

Base as a LCN Segment Coupler

Since 1.7.5 software version **DOMIQ/Base** can be used as a segment coupler in the LCN installations. This result in three important advantages:

- **Reducing the installation costs** – **LCN-SK** modules become expendable.
- **Speeding up of LCN programming** – **LCN** segments can be programmed in parallel using multiple **LCN-Pro** connections at the same time.
- **Local logic** – you can implement local timers and logical rules in each segment.

Further in this tutorial we present how to create LCN segment network using **DOMIQ/Base** modules.

1. LCN Segment Network

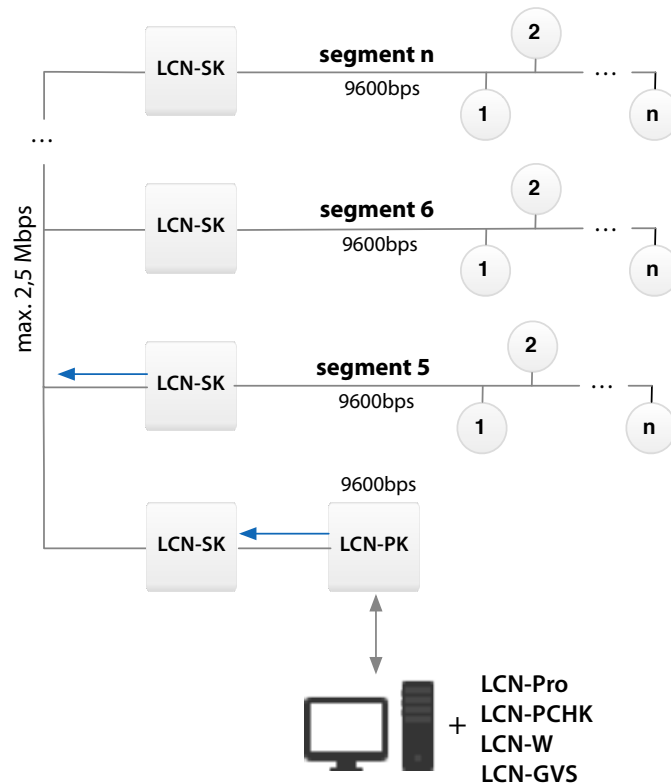
LCN segment network was designed for large building automation installations. Up to 250 modules can operate in a single segment, whereas single LCN installation can be divided into max. 120 segments. This adds a maximum of 30 000 units in the installation. Segments are numbered in the range of 5 to 124th. Addresses from 1 to 4 are reserved.

Address no. 3 is a broadcast address and it is used when there is a need to send out information to all available segments. Segment address No. 4 is used to send global messages to all segment couplers.

The division into segments has several advantages:

- Creating independently controlled areas, that can comunicate with each other, such as floors in a building, or building with building, etc.
- Increased clarity of the installation – large installation divided into smaller pieces is easier to manage and programming.
- Higher speed of data transmission. Segmented installation processes data much quicker than one segment with a lot of modules.

The traditional LCN segment network is presented in the following diagram:



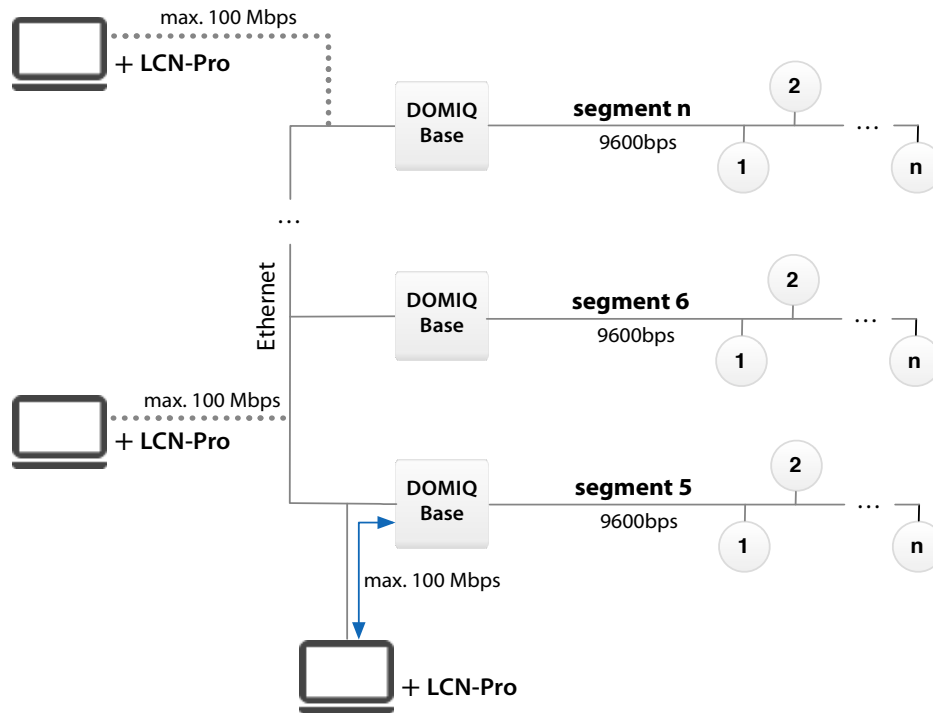
There are some limitations due to hardware capabilities of **LCN-PK** and **LCN-SK** modules.

