



EKSELANS BY ITS

# INTERNET OVER COAXIAL



ENTER THE EK WORLD



## **EKOAX / EKOAX PLUS INTERNET OVER COAXIAL CABLE**

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The EKOAX and EKOAX PLUS systems developed by Ek-selans have been specially designed to convert the coaxial network into a data network in a very simple way.

The EKOAX / EKOAX PLUS equipment allows to transmit and receive the internet signal through the existing coaxial cable installation, without having to make any change on the infrastructure.

Simply adding a master device in the headend (IPC-M2 / IPC-M3 / IPC-M300) and a user equipment (IPC-S2 / IPC24 / IPCAC) at each point to which internet is requested, the installation can be updated to transmit high speed IP data. The user device also acts as a WiFi router, so it's possible to create a WiFi network easily and with quality wherever the IPC S2 / 24 / AC comes installed.

A single master device allows managing up to 253 user computers with encrypted communications with each of them. It is also possible to increase the number of user devices using the same network, simply by installing new master equipment in parallel (up to a maximum of 4 IPC-M3 for the same coaxial cable, using the same FA 524 power supply).

### **EKOAX PLUS: the evolution**

The new EKOAX PLUS system represents an evolution respect to the EKOAX. In addition to being able to perform the same tasks as with the IPC-M2 / M3, the IPC-M3000 provides new provisioning and control functionalities such as the application of WiFi configuration templates to the users of the network. From the point of view of user equipment, EKOAX PLUS has slaves with WiFi 2.4GHz (IPC-24) and dual band 2.4 and 5 GHz (IPC-AC) with high speed wireless communication.

The EKOAX / EKOAX PLUS systems offer a very high versatility that adapts to any type of installation: single-family homes -both for Internet / WiFi extension and for operator IPTV extension-, buildings, hotels, resorts, ... Wherever it's needed to be distributed the internet signal without additional wiring costs, EKOAX and EKOAX PLUS are the solution.

