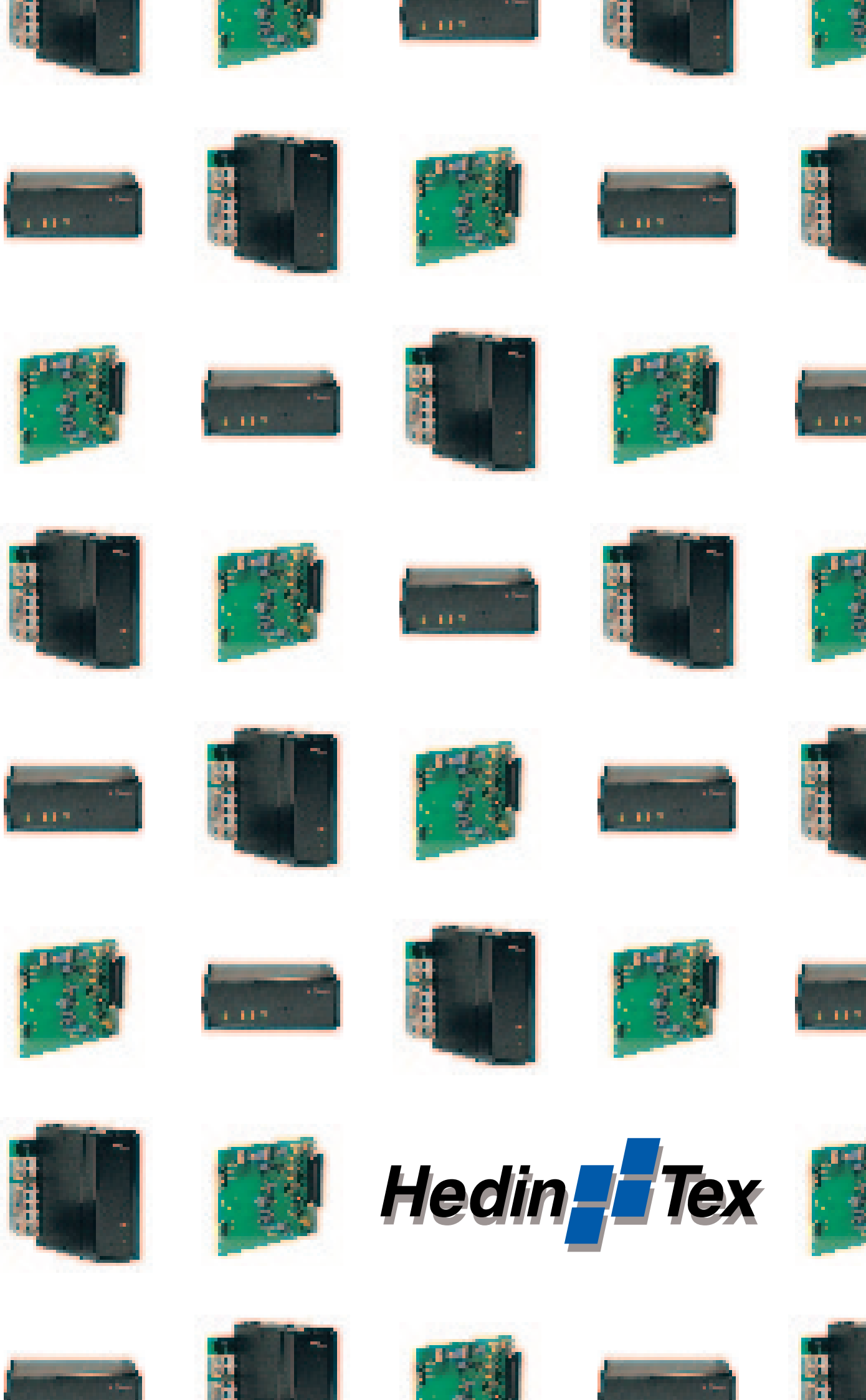


PRODUCT INFORMATION



Hedin  **Tex**

THE COMPANY

Hedin Tex is a company specialized in communication equipment for internal data networks. The company executive management and manufacturing facilities are based in Sweden, while the sales, service and warehouse operations are in Germany.

