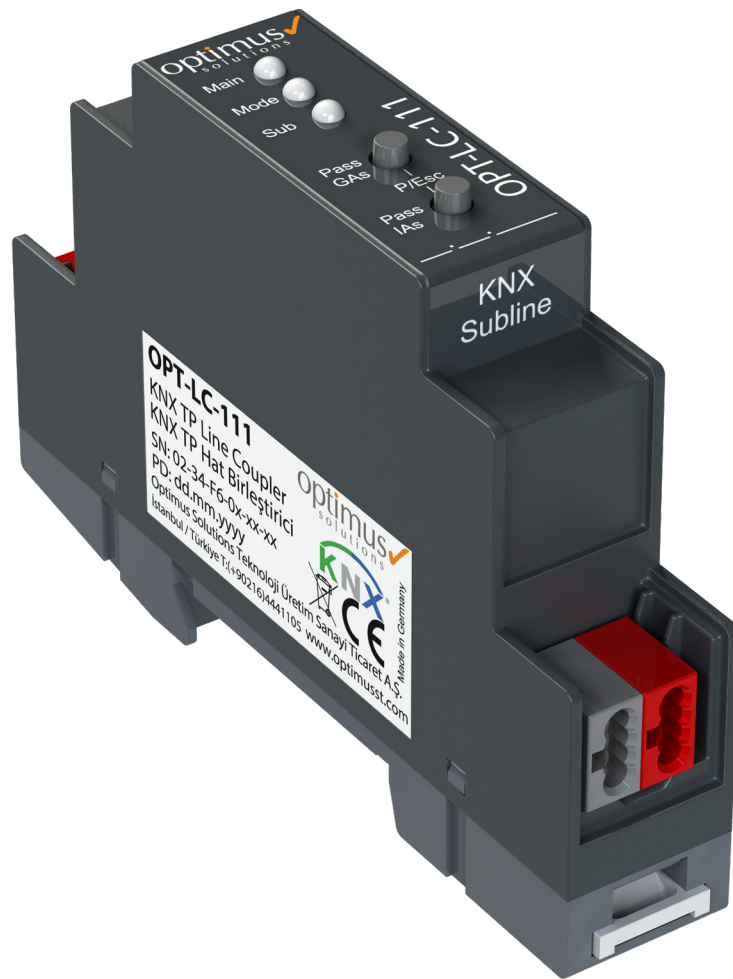


# Product Manual

## The KNX TP Line Coupler

OPT-LC-111



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## About this document

This document provides detailed technical information on the function, installation and programming of the OPT-LC-111 device.

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## Discarding the old device

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# 1 Product Description

The KNX TP Line Coupler is a KNX line coupler in a compact design. It connects two KNX bus segments (for example, a KNX line with a KNX area).

The device has a filter table (8k bytes) and ensures a galvanic separation between the lines. The coupler supports KNX longframes and is compatible with the ETS® software (ETS3 or higher).

The buttons on the front side allow to deactivate the telgraf filters for test purposes. The LEDs indicate operating conditions as well as communication errors on the KNX bus.

The power is supplied via the KNX bus (main line).

## 1.2 Coupler Function

The KNX TP Line Coupler operates as a line or backbone coupler. In both cases, KNX TP is used as a backbone.

The following table shows the application possibilities of The KNX TP Line Coupler compared to the IP based topology:

	<b>Classical Topology (without IP)</b>	<b>IP coupling of areas (IP area coupl.)</b>	<b>IP coupling of lines (IP line coupler)</b>
Area (Backbone)	TP	IP	IP
Coupling	The KNX TP Line Coupler (max. 15 Pcs.)	KNX IP Router (max. 15 Pcs.)	Directly via LAN Switch
Main line	TP	TP	IP
Coupling	The KNX TP Line Coupler (max. 15x15 Pcs.)	The KNX TP Line Coupler (max. 15x15 Pcs.)	KNX IP Router (max. 225 Pcs..)
Line	TP	TP	TP

### KNX TP Line Coupler as line coupler

The individual address assigned to The KNX TP Line Coupler determines whether the device operates as a line or area coupler. If the individual address is in the form of x.y.0 (x, y: 1..15), the device operates as a line coupler. If it is in the form of x.0.0 (x: 1..15), the router acts as a backbone coupler.

