GADGETGATEWAY IA

Configurable LON to IP Router and/or
Remote Packet Monitor.
ANSI 709.1 (LonTalk©) and ANSI 852
(IP) standards based.

Adept
Systems
Inc

CREATOR of GADGETTEK PRODUCTS

2966 Fort Hill Road
Eagle Mountain, Utah
84043-4108
USA
(voice) 801.766.3527
(fax) 801.766.3528
info@gadgettek.com
www.gadgettek.com

Document Version 2.39 - 2005.02.04

INTRODUCTION

The GadgetGateway™ Ia is a high performance EIA 852 compliant configurable ANSI 709.1 (Lon-Talk™) to IP gateway, router, and/or remote packet monitor. The small size, low cost, advanced functionality, and high degree of interoperability of the GadgetGateway make it a cost effective upgrade or replacement gateway for existing control networks and an attractive core component for new installations.

Because GadgetGateway I runs on a high performance 40 Mips 32 bit processor with a multi-tasking RTOS it can be flexibly configured to work either solely or simultaneously as a point-to-point configured router, a point to multi-point tunneling gateway, or a remote packet monitoring server. GadgetGateway I employs Adept's GadgetNIC 709.1 network interface and leverages Adept's extensive expertise in the ANSI 709.1 protocol (GadgetStack ™) and internet routing. The GadgetGateway is the first product in its class to provide support for 100 Base T, multi-cast routing, and Dynamic DNS for enhanced scalability.

INTEROPERABLE CONVENIENT CONFIGURATION

GadgetGateway was designed to be compliant with existing gateway configuration software to make upgrades easy for system's integrators (such as that for the i.Lon and Router-LL). It supports a direct IP connection to LNS or Lonmaker running on a PC. This enables LNS to communicate over IP-10/100 Ethernet to an ANSI 709.1 Network.

GadgetGateway's IP communications are based on the open ANSI 852 standard specification for interoperable Ansi 709.1 to IP gateways and tunneling repeaters. GadgetGateway is designed for seamless integration into existing Lon-Works© control networks and is highly interoperable with existing management tools, nodes, gateways, and routers. For example, two Gadget-Gateways can be configured to look like Side A and Side B of a standard LonTalk router.
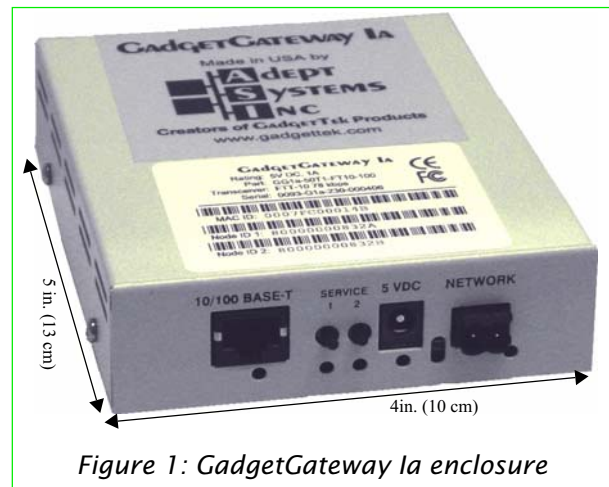

Figure 1: GadgetGateway Ia enclosure

FEATURES

✶ **ANSI 852 IP Tunneling Spec. Compliant**
  ◆ Supports direct IP interface to LNS and LonMaker
  ◆ Full ANSI 709.1 (LonTalk) Implementation.
  ◆ FT-10 or TP/XF-1250 LonTalk Transceiver.

