AdeptSystemsInc

LON®over IP 709.1 852

Creates a network architecture that cost effectively and transparently leverages readily available internet infrastructure and cost effective LonWorks® technology to provide scalable, flexible, open, interoperable, component level building automation systems. IP and LON can now advantageously complement and complete each other.

The critical enabling technology for this architecture is a LON over IP router based on the ANSI 852 and ANSI 709.1 standards. Adept's family of 709.1/852 routers provide the core components a systems integrator needs to tie together large networks over a high speed Ethernet or other IP backbones. Modern buildings usually have IP infrastructure pre-wired so this architecture can be cost effectively layered on top by merely adding LON/IP routers with little or no additional wiring for high speed back bone capability. With Adept's LON over IP routers, the traffic from multiple 709.1 channels can be tunneled transparently over high speed IP media (wired or wireless) thereby enabling applications such as remote monitoring, logging, and enterprise integration, as well as traffic consolidation, (See Figure 1). With the higher bandwith of 100 Base-T, dozens of LON channels can be connected together over the same Ethernet channel. Adept's routers accept 128 devices per 852 channel. Layered Ethernet networks with 1000 Base-T backbones further enhance scalability. The 852 specification provides for multiple 852 channels on the same IP network. With Adept's unique 852 to 852 bridging function, multiple 852 channels can inter-network for an inherently scalable architecture of LON networks connected by IP networks.