### KNX TP Line Coupler as area and line coupler

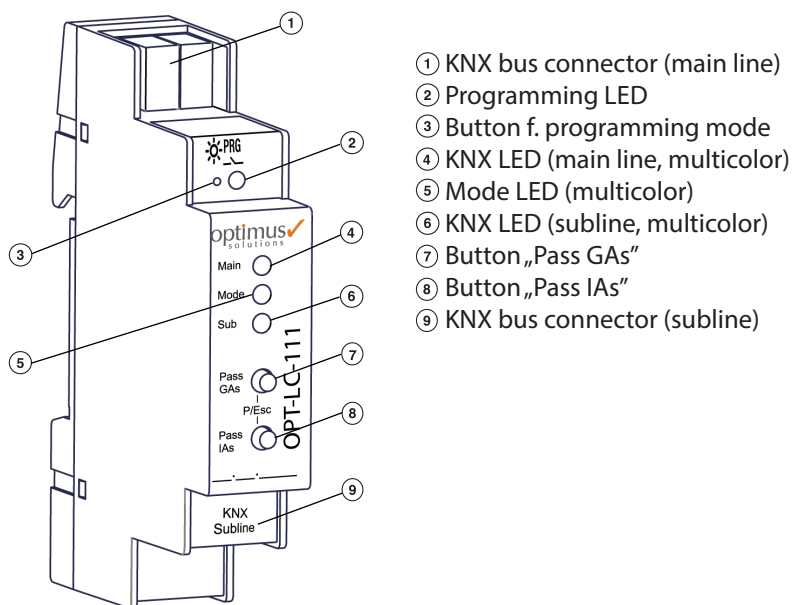
The KNX TP Line Coupler has a filter table and thus contributes to reducing the bus load. The filter table (8kB) supports the extended group address range and is automatically generated by the ETS.

## 1.3 Repeater Function

OPT-LC-111 can also be used as a repeater. In this case, the individual address has the form x.y.z, where z must not be equal to 0. The filter settings in the parameter dialog of the ETS are ineffective in repeater mode.

## 1.4 Installation And Connection

The KNX TP Line Coupler is designed for installation on a DIN rail with a width of 1 unit (18mm). It features the following controls and displays:



#### NOTE:

The device is not working without bus power (main line).

## KNX Programming Mode

The KNX programming mode is activated/deactivated either by pressing the flushed KNX programming button ③ or by simultaneously pressing the buttons ⑦ and ⑧.

## Manual Operation And Status Display

The KNX main line LED ④ lights up green if the device is successfully powered by the KNX bus. This LED flickers to indicate telgraf traffic on the KNX bus.

Communication failures (e.g. repetitions of telgrafs or telgraf fragments) are indicated by a short change of the LED color to red.

### Overview of the different indications of KNX main line LED ④:

LED Status	Meaning
LED lights green	KNX Bus power (main line) active
LED flashes green	Telgraf traffic on the KNX bus (main line)
LED turns red (short)	Communication error on the KNX Bus (main line)

The KNX subline LED ⑥ lights up green when the device is ready for operation (supplied by the main line) and the KNX bus voltage is present on the subline. If the LED is flickering, telgraf traffic takes place on the subline.

Errors in the communication (such as telgraf repeats or telgraf fragments) are indicated by a short-time color change to red.

### Overview of the different indications of KNX subline LED ⑥:

LED Status	Meaning
LED lights green	KNX Bus power (subline) active
LED flashes green	Telgraf traffic on the KNX bus (subline)
LED turns red (short)	Communication error on the KNX Bus (subline)

For testing purposes (for example, during commissioning) the configured routing settings (filter or block) can be by passed via manual operation.

With the button "Pass GAs" ⑦ the forwarding of group addressed telgrafs can be activated.

With the button "Pass IAs" ⑧ the forwarding of individually addressed telgrafs can be activated.

This is visualized with a single flash of the Mode LED ⑤ (orange). If both modes are activated the Mode LED ⑤ flashes two times.

Pressing button "Pass GAs" ⑦ or button "Pass IAs" ⑧ again these settings can be selected and deselected on demand. Via the Escape function (Esc) the manual operation can be stopped by simultaneously pressing the buttons "Pass GAs" ⑦ and "Pass IAs" ⑧.

If neither programming mode nor manual mode are active the LED ⑤ can visualize configuration errors (for details see table below).

