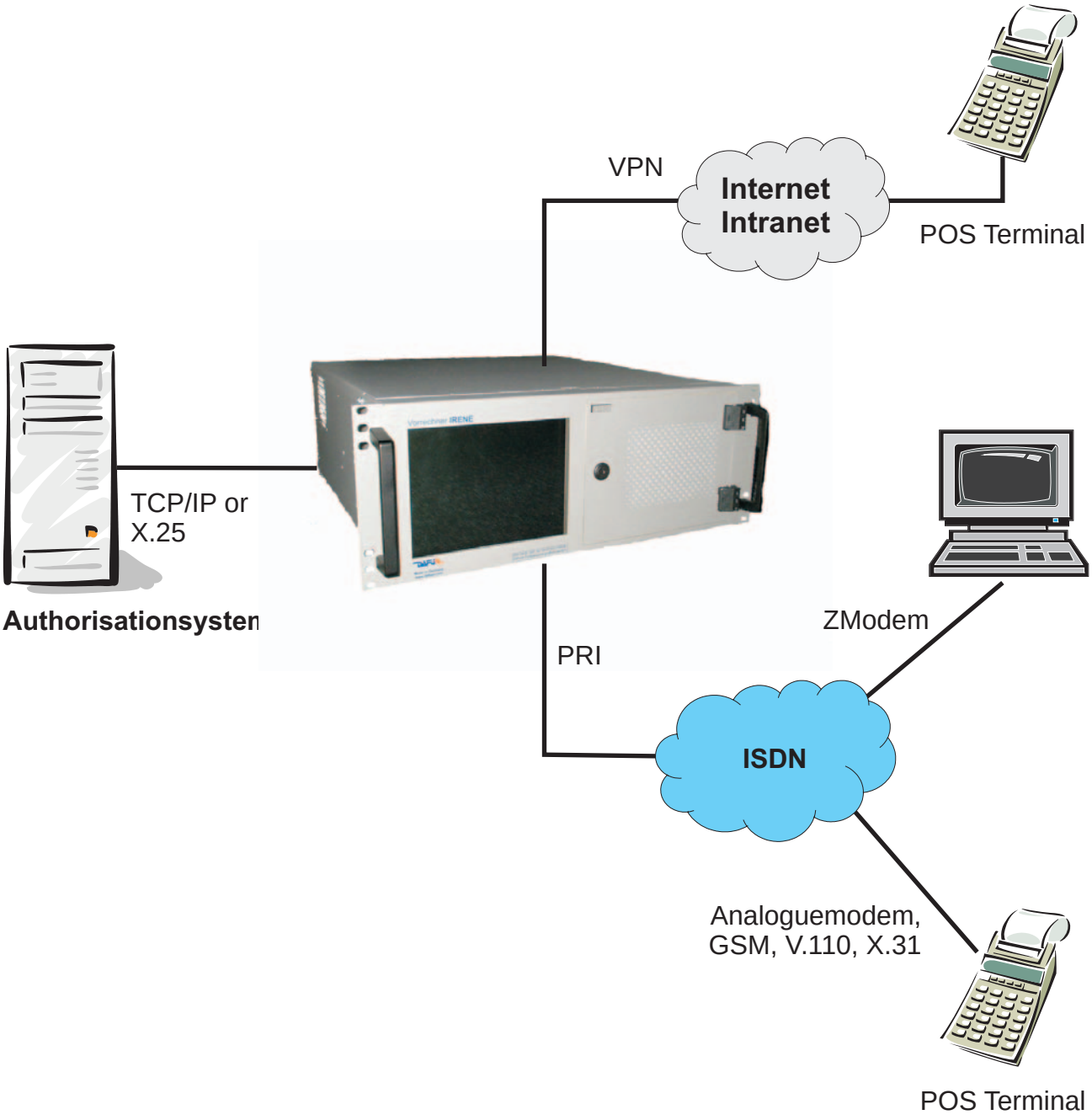
Access Node for POS - Terminals, the frontend processor

IRENE*



*Intelligent Router for Enhanced Networking with Ethernet protocolls

The frontend processor IRENE was especially developed as a frontend processor for credit card authorisation. It is thus optimally suited for connections to authorise computers via TCP/IP (or X.25).

