Linet Network, Controller sw rev. 6.3:

CONFIGURATION MANUAL

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1 THE INTERFACES

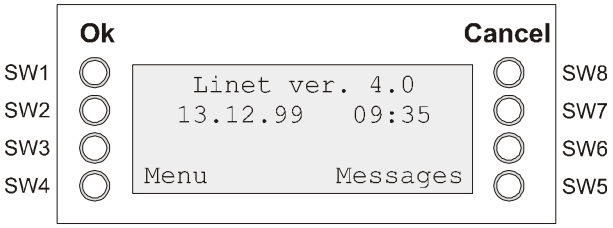
1.1 Choices of interfaces

In Linet system, the network controller is used as the tool to set up the network. The controller supports two alternative interfaces for this, which are the fixed user interface and the terminal interface. An interfaces is required during set-up only, so the user may disconnect it when the configuration has been done and the network is running.

These interfaces provide similar procedure to set-up the network. It is also possible to connect both of them to the controller at the same time.

1.2 The fixed interface

The fixed interface consists of a 4x20-character LCD display and 8 pushbutton softkeys. The softkeys are arranged to two rows, one on each side of the display. The uppermost key on the left row is the 'Ok'-button, on the right row the 'Cancel'-button. Function of the other keys varies depending on the display on the screen, so that the function of the key 'sw2' is displayed on the left side of the second row of the display, and so on. For instance, on the start-up screen, key 'sw4' has the function 'Menu' and key 'sw5' has the function 'messages'. Keys sw2, 3, 6 and 7 have no function on the start-up screen.

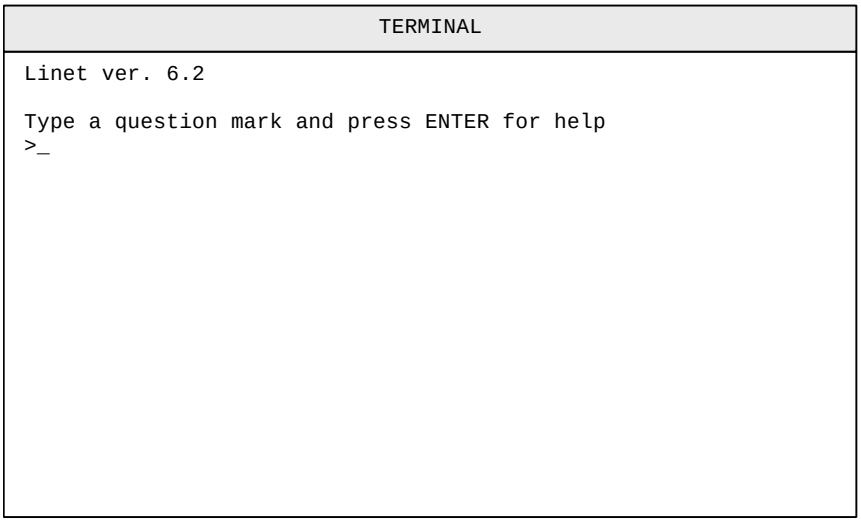


Start-up screen on the fixed user interface

The fixed interface is connected to the Linet controller with a short flat cable. It is often installed in the same closure with the controller. The interface is available from Linet as an assembly, but users who wish to modify the design to make it more compatible with the appearance of their present products, are encouraged to design their own interface based on the schematics available on the controller data sheet.

1.3 The terminal

The controller has a RS232 serial port, which may be connected to a PC's COM-port. The configuration may then be carried through using any terminal application, so any Linet-specific software is not required on the PC.



Start-up screen on the terminal

The controller also includes a set of run-time instructions, which are used to input or output to the nodes in the network. These instructions may be typed manually on the terminal, or they may be included in a host application on the computer.

2 PROCEDURES BEFORE CONFIGURING A NETWORK

2.1 Installing nodes

When installing nodes (or devices containing nodes) in a network, it is possible to test the installation at the same time. To do this, the controller should be disconnected from the net, and DC voltage should be feeded to the net. An appropriate voltage source is two 9 V batteries connected in series, thus the DC voltage in the net will be 18 V.

After this, new nodes can be installed to the net. When the nodes are connected to DC voltage and they sense no carrier, they enter self diagnostics mode where, by pressing the pushbutton on the node, it's output can be turned on and off. This way, each node can be tested immediately after it has been connected to the net.

When the nodes have been succesfully installed, the DC voltage source should be removed and the controller connected to the net.

2.2 Lamp test

A 'lamp test' is a simple yet useful procedure to inspect that the network has been correctly installed. Select `Configure net - Network debug - Set debug command - Set service command - Lamp test` This turns on outputs of all nodes connected in the net, also of those nodes that have not been configured. Eg. in building lighting application, the operator may set the lamp test on and walk through the building to see that all lights and other devices that should be connected to the network are on.

When the system has been inspected, lamp test should be removed. Select `Configure net - Network debug - Set debug command - Set service command - None`.

2.3 Display debug data

'Display debug data' is a powerful tool to define the net load seen by the controller. It indicates the margin between signals and noise in the system. The amount of noise raises when:

- the length of the network is extended, and/or
- the number of nodes connected to the network is increased.

```
                                TERMINAL
5  Unprogram node
6  Set node configuration
7  Display debug data
9  Clear node addresses and delete connections

NETWORK DEBUG DISPLAY

node 1, frame 7

1  Set service node
2  Set service frame
3  Set node 1 output on

in: 0, fid:0, ain:   3202, idl0:   3168, idl1:   3155
Frame: 7
> 0

NETWORK DEBUG DISPLAY

no node, frame 0
1  Set service node
2  Set service frame
in: 0, fid:0, ain:   12985, idl0:   3175, idl1:   3164
```

Display debug data

The debug data views raw analog analog data from a selected slot in the system frame. To display debug data, select `Configure net - Network debug - Display debug data`. Now the controller displays:

- *node/frame*: determines the slot to be viewed,
- *in*: input from the node,
- *out*: output to the node,
- *ain*: actual analog input data.