✶ **Scalable IP Backbone for LON Channels**
  ◆ 100 Base-T for higher bandwidth backbones
  ◆ 128 Routers per channel
  ◆ Selective forwarding between routers
  ◆ Multi-cast support
  ◆ Optional 852 to 852 Bridge/Router Support
  ◆ Flood mode "invisible links" for legacy integration

✶ **Interoperable Convenient Configuration**
  ◆ i.Lon™, and Router-LL™ configuration tool compliant
  ◆ LonMaker® Router configuration compliant
  ◆ Manual mode configuration with serial or web interface
  ◆ Remote configuration with enhanced web interface

✶ **Enhanced WAN support for NAT and DDNS**
  ◆ Can be used behind NAT router with static IP
  ◆ Can be used behind NAT router with Dynamic DNS

✶ **Remote Over IP Packet Monitoring & Protocol Analysis of 709.1 Channels with GadgetAnalyzer**

✶ **High Availability Application Support with Optional Redundant Twin Mode**

✶ **Inexpensive**
  ◆ Best price/performance on the market

✶ **Physical**
  ◆ Desktop and DIN mountable
  ◆ Compact: 4" x 5" x 1"
  ◆ Power, packets, service LEDs
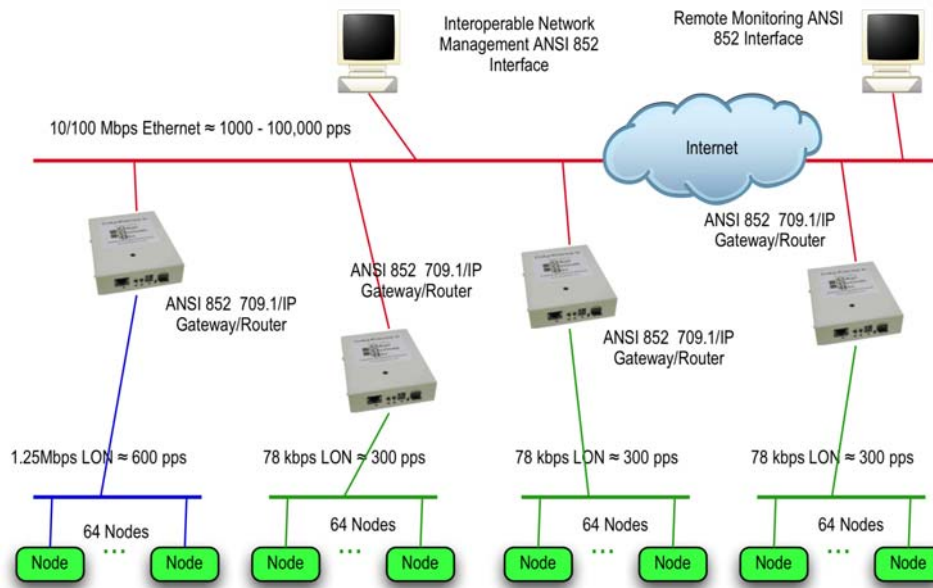 ◆ Two service buttons.
  ◆ Reset pins

Figure 2: IP backbone application

GadgetGateway includes an on-board web server for remote configuration as well as a direct connect serial port. The web configuration page includes a service pin button to enable remote commissioning in either Normal or Manual mode. The new look web interface includes even more functionality than previous versions.

The GadgetGateway will interoperate with and/or replace legacy "Router-LL" systems. The "Flood" repeater mode is totally transparent to the 709.1 side of the channel. This enables IP
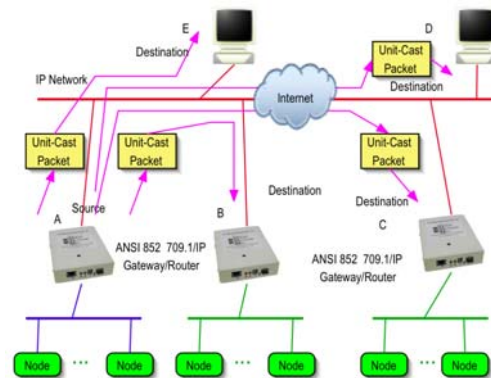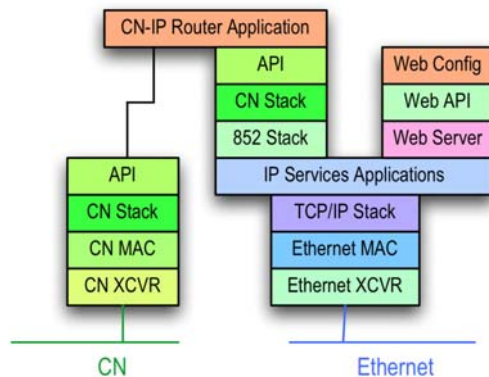