**Overview of the different indications of the Mode LED **:

<b>LED Status</b>	<b>Anlamı</b>
LED lights green	Device is working in standard operation mode.
LED light red	Programming mode is active.
LED flashes 1x orange	Programming mode is not active. Manual operation is active. Forwarding IA or GA
LED flashes 2x orange	Programming mode is not active. Manual operation is active. Forwarding IA and GA
LED flashes red	Programming mode is not active. Manual operation is not active. The device is not properly loaded e.g. after an interrupted download.

## 2 Factory Default Settings

The following configuration is set by factory default:

Individual device address:	<b>15.15.0</b>
Routing (subline -> main line):	
Individual addressed telgrafs:	<b>Filter</b>
Group addressed telgrafs:	<b>Locked</b>
Routing (main line -> subline):	
Individual addressed telgrafs:	<b>Filter</b>
Group addressed telgrafs:	<b>Locked</b>

### Reset to factory device settings

It is possible to reset the device to its factory settings:

- Disconnect the KNX Bus connector (main line) ① from device.
- Press the KNX programming button ③ and keep it pressed down.
- Reconnect the KNX Bus connector (main line) ① of device.
- Keep the KNX programming button ③ pressed for at least another 6 seconds
- A short flashing of the programming LEDs (②) visualizes the successful reset of the device to factory default settings

### 2.1 ETS Database

The ETS database (for ETS 4.2 and ETS 5) can be downloaded from the product website of the KNX TP Line Coupler(optimusst.com) For existing installations a database for ETS 3 is also available.

#### ETS parameter dialogue

The following parameters can be set using the ETS.

### 2.2 General Settings

--- OPT-LC-111 KNX TP Line Coupler > General		
Description	Device Name	OPT-LC-111 KNX Line Coupler
<b>General</b>	Programming Mode on Device Front	<input type="radio"/> Disabled <input checked="" type="radio"/> Enabled
Routing (Sub -> Main)	Manual Operation	1 min ▼
Routing (Main -> Sub)		

#### Prog. Mode On Device Front

In addition to the normal programming button ③ the device allows activating the programming mode on the device front without opening the switchboard cover. The programming mode can be activated and deactivated via pressing simultaneously both buttons ⑦ and ⑧.

This feature can be enabled and disabled via the parameter "Prog. mode on device front". The recessed programming button ③ (next to the Programming LED ②) is always enabled and not influenced by this parameter.



## Manual Operation On Device

This parameter sets the duration of the manual mode. Upon completion the normal display mode is restored.

### 2.2.1 Routing (Subline -> Main line)

--- OPT-LC-111 KNX TP Line Coupler > Routing (Sub -> Main)

Description	Group Telegrams (Main Groups 0 to 13)	Filter
General	Group Telegrams (Main Groups 14 to 31)	Filter
Routing (Sub -> Main)	Individual Addressed Telegrams	Filter
Routing (Main -> Sub)	Broadcast Telegrams	<input type="radio"/> Block <input checked="" type="radio"/> Route
	Repetition of Group Telegrams	<input type="radio"/> Disabled <input checked="" type="radio"/> Enabled
	Repetition of Individual Addressed Telegrams	<input type="radio"/> Disabled <input checked="" type="radio"/> Enabled
	Repetition of Broadcast Telegrams	<input type="radio"/> Disabled <input checked="" type="radio"/> Enabled
	Acknowledge (ACK) of Group Telegrams	<input type="radio"/> Always <input checked="" type="radio"/> Only if Routed
	Acknowledge (ACK) of Individual Addressed Telegrams	Only if Routed

#### Group telgrafs (main group 0 to 13)

- Block : No group telgrafs of this main group are routed to the main line.  
 Route : All group telgrafs of this main group are routed to the main line independent of the filter table. This setting is for test purposes only.  
 Filter : The filter table is used to check whether or not the received group telgraf should be routed to the main line.

#### Individually addressed telgrafs

- Block : No individually addressed telgrafs are routed to the main line.  
 Route : All individually addressed telgrafs are routed to the main line. This setting is for test purposes only.  
 Filter : The individual address is used to check whether the received individually addressed telgraf should be routed to the main line.

#### Broadcast telgrafs

- Block : No received broadcast telgrafs are routed to the main line.  
 Route : All received broadcast telgrafs are routed to the main line.

