

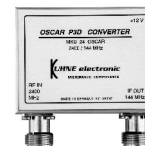
# Low Noise Converters

Type	Frequency Range RF	Frequency Range IF	Noise Figure	Gain	Remarks
MKU LNC 13 CON 28	1296 ... 1298 MHz	28 ... 30 MHz	0.6 dB	20 dB	
MKU LNC 13 CON 144	1296 ... 1298 MHz	144 ... 146 MHz	0.6 dB	20 dB	
MKU LNC 23 CON2	2320 ... 2322 MHz	144 ... 146 MHz	0.7 dB	26 dB	Option: ZF = 432 ... 434 MHz
MKU LNC 24 OSCAR2	2400 ... 2402 MHz	144 ... 146 MHz	0.7 dB	30 dB	Option: ZF = 432 ... 434 MHz oder IF = 50 ... 52 MHz
MKU LNC 24 OSCAR 2 TM	2400 ... 2402 MHz	144 ... 146 MHz	0.7 dB	30 dB	Option: ZF = 432 ... 434 MHz oder IF = 50 ... 52 MHz
MKU LNC 10 CON	10368 ... 10370 MHz	432 ... 434 MHz	1.2 dB	20 dB	
MKU LNC 10 OSCAR	10451 ... 10453 MHz	432 ... 434 MHz	1.2 dB	20 dB	
MKU LNC 23	2320 ... 2450 MHz	1403.5 ... 1533.5 MHz	0.7 dB	40 dB	Converter for digital/analogue ATV
MKU LNC 23 TM	2320 ... 2450 MHz	1403.5 ... 1533.5 MHz	0.7 dB	40 dB	Converter for digital/analogue ATV
MKU LNC 34	3400 ... 3475 MHz	1567 ... 1642 MHz	0.9 dB	38 dB	Converter for digital/analogue ATV
MKU LNC 34 TM	3400 ... 3475 MHz	1567 ... 1642 MHz	0.9 dB	38 dB	Converter for digital/analogue ATV
MKU LNC 57-3	5600 ... 5900 MHz	1400 .. 1700 MHz	1.0 dB	40 dB	Converter for ATV
MKU LNC 57-3 TM	5600 ... 5900 MHz	1400 .. 1700 MHz	1.0 dB	40 dB	Converter for ATV
MKU LNC 24 A	24000 ... 24250 MHz	1000 ... 1250 MHz	2.5 dB	45 dB	Converter for ATV
KU LNC 14 CON	1400 MHz +/-	VHF range	0.6 dB	20 dB	Please specify desired frequency in your order! Bandwidth max. 30 MHz
KU LNC 14 CON2	1400 MHz +/-	VHF range	0.6 dB	60 dB	Please specify desired frequency in your order! Bandwidth max. 30 MHz
KU LNC 15 CON	1550 MHz +/-	VHF range	0.6 dB	20 dB	Please specify desired frequency in your order! Bandwidth max. 30 MHz
KU LNC 17 CON	1695 ... 1710 MHz	138 ... 153 MHz	0.7 dB	20 dB	
KU LNC 17 CON2	1695 ... 1710 MHz	138 ... 153 MHz	0.7 dB	60 dB	
KU LNC 8084 B PRO	8000 ... 8450 MHz	850 ... 1300 MHz	1.2 dB	28 dB	Case: milled aluminium

# Super Low Noise Converters for the Amateur Radio Bands

**MKU LNC 13 CON 28 - MKU LNC 13 CON 144 - MKU LNC 23 CON2 - MKU LNC 24 OSCAR2  
MKU LNC 24 OSCAR2 TM - MKU LNC 10 CON - MKU LNC 10 OSCAR**

- Converters for the microwave amateur radio bands from 1.3 GHz up to 10 GHz
- Super low noise figure due to the use of the latest HEMT FETs
- Remote power supply via the coaxial cable
- Protection against damages by accidentally transmitting into the IF output port (not in the converter for 10 GHz)
- **MKU LNC 24 OSCAR 2 and MKU LNC 24 OSCAR 2 TM** with notch filter for 1268 MHz, for duplex operation on 1.3 GHz (transmit) and 2.4 GHz (receive)



