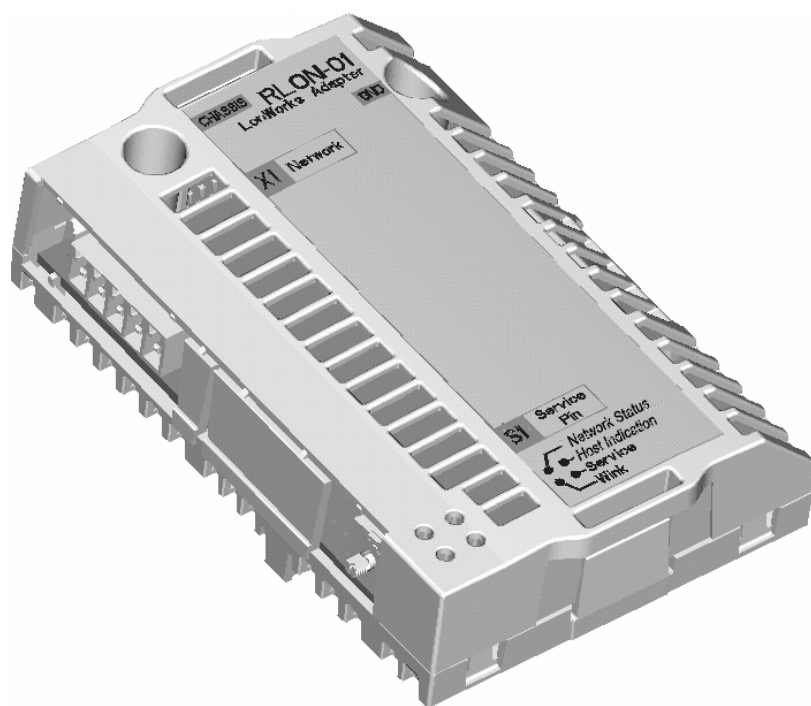


# ABB Drives

## User's Manual

### LONWORKS<sup>®</sup> Adapter Module RLON-01





LONWORKS<sup>®</sup> Adapter Module  
RLON-01

**User's Manual**

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# Safety instructions

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## Overview

This chapter states the safety instructions that must be followed when installing and operating the RLON-01 LONWORKS® Adapter module. The material in this chapter must be studied before attempting any work on, or with, the unit.

## Warnings and notes

This manual distinguishes two sorts of safety instructions. Warnings are used to inform of conditions which can, if proper steps are not taken, lead to a serious fault condition, physical injury and death. Notes are used when the reader is required to pay special attention or when there is additional information available on the subject. Notes are less crucial than Warnings, but should not be disregarded.

### Warnings

Readers are informed of situations that can result in serious physical injury and/or serious damage to equipment with the following symbols:



**Dangerous Voltage Warning:** warns of situations in which a high voltage can cause physical injury and/or damage equipment. The text next to this symbol describes ways to avoid the danger.



**General Warning:** warns of situations which can cause physical injury and/or damage equipment by means other than electrical. The text next to this symbol describes ways to avoid the danger.



**Electrostatic Discharge Warning:** warns of situations in which an electrostatic discharge can damage equipment. The text next to this symbol describes ways to avoid the danger.

## Notes

Readers are notified of the need for special attention or additional information available on the subject with the following symbols:

- WARNING!**      **Warning** aims to draw special attention to a particular issue.
- Note:**            **Note** gives additional information or points out more information available on the subject.

## General safety instructions

**WARNING!** All electrical installation and maintenance work on the drive should be carried out by qualified electricians.

The drive and adjoining equipment must be properly earthed.

Do not attempt any work on a powered drive. After switching off the mains, always allow the intermediate circuit capacitors 5 minutes to discharge before working on the drive, the motor or the motor cable. It is good practice to check (with a voltage indicating instrument) that the drive is in fact discharged before beginning work.

The motor cable terminals of the drive are at a dangerously high voltage when mains power is applied, regardless of motor operation.

There can be dangerous voltages inside the drive from external control circuits even when the drive mains power is shut off. Exercise appropriate care when working with the unit. Neglecting these instructions can cause physical injury and death.



**WARNING!** There are several automatic reset functions in the drive. If selected, they reset the unit and resume operation after a fault. These functions should not be selected if other equipment is not compatible with this kind of operation, or dangerous situations can be caused by such action.

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More Warnings and Notes are printed at appropriate instances along the text.

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The General Safety Instructions given in the Installation and Start-up Manual of the drive should be studied before attempting any work on or with the unit.



# Introduction

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## Overview

This chapter contains a description of the User's manual for the RLON-01 LONWORKS® Adapter module.

## Intended audience

The guide is intended for people responsible for installing, commissioning, and using the RLON-01 LONWORKS® Adapter module with an ABB drive. The reader is expected to have a basic knowledge of

- electrical fundamentals and wiring practices
- the drive and its control panel
- the host controller software.

## What this manual contains

The installation and start-up of the RLON-01 LONWORKS® Adapter module are introduced in this manual.

It is assumed that the drive is installed and ready to operate before starting the installation of the adapter module. For more information on the installation and start-up procedures of the drive, please refer to its user documentation.

**Safety Instructions** are featured in the first few pages of this manual.

**Introduction** contains a short description of the manual.

**Overview** contains a short description of the LONWORKS® system and the RLON-01 LONWORKS® Adapter module, a delivery checklist, and information on the manufacturer's warranty.

**Mechanical installation** contains the placing and mounting instructions for the module.

**Electrical installation** contains the wiring instructions.

**Programming** explains how to program the master station and the drive before the communication through the adapter module can be started.

**Communication** contains a description of how data is transmitted through the RLON-01 and information about resource files.

**Fault Tracing** explains how to trace faults with the Status LEDs on the RLON-01.

**Network variables** presents the network variable list of the RLON-01.

**Technical data** contains information on physical dimensions, configurable settings and connectors of the module and a specification of the fieldbus link.

## Terms and abbreviations

### *Communication Module*

Communication Module is a parameter name/parameter selection name for a device (e.g. a fieldbus adapter) through which the drive is connected to an external serial communication network (e.g. a fieldbus). The communication with the communication module is activated by a drive parameter.

### *CRC*

Cyclic Redundancy Check

### *Data Words*

The Control Word (sometimes called the Command Word) and the Status Word, References and Actual Values (see chapter [Communication](#)) are types of data words; the contents of some data words are user-definable. For more information, see the drive documentation.

*Functional profile*

Functional profiles may contain one or more objects that interact to perform the required profile defined operability. The Variable Speed Motor Drive Profile contains the general LONMARK® Node Object and the application specific Variable Speed Motor Drive Object.

*LonMark®*

Products that conform to LONMARK® Interoperability Guidelines, defined by the LONMARK® Interoperability Association, are eligible to carry the LONMARK® logo.

*LonTalk®*

The communication protocol in LONWORKS® networks

*LSB*

Least significant bit

*MSB*

Most significant bit

*nci*

Network configuration variable

*Neuron® ID*

Every LONWORKS® device or – as synonym – node must have a unique ID. This is called the Neuron® ID. This ID is, on Neuron® Chip-based nodes, stored in the chip itself and cannot be changed.

*RLON-01 LONWORKS® Adapter module*

The RLON-01 Adapter module is one of the optional fieldbus adapter modules available for ABB drives. The RLON-01 is a device through which the drive is connected to a LONWORKS® network.

*nv*

Network variable

*nvi*

Input network variable

*nvo*

Output network variable

*Object*

Object is a set of one or more network variables implemented as SNVTs with semantic definitions relating the behaviour of the object to the network variable values, in addition to a set of configuration properties. For example, the Variable Speed Motor Drive Object and the Node Object represent two types of objects.

*Parameter*

A parameter is an operating instruction for the drive. Parameters can be read and programmed by using the drive control panel, or through the RLON-01 module.

*Service Pin*

The Service Pin is used in installing the node. Pressing the Service Pin causes the LONWORKS® node to send the so-called Service Pin Message which includes, among other things, the Neuron® ID. This informs the network or installation tool about the node.

*SNVT*

Standard Network Variable Type

*UCPT*

User Configuration Property Type

**Further information**

Further information is available on the WWW from **[www.lonmark.org](http://www.lonmark.org)** and **[www.echelon.com](http://www.echelon.com)**.



# Overview

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## Overview

This chapter contains a short description of the LONWORKS® system and the RLON-01 Adapter module, a delivery checklist, and warranty information.

## The LONWORKS® system

The LONWORKS® system is an open serial communication solution that enables data exchange between all kinds of automation components.

A LONWORKS® network consists of intelligent devices, called nodes, connected by one or more communications media that communicate with one another using the LonTalk® protocol. A LONWORKS® network can consist of up to 32385 nodes divided into 255 subnets (127 nodes/subnet). Nodes are programmed to send messages to one another in response to external events or messages they receive. Each intelligent device, for example a programmable thermostat in a building control system, is a LONWORKS® node. A node is connected to other nodes with appropriate communications media, such as twisted pair cable, RF link, or power line circuit.