Hedin Tex offers a complete range of products for network structures including short haul modems, line splitters and interface converters. This equipment is primarily used for process control, alarm monitoring and measuring systems, water and drainage, power distribution and other electronic applications.

GUARANTEED BUYING, YOU KNOW WHAT YOU GET.

Hedin Tex products offer a high level of safety. Here you have combined specialist know-how for most applications, a tradition which means that the products are developed in close co-operation with the customers, reliable deliveries and a level of service far beyond the ordinary.

The company was founded in 1984 to meet the particularly high demands that apply in Germany. During the first ten years about 130,000 short haul modems were delivered, and during this period technical problems have occurred in just 50 cases and immediate action has been taken accordingly.

All products are CE-marked in accordance with the relevant EU directives. Many of them have been tested at the German telecommunication authority BZT in Saarbrücken, and have also been subjected to even more severe inhouse tests.

SERVICE OUT OF THE ORDINARY

- All inquiries will be answered within 12 hours.
- We can be contacted round the clock by telephone, telefax and E-mail.
- The line splitter booklet with application examples and all data sheets and installation manuals you will find in internet: www.hedintex.se



Our products find world wide applications. Some examples: Italy - for a safety-light-system in a railway tunnel, Austria - for data communication of a park-ride-system, for a sewage works data system network, Hungary - for controlling of band conveyor, Australia - for data communication on

- Delivery straight from stock same day as your order is received.
- Fast, free of charge service. Should a fault arise, we will come to your assistance immediately and rectify the fault free of charge - no matter what the cause of the fault is.
- If we need to travel, then we will do just that. Should it be found that our standard products do not meet your company's needs, we will develop modifications to match your requirements.

DOCUMENTATION IN GERMAN AND ENGLISH

Easy to understand documentation. All products are documented in English and German, explaining among other things how you solve specific problems.



rollingstock equipment, Egypt - for data communication within a cement factory, Malaysia - for data communication within an airport. Also in Belgium, Denmark, in the Netherlands, in France, Great Britain, Ireland, Israel, Poland, Portugal, Czech-Republic, Spain, in Switzerland and in Saudi Arabia our products are installed.

PRODUCTS

The equipment is designed for the transmission of data between personal computers and peripherals with speeds of up to 100,000 bytes a second. This speed is matched and quite sufficient for alarm systems, measuring data, and sensors in intracompany networks and corresponding applications, but not for linking up independent computers in regional or local networks.

All products are designed in accordance with a uniform system of modules, and are 'equipped' according to market needs. In this way, it has been possible to shorten lead times in the product development process to a minimum. This means among other things that should it be found that our current products do not meet your needs at present, then we will develop a new version in just six weeks to match your needs.

The range is based on the M-1 base module. This is a short haul modem that increases the maximum communication distance from 15 to 21,000 metres. It also functions as an 'in-house developed interface', which means that all products with a M-1 connection are built to function together.

Circuit card in Euro format

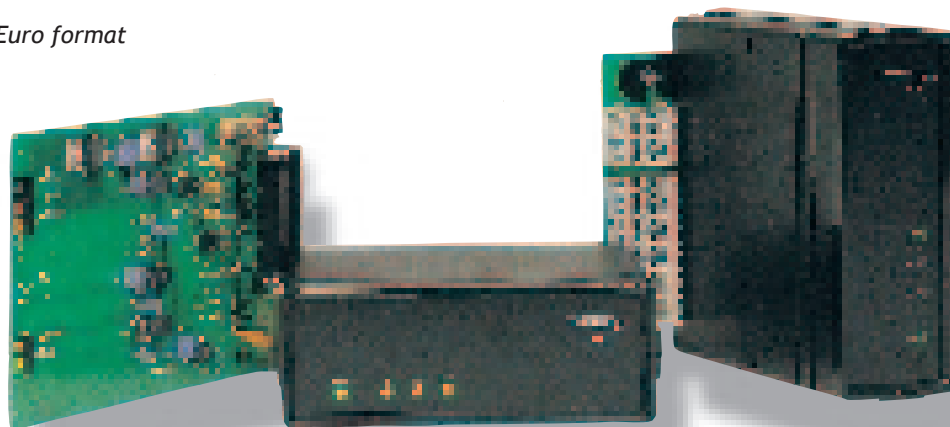
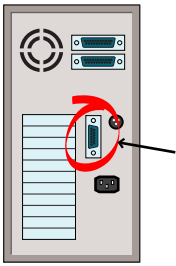


