acquisition.

4. Pico Pro 3E block diagram



5. Module Pro 3E block diagram



6. Picolo Pro 3E standard compliance



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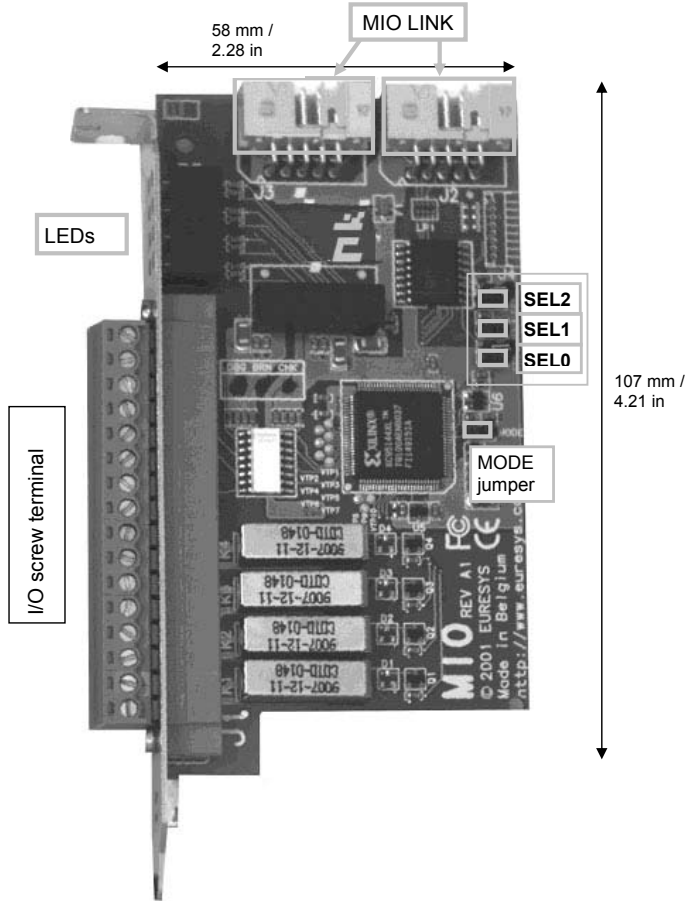
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Part V. MIO Module Product Description

1. Product appearance

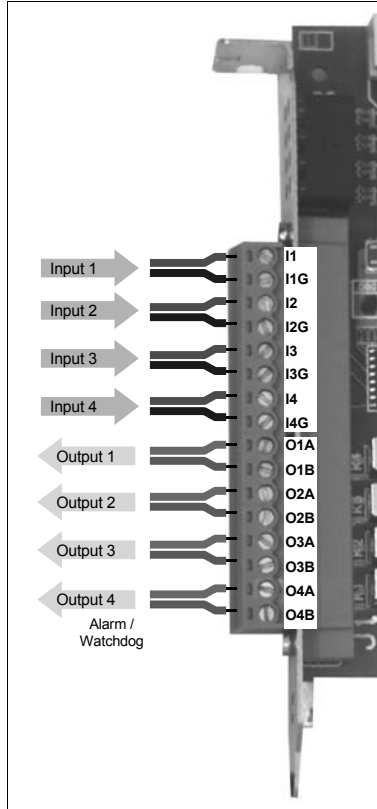
MIO stands for Module Input Output. This I/O module holds four isolated inputs and four isolated outputs. It can be attached to a PicoL Pro 3 as described in "Connecting MIO".



2. Connectors

2.1. “I/O screw terminal” connector

The sixteen terminals constituting the eight I/O lines of the MIO are collected in a removable 16-position screw terminal provided with each MIO.



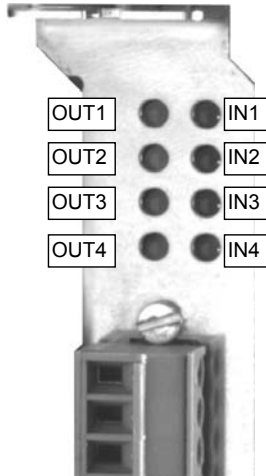
Note : The output 4 can be associated with a timer in order to be used as an alarm or a watchdog.
For more details, see “Output characteristics”.

2.2. “MIO LINK” connectors

Using flat cables, these 10-pin header connectors allow to link MIO with a Pico Pro 3 or another MIO.
For more details, see “Connecting MIO”.

3. Features

3.1. LEDs



The input state is displayed with 4 green LEDs: the "IN n " LED is lighted when the corresponding two terminals In and InG are connected. For more details, see "Input thresholds".

The output state is displayed with 4 orange LEDs: the "OUT n " LED is lighted when the corresponding terminal OnA is connected to OnB (contact shorted). For more details, see "Output characteristics".

4. MIO standard compliance



Notice for USA
Compliance Information Statement (Declaration of Conformity Procedure) DoC
FCC Part 15

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules.

These limits are designed to provide reasonable protection against harmful interference in a residential installation or when the equipment is operated in a commercial environment.

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.



Notice for Europe
This product is in conformity with the Council Directive 89/336/EEC amended by
92/31/EEC and 93/68/EEC

This equipment has been tested and found to comply with EN55022/CISPR22 and EN55024/CISPR24. To meet EC requirements, shielded cables must be used to connect a peripheral to the card. This product has been tested in a typical class B compliant host system. It is assumed that this product will also achieve compliance in any class B compliant unit.

Part VI. Hardware Installation Procedure

1. Warnings

Warning:

Electrostatic sensitive device

Piccolo series cards may be damaged by electrostatic discharges. Follow the procedure hereby described and apply any general procedure aimed at reducing the risk associated with electrostatic discharge.

Any damage caused by improper handling is not covered by the manufacturer's warranty.

Warning:

Electromagnetic compatibility

Piccolo series cards are compliant with electromagnetic compatibility regulatory requirements.

To ensure this compliance, it is mandatory to secure the card bracket with the relevant screw according to the procedure hereby described.

Failing to do so may affect image quality in allowing unwanted ground noise pickup.

Warning:

Risk of electrical shock

Do not operate the computer with any enclosure cover removed.

During the hardware installation, ensure the AC power cord is unplugged before touching any internal part of the computer.

Warning:

Heating device

In operation, it is normal that *Piccolo series* cards dissipate some heat.

To ensure the adequate cooling effect of the fan equipping your computer, it is mandatory to correctly fit all enclosure covers, including blank brackets.

2. Hardware installation procedure

The board of *Piccolo series* shall be physically inserted in an available PCI slot of your computer before operation becomes possible.

More than one EureSYS board can be hosted by a common PCI bus, as long as slots are available.

Following the hardware installing procedure below is recommended :

Switch-off the computer and all peripheral devices connected to it (monitor, printer...).

Discharge any electricity that could be accumulated on your body. You can achieve this in touching with bare hand an unpainted metal part of the enclosure of your computer. Make sure that the computer is linked to the AC mains outlet with proper earth connection.

Disconnect all cables from your computer, including AC power

Open the computer enclosure to gain access to the PCI slots according to the manufacturer instructions.

Locate an available PCI slot and remove the blank bracket associated to its location. To achieve this, remove the securing screw and keep it aside for later use in the procedure. Keep the blank bracket in a known place for possible re-use.

Unwrap the *EureCard*, take the board and carefully hold it. Avoid any contact of the board with unnecessary items, including your clothes.

Gently insert the board in the targeted PCI slot, taking care of pushing it fully down. If you experience some resistance, remove the board and repeat the operation keeping caution for a perfect mechanical alignment of board relative to slot. Ensure that the lower part of the bracket is inserting into the corresponding enclosure fastening.

Secure the board with the saved screw.

For Module Pro 3I, Module 12 Pro 3, Module Pro 3E, MIO Module, optionally install the auxiliary board (see next chapters).

Close the computer enclosure according to the manufacturer's instructions.