The *ain* views idle value, when the input from the node in the slot is '0', and set value, when that input is '1'. It is advisable to set the *ain* to view data from the node which is in the most distant location from the controller (in case it is an unconfigured node, select '0' as *fid*), and then ask somebody to press the pushbutton of that node, to see the idle and set values of *ain*.

The *ain* idle value should be close to 3000 in a no-load situation. It will increase when the load is added, but in all circumstances should be below 10000. The set value should be more than 6000 above the idle value.

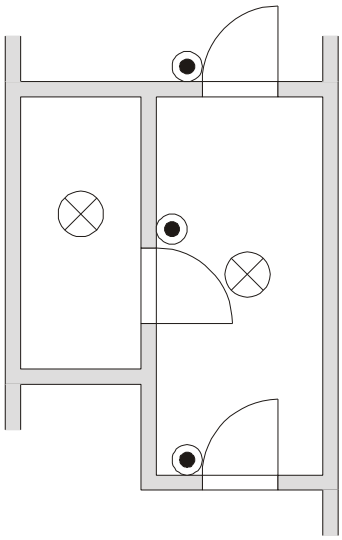
In the 'Display debug data' figure above, the *ain* value 3202 in the middle of the screen is an idle value, the *ain* value 12985 in the bottom of the screen is a set value, seen when a pushbutton of a (unconfigured) node has been pressed down.

3 SAMPLE CONFIGURATION IN A HOME AUTOMATION APPLICATION

3.1 Creating the first group using the fixed interface

The drawing below presents a floorplan of a corridor with entries at both ends, and a closet. There are lighting pushbuttons close to both entries and the closet door, and lighting fixtures on the corridor and closet ceiling.

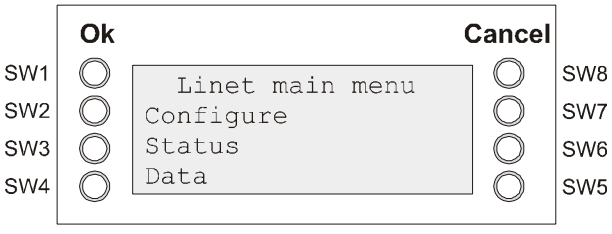
There is a Linet node integrated into each pushbutton switch. Light fittings are connected to the connection boxes on the ceiling, which both include a Linet node connected to a solid state relay to switch the lamp. Wiring is relatively simple: mains is brought to the connection boxes, and twisted pair cable required by Linet is shared to the connection boxes and the pushbuttons.



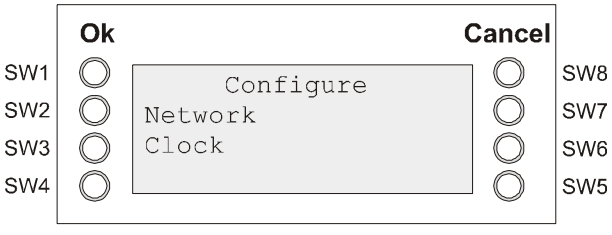
The sample floorplan.

Say that the system has recently been installed, so that all devices are 'blank'. The user starts to set up the corridor lighting: he wishes that the pushbuttons on both entries control the light on the corridor ceiling. He should thus consider them as a logical group.

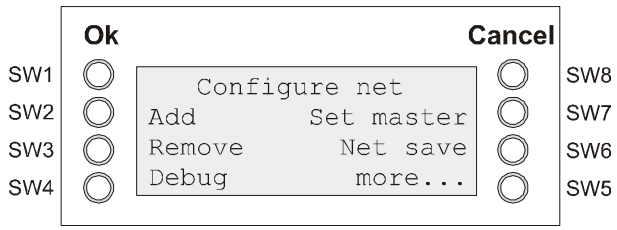
To make the group, the user selects 'Menu' on the fixed interface. The Linet main menu appears.



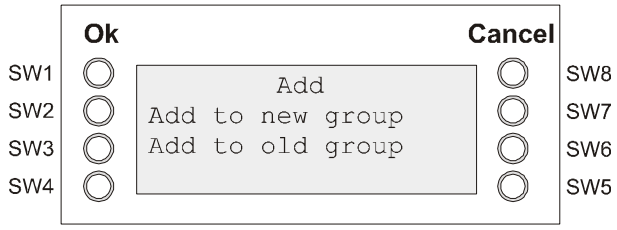
After that he selects 'configure'...



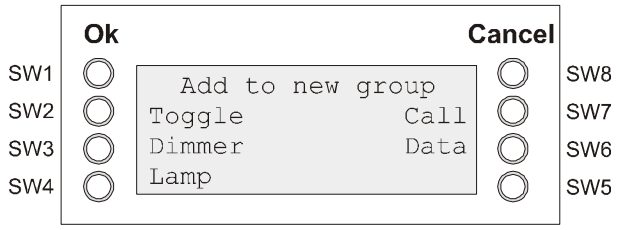
...'Network'...



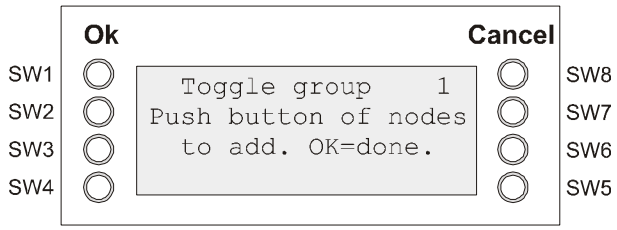
...'Add'...



