

## Next Generation Intelligent Lon<sup>®</sup> EIA/ANSI 709 Router

### Datasheet



#### Features

- ◆ Connects twisted pair LonWorks<sup>®</sup> nodes to fibre optic back-bones, links or subnets
- ◆ Linear Bus or Ring network topology
- ◆ Single-Fibre core 2.50 Mbps full duplex communication reduces installation cost by 50%
- ◆ Supports standard LonTalk<sup>®</sup> channel FO-20S, FO-20L and legacy FO-10
- ◆ Multimode fibre and Singlemode fibre {1310/1550nm WDM} supported
- ◆ Long haul Singlemode (up to 80Km) reduces the need for repeaters.
- ◆ Supports 1.25Mbps/2.50Mbps LonWorks<sup>®</sup> throughput with large node count
- ◆ Adapt different fibre optic port types i.e. multimode/singlemode supporting special user requirements allowing for a more cost effective solution
- ◆ LED Port link status for each fibre port showing connectivity
- ◆ Node status reporting via on-board Neuron chip to insure network reliability
- ◆ Onboard fibre alarm failure relay
- ◆ Din rail & Panel mountable
- ◆ Operating voltage: 10V to 30V AC/DC
- ◆ LonMark<sup>®</sup>, LonWorks<sup>®</sup>, LonTalk<sup>®</sup>, LNS<sup>®</sup>, LonMaker<sup>®</sup> compliant
- ◆ RoHS lead-free compliant
- ◆ CE, FCC pending

## Description

The router implements the full set of LonWorks<sup>®</sup> EIA/ANSI 709 router functions: Configured, Learning, Bridge or Repeater.

It connects LonWorks twisted pair copper networks to LonWorks Fibre optic networks, or extends twisted pair networks over long distances or through harsh environments. The Fibre router can be used to create links and back-bones that connect copper LonWorks subsystems. This Fibre router implements the open standard LonTalk<sup>®</sup> EIA-709 communications protocol. They are simple to install out of the box being fully compatible with all LNS based network management tools.

Fibre optic interconnection is ideal for applications needing high throughput, expandability, immunity to electromagnetic interference or communications over long distances. Maximum LonWorks<sup>®</sup> communication throughput is maintained on the Fibre optic interconnect regardless of the distance or number of nodes attached. A Fibre optic ring can implement multiple subnets with several hundred Fibre optic nodes (the allowable number of nodes is a function of average link length and the Fibre optic cable characteristics; 750 to 3,000 node capacity is typical). These capabilities make the next generation SMX transceiver ideal solutions for large projects with substantial message traffic as well as small projects to connect as few as two nodes together.

Next generation fibre optic network supports SMX transceivers operating at different throughput speeds up to 2.50Mbps on the same ring or linear bus automatically. Packet traffic is forwarded only to nodes with matching speed, while maintaining maximum network performance. On-board slide switch enabling the node to over-ride speed matching allowing receiving all traffic.

### **Fault Tolerant Network using Ring Topology**

All data is transmitted and received simultaneously using two light wave spectrums over a single strand of optic cable for each port. If the ring is broken i.e. one port no longer is connected or a node is powered off, data will then travel in both directions on the fibre so all nodes remain connected in the presence of a single fault.

### **Router Status Reporting**

Each Router has its own Neuron to enable remote status reporting of the fibre link. It sends a service request message across the network indicating a possible node problem i.e. node power cycling/loss, port link status change; port link transitions from

linked to not linked or vice versa. The node continuously monitors network ports and will notify the network user of a possible node fault. Each node has its own unique Neuron ID to help in identifying reporting nodes. Node status reporting supported via the on-board Neuron as follows:

1. 'Change' in Fibre port i.e. link loss, Link active or port failure causes the node to send current port status out to the network.

'Network Variable' Node Status provided as follows: {See fibre transceiver install notes for further definition}

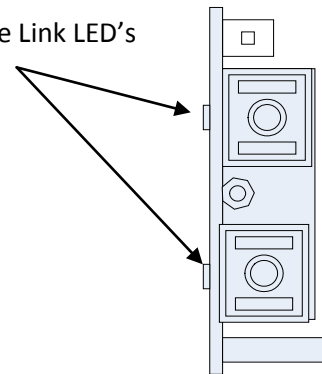
1. nvoNetworkStat
2. nvoLeftPortStat
3. nvoRightPortStat
4. nvoPortFailure
5. nviRelayControl
6. nviRelayEnable

{Neuron code can be created adapting to customer requirements.}

In addition each Router locally indicates via LED's the status of the fibre link as follows-

1. 'Solid green' LED means the fibre port is receiving link signals from far node and the fibre network is operating redundantly.
2. 'Solid yellow' LED means the fibre port is receiving link signals from far node and the fibre network is operating as a 'segment' or 'multidrop'.
3. 'Fast blinking yellow' LED means link loss i.e. no link pulses received from far end node.
4. 'Slow Blinking yellow' LED means port failure i.e. packets received on this fibre port are corrupted, CRC packet errors or no packets received while port is linked.