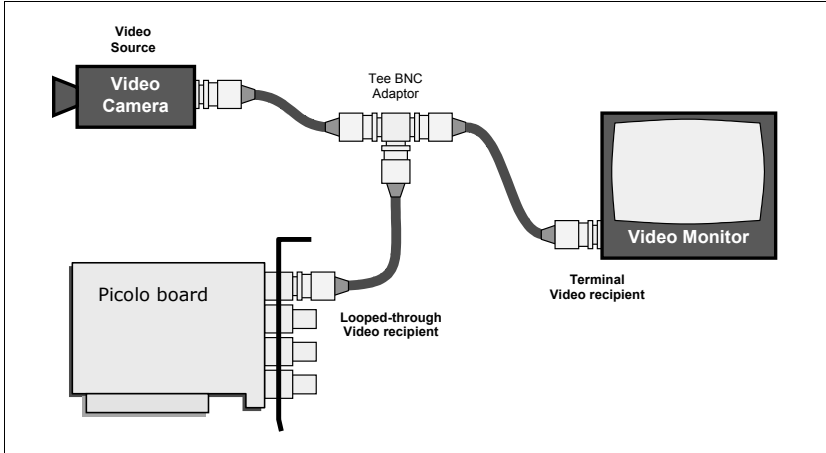
2.1. Usage of video terminations

The application may require the video signal to be monitored while being digitized by the capture board.

A possible way to address this requirement is using the looped-through technique. The coaxial cable delivering the video signal from the source camera to the capture board is continued towards a video monitor. In that manner, the camera serves both the board and the monitor.

This technique can be extended to distribute a video image to several video recipients. Each device where the video cable is connected in and out to the next one is called a "loop-through connection".

In a Pico-based system, any video input can be used in a loop-through fashion using an interconnecting "Tee" structure.



There is one **mandatory** precaution to consider when using this technique.

Normally, any video recipient device terminates the coaxial line with a so-called termination resistor (valued 75 ohms in video technology).

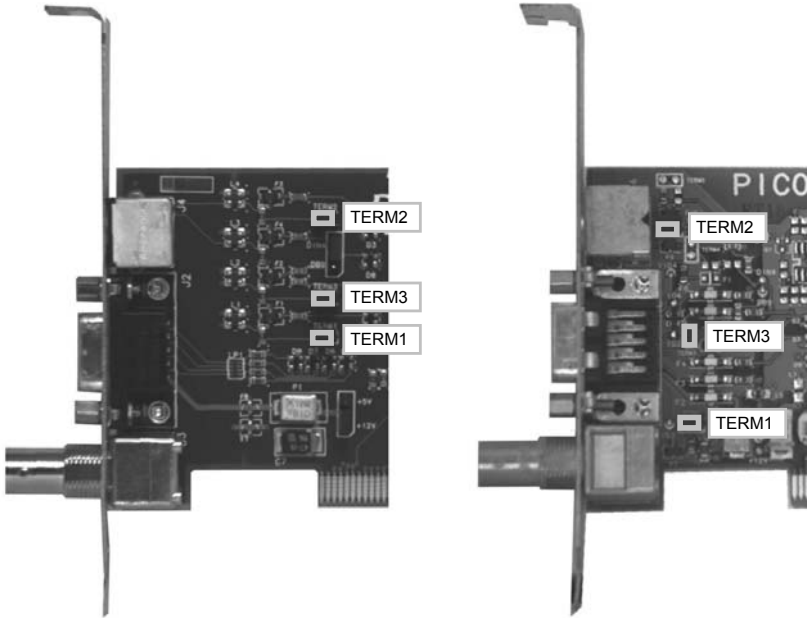
When using the looped-through technique, the termination resistor of all intermediate devices **should** be removed. Only the terminal device keeps the termination.

In order to support the looped-through technique, all Pico boards offer a way to remove the termination for any selected input.

3. Picolo hardware installation

3.1. Video termination jumpers

TERM1, TERM2 and TERM3 control the 75 Ω termination of the VID1, VID2 (LUMA on DIN4) and VID3 inputs.



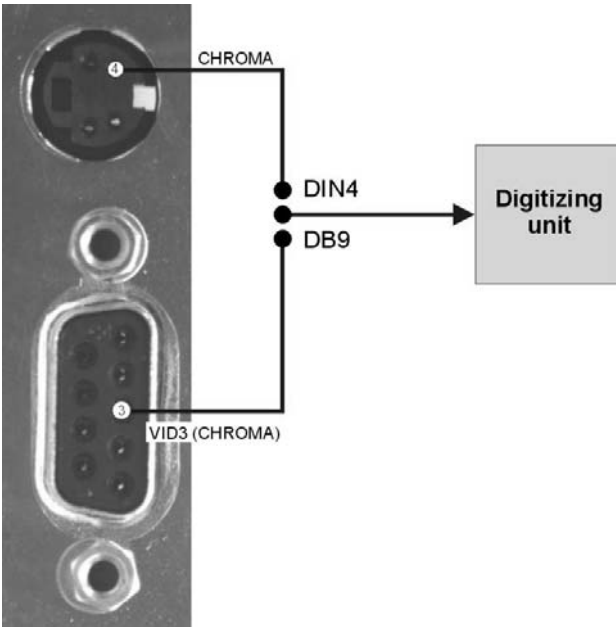
Applies to	
TERM1	VID1
TERM2	VID2 (DB9) or LUMA (DIN4)
TERM3	VID3 (DB9)

In the default configuration, all jumpers are 75 Ω terminated. Therefore, all jumpers are shorted.

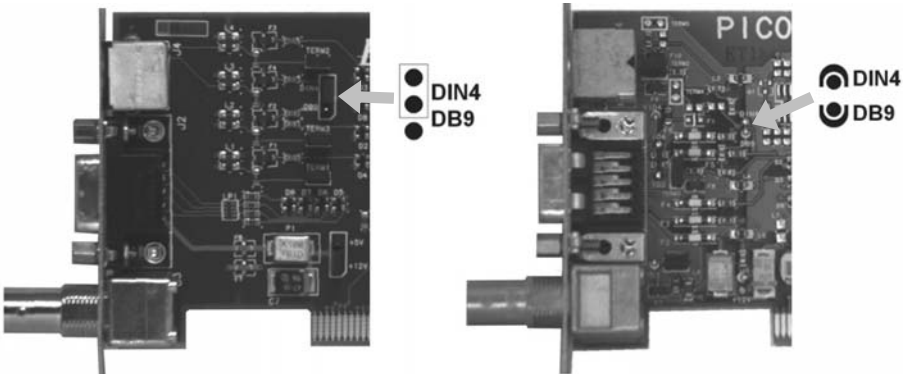
To use the looped-through technique on a video input, i.e. no load, its jumper must be removed (open).

3.2. Chrominance routing

The chrominance input (used when inputting a S-Video signal) can either be received from the CHROMA input of the MiniDin4 connector or from the VID3 input of the DB9 connector.



Depending on the Pico PCB version, the chrominance routing is activated using two different ways. Both of them are explained here.



DIN4 mode (default factory setting):

In this hardware setting, the chrominance input (used with a S-Video signal) is the CHROMA input of the Mini DIN4 connector of the PicoLo.



DIN4



Jumpers

To install the "DIN4" mode, insert a jumper at the "DIN4" location on the PicoLo (connecting the 2 top pins).

DB9



Solder bridges

To install the "DIN4" mode, establish a solder connection at the "DIN4" location on the PicoLo, and remove any connection at location "DB9".
This setting should be done by a qualified technician.

DB9 mode :

In this hardware setting, the chrominance input (used with a S-Video signal) is the VIDEO3 input of the DB9 connector of the PicoLo.



DIN4



Jumpers

To install the "DB9" mode, insert a jumper at the "DB9" location on the PicoLo (connecting the 2 bottom pins).

