



## Application

The MNK5 modem is designed for the operation on telecontrol lines together with different RTUs. However, it can also be connected to other data terminal equipment because it operates at the interfaces like a universal FSK-mode in the voice-band range (300- 3400 Hz) according to CCITT. The MNK5 modem allows the assignment of a four-wire line with communication channels in the CCITT raster for 50 to 2400 Bit/s.

- 1 channel 300 Bit/s
- 1 channel 600 Bit/s
- 1 channel 1200 Bit/s (V.23)

Full duplex operation is possible without special additional provisions like butterfly connection according to channel assignment. It is designed for the transfer characteristics of local-cable-wires.

Light emitting diodes indicate the most important operation states and allow an easy testing of the VFT-channels as also of the data terminal equipment (DTE) interface signals.

## Characteristics

There are different versions available. This datasheet explains the following version:

- MNK5D: Rack-mounted / Dual channel

The rubric MNK5D can be mounted inside a 19", 6U subrack. It is a direct replacement for **ABB NSK5**. Within a subrack the board occupies one 6hp slot and it supplies itself by the 24 V DC.

This equipment has two channels: Main and Standby. These channels are working in a redundant manner, i.e. when the communication fails over one channel, the second channel can take over the duties automatically. The other important feature of this modem is its capability of working in Synchronous mode, which enables sending and receiving Tx and Rx clocks through its data terminal.

A central processor is responsible for modulation and demodulation, i.e. the conversion of the binary information into the voice band and vice versa.

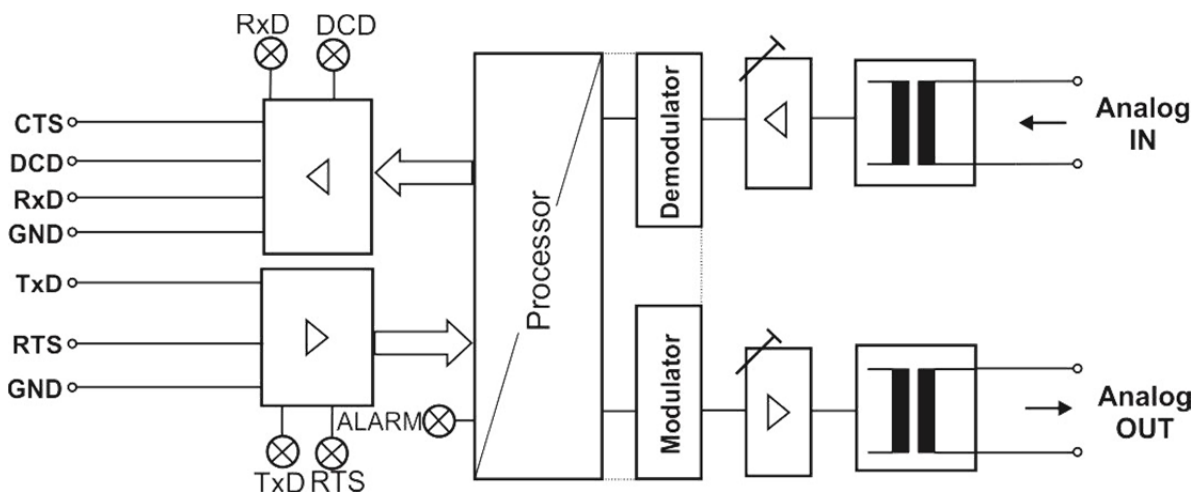


Figure 1. Block diagram of MNK5



The channel can be assigned in the CCITT raster. Transmitter and receiver can be configured to same baud rates.

The audio-frequency carrier is monitored and indicated respectively alarmed by the DCD signal.

The alarm relay of the modem responses at carrier drop-out (DCD delayed) and indicates by the ALARM red LED.

All essential settings like transmission gain, handshaking operation mode and baud rate are configured by switches.