Each node includes a physical interface, *transceiver* that interfaces with the communication media. The RLON-01 module uses the FT-X1 Free Topology Transceiver (compatible with FTT-10A transceiver) from Echelon Corporation. This is the most commonly used twisted-pair media in building automation and this architecture supports star, bus, and loop wiring. The FT-X1 transceiver connects to a twisted pair cable with a baud rate of 78 kbit/s and appears as a high impedance to the network when unpowered, hence it does not interfere with the network communications when powered down.

LONWORKS® nodes are objects that respond to various inputs and that produce desired outputs. Connecting the inputs and outputs of these network objects enables the network to perform specific tasks.

While the function of any particular node may be quite simple, the interaction among nodes enables a LONWORKS® network to perform complex tasks. A benefit of LONWORKS® networks is that a small number of common node types may perform a broad spectrum of different functions depending on how they are configured and connected.

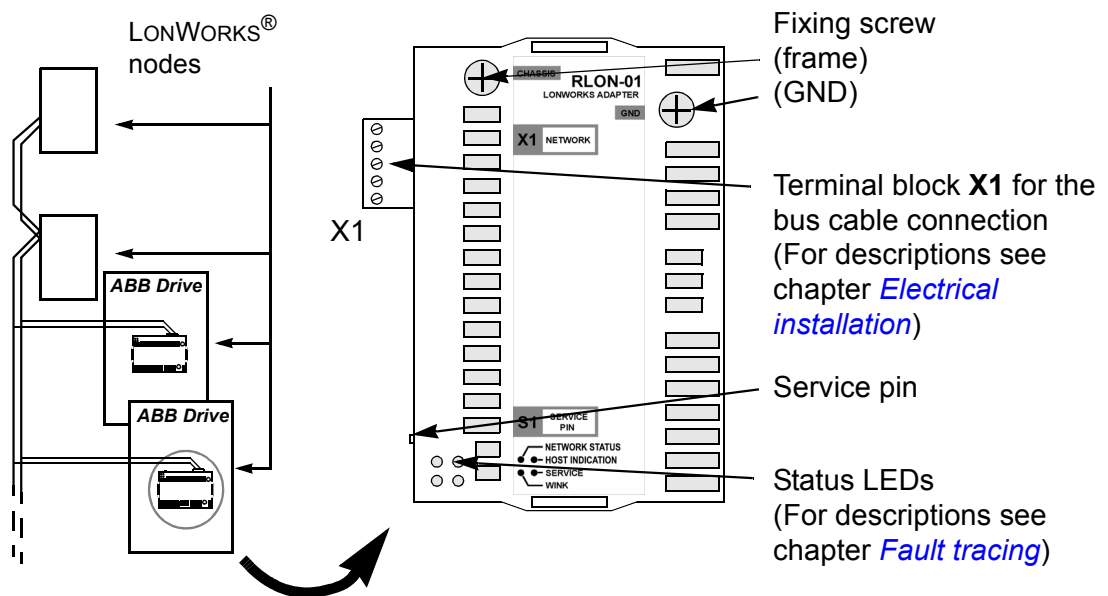
### **The RLON-01 LONWORKS® Adapter module**

The RLON-01 LONWORKS® Adapter module is an optional device for ABB drives which enables the connection of the drive to a LONWORKS® network. Through the RLON-01 LONWORKS® Adapter module it is possible to:

- give control commands to the drive (Start, Stop, Run enable, etc.)
- feed speed or frequency reference to the drive
- give a process actual value or a process reference to the PID controller of the drive
- read status information and actual values from the drive
- change drive parameter values
- reset a drive fault
- control other LONWORKS® nodes.

The network variables and functions supported by the RLON-01 LONWORKS® Adapter module are discussed in chapters [Programming](#) and [Communication](#).

The adapter module is mounted into an option slot on the motor control board of the drive. See the *Hardware Manual* of the drive for module placement options.



*The construction of the LONWORKS® network and the module layout of the ROLON-01 Adapter module.*

## Compatibility

The ROLON-01 is compatible with

- ACS550 and ACH550
- ACS800 Standard Application Program ASXR7010 or later.

## Delivery check

The option package for the ROLON-01 LONWORKS® Adapter module contains

- LONWORKS® Adapter module, type ROLON-01
- two screws (M3x10)
- this manual.

## Warranty and liability information

The manufacturer warrants the equipment supplied against defects in design, materials and workmanship for a period of twelve (12) months after installation or twenty-four (24) months from date of manufacturing, whichever first occurs. The local ABB office or distributor may grant a warranty period different to the above and refer to local terms of liability as defined in the supply contract.

The manufacturer is not responsible for

- any costs resulting from a failure if the installation, commissioning, repair, alternation, or ambient conditions of the drive do not fulfil the requirements specified in the documentation delivered with the unit and other relevant documentation
- units subjected to misuse, negligence or accident
- units comprised of materials provided or designs stipulated by the purchaser.

In no event shall the manufacturer, its suppliers or subcontractors be liable for special, indirect, incidental or consequential damages, losses or penalties.

If you have any questions concerning your ABB drive, please contact the local distributor or ABB office. The technical data, information and specifications are valid at the time of printing. The manufacturer reserves the right to modifications without prior notice.

# Mechanical installation

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**WARNING!** Follow the safety instructions given in this manual and in the Hardware Manual.

---

## Mounting

The RLON-01 is to be inserted into its option slot inside the drive. The module is held in place with plastic retaining clips and two screws. The screws also provide the earthing of the I/O cable shield connected to the module, and interconnect the GND signals of the module and the control board of the drive.

On installation of the module, the signal and power connection to the drive is automatically made through a 34-pin connector.

Mounting procedure:

- Insert the module carefully into its position inside the drive until the retaining clips lock the module into position.
- Fasten the two screws (included).

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**Note:** Correct installation of the screws is essential for fulfilling the EMC requirements and for proper operation of the module.

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# Electrical installation

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## Overview

This chapter contains

- cabling instructions
- instructions for bus termination
- connection instructions for the RLON-01 module and earthing instructions for the bus cable.



**WARNING!** Before installation, switch off the drive power supply. Wait for five minutes to ensure that the capacitor bank of the drive is discharged. Switch off all dangerous voltages connected from external control circuits to the inputs and outputs of the drive.

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## Cabling

Arrange the bus cables as far away from the motor cables as possible. Avoid parallel runs. Use bushings at cable entries.

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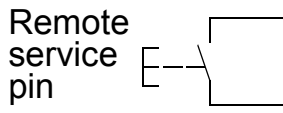
**Note:** LONWORKS® networks require special cable. It is recommended to use cables defined by LONMARK® Layer 1-6 Guidelines. See chapter [Technical data](#).

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### RLON-01 connections

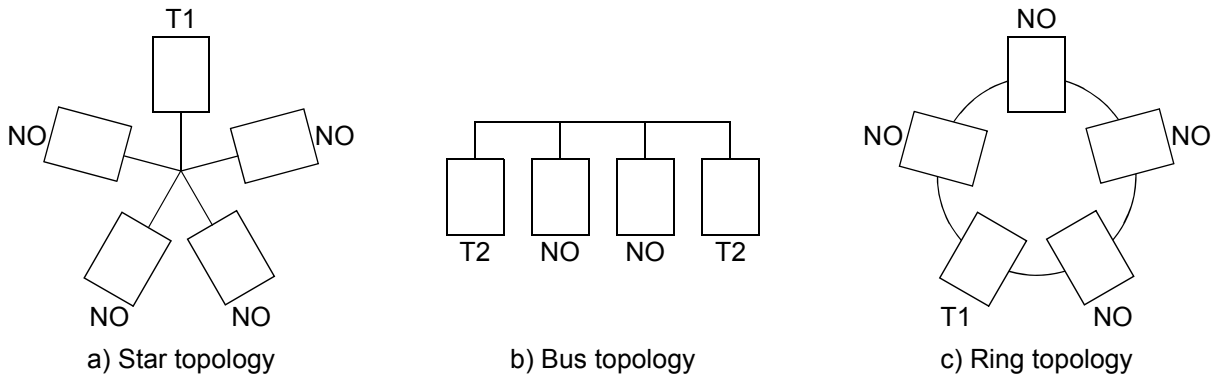
The bus cable is connected to terminal block X1 on the RLON-01.

X1		Description
1	SHF	RC-filtered connection to the module ground
2	GND	Service pin ground
3	Service pin	Remote functionality for service pin push button
4	Net B	Network cable connection
5	Net A	



### Bus termination

The bus line is terminated with resistors connected between the network cable connection interfaces A and B when the RLON-01 module is at the end of the bus. Termination prevents signal reflections from the bus cable ends.