#### Repetition of group telgrafs

- Disabled : The received group telgraf is not resent to the main line in case of a fault.  
 Enabled : The received group telgraf is resent up to three times in case of a fault.

#### Repetition of individually addressed telgrafs

- Disabled : The received individually addressed telgraf is not resent to the main line in case of a fault.  
 Enabled : The received individually addressed telgraf is resent up to three times in case of a fault.

### Repetition of broadcast telgrafs

- Disabled : The received broadcast telgraf is not resent to the main line in case of a fault.
- Enabled : The received broadcast telgraf is resent up to three times in case of a fault.

### Acknowledge (ACK) of group telgrafs

- Always : An acknowledge is generated for every received group telgraf (from the subline).
- Only if routed : A acknowledge is only generated for received group telgrafs (from the subline) if they are routed to the main line.

### Acknowledge (ACK) of individually addressed telgrafs

- Always : An acknowledge is generated for every received individual addressed telgraf (from the subline).
- Only if routed : An acknowledge is only generated for received individually addressed group telgrafs (from the subline) if they are routed to the main line.
- Answer with NACK : Every received individually addressed telgraf (from the subline) is responded to with NACK (Not acknowledge). This means that communication with individually addressed telgrafs on the corresponding KNX line is not possible. Group communication (group telgrafs) is not affected. This setting can be used to block attempts at manipulation.

#### NOTE:

When using "Answer with NACK" an access to the device via the KNX subline is no longer possible. The configuration must be performed via the main line.

### 2.2.2 Routing (Main line -> Subline)

--- OPT-LC-111 KNX TP Line Coupler > Routing (Main -> Sub)

Description	Group Telegrams (Main Groups 0 to 13)	Filter
General	Group Telegrams (Main Groups 14 to 31)	Filter
Routing (Sub -> Main)	Individual Addressed Telegrams	Filter
<b>Routing (Main -&gt; Sub)</b>	Broadcast Telegrams	<input type="radio"/> Block <input checked="" type="radio"/> Route
	Repetition of Group Telegrams	<input type="radio"/> Disabled <input checked="" type="radio"/> Enabled
	Repetition of Individual Addressed Telegrams	<input type="radio"/> Disabled <input checked="" type="radio"/> Enabled
	Repetition of Broadcast Telegrams	<input type="radio"/> Disabled <input checked="" type="radio"/> Enabled
	Acknowledge (ACK) of Group Telegrams	<input type="radio"/> Always <input checked="" type="radio"/> Only if Routed
	Acknowledge (ACK) of Individual Addressed Telegrams	Only if Routed

**Group telgrafs (main group 0 to 13)**

Block	:	No group telgrafs of this main group are routed to the subline.
Route	:	All group telgrafs of this main group are routed to the subline independent of the filter table. This setting is for test purposes only
Filter	:	The filter table is used to check whether or not the received group telgraf should be routed to the subline.

**Group telgrafs (main group 14 to 31)**

Block	:	No group telgrafs of main groups 14 to 31 are routed to the subline.
Route	:	All group telgrafs of main groups 14 to 31 are routed to the subline. This setting is for test purposes only.
Filter	:	The filter table is used to check whether or not the received group telgraf should be routed to the subline.

**Individually addressed telgrafs**

Block	:	No individually addressed telgrafs are routed to the subline.
Route	:	All individually addressed telgrafs are routed to the subline. This setting is for test purposes only.
Filter	:	The individual address is used to check whether the received individually addressed telgraf should be routed to the subline.

**Broadcast telgrafs**

Block	:	No received broadcast telgrafs are routed to the subline.
Route	:	All received broadcast telgrafs are routed to the subline.

**Repetition of group telgrafs**

Disabled	:	The received group telgraf is not resent to the subline in case of a fault.
Enabled	:	The received group telgraf is resent up to three times in case of a fault.

**Repetition of individually addressed telgrafs**

Disabled	:	The received individually addressed telgraf is not resent to the subline in case of a fault.
Enabled	:	The received individually addressed telgraf is resent up to three times in case of a fault.

**Repetition of broadcast telgrafs**

Disabled	:	The received broadcast telgraf is not resent to the subline in case of a fault.
Enabled	:	The received broadcast telgraf is resent up to three times in case of a fault.

**Acknowledge (ACK) of group telgrafs**

Always	:	A acknowledge is generated for every received group telgraf (from the main line).
Only if routed:	:	A acknowledge is only generated for received group telgrafs (from the main line) if they are routed to the subline.