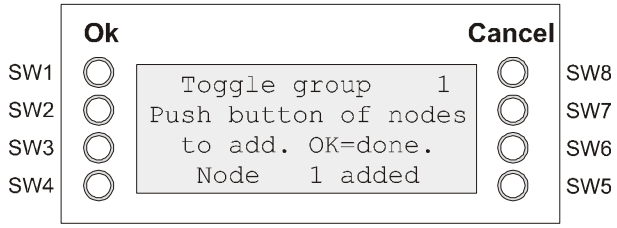
...and the interface prompts whether to add a new, or to expand an existing group. As the system is blank, no groups exist, so he selects 'Add to new group'.



Now he is prompted to choose the type of the group to be created. In the Linet system, fixed interfaces are used instead of programming the node. The type is necessary for the system to decide which interface to use. On/off-type lighting groups are toggle groups, so he selects 'Toggle'.



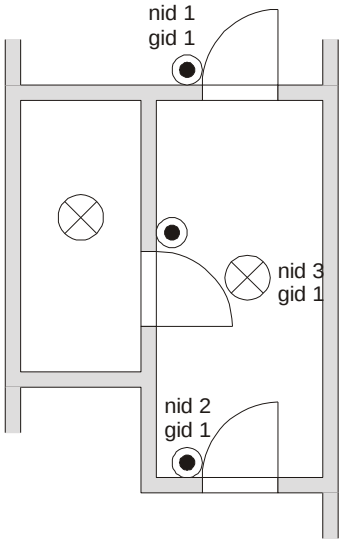
Now the controller asks the user to indicate which nodes to add to this group. He then presses the pushbutton next to the upper entry on the plan.



While pressing the button, the indicator led on the button (when present) illuminates to indicate that the configuration has been successful. At the same time, the interface prompts 'Node 1 added'. While pressing down the button connected to the node, the

system notified that the node had no network identifier, so it assigned the lowest unused identifier (nid) to it, which was '1' in this case, as the system was blank. The group has a group identifier (gid), which is also '1'.

After that, the user presses the pushbutton next to the lower entry, then the button connected to the node on the corridor ceiling. These nodes are thus assigned with identifiers 2 and 3. He then presses the 'Ok' button on the interface a couple of times, to return to the start-up screen.

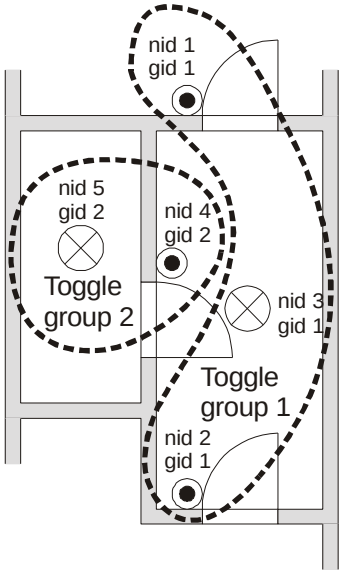


Toggle group 1 created.

The group has now been set up. A push on either of the pushbuttons controls the lamp. (Accurately: In a toggle group, all nodes within the group output the state of the group - 0 or 1. The state is inverted when a pushbutton connected to any of the nodes within the group is pressed down).

3.2 Creating another group

The user now wishes to set up closet lighting. He wishes to use the switch next to closet door to switch the light inside the closet. He selects on the interface: `Menu - Configure - Network - Add - Add to new group - Toggle` This creates another toggle group, which gets group identifier (gid) 2. He pushes the pushbutton next to the closet door, then the button connected to the node on the closet ceiling.

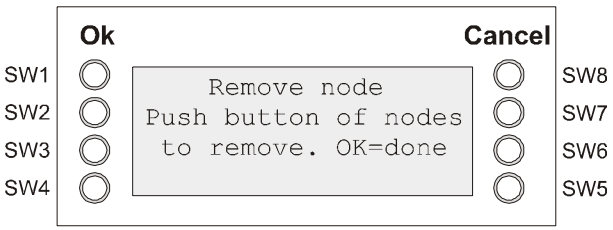


Toggle groups 1 and 2 assigned.

Now the system consisting of two lighting groups has been completely set up.

3.3 Changing existing groups

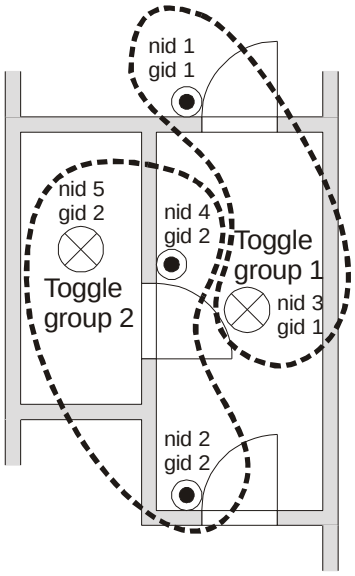
Assume that the user wishes to use the pushbutton next to the lower corridor entry (nid 2) to control the closet light in parallel with the original closet light switch (nid 4). He should first remove it from it's current group. To do this, he selects on the interface: `Menu - Configure - Network - Remove`. Now the system asks him to indicate which node(s) to remove.



The user presses the pushbutton (nid 2) to remove it from the group. After this, that node still has the node identifier 2, but it is no longer associated to any group.

Then he selects on the interface: `Menu - Configure - Network - Add - Add to old group`. The system asks him to indicate which is the group to be expanded, so he presses the button next to corridor door (nid 4). Then the system asks him to indicate which nodes to add to this group, so he presses the node removed from the other group (nid 2).

Now the pushbutton switch next to the lower corridor entry control the closet light in parallel with the pushbutton next to corridor door.