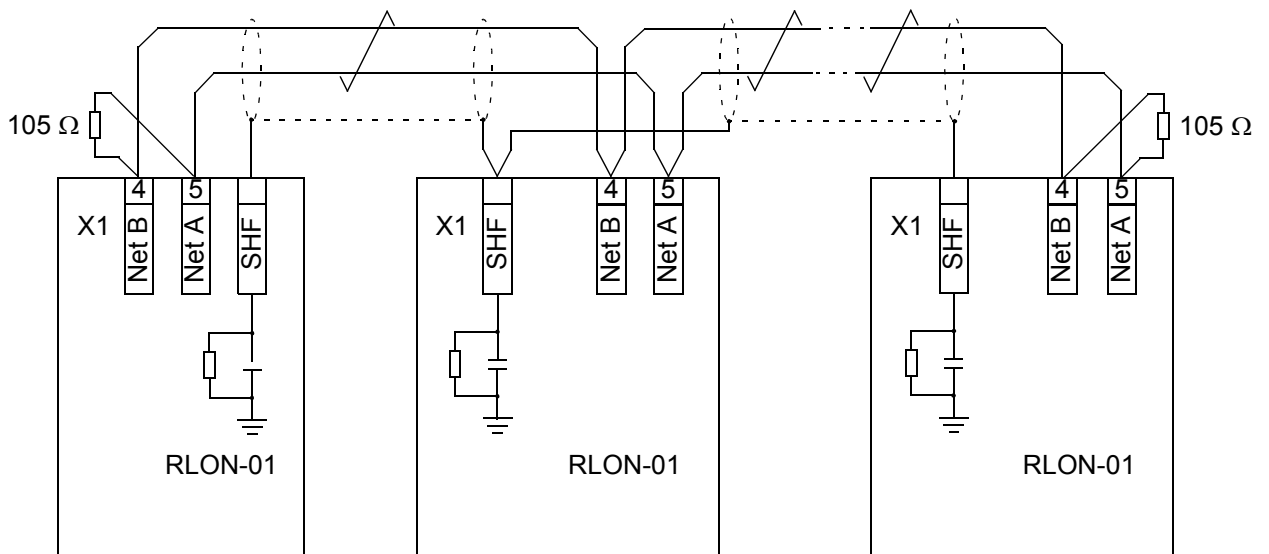
*Bus termination for different network topologies*



Different bus terminations	
T1	52.5 ohm termination at one of the nodes in one bus segment
T2	105 ohm termination at both ends of the line
NO	No termination

### Earthing the LONWORKS® cable screens

The LONWORKS® cable screen can be directly earthed at one station only. At other stations the screen should be earthed via an RC filter.



*Network cable connection for bus topology.*



# Programming

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## Overview

This chapter gives information on configuring the drive for operation with the LONWORKS® Adapter module.

## Configuring the system

After the RLON-01 LONWORKS® Adapter module has been mechanically and electrically installed according to the instructions given in chapters 3 and 4, the LONWORKS® network and the drive must be prepared for communication and operation with the module.

The RLON-01 cannot communicate with the drive before it is configured for the LONWORKS® network. The LONWORKS® communication configuration does not require parametrisation of the drive. The LONWORKS® network is configured using a network installation tool. Please, refer to the installation tool documentation for network configuration and to chapter [Communication](#) for the resource files.

## Configuring the drive

It is preferable to configure the drive before the RLON-01 is configured for the network. The reason for this is that the RLON-01 reads several parameter values from the drive in order to operate correctly and in order to select different modes. Furthermore, some of the configuration network variable values receive their defaults from the drive. The drive control location parameters should also be set accordingly to enable full and logical operation of the RLON-01. See chapter [Drive parameter settings](#).

RLON-01 information parameters		
Fieldbus par. no.	Parameter name	Description
1	MODULE TYPE	Type of the module (LonWorks)
2	NODE STATE	State of the RLON-01
3-8	NEURON ID [5...0]	Neuron <sup>®</sup> chip ID
9	NODE ADDRESS 1	ID of the node within this subnet
10	NODE SUBNET 1	Subnet to which the node belongs
11-16	DOMAIN ID 1 [4...0]	Domain ID in a LonWorks network
17	NODE ADDRESS 2	ID of the node within this subnet
19-24	DOMAIN ID 2 [4...0]	ID in a LonWorks network
25	XMIT ERRORS	Number of CRC errors
26	TRANS TIMEOUTS	Number of transmission failures

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**Note:** These parameters become visible in the drive only after the RLON-01 has been configured on the network side.

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## MODULE TYPE

### *Explanation:*

Shows the module type as detected by the drive. The value cannot be adjusted by the user. (If this parameter is undefined, the communication between the drive and the module has not been established.)

## NODE STATE

### *Explanation:*

Contains the current state of the network interface. Configured on-line is the normal run-time mode and means that the node is commissioned and on-line on the network. Soft/Bypass/Hard off-line means that the node is not participating actively on the network.

0 = Unknown state

1 = Unconfigured

2 = Applicationless

3 = Configured on-line

4 = Configured off-line

5 = Soft off-line

6 = Configured bypass off-line

7 = Hard off-line, Bypass off-line

## NEURON ID

### *Explanation:*

Displays the Neuron® chip ID of the module in decimal format. The ID is determined by the chip and cannot be changed.

NEURON ID [5] = byte 6 of the unique Neuron ID (MSB)

NEURON ID [4] = byte 5 of the unique Neuron ID

NEURON ID [3] = byte 4 of the unique Neuron ID

NEURON ID [2] = byte 3 of the unique Neuron ID

NEURON ID [1] = byte 2 of the unique Neuron ID

NEURON ID [0] = byte 1 of the unique Neuron ID (LSB)

## NODE ADDRESS 1

Indicates the ID of the node within the subnet.

### *Range:*

1-127

0 means that the node address 1 is not assigned.

## NODE SUBNET 1

### *Explanation:*

Indicates to which subnet the node belongs.

### *Range:*

1-255

0 means that the node subnet 1 is not assigned.

## DOMAIN ID 1

### *Explanation:*

Indicates the ID of the domain within this subnet. Each domain in a LonWorks® network has a unique ID of 0, 1, 3 or 6 bytes in length. If the ID is shorter than 6 bytes, it is left justified in this field.

DOMAIN ID 1 [5] = byte 6 of the domain ID (MSB)

DOMAIN ID 1 [4] = byte 5 of the domain ID

DOMAIN ID 1 [3] = byte 4 of the domain ID

DOMAIN ID 1 [2] = byte 3 of the domain ID

DOMAIN ID 1 [1] = byte 2 of the domain ID

DOMAIN ID 1 [0] = byte 1 of the domain ID (LSB)

## NODE ADDRESS 2

### *Explanation:*

Indicates the ID of the node within this subnet.

### *Range:*

1-127

0 means that the node address is not assigned.

## DOMAIN ID 2

### *Explanation:*

Indicates the ID of the domain within this subnet. Each domain in a LonWorks® network has a unique ID of 0,1,3 or 6 bytes in length. If the ID is shorter than 6 bytes, it is left justified in this field.

DOMAIN ID 2 [5] = byte 6 of the domain ID (MSB)

DOMAIN ID 2 [4] = byte 5 of the domain ID

DOMAIN ID 2 [3] = byte 4 of the domain ID

DOMAIN ID 2 [2] = byte 3 of the domain ID

DOMAIN ID 2 [1] = byte 2 of the domain ID

DOMAIN ID 2 [0] = byte 1 of the domain ID (LSB)

## XMIT ERRORS

### *Explanation:*

Indicates the number of CRC errors detected during packet reception. An increasing value may be due to collisions or noise on the transceiver input.

## TRANS TIMEOUTS

### *Explanation:*

Indicates the number of times that the node failed to receive expected acknowledgements or responses after retrying configuring number of times. An increasing value may be due to destination nodes being inaccessible on the network, transmission failures because of noise on the channel, or if any destination node has insufficient buffers or receive transaction records.



# Drive parameter settings

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## ACx550 parameter settings

Parameter	Setting	Function
9904 MOTOR CTRL MODE	Motor control mode SPEED; SCALAR	Initialises RLON-01 operation mode.
9907 MOTOR NOM FREQ*	Motor nominal frequency	Initialises the nciNmlFreq value.
9908 MOTOR NOM SPEED*	Motor nominal speed	Initialises the nciNmlSpeed value. This value corresponds to nviSpeedStpt value 100% (of nominal speed or frequency).
1001 EXT1 COMMANDS	COMM	Enables network control of the drive.
1003 DIRECTION	REQUEST	Enables change of direction.
1102 EXT1/EXT2 SEL	COMM	Enables the change of external control location via nviExt1Ext2Sel
1103 REF1 SELECT	COMM	Enables setting the reference 1 via network.
1106 REF2 SELECT	COMM	Enables setting the reference 1 via network.
1401 RELAY OUTPUT1	COMM	Enables control of relay output 1 via nviDigOutput and nviDigOutput1.
1402 RELAY OUTPUT2	COMM	Enables control of relay output 2 via nviDigOutput and nviDigOutput2.
1403 RELAY OUTPUT3	COMM	Enables control of relay output 3 via nviDigOutput and nviDigOutput1.
1601 RUN ENABLE	COMM	Enables the run enable command via the network.

Parameter	Setting	Function
1604 FAULT RESET SEL	COMM	Enables the fault reset command via the network.
2001 MINIMUM SPEED*	Minimum motor speed.	Initialises nciMinSpeed value.
2002 MAXIMUM SPEED*	Maximum motor speed.	Initialises nciMaxSpeed value.
2007 MINIMUM FREQ*	Minimum output frequency.	Initialises nciMinSpeed value.
2008 MAXIMUM FREQ*	Maximum output frequency.	Initialises nciMaxSpeed value.
2202 ACCELER TIME 1	Acceleration time	Initialises nciRampUpTm value.
2203 DECELER TIME 1	Deceleration time	Initialises nciRampDownTm value.
4001 GAIN*	PID gain	Initialises nciPidGain value.
4002 INTEGRATION TIME*	PID integration time	Initialises nciPidIntTime value.
4003 DERIVATION TIME*	PID derivation time	Initialises nciPidDerTime value.
9802 COMM PROT SEL	EXT FBA	Enables fieldbus communication with the drive.

