4404L Digital Dimmer Manual

Revision 1.5

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This Manual

This manual provides any required information for installation, configuration and operation of the 4404L Digital Dimmer controller.

It exclusively treats the handling of this device. It neither describes the LonWorks technology by Echelon nor the LonMark profile implemented in detail. More specific information concerning these subjects can be found in the documentation of Echelon (www.echelon.com) and the LonMark Interoperability Association (www.lonmark.org).

The first part of this manual provides a survey about the device and its installation in chapters 1 to 3. The 2nd part describes the implemented application for lighting control and its configuration possibilities. Chapter 4 contains a description of the firmware interface while chapter 5 describes the implemented LonMark Objects in detail providing an outlook of the individual objects, their tasks and their relevant configuration parameters.

Chapter 6 explains the basics required to connect the objects to each other.

This manual is relevant for all variants of the 4404L Digital Dimmer Controller where applications for lighting control are implemented.

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2 Product Information

2.1 Functional Elements

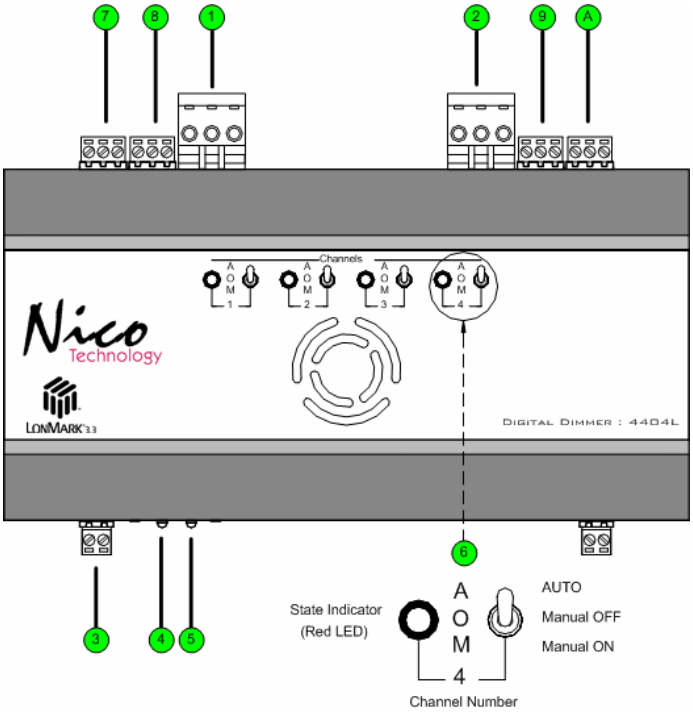


Figure 1.1 4404L Digital Dimmer Controller

No	Description
1	Channel 1, 2 Input AC power supply connection.
2	Channel 3, 4 Input AC power supply connection
3	Connect to LonWorks network
4	Service Pin button and Service Pin LED indicator
5	Reset button and Reset LED indicator
6	3 way by-pass switch for Auto/Manual OFF/Manual ON
7	Channel 1 output circuit
8	Channel 2 output circuit
9	Channel 3 output circuit
A	Channel 4 output circuit

2.2 Variants and Identifications

2.3 Scope of Delivery

3 Installation

This chapter first describes the installation of the device; the installation of the configuration software is described in section 2.4.