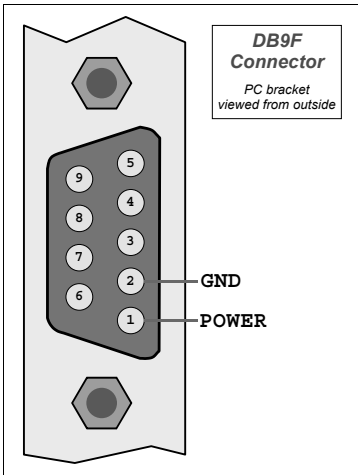
DB9



Solder bridges

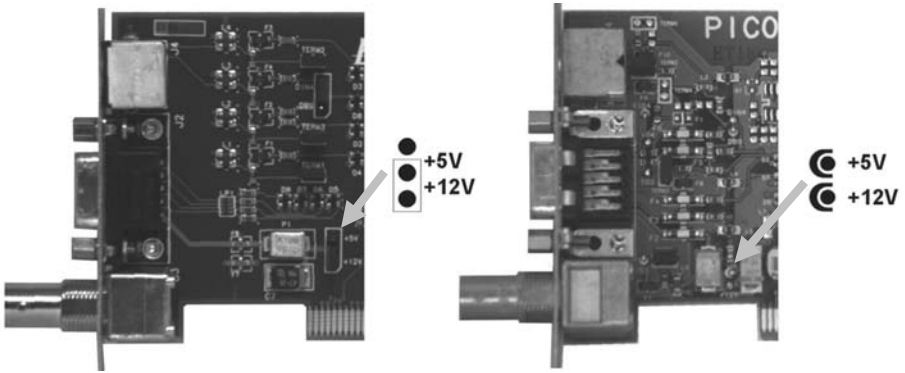
To install the "DB9" mode, establish a solder connection at the "DB9" location on the PicoLo, and remove any connection at location "DIN4".
This setting should be done by a qualified technician.

3.3. "DB9" connector power supply

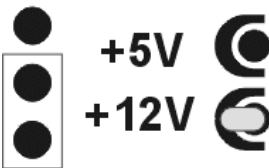


The POWER pin of the "DB9" connector is a 12V power supply to power up one or more cameras. This line is protected by an automatic fuse (1 A). According to the PCI specification it is not recommended to consume more than 500 mA (at 12V). The voltage on POWER pin can be configured to provide 5V instead of 12V (see below).

Depending on the Pico PCB version, the voltage options on POWER pin are activated using two different ways. Both of them are explained here.



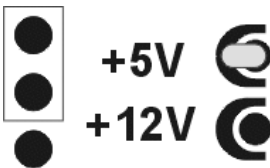
Power supply = +12V (default factory setting) :



Jumpers
To install the +12V power supply, insert a jumper at the "+12V" location on the Pico (connecting the 2 bottom pins).

Solder bridges
To install the +12V power supply, establish a solder connection at the "+12V" location on the Pico and remove any connection at location "+5V".
This setting should be done by a qualified technician.

Power supply = +5V :



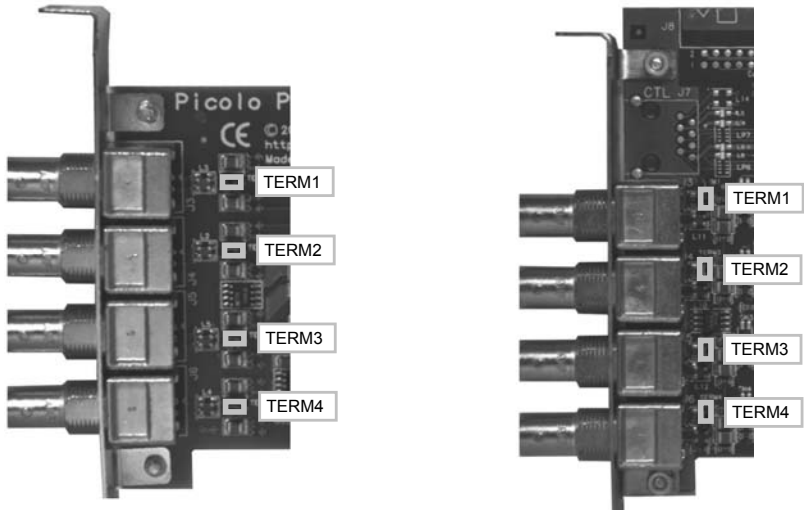
Jumpers
To install the +5V power supply, insert a jumper at the "+5V" location on the Pico (connecting the 2 top pins).

Solder bridges
To install the +5V power supply, establish a solder connection at the "+5V" location on the Pico and remove any connection at location "+12V".
This setting should be done by a qualified technician.

4. Pico Pro 2 hardware installation

4.1. Video termination jumpers

The TERM n jumper controls the 75 Ω termination of the corresponding VID n input.



In the default configuration, all jumpers are 75 Ω terminated. Therefore, all jumpers are shorted.

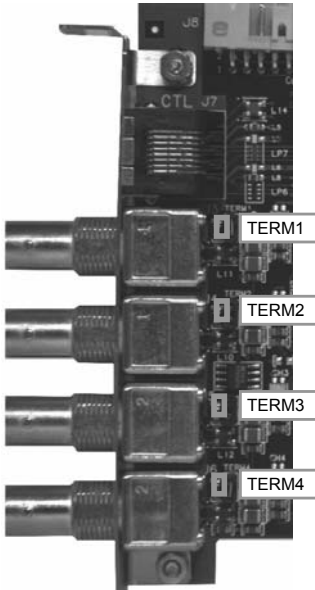
To use the looped-through technique on a video input, i.e. no load, its jumper must be removed (open).

5. Pico Pro 3I hardware installation

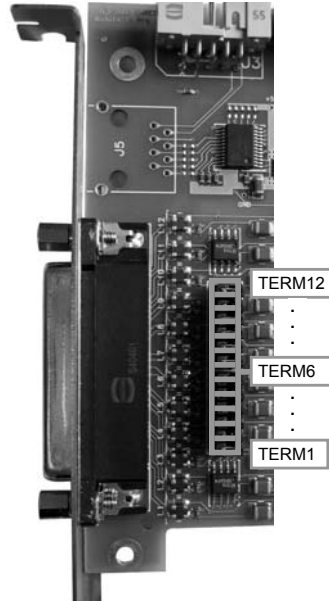
5.1. Video termination jumpers

The $TERM_n$ jumper controls the $75\ \Omega$ termination of the corresponding VID_n input.

Pico Pro 3I and Module Pro 3I



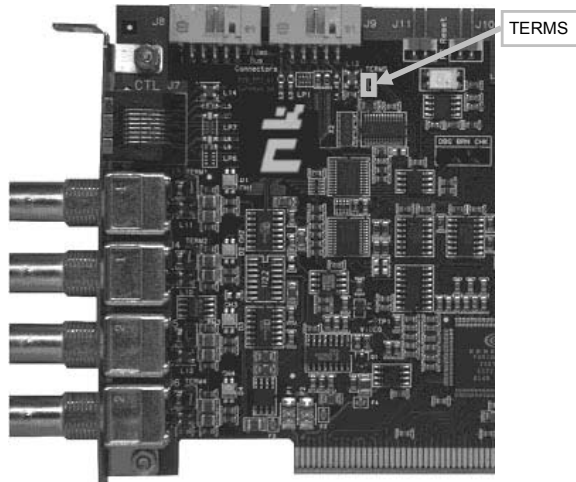
Module 12 Pro 3



In the default configuration, all jumpers are $75\ \Omega$ terminated. Therefore, all jumpers are shorted.

To use the looped-through technique on a video input, i.e. no load, its jumper must be removed (open).

5.2. RS-485 serial line



TERMS controls the 120 Ω termination of the RS-485 serial line.