IP on  
coaxial cable

Transmission  
**1 Gbps**

**HDTV**

Coaxial  
cable  
7,5-65 MHz

**QoS**

Low  
attenuation  
Long  
range

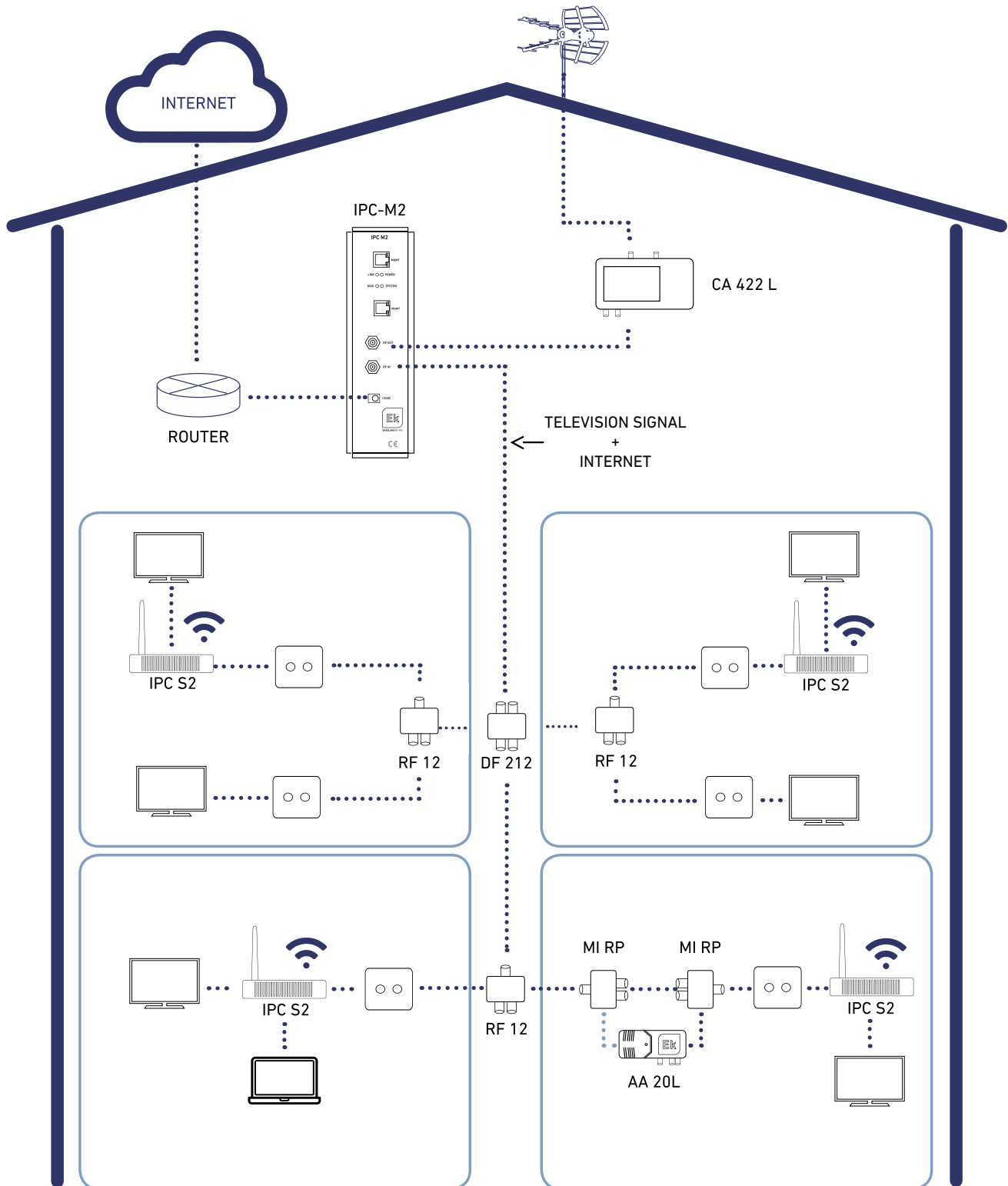
**WiFi**

Configuration  
**VLAN**

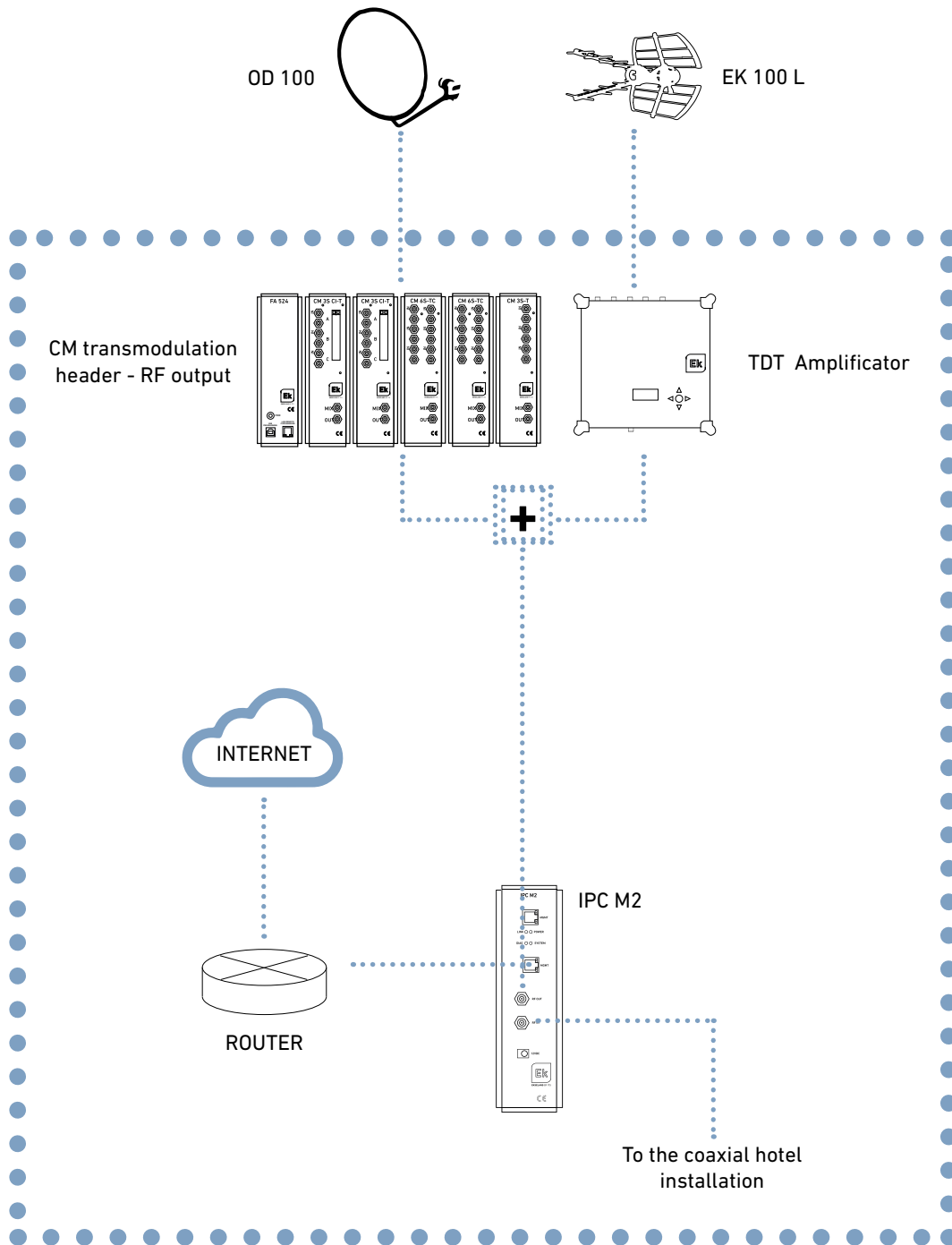
Remote  
management

**IPTV**

# IMPLEMENTATION OF THE EKOAX SOLUTION IN RESIDENTIAL INSTALLATIONS



# IMPLEMENTATION OF THE EKOAX SOLUTION IN HOTEL INSTALLATIONS



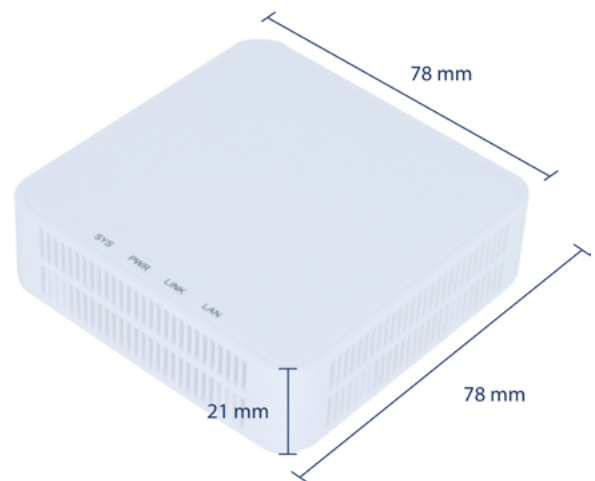