\*If one of the drive parameter values marked with \* not using the corresponding configuration network variable is changed, the RLON-01 needs to be re-initialised in order to update it's value. For example, if the stop mode parameter is changed with the control panel, the RLON-01 needs to be either rebooted or temporarily disabled for the RLON-01 to read the updated value from the drive. The same applies if one of the marked parameters using the nciParValue configuration parameter is changed.

## ACS800 parameter settings

Parameter	Setting	Function
99.02 APPLICATION MACRO*	Set to PID if corresponding network variables are to be used	Enables the updates of nciPidGain, nciPidIntTime and nciPidDerTime.
99.04 MOTOR CTRL MODE	Motor control mode DTC; SCALAR	Initialises RLON-01 operation mode.
99.07 MOTOR NOM FREQ*	Motor nominal frequency	Initialises the nciNmlFreq value.
99.08 MOTOR NOM SPEED*	Motor nominal speed	Initialises the nciNmlSpeed value. This value corresponds to nviSpeedStpt value 100% (of nominal speed or frequency).
10.01 EXT1 STRT/STP/DIR	COMM MODULE	Enables network control of the drive.
10.03 DIRECTION	REQUEST	Enables change of direction.
11.02 EXT1/EXT2 SEL	11.09	Enables the change of external control location via pointer parameter 11.09 EXT1/EXT2 SEL PTR.
11.03 EXT REF1 SELECT	COMM MODULE	Enables network reference setting.
11.09 EXT1/EXT2 PTR	+009.006.11	Determines the parameter 11.09 to point to signal 9.06 DS MCW bit 11, which carries the nviExt1Ext2Ctrl command.
16.01 RUN ENABLE	COMM MODULE	Enables the run enable command via the network.
16.04 FAULT RESET SEL	COMM MODULE	Enables the fault reset command via the network.

Parameter	Setting	Function
20.01 MINIMUM SPEED*	Minimum motor speed. Only in DTC mode.	Initialises nciMinSpeed value.
20.02 MAXIMUM SPEED*	Maximum motor speed. Only in DTC mode.	Initialises nciMaxSpeed value.
20.07 MINIMUM FREQ*	Minimum output frequency. Only in SCALAR mode.	Initialises nciMinSpeed value.
20.08 MAXIMUM FREQ*	Maximum output frequency (in SCALAR MODE ONLY)	Initialises nciMaxSpeed value.
22.02 ACCEL TIME1	Acceleration time	Initialises nciRampUpTm value.
22.03 DECEL TIME1	Deceleration time	Initialises nciRampDownTm value.
40.01 PID GAIN*	PID gain	Initialises nciPidGain value.
40.02 PID INTEG TIME*	PID integration time	Initialises nciPidIntTime value.
40.03 PID DERIV TIME*	PID derivation time	Initialises nciPidDerTime value.
98.02 COMM MODULE LINK	FIELDBUS	Enables fieldbus communication with the drive.
98.07 COMM PROFILE	GENERIC	Enables control of the drive via the Variable Speed Motor Drive object.

\*If one of the drive parameter values marked with \* not using the corresponding configuration network variable is changed, the RLON-01 needs to be re-initialised in order to update it's value. For example, if the stop mode parameter is changed with the control panel, the RLON-01 needs to be either rebooted or temporarily disabled for the RLON-01 to read the updated value from the drive. The same applies if one of the marked parameters using the nciParValue configuration parameter is changed.

# Communication

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## Overview

This chapter describes the RLON-01 operation on a LONWORKS® network.

## General

In LONWORKS® networks, the network design emphasis is on designing the network variable connections. The connection design determines the amount of data flow between different nodes, thus determining the decision of transmission media and network topology overall in the network.

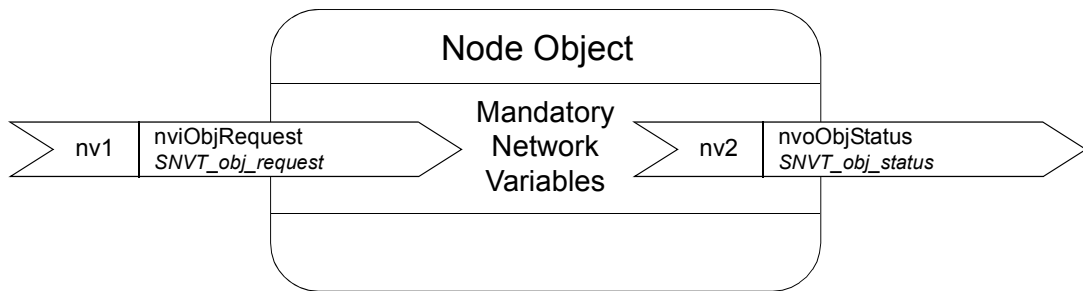
In designing the connections, the selection of protocol services is also crucial when determining the network data flow. By default, the network connections use acknowledged messaging with a certain retry count. This can, however, be changed by the installation tool to optimize the overall network performance.

To be able to realise the required operation of the whole system, a clear picture of the capabilities of individual nodes is needed. These capabilities are determined by the network variables.

## LonMark objects

The RLON-01 includes two objects, a node object and a drive object. The node object is used to control the drive object. The drive object realises the LONMARK® Functional Profile: 'Variable Speed Motor Drive Version', 1.1. The profile defines a set of network variables and configuration properties. In addition, the drive object includes a set of manufacturer defined network variables and configuration properties that are defined in order to realise functions only applicable for ABB Drives.

## Node object



## Input network variable

### NviObjRequest

#### Definition:

Network input SNVT\_obj\_request nviObjRequest

#### Explanation:

Enables control commands and updates from network. The status of the node is reported in nvoObjStatus.

#### Valid range:

Object request	Function
RQ_UPDATE_STATUS	Updates nvoObjStatus.
RQ_CLEAR_STATUS	Clears nvoObjStatus.
RQ_CLEAR_ALARM	Resets fault in the drive.
RQ_REPORT_MASK	Reports supported requests in nvoObjStatus.
RQ_NORMAL	Sets object to default state. (the normal request)
RQ_DISABLE	Stops the drive with the selected stop mode and disables the operation and object.
RQ_ENABLE	Enables the drive for operation and enables the object.

Commands not listed above will be reported as invalid\_request in nvoObjStatus.