IRENE supports the following formats for POS terminals:

V.24:

- ISO 8583, V.22bis with Autocall
- ISO 8583, V.22bis with PAD (Poseidon)
- ISO 8583, 9600 Baud with Autocall
- ISO 8583, 9600 Baud with PAD (Poseidon)
- V.24, LSV2
- 1200 Baud half-duplex, Makatel, V.23

ISDN:

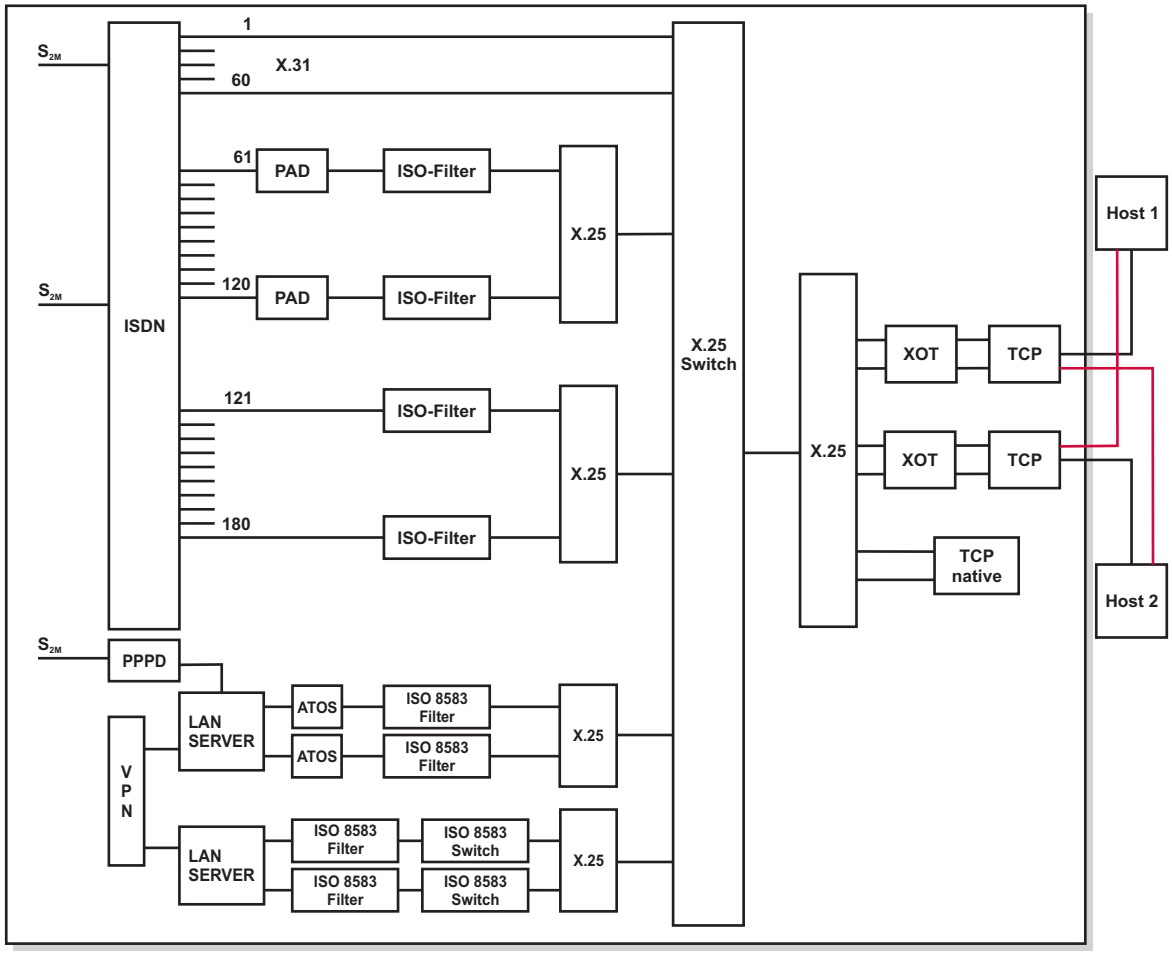
- X.25 in the B-channel, (X.31)
- X.25 in the D-channel
- V.110 with Autocall
- V.110 with PAD (Poseidon)
- ISO 8583, V.22bis with Autocall
- ISO 8583, V.22bis with PAD (Poseidon)
- ISO 8583, V.32/V.32bis with Autocall
- ISO 8583, V.32/V.32bis with PAD (Poseidon)
- LSV2

TCP/IP:

- PPP (Point-to-Point Protocol)
- VPN (Virtual Private Network)
- GPRS

If desired, individual transactions can be routed to different host computers depending on the dial-up number or availability of the machine concerned (backup).