# 1 MASTER HOME SOLUTION

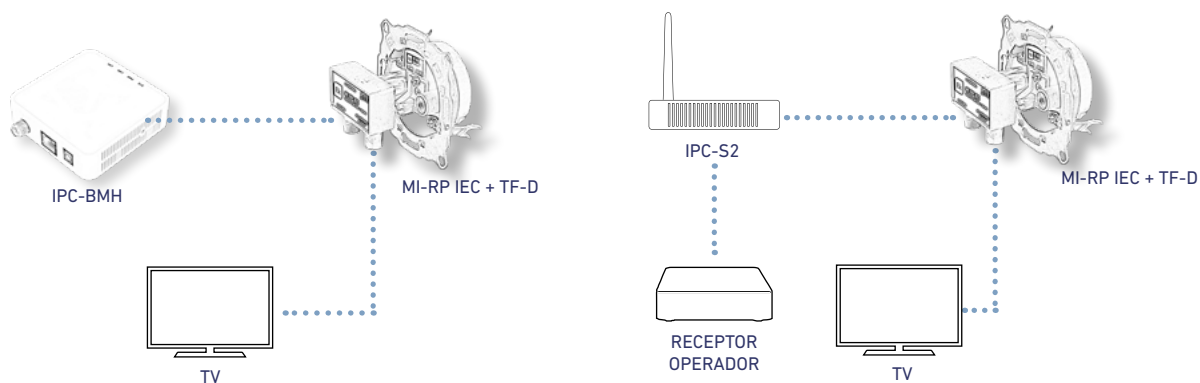
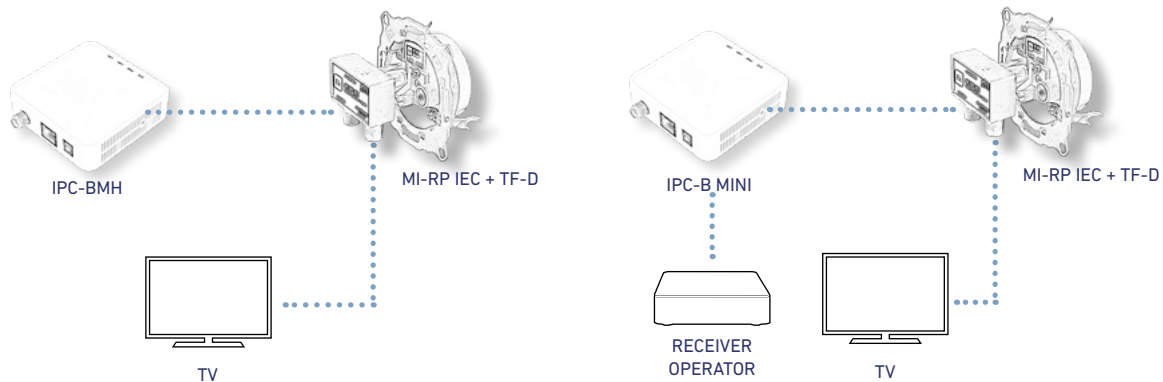
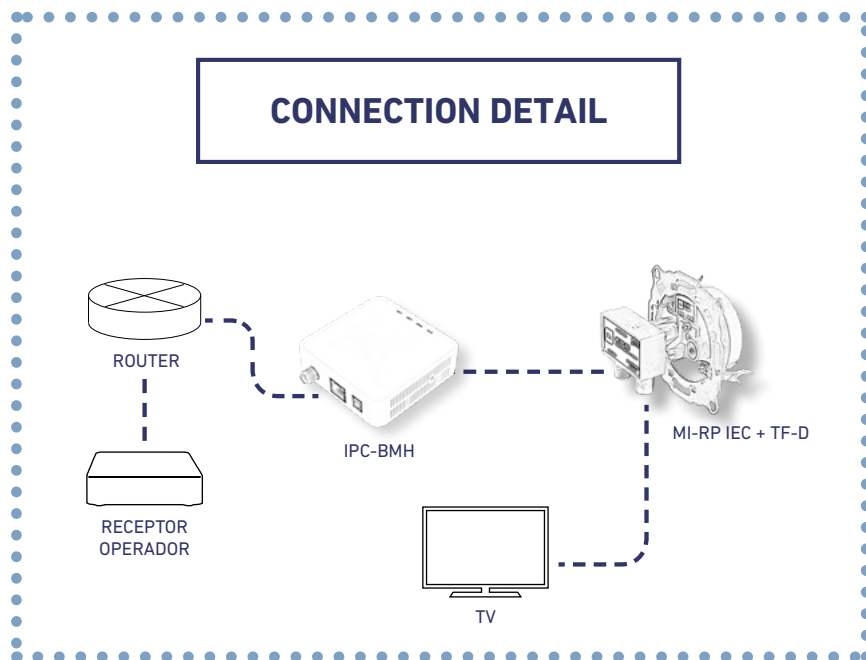
REFERENCE	IPC BMH
Code	250015
Operating characteristics	
RF parameters	
Frequency	7,5 – 65 MHz
Output level	95 dBuV
Minimum input level	45 dBuV
Return loss	> 15 dB
Transmission speed	
Physical layer speed	600 Mbps
Physical layer MAC	300 Mbps
Modulation	OFDM-2690 portadoras 4096/1024/256/64/16/8-QAM, QPSK, BPSK, ROBO
Operating mode	TDMA / CSMA
Encryption	AES-128
Standards	
EOC Standard	IEEE P1901 HomePlug AV
Ethernet protocols	IEEE802.3, IEEE802.3x, IEEE802.3u, IEEE802.1P, IEEE802.1Q
RF Connection	1 RF OUT (conector F)
Ethernet Interface	1 port Ethernet (RJ45)
Alimentation	12 Vdc
Consumption	< 5 W

## IPC-BMH

- Master device for indoor use
- IP transmission over coaxial cable
- Frequency 7,5-65 MHz
- 600 Mbps speed (physical layer)
- Up to 6 slave-devices IPC-S / S2
- Plug&Play
- 1 RJ45 Port
- With IPTV management for indoor internet extension