## Output network variable

### **NvoObjStatus.**

*Definition:*

Network output SNVT\_obj\_status nvoObjStatus

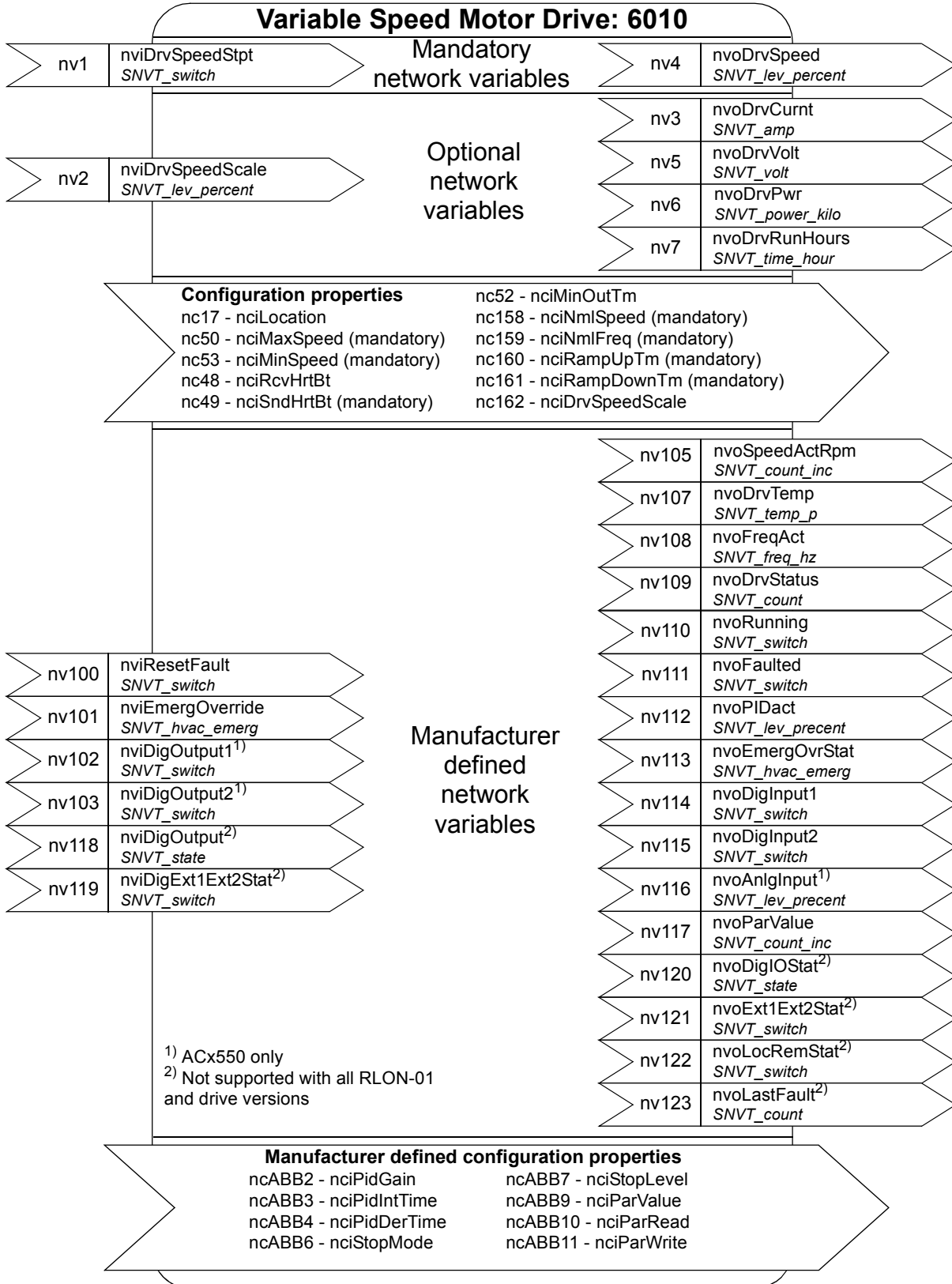
*Explanation:*

Reports the node object status.

*Valid range:*

<b>Bit settings</b>	<b>Description/Function</b>
invalid_id	Invalid node ID requested
report_mask	Reporting supported fields
disabled	If RQ_DISABLE active
electrical_fault	Fault bit in Status Word
in_alarm	Alarm bit in Status Word

## Variable speed motor drive object





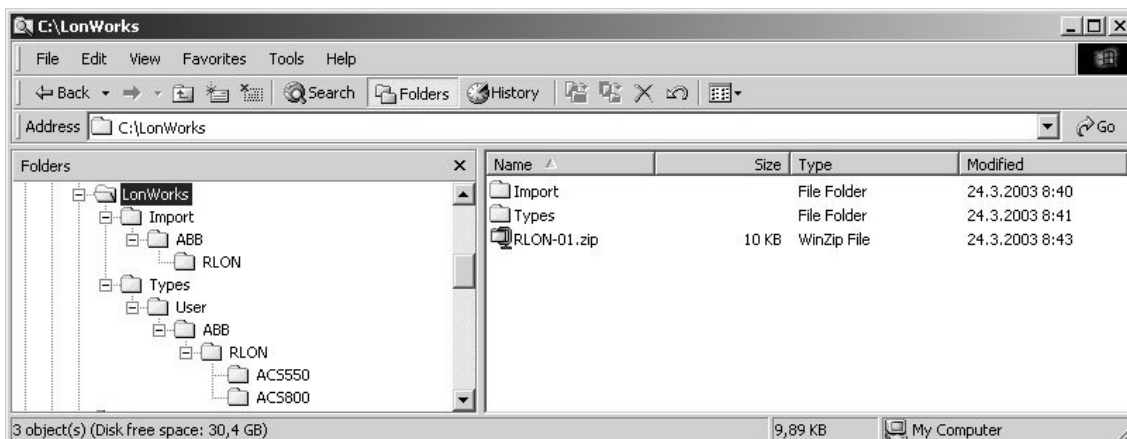
## RLON-01 network variables

A detailed description of all the RLon-01 network variables and configuration properties is given in chapter [Network variables](#).

## Resource files

For the installation of the RLon-01 with different installation tools, resource files are needed. If you have not received these files together with the RLon-01, please consult your local ABB representative.

The downloadable application is provided for different drive types. The resource files are delivered as a compressed (\*.ZIP) archive. Copy the ZIP archive to your LonWorks® directory and unpack the compressed files. The following directory structure is created:



The directory

### **LONWORKS\TYPES\USER\ABB\RLON**

holds the user type and enumeration file (VSD\_RLON01.TYP), the user type formatting file (VSD\_RLON01.FMT), the functional profile template file (VSD\_RLON01.FPT) and the language file (VSD\_RLON01.ENU).

The directory

### **LONWORKS\IMPORT\ABB\RLON**

holds the external interface files (\*.XIF).

The directories

**LONWORKS\IMPORT\ABB\RLON\ACS800**  
**LONWORKS\IMPORT\ABB\RLON\ACS550**  
**etc.**

hold the external interface files (\*XIF)

XIF version 2.0 (e.g. ACS800\_V20.XIF)

XIF version 3.1 (e.g. ACS800\_V31.XIF)

XIF version 4.1 (e.g. ACS800\_V41.XIF)

XIF version 4.4 (e.g. ACS800\_V44.XIF)

The device interface (XIF) file is a standalone file that documents the device interface for a type of device. It also documents the default values for all the configuration properties on the device. The three different \*XIF files are for the different versions of the LonMaker-tool. The appropriate XIF file version is chosen depending on the installation tool used.

# Network variables

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## Supported input network variables

The actual valid range of a network input variable can be smaller than the one reported in this manual, depending of the drive firmware. Typically the ACx550 discards the parameter changes, if the value coming from the fieldbus is outside the range of the drive parameter; ACS800 limits too large values to the highest value allowed.

<b>Name</b>	<b>Description</b>
<i>NviDrvSpeedStpt</i>	Low-resolution speed set point.
<i>NviDrvSpeedScale</i>	Scaling for nviDrvSpeedStpt.
<i>NviResetFault</i>	Input to the motor to clear the fault status in the drive.
<i>NviEmergOverride</i>	Possibility to stop the motor in case of an emergency.
<i>NviDigOutput</i>	Controls the state for digital output 1-8.
<i>NviDigOutput1</i>	Controls the state for digital output 1.
<i>NviDigOutput2</i>	Controls the state for digital output 2.
<i>NviExt1Ext2Ctrl</i>	Sets the control location that should be used (Ext1/Ext2).

## NviDrvSpeedStpt

### Definition:

Network input SNVT\_switch nviDrvSpeedStpt

### Explanation:

Provides a low-resolution speed set point. The speed set point is the result of multiplication of nviDrvSpeedStpt and nviDrvSpeedScale. For example if the value of the nviDrvSpeedStpt is 100% and the value of the nviDrvSpeedScale is -150%, the actual speed setpoint value is -150% meaning 1.5 times nominal speed in reverse direction.

### Valid range:

State	Value	Equivalent percentage	Requested speed
0	Not used	Not used	STOPPED
1	0	0%	0%
1	1 to 100	1 to 100.0%	1 to 100.0%
0xFF	Not used	Not used	AUTO (invalid)

### Default value:

The default value is AUTO (state = 0xFF). The value will be adapted at power-up and in case of not receiving an update within the specified Receive Heartbeat time. This input network variable may use the Receive Heartbeat function if the Receive Heartbeat function is set up for use. The actual drive speed also depends on nviDrvSpeedScale.

This value is transmitted immediately when its value has changed significantly, but no faster than the Minimum Send Time (nciMinOutTm) configuration value, if used.

Additionally, this network variable will also be transmitted as a heartbeat output on a regular basis as specified by the Maximum Send Time (nciSndHrtBt) configuration value.

## NviDrvSpeedScale

### Definition:

Network input SNVT\_lev\_percent nviDrvSpeedScale

### Explanation:

Provides scaling for nviDrvSpeedStpt. For example if nviDrvSpeedStpt value is 100% and nviDrvSpeedScale value is -150%, then the actual speed setpoint value is -150% meaning 1.5 times the nominal speed in reverse direction.

### Valid range:

-163.84% .. 163.83% (0.005% or 50 ppm)

The value 0x7FFF represents invalid data.

### Default value:

Defined by nciDrvSpdScale. This value will be adopted at power-up and in case of not receiving an update within the specified Receive Heartbeat time.

## NviResetFault

### Definition:

Network input SNVT\_switch nviResetFault

### Explanation:

Provides an input to the motor to clear the fault status in the drive.

### Valid range:

State	Value	Command
0	0%	Enable reset fault
1	100%	Reset fault

On a transition from 0 to 1, this input network variable clears the fault condition in the drive. Following a fault reset, this variable should be set to '0' to enable the next reset fault.

*Default value:*

The module will power-up in the 'Enable Reset Fault' state.

**NviEmergOverride***Definition:*

Network input SNVT\_hvac\_emerg nviEmergOverride (HVAC Emergency Mode)

*Explanation:*

Provides the possibility to stop the motor in case of an emergency.

*Valid range:*

<b>Setting</b>	<b>Function</b>
EMERG_NORMAL	No emergency mode, motor control enabled.
EMERG_PRESSURIZE	Not in use
EMERG_DEPRESSURIZE	Not in use
EMERG_PURGE	Not in use
EMERG_SHUTDOWN	Emergency shutdown mode. Stops motor.
EMERG_FIRE	Not in use
EMERG_NUL	Not in use

*Default value:*

EMERG\_NORMAL

## NviDigOutput

---

**Note:** The number of digital inputs varies between the drive types.

---

*Definition:*

Network input SNVT\_state nviDigOutput

*Explanation:*

Controls the state for digital output 1-8.