3.1 Warnings

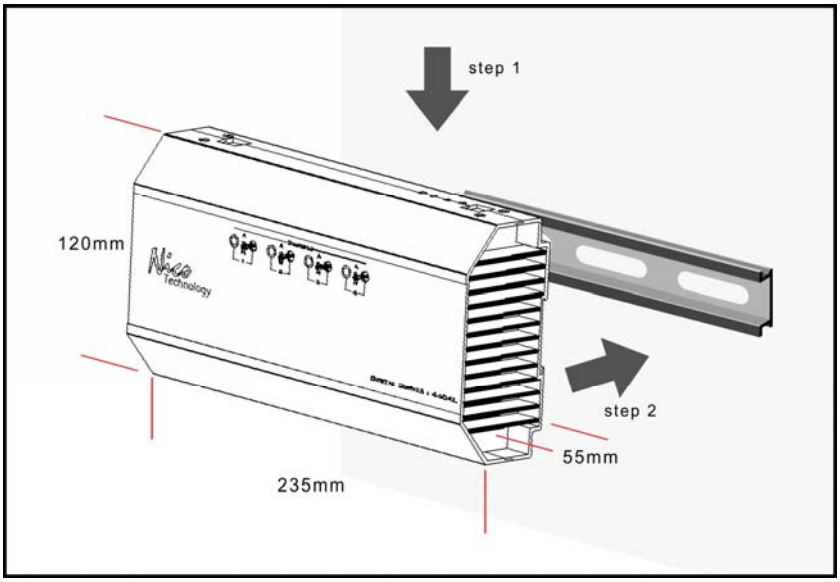
Attention

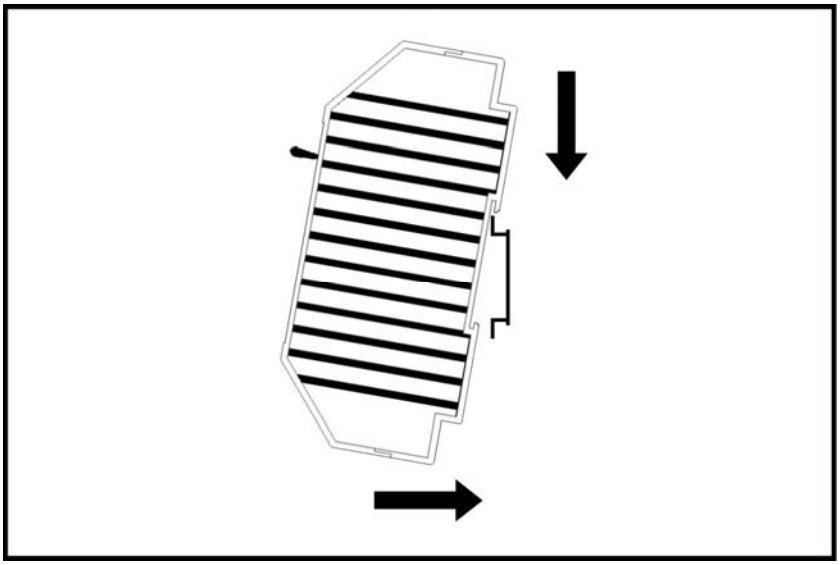
The device must be installed in compliance with the relevant DIN/VDE regulations or the relevant national standards. The connection to the supply voltage must be performed in accordance with VDE 0100 and VDE 0160 or the relevant national standards. Installation should perform by qualified and technical experienced personnel only.

CAUTION

At the connections of the output channels 1 – 4 (Fig. 1.1, terminals 7, 8, 9, A) and the power supply (terminals 1, 2) 110/240V main voltage with load guard band is accessible. The installation of the unit therefore has to be effected in a switch cabinet or behind a respective cover.

3.2 Mounting





3.3 Connections

The 4404L has to be connected to a 110/240VAC power supply and to the LonWorks network. According to the respective application peripheral equipment has to be connected to outputs.

Attention

Before connecting peripheral equipment the power supply device has to be switched off and by-pass switch has to be switch to manual off.

The connection is effected by means of the included plug-screw terminals.

Clamping range of the plug-screw terminals:

- High load connections (5.08mm grid, terminals **1, 2, 7, 8, 9, A**): 0.2 – 2.5mm
- Low voltage connections (3.5mm grid, terminals **3**): 0.14 – 1.5mm

The pin assignment of the connections is described in chapter 3.1, also containing wiring details.

Voltage

The 110/240 Volt connections are through connected in order to achieve easy wiring.

LonWorks Network

The connection to the LonWorks network is made by means of twisted-pair cables. The connection "shield" has to be connected to ground in order to achieve a reliable dissipation of over-voltage on the LON circuits.

Dimming Outputs

The actors to be controlled are connected to the dimming outputs. In each case the connection is effected between terminals 7, 8, 9, A)..

Attention

The 4404L input power supply must be same AC power phase.

3.4 Software Installation

The configuration software of the 4404L Digital Dimmer Controller has to be installed by starting the program Setup.exe on the data carrier provided. It suns under Windows 9x/2000 and NT.

Download url: http://www.nico-tech.com/download

4 Device Description

The 4404L is a Digital Dimmer Controller for LonWorks network in building automation. Its peripheral scope has been specially designed for the use as lighting controller for device spreading control of applications such as lighting control.

For the use in lighting the 4404L realizes 4 independent channels with four dimming output to control conventional lamps.
The LonMark object available per channel flexible use of the 4404L; Furthermore there are several timer functions for the operation by dimming function. The configuration of the lighting control application is effected via a plug-In.