# IMPLEMENTATION OF THE EKOAK SOLUTION IN RESIDENTIAL INSTALLATIONS



# 1 MASTER PROFESSIONAL SOLUTION

REFERENCE	IPC M2		
Code	250003		
Operating characteristics			
RF Parameters			
Frequency	7,5 – 65 MHz		
Output level	120 dBuV		
Minimum Recommended Input Level	43 dBuV		
Return loss	> 16 dB		
Transmission speed			
Speed on physical layer	600 Mbps		
Speed on MAC layer	300 Mbps		
Modulation	OFDM-2690 carriers 4096/1024/256/64/16/8-QAM, QPSK, BPSK, ROBO		
Work band	TDMA / CSMA		
Encryption	AES-128		
Standards			
EOC Standard	IEEE P1901 HomePlug AV		
Ethernet protocols	IEEE802.3ab, IEEE802.3, IEEE802.3x, IEEE802.3u, IEEE802.1P, IEEE802.1Q		
Software			
Method of use	WEB, CLI y SNMP		
Software characteristics	VLAN, QoS, bandwidth control, limitation "broadcast storm",...		
Conexions			
RF Conexion	1 RF IN-MIX (F connector) 1 RF OUT (F connector)		
Ethernet interface	1 port 10/100M/1000M Self-adaptive Ethernet (RJ45)		
Power	24 Vdc		
Consumption	< 8 W		

## IPC-M2

- Master equipment
- Transmission IP signal over coaxial cable
- Work band 7,5-65 MHz
- Speed 600 mbps on physical layer
- Up to 253 users (Ekoax slaves)
- Possibility of remote management
- Power supply (12Vdc) included
- With IPC-M2 is only possible to install one master using the same power supply. Is able to install up to 4 masters in parallel, each one with its own power supply





# 1 TO 4 MASTER PROFESSIONAL SOLUTION

## IPC-M3

- Master equipment
- Transmission IP signal over coaxial cable
- Work band 7,5-65 MHz
- Speed 600 mbps on physical layer
- Up to 253 users (Ekoax slaves)
- Possibility of remote management
- Power supply 5Vdc
- Up to 4 masters in parallel with one FA 524



REFERENCE	IPC M3	
Code	250016	
Operating characteristics		
RF Parameters		
Frequency	7,5 – 65 MHz	
Output level	120 dBuV	
Minimum Recommended Input Level	43 dBuV	
Return loss	> 16 dB	
Transmission speed		
Speed on physical layer	600 Mbps	
Speed on MAC layer	300 Mbps	
Modulation	OFDM-2690 carriers 4096/1024/256/64/16/8-QAM, QPSK, BPSK, ROBO	
Work band	TDMA / CSMA	
Encryption	AES-128	
Standards		
EOC Standard	IEEE P1901 HomePlug AV	
Ethernet protocols	IEEE802.3, IEEE802.3x, IEEE802.3u, IEEE802.1P, IEEE802.1Q	
Software		
Method of use	WEB, CLI y SNMP	
Software characteristics	VLAN, QoS, bandwidth control, limitation "broadcast storm", ...	
Conexions		
RF Conexion	1 RF IN-MIX (F connector) 1 RF OUT (F connector)	
Ethernet interface	1 port 10/100M/1000M Self-adaptive Ethernet (RJ45)	
Power	5 Vdc	
Consumption	< 8 W	

# END USER DEVICES

## IPC-S2

REFERENCE	IPC-S2
Código	250017
Operating characteristics	
RF parameters	
Frequency	7.5–65MHz
Output level	110 dBuV
Minimum input level	45 dBuV
Return loss	> 15 dB
Transmission speed	
Operating mode	TDMA / CSMA
Encryption	AES-128
Standards	
EOC Standard	IEEE1901 HomePlug AV
Ethernet protocols	IEEE802.3, IEEE802.3x, IEEE802.3u, IEEE802.1P, IEEE802.1Q
Software	
Manner of use	Network management WEB, CLI and SNMP
Software characteristics	VLAN, QoS, bandwidth control, limitation "broadcast storm",...
Connections	
RF Connection	1 RF IN (connector F) 1 RF OUT (connector F)
Ethernet Interface	4 10/100M Ethernet (connectors RJ45) ports
Power Supply	DC 12Vdc Connector
Consumption	< 5W
Wi-Fi Characteristics	
Operating mode	Router or Bridge
Antenna	2 x Antennas 2.4 Ghz
Throughput	IEEE802.11b: 11Mbps IEEE802.11g: 54Mbps IEEE802.11n: 300Mbps
Frequency	2.412GHz–2.472GHz
Channel	13. Configurable for various standards
Modulation mode	DSSS, CCK and OFDM
Coding	BPSK, QPSK, 16QAM and 64QAM
Encryption	802.11i Security: WEP-64/128, TKIP(WPA-PSK) and AES(W- PA2-PSK)