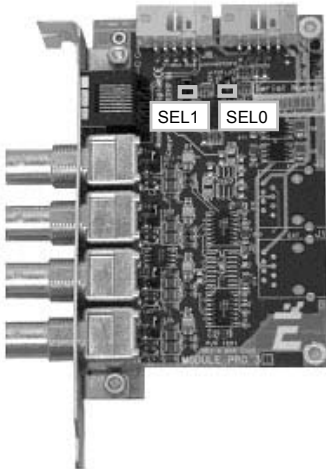
Inserting a jumper enables the 120 Ω load, this is the default configuration.

5.3. Module Pro 3I installation

5.3.1. Identification

All the Modules Pro 3I linked with a Pico Pro 3I board must have a unique ID. Failing to do so will cause logic signal contention. Set the Module ID when the system is shut off.

Configuration	Module ID
Pico Pro 3I and 1 Module Pro 3I	0
Pico Pro 3I and 2 Modules Pro 3I	0, 1
Pico Pro 3I and 3 Modules Pro 3I	0, 1, 2



Module	ID	SEL1	SEL0
First	0	●●	●●
Second	1	●●	●●
Third	2	●●	●●

●● means a jumper shorted.

●● means a jumper open.

5.3.2. Connecting the Modules Pro 3I

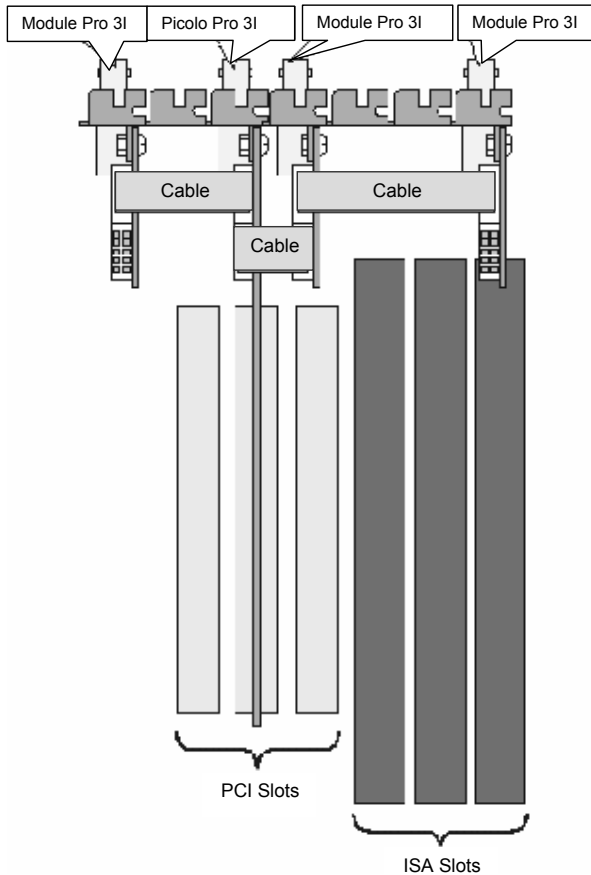
The Modules Pro 3I are connected with a PicoLo Pro 3I directly or indirectly through other modules. The modules are linked with flat cables at the MOD LINK connectors.

If at least one Module Pro 3I is present, a Module 12 Pro 3 cannot be added.

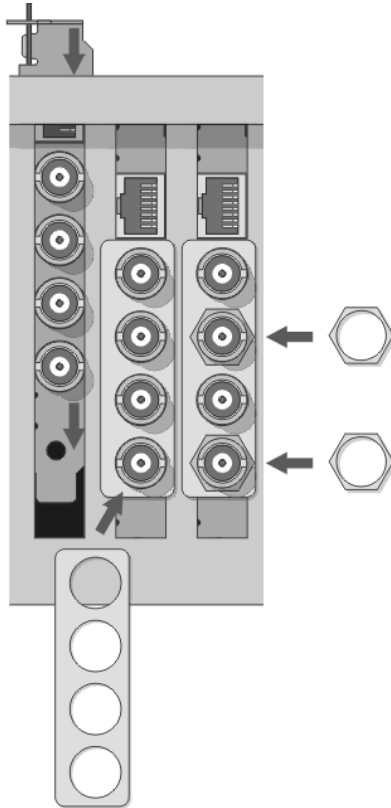


Modules don't need a PCI or ISA slot, any blind slot will be adequate.

All cables are identical and may be interchanged. The flat cables should be as short as possible.



In order to firmly secure the Module Pro 3I to the PC box, an additional plate and two screwnuts are delivered. See the picture below to know how to install these accessories.



5.4. Module 12 Pro 3 installation

The Module 12 Pro 3 has no identification.

The unique Module 12 Pro 3 is directly linked with a flat cable at the MOD LINK connector of the Pico Pro 3I.

A Module 12 Pro 3 cannot be used together with another Module 12 Pro 3 or Module Pro 3I.

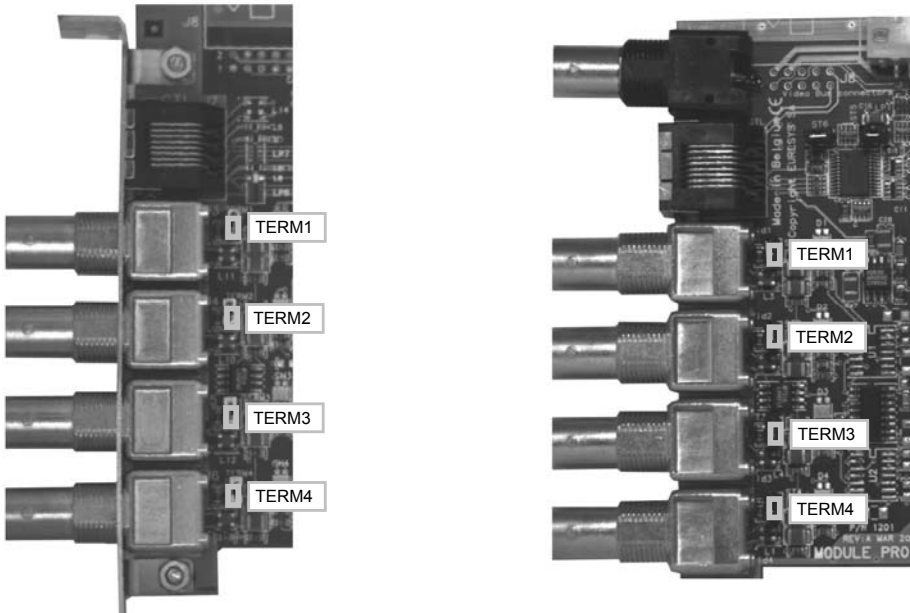


Module 12 Pro 3 doesn't need a PCI or ISA slot, any blind slot will be adequate.

6. Pico Pro 3E hardware installation

6.1. Video termination jumpers

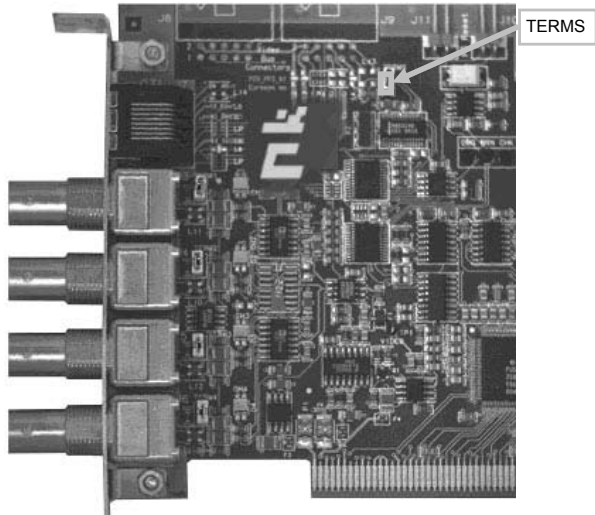
The TERM n jumper controls the 75 Ω termination of the corresponding VID n input.



In the default configuration, all jumpers are 75 Ω terminated. Therefore, all jumpers are shorted.

To use the looped-through technique on a video input, i.e. no load, its jumper must be removed (open).

