

# Helium™ 100 Communications Processor

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## KEY FEATURES

- ▶ **ATM switching and layer 2/3 processing device**
- ▶ **USB interfaces for external modem applications**
- ▶ **Utopia — 1/2 and ADSL T1.413 interfaces**
- ▶ **Ethernet — 10baseT interface**
- ▶ **Dual ARM RISC processor architecture**

## Product Applications

- DSL modem
- DSL gateway
- Cable modem
- ATM line cards
- ATM access
- ATM SCU/DSU
- Bridging and routing

## Description

Helium 100 is a single-chip, highly-integrated ATM switching and Layer 2/3 processing device. A general purpose RISC Protocol Processor runs higher layer protocols while a high-performance microcoded RISC Network Processor is used for cell and frame handling switching at up to 75 Mbps.

Integrating many common interface functions, Helium 100 is designed for flexible, low-cost, high-functionality, high-performance products. It may be used in a gateway, ATM access device, or USB modem customer premises equipment (CPE) or central office (CO).

Helium 100 contains a network processor that controls the direct connections to Ethernet and USB, as well as physical interfaces for Utopia 1 and 2, HDLC and I.432.

The network processor has 16K of micro-code RAM and a high-speed interface to external SDRAM. This supports both ATM cells and packets, OAM cell handling, policing, shaping and accounting.

The two processors communicate via the inter-processor gateway (IPG).

Helium 100 extends GlobespanVirata's ATOM architecture and runs the complete suite of ATMOS™ software, including support for routing, bridging, signaling, and SNMP Management.

Software flexibility, high integration, and built-in hardware debugging (ICE) support allow rapid product development.

This combination of hardware and software, and Integrated Software on Silicon™ (ISOS™) provides a unique time-to-market advantage.

## Reference Platform

The BD6100 is the development reference platform for Helium 100, providing a wealth of hardware and software debug tools to assist partners in rapid development and deployment of their products. Training, documentation, and support are also available.

## Specifications

### Processors

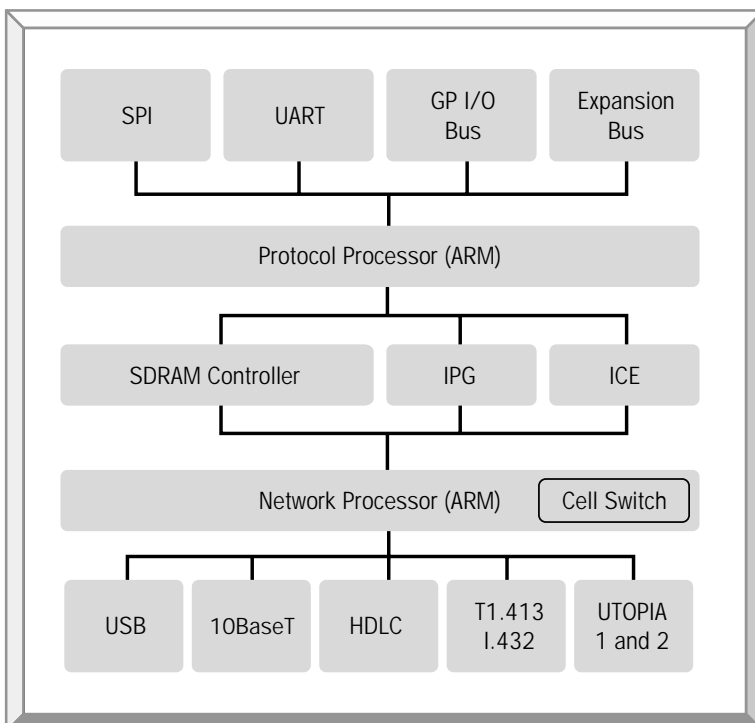
- Protocol Processor (PP) is a 48 MHz ARM7TDMI RISC core, which includes an 8K cache providing:
  - Modem PHY Management (depending on application)
  - Initialization code
  - Soft real-time tasks
- Network Processor (NP) is a 48 MHz ARM7TDMI RISC core with 16K of SRAM performing:
  - Data Transfer Framing Interleaving CRC Generation Switching
  - Hard real-time tasks

### USB

USB 1.1 slave interface — up to 12 Mbps using Control, Interrupt, Bulk, and Isochronous endpoints and transfers.

### 10BaseT Ethernet

Helium 100 contains a 10baseT Ethernet MAC with a low power integrated PHY.



Helium 100 System Interfaces

# Helium 100

## Interfaces

- USB
- 10baseT Ethernet
- Utopia 1/2
- HDLC/T1.413
- GPIOs
- Expansion bus
- UART
- SDRAM
- Flash PROM
- EEPROM

## Utopia

Utopia 1 and 2 (master/slave) interfaces with 31 ports, configuration:

- 8 ports dual-latency, or
- 2 ports dual-latency and 29 ports single latency
- 2 ports dual-latency and 12 ports single latency

## ADSL

ADSL full duplex data interface to external ADSL PHY implementing all the framing requirements I.432 of T1.413.

## HDLC

The HDLC interface, using the same pins as ADSL, conforms to Q.921 at a frame rate of 25MHz with a 16-bit CRC generation.

## GPIO

The General Purpose I/O bus contains 13 pins. Of these pins, two are used for the UART serial interface (Tx and Rx at a speed of 38,462 baud) and three for the serial boot EEPROM (data in, data out, and clock). Five pins can also be configured as Ethernet status indicators.

## SDRAM

SDRAM interface conforms to JEDEC requirements, supporting address space from 2 to 32 Mbytes with a selectable 16- or 32-bit wide data bus.

## Expansion Bus

The expansion bus is configurable as an 8- or 16-bit peripheral bus, which can support 8-bit Motorola, 16-bit Intel or 16-bit multiplexed modes. It is mainly used to control external devices and boot Helium 100 from memory, ROM or Flash PROM. It supports up to 4 devices using 4 pins as programmable chip selects or more with additional decoder.

## Boot Options

- USB interface
- Serial EEPROM
- UART
- Flash PROM
- Ethernet Network Boot

## Software

Helium 100's Protocol Processor runs GlobespanVirata's extensive networking software suite. See separate datasheet for full details:

- OS Kernel and C/C++ Library (either ATMOS or VxWorks)
- Non-zero VPI support
- OAM I.610 full implementation
- SNMP v1, v2, and v3
- Flash-FS and In Store-FS
- USB drivers for Windows® 98, ME and 2000
- QOS: UBR, CBR, nrt-VBR, rt-VBR
- ATM Forum UNI 3.0, 3.1 and 4.0 Signaling
- ILMI 4.0
- SSCOP and AAL-2 CPCS
- Bridge-mode RFC1483 PVC and SVC
- PPP over ATM PVC (RFC 2364)
- Classical IP - RFC1577, RFC1483, RFC1755
- Classical IP ARP server
- MAC-layer Bridge (Spanning Tree 802.1d)
- ATM Forum LEC
- TCP/IP Stack
- IP Router - RIP1, RIP2
- TFTP Client and Server
- PPTP and L2TP
- DHCP Client, Server, and Relay
- NAT with extensive ALG
- DNS Relay and Client
- PPPoE Client and Relay Agent
- FRF.12 Frame Relay fragmentation
- LMI for Frame Relay PVC link management

## Package

- 225 PBGA

## Environmental

- Core Supply 1.8V, +/- 10%
- I/O Supply 3.3V, +/- 10%
- Commercial temperature range 0 to +70°C

## Ordering Information

- VC-45100-PBC
- BD6100, Helium 100 Development Board
- Data book available on request DO-008532-PS

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