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Datasheet

Pluto

Pluto 5 and Pluto 5 Casino Control Boards

Pluto 5 is a single board solution for the control of most amusement machines. It uses a Motorola 68340 processor and has the on-board capacity for up to 2Mbyte of EPROM with further RAM and EPROM space available on expansion boards. There is also on-board facility for EEPROM and a real time clock.

A key feature of **Pluto** is that is has an FPGA chip. This is used to control and map the I/O and also includes some of the multiplexing and DMA control functions. This solution is not only cost effective, but is also a positive software security feature. Each user of **Pluto** has a unique FPGA which prevents other users software from running on your boards, and vice versa.

The 68340 processor has an in-built debug facility enabling software to be developed without the need for separate and expensive emulators. Programmers familiar with 68000 code will easily adapt to this powerful modern processor.

Connectors are provided for machine functions. The capabilities include a total of 64 power output lines with up to 1.5A capacity, 32 input lines and further undedicated TTL lines provide a high degree of flexibility.

Pluto 5 is fine tuned to the needs of the amusement machine manufacturer. There are 16 DIL switches for option configuration. Two RS232 ports are provided, one in the BACTA standard configuration. There is also a current sense on a 12V line to confirm that coin meters have operated.

There is an on board 2 channel sound system including stereo power amplifier. **Pluto 5** even includes the 5 volt regulator.

Pluto 5 is fitted with the following connectors:

- RS-232 comms port with handshakes
- Dataport
- Power Supply Input
- Multiplex lamp columns
- Multiplex LED segments
- Multiplex lamp rows/LED digits
- 6 reels inc. lamps and position Sensor
- General purpose I/O 1
- General purpose I/O 2
- I²C bus expansion
- Speakers
- Multiplex expansion
- TTL I/O
- I²C bus expansion
- I/O expansion
- Memory expansion

Pluto 5

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Datasheet

The **Pluto 5 Casino** Controller is an enhanced version of the **Pluto 5** Controller with additional facilities aimed at the implementation of Casino Style machines. All features of the **Pluto 5** are retained but with the following additions:

- Up to 6 additional Serial Communication Channels, 5 configured at RS-232 levels and 1 at TTL levels for connection to a range of optional interface boards.
- Power-Down Switch Monitoring added using a battery backed microcontroller. This enables up to 7 switches in the machine to be monitored while the machine is powered down.
- 32K additional battery backed RAM. This is an independent area of non-volatile RAM with a second battery. It is completely separate to the main area of RAM.

SPECIFICATION

Processor	• Motorola MC68340 running at 16.7MHz
RAM	• 64K bytes (32Kx16), battery backed static (96K on **Pluto 5 Casino**)
EPROM	• Up to 2Mbytes on board EPROM capacity
Sound	• OKI MSM6585 sampled sound. Socket for optional second channel for stereo or dual channel sound. Sample rates from 8KHz to 32KHz. • Sound samples are stored in main EPROM and are transferred under the control of the FPGA using DMA.
Amplifier	• 5W + 5W Stereo Amplifier with software volume control.
Lamps	• Up to 256 (16x16) multiplex lamp drives with 36v or 48v software selectable operation with dimming and 'overdrive' capabilities. Current sensing to allow test for both 'Bulb Present' and 'Bulb Short'.
LED Multiplex	• 32 digits, 7 segment LED.
Power Outputs	• 64 Open Drain outputs, each sinking up to 1.5A peak @ 40V.
Power-Down Switch Monitors	• 7 inputs (**Pluto 5 Casino** only**)**.
Inputs	• 32 general purpose inputs pulled up to +5V.
Dataports	• BACTA compliant 'Dataport', • Secondary RS232 Channel (RX/TX/RTS/CTS) • 5 extra RS232 Channels & 1 TTL port – **Pluto 5 Casino only.**
TTI I/O	• 6 TTL lines. Can be configured as serial I/O for VFD modules and used for I/O expansion.
DIL Switches	• 16 DIL Switches, for option setting.
I²C Bus	• I²C bus expansion connector.
Real Time Clock	• Socket for optional PCF8583 RTC.
Memory Expansion	• Memory Card Connector or via I²C.
EEPROM	• EEPROM socket. Provision for 24C01/02/04 I²C EEPROM giving 128, 256 or 512 bytes of non-volatile storage.
Security Meter Drive	• A 12V output line is equipped for sensing current flow for security and monitoring uses. This allows the confirmation of operation of counters.
PSU	• On board regulators powered by 12V DC unregulated (±15%) supply.
Dimensions	• 206mm x 188mm **(Pluto 5)** • 206mm x 252.73mm **(Pluto 5 Casino)**

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