*Valid range:*

bit0	Sets Digital Output 1
bit1	Sets Digital Output 2
bit2	Sets Digital Output 3
bit3	Sets Digital Output 4
bit4	Sets Digital Output 5
bit5	Sets Digital Output 6
bit6	Sets Digital Output 7
bit7	Sets Digital Output 8
bit8-15	Unused

*Default value:*

0

## NviDigOutput1

---

**Note:** For ACx550 only.

---

*Definition:*

Network input SNVT\_switch nviDigOutput1

*Explanation:*

Controls the state for digital output 1.

*Valid range:*

State	Value	Command
0	0%	Set digital output to LOW state (0).
1	100%	Set digital output to HIGH state (1).

*Default value:*

0

## NviDigOutput2

---

**Note:** For ACx550 only.

---

*Definition:*

Network input SNVT\_switch nviDigOutput2

*Explanation:*

Controls the state for digital output 2.

*Valid range:*

state	value	command
0	0%	Set digital output to LOW state (0).
1	100%	Set digital output to HIGH state (1).

*Default value:*

0



**NviExt1Ext2Ctrl***Definition:*

Network input SNVT\_switch nviExt1Ext2Ctrl

*Explanation:*

This input variable sets the control location that should be used (Ext1/Ext2).

*Valid range:*

<b>state</b>	<b>value</b>	<b>command</b>
0	0%	Ext1 selected.
1	100%	Ext2 selected.

## Supported output network variables

<b>Name</b>	<b>Description</b>
<i>NvoDrvSpeed</i>	Speed of the drive as a percentage of the nominal speed.
<i>NvoDrvCurnt</i>	Drive current in Amp
<i>NvoDrvPwr</i>	Drive power in kilowatt
<i>NvoDrvRunHours</i>	Total power-on time in whole hours
<i>NvoDrvVolt</i>	Motor output voltage in Volts.
<i>NvoSpeedActRpm</i>	Output speed in rpm
<i>NvoDrvTemp</i>	Temperature in degrees C
<i>NvoFreqAct</i>	Output frequency in Hz
<i>NvoDrvStatus</i>	Status of the drive.
<i>NvoRunning</i>	Motor running state.
<i>NvoFaulted</i>	Information on the fault status of the drive.
<i>NvoPidAct</i>	PID controller feedback value
<i>NvoEmergOvrStat</i>	Feedback for the nviEmergOverride
<i>NvoDigInput1</i>	Status of Digital Input 1 (DI1).
<i>NvoDigInput2</i>	Status of Digital Input 2 (DI2).
<i>NvoAnlgInput</i>	Status of Analog Input.
<i>NvoParValue</i>	Data read at parameter set by nciParRead.
<i>NvoDigIOStat</i>	State for digital output 1-8.
<i>NvoExt1Ext2Stat</i>	Control location currently used (Ext1/Ext2).
<i>NvoLocRemStat</i>	Control mode (Local or Remote).
<i>NvoLastFault</i>	Latest malfunction code that has occurred.

**NvoDrvSpeed***Definition:*

Network output SNVT\_lev\_percent nvoDrvSpeed

*Explanation:*

Provides the speed of the drive as a percentage of the nominal speed.

*Valid range:*

-163.84% .. 163.83% (0.005% or 50 ppm)

A value of 0x7FFF represents invalid data.

**NvoDrvCurnt***Definition:*

Network output SNVT\_amp nvoDrvCurnt

*Explanation:*

Drive current in Amp

*Valid Range:*

-3276.8 .. 3276.7 Amp (0.1 A)

A value of 0x7FFF represents invalid data.

**NvoDrvPwr***Definition:*

Network output SNVT\_power\_kilo nvoDrvPwr

*Explanation:*

Drive power in kilowatt

*Valid range:*

0 .. 6553.5 kW (0.1 kW)

A value of 0xFFFF represents invalid data.

**NvoDrvRunHours***Definition:*

Network output SNVT\_time\_hour nvoDrvRunHours

*Explanation:*

Total power-on time in whole hours

*Valid range:*

0 .. 65535 hour (1 hour)

A value of 0xFFFF represents invalid data.

**NvoDrvVolt***Definition:*

Network output SNVT\_volt nvoDrvVolt

*Explanation:*

Motor output voltage in Volts.

*Valid range:*

-3276.8 .. 3276.7 Volt (0.1 V)

A value of 0x7FFF represents invalid data.

**NvoSpeedActRpm***Definition:*

Network output SNVT\_count\_inc nvoSpeedActRpm

*Explanation:*

Output speed in rpm

*Valid range:*

-32768 .. 32767 rpm (1 rpm)

**NvoDrvTemp***Definition:*

Network output SNVT\_temp\_p nvoDrvTemp

*Explanation:*

Temperature in degrees C

*Valid range:*

-274 .. 6279.5 degrees C (0.1 degrees C )

A value of 0x7FFF represents invalid data.

**NvoFreqAct***Definition:*

Network output SNVT\_freq\_hz nvoFreqAct

*Explanation:*

Output frequency in Hz

*Valid range:*

0 .. 6553.5 Hz (0.1 Hz)

## NvoDrvStatus

### Definition:

Network output SNVT\_state nvoDrvStatus

### Explanation:

Indicates the status of the drive.

### Valid range:

Bit	Name	Value	Description
0	FWD	1	The motor is rotating in forward direction.
1	REV	1	The motor is rotating in reverse direction.
2	NETCTRL	1	The LonWorks network is selected as the active control source.
3	NETREF	1	The LonWorks network is selected as the active reference source.
4	RTSO	1	Inverter power section is ready to be switched on.
5	FAULT	1	The inverter has a fault.
6	ALARM	1	The inverter has an alarm.
7	REF	1	The motor is running at reference speed / frequency.
8	FORN	1	Not in use.
9	ZERO SPEED	1	The motor is running inside the zero speed window.
10	LIMIT	1	The speed, frequency or torque is out of its limits.
11	ACC	1	The motor is accelerating.
12	DEC	1	The motor is decelerating.
13	Vendor Specific 1	1	Not in use
14	Vendor Specific 2	1	Not in use
15	Vendor Specific 3	1	Not in use

**NvoRunning***Definition:*

Network output SNVT\_switch nvoRunning

*Explanation:*

Indicates the motor running state.

*Valid range:*

TRUE, 100% Motor is running

FALSE, 0% Motor is not running

A value of 0xFF on nvoRunning.state represents invalid data.

**NvoFaulted***Definition:*

Network output SNVT\_switch nvoFaulted

*Explanation:*

Provides information on the fault status of the drive.

*Valid range:*

TRUE, 100% Drive is in faulted mode

FALSE, 0% Normal mode

A value of 0xFF on nvoFaulted.state represents invalid data.

**NvoPidAct***Definition:*

Network output SNVT\_lev\_percent nvoPidAct

*Explanation:*

PID controller feedback value

*Valid range:*

-163.84% .. 163.83% (0.005% or 50 ppm)

A value of 0x7FFF represents invalid data.

## NvoEmergOvrStat

### Definition:

Network output SNVT\_hvac\_emerg nvoEmergOvrStat

### Explanation:

Feedback for the nviEmergOverride

### Valid range:

Value	Function
EMERG_NORMAL	No emergency mode, motor control enabled
EMERG_SHUTDOWN	Emergency shutdown mode. Stops motor.

A value of EMERG\_NUL represents invalid data.

## NvoDigInput1

### Definition:

Network output SNVT\_switch nvoDigInput1

### Explanation:

Indicates the status of Digital Input 1 (DI1).

### Valid range:

State	Value	Command
0	0%	low
1	100%	high

A value of 0xFF on nvoDigInput1.state represents invalid data.



## NvoDigInput2

### *Definition:*

Network output SNVT\_switch nvoDigInput2

### *Explanation:*

Indicates the status of Digital Input 2 (DI2).

### *Valid range:*

State	Value	Command
0	0%	low
1	100%	high

A value of 0xFF on nvoDigInput2.state represents invalid data.

## NvoAnlgInput

---

**Note:** For ACx550 only.

---

### *Definition:*

Network output SNVT\_lev\_percent nvoAnlgInput

### *Explanation:*

Contains the status of Analog Input.

### *Valid range:*

-163.84% .. 163.83% (0.005% or 50 ppm)

A value of 0x7FFF represents invalid data.

## **NvoParValue**

### *Definition:*

Network output SNVT\_count nvoParValue

### *Explanation:*

Contains the data read at parameter set by nciParRead.

### *Valid range:*

0 .. 65535

A value of 0xFFFF represents invalid data.

## **NvoDigIOStat**

---

**Note:** The number of digital inputs and outputs varies between the drive types.

---

### *Definition:*

Network output SNVT\_switch nvoDigIOStat.

### *Explanation:*

This output variable contains the state for digital inputs 1...8 and digital outputs 1...8.