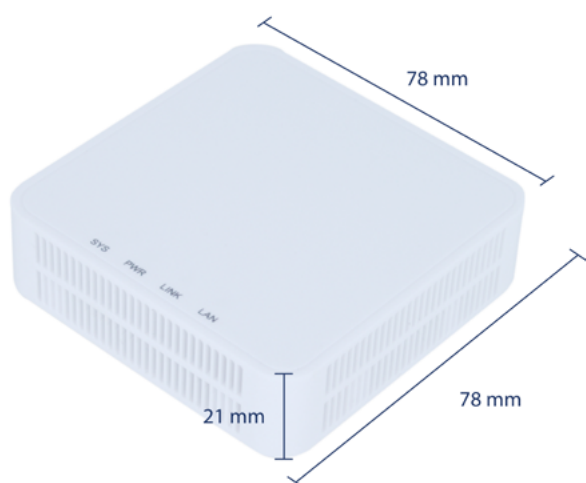
- IP reception signal via coaxial cable
- Working bandwidth 7,5-65 MHz
- 4 ports LAN 10/100 + Router Wifi
- VLAN Configuration
- 2 antenna, 300 Mbps
- IPC-S2 with IPTV management for indoor WiFi extension



# END USER DEVICES

## IPC-B MINI

- IP reception signal via coaxial cable
- Working bandwidth 7,5-65 MHz
- 4 ports LAN
- Transparent media converter (bridge)
- With IPTV management for indoor internet extension



REFERENCE	IPC-B MINI
Code	250013
Operating characteristics	
RF parameters	
Frequency	7.5–65MHz
Minimum input level	45 dBuV
Return loss	> 15 dB
Transmission speed	
Physical layer speed	600 Mbps
Operating mode	TDMA / CSMA
Encryption	AES-128
Standards	
EOC Standard	IEEE1901 HomePlug AV
Ethernet protocols	IEEE802.3, IEEE802.3x, IEEE802.3u, IEEE802.1P, IEEE802.1Q
Software	
Manner of use	Network management WEB, CLI and SNMP
Software characteristics	VLAN, QoS, bandwidth control, limitation "broadcast storm", ...
Connections	
RF Connection	1 RFIN (connector F)
Ethernet Interface	1 10/100/1000 Ethernet (connectors RJ45) port
Power Supply	DC 12Vdc Connector
Consumption	< 5W
Operating mode	Bridge

# MIXER / DEMIXER FOR EKOAX

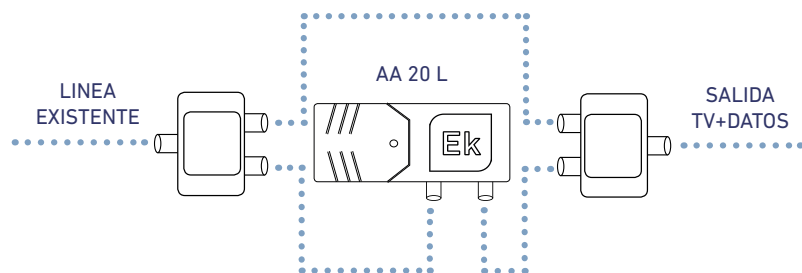
REFERENCE	MI RP		
Code	132001		
Inputs	DATA	TV	
Input connector	F	F	
Frequency range	MHz	5-65	85-2150
Insertion loss	dB	<1	<1,5
Rejection	dB	>30	>25
Outputs	N°	1= DATA + TV	
Output connectors		F	
DC Pass		NO	SI