Table model sized 130 x 140 x 40 mm

Modem for fitment on a DIN bar with 24V DC voltage

AN EASY WAY TO COMMUNICATE



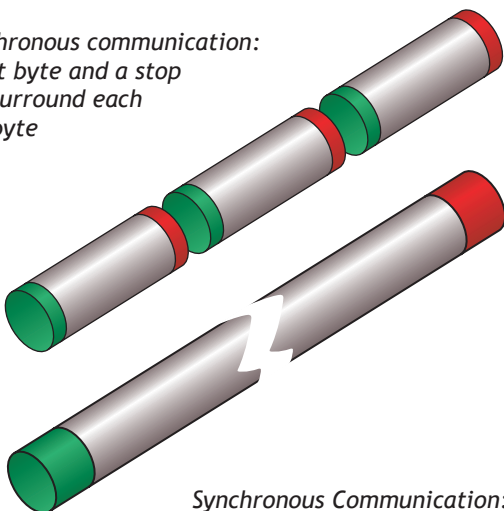
Designing alarm and monitoring systems, measuring systems for laboratory environments, remote reading systems etc. with modems, line splitters, and interface converters is a very flexible way of working. In fact, it's so flexible that only your imagination sets the limits. This is due among other things to the fact that each PC has an RS232 output for many types of communication.

ASYNCHRONOUS OR SYNCHRONOUS COMMUNICATION

Asynchronous communication means that you transmit one byte at a time, separated by one start and one stop byte. This is a simple and inexpensive method, and is therefore the one used most often. The disadvantage is that as much as 25 per cent of the volume of data consists of control characters.

Synchronous transmission means that you first transmit start and control characters, and then the entire flow of data at one and the same time, concluding with a stop character. Transmission is maintained by a clock frequency. This means that the proportion of control characters is reduced to 3 per cent, however, more expensive equipment is required.

*Asynchronous communication:
a start byte and a stop
byte surround each
data byte*



*Synchronous Communication:
first start bytes, then the entire
flow of data, and finally stop bytes*

RS232/V.24

The RS232 and V.24 are two widely used standards which are principally identical, but which have two essential disadvantages:

1. The maximum distance between units is 15 metres.
2. There is considerable sensitivity to interference.

RS422

The RS422 is a standard which is frequently used in industry, such as for building data buses and linking mainframe computers with subcentres. The interface uses a four-wire cable and can connect up to 32 units at the same time as transmission is relatively insensitive to interference. The maximum distance is 1,200 metres at 100 kbps.

RS485

The RS485 is a further development of the RS422 and is still even more frequent. This is due to the fact that two-wire cables are used, and these give lower overall costs.

The RS485 is used chiefly in so-called star and bus networks. A star network means that the various peripherals are connected only to a central computer, and a bus network to a main cable where the units connect as nodes.

CURRENT LOOP, 20 mA

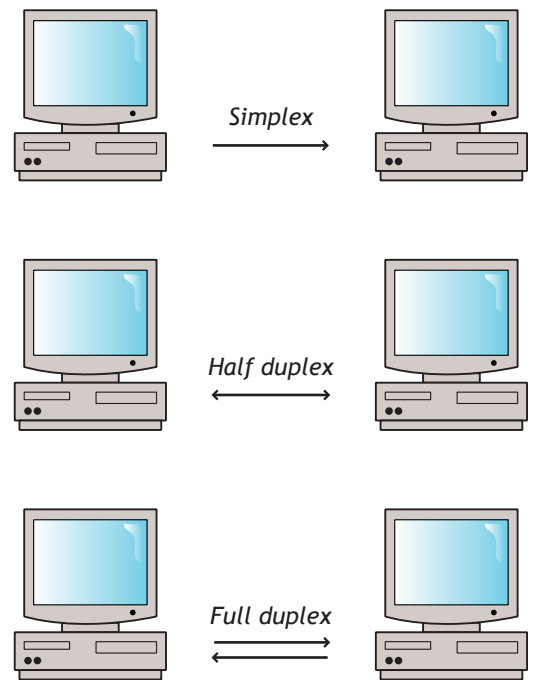
Copper wire for long distances means that communication is sensitive to interference. By converting the V.24 signals to ones and zeros, where one equals 'live' and zero equals 'dead', a more reliable and less sensitive form of data transmission is created.