## Specifications

Type	MKU LNC 13 CON 28	MKU LNC 13 CON 144	MKU LNC 23 CON2	MKU LNC 24 OSCAR2	MKU LNC 24 OSCAR2 TM	MKU LNC 10 CON	MKU LNC 10 OSCAR
Frequency range RF (MHz)	1296 .. 1298	1296 ... 1298	2320 ... 2322	2400 ... 2402	2400 ... 2402	10368 ... 10370	10451 ... 10453
Frequency range IF (MHz)	28 ... 30	144 ... 146	144 ... 146	144 ... 146	144 ... 146	432 ... 434	432 ... 434
Option 70 cm	-	-	432 ... 434	432 ... 434	432 ... 434	-	-
Option 6 m	-	-	-	50 ... 52	50 ... 52	-	-
Noise figure @ 18 °C	0.6 dB	0.7 dB	0.7 dB	0.7 dB	0.7 dB	1.2 dB	1.2 dB
Gain	20 dB	20 dB	26 dB	30 dB	30 dB	20 dB	20 dB
Supply voltage	+12 ... 15 V DC	+12 ... 15 V DC	+12 ... 15 V DC	+12 ... 15 V DC	+12 ... 15 V DC	+12 ... 15 V DC	+12 ... 15 V DC
Current consumption	typ. 100 mA	typ. 100 mA	typ. 130 mA	typ. 130 mA	typ. 130 mA	typ. 220 mA	typ. 220 mA
Input / 50 ohms	SMA-female	SMA-female	N-female	N-female	N-female	SMA-female	SMA-female
Output / 50 ohms	BNC-female	BNC-female	N-female	N-female	N-female	N-female	N-female
Case	German Silver	German Silver	German Silver	German Silver	German Silver, mounted into water resistant case	German Silver	German Silver
Dimensions (mm)	74 x 56 x 30	74 x 56 x 30	74 x 56 x 35	74 x 56 x 35	109 x 85 x 60	74 x 56 x 30	74 x 56 x 30

Versions for other frequencies on request.

# Super Low Noise Converters for ATV

**MKU LNC 23 - MKU LNC 34 - MKU LNC 57-3 - MKU LNC 24 A**

**Converters in Tower-Mount Case: MKU LNC 23 TM - MKU LNC 34 TM - MKU LNC 57-3 TM**

- Amateur Television (ATV) converter for conversion of the microwave bands into the frequency range of TV Sat Receivers
- F connector at the output for direct connection to a TV satellite receiver
- Remote power supply via the coaxial cable
- Super low noise figure due to the use of the latest HEMT FETs
- High gain
- Converters are suitable for DATV (only MKU LNC 23 and MKU LNC 34 LNC)
- MKU LNC 23 and MKU LNC 23 TM with notch filter for 1.3 GHz for duplex operation on 1.3 GHz (transmit) and 2.3 GHz (receive)



Converters in water resistant tower mount case:  
MKU LNC 23 TM  
MKU LNC 34 TM  
MKU LNC 57-3 TM