In IRENE, data can be forwarded by means of autocall or in accordance with an internal PAD dialogue. The Call User Data Field acquired in the PAD dialogue therefore makes it possible to control routing to the desired TCP port.



Example: software structure of the “IRENE” system as ISDN-TCP/IP frontend processor for credit card authorisation

One interface for all incoming terminals

The gateway IRENE gives you *one* common interface for all incoming terminals and ATMs, no matter if they are using modem protocol (2.400 bps, 9.600 bps with MNP4, without MNP4, with V.42, without V.42) with V.110, with X.31 in the B-channel or with PAD dialogue.
While standard systems need 15 to 20 seconds even for the modem connection, the gateway IRENE can do this in 7 to 8 seconds!
Your customers therefore have less waiting time at the cashier and you can support a greater load with less lines.

Routing by ISDN extensions

The PRI lines coming from ISDN are treated as PABXs and via the extensions numbers it is decided which services the incoming terminals needs. If the call is via analogue modems the internal modems in IRENE are routed dynamically; therefor you don´t need different hardware for analogue and digital calls.

Host routing via Call-User-Data-Field or calling-line-identification (CLIP)

Often the terminals are using dedicated Call-User-Data (CUD). IRENE can read this CUD and take this for a TCP addressing. Further on you can define a routing via CLIP. E.g. the ISDN calling number can be put on the X.25 call packet if XOT or XIP is used between IRENE and host.

Connecting of PPP-data

As you can see from the block diagramm, the PPP-deamon is connected directly to the PRI module and feeds a LAN-server. Via the LAN-server and an ISO-filter the data is send to the host. This technic assures, that only ISO 8583 packets are coming through. All other data which are not according to ISO 8583 are already deleted in the gateway IRENE.

Access for Virtuell Private Networks (VPN)

The block diagramm also shows that the LAN-server is used both for the PPP-deamon and as an interface to the VPN. The flow off data remains the same.
With that you get an application layer firewall (ALF) which is unique in the market.
All danger which can normally come via VPN accesses to a customer´s system, are succesfully deleted. There are no viruses known yet which have been written in an ISO 8583 format!

The statistics in IRENE shows you weak points before the customer tells you

IRENE gives you syslog information about all the transactions.
You get info about:

- number of calls
- number of calls, which are active at the same time (max load)
- received data blocks
- transmitted data blocks
- transmission errors
- alarms before limits are exceeded

These statistics (supported by graphics) may be called via a web interface.
The access may be local or remote.
Beside the web interface IRENE has a SNMP-MIB which may be used in existing SNMP-management systems like HP OpenView, etc.
You can define your own traps and the reaction on those traps.

Money card transaction

Transferring the transactions of a money card, you have to consider one feature which is not existing with credit card authorisation. There will be send a lot of ISO 8583 packets, one after the other, without a response from the host.

These ISO blocks have to be handled as blocks on the host. With common Remote Access Servers (RAS) an intercharacter time-out is activated to look for pauses in the datastream. After the end of an ISO 8583 block there should be a pause, so the timer sends the meanwhile received data to the host.

So far the theorie...

Some terminals transmit not only at the end of an ISO block a pause but unfortunatly very often in the middle of a data block and thus the host received uncomplete and therefore not useable frames.

The gateway IRENE however knows the logical construct of an ISO 8583 block and assures that only complete ISO block are transmitted to the host.

Backup-Routing in case of errors

In case you can´t contact the authorisation host due to LAN errors or total collapse there are several ways for backup in IRENE. Via predefined data pathes IRENE is automatically looking for a backup host.
By sending continuously a dummy diagnostic message, IRENE assures that all layers up to the application layer are active if it receives a proper diagnostic response in a given time. If not, this path is considered as being defective, so automatically a working path is chosen by IRENE.

Normal load balancer can check if proper ping response is working but IRENE goes far beyond this level of approving, because it goes to the application layer.

High availability offered by upgraded hardware

The frontend processor IRENE will be delievered with three separate power-supplies and two separate voltage feed.
These power-supplies work redundantly and can be replaced from the front while the system is running.

Those requiring even greater reliability can opt for the SCSI-based hardware RAID specification with high MTBF harddisks. As the frontend processor IRENE runs the Linux operating system, you have automatic access to Linux's access protection mechanisms (SSH, firewall...).

Commissioning guarantee

DAFÜR GmbH delivers IRENE with a commissioning guarantee. This means that the DAFÜR technician will remain on your premises until you are 100% satisfied!