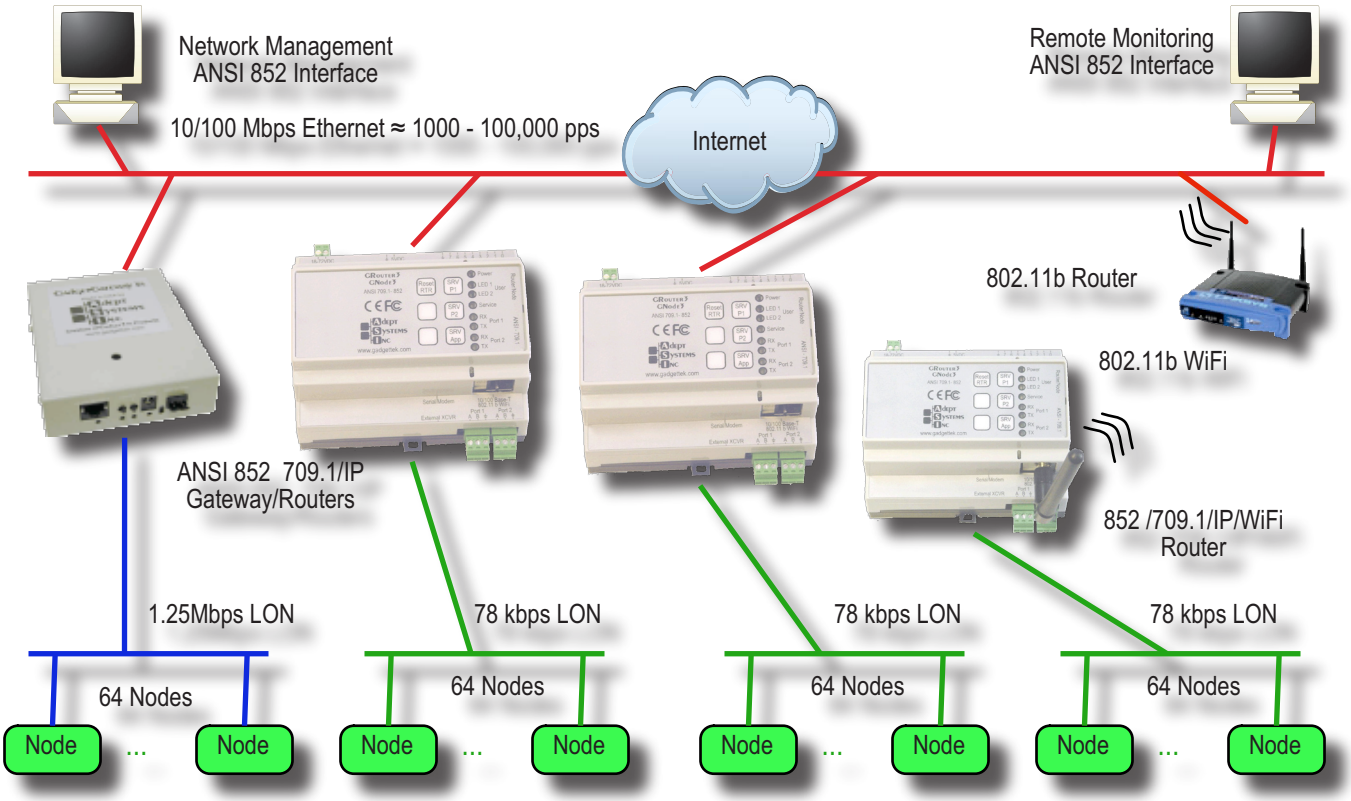


Figure 1: Scalable component network with IP backbone using Adept's 852 based LON over IP routers.

Adept Systems Inc
THE 852/709.XPERTS
CREATORS of GADGETEK PRODUCTS

Adept Systems Inc.
2966 Fort Hill Road
Eagle Mountain
Utah 84043-4108
USA
T: 1.801.766.3527 x 112
F: 1.801.766.3528
info@adeptsystemsinc.com
www.adeptsystemsinc.com

LONMARK® ASSOCIATE

BUILDING OPEN SYSTEMS 2005

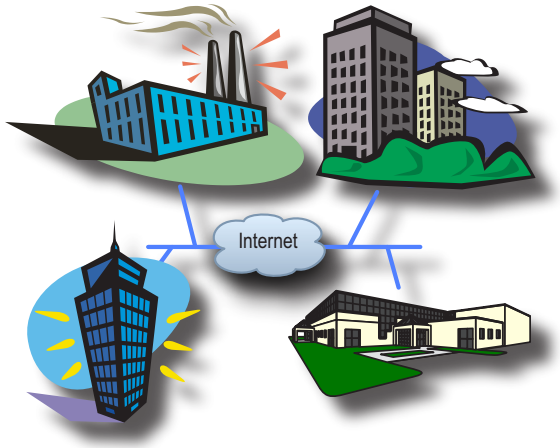


Figure 2: Multi-Site Automation Network

GadgetGateway1A

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

Features and Specifications	
Protocols:	ANSI 709.1, ANSI 852, HTTP for web configuration, 128 852 devices on channel, optional 852 to 852 bridge mode, flood mode, IP multi-cast, IP uni-cast with selective forwarding
Configuration:	Serial console for IP, web server for configuration, remote reboot, 852 normal mode using configuration server, 852 and 709.1 manual mode using console or web browser, manual mode setting 709.1 domain/subnet/node address, SNFT, GFT router tables, 852 channel parameters
Interoperability:	Standard LonWorks® network management tools such as LonMaker™, i.LON™ configuration server, Coactive Router LL
WAN:	Support for NAT and DDNS (no static IP needed)
Monitoring:	Remote protocol analysis with GadgetAnalyzer client
High Availability:	Optional redundant twin mode
Processors:	NetSilicon Net+50, 32 Bit ARM 7 - TDMI, 33MHz GadgetNIC chip XILINX® Spartan™ FPGA 40 MHz
Ethernet & IP:	10/100 Base-T RJ-45 Connector
Serial Console:	RJ-11, 9600 bps
Pins and LEDs:	Two service pins and LEDs, reset pin, power LED, Ethernet link LED, LON traffic LED
709.1 LonTalk:	FT-10A or TP-1250. DC blocking capacitors for link power. 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:	Powder coated steel 4.080" x 5.170" x 1.062" (10.36cm x 13.132cm x 2.7cm)
Mounting:	Desktop, keyhole (screw mount), optional DIN rail
EMI:	FCC Class B, CE mark compliant
Temperature:	0 to 70 degrees C

Point to Point to Multi-Point Router

Each LON/IP router 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. Adept's routers are currently the only 852 compliant router to support 852's IP multi-cast mode.