6.2. RS-485 serial line



TERMS controls the 120 Ω termination of the RS-485 serial line.

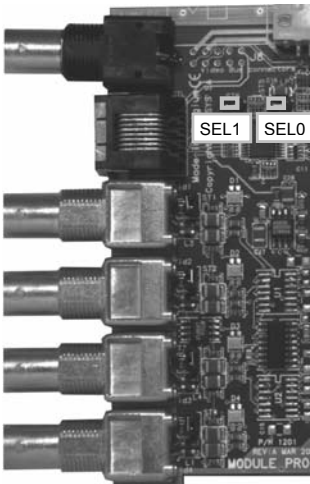
Inserting a jumper enables the 120 Ω load, this is the default configuration.

6.3. Module Pro 3E installation



6.3.1. Identification

All the Modules Pro 3E linked with a Pico Pro 3E board must have a unique ID. Failing to do so will cause logic signal contention. Set the Module ID when the system is shut off.

Configuration	Module ID
Pico Pro 3E and 1 Module Pro 3E	0
Pico Pro 3E and 2 Modules Pro 3E	0, 1
Pico Pro 3E and 3 Modules Pro 3E	0, 1, 2
Pico Pro 3E and 4 Modules Pro 3E	0, 1, 2, 3

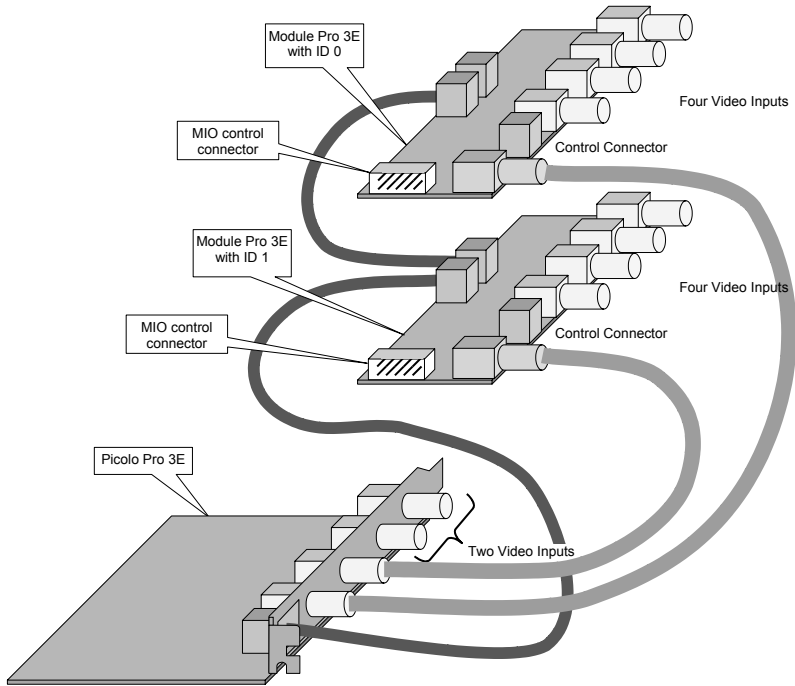


Module	ID	SEL1	SEL0
First	0	●●	●●
Second	1	●●	●●
Third	2	●●	●●
Fourth	3	●●	●●

-  means a jumper shorted.
-  means a jumper open.

6.3.2. Connecting the Modules Pro 3E

The video is sent from an external Module Pro 3E through a coaxial cable connecting the video output of the module and an input of the Pico Pro 3E.



Important notes:

The video output of Module #0 (see "Identification" page 48) must be linked to the VID1 input of the Pico Pro 3E, (see "Video inputs").

The video output of Module #1 must be linked to the VID2 input of the Pico Pro 3E.

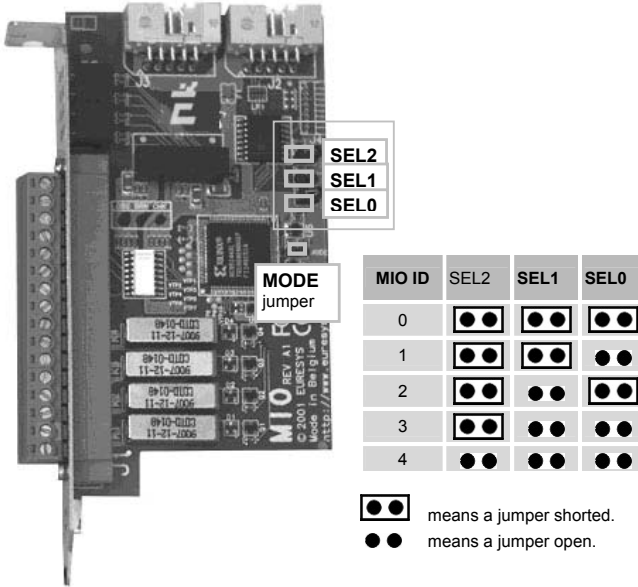
The video output of Module #2 must be linked to the VID3 input of the Pico Pro 3E.

The video output of Module #3 must be linked to the VID4 input of the Pico Pro 3E.

7. MIO hardware installation

7.1. Identification

All modules MIO linked with a Pico Pro 3 must have a unique ID. Failing to do so will cause logic signal contention. Set the MIO ID when the system is shut off.



7.2. MODE jumper

This jumper is used to select either the alarm or watchdog of the MIO's output 4.

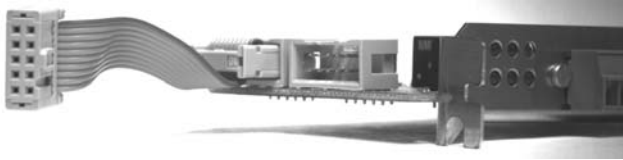
Function	MODE jumper
Alarm	●● open
Watchdog	●● short

The factory setting of the MODE jumper is **open** (alarm functionality).

7.3. Connecting MIO to a Pico Pro 3I

Up to 5 MIO modules can be connected to the same Pico Pro 3I.

MIO are linked with flat cables at the MOD LINK connectors of Pico Pro 3I, Module Pro 3I or Module 12 Pro 3.

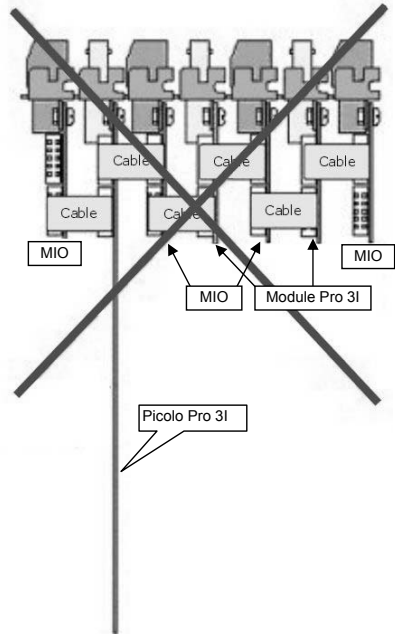
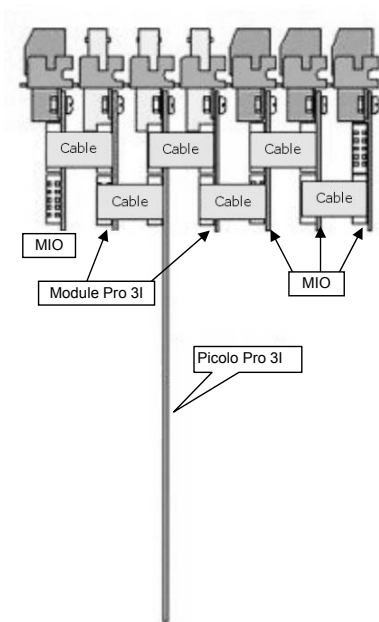


MIO doesn't need a PCI or ISA slot, any blind slot will be adequate.

MIO must be attached behind the Modules Pro 3I or behind the Module 12 Pro 3.

