

PICO SERV

## A low cost, low power integrated miniature web server

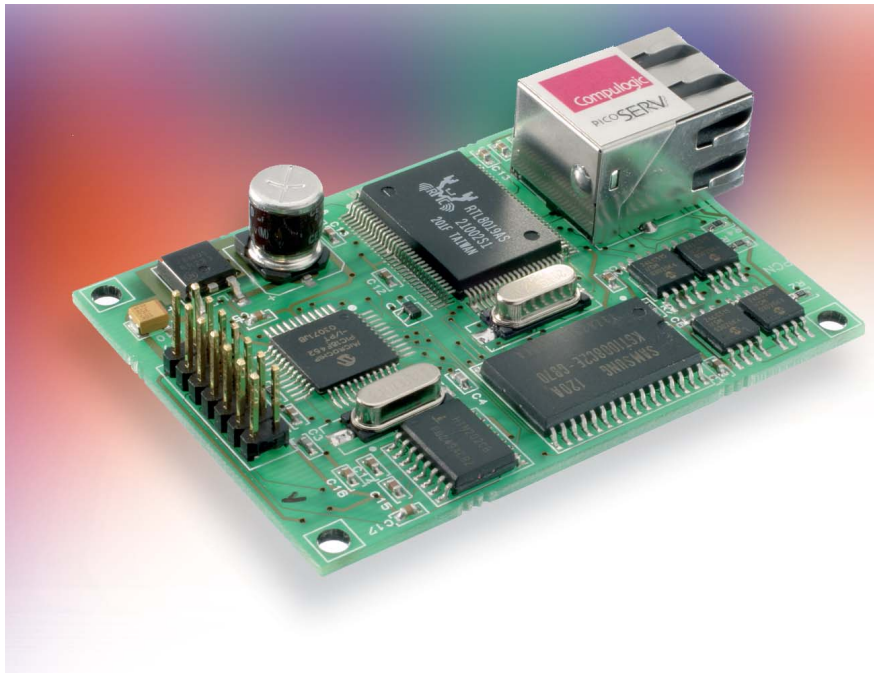
featuring a fully integrated 10baseT Ethernet interface, an RS232 Serial Port, a variety of interfaces to the 'real world' and EEPROM storage for web pages and other files

***PicoServ is a powerful, low cost, miniature web server module featuring a fully integrated 10baseT Ethernet interface, a variety of interfaces to the 'real world' and EEPROM storage for web pages and other files.***

The web browser is becoming both ubiquitous and indispensable. To most of us the web browser is a very familiar application and is fast becoming the standard user interface for a myriad of applications and systems. An internet or network, browser based interface, is becoming a desirable or essential requirement for many systems.