Figure 4: Uni-cast Communications

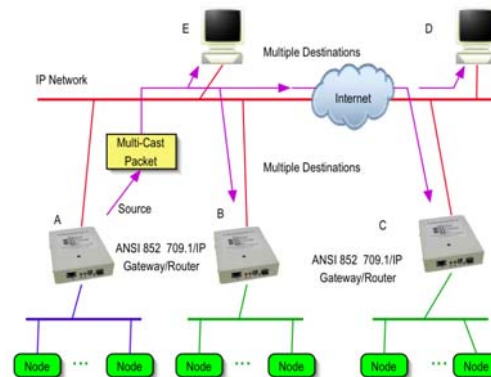*Figure 3: Gadget Gateway Architecture.*

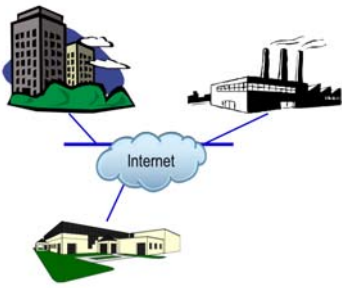*Figure 5: Multi-cast Communications*

Figure 6: Distributed Multi-Building Network

tunneling of 709.1 traffic for even the most problematic configurations.

TRAFFIC CONSOLIDATION OVER IP BACKBONES

GadgetGateway provides the core component a system's integrator needs to tie together large networks over a high speed Ethernet or other IP backbones. With GadgetGateway, the traffic from multiple 709.1 channels can be tunneled transparently over high speed IP media thereby enabling applications such as remote monitoring, logging, or traffic consolidation. See Figure 2. The higher bandwidth resulting from Gadget-

Gateway's 100 Base-T support enables more LON channels to be attached to the same Ethernet backbone. Current firmware supports up to 128 routers per channel. GadgetGateway supports selective forwarding between routers to maximize available bandwidth.

POINT TO POINT TO MULTI-POINT ROUTER

Each GadgetGateway can be configured to send to and receive from multiple other routers using selective forwarding. This allows more effective and efficient networks by reducing the number of routers needed to interconnect the 709.1 channels. Routers communicate by using either IP uni-cast or IP multi-cast. GadgetGateway is the only 852 compliant router to support 852's IP multi-cast mode.

REMOTE PACKET MONITOR

The GadgetGateway Router's on-board remote packet monitor server allows remote clients such as Adept's free GadgetAnalyzer software to dynamically register which packets get forwarded over IP and which ones get filtered out. Thus remote protocol analysis or data logging is supported anywhere there is an internet connection.
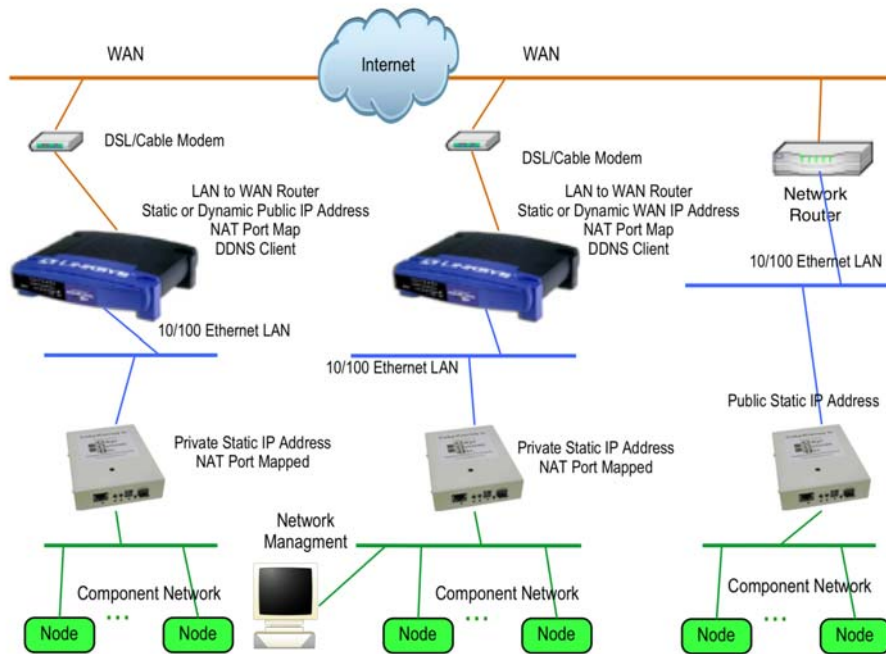