Interoperability and Integration

Adept's routers are designed for seamless integration into existing LonWorks® control networks. Because they are open standards based, they interoperate with existing LonWorks devices, and network management and configuration software, such as, the i.LON 600 or 1000, i.LON configuration server, and LonMaker. Adept's routers also interoperate with and/or replaces legacy "Router-LL" systems.

Adept's routers provide unique features that solve problems for systems integrators. For example, the routers have a flood mode where two or more routers will be "invisible" to other LON network components and network management tools. This allows seamless connection of remote channels over a LAN or the internet such that they all appear as members of the local subnet. This is useful with legacy network controllers or embedded network configuration tools that are unable to configure routers. Multi-cast support makes flood mode efficient and scalable.

The on-board web server for remote configuration simplifies installation, especially in multi-building sites. The web page includes a ser-

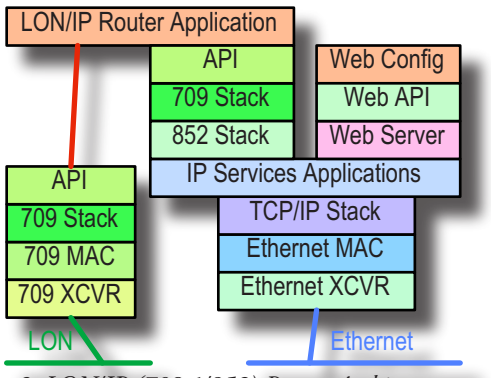


Figure 3: LON/IP (709.1/852) Router Architecture

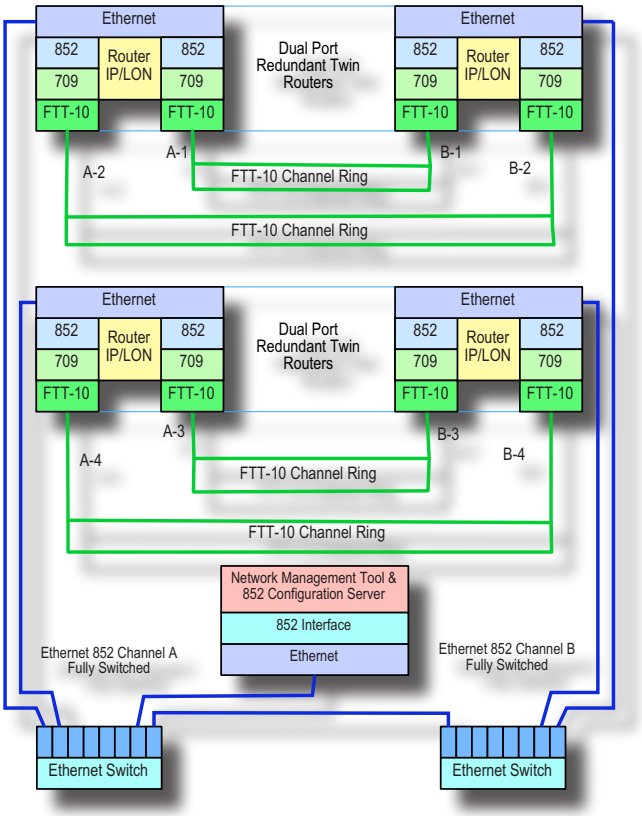


Figure 4: High Availability Redundant Twin Mode

vice pin button to enable remote commissioning in either Normal or Manual mode. The new look web interface includes even more functionality than previous versions.