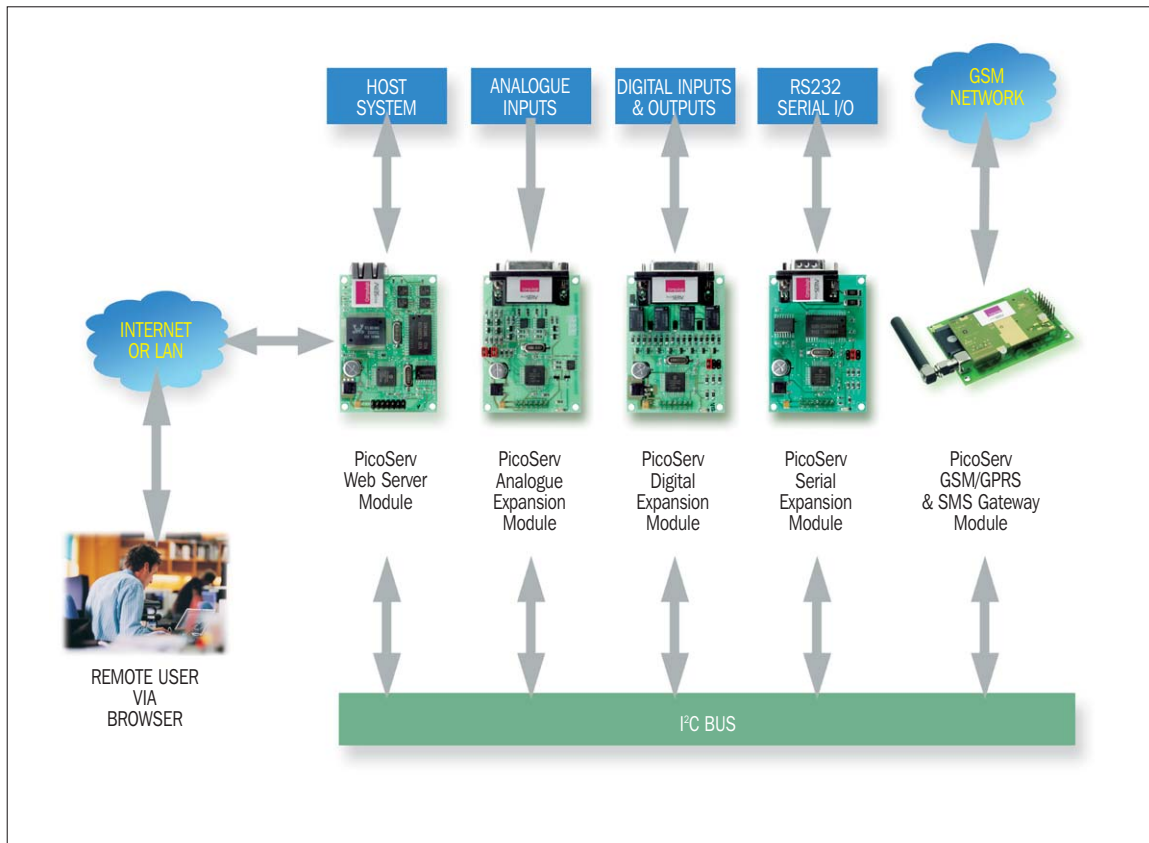
The PicoServ miniature web server module is an 'Internet engine' designed to be able to provide such a browser based interface over a LAN, the internet or GPRS network in a small space, at low power, at low cost and with little or no design effort.

PicoServ supports dynamic web pages which means that real-time data can be both displayed and/or updated from a standard web browser.



*System designers or integrators need only be familiar with their own products or systems. The PicoServ module takes care of network interfacing, network and internet communications protocols and storage of web pages and other files.*

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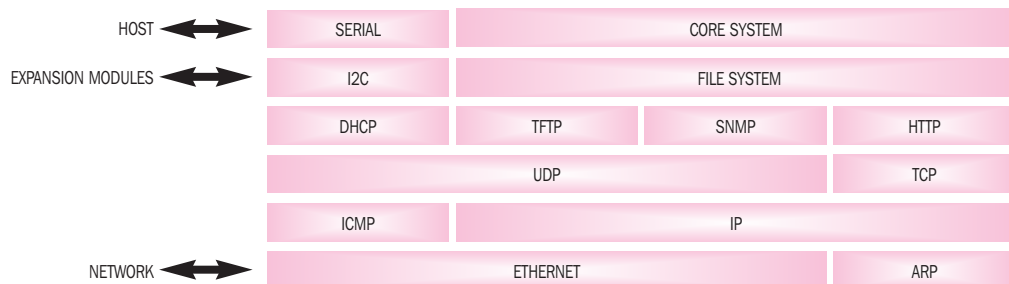
**Dynamic web pages are supported using an innovative and simple to use method which allows real-world variables and information from a host system, for example temperatures, speeds, levels, voltages, switch positions etc. to be displayed or changed using only simple HTML techniques. Virtually any number and type of host variables and parameters can be handled without any need to specify or pre-define fields on the PicoServ server.**

A simple RS232 serial interface is provided to allow data to be exchanged between the PicoServ server module and a host system. A second serial interface conforming to the I2C bus standard is also provided. In addition a number of standard intelligent interface modules are available which provide 'no development' parallel, serial, analogue, and digital I/O interfaces between the server module and the outside world.