3.4 Which group type to select

The table below contains some typical applications for the Linet local control network and their suggested group types. Note that a single network can contain any combination of these applications.

Application	Function	Group
Lighting system	ON/OFF lighting groups Dimmer groups Lighting master switch Lamp controller with fault feedback	toggle dimmer I/O-node lamp
Heating system	Discrete sensors Heaters Remote displays Heating controllers	AD/state toggle / I/O-node Data8/12/16 Control
Fire/burglar alarm	Loop wires IR-sensors Alarm bells	Call Call toggle / I/O-node

3.5 Creating the first group using the terminal interface instead of the fixed interface

The same configuration procedure can be carried out using the terminal interface instead of the fixed interface. When the terminal is used, the function is selected by pressing a number key according to the displayed selection. 'Return' represents 'Ok'-key on the fixed interface, 'Esc' represents 'Cancel'.

By default, the terminal is at command-mode. This is the mode in which the controller accepts run-time control instructions. To enter the configuration mode, the user should type 'config' and press enter. Then the configuration menu appears.

TERMINAL

```
Linet ver. 6.2
Type a question mark and press ENTER for help
> OK!
> CONFIG

CONFIGURE

1  Configure net
2  Status
3  Configure input/output
```

To create a new toggle group, the user selects '1' (configure net)...

TERMINAL

```
OK!
>
> OK!
> CONFIG

CONFIGURE

1  Configure net
2  Status
3  Configure input/output

CONFIGURE NET

1  Add a Linet node
2  Delete a Linet node
3  Identify node
4  Set group master controls
5  Set frame size
6  Set clock
7  Save net configuration
8  Restore net configuration
9  Set delay group time
A  Network debug
```

...then '1' (Add a Linet node)...

TERMINAL

```
CONFIGURE

1  Configure net
2  Status
3  Configure input/output

CONFIGURE NET

1  Add a Linet node
2  Delete a Linet node
3  Identify node
4  Set group master controls
5  Set frame size
6  Set clock
7  Save net configuration
8  Restore net configuration
9  Set delay group time
A  Network debug

ADD A LINET NODE

1  Add to a new group
2  Add to an existing group
```

...then '1' (Add to a new group)...

TERMINAL

```
1  Add a Linet node
2  Delete a Linet node
3  Identify node
4  Set group master controls
5  Set frame size
6  Set clock
7  Save net configuration
8  Restore net configuration
9  Set delay group time
A  Network debug

ADD A LINET NODE

1  Add to a new group
2  Add to an existing group

ADD TO NEW GROUP

Select a group to add into
1  Add to a new toggle group
2  Add to a new dimmer group
3  Add to a new data group
4  Add to a new extended group
```

...then '1' (Add to a new toggle group).

TERMINAL

```
6  Set clock
7  Save net configuration
8  Restore net configuration
9  Set delay group time
A  Network debug

ADD A LINET NODE

1  Add to a new group
2  Add to an existing group

ADD TO NEW GROUP

Select a group to add into
1  Add to a new toggle group
2  Add to a new dimmer group
3  Add to a new data group
4  Add to a new extended group
ADD A LINET NODE

Toggle group   1
Push buttons of nodes to be added to this group
When all is done push back space
```

The terminal now indicates the group identifier of the group to be added. As new nodes are configured into this group, their identifier (nid) is displayed on the terminal.

TERMINAL

```
9  Set delay group time
A  Network debug

ADD A LINET NODE

1  Add to a new group
2  Add to an existing group

ADD TO NEW GROUP

Select a group to add into
1  Add to a new toggle group
2  Add to a new dimmer group
3  Add to a new data group
4  Add to a new extended group
ADD A LINET NODE

Toggle group   1
Push buttons of nodes to be added to this group
When all is done push back space
Node   1 added
Node   2 added
Node   3 added
```

4 DESCRIPTION OF AVAILABLE GROUPS

4.1 Basic group types - toggle, analog input, dimmer, data

TOGGLE GROUP

`Menu - Configure - Network - Add - Add to new group - Toggle`

Active I/O-pins

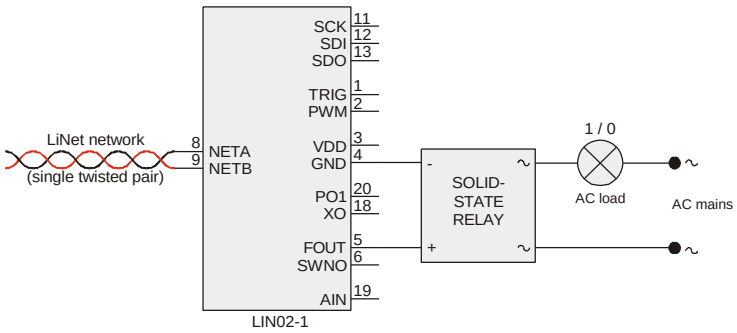
FOUT - toggle output
SWNO - switch input

Functional description

Each node within a toggle group outputs a binary state, which is common to all nodes within the group. The state is inverted when there is rising edge detected on switch input on any of the nodes within the group.

Application examples

Lighting groups.



