

## SIMATIC S5

### Telecommunications Device TK 858

### Commissioning Instructions

10920.3

Release: 02

Order No: 6ES5 998-0CM01

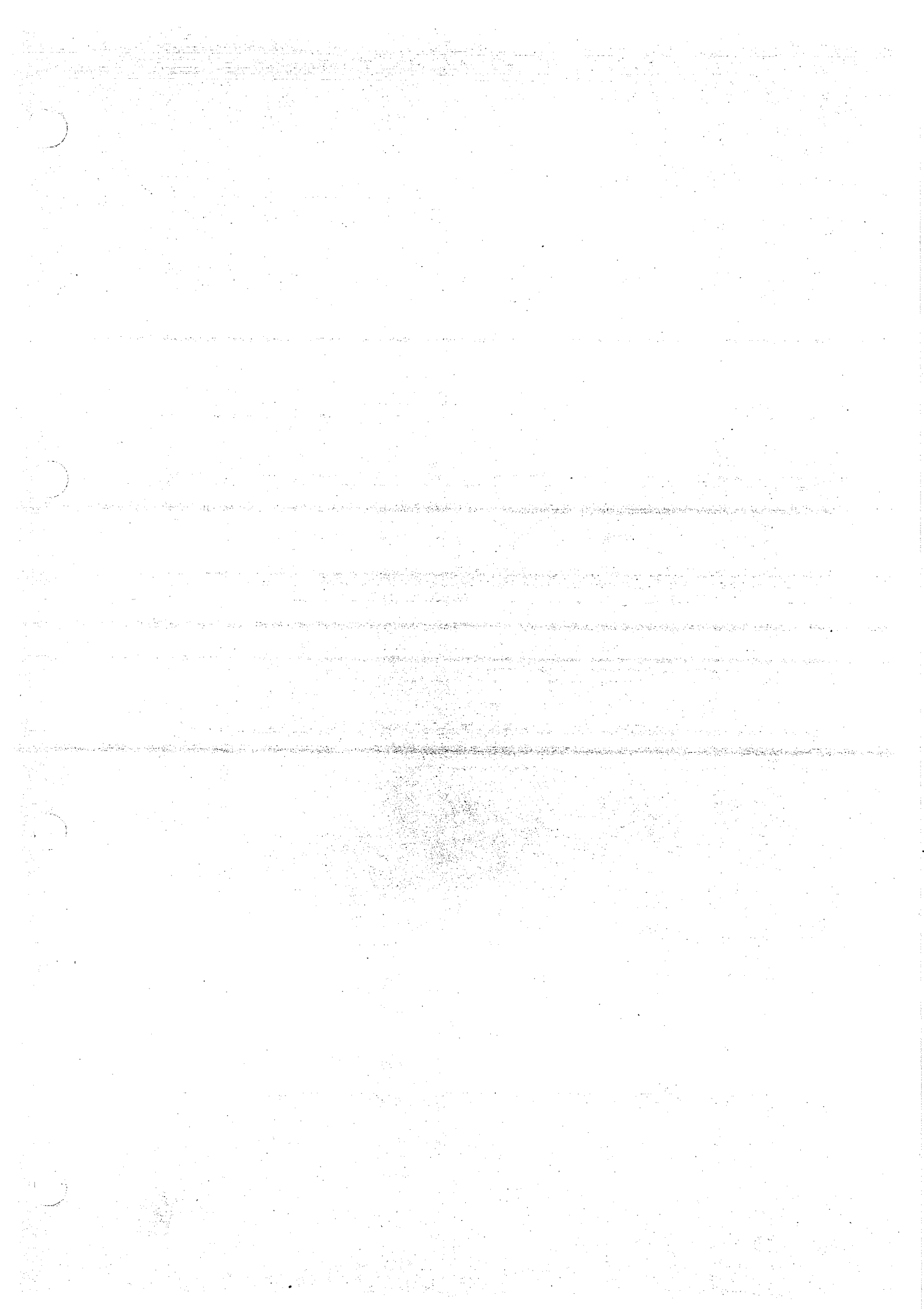
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