High Availability Twin Mode

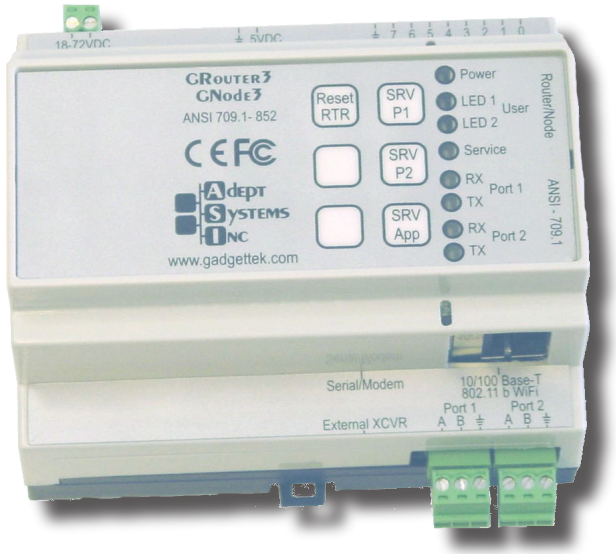
Another unique feature of Adept's routers is an optional redundant twin mode with enhanced reliability for high availability applications such as transportation systems. In redundant twin mode, two routers connect to the same LON channel but without duplicate forwarding of packets. This provides greater 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. 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 and automatically synchronized between the two routers to reduce failover time and increase the fidelity between the backup and primary router operation.

Integrated Short Isolator

The new GRouter3 device will provide enhanced high availability support with an optional integrated short isolator module. This module detects and isolates shorts on an FT-10 bus or ring. The isolator is two sided, so communication from the LON side of the router to the IP side is preserved in the event of a short.

Integrated WiFi Support

Adept's new GRouter3 device is the first ever 852 router to provide integrated 802.11b WiFi support. With the WiFi option the Ethernet port is replaced with a WiFi port. The standard configuration includes an omnidirectional whip antennae. Other antennas are available. This makes it convenient to extend the network between buildings and other remote sites or for retrofit applications.



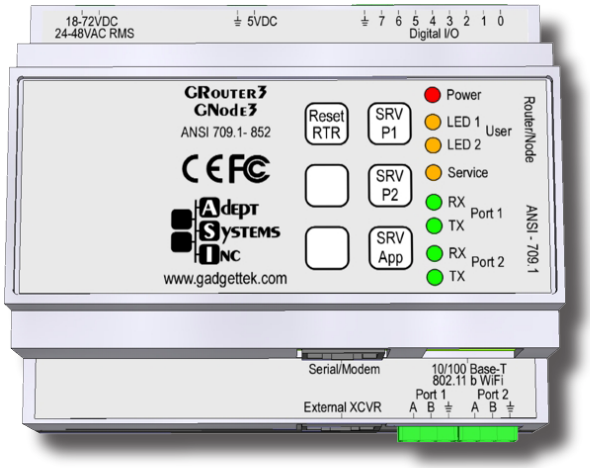
GRouter3A

Modular scalable multi-port platform for LON® over IP routing. 10/100 Base-T Ethernet or 802.11b WiFi.

Features and Specifications	
Protocols:	ANSI 709.1, ANSI 852, HTTP for web configuration, 128 852 devices on channel, optional 852 to 852 bridge mode, flood mode, IP multi-cast, IP uni-cast with selective forwarding
Configuration:	Web server for configuration, remote reboot, 852 normal mode using configuration server, 852 and 709.1 manual mode using console or web browser, manual mode setting 709.1 domain/subnet/node address, SNFT, GFT router tables, 852 channel parameters
Interoperability:	Standard LonWorks® network management tools such as LonMaker™, i.LON™ configuration server, Coactive Router LL
WAN:	Support for NAT and DDNS (no static IP needed)
Monitoring:	Remote protocol analysis with GadgetAnalyzer client
High Availability:	Optional redundant twin mode
Processors:	NetSilicon® 7520 50Mhz, 32bit Arm 7 TDMI 709.1 MAC XILINX® Spartan 3™ FPGA 50 MHz
IP:	10/100 Base-T RJ-45 or 802.11b WiFi Antenna
Pins and LEDs:	Two service pins/LEDS, reset pin, power LED, Ethernet link & traffic LED, LON RX & TX traffic LEDs
709.1 Internal XCVR Ports:	One or two, FT-10A (2 pin) or RS-485 (3 pin), DC blocking capacitors, Euro style 3.5mm connector
709.1 External XCVR Port:	RJ-45 CP0-CP5 Direct mode or Special purpose mode
Input Power:	< 2.5 Watts, 2 Pin Euro 3.5mm connector 18-75 VDC or 24-48 VAC RMS 24-60 VDC Power over Ethernet POE pass through (non WiFI version), optional 5 VDC
Enclosure & Mounting:	Plastic "TopHat" 105 x 86 x 58 mm with integrated DIN rail
EMI:	FCC Class B, CE mark compliant
Temperature:	-25 to 71˚C, optional -40 to 85˚C

GRouter3a WiFi

Modular scalable multi-port platform for LON® over IP routing. Integrated 802.11b WiFi.