Here is our "Commissioning Guarantee", as stated in an IRENE offer:

We have investigated with maximum diligence the task you asked us to perform. This offer contains all the services needed to fulfil that task. Should we have overlooked anything, and you inform us within two months that you are not entirely satisfied with the delivered performance, we will take back the equipment without any installation or return costs being charged.

Remote Access as if you were sitting directly in front of IRENE

IRENE is running under Linux, so you can use all your Linux know-how immediatly. With Telnet or FTP you can look at all the data pathes and trace them whenever it is applicable. This remote service can be used both, by you and the engineers from DAFÜR.

If something is going wrong (and this may occur from time to time) the causes can be found out pretty fast and you will have a solution immediatly. You can trace any data traffic between any modules and analyze the faulty situation.

In most cases something has been changed or has gone wrong in the environment of the installation. With this remote access facilities we can find out them very fast and help you to recover from this faulty situation.

A real-life example:

A service operator called us telling us that one of his customers was to start dialling into the host via IRENE. Although all the parameters appeared to be correct, the test failed. Our technician was able to check IRENE´s internal parameters online, even while the phone-call was still in progress. All the settings were correct.

The technician then decided to run a trace on the faulty transaction (also remotely). It showed that an incorrect X.25 call number had been set in the terminal.
The error was corrected.

This, and other positive experiences, have included us to set up an IRENE helpdesk.

IRENE users who take advantage of this helpdesk can receive online help and analyses for their data transmission at any time.

Special features of IRENE: Overview

- **When you purchase IRENE, you do not simply acquire a "device" but a fully integrated system.**

  You have the guarantee that everything works the way you want, and save yourself complex, time-consuming system specifications because we only conclude the commissioning once you deem your requirements fulfilled. Our expertise in this area manifests itself in the form of exceptionally short installation times.

- **Active monitoring of the functionality**

  Critical states (traps are defined jointly with you) are recognised by the system and notified via SNMP. In this way, potential failures can be recognised before they become acute and before they affect the POS customers.

- **Automatic connection to the authorisation system**

  IRENE's automatic backup routing improves system availability without you having to install continuously monitoring or intervene manually. The ISDN backup even allows the stand-in host to run at a separate site. Fees exclusively for backup lines can thus be saved.

- **Statistics (also for the ISDN functions) can be called up via WEB and SNMP**

  Loading statistics are immediately visible, enabling you to increase bandwidth before customers start receiving a busy tone. The modem/ISDN distribution can be displayed, making it possible to tune the configuration to reflect customers actual needs.

- **All data channels can be monitored remotely.**

  In the event of a terminal fault, you and DAFÜR can immediately trace and analyse the data traffic without a technician having to be on site or purchasing additional hardware.

  This allows faster rectification and localisation of failures and the avoidance of travelling costs. Customers can be helped directly without the need for guesswork or assumptions.

- **The Dafür online helpdesk offers professional support in the event of transmission problems.**

  Our engineers' experience in interfaces and transmission protocols is available at short notice for localising faults. Shortening the time it takes to find and rectify errors will improve your standing and boost customer loyalty.

Technical Data

Supported protocols	V.24	ISDN	TCP/IP
	ISO8583, V.22bis with Autocall	X.25 in B-channel (X.31)	PPP
	ISO8583, V.22bis with PAD (Poseidon)	X.25 in D-channel	VPN
	ISO8583, 9600 Baud with Autocall	V.110 with Autocall	GPRS
	ISO8583, 9600 Baud with PAD (Poseidon)	V.110 with PAD (Poseidon)	
	V.24, LSV2	ISO 8583, V.22bis with Autocall	
	1200 Baud half-duplex	ISO 8583, V.22bis with PAD (Poseidon)	
	Makatel	ISO 8583, V.32/V.32bis with Autocall	
	V.23	ISO 8583, V.32/V.32bis with PAD (Poseidon)	
	V.21		

Connections	Host	ISDN
	TCP/IP 10/100/1000 Mbps	up to 3 x PRI with 30 modems each
	XIP	
	XOT	
	ISO TP0 (RFC 1046)	
	“ATOS” (OPAL)-format (Message with length-byte)	
	X.25 with HDLC V.24/X.21 up to 2Mbps	

Management	
	WEB
	SNMP
	Syslog
	Telnet

General	
Bimensions WxHxD	485 mm (19”), 178 mm (4HE), 462 mm; incl. PRI cards
Weight	depending on specification: between 10 and 18 kg
Power Consumption	460W

Subject to technical changes
Release: 26. March 2007
8.DAFÜR.33.1.4 POS-IRENE_englisch_V_1.01.cdr

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