Typical toggle node schematics

ANALOG INPUT GROUP

`Menu - Configure - Network - Add - Add to new group - Data - Data12`

Active I/O-pins

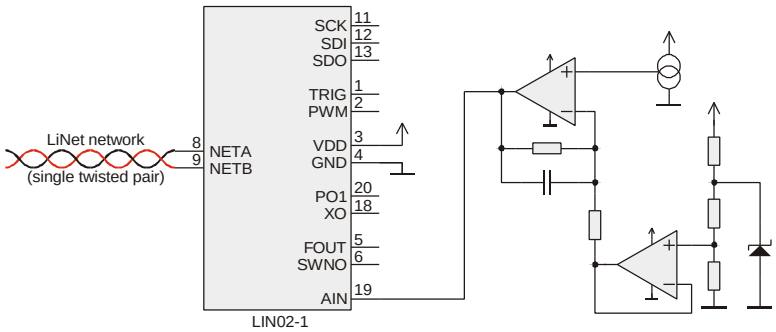
AIN - analog input
ADE - A/D converter enable (on the IC)

Functional description

Each Linet node contains an integrated 12-bit A/D-converter with internal, 1,25V reference. When in use, the converter performs the conversion and feeds the resulting 12-bit figure to the network similarly as conventional Data12 -node. The A/D-converter is enabled by setting the ADE pin on the IC, or by setting configuration bit Rb3 on the hybrid.

Application examples

Temperature sensors.



Typical analog input node schematics

DIMMER GROUP

`Menu - Configure - Network - Add - Add to new group - Dimmer`

Active I/O-pins

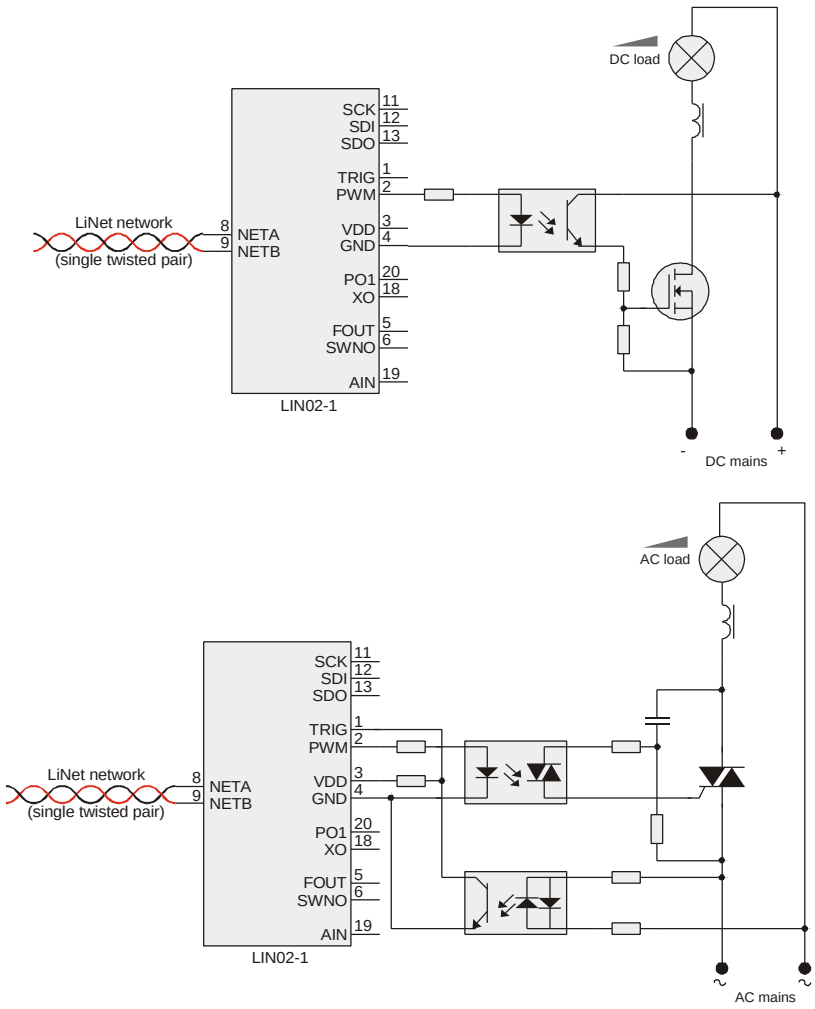
PWM - dimmer output
TRIG - trigger input
SWNO - switch input

Functional description

Each node within a dimmer group outputs a state, which is common to all nodes within the group. The state is outputted as pulse width modulation at approx. 100 Hz, comprising 32 steps from minimum to maximum. At turn-on the output duty cycle is 50%. An input switch connected to any of the nodes within the group may be used to control the output; then a short push turns the output on (to 50%) and off, a long push adjusts the output.

Application examples

Lighting dimmer groups.
Ventilator power controllers.



Typical dimmer node schematics

DATA GROUPS

```
Menu - Configure - Network - Add - Add to new group - Data - Data8
Menu - Configure - Network - Add - Add to new group - Data - Data12
Menu - Configure - Network - Add - Add to new group - Data - Data16
Menu - Configure - Network - Add - Add to new group - Data - Data exch
```

Active I/O-pins

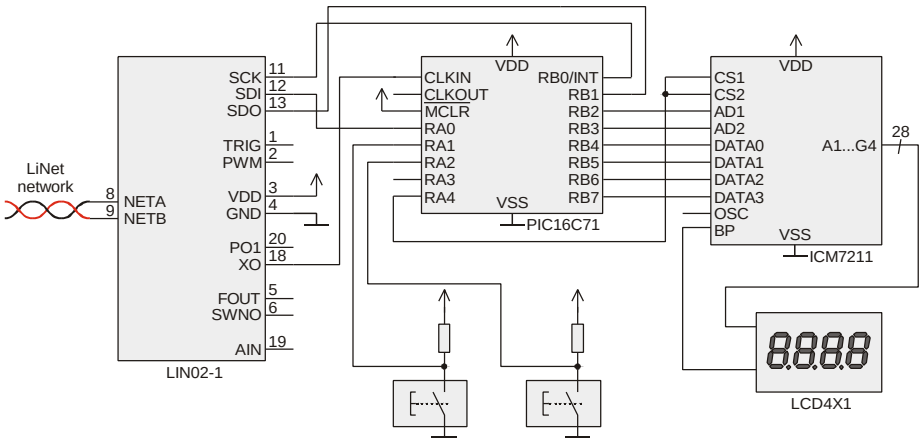
SCK - serial clock
SDI - serial data in
SDO - serial data out
XO - clock output