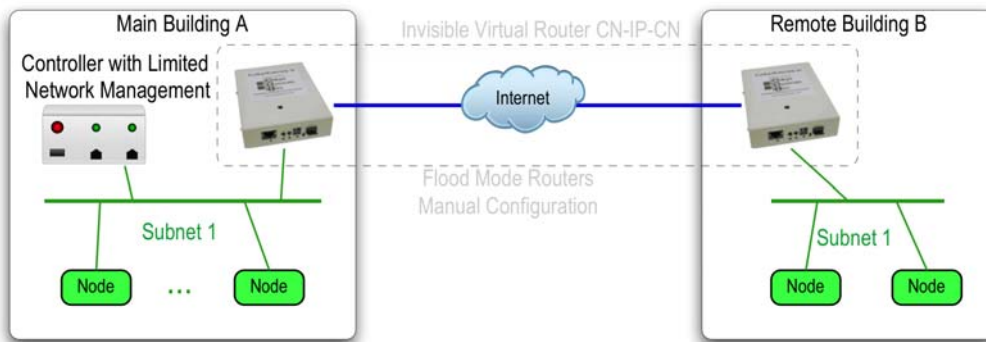*Figure 7: System Architecture for LAN to WAN routing, NAT, and DDNS.*

Figure 8: Flood Mode "Invisible Link".

WAN SUPPORT WITH NAT AND DDNS

GadgetGateway provides support for network address translation (NAT) when installed on a local IP LAN. The NAT WAN to LAN router's WAN address is substituted in the appropriate 852 headers. Unique to 852 routers is GadgetGateway's support for Dynamic DNS (DDNS). With a DDNS compliant NAT router such as the LinkSys[TM] BEFSX41, the GadgetGateway will do DNS lookups to track changing IP addresses of its local WAN access point and those of other GadgetGateways. This saves the expense of static IP addresses for widely distributed sites. The HTTP port for the GadgetGateway router is also user configurable to avoid conflicts when used behind a NAT router.

LEGACY INTEGRATION WITH FLOOD MODE

The GadgetGateway Router has a totally transparent flood mode. When in flood mode two or more routers will be "invisible" to other LON network components and network management tools. This allows one to seamlessly join remote nodes over a LAN or the internet such that they all appear as members of the local subnet. Multi-cast makes this "Flood" mode efficient and scalable. Flood can only be activated with manual (web or serial) configuration.

HIGH AVAILABILITY REDUNDANT TWIN MODE

The GadgetGateway now supports an optional redundant twin mode with enhanced reliability for high availability applications. In redundant twin mode two routers connect to the same LON channel but without duplicate forwarding of packets. This provides greater reliability without the scalability problems of excess duplicate packet traffic. The twins monitor, diagnose, and report faults. The secondary twin will automatically go active if the primary fails. This feature achieves the increased system reliability of a redundant router without the problems of doubled traffic. Should there be a fault in either interface then both routers will go active and forward traffic until the fault has been healed. The router configuration is periodically automatically synchronized between the two routers to reduce fail-over time and increase the fidelity between the backup and primary router operation. In redundant twin mode the GadgetGate-
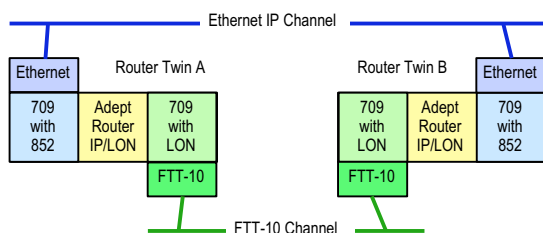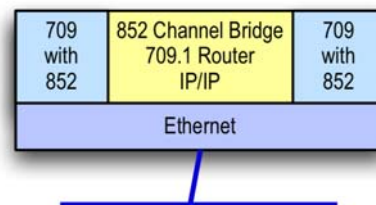

Figure 9: Redundant Twin Mode.