LCN-PK can exchange data between PC and **LCN-SK** only at speed of 9600 bit/s. In large installation (large amount of data to be exchanged) it greatly reduces the comfort of the configuration and programming. In the biggest known LCN installations, duration of reading whole installation is counted in days!

If you use a dedicated LCN visualization system, low data transmission speed also affects the response time of visualization. Changes in the system are presented with a delay.

Another limitation of traditional LCN segment installation is that you can programm remotely only a single segment at a time.

All mentioned limitations disappear when using **DOMIQ/Base** modules in place of the **LCN-SK**. Structure of LCN segment network with **DOMIQ/Base** modules as segment couplers is presented in the following diagram:



Analyzing the diagram above, we can see that **LCN-PK** module is no longer needed. Thanks to that we eliminated the weakest link of the LCN segment network. **Base** modules can exchange data at speed of 100Mbit/s (LAN). This provides a great workflow.

Single **Base** module allows to programm unbounded number of segments simultaneously. Having few computers with **LCN-Pro** software, you can greatly speed up the work by programming segments in parallel (dotted lines in the diagram).

2. LCN Configuration

The first step is to configure LCN modules using **LCN-Pro** software. We used version 3.81.

In order to provide, that **Base** module reads the LCN modules status changes properly, their properties have to be set to send global status messages:

1. Choose a LCN module and then click op **Properties**.
2. In the window that appears, check **Show extended**. Then check **Status messages active** and select **Global messages** from the drop-down list.

S10 M111 SH-1-1: Module properties

Name: SH-1-1 Comment: W/C, tem OS Seg Mod: 10 111 Software: 120C17, 14A10D-5D6D Type of hardware: LCN-SH+ module

Output ports: Triacs Input ports: T- I- P-port

Last modification: DOMIQ_FZ 09.05.2012 10:51
Last but one modification: DOMIQ_FZ 09.05.2012 10:49

Membership of groups:

1:	2:	3:	4:	5:	6:
7:	8:	9:	10:	11:	12:

Beep on:

Commands
 Key press Errors

Operating-notification commands >>

Show extended:

Password: (max. 5 chars. Leave empty for no pwd)

Status messages active Local messages

Do not send internal commands

Accept commands

from all module IDs (default) only from the following module IDs:

Module Id: Append

Entries left: 10 Remove selected

Quit and save Cancel

In the properties window of a segment coupler (**Base** module), transmission parameters are displayed. In present form they are informational only. **Do not change these settings. This can cause abnormal communication with the other segments.**

S10 M254 DOMIQ: Segment coupler properties

Name: DOMIQ Comment: Home Automation Server Seg Mod: 10 254 Software: 09090D-65AD Type of hardware: LCN-SK module

Last modification: 01.01.1970 0:59 Reconnect: 0
Last but one modification: 01.01.1970 0:59

Segment coupler properties:

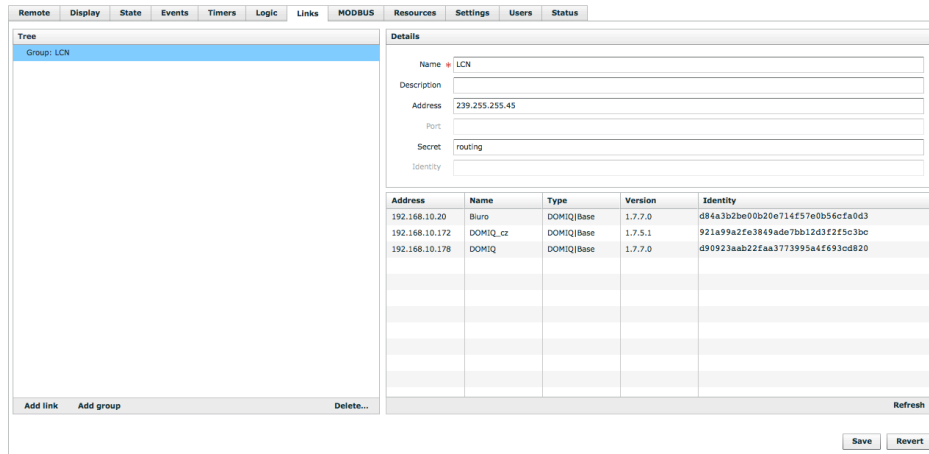
Segment:	Password:	Bus speed:	Send stat.msg to Seg-Bus:	Rec. stat.msg from Seg-Bus:
10		2.5 MB/s	global telegrams	global telegrams