## MI RP

- Return path mixer / demixer
- Ekoax compatible



### Installation with line amplifier without return path



# MIXER / DEMIXER FOR EKOAX

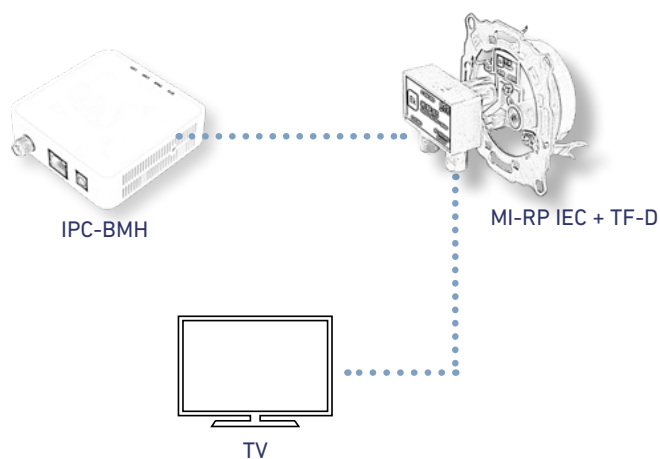
## MI RP IEC

- Return path mixer / demixer
- Ekoax compatible



REFERENCE		MI RP IEC	
Code		132002	
Inputs		DATA	TV
Input connector		F	IEC Macho
Frequency range	MHz	5-65	85-1000
Insertion loss	dB	<0,5	<1
Rejection	dB	>40	>32
Outputs	N°	1 = DATA + TV	
Output connectors		IEC Hembra	
DC Pass		NO	SI

### Installation of MI RP IEC mix-demix in a wall-socket



## IPC M300

REFERENCE	IPC M300		
Code	250019		
Operating characteristics			
RF Parameters			
Frequency	7,5 – 65 MHz		
Output level	120 dBuV		
Minimum Recommended Input Level	43 dBuV		
Return loss	> 16 dB		
Transmission speed			
Speed on physical layer	600 Mbps		
Speed on MAC layer	300 Mbps		
Modulation	OFDM-2690 carriers 4096/1024/256/64/16/8-QAM, QPSK, BPSK, ROBO		
Work band	TDMA / CSMA		
Encryption	AES-128		
Standards			
EOC Standard	IEEE P1901 HomePlug AV		
Ethernet protocols	IEEE802.3ab, IEEE802.3, IEEE802.3x, IEEE802.3u, IEEE802.1P, IEEE802.1Q		
Software			
Method of use	WEB, CLI y SNMP		
Software characteristics	VLAN, QoS, bandwidth control, limitation "broadcast storm",...		
Conexions			
RF Conexion	1 RF IN-MIX (F connector) 1 RF OUT (F connector)		
Ethernet interface	2 x port 10/100M/1000M Self-adaptive Ethernet (RJ45)		
Power	12 Vdc		
Consumption	< 10 W		

- Master equipment
- Transmission IP signal over coaxial cable
- Work band 7,5-65 MHz
- Speed 600 mbps on physical layer
- Up to 253 users (Ekoax slaves)
- Possibility of remote management
- Optimized configuration menu for simple system provisioning.
- Complete provisioning of IPC 24 and IPC AC equipment.
- Configuration of templates of all parameters, including WiFi, of IPC 24 user equipment and IPC AC.



IPC-M3

## IPC 24

- Receiving an IP signal through coax
- Working frequency 7.5-65 MHz
- 4 LAN ports 10/100 + Wifi Router
- VLAN configuration
- 2 antennas (1 internal and 1 external), 300 Mbps, 2.4GHz



IPC 24

REFERENCE	IPC-24
Code	250020
Operating characteristics	
RF parameters	
Frequency	7.5–65MHz
Output level	110 dBuV
Minimum input level	45 dBuV
Return loss	> 16 dB
Transmission speed	
Operating mode	TDMA / CSMA
Encryption	AES-128
Standards	
EOC Standard	IEEEP1901 HomePlug AV
Ethernet protocols	IEEE802.3, IEEE802.3x, IEEE802.3u, IEEE802.1P, IEEE802.1Q
Software	
Manner of use	Network management WEB, CLI and SNMP
Software characteristics	VLAN, QoS, bandwidth control, limitation "broadcast storm",....
Connections	
RF Connection	1 RF IN (connector F) 1 RF OUT (connector F)
Ethernet Interface	4 10/100M Ethernet (connectors RJ45) ports
Power Supply	DC 12Vdc Connector
Consumption	< 5W
Wi-Fi Characteristics	
Operating mode	Router or Bridge
Antenna	2 x Antennas 2.4 Ghz
Throughput	IEEE802.11b: 11Mbps
	IEEE802.11g: 54Mbps
	IEEE802.11n: 300Mbps
Frequency	2.412GHz–2.472GHz
Channel	13. Configurable for various standards
Modulation mode	DSSS, CCK and OFDM
Coding	BPSK, QPSK, 16QAM and 64QAM
Encryption	802.11i Security: WEP-64/128, TKIP(W-PA-PSK) and AES(WPA2-PSK)