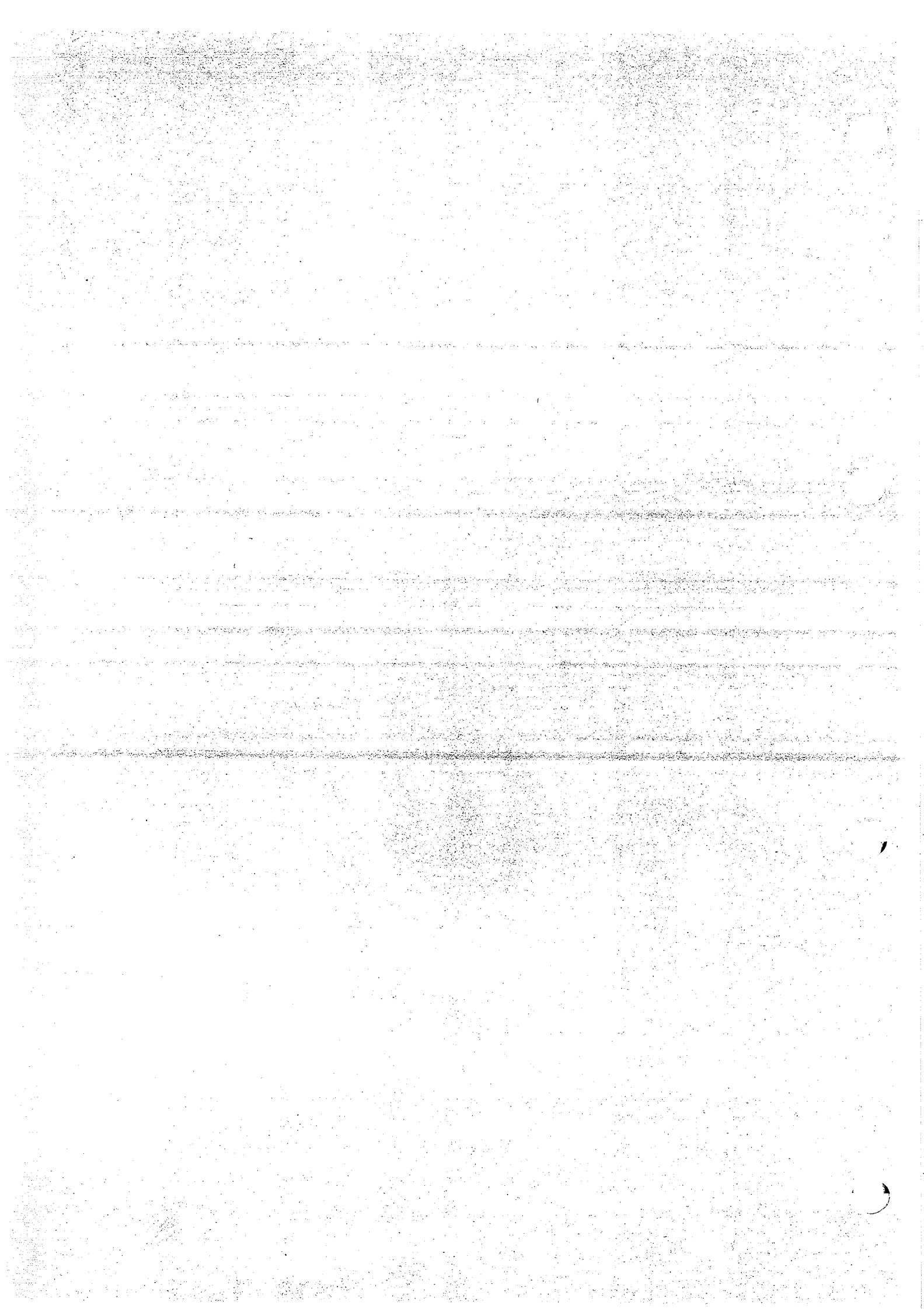
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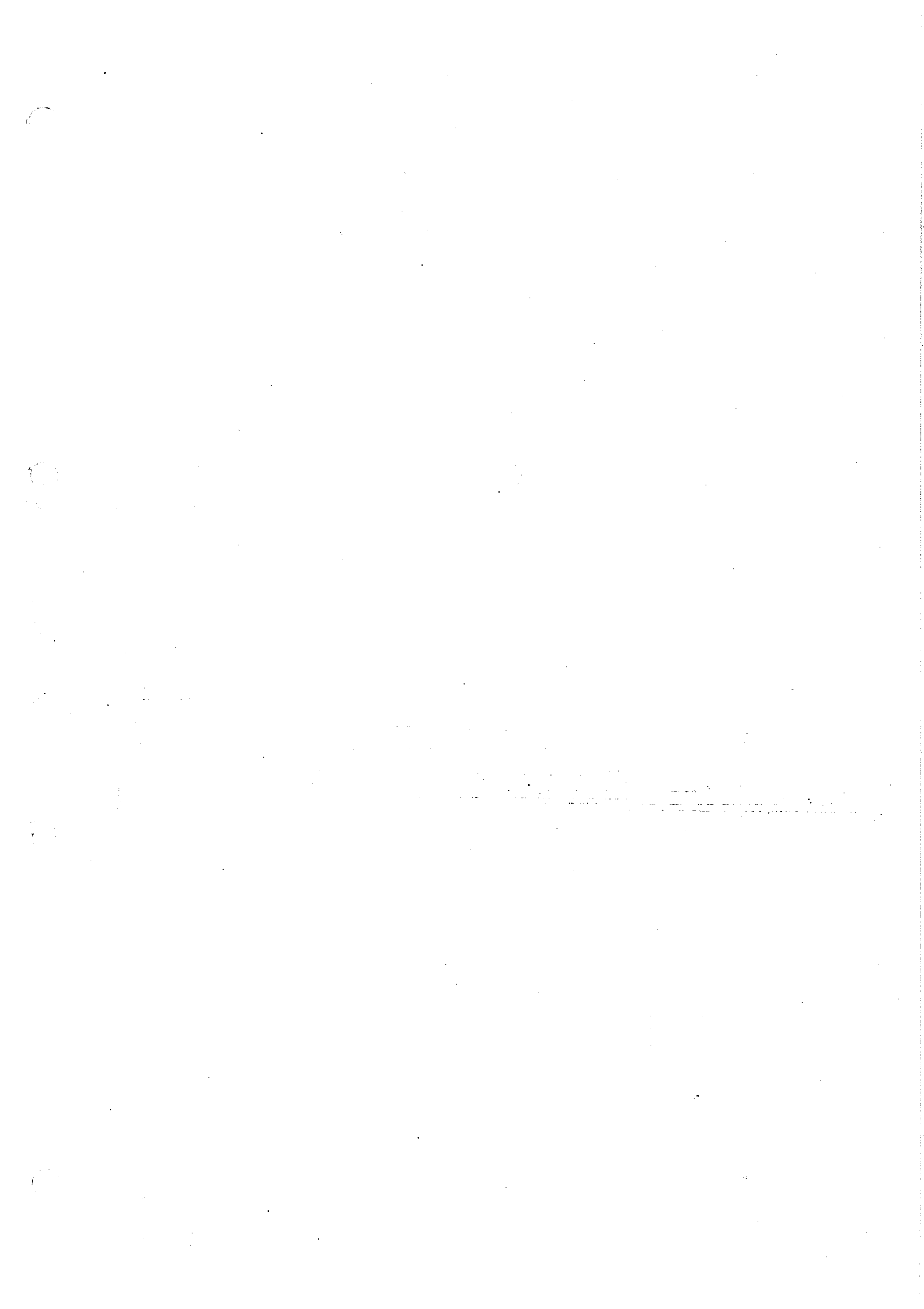
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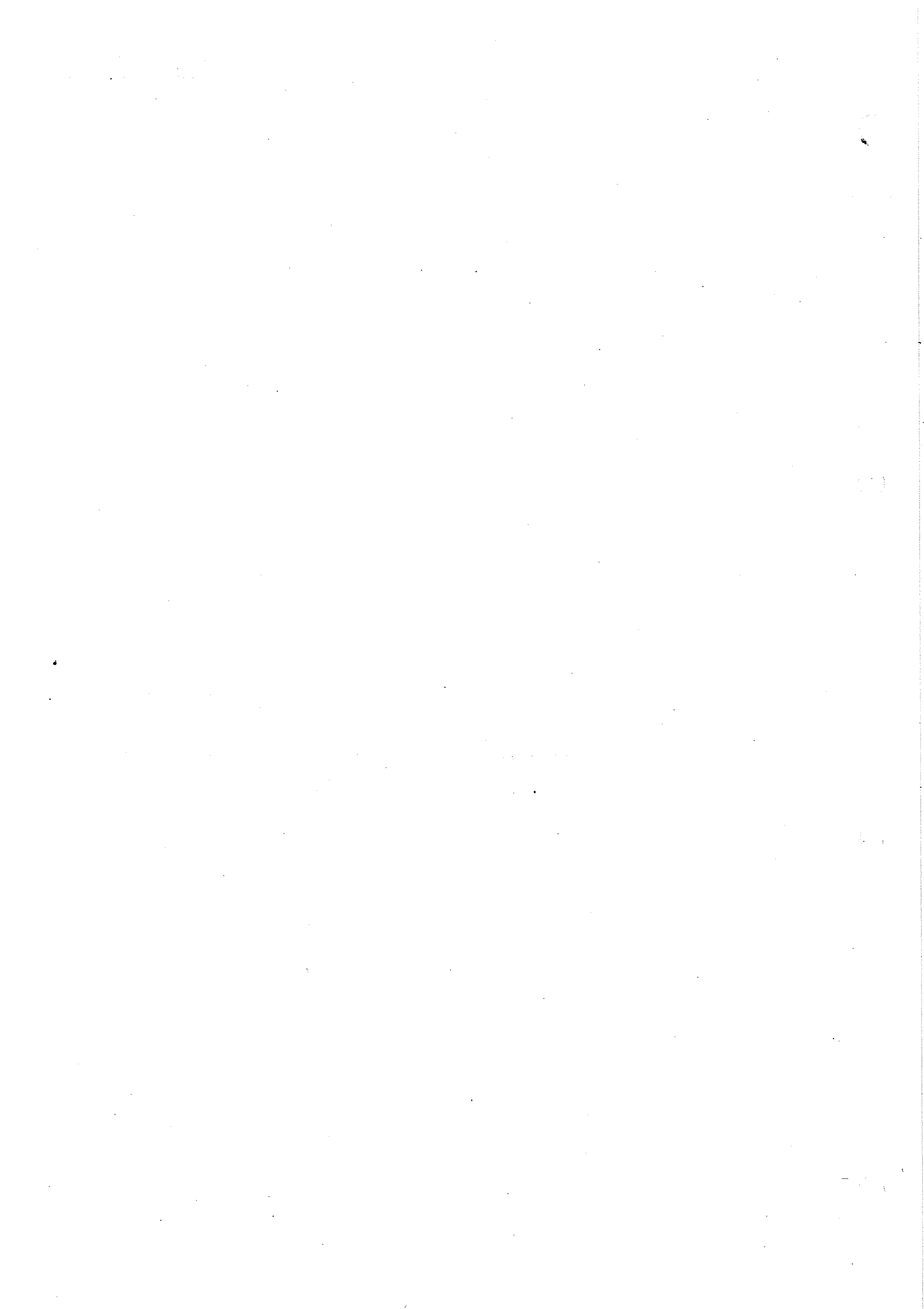