GNode3a

Modular scalable platform for custom embedded LON® and IP application development. Binary libraries support open interoperable ANSI 709.1 and 852 protocols. Flexible I/O, LON, and IP hardware configurations.

Features and Specifications	
Libraries	ANSI 709.1 & 852 stack libraries and API Net+OS Real Time OS, GNU Tool Chain
Applications:	DIGI ME or DIGI WIME module based device allows easy migration of IP only custom applications to custom hardware
Platform:	55 MHz ARM 7, 8 Mb Ram 2 Mb Flash
RTC:	Real time clock
I/O:	8 Digital I/O Pins, one user programmable button and two user programmable LEDs on top panel, optional serial port UART or integrated modem, either 10/100 Base-T Ethernet or 802.11b WiFi, two internal LON ports (FT-10 or RS-485), one optional external XCVR port

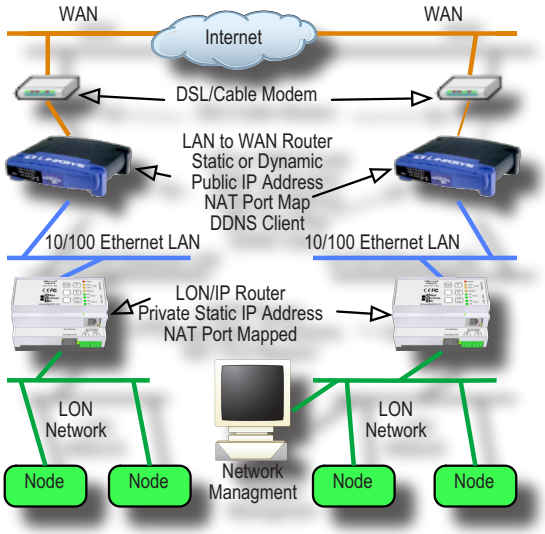


Figure 5: NAT and Dynamic DNS (DDNS)

WAN Support with NAT and DDNS

Adept's LON/IP routers provides support for network address translation (NAT) when installed on a local IP LAN. Unique to Adept is support for Dynamic DNS (DDNS). With a DDNS compliant NAT router, such as, the LinkSys™ BEFSX41, Adept's routers will do DNS lookups to track changes in the IP addresses of its local WAN access point. This saves the expense of static IP addresses for widely distributed sites. The HTTP port for the GRouter3 device is also user configurable to avoid conflicts when used behind a NAT router.

Custom application support

Adept provides OEM hardware, called the GNode3, for custom applications. The GNode3 platform is based on the same hardware as the GRouter3 device. The associated software development kit includes hardware, operating system, GStack binaries, GNU tool chain, and JTag debugger. The GStack libraries include both 709.1 and 852 (LON over IP) stacks with a convenient API. The operating system used by the GNode3 platform is Net+OS which includes support for all the important IP and Web based protocols, such as, TCP/IP, HTTP, SMTP, POP3, Telnet, DNS, DHCP, BootP, RARP, ICMP, FTP, SNTP, and SNMP. The included embedded web server enables remote configuration of the custom application.

Ordering Pricing Availability

For up-to-date ordering, pricing, and availability information, please contact our sales staff or check our online catalog. The GadgetGateway1a product is available either direct or through one of Adept's distributors. The GRouter3 and GNode3 products are expected to be released 2nd quarter 2005. Please call if you would like a pair of evaluation units on 30 day sale or return.

801.766.3527 x 112 (voice)
801.766.3528 (fax)
info@adeptsystemsinc.com
http://www.adeptsystemsinc.com