DUPLEX AND SIMPLEX

Simplex means that communication is one-way.

Full duplex means two-way communication and that it runs in parallel lines - a fact that is particularly suitable when you want to connect measuring equipment that spontaneously reports local occurrences.

Half duplex means that the communicating units have to transmit and receive information one at the time on the same line.



INSIDIOUS DATA INTERFERENCES

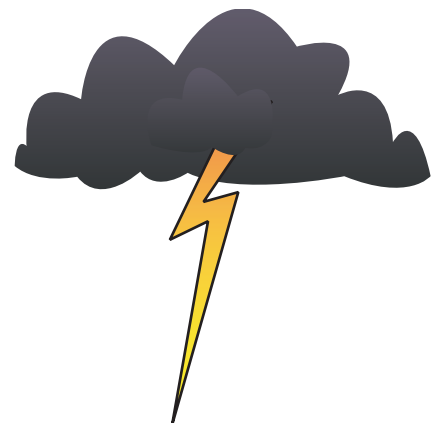
With each transmission of data there is risk of transmission errors and various types of interference, which at worst could cause expensive equipment to fail or give rise to measuring errors.

The most common types of interference are transients, or 'spikes', as they are also called. For a millisecond the equipment is subjected to voltages of up to 10 kV with resulting major damaging effects to modem, computers and connected equipment.

Another type of interference are earth current problems. These are known as stray currents from electric cables that creep in an undesirable way and give rise to magnetic fields that not only interfere with the data transmission, but are also hazardous to personal health.

Hedin Tex applies an extensive interference guard to all its products. By using various forms of galvanic insulation, data interference is prevented from spreading and causing damage. Another way is to continuously transmit a weak current of 20 mA through the network and read off to see if the current gets through. If it doesn't, a fault has occurred. A third way is to use an earth current deflector.

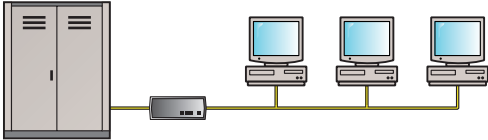
Our technicians will gladly assist you and guarantee the best possible protection against data interference for your specific applications.



Data interferences occur when you least expect them to. All our products provide you with the best possible protection.

LINE SPLITTERS

Line splitters represent a flexible alternative to modems used for example for monitoring and controlling processes in the industry. The equipment consists of three integrated modems with one input line and two output lines. When building networks with modems, the sum of all individual distances must not exceed 30 km. By using line splitters instead, the total distance can be any length on condition that each individual distance does not exceed 21 km.

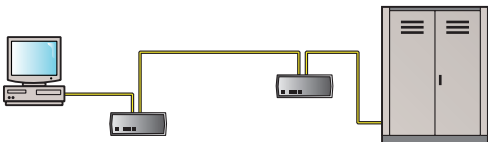


LEGEND

- L Line splitter (three modems in one)
- T Table model
- R Modem on insert card (circuit card) for installation in rack
- H For fitment on DIN bar
- 1 V.24/RS232 PC-Standard to M-1
- 2 V.24/RS232 to 20 mA current loop
- 3 Synchronous version with clock
- 4 RS485 to V.24
- C For star networks
- V DC current
- G Extra galvanic insulation
- LWL Fibre-optic cable

SHORT HAUL MODEMS

Equipment that creates a reliable and interference-free point to point connection between a central computer, measuring equipment, and other peripherals. The various units may be located in different buildings a distance of 21 km from each other.