Functional description

Each node is capable to send and receive binary data at a constant rate. Data8, Data12 and Data16 nodes exchange data with the network controller, using word length of 8, 12 or 16 bits, respectively. Data exchange group consists of two nodes that exchange data between themselves. The device connected to the node should generate the data so that it is compatible with the following frame:
0 1 1 1 1 1 0 X7 X6 X5 X4 0 X3 X2 X1 X0 0 (8 bits),
0 1 1 1 1 1 0 X11 X10 X9 X8 0 X7 X6 X5 X4 0 X3 X2 X1 X0 0 (12 bits),
0 1 1 1 1 1 0 X15 X14 X13 X12 0 X11 X10 X9 X8 0 X7 X6 X5 X4 0 X3 X2 X1 X0 0 (16 bits).

Application examples

Communication units.



Typical data node schematics

4.2 Additional groups - I/O-node, lamp group, call group, AD/state, control

I/O-NODE GROUP
`Menu - Configure - Network - Add - Add to new group - Data - I/O-node`

Active I/O-pins

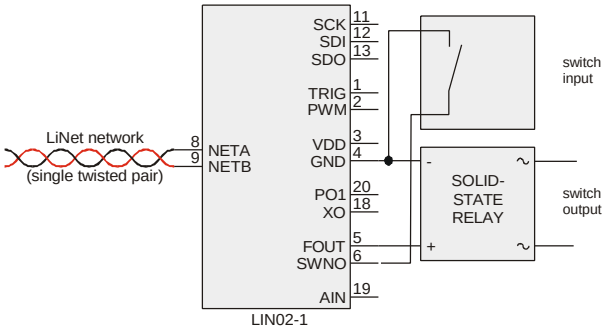
FOUT - output
SWNO - input

Functional description

Toggle node is an individual I/O-device, comprising one input and one output.

Application examples

Lighting master switch.
Setting and detecting appliances.



Typical I/O-node schematics

LAMP NODE
`Menu - Configure - Network - Add - Add to new group - Extended - Lamp`

Active I/O-pins

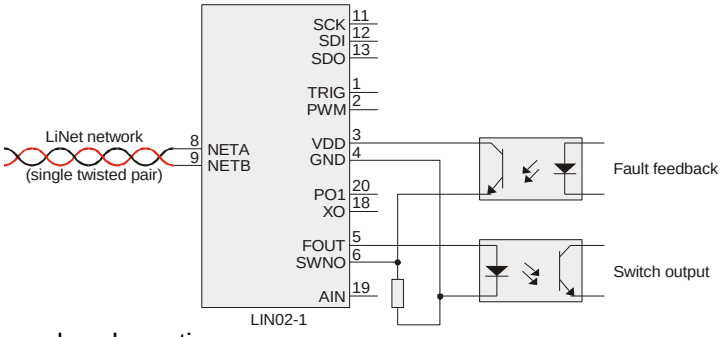
FOUT - toggle output
PWM - dimmer output
SWNO - fault input

Functional description

A lamp node uses FOUT or PWM output to control a load. High on SWNO input is computed as fault signal, generating an error message 'lamp fault at *nid*' on the user interface. Lamp node may be configured to operate as a slave to a toggle or dimmer group.

Application examples

Essential lighting systems.



Typical lamp node schematics

CALL NODE

`Menu - Configure - Network - Add - Add to new group - Extended - Call`

Active I/O-pins

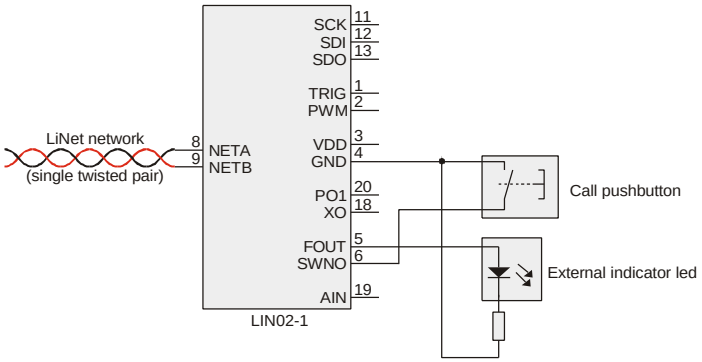
FOUT - call active output
SWNO - call input

Functional description

In a call node a pushbutton input turns on the output and generates a 'call at *gid*' message on the user interface. When the message is acknowledged in the interface, output turns off.

Application examples

Alarm systems.
Hostess call systems.



Typical lamp node schematics

AD/STATE

`Menu - Configure - Network - Add - Add to new group - Data - AD/state`

Active I/O-pins

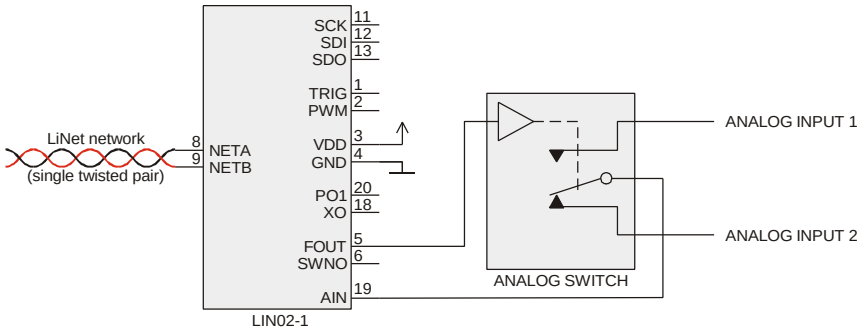
FOUT - toggle output
AIN - analog input

Functional description

The AD/state node is an analog input - switch output node. When configured, PO3 output is automatically set to enable the on-chip AD-converter.