*Valid range:*

bit0	Status of Digital Input 1
bit1	Status of Digital Input 2
bit2	Status of Digital Input 3
bit3	Status of Digital Input 4
bit4	Status of Digital Input 5
bit5	Status of Digital Input 6
bit6	Status of Digital Input 7
bit7	Status of Digital Input 8
bit8	Status of Digital Output 1
bit9	Status of Digital Output 2
bit10	Status of Digital Output 3
bit11	Status of Digital Output 4
bit12	Status of Digital Output 5
bit13	Status of Digital Output 6
bit14	Status of Digital Output 7
bit15	Status of Digital Output 8

*Default value:*

0

### **NvoExt1Ext2Stat**

---

**Note:** For ACx550 only.

---

*Definition:*

Network output SNVT\_switch nvoExt1Ext2Stat

*Explanation:*

This output variable shows the control location currently used (Ext1/Ext2).

*Valid range:*

<b>State</b>	<b>Value</b>	<b>Command</b>
0	0%	Ext1 Selected
1	100%	Ext2 Selected

A value of 0xFF on nvoExt1Ext2Stat represents invalid data.

### **NvoLocRemStat**

*Definition:*

Network output SNVT\_switch nvoLocRemStat

*Explanation:*

This output variable shows if the drive is in Local or Remote control mode.

*Valid range:*

<b>State</b>	<b>Value</b>	<b>Command</b>
0	0%	Drive is controlled locally
1	100%	Drive is controlled from the network

A value of 0xFF on nvoLocRemStat represents invalid data.

### **NvoLastFault**

*Definition:*

Network output SNVT\_switch nvoLastFault

*Explanation:*

This output variable shows the latest malfunction code that has occurred.

*Valid range:*

As parameter 82 in Profile Server

## Supported network configuration properties

All configuration properties are defined as configuration network variables in this product. Some network management tools will show these variables as SCPT/UCPT configuration properties and some as network configuration variables. The difference in the network management tools only affects the presentation of the variables but not their functionality.

<b>Name</b>	<b>Description</b>
<i>SCPTmaxSendTime / nciSndHrtBt</i>	Maximum send time for the variable nvoDrvSpeed.
<i>SCPTmaxRcvTime / nciRcvHrtBt</i>	Defines the maximum allowed update interval for input network variables nviDrvSpeedStpt and nviDrvSpdScale.
<i>SCPTminSendTime / nciMinOutTm</i>	Defines the minimum wait time before the network output variables can be propagated (resent).
<i>SCPTnomRPM / nciNmISpeed</i>	Sets the nominal motor speed.
<i>SCPTnomFreq / nciNmIFreq</i>	Sets the nominal frequency of the motor.
<i>SCPTminSetpoint / nciMinSpeed</i>	Defines the minimum speed of the motor as a percentage of the nominal speed defined by the Nominal Speed (nciNmISpeed) configuration value.
<i>SCPTmaxSetpoint / nciMaxSpeed</i>	Defines the maximum motor speed.
<i>SCPTrampUpTm / nciRampUpTm</i>	Sets the ramp up time of the drive.
<i>SCPTrampDownTm / nciRampDownTm</i>	Sets the ramp down time of the drive.
<i>SCPTlocation / nciLocation</i>	Physical location of the node.
<i>SCPTdefScale / nciDrvSpdScI</i>	Default value for nviDrvSpeedScale

<i>UCPTstopMode / nciStopMode</i>	Selects between coast and ramp stop.
<i>UCPTstopLevel / nciStopLevel</i>	Stop level value in ramp stop mode.
<i>UCPTpidGain / nciPidGain</i>	PID controller gain in percentage.
<i>UCPTpidIntTime / nciPIDIntTime</i>	PID controller integration time in seconds.
<i>UCPTpidDerTime / nciPidDerTime</i>	PID controller derivation time in seconds.
<i>UCPTparValue / nciParValue</i>	Value input for the user selected parameter nciParWrite.
<i>UCPTparRead / nciParRead</i>	Chooses the parameter value to be read from the drive.
<i>UCPTparWrite / nciParWrite</i>	Defines the parameter value to be written to the drive.

### **SCPTmaxSendTime / nciSndHrtBt**

*Definition:*

Network config input SNVT\_time\_sec nciSndHrtBt

*Explanation:*

Provides the maximum send time for the variable nvoDrvSpeed.

*Valid range:*

0 .. 6553.5 sec (0.1 sec)

The value 0xFFFF represents invalid data.

*Default value:*

0 (disabled)

**SCPTmaxRcvTime / nciRcvHrtBt***Definition:*

Network config input SNVT\_time\_sec nciRcvHrtBt

*Explanation:*

Defines the maximum allowed update interval for input network variables nviDrvSpeedStpt and nviDrvSpdScale. A timeout occurs, if the set update time is exceeded.

*Valid range:*

0 .. 6553.5 sec (0.1 sec)

The value 0xFFFF represents invalid data.

The value 0 disables the Receive Heartbeat mechanism.

*Default value:*

0 (disabled)

**SCPTminSendTime / nciMinOutTm***Definition:*

Network config input SNVT\_time\_sec nciMinOutTm

*Explanation:*

Defines the minimum wait time before the network output variables can be propagated (resent).

*Valid range:*

0 .. 6553.4 sec (0.1 sec)

The value 0xFFFF represents invalid data.

The value 0 disables transmission limiting.

*Default value:*

0 (disabled)

**SCPTnomRPM / nciNmlSpeed***Definition:*

Network config input SNVT\_rpm nciNmlSpeed

*Explanation:*

Is used to set the nominal motor speed.

*Valid range:*

0 .. 65535 rpm (1 rpm)

The value 0xFFFF represents invalid data.

*Default value:*

Read from the drive. Otherwise 0.

**SCPTnomFreq / nciNmlFreq***Definition:*

Network config input SNVT\_freq\_hz nciNmlFreq

*Explanation:*

Is used to set the nominal frequency of the motor.

*Valid range:*

0 .. 6553.5 Hz (0.1 Hz)

*Default value:*

Read from the drive. Otherwise 0.



### **SCPTminSetpoint / nciMinSpeed**

*Definition:*

Network config input SNVT\_lev\_percent nciMinSpeed

*Explanation:*

Defines the minimum speed of the motor as a percentage of the nominal speed defined by the Nominal Speed (nciNmlSpeed) configuration value.

The value of the minimum speed must be defined so that

$$-163.0 \leq \text{minimum speed} \leq \text{maximum speed} \leq 163.0$$

*Valid range:*

-163.84% .. 163.83% (0.005% or 50 ppm)

The value 0x7FFF represents invalid data.

*Default value:*

Read from the drive. Otherwise 0.

### **SCPTmaxSetpoint / nciMaxSpeed**

*Definition:*

Network config input SNVT\_lev\_percent nciMaxSpeed

*Explanation:*

Is used to define the maximum motor speed. The value is entered as a percent of nominal speed, as defined by the Nominal Speed (nciNmlSpeed) configuration value.

The value of the maximum speed must be defined so that

$$-163.0 \leq \text{minimum speed} \leq \text{maximum speed} \leq 163.0$$

*Valid range:*

-163.84% .. 163.83% (0.005% or 50 ppm)

The value 0x7FFF represents invalid data.

*Default value:*

Read from the drive. Otherwise 0.

**SCPTrampUpTm / nciRampUpTm***Definition:*

Network config input SNVT\_time\_sec nciRampUpTm

*Explanation:*

Is used to provide to set the ramp up time of the drive.

*Valid range:*

0 .. 6553.5 sec (0.1 sec)

The value 0xFFFF represents invalid data.

*Default value:*

Read from the drive. Otherwise 0.

**SCPTrampDownTm / nciRampDownTm***Definition:*

Network config input SNVT\_time\_sec nciRampUpTm

*Explanation:*

Is used to provide to set the ramp down time of the drive.

*Valid range:*

0 .. 6553.5 sec (0.1 sec)

The value 0xFFFF represents invalid data.

*Default value:*

Read from the drive. Otherwise 0

**SCPTlocation / nciLocation***Definition:*

Network config input SNVT\_str\_asc nciLocation

*Explanation:*

Location Label: used to provide physical location of the node.

*Valid range:*

31 characters

*Default value:*

empty spaces

**SCPTdefScale / nciDrvSpdScI***Definition:*

Network config input SNVT\_lev\_percent nciDrvSpdScI

*Explanation:*

Default value for nviDrvSpeedScale

*Valid range:*

-163.84% .. 163.83% (0.005% or 50 ppm)

The value 0x7FFF represents invalid data.

*Default value:*

0

**UCPTstopMode / nciStopMode***Definition:*

Network config input SNVT\_switch nciStopMode

UCPT type index: 6

*Explanation:*

Is used to select between coast and ramp stop.

*Valid range:*

OFF = COAST, ON = RAMP

*Default value:*

COAST

**UCPTstopLevel / nciStopLevel***Definition:*

Network config input SNVT\_lev\_percent nciStopLevel

UCPT type index: 7

*Explanation:*

Stop level value in ramp stop mode. When the speed of the drive reaches this level, a coast stop is performed. The value is relative to nvoDrvSpeed i.e. the value of 5% corresponds to nvoDrvSpeed value 5%.

*Valid range:*

Valid range 5-100%

-163.84% .. 163.83% (0.005% or 50 ppm)

The value 0x7FFF represents invalid data.

*Default value:*

5%.