LEGEND

- M Independent short haul modem
- R Modem on insert card (circuit card) for installation in rack
- H For fitment on DIN bar
- 1 V.24/RS232 PC-Standard to M-1
- 3 Synchronous version with clock
- 5 V.24 to RS485/RS422
- A 4..20 mA analog signal
- V DC current
- G Extra galvanic insulation
- LWL Fibre-optic cable
- X X.21 interface

INTERFACE CONVERTERS

Interface converters are special switching units whose function is to convert the signal from a standard to another, that is M-1, RS232 or RS485/RS422.



LEGEND

- M Independent short haul modem
- R Modem on insert card (circuit card) for installation in rack
- H For fitment on DIN bar
- P Parallel modem
- 1 V.24/RS232 PC-Standard to M-1
- 2 V.24/RS232 to 20 mA current loop
- 4 RS485 to V.24
- V DC current
- G Extra galvanic insulation
- LWL Fibre-optic cable
- AC 115/230V AC power supply

LT-1V



Asynchronous line splitter featuring its own current supply with 230V alternating current and 24V direct current voltage.

- There is both an RS232/V.24 and M-1 lines on each input and output.
- By-pass function which means that data is allowed to flow past even if one of the units fails.
- Transmission with up to 100,00 bps in semi or full duplex, irrespective of protocol.

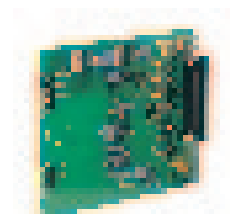
- Overvoltage protection.
- CE-marked and tested by the German telecommunication authority BZT in Saarbrücken.



LR-1V



A LT-1V line splitter in the form of a European-size circuit card.



M-1



An asynchronous short haul modem extends a RS232/V.24 connection from 15 to 21,000 metres at speeds of between 600 and 100,000 bps with a four-wire cable at a distance of up to 21 km.

- Functions independently of the data-structure and protocol in both full and half duplex and simplex form.
- Connected directly to a 230V alternating current.
- Supervises the condition of connected equipment through a symmetrical weak current signal.

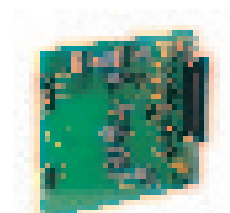
- Galvanic insulated opto connectors.
- Standard size 130 x 140 x 40 mm.
- CE-marked and tested by the German telecommunication authority BZT in Saarbrücken.



R-1



A version of the M-1 in the form of a European-size circuit card for installation in a RV-1 rack. Used for saving space.



M-2



Signal converter for 20 mA current loop. Used chiefly in shop systems as well as certain industrial robots and PLC systems.

- Transmits a 20 mA current loop to RS232/V.24 at a speed of 19,200 bps at a distance of up to 400 metres.
- The converter can be configured as 'active' and 'passive' respectively, depending on the application.
- Complete galvanic insulation with opto connector protects against earth currents.

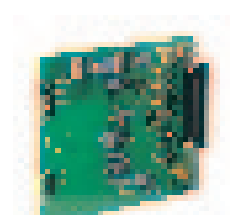
- Full, half duplex and simplex.
- CE-marked and tested by the German telecommunication authority BZT in Saarbrücken.



R-2



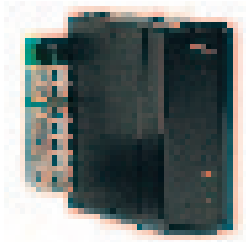
A version of the M-2 in the form of a European-size circuit card for installation in a RV-1 rack.



LH-1V



A version of the LT-1V for fitment on a DIN bar with 24V DC voltage.



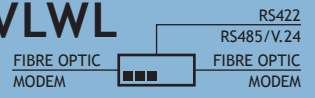
LT-4V



Line splitter for industrial applications with the same function as the LT-1V, but designed for an RS485 network. The outputs have either an RS232/V.24 interface or our own M-1 interface.



LT-4VLWL



A version of the LT-4V with extra galvanic insulation and designed for connection with fibre-optic cable.



H-1



A version of the M-1 for fitment on a DIN bar with 24V DC voltage. Easy to install and replace by the fact that it is hooked onto a frame, and all connections are completed.



