



Control Network Solutions

O P E N I N G N E T W O R K F R O N T I E R S

CNS Network Infrastructure Products Basic FAQs

What are Network Infrastructure Products (NIPs)?

These are products used in any distributed intelligent system to bring order and control to networkable data. Simple examples are in Ethernet/IP computer networks where you may use Hubs, Switches, Routers and Media converters to create an organised and managed computer network for sharing data between computers.

Why do you need Network Infrastructure Products (NIPs)?

In any distributed intelligent system for example a Building Automation system you cannot simply connect all the separate intelligent building control and monitoring devices to one length of wire and expect all the devices to successfully communicate with each other. Reasons being for example;

Physical laws determine - How far an electrical signal representing a piece of data can travel along a piece of wire or any other medium like fibre optics or wireless. This is like you throwing a ball. It will travel 10's of metres through the air before the law of physics, namely those associated with aerodynamics and gravity bring the ball to rest on the ground again. You would have to then pick it up and throw again to cover additional distance just like a Router or Repeater does in a data network.

How many electrical devices you can connect to any given length of wire. Imagine a length of water pipe filled with water at a set pressure the more taps you attach to it and have turned on the lower the overall pressure becomes until no water at all runs from so of them.

Using different network media –

Data travels at different speeds and is managed in different ways on different media. For example electrical signals convey data over copper wired media whilst light signals do the same over fibre optic media. There is also a difference in the speed at which data is transmitted, usually dictated by physical laws or agreed/defacto standards, over differing media for example 4.7Kbps over mains power cable and 1.25Mbps over fibre optic cable.



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Lastly in this section there is the issue of managing data in a network. It is very unlikely that you would want data from any networked device to be propagated over the whole of your network. Mainly because with all media types there is a limit to how much data traffic you can squeeze onto it at any one time, technically this is called the bandwidth of the media. Ideally you want to keep the amounts of traffic at any one time as low as is possible to insure maximum reliability of data transmitted from one device being received by another.

What Network Infrastructure Products (NIPs) do I use?

This tends to be dependent upon the networking technology you are using. We shall deal with the two types that Control Network Solutions NIP's range covers, namely LonWorks® and Ethernet/IP.

Latest CNS Products Catalogue:

http://www.control-network-solutions.co.uk/products/CNS_PRODUCT_PROFILE.pdf

What Network Infrastructure Products (NIPs) do I use for LonWorks Networks?

LonWorks Network Universal Terminator

The most basic network infrastructure product for a LonWorks network is the Universal Terminator. Terminators provide an electrical balancing function for copper wired networks, excluding mains power networks. They should be used in accordance with the rules laid out in the linked documents. The UTERM and UTERM II are unique in that not only is it Din mounted and highly visible but they can terminate all three standard LonWorks based copper wired networks and that includes simultaneously terminating a 78Kbps and 1.25Mbps network. Data on this device is available at the data sheet link below.

See: *CNS UTERM & UTERMII Data Sheet*

CNS Basic LonWorks Networks Guide Lines

<http://www.control-network-solutions.co.uk/products/>

LonWorks Physical Layer Repeater

Physical Layer Repeaters are simple Plug and Play devices that allow a segment of LonWorks 78Kbps Free Topology cable to be extended in length, **only**. For example if you have installed a Free Topology network cable with the recommended length of

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500mtrs (or 2,700mtrs in Bus Topology) and then realise that infact you need to add another up to 500mtrs of cable in order to connect up all the network devices. You can fit a CNS LonWorks Repeater and simply add this extra length of cable. Though you have now extended the segment length to say 1,000mtrs you are still limited to 64 devices over that total length. The recommendations for how to use this product are found in the CNS Repeater Product Guide at:

<http://www.control-network-solutions.co.uk/products/index.htm>

LonWorks Intelligent Routers

Routers provide two main functions:

- a) They allow you to seamlessly connect different media types together for example 78Kbps to 1.25Mbps or 19Kbps LonWireless or 1.25Mbps Fibre Optics or PowerLine or any combination etc.
- b) They allow you to manage the data traffic over the network so that busy local data traffic sections can be isolated from, for example the main network backbone.

In any Lon network for which you are considering the use of these devices, you must always remember these simple rules:

- 1) Each side of an intelligent standard LonWorks Router is a node on that side of the network. In other words if you have a segment of devices with say 50 controllers attached fitting a router will mean that there are infact 51 devices connected to that segment
- 2) Remember to terminate on either side of the router
- 3) Once a router is physically installed and running, if you just move its position in the network it will not function with out resetting the unit.
- 4) It is recommended that the highest speed transceiver side is connected to that side of the network nearest the network management PC.
- 5) These intelligent routers can be configured to operate in a number of ways for example as Repeaters, Configured Routers and Learning Routers. This configuration can be done prior to shipment or on-site with appropriate Network Management tools.

The above is not exhaustive but will help avoid many initial support calls to specialist

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staff. For further information please refer to the CNS Router Product Guide at <http://www.control-network-solutions.co.uk/products/index.htm>

It is always advisable to consult a Network Specialist, unless you have significant experience, when considering using these products.