## Specifications

	MKU LNC 23	MKU LNC 34	MKU LNC 57-3	MKU LNC 24 A
<b>Type</b>	MKU LNC 23	MKU LNC 34	MKU LNC 57-3	MKU LNC 24 A
<b>Frequency range RF</b>	2320...2450 MHz	3400...3475 MHz	5600 ... 5900 MHz	24...24.25 GHz
<b>Frequency range IF</b>	1404...1534 MHz	1563...1638 MHz	1400 ... 1700 MHz	
<b>Local Oscillator (LO)</b>	916.5 MHz SAW	1833 MHz SAW	4200 MHz	23 GHz (SHM 11.5 GHz)
<b>Frequency stability</b>	+/- 20 kHz	+/- 40 kHz	+/- 20 kHz	
<b>Noise figure @ 18 °C</b>	typ. 0.7 dB	typ. 0.9 dB	typ. 1.0 dB, max. 1.3 dB NF	max. 2.5 dB
<b>Gain</b>	typ. 40 dB	typ. 38 dB	typ. 40 dB, min. 38 dB	min. 45 dB
<b>Supply voltage</b>	+ 9...18 V DC	+ 9...18 V DC	+ 9...18 V DC	+ 12...18 V
<b>Current consumption</b>	typ. 70 mA	typ. 100 mA	typ. 180 mA	max. 150 mA
<b>Input connector</b>	N-female / 50 ohms	N-female / 50 ohms	N-female / 50 ohms	R 220
<b>Output connector</b>	F-female / 75 ohms	F-female / 75 ohms	F-female / 75 ohms	F-female / 75 ohms
<b>Weight</b>	typ. 120 g	typ. 100 g	typ. 120 g	typ. 130 g
<b>Case</b>	German silver	German silver	German silver	milled aluminium
<b>Dimensions (mm)</b>	74 x 56 x 30	74 x 56 x 30	82 x 64 x 22	128 x 35 x 20
<b>Converter mounted into water resistant case</b>	<b>MKU LNC 23 TM</b>	<b>MKU LNC34 TM</b>	<b>MKU LNC 57-3 TM</b>	

Versions for other frequencies on request.

# Super Low Noise Converters for Radio Astronomy and Satellite Reception

## KU LNC 14 CON - KU LNC 14 CON2 - KU LNC 15 CON - KU LNC 17 CON - KU LNC 17 CON2

- Conversion of the L-Band into the VHF range
- Super low noise figure due to the use of the latest HEMT FETs
- Remote power supply via the coaxial cable
- **Important notes:**  
For KU LNC 14 CON, KU LNC 14 CON2 and KU LNC 15 CON:  
Please specify desired frequency in your order! (Bandwidth max. 30 MHz)



### Specifications

Type	KU LNC 14 CON	KU LNC 14 CON2	KU LNC 15 CON	KU LNC 17 CON	KU LNC 17 CON2
Frequency range RF	1400 MHz +/-	1400 MHz +/-	1550 MHz +/-	1695 ... 1710 MHz	1695 ... 1710 MHz
Frequency range IF	VHF	VHF		138 ... 153 MHz	138 ... 153 MHz
Noise figure @ 18 °C	typ. 0,6 dB	typ. 0,6 dB	typ. 0,6 dB	typ. 0,7 dB	typ. 0,7 dB
Gain	min. 20 dB	min. 60 dB	min. 20 dB	min. 20 dB	min. 60 dB
Supply voltage	+12 ... 15 V DC	+12 ... 15 V DC	+12 ... 15 V DC	+12 ... 15 V DC	+12 ... 15 V DC
Current consumption	typ. 100 mA	typ. 200 mA	typ. 100 mA	typ. 150 mA	typ. 250 mA
Input connector	SMA-female / 50 ohms	SMA-female / 50 ohms	N-female / 50 ohms	SMA-female / 50 ohms	SMA-female / 50 ohms
Output connector	BNC-female / 50 ohms	BNC-female / 50 ohms	N-female / 50 ohms	BNC-female / 50 ohms	N-female / 50 ohms
Case	German Silver	German Silver	German Silver	German Silver	German Silver
Dimensions (mm)	74 x 56 x 30	111 x 56 x 30	74 x 56 x 30	74 x 56 x 30	111 x 56 x 30

Versions for other frequencies on request.

# Super Low Noise Converters for Satellite Reception

## KU LNC 8084 B PRO

The KU LNC 8084 B PRO is a low noise down converter for deep space communication applications.

A special feature is the 10 MHz reference frequency input at the output connector. This feature can be used to lock the internal local oscillator to an external reference frequency.

Recommended bias tee is the KU BT 3000 DIP. This module includes bias tee and a diplexer for the 10 MHz reference frequency in one case. It can be used to put the supply voltage and an external 10 MHz reference frequency on the IF cable.