M-1A



Analog short haul modem. Transmits analog 4..20 mA signals up to a distance of 10 km.



M-1G



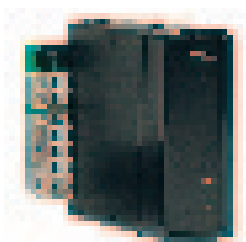
A version of the M-1 with total galvanic insulation.



H-2



A version of the M-2 for fitment on a DIN bar with 24V DC voltage.



LH-4V



A version of the LT-4V for fitment on a DIN bar with 24V DC voltage.



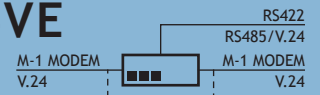
LH-4VLWL



A version of the LT-4V with extra galvanic insulation and designed for connection with fibre-optic cable.



LH-4VE



A version of the LH-4V with an additional RS422 interface.



M-1V



A version of the M-1 with 24V DC voltage.



M-1LWL



A version of the M-1 for networks featuring fibre-optic cables.



M-4



Specially made signal converter for Multi-drop, that is, a system in which the mainframe computer requests measuring data from connected peripherals.

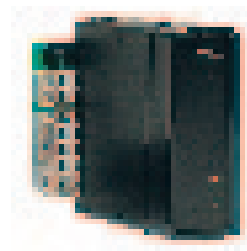
- Converts V.24 to RS422 and RS485 respectively in both directions.
- Up to 100,00 bps at a distance of 1.2 km.
- Full, half duplex and simplex.
- CE-marked and tested by the German telecommunication authority BZT in Saarbrücken.



H-4



A version of the M-4 for fitment on a DIN bar with 24V DC voltage.



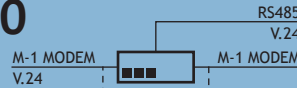
LH-4VR



A version of the LH-4VE, expanded with the redundancy card OR-1 for ring systems.



LH-10



Line splitter for networks featuring computers and peripherals. Functions irrespective of whether there is main-frame computer that requests data, or if a peripheral is to continuously report measuring data.

- Automatic engagement as it hooks onto a 35 mm DIN bar.
- Three ports: M-1, RS232/V.24 and RS485.
- Relay-controlled by-pass function that transmits data when there is a voltage drop.
- Transmission speeds of up to 100,000 bps at full and half duplex.



M-3



A synchronous short haul modem for point to point transmission and multi-drop. The latter means that the main-frame computer requests on its own initiative data from up to four connected peripherals. This method is suitable especially for passage control, acquisition of measuring values, and shop computer systems.

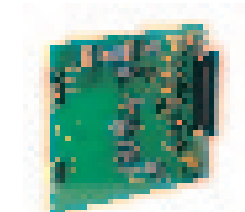
- Synchronous transmission over a maximum distance of 5 km at speeds of up to 64,000 bps.
- Functions at both full and half duplex irrespective of protocol.
- Overvoltage protection and galvanic insulation with opto couplers.



R-3



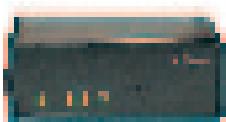
A version of the M-3 in the form of a Eurosize circuit card for installation in a RV-1 rack. Used for saving space.



M-4AC



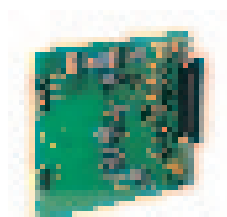
A version of the M-4 with 230/115V power supply.



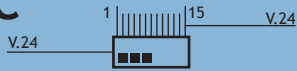
R-4



A version of the M-4 in the form of a Eurosize circuit card.



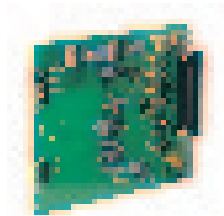
LR-3C



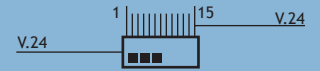
Specially made line splitter for star networks consisting of two circuit cards: the host card LR-3C and the expansion card LR-3. These cards are linked to each other by the rack RV-1.