Application examples

Combined temperature and humidity sensor.



Typical AD/state node schematics

CONTROL
`Menu - Configure - Network - Add - Add to new group - Data - Control`

Active I/O-pins

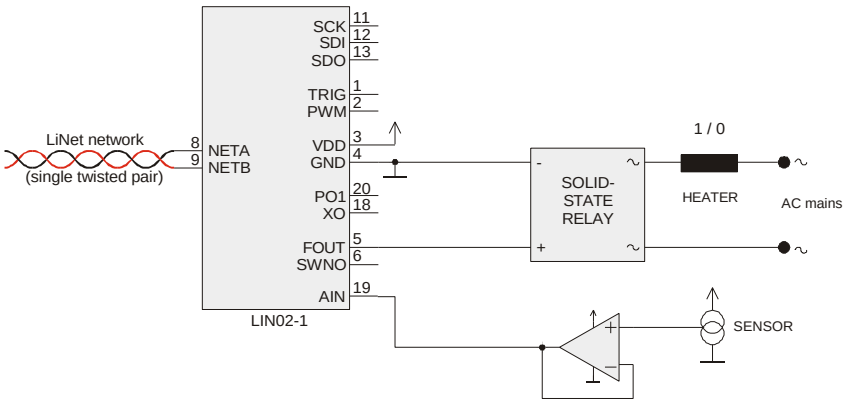
FOUT - toggle output
AIN - analog input

Functional description

A 'control group' is used to replace thermostats when controlling temperature (or other magnitude). The task of the group is real-time control; a host system, connected to the Linet controller via serial or Ethernet interface, is used for setting the set values for the group and converting the raw numerical values used within the group into centigrades (or other known values).
It is recommended that load controlled by a control group (eg a heater) is driven by a zero voltage turn-on solid state relay.
A control group can be written and read over the serial and Ethernet interfaces similarly as a Data12 group. When a value is written to a control group, it is computed as a user given set value. When the group is read, the value returned by the group is a measured value from the AD-converter of the node of the group. When set value is above measured value, the FOUT output will be ON. When set value is below measured value, the FOUT output will be OFF. A small (fixed) hysteresis has been added to prevent flickering.
Single or many nodes may belong to a control group: in case of the latter, the first node gives the measured value for the group.

Application examples

Heat control systems.



Typical control group node schematics

4.3 Master/slave-configuration

A lamp node can operate as a slave to toggle or dimmer groups. To configure this, select `Configure net - Set group master controls`, then press the button on the lamp (slave) node, then on any node within the toggle or dimmer (master) group. When operating, the output on the lamp node is the same that on the master group, the input on the lamp node is computed as lamp fault.

An I/O-node can operate as a master-on or master-off switch for a combination of toggle and/or dimmer groups. Up to two such masters can be configured in a system. The same node can operate as a master-off and master-on switch for different groups at the same time.

To set an I/O-node as a master for a specific group, select `Configure net - Set group master controls`, then press a button on any of the nodes in the slave

group, then select whether to use master-on or master-off function, then press button on the master node.

5 NETWORK SETTINGS

5.1 To load and save network configuration

Each node holds 12 bits of data in it's non-volatile eeprom memory. 8 bits are used for the network identifier (nid), 4 for configuration bits. Nid is stored when the node is configured, configuration bits are stored when the 'set node configuration' function is used. The node does not include any other configurable parameters or settings.

The information that the controller holds includes each group and which are the nids associated to each group. This information is stored in the controller's RAM memory. To save the configuration setting in the controller's non-volatile memory, select `Configure net - Save net configuration`

The latest configuration saved in the non-volatile memory is automatically copied to the RAM memory during controller power turn-on, or 'init' instruction. To manually load a setting from the non-volatile memory, select `Configure net - Restore net configuration - Restore from active save`, which loads the latest configuration, or `Restore from backup`, which loads the second latest configuration.

5.2 Clearing a network

To clear network configuration and addresses, select `Configure net - Network debug - Clear node addresses and delete connections` This clears the configuration file from the controller AND the addresses and configuration bits from the nodes. Note that this is a very powerful instruction after which all nodes and the controller are blank.

5.3 Frame size

The standard size frame holds positions for 200 nodes, which gives the simultaneous I/O-capacity of 80 bits/second per node. The frame can be reduced to hold 100, or 50, positions, which increases the capacity to 160 or 320 bits/second per node. This setting is available at `Configure net - Set frame size`.

5.4 Date and time

Linet controller has built-in clock and calendar. No ready-made time triggered operations are provided in the standard set of groups and functions.

5.5 Node configuration bits

The node holds 4 configuration bits. Once set, these bits are stored into the node's non-volatile memory. When a single node is assigned to a group, or deleted from network, configuration bits remain unchanged. When the total network is cleared, configuration bits are set to zero. The configuration bits may be set only when the network is in the config mode. Setting of the configuration bits remain when power is turned off.

On a hybrid node, configuration bit PO3 is used to enable the on-chip A/D-converter, and PO1 is available for external use. To set the configuration bits, select `Configure net - Network debug - Set debug data - Set configuration data`, type configuration word ('4' to enable A/D-converter of a hybrid node), and press enter twice. Now select `Set node configuration`, and press the pushbutton on the node to be configured.

5.6 Backup diskette

The terminal interface allows to load and save the network configuration to a text file on a PC. This file may be used as a backup copy from the configuration, or to modify the configuration with text editing tools.

