

PI-1

PI-1 X4

# INFRARED ADD-ON



**Add-On Peripheral  
for PI-1 and PI-1 X4 boards:  
Infrared Sensor  
for TV Remote Control**

***WARNING***  
***PI-1 boards must be equipped  
with an MCU  
bearing the following logo:***



REV. 1.3

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2003-2019

**To Béatrice, Quentin, Arthur and Alexandre.**

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All games names from « System 1 » series are © *Gottlieb*

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**This sign shows very important instructions to be closely followed.**

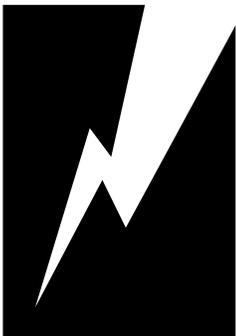
## AN INFRARED SENSOR ON A PINBALL GAME???

The infrared sensor is an add-on to both **PI-1** and **PI-1 X4** boards. This sensor allows the navigation through all the configuration and test menus, in an easy and user-friendly way, thanks to a simple TV remote control, instead of juggling with the two TEST and CREDIT buttons only.

Moreover, new navigation features become available thanks to the additional cursor keys (VOLUME - and +, PROGRAM - and +) and the numeric keypad found on some remote controls.

And if several games are equipped with a remote sensor and lined up side by side, the same remote control can also configurate all games in parallel!

## INSTALLING THE INFRARED SENSOR



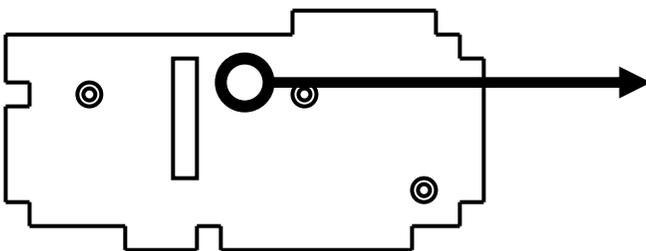
### Important instructions prior to installing the sensor

1. The pinball must be **turned off** before any removal of the boards and/or attached connectors. In case of doubt, **unplug** the mains cord.
2. The electronic board must be handled **by its edges**. Do **NOT** touch the components, tracks or connectors to avoid any damage due to static electricity.

### STEP 1a : FOR **PI-1** BOARDS

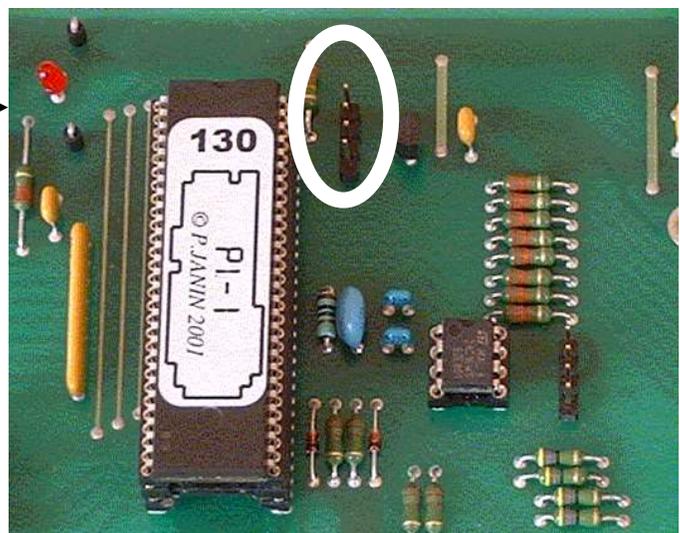
#### VERSION 2.1 and earlier

Locate on the **PI-1** board the empty 4-pin connector space labelled « U6 » on the top right corner of the main microprocessor.



Pin #1 is the topmost.  
Only pins #1, 2 and 4 will be used.