Left and Right Fibre Link LED's



The new Transceiver automatically monitors all fibre packet traffic looking for sustained periodic crc packet errors or no packet traffic.

The new router relay activates if the fibre port link is lost or if there is a possible problem indicating a fibre port failure. This on-board mechanical relay provides node status of fibre ports by activating when the fibre port link is lost or fibre port failure. The relay can be remotely controlled via network management, supporting equipment remote control i.e. lighting, pumps, motors etc. The on-board mechanical relay provides SPDT operation supporting the following voltages: 240VAC@5Amps, 120VAC@10/5Amps, 28VDC@10/5Amps

## Installation

Installation is easy and units are fully compatible with all LNS based network management tools.

### **Merging Legacy and Next Generation Networks**

Legacy networks i.e. linear/bus or ring can be expanded when migrating from {880nm} network to next generation {1310/1550nm} network using a Lon router converting to twisted pair copper and vice versa. Additionally the existing old and obsolete routers can be upgraded by replacing the existing LonFibre transceiver with the latest version. However, the old router end plate will not be compatible with the new transceiver so will have to be discarded.

### **Connections**

Fibre ports must always be connected so that a left port is connected to a right port of the next node in the ring. Segments must obey the same rules; i.e. even if only two nodes are connected, the left port of one must connect to the right port of the next. All connections must be made with multimode or singlemode fibre optic cable, using 'SC' style termination.

Minimum use of patch panel connections is recommended, as each patch introduces optical loss. ST to SC adapter's available.

## Specification

### Mechanical -



### Electrical –

Operating voltage:  $\pm 10 - 50$  VDC or  $12 - 30$  VAC

### Network –

Two SC connectors for network connection, 1310/1550nm Multi Mode and Single Mode supported. The unit is compatible with 62.5/125 micron and 100/140 micron multimode. 50/125 micron may be used with reduced optical link budgets.

Also single mode is compatible with 9.0 micron single mode cable.

### Environmental-

Operating temperature: 0C to +70C, cost option -40C to +85C

Humidity: 95% non-condensing

## Optical Performance Information

See separate document on our website, [click here](#).

## Ordering Information

### Model Part Number Format – CNSA-BB-CDE-FGH

Example part number: “CNS8-03-M11-1DC” means:

- Intelligent LonWorks Router
- 3KM fibre optic range
- Multimode
- SC fibre connection
- 1310/1550nm WDM
- FTT-10A transceiver
- DIN mountable
- 0C to +70C

**A** = 8, Intelligent LonRouter, RTR-10, two full duplex Fibre ports, one Lon transceiver port

**BB** = 03, 3km multimode optics  
= 15, 15km single mode optics  
= 25, 25km single mode optics  
= 40, 40km singlemode optics  
= 60, 60km singlemode optics  
= 80, 80km singlemode optics

**C** = S, Singlemode optics  
= M, Multimode optics

**D** = 1, Fibre port connection “SC”

**E** = 1, Fibre optic wavelength 1310/1550nm WDM single core full duplex

**F** = 1, FTT-10A Free Topology 78Kbps twisted pair copper interface.  
= 2, TPT78, 78Kbps twisted pair copper interface.  
= 3, TPT/XF 1.25Mbps twisted pair copper interface.

**G** = D, Din Mounted  
= P, Panel mount

**H** = C, Commercial temperature range 0C to +70C  
= E, Extended temperature range -40C to +85C

**Note:** All Fibre terminations are “SC”.

## Contact Details

### Control Network Solutions Ltd

Studio 7, Intec 2, Intec Business Park  
Wade Road, BASINGSTOKE,  
Hampshire, RG24 8NE, England

Tel: +44 (0) 1256 818700

Fax: +44 (0) 1256 812520

Email: [cns@control-network-solutions.co.uk](mailto:cns@control-network-solutions.co.uk)

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

No part of this publication may be reproduced or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, in part or in whole, without prior permission of Control Network Solutions. We reserve the right to make changes without notice to any products herein as part of its continued product development and improvements. We do not assume any liability arising out of the application or use of any product or circuit described herein.

LON, Neuron, LNS, LonMark, LonTalk, LNS are the registered trademarks of Echelon Corp.