### Acknowledge (ACK) of individually addressed telgrafs

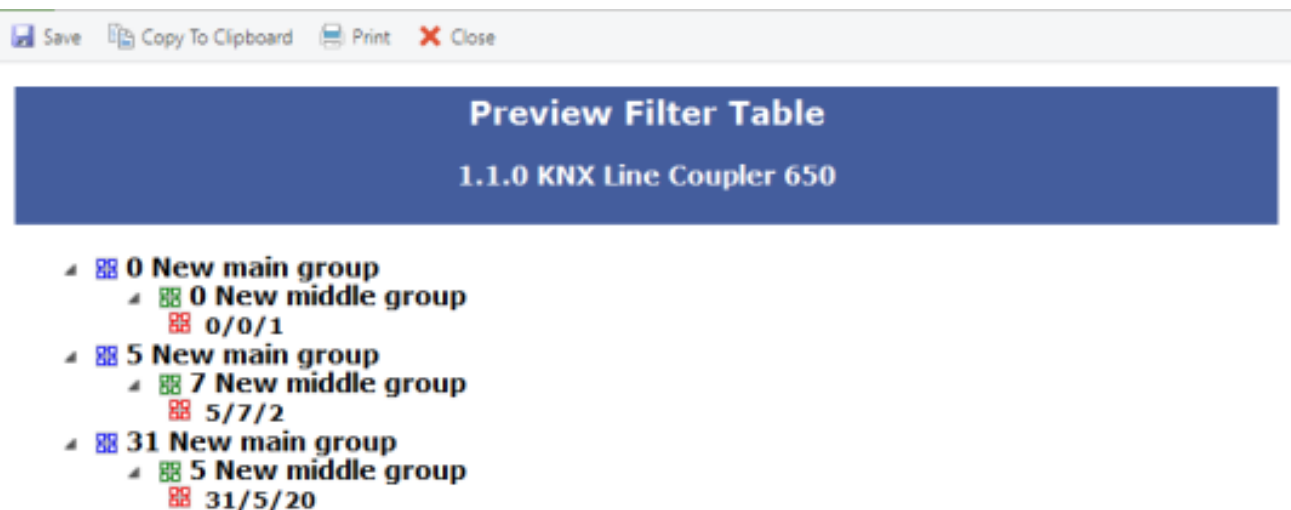
- Always : A acknowledge is generated for every received individual addressed telgraf (from the main line).
- Only if routed : A acknowledge is only generated for received individually addressed group telgrafs (from the main line) if they are routed to the subline.
- Answer with NACK : Every received individually addressed telgraf (from the main line) is responded to with NACK (Not acknowledge). This means that communication with individually addressed telgrafs on the corresponding KNX line is not possible. Group communication (group telgrafs) is not affected. This setting can be used to block attempts at manipulation.

#### NOTE:

When using "Answer with NACK" an access to the device via the KNX main line is no longer possible. The configuration must be performed via the subline.

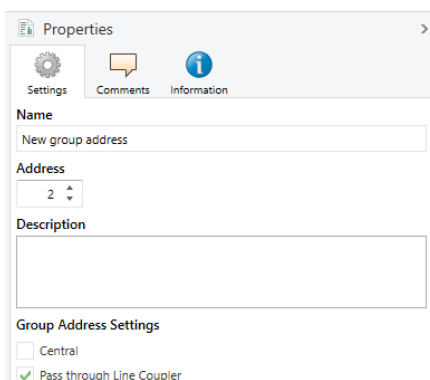
### Filter Table

The filter table is automatically created by the ETS. The group addresses of the telgrafs which shall be forwarded via the coupler are added to the filter table. The contents of the filter table can be displayed via the preview:



Preview of the filter table

The filter table can be extended by manually adding group addresses. This requires activating "Pass through Line Coupler)" in the property window of the corresponding group address.



Property window of a group address



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OPTIMUS SOLUTIONS Teknoloji  
Üretim Sanayi Ticaret A.Ş.  
Emek Mh. Ordu Cd.  
No: 4 34785 Sancaktepe  
İstanbul / Türkiye  
Tel.: +90 216 487 33 46  
Fax: +90 216 487 33 48  
Email: [info@optimusst.com](mailto:info@optimusst.com)

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