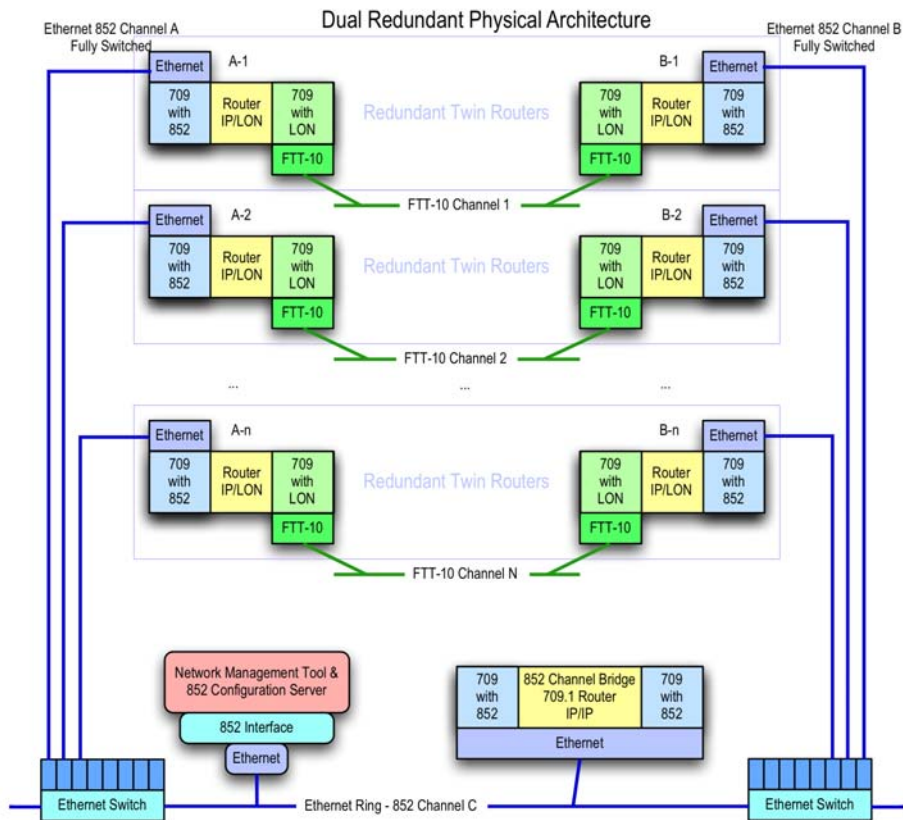*Figure 10: 852 to 852 Bridging Router.*

Figure 11: High Availability Application Using Redundant Twin Mode and 852 Bridging.

way routers activate an embedded application with Status and Alarm SNVTs and a Report UNVT to facilitate monitoring of the router health. The web interface includes state and statistics information. Please contact Adept Systems Inc. for more information on activating the redundant twin mode capability.

ANSI 852 BRIDGING CAPABILITY

In order to better support large installations with dozens of IP to LON routers a GadgetGateway router can be configured in 852 to 852 bridging router mode. In this mode one can bridge two logical 852 channels. When acting as an 852 bridge the router is a member of two logical 852 channels sharing one ethernet interface. The router bridges traffic between the two channels. On the LON side the bridge looks like a LON router. This overcomes limitations of some network managers on the number of 852 devices per channel and provides for enhanced

scalability by partitioning the 852 traffic seen by any given router.

LOW POWER CONSUMPTION

Since the GadgetGateway only consumes 1.5 watts of power, running from battery backup power is eminently practical, thereby making it an ideal component for critical services such as fire, security, and systems monitoring.