A correct configuration is drawn below.

An inoperative configuration is drawn below.

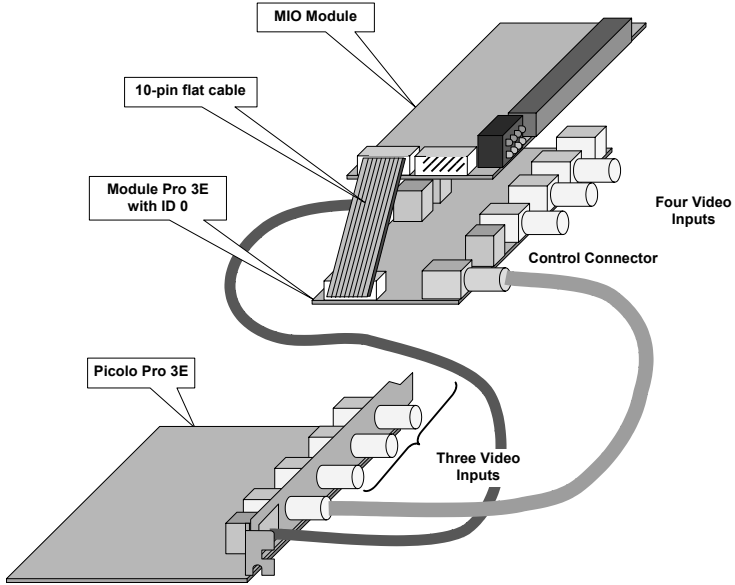


7.4. Connecting MIO to a Pico Pro 3E

Up to 5 MIO modules can be connected to the same Pico Pro 3E.

MIO are linked with flat cables at the 10-pin connector standing on the Modules Pro 3E and on the MIO.

Therefore, MIO requires at least one Module Pro 3E in the system.



Part VII. MultiCam Installation Guide

1. Hardware requirements

Following features are recommended to operate MultiCam :

CPU	Pentium III Class or above
System memory	Minimum 128 MB
Hard disk drive	Minimum 150 MB free

2. Linux installation

2.1. Run-time software requirements

MultiCam and EureCards can be operated on the following Linux operating systems.

OS version	Additional information
RedHat 8.0	Kernel 2.4.18-14
RedHat 7.3	Kernel 2.4.18-3

Refer to the MultiCam Installation Guide for updated information about OS and supported boards.

2.2. Development software requirements

MultiCam comes with documentation, development tools and sample programs.

The documentation is provided in standard CHM format. It can be viewed using xchm. In addition, some information may be provided as Adobe Acrobat PDF files. To view these files it is required to use an appropriate PDF file viewer. For example: xpdf or Adobe Acrobat Reader 4 (or later).

The development tools are C or C++ based. Thus all popular development environments can be used to develop applications using EureCards and MultiCam.

Sample programs are provided for various development environments.

2.3. Installation instructions

Switch-on your computer and start Linux.

Place Euresys CD-ROM in the drive and mount it.

Copy `multicam-n.n.tar.gz` on hard disk drive where *n.n* is the release number of MultiCam.

For example, using release 4.5 of MultiCam, copy `multicam-4.5.tar.gz`.

Extract this archive: `# tar -xzvf multicam-n.n.tar.gz`

Go in directory multicam: `# cd multicam-n.n`

Log in as root.

Execute the installation script: `# ./install`

Check for proper installation: connect a camera to the Picolo board and run `eVisionStudio`.

3. Windows installation

3.1. Run-time software requirements

MultiCam and EureCards can be operated with the following Microsoft Windows operating systems.

OS version	Additional information
Windows server 2003	-
Windows XP Embedded	-
Windows XP	-
Windows 2000	Service Pack 2 or later

Refer to the MultiCam Installation Guide for updated information about OS versions.

3.2. Development software requirements

MultiCam comes with documentation, development tools and sample programs.

The documentation is provided in Microsoft standard CHM format. To view the documentation, Internet Explorer 4 or later must be installed on your system.

In addition, some information may be provided as Adobe Acrobat PDF files. To view these files it is required to use Adobe Acrobat Reader 4 or later.

The development tools are C, C++, ActiveX and .NET based. Thus all popular development environments can be used to develop applications using EureCards and MultiCam.

Sample programs are provided for various development environments. Refer to the release notes for detailed information about the supported development environment versions.

3.3. Installation instructions

Switch-on your computer and start Windows. Log in with administrative rights.

If a EureCard was newly added in the system, Windows "Hardware installation Wizard" will detect the EureCard and possibly prompt for user action. If this prompt appears, click on the "Cancel" button.

Place Euresys CD-ROM in the drive. The setup application starts automatically. If the setup doesn't start, you may run 'setup.exe' directly from the CD-ROM.

Select the option to install MultiCam.

Depending on the operating system, the installation procedure may differ. Follow carefully the setup program instructions.

After the installation process, execute the eVision Studio application to control the proper system operation.

Part VIII. Technical Specifications

1. Technical specifications for all PicoLo products

1.1. Video image formats

The PicoLo series frame grabbers acquire color or monochrome video images from composite interlaced video signals. The NTSC and PAL color standards are supported. The monochrome video acquisition complies with the so-called CCIR (625 lines) and EIA RS-170 (525 lines) standards.

Acquisition of full frame (two fields) or single field images is selectable.

1.2. Acquisition

Before PCI transfer to the PC, the acquired images can be scaled to any format smaller than the original one, down to 1/12. The downscaling process involves a sophisticated hardware device, performing an accurate interpolation in both the horizontal and vertical directions. The image buffer for a downscaled image is smaller in size, and its transfer needs less PCI bandwidth.

Moreover, any part of the incoming image can be retained for further PCI transfer, allowing to define region of interest.

All desirable adjustments can be applied to the images during acquisition, such as video contrast, brightness, color saturation and hue (NTSC only).

1.3. Synchronization

A fully digital technique is used to synchronize the digitizer operation on the incoming video signal. This ensures a stable and robust operation despite the varying video conditions.

A poor video signal issued by a low end VCR is robustly supported. When using high-quality video surveillance cameras, the acquisition performance is exemplary, as demonstrated by a jitter figure in the nanosecond range.

1.4. Image fidelity

All precautions have been taken in the PicoLo series to ensure an excellent fidelity of the grabbed bitmap in respect of the original video signal. In particular, environmental conditions may induce common-mode noise in the signal issued by distant cameras. PicoLo Pro 2 and Pro 3 have special circuitry to remove this defect, and this is highly appreciated in the video surveillance applications.

1.5. Bitmap image formats

Before storing the acquired images into the destination memory buffer, a pixel format conversion takes place in real-time. Numerous color or monochrome formats can be chosen.

Packed	Planar
RGB32	YCrCb 4:2:2
RGB24	YCrCb 4:1:1
RGB16	YCrCb 4:2:0
RGB15	YCrCb 4:1:0
YCrCb 4:2:2	YCbCr 4:2:0
YCrCb 4:1:1	YCbCr 4:1:0
Y8	

1.6. Bus mastering

All Picolo capture boards are PCI bus mastering agents that directly store the acquired images into the PC physical memory without CPU involvement. As a unique feature, the Picolo series automatically recovers the scatter-gather virtual memory mapping to present the data as a regular bitmap image in a user allocated memory buffer.