Of course, the 4404L is also free programmable in Neuron C. As a flash module is used the application can be load via the LonWorks network, making the 4404L a digital dimmer controller, e.g.

4.1 Hardware Survey

The 4400L disposes of four output circuit for each. The output circuit can be controlled individually dimming 10A@110/250VAC.

4.2 Operation and Display Elements

The 4404L is fitted with a service button accessible via a small gap on the front panel (see Figure. 1.1, **4**). Activation of the buttons generates a service-pin message transmitted via the LonWorks network. The processor status as well as the service-pin status are displayed by the service LED (figure. 1.1.**4**), which is on while the service button is activated. By use the network management function Wink the service LED flashes.

Furthermore the 4404L is fitted with a reset LED (figure. 1.1, **5**), displaying the availability of device occur reset. The LED is connection to an I/O pin of the Neuron chip processor.

4.3 Connection Pin Assignment

The following tables show the connector pin assignment of the individual connectors. Connection the ***7, 8, 9, A*** marking cf. Figure. 1.1 on previously page. In each clamp block pin 1 is situated on the left. For further wiring information see chapter 3.4.

LonWorks Network Connection

The double-core bus line can be connection either to LON A or to LON B.
No polarity has to be considered by connecting the LonWorks network.

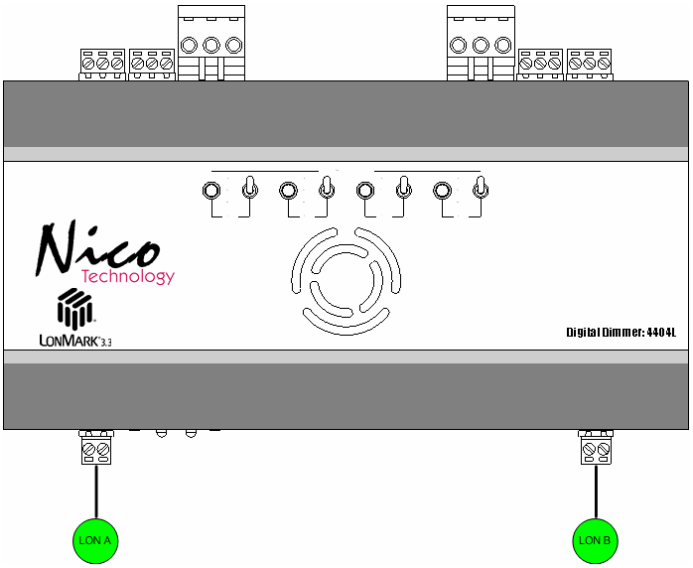


Figure 3.1 Connector pin assignment LonWorks network

Dimming output circuit

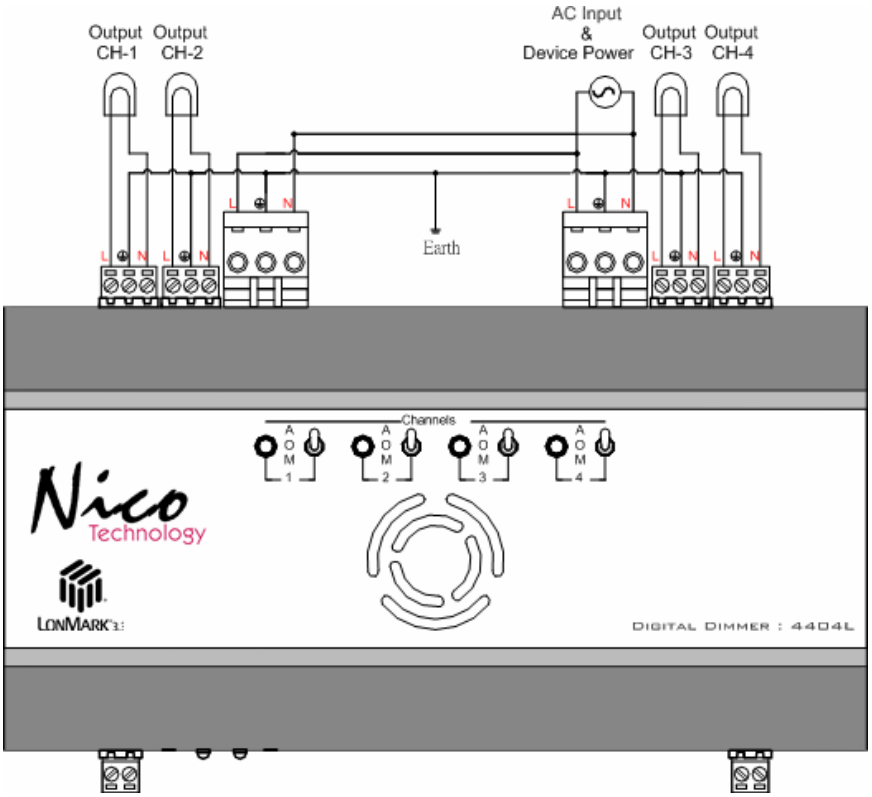


Figure 3.2 Connector pin assignment output circuit.

Power Supply

The 4404L has to be connected via connector 1, 2 to 110/240V main voltage. Also see figure. 3.3.