- RS232 transmission with up to 38,400 bps.
- Independent of codes and protocol.

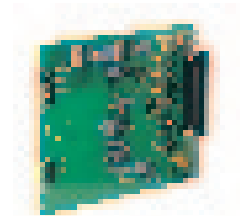
- Each connection transmits up to three input and three output signals in addition to a special control signal.
- Up to 15 different sub-networks can be connected as nodes to a bus network.
- Transmission of up to six V.24 signals.



LR-3



Expansion card for the LR-3C in form of Eurosize circuit card for installation in a RV-1 rack.



M-3X



A version of the M-3 with X.21 interface.



M-3XLWL



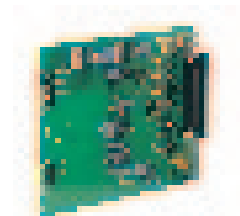
A version of the M-3 with X.21 interface and connection with fibre-optic cable.



R-3X



M-3X in the form of a Eurosize circuit card.



LT-2



Line splitter or line repeater with two inputs and two outputs. Used for extending a two-wire RS485 or four-wire RS422 connection by 1,200 metres, and also to convert between these two interfaces.

- Transmits at speeds of up to 100,000 bps in full and half duplex as well as simplex.
- 'Water-proof' insulation between different segments.
- Complete galvanic insulation with optoconnector protects against earth stray currents.

- CE-marked and tested by the German telecommunication authority BZT in Saarbrücken.



LT-2G



A version of the LT-2 with overvoltage protection for up to 2500V DC. Connected up directly in a RS485 based network without any special configuration.

M-5E



Asynchronous short haul modem used for achieving reliable transmission in a RS485 based network, at the same time obtaining the most effective type of protection against stray currents. Transforms a RS485 respectively a RS422 signal to a M-1 signal

- Asynchronous transmission with 600-100,000 bps, depending on the distance.
- Automatically senses the direction of the data transmission.

- CE-marked and tested by the German telecommunication authority BZT in Saarbrücken.



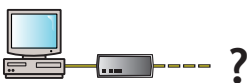
M-5LWL



A M-5 version for use with fibre-optic cable

SPECIAL PRODUCTS

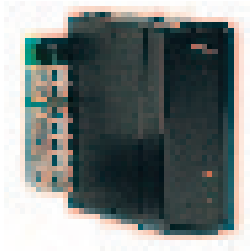
Hedin Tex offers a number of practical accessories and other more or less unusual products which were originally developed to solve specific problems at our customers, and which we believe may be of use in several applications.



LH-2



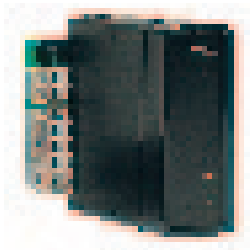
A version of the LT-2 for fitment on a DIN bar with 24V DC voltage.



H-5



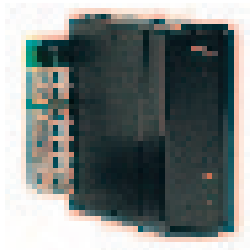
A M-5 version for fitment on a DIN bar with 24V DC voltage.



H-5H



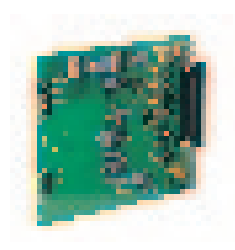
A version of the H-5 for extra long distances at 9.600 bps (12km).



R-5



A M-5 version in the form of Eurosize circuit card for installation in a RV-1 rack. Used for saving space.



PM-1



A modem that is connected to the computer's parallel port (Centronix) instead of the serial RS232 output. Thus it will be possible to transmit data on several lines in parallel, at which the total transmission speed will be apparently much faster.

Parallel transmission normally requires an expensive cable, but in this case it is sufficient to have a standard four-wire cable. The maximum distance between the connected units is 15 km.

- Complete galvanic insulation provides protection against all types of data interference.
- Connected to 230V alternating current.

- Transmission speeds: 2.400, 4.800, 9.600, 19.200 and 57.600 bps with 7- or 8 byte codes.
- The parallel interface can be configured either as an input or output, and be connected in the same way as the M-1 modem.