PRODUCT QUALITY

Long recognized as an industry leader in the ANSI 709.1 (LonTalk) protocol, Adept Systems' expertise ensures that our products are of the highest quality. Under contract to Echelon Corp., Adept Systems authored the C Reference Implementation of the LonTalk protocol which became the basis for the EIA 709.1 standard protocol. Adept has since developed a performance enhanced implementation and ported it to several platforms. We offer the highest quality product at a very aggressive price.

CUSTOMIZED VERSIONS & APPLICATIONS

Adept provides custom solutions for interoperable network-centric automation systems to OEMS with large quantity applications. Customized enhancements to the GadgetGateway I can also be provided such as modem support. If you have need for custom features please call. Sophisticated custom control, monitoring, and logging applications are enable by the combination of Adept's GadgetStack IP running on a PC with an IP connection and at least one Gadget-Gateway. Using the PC as a development and application platform eases ramp up time and leverages the installed base of user applications. The convenient API of the GadgetStack enables cost effective development of custom applications.

ORDERING

The price for the GadgetGateway is US $575.00 quantity 1-19. This includes phone support for installation. 110 or 220 VAC adapters are $9.95 extra. Quantity discounts are available. Additional support contracts are also available, as well as on-site support.

Prices are subject to change without notice. For up-to-date ordering, part numbers, pricing, and availability information, please check on online catalog or contact our sales staff.

801.766.3527 (voice)
801.766.3528 (fax)
info@gadgettek.com (E-mail)
http://www.gadgettek.com/

Echelon, Neuron, LonTalk, LNS, LON, and LonWorks are trademarks of Echelon Corporation. All other trademarks are the property of their respective owners.
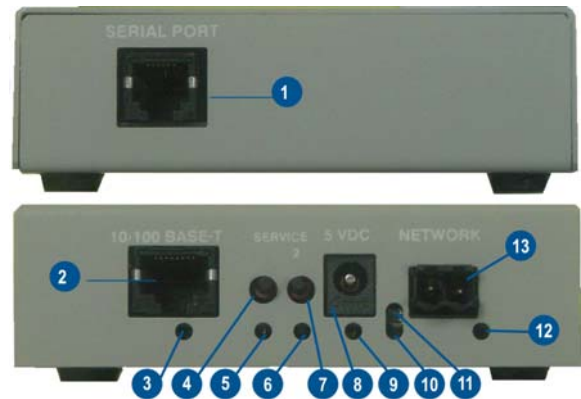

Figure 12: GadgetGateway Ports and I/O

1) Console
2) Ethernet
3) Ethernet Link LED
4) Service Pin 1
5) Service Pin 1 LED
6) Service Pin 2 LED
7) Service Pin 2
8) 5V DC In
9) Power On LED
10) Orange LED Reserved
11) Green LED Reserved
12) 709.1 Traffic LED
13) 709.1 Interface

GadgetGateway Ia Specifications

Main CPU:	NetSilicon Net+50, 32 Bit ARM 7 - TDMI,
Clock:	33 MHz (40Mips)
Ethernet:	RJ-45 Connector Integral 10/100 Base-T Ethernet MAC
Ports:	ANSI 709.1, serial console, HTTP 80 standard, remote packet monitor (any open port, ANSI 852 1628 standard
Serial Interface:	UART with full duplex handshaking, RJ- 485 connector
GadgetNIC Chip:	XILINX® Spartan™ FPGA
GadgetNIC Clock:	40 MHz
709.X Transceiver Type:	FTT-10A with blocking capacitors for compatibility with link power channel (model 72001) or TPT 1250
709 TP Connector:	Weidmuller 2-conductor BLA (PN:151491)
Input Power:	< 1.5 watts, 300 milliamps at 5 Volts from AC adapter (specify either 220V or 120V). Supplied AC Adapter rated to 5 Watts
Enclosure & Dimensions:	Metal box 4.080" x 5.170" x 1.062" (10.36cm x 13.132cm x 2.7cm)
Mounting Options:	Din rail, keyhole (screw mount), desktop
EMI:	FCC and CE mark compliant