The relatively large file storage area of 260K bytes for such a system, which

can support almost any type of file including HTML, GIF, JPEG, and JAVA, means that only standard web authoring techniques are required to be able to provide an eloquent and professional browser based interface for almost any system.

The PicoServ software (firmware) is based entirely on Compulogic proprietary software. The cost of the software is included in the module hardware costs and there are no additional licence fees etc. payable.



## GSM, GPRS and SMS Gateway Module

PicoServ is all about providing simple remote access. In order to provide even greater flexibility and extend access even further, the PicoServ GSM, GPRS and SMS gateway module allows monitoring and control of equipment or systems connected to PicoServ via a GSM mobile phone or modem using SMS. The PicoServ SMS gateway module is designed to interoperate with any of the PicoServ expansion modules and can be installed with or instead of the PicoServ web server module.

## SNMP

In addition to HTTP, the Simple Network Management Protocol (SNMP) is also supported. SNMP is an Internet-standard protocol for managing devices on IP networks. Any PicoServ parameter can be read or updated using the SNMP protocol, including parameters from I/O modules and external systems. In this way the PicoServ system can be used as an "SNMP Proxy Agent" to enable the remote monitoring and control of devices not capable of supporting the SNMP protocol directly, using a network management system such as HP Open View.

### **PicoServ supports the following protocols:**

*Ethernet ARP, IP, ICMP, TCP, UDP, HTTP, SNMP, TFTP, DHCP, PPP, LCP, IPCP and PAP.*

*The TCP implementation is socket based and can support 16 simultaneous connections while the inclusion of a DHCP client simplifies module configuration to 'plug and go' when a DHCP server is available.*

## Expansion Modules



The PicoServ module is able to interface to a host system via a built-in RS232 serial or I2C bus interface, allowing static and variable data to be exchanged between the host system and the user's browser interface. This is accomplished using a very simple serial protocol which is implemented on the host system. Almost any number of data parameters can be exchanged between the host and the user in this way.



In addition, or as an alternative to the serial interface, a number of standard interface modules are available which simply plug into the PicoServ web server module and provide a range of analogue, digital and serial inputs and outputs. This method provides a 'no development', real-world interface to the PicoServ system with the input and output variables available to the user's browser interface.

The PicoServ expansion modules have their own processor system and have additional built-in functions such as programmable alarms, time qualification and programmable measurement offsets.



The range of standard interface modules is continually increasing to include further application specific and specialist interfaces.

Compulogic are also able to undertake the design and supply of PicoServ interface modules to suit individual customer requirements for specific applications.

## Options

As standard the PicoServ web server module is supplied as a PCB for integration into customer equipment or systems.

The following options and accessories are also available.

### Aluminium Enclosure



The tough, anodised, solid aluminium enclosure, which is capable of housing the PicoServ server module and up to three other expansion modules, is ideal for deploying the PicoServ system on the factory floor, plant rooms and other industrial environments. The sleek anodised finish also makes this enclosure equally at home on the desktop or in the lab.

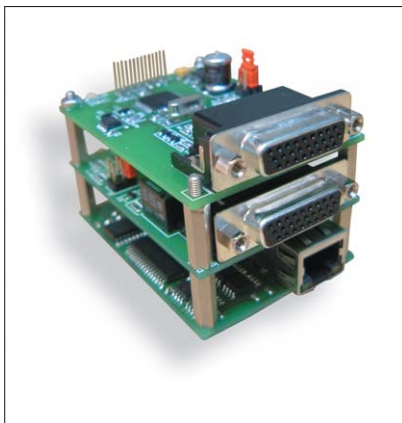
### Power Supply

An AC adaptor providing a 9VDC output. Capable of powering the PicoServ server module and four expansion modules.



### Serial/Power Cable

A pre-assembled cable providing a simple method of connecting the PicoServ system to a power supply and a serial host.