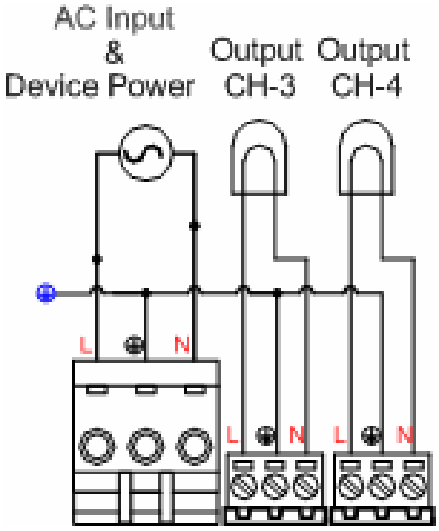


Figure 3.3 Connector pin for Power Supply

4.4 Wiring Diagram

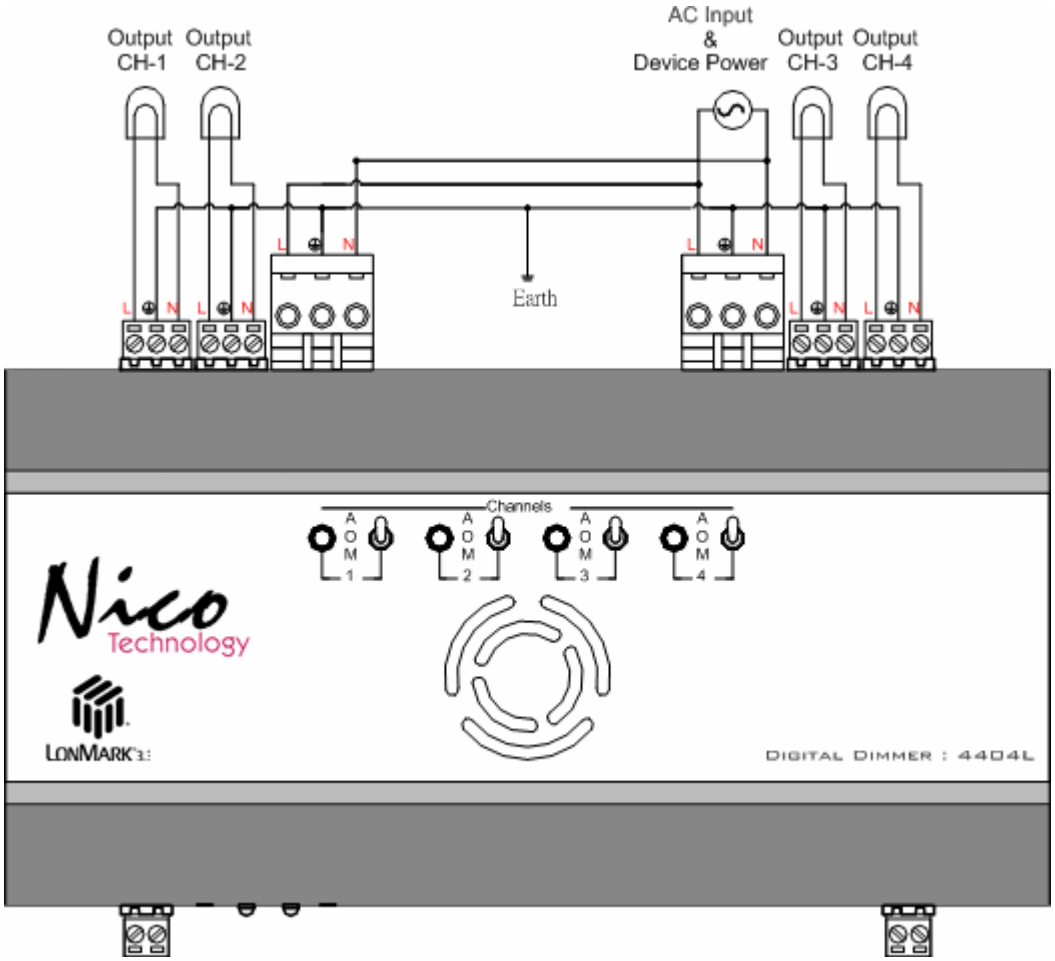


Figure 3.4 Connecting to 4404L

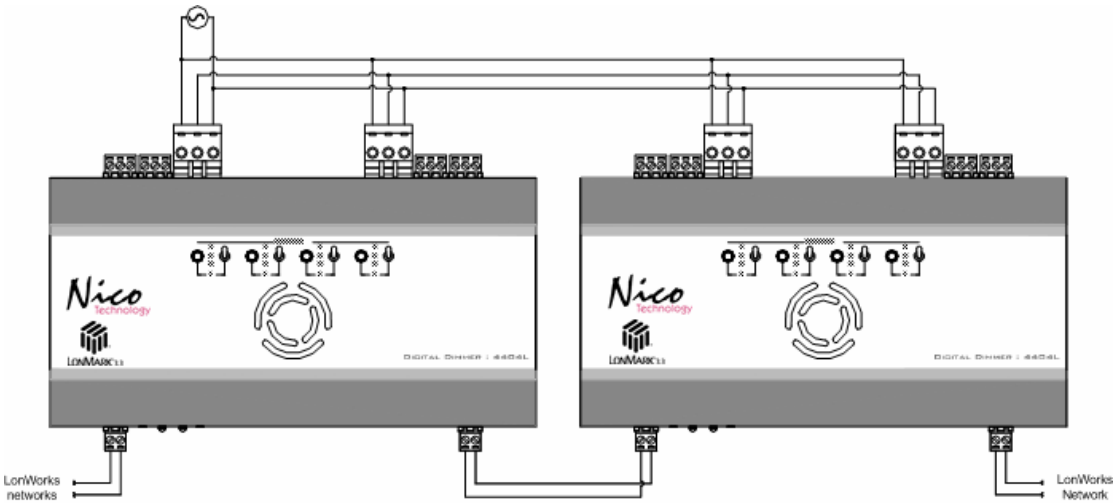


Figure 3.5 Connecting to two 4404L

4.5 EMC

The 4404L Digital Dimmer Controller is a CE certified device according to the regulation 89/336/EEC for electron magnetic compatibility, modified by 92/31/EEC". Concerning the emission it fulfills classification B (living area) according to EN 55022A/B, EN 55011 A/B and EN 50081-1/2 and, concerning the interference sensibility, classification A (industrial area) according to EN 50082-2.

4.6 Technical Specifications

CPU	Echelon Neuron 3150,10MHz	
Memory	64Kbytes Flash memory, 512Bytes EEPROM,2Kbytes SRAM,8Kbyte external SRAM	
LonWorks Transceiver	FTT-10A/FT-X1/PL-3150	
Power supply	240VAC/24VDC	
Power consumption	10~20mA	
Connection	Plug-screw clamp 0.2-2.5mm	
Protection class	IP 20	
Temperature	Operation	0 ~ +50
	Storage	-20 ~ +70
Admitted relative humidity	5 ~ 93%, non condensing	
Dimensions	235 x 120 x 54 mm, DIN 43880, incl. clamps	
Mounting	DIN rail(EN 50022, 35 x 15)	
Display & Operation	Service-pin and Reset LED indicator and button	
I/O Channels	Four output channels with 3 way by-pass switch and indicator.	