Quit and save Cancel

3. DOMIQ/Base Configuration

3.1. General Information

Since version 1.7.5 **Base** configurator has a new tab – the **Links** tab.



The **Links** tab allows us to define intersegmental communication. Using the **Links** tab you can also create direct point to point connections between two **Base** modules. This functionality is presented in a separate tutorial.

A framework of the **Links** tab is very similar to the **Events** and **Timers** tabs. The left side of the window is the **Structure**. It contains a list of defined groups and connections. Groups are used to connect and communicate bigger groups of **Base** modules, including intersegmental communication.

In the right side of the **Links** tab, there is the **Details** section, in which connection parameters are configured. We will focus on **Name**, **Address** and **Password** parameters.

In order to provide intersegmental communication enter **LCN** in the **Name** field. **Any other name will prevent communication between LCN segments.** v

In the intersegmental communication **Base** modules use multicast IP to exchange information. In the multicast IP, according to RFC 3171, the IP addresses are assigned in range from **224.0.0.0** to **239.255.255.255**. By default **Base** uses multicast IP **239.255.255.44** and port: **44544**. You can leave the **Address** field blank if you want to use default IP and port. Otherwise enter IP from range mentioned above. Remember that each **Base** within particular group must have the same multicast IP address.

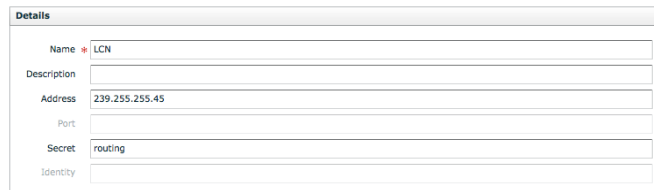
If you fill the **Password** field, the exchanged data will be encrypted.

Below **Details** section, there is a list of all **Bases** present in the installation.

3.2. Configuration Example

Each **DOMIQ/Base** module with software 1.7.5 or newer includes a default configuration, which enables LCN intersegmental communication. Configuration presented further in this section is a modification of a default one. We changed the **Address** and **Password** to present full configuration options. Intersegmental communication is defined by the following procedure:

1. Add a group in the **Links** tab.
2. In the **Name** field enter LCN.
3. You can leave the **Address** field blank if you want to use default multicast IP. Otherwise enter IP from range mentioned in section 3.1. In our example we used: *239.255.255.45*.
4. You can also leave the **Password** field empty if you don't want the data to be encrypted. Otherwise enter a password. In our case: *routing*.



Details	
Name *	LCN
Description	
Address	239.255.255.45
Port	
Secret	routing
Identity	

5. Choose the **Settings** tab, in the **Segment** field enter the number of the LCN segment.
6. Check **Events for other segments** to allow **Base** module to react on **Events** from other segments. It also enables **Base** module to keep the state of LCN modules from other segments.



LCN Configuration	
Module *	254
Segment	10
<input checked="" type="checkbox"/> Events for other segments	

7. Repeat whole procedure in other **Base** modules.

3.3. Application

As we mentioned in the introduction to this tutorial, using **Base** module as a segment coupler allows us to react on changes of state of devices from the other segments. It means that we can create events, timers, Lua scripts or visualizations which involve LCN modules from other segments. The operation principle and channels syntax doesn't change, you need only to remember to change segment number.

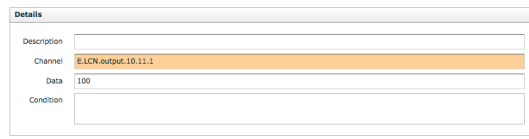


Example

As an example we will present creation of an event, which will be triggered by switching on a dimmable output from the other segment.

Let us assume that the segment number is **10**, the module ID is **11** and output number **1**

Add an event, in the **Name** field type: `E.LCN.output.10.11.1` and in the **Data** enter 100.



The screenshot shows a 'Details' form with the following fields:

Description	
Channel	E.LCN.output.10.11.1
Data	100
Condition	

Next declare actions to be performed when the event is triggered.

REMEMBER! The only difference is definitions involving modules from other segments is the segment number.