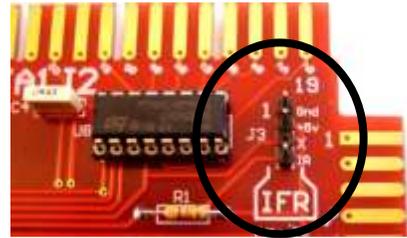
Depending on the **PI-1** board version, a male connector (one row of 4 pins, 0.100 inch spacing) may already be found at this place, with pin 3 already cut to minimize insertion



risk.

**VERSION 2.2 and over**

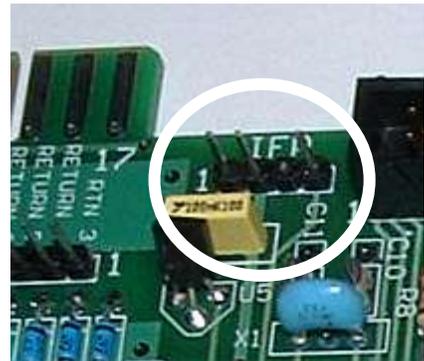
On the most recent **PI-1** boards (from 2010), the “IFR” connector is located on the far right side of the board, just below A1J2, to be closer to the display panel hinge and be able to swing the display panel open without unplugging the cable:



**STEP 1b : FOR PI-1 X4 BOARDS**

**VERSION 2.3 and earlier**

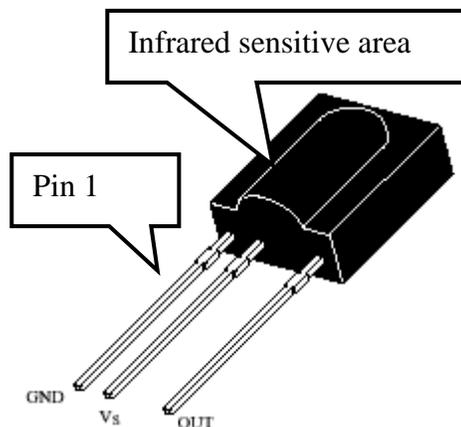
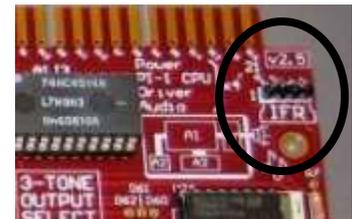
Locate on the **PI-1 X4** board the male connector (one row of 4 pins, 0.100 inch spacing) labelled « IFR » on the right side of A1J7 (top center of the board).



Pin #1 is the leftmost, as printed on the PCB. Only pins #1, 2 and 4 will be used.

**VERSION 2.4 and over**

On the most recent **PI-1 X4** boards (from 2010), the “IFR” connector is located on the far right side of the board, just below A1J3, to be closer to the display panel hinge and be able to swing the display panel open without unplugging the cable:



**STEP 2 : THE SENSOR**

The infrared sensor to fit to the board is a **VISHAY** (or **TEMIC**) brand, model name **TSOP1738** (38kHz carrier). Its cost is very reasonable (around 2 €).

**STEP 3 : THE CABLE**

The sensor must be connected to the board by means of a 3-wire (2 wires + ground) cable, **preferably shielded**.

A standard CDROM cable, such as is delivered with internal CD-ROM drives for PCs, can be used to great effect:



Sensor - 2-wire + ground cable - To infrared connector

The cable must be long enough to install the infrared sensor to a suited location for the infrared light.



Carefully link the pins 1, 2 and 4 between the board and the infrared sensor without swapping any pin.

**ANY DAMAGE CAUSED TO THE BOARD WILL BE YOUR COST!**

## STEP 4 : SENSOR POSITION

After several trials, it has been found out that the sensor can be installed anywhere behind the backglass, even behind the supposedly opaque paint, and it works beautifully!

Care must simply be taken to install the **bulging** sensor area against the backglass, otherwise the infrared ray will not hit it (refer to the drawing at step 2).

It may also be mounted on any display board; in this picture, the sensor was taped on the PCB of the 2<sup>nd</sup> player display of a « Genie » game. Carefully position it to avoid overlapping the display itself, otherwise the sensor would block part of the leftmost digit.