## Applications

The applications areas where PicoServ could be used to provide a LAN or Internet browser based interface are probably only limited by the imagination, a few of the more obvious applications are listed:

- Security Systems
- Heating Equipment
- Air Conditioning Equipment
- Refrigeration Equipment
- Home Automation
- IT Systems Monitoring
- Process Monitoring & Control
- Power Generation Plants
- Factory Machinery and Processes
- Vending Machines
- Municipal Water & Waste Water Treatment Plants
- Medical Equipment
- Pathological Equipment
- Environmental Monitoring
- Remote on/off Switching of Electric Motors, Pumps, Lighting etc

## Features and Benefits

- Little or no development required to get products 'on the net'
- Web pages created using standard authoring tools
- Supports dynamic web pages
- Small size
- Low power
- Low cost
- Large 256K byte EEPROM file system
- Supports RS232 and I<sup>2</sup>C bus host interfaces
- Range of I/O expansion modules available
- Can support up to 8 expansion modules
- Flash based firmware up-loadable via network
- Web pages & files up-loadable via network
- Built-in security features
- Direct connection to 10baseT Ethernet network
- Server configuration via browser interface



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PICO SERV Miniature Web Server Module

## Specifications

### Interfaces

10baseT Ethernet	RJ45 connector.
RS232Serial host interface	Used for parameter and data exchange between host system and PicoServ server.
Format	8 data bits, no parity.
Baud rates	2400, 4800, 9600, 19200, 38400,76800, 102400bps.
Addresses	up to 8 logical host addresses supported.
Connector	14 pin 0.1" male header.

### I<sup>2</sup>C Serial bus interface

Specification	Used for parameter and data exchange between PicoServ expansion I/O modules or I <sup>2</sup> C host. Conforms to Philips I <sup>2</sup> C bus specification.
Speed	750Kbps.
Addresses	Up to 17 I <sup>2</sup> C device addresses supported.
Connector	14 pin 0.1" male header.

### Protocols

Ethernet	10baseT on-board interface.
IP	Internet Protocol, RFC 791. TX & RX fragmentation supported. Max IP fragment size 16K. Max IP Datagram size 64K.
TCP	Transmission Control Protocol, RFC 793. 16 simultaneous TCP connections supported. TCP Datagram size unlimited. TCP segment size up to 64K bytes. Client advertised MSS and Window size supported. Payload checksum generation & checking supported.
DHCP	Dynamic Host Configuration Protocol, RFC 2131. Supports DHCP client to enable automatic assignment of IP address on networks where a DHCP server is available.
ICMP	Internet Control Message Protocol, RFC 792. Payload checksum generation & checking supported. Extended to provide alternative method of IP address assignment.
HTTP	Hypertext Transport Protocol, RFC 2616. Version HTTP/1.1.
SNMP (not GPRS version)	Simple Network Management Protocol, RFC 1157. (SNMPv1).
UDP	User Datagram Protocol, RFC 768. Payload checksum generation & checking supported.
TFTP	Trivial File Transfer Protocol, RFC 783. Used for uploading web pages, files and system firmware updates.
ARP	Address Resolution Protocol, RFC 826.
PPP (GPRS version)	Point-to-Point Protocol LCP, IPCP, PAP, RFC's 1548, 1661, 1662, 1570, 1172.

### IP Address Allocation

Static	User configurable via browser and via extended ICMP 'Ping' command.
Dynamic	Using DHCP protocol.

### File System

Type	256K byte EEPROM.
User file capacity	260,096 bytes.
Max file size	61,440 bytes.
Max file size	(HTML files) 59,322 bytes.
Max number of files	64.
Max filename length	25 characters including extension.
Up-loadable	via TFTP.

### Electrical

Power requirements	6-24 VDC, 40mA.
Power consumption	280mW.

### Environmental

Operating Temperature	0 - +70°C.
Storage Temperature	-40 - +100°C.
Humidity	0-95% non-condensing.
Dimensions	70mm x 50mm x 16mm (2.75" x 2" x .625")



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