## IPC AC

- Receiving an IP signal through coax
- Working frequency 7.5-65 MHz
- 4 LAN ports 10/100 + Wifi Router
- VLAN configuration
- 2 antennas, 300 Mbps, 2.4GHz
- 2 antennas, 800 Mbps, 5GHz

REFERENCE	IPC-AC	
Code	250021	
Operating characteristics		
RF parameters		
Frequency	7.5-65MHz	
Output level	110 dBuV	
Minimum input level	45 dBuV	
Return loss	> 16 dB	
Transmission speed		
Operating mode	TDMA / CSMA	
Encryption	AES-128	
Standards		
EOC Standard	IEEE1901 HomePlug AV	
Ethernet protocols	IEEE802.3, IEEE802.3x, IEEE802.3u, IEEE802.1P, IEEE802.1Q	
Software		
Manner of use	Network management WEB, CLI and SNMP	
Software characteristics	VLAN, QoS, bandwidth control, limitation "broadcast storm", ...	
Connections		
RF Connection	1 RF IN (connector F) 1 RF OUT (connector F)	
Ethernet Interface	4 10/100M Ethernet (connectors RJ45) ports	
Power Supply	DC 12Vdc Connector	
Consumption	< 5W	
Wi-Fi Characteristics		
Operating mode	Router or Bridge	
Antenna	2 x Antennas 2.4 Ghz	2 x Antennas 5 Ghz
Throughput	IEEE802.11b: 11Mbps IEEE802.11g: 54Mbps IEEE802.11n: 300Mbps	IEEE802.11b: 11Mbps IEEE802.11g: 54Mbps IEEE802.11n: 300Mbps IEEE802.11ac: 800Mbps
Frequency	2.412GHz-2.472GHz	
Channel	1 - 13 para 2.4 Ghz 36 - 165 para 5.8 Ghz	
Modulation mode	DSSS, CCK and OFDM	
Coding	BPSK, QPSK, 16QAM and 64QAM	
Encryption	802.11i Security: WEP-64/128, TKIP(W-PA-PSK) and AES(WPA2-PSK)	





The new EKOAX PLUS system represents an evolution respect to the EKOAX. In addition to being able to perform the same tasks as with the IPC-M2 / M3, the IPC-M3000 provides new provisioning and control functionalities such as the application of WiFi configuration templates to the users of the network. From the point of view of user equipment, EKOAX PLUS has slaves with WiFi 2.4GHz (IPC-24) and dual band 2.4 and 5 GHz (IPC-AC) with high speed wireless communication.

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Software

Massive application of templates including all WiFi parameters

**Ek**  
EKSELANS BY ITS

Estado básico Otro estado MPDU Señal Editar QoS Actualizar Sincronizar Gestionar

- FoC Manage
  - Canal de trabajo
  - Auto VID
  - Lista de CNU
  - Consulta de CNU
  - Registro de dispositivos
  - Plantilla de esclavo
  - Plantilla aplicar
  - Ajuste de la lista blanca
  - Sincronizar configurar
  - Actualizar Configurar
  - Prueba de bucle
- Gestionar el sistema
  - Gestión de dispositivos
  - Gestionar usuario
  - RF
  - Ajustes avanzados
  - Cerrar sesión

Información básica		
Dirección MAC	1c18.4a2f8cbf	
Nombre de usuario	<input type="text"/>	
Teléfono	<input type="text"/>	
Dirección de contacto	<input type="text"/>	
Descripción	<input type="text"/>	
Elegir la plantilla	Personalizado ▼	
Ancho de cable		
Limite de enlace ascendente	0 Kbps(0~102400,0 significa limite deshabilitado)	
Limite de enlace descendente	0 Kbps(0~102400,0 significa limite deshabilitado)	
Limitación de direcciones MAC		
Limite de número de MAC	0 ▼ ↑ (0 significa limite desactivado)	
interfaz		
Nombre de la interfaz	Mapa del puerto	Funcionar
1_INTERNET_R_VID_-1		<input type="checkbox"/>
Agregar		
LAN		
WLAN		
WLAN		
Aplicar los cambios		



**EKSELANS BY ITS**

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