### Specifications

<b>Type</b>	<b>KU LNC 8084 B PRO</b>
<b>Input Frequency (RF)</b>	8000 ... 8450 MHz
<b>RF Input Power</b>	max. 1 mW (0dBm)
<b>Output Frequency (IF)</b>	850 ... 1300 MHz
<b>Output IP3</b>	typ. +16dBm
<b>Gain</b>	typ. 28 dB
<b>Noise Figure @ 18 °C</b>	typ. 1.2 dB, max. 1.5 dB
<b>LO Frequency</b>	7150 MHz
<b>LO Accuracy @ 18°C</b>	+/- 2 ppm
<b>LO Frequency Stability</b>	+/- 3 ppm (0 ... +40 °C)
<b>Phase Noise</b>	
<b>@ 1 kHz</b>	typ. -82 dBc/Hz
<b>@ 10 kHz</b>	typ. -82 dBc/Hz
<b>@ 100 kHz</b>	typ. -109 dBc/Hz
<b>Maximum case temperature</b>	+55 °C
<b>Supply Voltage</b>	+12 ... 14 V DC
<b>Current Consumption</b>	typ. 320 mA
<b>Input connector, impedance</b>	SMA-female, 50 ohms
<b>Output connector, impedance</b>	N-female, 50 ohms
<b>Dimensions (mm)</b>	82 x 64 x 22
<b>Case</b>	milled aluminium
<b>Weight</b>	typ. 220 g

### Features

- Low noise figure
- Large bandwidth
- Low phase noise oscillator
- High frequency stability of the oscillator
- High linearity
- Over voltage protection and reverse polarity protection
- Remote power supply via output connector
- Solder pin for direct power supply, this pin can also be used to supply an external preamplifier via the remote
- power supply feature of the converter
- Input for 10 MHz reference frequency via output connector
- Automatic activation of PLL if external 10 MHz signal is supplied

### Applications

- Deep space communications

### Zubehör

- Bias Tee / Diplexer KU BT 3000 DIP
- Bias Tee KU BT 271 N
- Bias Tee KU BT 3000 N
- Preamplifier KU LNA 8000 A

### Options

- Other connectors on request

Versions for other frequencies on request.

# Up-Converter

Type	Frequency Range RF	Frequency Range IF	Bandwidth	Output Power	Remarks
MKU UP 13 OTX	1268 ... 1270 MHz	144 ... 146 MHz	2 MHz	1 W	Option: IF = 436 ... 438 MHz
MKU UP 24 OTX	2446 ... 2448 MHz	144 ... 146 MHz	2 MHz	1 W	
MKU UP 57 OTX	5668 ... 5670 MHz	144 ... 146 MHz	2 MHz	200 mW	Option: IF = 436 ... 438 MHz
KU UP 107 A	10000 ... 10700 MHz	2260 ... 2310 MHz	50 MHz	1 W	Please specify desired frequency in your order!

## Specifications

<b>Type</b>	<b>KU UP 107 A</b>
<b>Input frequency range (IF)</b>	2260 MHz ... 2310 MHz
<b>Output frequency range</b>	selectable in the range from 10000 MHz ... 10700 MHz with 50 MHz bandwidth in the range between 7740 MHz ... 8440 MHz
<b>LO frequency</b>	+/- 50 kHz
<b>LO accuracy @ 18 °C</b>	+/- 50 kHz
<b>LO frequency stability (0...40 °C)</b>	typ. 1 mW
<b>IF input power</b>	> 30 dBm
<b>RF Output power CW</b>	typ. 23 dBm
<b>RF Output power (digital applications)</b>	> 50 dB
<b>Image rejection</b>	typ. 30 dB
<b>Gain</b>	typ. -103 dBc/Hz @ 100 kHz
<b>Phase noise</b>	+12...14 V DC
<b>Supply Voltage</b>	typ. 1.5 A
<b>Current consumption</b>	SMA – female / 50 ohms
<b>Input connector</b>	SMA – female / 50 ohms
<b>Output connector</b>	126 x 64 x 22
<b>Dimensions (mm)</b>	milled aluminium
<b>Case</b>	typ. 340 g
<b>Weight</b>	

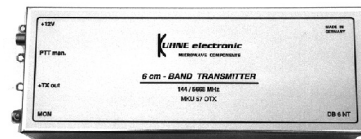


# Up converters for DATV and Satellite Transmission

## MKU UP 13 OTX - MKU UP 24 OTX - MKU UP 10 LTX

These modules convert the VHF or UHF band up to 1.3 GHz, 2.4 GHz, 5.6 GHz or 10 GHz. The use of cavity resonators, high-Q helical filters and an advanced circuit design lead to excellent technical characteristics. The output power can be increased up to 50 watts by the use of additional power amplifiers.