The cable may also run through the top head vents.

## SUPPORTED REMOTE CONTROLS

The remote controls of RCA (USA) and Sony **televisions** are supported, either as original branded equipment or as universal remote controls configured for such television brands.

For example, the following remote brands and models have been successfully tried:

- RCA : *universal* SYSTEMLINK 3 (RCU403), RCU301
- GENERAL ELECTRIC : *universal* GEU440
- SONY : *original* RMT-333E, RM-676, RM-836, RM-862, RM-V2T (no MUTE key), RM-Y116 (the JUMP key replaces the PREV CH key)
- THOMSON : *universal* ROC130 (basic), Rc7009, RCT842MN
- ONE-REPLACE-FIVE : *universal*
- ONE FOR ALL : *universal* ONE-SHOT (basic)
- X-10 : *universal* SuperREMOTE 6-in-1 UR19A

Depending on the usage, the universal remote controls may be of the following types:

- **Basic** : only the main features (ON/OFF, volume, channel, sound mute) are available
- **Extended** : with an additional numeric keypad (keys 0 to 9), video input etc..



**RCU301** (RCA)

**GEU440** (General Electric)

**ROC130** (Thomson)

**RM-EZ4T** (Sony)

## UNIVERSAL REMOTE CONTROLS CONFIGURATION

To drive an RCA or Sony TV, these remote controls must be preset with a code number depending on the brand and model of the TV.

For this, follow the configuration procedure explained in the remote control manual, to set the « TV » mode with the appropriate code (either RCA or Sony) found in the following chart:

TV Brand	RCA Code	General Electric Code	Thomson ROC130 Code (*)	Thomson Rc7009, RCT842MN Code	One-Replace-Five Code	One-For-All One-Shot Code	Sony RM-EZ4T
RCA (USA)	003	003	-no-	-no-	-no-	-no-	-no-
Sony	002	002	089	014	208	11133	8201 .. 8210

(\*)Thomson code for ROC130 is also fitted for all models of ROC 40, 230, 240, 330, 340, 430 and 440 series.

**If the remote control is not listed in the chart above:** follow the procedure by successive trials as described in the remote control manual, until finding the proper code which allows entry to the configuration menus by pressing the « ON/OFF » key.

## CONTROL KEYS

Only some of the remote control keys will be used, as on the following examples for both « basic » and « extended » models.

### **BASIC MODEL (e.g. Thomson ROC130)**



-  « ON/OFF », « M/A » or « Power »  
Acts as pinball « TEST » button.
-  «  $\wedge$  », « Program + » or « Channel + »
-  «  $\vee$  », « Program - » or « Channel - »  
These 2 keys allow navigation between menus, sub-menus or parameters.
-  « > », « + » or « Volume + »
-  « < », « - » or « Volume - »  
These 2 keys increase or decrease the current parameter value.
-  **Sound mute key « MUTE »**  
Acts as pinball « CREDIT » button.

## SPECIAL FEATURES

- ✓ The remote control does not work during the initial game selection phase, when the pinball is turned on. This is a protection against any unwanted game change with the remote control.
- ✓ The 4 scrolling keys « Program + », « Program - », « Volume + » and « Volume - », usually arranged in a cross style, support a **variable auto-repeat function** if left depressed: first slowly then quickly. This avoids pressing the keys many times to reach the N<sup>th</sup> parameter at the far end of a sub-menu, for example.
- ✓ To enter a menu or sub-menu, the « > » key acts as the « MUTE » (= CREDIT) key **upon the very first time**. This allows easy navigation through all the menus and sub-menus by sole means of the “cross-style” cursor keys.