## Technical Data

The following data is applicable:

### General Data

Type of modulation	Frequency shift keying(FSK)
Type of communication	Point-to-point
Operation mode	Full Duplex via four-wire links
Channel assignment	According to CCITT raster

### Serial interface to DTE

Signal definition	V.24 / V.28	
Signal lines on X4 (DB25 female)	TXD	X2 / pin #2
	RXD	X2 / pin #3
	RTS	X2 / pin #4
	CTS	X2 / pin #5
	GND	X2 / pin #7
	DCD	X2 / pin #8

### Interface to transmission line

Input- / Output impedance on X1 and X2	600 Ω non-earthed
Transmission level at 600 Ω	0 ... -12 dBm configurable by switches
Receiver level range	0 ... -30 dBm
Nominal receive level	-6 dBm

### Signal quality level monitor

Threshold	>40% for 600 and 1200 bps
ALARM - LED	ON: DCD drop-out with 5 sec. delay OFF: no errors for at least 5 sec.

### DCD monitoring

DCD alarm at full duplex operation	Switches with carrier directly, operation mode configurable by jumper
DCD - LED	Switches with carrier directly

### Alarm relay

Switching function	DCD alarm, Normally Open
Alarm contact on X3	60 V DC / 0.5 A / 30 W

### Power Supply

Supply input	24V DC ±20%, 150mA max
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## Mechanical Layout

Housing	PCB with Aluminum front panel
Mounting	Standard 19", 6U subrack (ABB type)
Dimensions	220 x 233 x 30 mm
Weight approx.	230 gr

## Switch Setting

Baud Rate	1200 bps 600 bps 300 bps
RX/TX Polarity *	Reverse Normal
RTS ON **	Always ON Normal
Standby Channel	ON OFF
RX Clock (Regenerator)	ON OFF
TX Level Adj.	0, -3, -6, -9, -12dBm only one switch should be ON

## Connection Type

X1 connector	Terminal block 4-pin – Screw type
X2 connector	Terminal block 4-pin – Screw type
X3 connector	Terminal block 2-pin – Screw type
X4 connector	DB25 female

\* RXD and TXD polarity assignment according to Mark and Space frequencies.

\*\* It means RTS signal is always on, irrelevant to RTS signal input. When no handshaking is used, it should be ON.

## Environmental Conditions

Temperature	0 ... 70 °C
Relative humidity	5 ... 95 % non condensing

<b>Data format</b>	Serial, binary, asynchronous / synchronous		
<b>CCITT Channel</b>	<b>300 Bd</b>	<b>600 Bd</b>	<b>V.23</b>
<b>Nominal Baud rate</b>	300 bps	600 bps	1200 bps
<b>Mid-frequency</b>	2760 Hz	2760 Hz	1700 Hz
<b>Frequency deviation</b>	±120 Hz	±240 Hz	±400 Hz

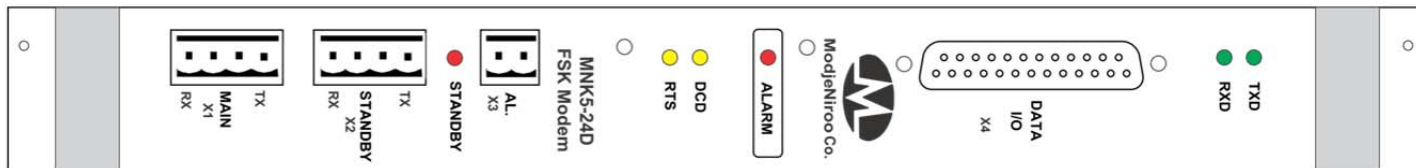


Figure 2. Front panel view of MNK5

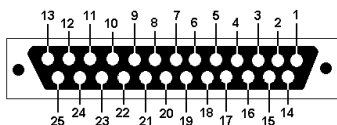


Figure 3. X2 pin numbering (DB25 Female)

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Subject to alteration