- Built-in control circuit with control voltage output for controlling power amplifiers and antenna relays
- Built-in 3 watts IF-attenuator for direct operation in connection with a 2 m transceiver



### Specifications

	MKU UP 13 OTX	MKU UP 24 OTX	MKU UP 10 LTX
Type	1268...1270 MHz	2446...2448 MHz	10...10,5 GHz*
Frequency range	144...146 MHz	144...146 MHz	100...500 MHz*
Input frequency (IF)	436...438 MHz		
Optional IF	1 W	min. 1 W	min. 200 mW
Output power	max. 3 W adjustable	max. 3 W adjustable	1...100 mW adjustable
IF input power	+12...14 V DC	+12...14 V DC	+12...14 V DC
Supply voltage	typ. 500 mA	typ. 600 mA	typ. 600 mA
Current consumption	German silver	German silver	German silver
Case	SMA-female / 50 ohms	SMA-female / 50 ohms	SMA-female / 50 ohms
Input connector	SMA-female / 50 ohms	SMA-female / 50 ohms	SMA-female / 50 ohms
Output connector	30 x 56 x 74	30 x 56 x 150	30 x 56 x 150
Dimensions (mm)	+12 V on TX	max. 3 A	max. 0,5 A
DC-TX out	-	min. +1 V	min. +1 V
Monitor out	typ. 120 g	typ. 310 g	typ. 220 g
Weight			* Please specify frequency

Up converters for other frequencies on request.

# Imprint

## **KUHNE electronic**

**MICROWAVE COMPONENTS**

**Innovative high quality products  
using advanced technology  
for microwave communications**

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Erfüllungsort ist / Place of performance and court of jurisdiction is Hof/Saale - Amtsgericht - HRB 3350  
Geschäftsführerin / Manager: Jutta Kuhne

# General Terms and Conditions of Business with Private Customers

Note: This is a translation of a German document into English language.  
As we do business only under German Law, in cases of dispute only the German wording of the GTCs will apply.

## 1. Scope

The following general terms and conditions (GTCs) apply for all contracts, shipments, and other services between Kuhne electronic GmbH and private customers. Private customers in the sense of this document are natural persons which do or intend to do business with Kuhne electronic GmbH not practising a commercial or self-employed business thereby.

Kuhne electronic GmbH does not accept any conditions which are opposite to or deviating from these GTCs conflicting terms and conditions of a customer do not become valid unless the terms and conditions are explicitly and individually recognized in writing by Kuhne electronic GmbH.

## 2. Conclusion of Contract

The presentation of the products in the catalogue does not constitute a legally binding offer of Kuhne electronic GmbH but an invitation to order. By sending an order, customer enters into a legally binding offer for a respective contract. The contract will be concluded with our confirmation of the order within two weeks after dispatch of the order or by delivery of goods ordered.

## 3. Instruction on Right of Revocation:

### **Right of Revocation**

You may declare the revocation of your contractual statement in text form (e.g. letter, fax, email) or by returning the merchandise within a period of two weeks. The revocation does not have to contain any grounds. The revocation period commences upon receipt of this declaration of revocation in text form but not before receipt of merchandise (in cases of recurrent deliveries of uniform goods not before receipt of first instalment) and also not before fulfilment of our information obligation upon § 312 c para 2 BGB (German commercial Code) in conj. with § 1 para 1,2, and 4 BGB-InfoV. The time-limit shall be deemed to be observed by the timely dispatch of the declaration of revocation or the return shipment.