To read the configuration, type '`get`' on the terminal. To convert the setting to a text file, use the text capture tool of the terminal.

TERMINAL

```
CONFIGURE

1  Configure net
2  Status
3  Configure input/output


OK!
> GET

put
; Linet Oy, LINET controller, version 6.2, serial no. 0
; At: 02.10.01 09:57:29
v 2
m 200
g 1 1
n 1 1
n 2 1
n 3 1
e

OK!
>
```

The outputted string begins with '`put`' instruction. To upload the settings on the file to the controller, use terminal's text send tools.

5.7 Display status

The `status` display in the menu root views the number of configured nodes in the network, i.e. nodes which hold nid. It does not include any unconfigured nodes.

6 DEBUGGING

Please note that these menus offer a very low-level interface to the network. It is easy to upset the network with these menus. For most users, the actions described in paragraph 2 should be adequate.

`NETWORK DEBUG`
The debug main menu selects the debug sub-menus.

`- Set debug data`
The menu sets up the data values used in the service commands.

`- - Set service frame`
The menu sets the service frame. It also sets up the service node to match.

`- - Set service node`
The menu sets the service node. It also sets the service frame to match.

`- - Set service data`
The menu sets the service data.

`- - Set configuration data`
The menu sets the node configuration data.

`- Set debug command`
The menu selects the service commands to send.

`- - Set service data`
The selection sends the service data set up in the data menu.

`- - Set configuration data`
The selection sends the configuration data set up in the service menu.

`- - Set service command`
The menu sets current service command. The options are: None, Lamp test, Data inhibit and Loop data.

`- - Clear address`
The selection sends the clear address and data inhibit service commands.

`- - Clear memory`
The selection sends the clear memory and data inhibit service commands.

`- - Read memory`
The selection sends the read address and data inhibit service commands.

`- - Write memory`
The selection sends the write memory and data inhibit service commands.

`- - Set PWM on`
The selection sets the selected node output on.

`- - Set PWM off`
The selection sets the selected node output off

`- - Increment PWM`
The selection sends the PWM increment sequence to the selected node.

- - Decrement PWM
  The selection sends the PWM decrement sequence to the selected node.

- Identify node
  The selection identifies the node with the button pushed. It also shows the group for that node, if there is any.

- Program node
  The selection programs the selected node number into the node with the button pushed.

- Unprogram node
  The selection unprograms the node with the button pushed.

- Set node configuration
  The selection writes the selected configuration byte into the node with the button pushed.

- Display debug data
  The selection displays a line with raw network analog data from the Linet ASIC.

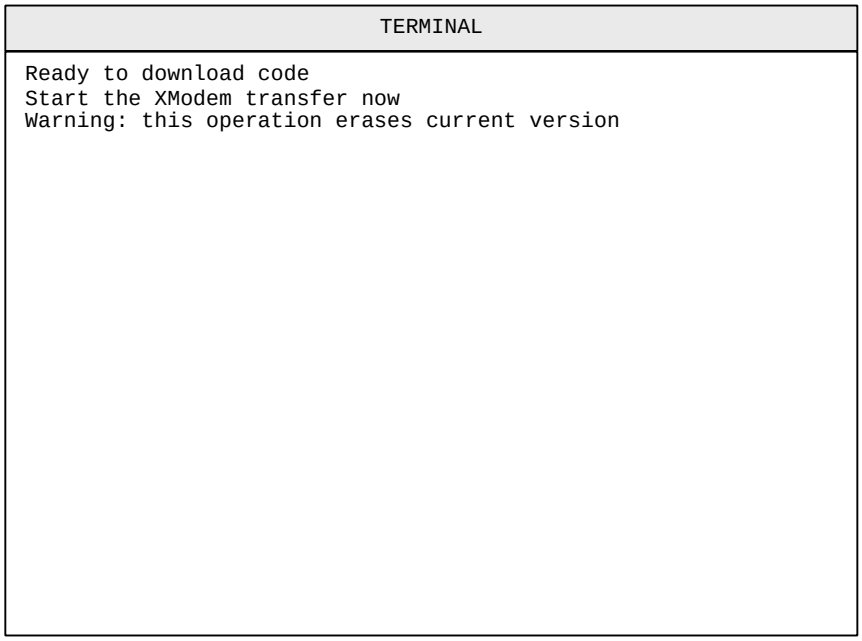
- Clear node addresses and delete connections
  The selection clears all connections and resets all nodes to unprogrammed state. It asks for confirmation before doing so.

7 SOFTWARE UPGRADE

The software and OS running on the controller can be upgraded using a PC with a terminal application that supports XMODEM protocol. Newest controller software is available at http://www.linet-network.com/html/solutions.html.

The network configuration on the controller will remain when the software is upgraded. It is recommended to take a backup (using the 'get' instruction and text capture tool of the terminal) before the upgrade.

To upgrade the controller software, connect the terminal to the controller via serial port, set the terminal bit rate to 9600 bits/s, press the reset pushbutton on the controller and hit 'L'-key (shift + 'l') within 4 seconds. When this is done succesfully, the controller displays a text on the terminal indicating it is ready for software download.



XMODEM transmission to replace the software on the controller may now be started. The transmission should take approx. one minute to complete. When the transmission has been finished, press the reset pushbutton on the controller to start the new software.

8 COMMUNICATION SETTINGS

8.1 Serial port

The baud rate of the serial port can be set between 600 bits/sec and 19200 bits/sec, and the parity check can be set to no-parity or even-parity, using the fixed interface. Select `Menu - Configure - Input/Output`.

8.2 Ethernet

When (optional) Ethernet interface is mounted on the controller, the IP address and UDP port of the controller can be set with both interfaces. Select `Menu - Configure - Input/Output`.