PS-1



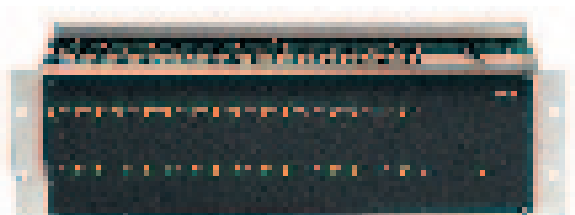
Parallel signal converter. Same function as the PM-1, but the modem function has been replaced by a RS232/V.24 interface



RV-1 19" Rack

19" rack for the installation of up to 16 insert cards in the single European size (DIN 41494). By using a modem and interface converters in R versions (circuit cards), you can save space, while at the same time the total costs are reduced.

- Made of aluminium with LED crystals on the outside.
- Additional fuses prevent the interference from spreading from one card to another.



- Two current supply units can be connected. In the case of sensitive applications, two network units are recommended to ensure that you always have a reserve unit that will guarantee a supply of current to the circuit card.

GH-1 Housing

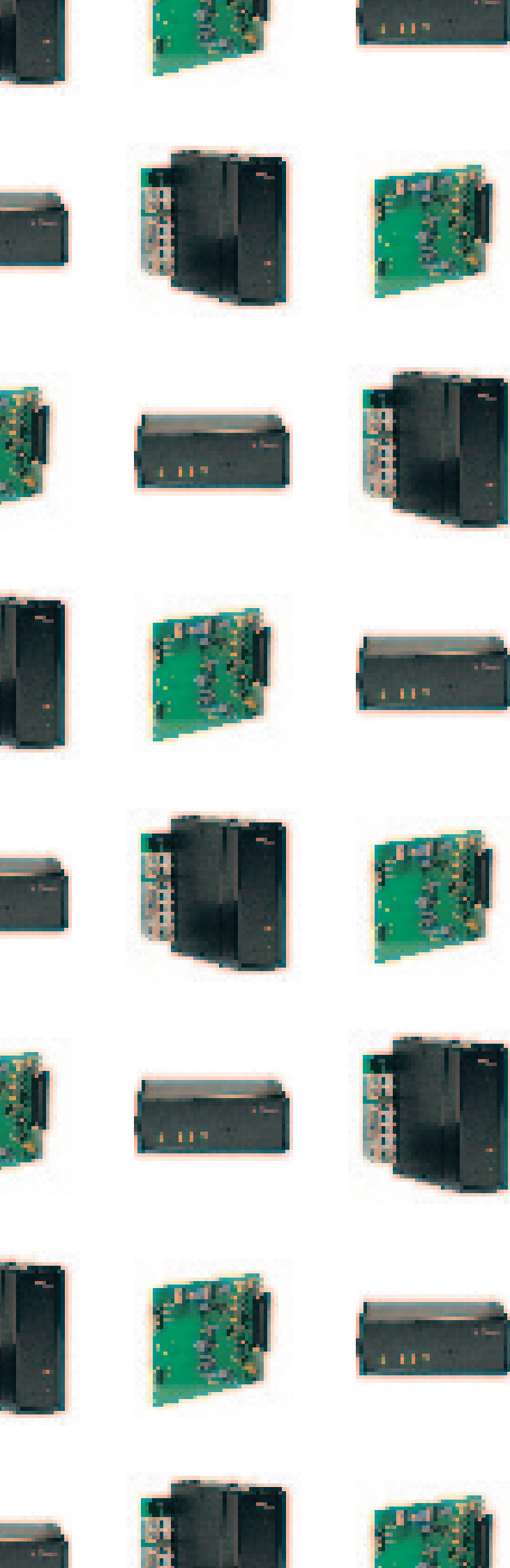
Enclosure that protects the RV-1 rack and the circuit cards against external interferences.

P-1 Network unit

Power supply for 230V alternating current for the RV-1 rack.

OR-1 Redundancy card

The redundancy card makes the realisation of ring systems based on the M-1 interface possible.
(see LH-4VR, page 10)



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