2. Picolo technical specifications

2.1. Characteristics

Dimensions	121 mm x 70 mm or 125 mm x 70 mm 4.76 in x 2.76 in or 4.92 in x 2.76 in
Power consumption	1 W
PCI requirements	32 bits, 33 MHz, 5 V signaling
Certification	FCC class B and CE
Video connections	Up to 3 cameras (one may have a S-Video output)
TTL I/O lines	4 (one can be configured as an external trigger for the acquisition)

2.2. Recommended operating conditions

Parameter	Symbol	Min	Typ	Max	Units	Note	
Power supply +5V	V_{+5V}	4.75	5.00	5.25	V		
Analog video input levels	Overall peak to peak amplitude	V_{in}	0.6	1.0	2.0	V	
	Sync amplitude	V_{sync}	180	300	600	mV	1
	Rise/fall time of sync edges		50		300	ns	
	Tolerated noise on sync				50	mV	2
	Input voltage range	V_{DM}	-2		2	V	
Ambient operating temperature	T_A	0		50	°C		

Notes:

- Vertical sync pattern (equalisation pulses & serration pulses) must comply with PAL/NTSC standard.
- Peak-to-peak amplitude of noise within the sync part of the video line measured with a low-pass filter of 20 MHz cut-off frequency.

2.3. Power supply currents requirements

Parameter	Symbol	Max	Units
Supply current for +5V	I_{+5V}	200	mA

2.4. DC characteristics

Parameter		Symbol	Min	Typ	Max	Units
Digital inputs (IO1..4)	Input high voltage	V_{IH}	2.0		5.5	V
	Input low voltage	V_{IL}	-0.5		0.8	V
Digital outputs (IO1..4)	Output high voltage ($I_{OH}=-400\mu A$)	V_{OH}	2.4		5.25	V
	Output low voltage ($I_{OL}=3.2mA$)	V_{OL}			0.4	V

3. Picolo Pro 2 technical specifications

3.1. Characteristics

Dimensions	121 mm x 85 mm or 125 mm x 107 mm
	4.76 in x 3.34 in or 4.92 in x 4.21 in
Power consumption	1.7 W
PCI requirements	32 bits, 33 MHz, 5 V signaling
Certification	FCC class B and CE
Video connections	Up to 4 cameras
TTL I/O lines	13

3.2. Recommended operating conditions

Parameter	Symbol	Min	Typ	Max	Units	Note	
Power supply +5V	V _{+5V}	4.75	5.00	5.25	V		
Power supply +12V	V _{+12V}	11	12	13	V		
Power supply -12V	V _{-12V}	-11	-12	-13	V		
Analog Video Input levels	Overall peak to peak amplitude	V _{in}	0.6	1.0	2.0	V	
	Sync Amplitude	V _{sync}	180	300	600	mV	1
	Sync Amplitude Ratio	SAR	0.3		3.3		2
	Rise/Fall time of sync edges		50		300	ns	
	Tolerated Noise on sync				50	mV	3
Input voltage range	V _{DM}	-2		2	V		
Ambient operating temperature	T _A	0		50	°C		

Notes:

- Vertical Sync pattern (equalisation pulses & serration pulses) must comply with PAL/NTSC standard.
- SAR=SL_A/SL_B where SL_A is the amplitude of the sync tip of video signal after switching and SL_B is the amplitude of the sync tip of video signal before switching.
- Peak to peak amplitude of noise within the sync part of the video line measured with a low-pass filter of 20 MHz cut-off frequency.

3.3. Power supply currents requirements

Parameter	Symbol	Max	Units
Supply current for +5V	I _{+5V}	240	mA
Supply current for +12V	I _{+12V}	10	mA
Supply current for -12V	I _{-12V}	30	mA

3.4. DC characteristics

Parameter	Symbol	Min	Typ	Max	Units
Digital Inputs (IO1..13)	Input High Voltage	V _{IH}	2.0	5.0	V
	Input Low Voltage	V _{IL}	-0.5	0.8	V
Digital Outputs (IO1..13)	Output High Voltage (I _{OH} =-400μA)	V _{OH}	2.4	5.0	V
	Output Low Voltage (I _{OL} =3.2mA)	V _{OL}		0.4	V
Common Mode Voltage Range (V _{DM} =±1V) on Video Inputs	V _{CM}	-2.0		+2.0	V

3.5. Performance parameters

Parameter	Min	Typ	Max	Units	Note
Horizontal Lock Range		± 7		% of Line Length	
Color sub-carrier Lock-in Range		±800		Hz	
Overall AGC range	-6		+6	dB	
AGC recovery delay after video source switch			1	Field_period	1
Low signal threshold			133	mV	2
Recovery delay after video source switching	0.8<SAR<1.25		2	Field_period	3
	0.5<SAR<2.0		4	Field_period	3
Video Input CMRR @ 50 Hz	60			dB	
Video Input CMRR @ 4 MHz	40			dB	

Notes:

1. With worst case Sync Amplitude Ratio.
2. Sync Amplitude threshold of "EC_ERROR_NOSIG" into MultiCam Driver.
3. Acquisition begins immediately after this delay.

4. Pico Pro 3I technical specifications

4.1. Characteristics

	Pico Pro 3I	Module Pro 3I	Module 12 Pro 3
Dimensions	125 mm x 107 mm	63 mm x 107 mm	63 mm x 107 mm
	4.92 in x 4.21 in	2.48 in x 4.21 in	2.48 in x 4.21 in
Power consumption	1.9 W	0.3 W	0.2 W
PCI requirements	32 bits, 33 MHz, 5 V signaling	-	-
Certification	FCC class B and CE		
Video connections	Up to 16 cameras with 3 Modules Pro 3I or with 1 Module 12 Pro 3		
TTL I/O lines	Up to 20 I/O lines with 3 Modules Pro 3I		

Configuration	Number of video inputs	Number of TTL I/O lines
Pico Pro 3I board only	4	5
Pico Pro 3I and 1 Module Pro 3I	8	10
Pico Pro 3I and 2 Modules Pro 3I	12	15
Pico Pro 3I and 3 Modules Pro 3I	16	20
Pico Pro 3I and 1 Module 12 Pro 3	16	5

4.2. Recommended operating conditions

Parameter	Symbol	Min	Typ	Max	Units	Note	
Power supply +5V	V _{+5V}	4.75	5.00	5.25	V		
Power supply +12V	V _{+12V}	11	12	13	V		
Power supply -12V	V _{-12V}	-11	-12	-13	V		
Analog Video Input levels	Overall peak to peak amplitude	V _{in}	0.6	1.0	2.0	V	
	Sync Amplitude	V _{sync}	180	300	600	mV	1
	Sync Amplitude Ratio	SAR	0.3		3.3		2
	Rise/Fall time of sync edges		50		300	ns	
	Tolerated Noise on sync				50	mV	3
	Input Voltage Range	V _{DM}	-2		2	V	
Ambient operating temperature	T _A	0		50	°C		

Notes :

- Vertical sync pattern (equalisation pulses & serration pulses) must comply with PAL/NTSC standard.
- SAR=SL_A/SL_B where SL_A is the amplitude of the sync tip of video signal after switching and SL_B is the amplitude of the sync tip of video signal before switching.
- Peak to peak amplitude of noise within the sync part of the video line measured with a low-pass filter of 20 MHz cut-off frequency.

4.3. Power supply currents requirements

Parameter	Symbol	Typical			Units
		Piccolo Pro 3I Power = 1.9W	Module 12 Pro 3 Power = 0.2W	Per Module Pro 3I Power = 0.3W	
Supply current for +5V	I _{+5V}	250	0	0	mA
Supply current for +12V	I _{+12V}	15	10	20	mA
Supply current for -12V	I _{-12V}	40	5	5	mA

4.4. DC characteristics

Parameter		Symbol	Min	Typ	Max	Units
Digital Inputs (IO1..5)	Input High Voltage	V _{IH}	3.5		5.0	V
	Input Low Voltage	V _{IL}	0		1.5	V
Digital Outputs (IO1..5)	Output High Voltage (I _{OH} =-30 to -300 μ A)	V _{OH}	3.5		5.0	V
	Output Low Voltage (I _{OL} =1.6 mA)	V _{OL}			1.4	V
	Output Low Level Current	I _{OL}	0		10	mA
Common Mode Voltage Range (V _{DM} = \pm 1V) on Video Inputs		V _{CM}	-2		2	V

4.5. Performance parameters

Parameter	Min	Typ	Max	Units	Note	
Horizontal lock range		± 7		% of Line Length		
Color sub-carrier lock-in range		± 800		Hz		
Overall AGC range	-6		+6	dB		
AGC recovery delay after video source switch			1	Field_period	1	
Low signal threshold		133		mV	2	
Recovery delay after video source switching	0.8<SAR<1.25	1	1.5	2	Field_period	3
	0.5<SAR<2.0	1	1.5	4	Field_period	3
Video input CMRR @ 50 Hz	60			dB		
Video input CMRR @ 4 MHz	40			dB		

Notes:

1. With worst case Sync Amplitude Ratio.
2. Sync Amplitude threshold of "EC_ERROR_NOSIG" into MultiCam Driver.
3. Acquisition begins immediately after this delay.