Table 3.1 Technical Specification

4.7 Dimensions

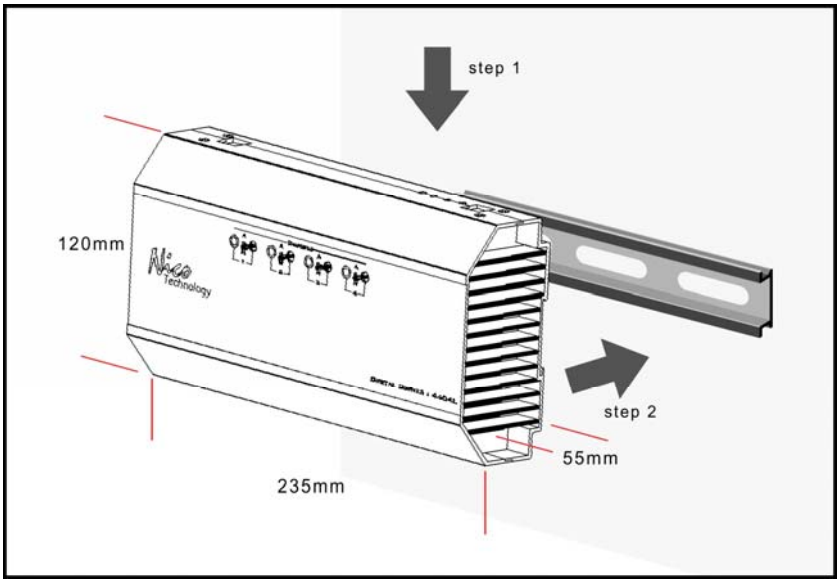


Figure 3.5 Device dimensions without plug-screw clamps

5 Application Software for Lighting Control

On the 4404L an application for lighting control is implemented, making output functionality as well as dimming control functions available.
Therefore the relevant LonMark profiles stated in Table 4.1 are implemented.
The use of network variables (NV) compiles with the LonMark standard, no customized network variables are used. SCPT's are used for parameterization by applying the read/write-memory method.

Title	Present Version	Identification
LonMark Application Layer Interoperability Guidelines	V3.1	078-0120-01D
The SNVT Master List and Programmer's Guide	V 8.0	
The SCPT Master List	V 8.0	
LonMark Functional Profile Lamp Actuator	V 1.0	0340

Table 4.1 Referring document about LonMark profiles

5.1 System Scope

The 4404 is equipped with four channels, each consisting of 4 dimming output.
The dimming outputs of the 4404L allow the connection of dimmable lamp. A lamp actuator object according to LonMark Standard can be assigned to these output and configured.
Furthermore the 4404L can act as constant light controller. The current ambient brightness is either generated by the internal Lamp Actuator object; via an input network variable.

The 4404L is equipped with four dimming output circuit to connect e.g. Down light, Spot light

5.2 Interoperable Interface

The LonMark profile *0340* is realized in the 4404L. As no customized NVs are used, the network interface remains standardized, clear and especially it is interoperable. That means, the 4404L can be used in connection with network components by other manufactures. The following table contains a survey of the network variables defining the 4404L network interface and

their assignment.

NV Name	Type	Allocated Object
nvoLampValue	SNVT_switch	LampActator
nvoLampValueFb	SNVT_switch	LampActator

Table 4.4 Allocation of NVs and LonMark objects

Under the order code 4404L a data carrier containing the interface describing file ***Nico_Dimmer-4404L_r1.XIF*** and the application ***Nico_Dimmer-4404L_r1.APB*** is provided free of charge at simultaneous purchase of a 4404L. the XIF-file is necessary for integration with LonMaker for Windows or any other LonWorks network management tool.

6 System Objects

This chapter describes the LonMark objects implemented in the 4404L Digital Dimmer Controller. For each it states the network variable les used, special configuration properties, general object properties, response during modification of the configuration and after a reset, and, if available, further object properties.

Finally the relevant plug-in designated to configure the object is described. Details about handling of the plug-ins can be found in chapter 7.

6.1 Node Object

The functionality of the node object is defined in the Application Layer Guidelines of LonMark Interoperability Association (www.lonmark.org).

Network Variables

NV Name	NV Type	Comment
nviRequest	SNVT_obj_request	Status request
nvoStatus	SNVT_obj_status	Status response
nvoAlarm	SNVT_alarm	Alarm generating
nvoFileDirectory	SNVT_address	Address of file for parameterization

6.2 Lamp Actuator Object

Network Variables

NV Name	NV Type	Comment
LampValue	SNVT_switch	Input value of lamp value
LampValueFb	SNVT_switch	Feedback value of current lamp value

Configuration Properties

CP Name	CP Type	CP Index	Comment
Location	SCPT_location	17	Additional free comment
RampDown	SCPTrampDownTm		Dimming down delay time
RampUpTm	SCPTrampUpTm		Dimming up delay time