The revocation is to be addressed to:

Kuhne electronic GmbH, Scheibenacker 3, D-95180 Berg  
Telefax: + 49 (0)9293/800938  
Email: info@kuhne-electronic.de

### Consequences of revocation

In case of a valid revocation, all mutually received performances as well as emoluments taken, if applicable, are to be restituted by either side. If you are unable or partially unable to reconstitute the merchandise to us or can only reconstitute it in a deteriorated condition, then you have to insofar compensate for its value. This does not apply if the deterioration is exclusively due to examining the merchandise as for instance in a retail store. In addition you can avoid compensation for deterioration by having put merchandise to its intended use by not putting merchandise in its intended use as if it were your belongings and refrain from everything affecting its value. Things that can be shipped by parcel are to be returned on our risk. You are obliged to bear the costs of the return shipment if the merchandise delivered corresponds to the merchandise ordered, and if the price of merchandise to be sent back does not exceed an amount of 40 € or if, where the price is higher, you have at the date of the revocation not yet rendered consideration or given a part payment. In all other cases, the return shipment for you is free of charge. Things that cannot be shipped by parcel will be picked up.

All reimbursement obligations must be fulfilled within 30 days. For you, time limit starts with sending of the declaration of revocation or merchandise, for us with their receipt.

### **End of revocation instruction**

## 4. Dispatch and Delivery

The delivery of goods ordered will be effected within one to three workdays. The compliance with our delivery obligation furthermore requires the due and orderly performance of the customer's obligations in due time. The defence of non-performance of the contract is reserved.

Delivery times for customized products and goods not in stock are not binding unless seller committed itself to a binding delivery date in written form.

In case we are not able to keep bidding delivery dates due to reasons we are not responsible for (impossibility of performance, e.g. because our suppliers fail to deliver) we shall inform the buyer without delay and determine a new delivery period which appears reasonable according to the circumstances.

If performance continues to be impossible also within the newly determined period, we shall be entitled to cancel the agreement completely or partly; we shall thereupon immediately reimburse any already provided counter-performance. Cases of impossibility of performance include cases of force majeure (e.g. strike, business interruptions/restraints, or transport difficulties).

## 5. Prices and Payment

The prices stated are EURO-prices (including VAT). Shipping cost are not included.

We offer delivery against payment in advance, against invoice, direct debit, or credit card. For delivery to new customers or customers from outside Germany, payment has to be effected in advance. In case of purchase on account (invoice), customer is obliged to settle invoice within 21 days after receipt of goods in full unless otherwise agreed. For payments with credit card or debit credit, collection takes place before the goods are dispatched.

The buyer shall not be entitled to offset payment against counterclaims unless such claims are undisputed or finally established by court. Further, buyer is only authorized to exercise the right of retention to the extent as his counter claim is based on the same contractual relationship.

If you use your right of revocation, you have to bear regular cost of return if the merchandise delivered corresponds to the merchandise ordered, and if the price of merchandise to be sent back does not exceed an amount of 40 € or if, where the price is higher, you have at the date of the revocation not yet rendered consideration or given a part payment. In all other cases, the return shipment for you is free of charge.

## 6. Warranty

Palpable defaults in material or production including transport damages should be notified to us in writing within two weeks upon receipt. Failure of timely complaint does not effect your legal claims.

Buyer has the choice if supplementary performance is to be executed by remedial action or substitute delivery. Whereas, we are authorized to refuse chosen alternative if this is only feasible under disproportional cost and the other alternative does not stay with any substantial disadvantages. During supplementary performance, a reduction of price or rescission of contract are excluded. Supplementary performance deems to be failed when performed twice without success if

# General Terms and Conditions of Business with Private Customers

from the mod of article or failure any other result can be drawn.

In addition, statutory provisions apply.

## 7. Retention of Title

We reserve title of all goods delivered until complete settlement of all contractual receivables. Also, extended reservation of title applies.

Upon any levy of execution or other respective third party actions we have to be immediately informed to execute our rights under § 771 BGB.

## 8. Final Provisions

All disputes resulting from this contractual relationship are solely governed by German law. If any regulation in these terms and conditions or within the scope of further agreements should become ineffective the effectiveness of all remaining regulations or agreements is not touched. The stipulation which is invalid in whole or in part shall be replaced by an arrangement which comes as closely as possible to the invalid stipulation in terms of its economic effect.

In case of any dispute of these GTCs, the German version of the GTCs will prevail over the English version.