**EXTENDED MODEL (e.g. General Electric GEU440)**



-  **« ON/OFF », « M/A » or « Power »**  
Acts as pinball « TEST » button.
- **Key « ^ », « Program + » or « Channel + »**
- **Key « v », « Program - » or « Channel - »**  
These 2 keys allow navigation between menus, sub-menus or parameters.
- **Key « > », « + » or « Volume + »**
- **Key « < », « - » or « Volume - »**  
These 2 keys increase or decrease the current parameter value.
-  **Sound mute key « MUTE »**  
-or-  
 **Key « Enable CLOSE CAPTION »**  
Act as pinball « CREDIT » button.
-  **Key « PREV CH » (USA) or Video Input**  
-or-  
 **Key « Disable CLOSE CAPTION »**  
Allows the current menu or sub-menu to be quit directly without scrolling through the display until the very last « -- ».
- **Numeric keypad « 0 » to « 9 »**  
Allows the direct entry of a 1-digit (0 to 9) or 2-digit (00 to 99) number, to move directly to a menu, sub-menu or parameter. Their action depends on the current menu or sub-menu.

The other keys, such as those dedicated to control a VCR, are ignored.

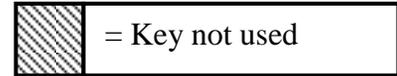
## NAVIGATING THRU THE MENUS

Each menu or sub-menu having specific features, their use with the remote control is described hereafter in every detail, case by case, for each key.

The ‘real’ TEST and CREDIT keys can also be used in parallel, as on the board manual.

### ENTERING THE MAIN MENU

By means of the « ON/OFF » key only.



### MAIN MENU

Key	Feature
<b>POWER ON/OFF</b>	Next menu
∧ or <b>Prog +</b>	Next menu
∨ or <b>Prog -</b>	Previous menu
> or <b>Vol +</b>	Enter menu
< or <b>Vol -</b>	
<b>MUTE</b>	Enter menu
<b>Video Input or PREV CH</b>	Exit main menu
<b>0 to 9</b>	Direct access: 0. Audits 1. Tests 2. Dip SW 3. DipSW+ 4. Preset 5. Type 6. Erase 7. Langua

### MENU ‘0’: AUDITS

Key	Feature
<b>POWER ON/OFF</b>	Next step
∧ or <b>Prog +</b>	Next step
∨ or <b>Prog -</b>	Previous step
> or <b>Vol +</b>	Value + 10,000 (*1)
< or <b>Vol -</b>	Value - 10,000 (*1)
<b>MUTE</b>	1 <sup>st</sup> pressure: Step reset (*2) Next pressures: Value +10,000 (*1)
<b>Video Input or PREV CH</b>	Return to main menu
<b>0 to 9</b>	2-digit direct access (00 to 14) to all steps (*3)

(\*1): Only for steps 7, 8, 9 and 10 (3 scores to beat and high game to date)

(\*2): Reset also after any press on VOL+ or VOL- for steps 7, 8, 9 and 10

(\*3): Any keyed-in number >14 jumps directly to step « -- »

**MENU '1': TEST MODES**

Key	Feature
<b>POWER ON/OFF</b>	Next sub-menu
∧ or <b>Prog +</b>	Next sub-menu
∨ or <b>Prog -</b>	Previous sub-menu
> or <b>Vol +</b>	Enter sub-menu
< or <b>Vol -</b>	
<b>MUTE</b>	Enter sub-menu
<b>Video Input or PREV CH</b>	Return to main menu
<b>0 to 9</b>	Direct access: 1. DISPLAY 2. COILS 3. LAMPS 4. SWITCH

**SUB-MENU '11': DISPLAY**

The remote control adds some new features to this sub-menu:

Key	Feature
<b>POWER ON/OFF</b>	Return to menu '1'
∧ or <b>Prog +</b>	Next number (000000 to 999999) (*1)
∨ or <b>Prog -</b>	Next number (000000 to 999999) (*1)
> or <b>Vol +</b>	1 <sup>st</sup> press: Enter fixed single digit mode Next press: Next digit (*2)
< or <b>Vol -</b>	1 <sup>st</sup> press: Enter fixed single digit mode Next press: Previous digit (*2)
<b>MUTE</b>	Enter fixed single digit mode + scrolling
<b>Video Input or PREV CH</b>	Return to menu '1'
<b>0 to 9</b>	Direct number access (000000 to 999999) (*1)

(\*1): The display freezes on the selected number for 3 seconds, then scrolling resumes.