5. Pico Pro 3E technical specifications

5.1. Characteristics

	Pico Pro 3E	Module Pro 3E
Dimensions	125 mm x 107 mm	63 mm x 107 mm
	4.92 in x 4.21 in	2.48 in x 4.21 in
Power consumption	1.9 W	0.48 W
PCI requirements	32 bits, 33 MHz, 5 V signaling	-
Certification	FCC class B and CE	-
Video connections	Up to 16 cameras with 4 Modules Pro 3E	
TTL I/O lines	Up to 20 I/O lines with 4 Modules Pro 3E	

Configuration	Number of video inputs	Number of TTL I/O lines
Pico Pro 3E board only	4	0
Pico Pro 3E and 1 Module Pro 3E	7	5
Pico Pro 3E and 2 Modules Pro 3E	10	10
Pico Pro 3E and 3 Modules Pro 3E	13	15
Pico Pro 3E and 4 Modules Pro 3E	16	20

5.2. Recommended operating conditions

Parameter	Symbol	Min	Typ	Max	Units	Note	
Power supply +5V	V_{+5V}	4.75	5.00	5.25	V		
Power supply +12V	V_{+12V}	11	12	13	V		
Power supply -12V	V_{-12V}	-11	-12	-13	V		
Analog Video Input levels	Overall peak to peak amplitude	V_{in}	0.6	1.0	2.0	V	
	Sync Amplitude	V_{sync}	180	300	600	mV	1
	Sync Amplitude Ratio	SAR	0.3		3.3		2
	Rise/Fall time of sync edges		50		300	ns	
	Tolerated Noise on sync				50	mV	3
	Input Voltage Range	V_{DM}	-2		2	V	
Ambient operating temperature	T_A	0		50	°C		

Notes:

- Vertical sync pattern (equalisation pulses & serration pulses) must comply with PAL/NTSC standard.
- $SAR = SL_A / SL_B$ where SL_A is the amplitude of the sync tip of video signal after switching and SL_B is the amplitude of the sync tip of video signal before switching.
- Peak to peak amplitude of noise within the sync part of the video line measured with a low-pass filter of 20 MHz cut-off frequency.

5.3. Power supply currents requirements

Parameter	Symbol	Typical		Units
		Piccolo Pro 3E Power = 1.9W	Per Module Pro 3E Power = 0.48W	
Supply current for +5V	I _{+5V}	250	0	mA
Supply current for +12V	I _{+12V}	15	20	mA
Supply current for -12V	I _{-12V}	40	20	mA

5.4. DC characteristics

Parameter		Symbol	Min	Typ	Max	Units
Digital Inputs (IO1..5)	Input High Voltage	V _{IH}	3.5		5.0	V
	Input Low Voltage	V _{IL}	0		1.5	V
Digital Outputs (IO1..5)	Output High Voltage (I _{OH} =-30 μA to -300 μA)	V _{OH}	3.5		5.0	V
	Output Low Voltage (I _{OL} =1.6 mA)	V _{OL}			1.4	V
	Output Low Level Current	I _{OL}	0		10	mA
Common Mode Voltage Range (V _{DM} =±1V) on Video Inputs		V _{CM}	-2		2	V

5.5. Performance parameters

Parameter		Min	Typ	Max	Units	Note
Horizontal Lock Range			± 7		% of Line Length	
Color sub-carrier Lock-in Range			±800		Hz	
Overall AGC range		-6		+6	dB	
AGC recovery delay after video source switch				1	Field_period	1
Low signal threshold			133		mV	2
Recovery delay after video source switching	0.8<SAR<1.25	1	1.5	2	Field_period	3
	0.5<SAR<2.0	1	1.5	4	Field_period	3
Video Input CMRR @ 50 Hz		60			dB	
Video Input CMRR @ 4 MHz		40			dB	

Notes:

1. With worst case Sync Amplitude Ratio.
2. Sync Amplitude threshold of "EC_ERROR_NOSIG" into MultiCam Driver.
3. Acquisition begins immediately after this delay.

6. MIO technical specifications

6.1. Characteristics

Dimensions	58 mm x 107 mm 2.28 in x 4.21 in
Power consumption	1.8 W (150 mA @ +12 V)
Certification	FCC class B and CE
I/O lines	4 opto-isolated inputs and 4 reed relay outputs

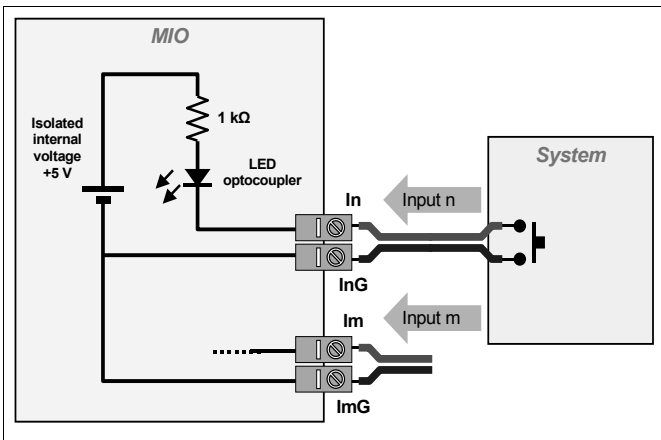
6.2. Input thresholds

The four inputs are electrically isolated (by optocoupler) from the potential of the PC case in which the MIO is inserted. However they are not isolated from each other.

Each input is represented by two terminals named In and InG , where n is 1,2,3 or 4.

An input is active when In and InG are connected. In this condition, a DC current of about 3.5 mA flows between In and InG .

An input is inactive when the contact between In and InG is open.



The input state is displayed with 4 green LEDs: a LED is lighted when the corresponding input is active.

$V_{In} - V_{InG}$	Effect
< -1 V	Forbidden
-1 to 1.5 V	Active input detected
1.5 to 10 V	Inactive input detected
> 10 V	Forbidden

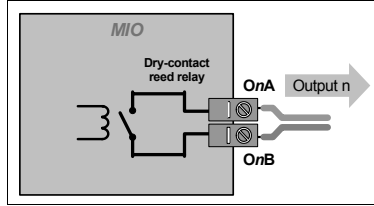
6.3. Output characteristics

The four outputs are electromagnetic dry-contact reed relays. So electrical isolation from the PC case potential and other outputs is provided.

Each output is represented by two terminals named *OnA* and *OnB*, where *n* is 1, 2, 3 or 4.

An output is active when *OnA* is connected to *OnB* (dry-contact shorted). In these conditions, a current of 1A maximum can flow, in any direction, through the contact.

An output is inactive when *OnA* and *OnB* are not connected (dry-contact open). In these conditions, a voltage of 200 V maximum can be sustained between the terminals.



The output state is displayed with 4 orange LEDs : a LED is lighted when the corresponding output is active.

The output 4 of the MIO module can be used as an alarm or a watchdog (see MODE jumper page 50). At start up, this association is done, unless AlarmConfig or WatchDogConfig is DISABLE. See electronic documentation.

Parameter	Maximum value
Switched current	0.5 A
Switched voltage	200 V
Switched power	10 W

Note:

The product of the switched current and the switched voltage cannot be greater than the switched power.