**UCPTpidGain / nciPidGain***Definition:*

Network config input SNVT\_lev\_percent nciPidGain  
UCPT type index: 2

*Explanation:*

PID controller gain in percentage.

*Valid Range:*

-163.84% .. 163.83% (0.005% or 50 ppm)  
The value 0x7FFF represents invalid data.

*Default Value:*

Read from the drive. Otherwise 0.

**UCPTpidIntTime / nciPIDIntTime***Definition:*

Network config input SNVT\_time\_sec nciPidIntTime  
UCPT type index: 3

*Explanation:*

PID controller integration time in seconds.

*Valid range:*

0 .. 6553.5 sec (0.1 sec)  
The value 0xFFFF represents invalid data.

*Default value:*

Read from the drive. Otherwise 0.

**UCPTpidDerTime / nciPidDerTime***Definition:*

Network config input SNVT\_time\_sec nciPidDerTime

UCPT type index: 4

*Explanation:*

PID controller derivation time in seconds.

*Valid range:*

0 .. 6553.5 sec (0.1 sec)

The value 0xFFFF represents invalid data.

*Default value:*

Read from the drive. Otherwise 0.

**UCPTparValue / nciParValue***Definition:*

Network config input SNVT\_count\_inc nciParValue

UCPT type index: 9

*Explanation:*

This input network variable is used as a value input for the user selected parameter nciParWrite.

*Valid range:*

-32768 .. 32767

*Default value:*

0

**UCPTparRead / nciParRead***Definition:*

Network config input SNVT\_count nciParRead

UCPT type index: 10

*Explanation:*

Chooses the parameter value to be read from the drive.

*Valid range:*

0 .. 65535

*Default value:*

0

**UCPTparWrite / nciParWrite***Definition:*

Network config input SNVT\_count nciParWrite

UCPT type index: 11

*Explanation:*

Defines the parameter value to be written to the drive.

*Valid range:*

0 .. 65535

*Default value:*

0

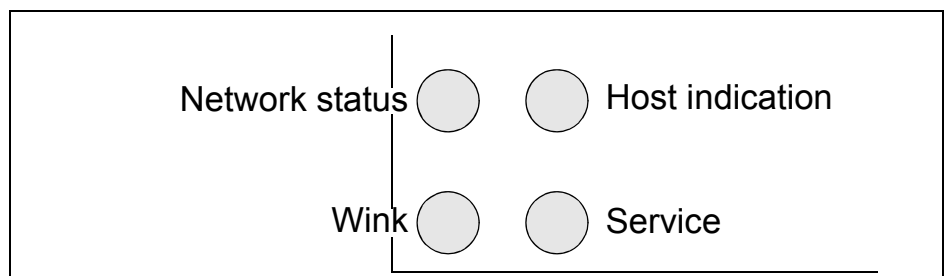




# Fault tracing

## LED indications

The RLO-01 module is equipped with four diagnostic LEDs. The description of the LEDs is presented below.



Name	Colour	Function
Host indication	Green	<b>Lit</b> - Link functions.
	Red	<b>Lit</b> - Link is lost permanently. <b>Flashing</b> - Link is lost temporarily.
Service	Green	<b>Off</b> - The module is configured and installed in a network. <b>Flashing</b> - The module has an application but it is not yet installed in a network. <b>Lit</b> - The module is unconfigured and applicationless. Indicates errors detected by the Neuron self-test routine.
Wink	Red	<b>Off</b> - Normal state <b>Flashing</b> - A wink command is received via the LonWorks® network.
Network status	Green	<b>Lit</b> - The module has been initialised correctly and is working properly. <b>Off</b> - The module is not powered.
	Red	<b>Flashing</b> - A receive heartbeat timeout has occurred. Results in a network communication loss indication to the drive.

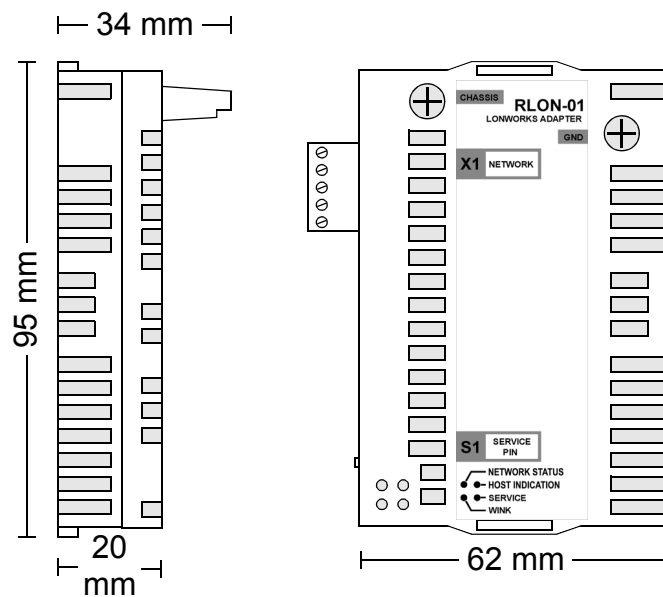


# Technical data

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## RLON-01

### Enclosure:



### Mounting:

Into its option slot inside the drive

### Degree of protection:

IP 20

### Ambient conditions:

The applicable ambient conditions specified for the drive in its *Hardware Manual* are in effect.

### Connectors:

- 34-pin parallel bus connector
- 5-pole screw type connector (detachable)

**Current consumption:**

- 160 mA maximum (5 V), supplied by the control board of the drive.

**General:**

- Estimated minimum lifetime 100 000 h
- All materials are UL/CSA approved
- Complies with EMC Standards EN 50081-2 and EN 50082-2.

**LONWORKS® network****RLON-01 compatible devices:**

All devices equipped with FT-X1 and FTT-10A compatible transceivers.

**Size of the network:**

32385 nodes divided into 127 nodes / subnet with 255 subnets / domain.

**Medium:**

- Special LON® cable
- Termination: 105  $\Omega$  / 52.5  $\Omega$ , depending on the network topology. See [Bus termination](#).
- Cable specifications: See the following tables

<b>LONWORKS® network cable specifications</b>				
	<b>Control / signalling grade</b> 16 AWG (1.3 mm)	<b>General purpose grade</b> 16 AWG (1.3 mm)	<b>Data grade level 4</b> 22 AWG (0.65 mm)	<b>JY (St) Y 2×2×0.8</b> 20.4 AWG (0.8 mm)
<b>Max. DC resistance at 20 °C loop</b>	28.2 Ω/km	28.2 Ω/km	118 Ω/km	74.0 Ω/km
<b>Max. DC resistance unbalance</b>			5%	
<b>Max. mutual capacitance of a pair</b>	58 nF/km	74 nF/km	56 nF/km	100 nF/km
<b>Max. pair-to-ground capacitance unbalance</b>			3.28 nF/km	
<b>Nominal impedance</b>	95 Ω at 1.0 MHz	100 Ω at 1.0 MHz	102 Ω ±15% at 772 kHz 100 Ω ±15% at 1, 4, 8, 10, 16 and 20 MHz	
<b>Max. attenuation at 20 °C</b>			15 dB/km at 772 kHz 18 dB/km at 1.0 MHz 36 dB/km at 4.0 MHz 49 dB/km at 8.0 MHz 56 dB/km at 10.0 MHz 72 dB/km at 16.0 MHz 79 dB/km at 20.0 MHz	
<b>Pair twists per metre</b>	20 (nominal)	20 (minimum)		5 (minimum)

<b>LONWORKS® network cable specifications</b>				
	<b>Control / signalling grade</b> 16 AWG (1.3 mm)	<b>General purpose grade</b> 16 AWG (1.3 mm)	<b>Data grade level 4</b> 22 AWG (0.65 mm)	<b>JY (St) Y 2×2×0.8</b> 20.4 AWG (0.8 mm)
<b>Cable parameters</b>	single twisted pair stranded 19/29 unshielded Tefzel Insulation & Jacket High 150 °C max.	single twisted pair stranded 19/29 unshielded PVC Insulation & Jacket Medium 80 °C max.	twisted pair, single or multiple typically solid and unshielded	wire pair: red/black per DIN VDE 0815 4-wire helical twist solid shielded

<b>LONWORKS® network, maximum bus lengths</b>					
		<b>Control / signalling grade</b> 16 AWG (1.3 mm)	<b>General purpose grade</b> 16 AWG (1.3 mm)	<b>Data grade level 4</b> 22 AWG (0.65 mm)	<b>JY (St) Y 2×2×0.8</b> 20.4 AWG (0.8 mm)
<b>Doubly terminated bus topology</b>	<b>Bus length</b>	2200 m	2200 m	1150 m	750 m
	<b>Stub length</b>	3 m	3 m	3 m	3 m
<b>Singly-terminated free topology</b>	<b>Node-to-node distance</b>	500 m	400 m	400 m	320 m
	<b>Total wire length</b>	500 m	500 m	500 m	500 m

**Topology:**

Supports free topology wiring, and will accommodate bus, star, loop, or any combination of these topologies.

**Serial communication type:**

Asynchronous, half duplex

**Transfer rate:**

78 kbit/s

**Protocol:**

LonTalk®

**Documents:**

LONMARK® Layers 1-6 Interoperability Guidelines, version 3.3









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