This allows testing the display of the same number over all digits of all displays for a longer duration (segment outputs test).

(\*2): The scrolling freezes on the selected digit, which flashes for 5 seconds, then scrolling resumes.

This allows testing the display of a given number on a given digit for a longer duration (digit outputs test).

### SUB-MENU '12': COILS

The remote control adds some new features to this sub-menu:

Key	Feature
<b>POWER ON/OFF</b>	Next coil
∧ or <b>Prog +</b>	Next coil
∨ or <b>Prog -</b>	Previous coil
> or <b>Vol +</b>	Energize coil
< or <b>Vol -</b>	
<b>MUTE</b>	Energize coil
<b>Video Input or PREV CH</b>	Return to menu '1'
<b>0 to 9</b>	Direct coil access: 1. to 8. Coil #1 to #8 (refer to manual) 9. GAME OVER relay 0. TILT relay

Two coils may now be energized directly:

- The 1<sup>st</sup> coil (the currently displayed one) with the cursor keys then « > » or MUTE key
- The 2<sup>nd</sup> coil with the numeric pad (directly energized, but not displayed)

### SUB-MENU '13': LAMPS

The remote control adds some new features to this sub-menu:

Key	Feature
<b>POWER ON/OFF</b>	Return to menu '1'
∧ or <b>Prog +</b>	1 <sup>st</sup> pressure: Enter single lamp mode Next pressures: Flash next lamp (*1)
∨ or <b>Prog -</b>	1 <sup>st</sup> pressure: Enter single lamp mode Next pressures: Flash previous lamp (*2)
> or <b>Vol +</b>	Enter single lamp mode, Steady lamp ON
< or <b>Vol -</b>	Enter single lamp mode, Steady lamp OFF
<b>MUTE</b>	1 <sup>st</sup> press: Enter single lamp mode Next press: Flash next lamp (*1)
<b>Video Input or PREV CH</b>	Return to menu '1'
<b>0 to 9</b>	2-digit direct access (03 to 36) to all lamps, even those not assigned to the game (in that case, nothing happens)

This allows a direct access to any lamp (even not assigned) and turns it on or off.

(\*1): The scrolling by increasing numbers runs from lamp #3 to lamp #36, then rolls back to lamp #3.

(\*2): The scrolling by decreasing numbers runs from lamp #36 to lamp #3 and stops.

**SUB-MENU '14': SWITCH**

Key	Feature
<b>POWER ON/OFF</b>	Display '00' then return to menu '1'
∧ or <b>Prog +</b>	Energize all coils assigned to the game
∨ or <b>Prog -</b>	
> or <b>Vol +</b>	
< or <b>Vol -</b>	
<b>MUTE</b>	
<b>Video Input or PREV CH</b>	Display '04' then return to menu '1'
<b>0 to 9</b>	

**MENU '2': ORIGINAL DIP SWITCHES**

Key	Feature
<b>POWER ON/OFF</b>	Next DIP SW
∧ or <b>Prog +</b>	Next DIP SW
∨ or <b>Prog -</b>	Previous DIP SW
> or <b>Vol +</b>	Next value (ON, OFF or numerical)
< or <b>Vol -</b>	Previous value (ON, OFF or numerical)
<b>MUTE</b>	Next value (ON, OFF or numerical)
<b>Video Input or PREV CH</b>	Return to main menu
<b>0 to 9</b>	2-digit direct access (01 to 23) (*)

(\*): If the entered number is between 01 and 23 but corresponds to no valid DIP SW, the display remains on the current DIP SW.

If the entered number is either 00 or >23, the display jumps immediately to step « -- ».