CNS has three types of LonWorks Router:

- 1) SMX Router allows you to connect virtually any LonWorks media to any LonWorks media. It allows changes in media types to be accommodated even after installation. It has wide input power supply, simple to use LonMark Compliant, LNS Compliant and fully approved for all LonWorks tools.
- 2) Din Router, compact Din Mountable, wide input power supply, simple to use LonMark Compliant, LNS Compliant and fully approved for all LonWorks tools.
- 3) eNode™ Lon/IP Router allows seamless connectivity of LonWorks devices over Ethernet/IP networks. It is compact, simple to use, Din Mountable, IP852 compliant, i.Lon@1000 & 600 Configuration Server compliant and Coactive Router-LL compliant. It is fully approved to work with Honeywell's, TAC's software tools as well as LonMaker for Windows.
This product allows you to extend LonWorks networks over wide area Ethernet networks for long distances, increased flexibility uses existing TCP/IP infrastructure media, provides high speed back bone with 10/100M Ethernet connectivity. The LonWorks EIA 709 connection is via FTT10, TPT1250 and LonWireless transceivers.

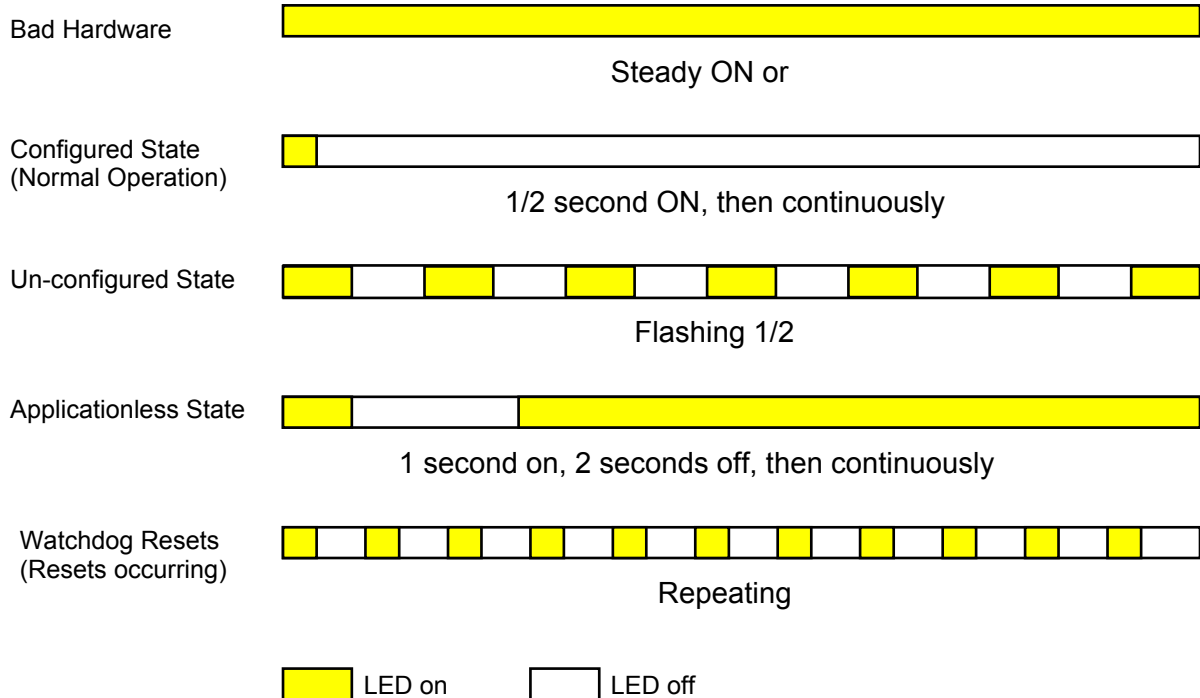
What does the Service Pin LED tell me?

Typically every LonWorks device has a Service LED. This LED can provide some simple debugging information in the absence of more sophisticated analysis tools, as can be seen in the following:



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OPENING NETWORK FRONTIERS





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eNode™ Lon/IP Router Family

Do You Need a Lon/IP *Configuration Server* for your Lon/IP networked devices?

Answer = Not necessarily

Firstly, with the CNS/Adept eNode™III/Grouter3 technology you do not need a *Configuration Server* for small and static IP addressed networks.

The 852 standard has two installation modes, Normal and Manual. The eNode™III/Grouter3 supports both Normal and Manual mode. Other manufacturers 852 routers do not support manual mode. With manual mode you do not need a configuration server unless LNS or LonMaker is on the same 852 channel. For small 852 channels Manual Mode is simple to use.

If you choose to use a *Configuration Server* then it only needs to be running whilst the network is being set up. Once the network is configured and assuming static IP addresses are used and the routing tables will not change then the *Configuration Server* can be turned off.

Do I need to pay for a Lon/IP *Configuration Server*?

Answer = No

The i.Lon® *Configuration Server* is freely available and compatible with all currently available Lon/IP products from the three main suppliers.

Do I need to run a Lon/IP *Configuration Server* on every channel?

Answer = No

The i.Lon® *Configuration Server* is a multi-channel product.

Is Lon/IP *Configuration Server* part of the 852 standard?

Answer = No



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Additional production information and installation guides can be found at:

<http://www.control-network-solutions.co.uk/products/index.htm>

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