**MENU '3': DIP SWITCHES "PLUS" (EXTENDED)**

Key	Feature
<b>POWER ON/OFF</b>	Next DIP SW+
∧ or <b>Prog +</b>	Next DIP SW+
∨ or <b>Prog -</b>	Previous DIP SW+
> or <b>Vol +</b>	Next value (ON or OFF)
< or <b>Vol -</b>	Previous value (ON or OFF)
<b>MUTE</b>	Next value (ON or OFF)
<b>Video Input or PREV CH</b>	Return to main menu
<b>0 to 9</b>	2-digit direct access (25 and beyond) (*)

(\*): If the entered number is between 25 and the last valid DIP SW+ (see manual), but corresponds to a DIP SW+ whose setting has been disabled by another DIP SW+ (see charts at the end of the **PI-1** or **PI-1 X4** manual), the display remains on the current DIP SW+.

If it is either <25 or beyond the last valid DIP SW+, the display jumps immediately to step « -- ».

**MENU '4': DATA PRESETS**

<b>Key</b>	<b>Feature</b>
<b>POWER ON/OFF</b>	Next sub-menu <i>or</i> Next game (sub-menu 'FROM -') <i>or</i> Cancel Action (if confirmation was prompted)
$\wedge$ or <b>Prog +</b>	Next sub-menu
$\vee$ or <b>Prog -</b>	Previous sub-menu
<b>&gt;</b> or <b>Vol +</b>	Ask action <i>or</i> Confirm Action (if prompted) <i>or</i> Next game (sub-menu 'FROM -')
<b>&lt;</b> or <b>Vol -</b>	Previous game (sub-menu 'FROM -')
<b>MUTE</b>	Ask Action <i>or</i> Confirm Action (if prompted)
<b>Video Input</b> or <b>PREV CH</b>	Return to main menu
<b>0</b> to <b>9</b>	Direct access: 0. ORIGIN 1. WIZARD 2. AUDITS 3. SCORES 4. FROM - 5. TO ALL

**MENU '5': TYPE**

<b>Key</b>	<b>Feature</b>
<b>POWER ON/OFF</b>	Next sub-menu <i>or</i> Cancel Action (if confirmation was prompted)
$\wedge$ or <b>Prog +</b>	Next sub-menu
$\vee$ or <b>Prog -</b>	Previous sub-menu
<b>&gt;</b> or <b>Vol +</b>	Ask action <i>or</i> Confirm Action (if prompted)
<b>&lt;</b> or <b>Vol -</b>	
<b>MUTE</b>	Ask action <i>or</i> Confirm Action (if prompted)
<b>Video Input</b> or <b>PREV CH</b>	Return to main menu
<b>0</b> to <b>9</b>	Direct access: 0. UNIQUE 1. COMMON

**MENU '6': ERASE**

<b>Key</b>	<b>Feature</b>
<b>POWER ON/OFF</b>	Next sub-menu <i>or</i> Cancel Action (if confirmation was prompted)
$\wedge$ or <b>Prog +</b>	Next sub-menu
$\vee$ or <b>Prog -</b>	Previous sub-menu
$>$ or <b>Vol +</b>	Ask action <i>or</i> Confirm Action (if prompted)
$<$ or <b>Vol -</b>	
<b>MUTE</b>	Ask action <i>or</i> Confirm Action (if prompted)
<b>Video Input or PREV CH</b>	Return to main menu
<b>0 to 9</b>	Direct access: 0. GAME 1. ALL

**MENU '7': LANGUAGE**

<b>Key</b>	<b>Feature</b>
<b>POWER ON/OFF</b>	Next language
$\wedge$ or <b>Prog +</b>	Next language
$\vee$ or <b>Prog -</b>	Previous language
$>$ or <b>Vol +</b>	Select language
$<$ or <b>Vol -</b>	
<b>MUTE</b>	Select language
<b>Video Input or PREV CH</b>	Return to main menu
<b>0 to 9</b>	Direct language access: 0. FRANCAis 1. ENGLISH 2. DEUTSch 3. ESPANOl 4. ITALIAno 5. PORTUGues

# PI-1 PI-1 X4 INFRARED ADD-ON

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