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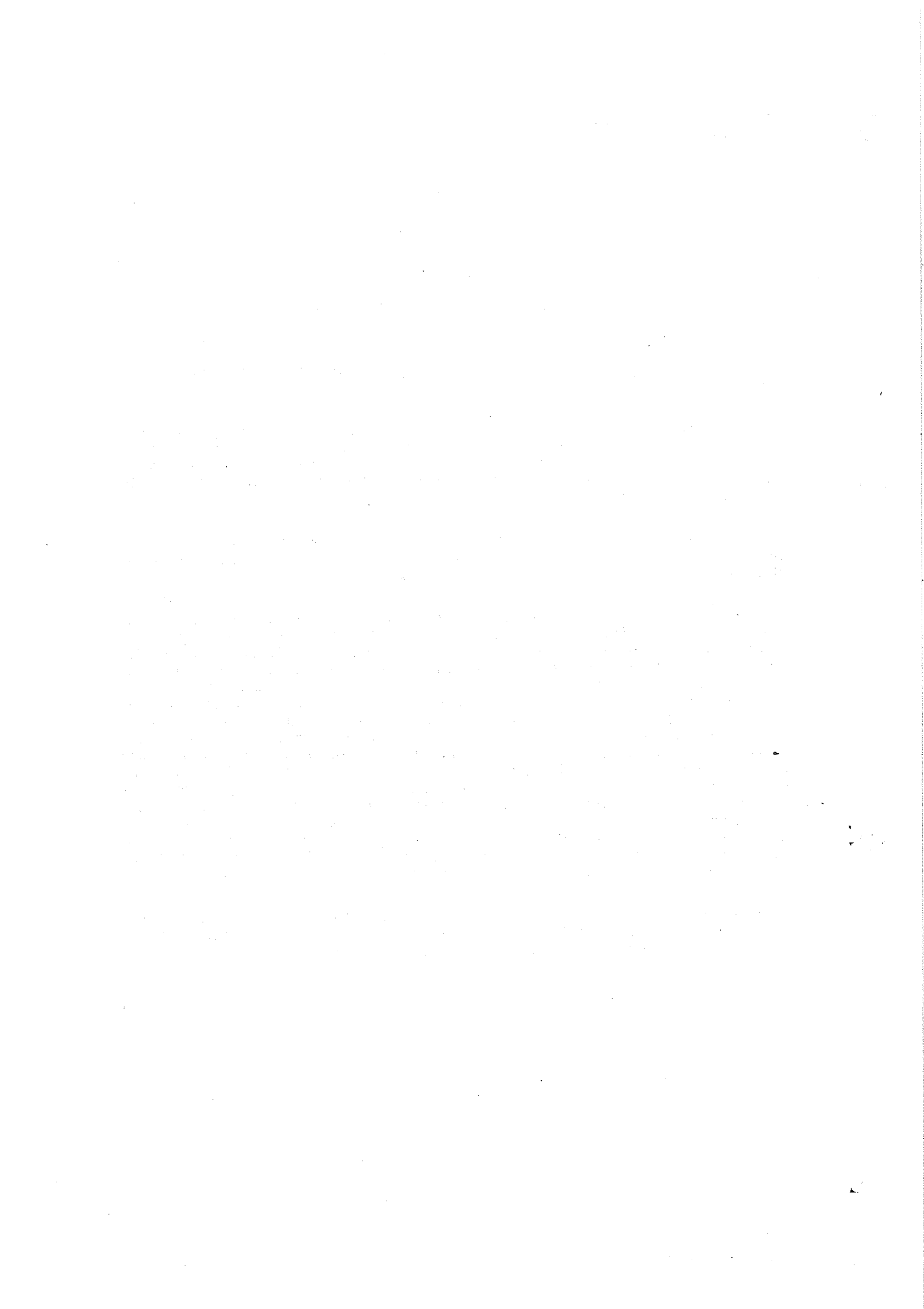
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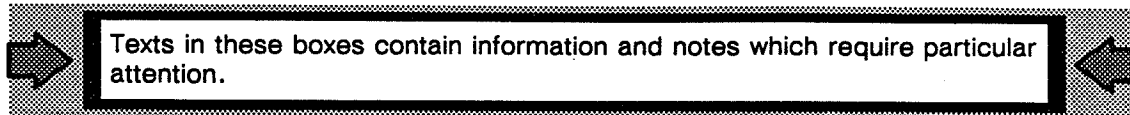
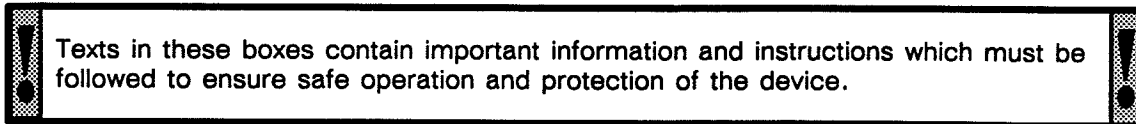
In the event of product liability damages due to the use of so-called SIMATIC-compatible modules, Siemens is not liable since we have taken timely action in warning users of the potential hazards involved in so-called SIMATIC-compatible modules."





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For clarity's sake, these commissioning instructions do not cover every conceivable situation in complete detail.

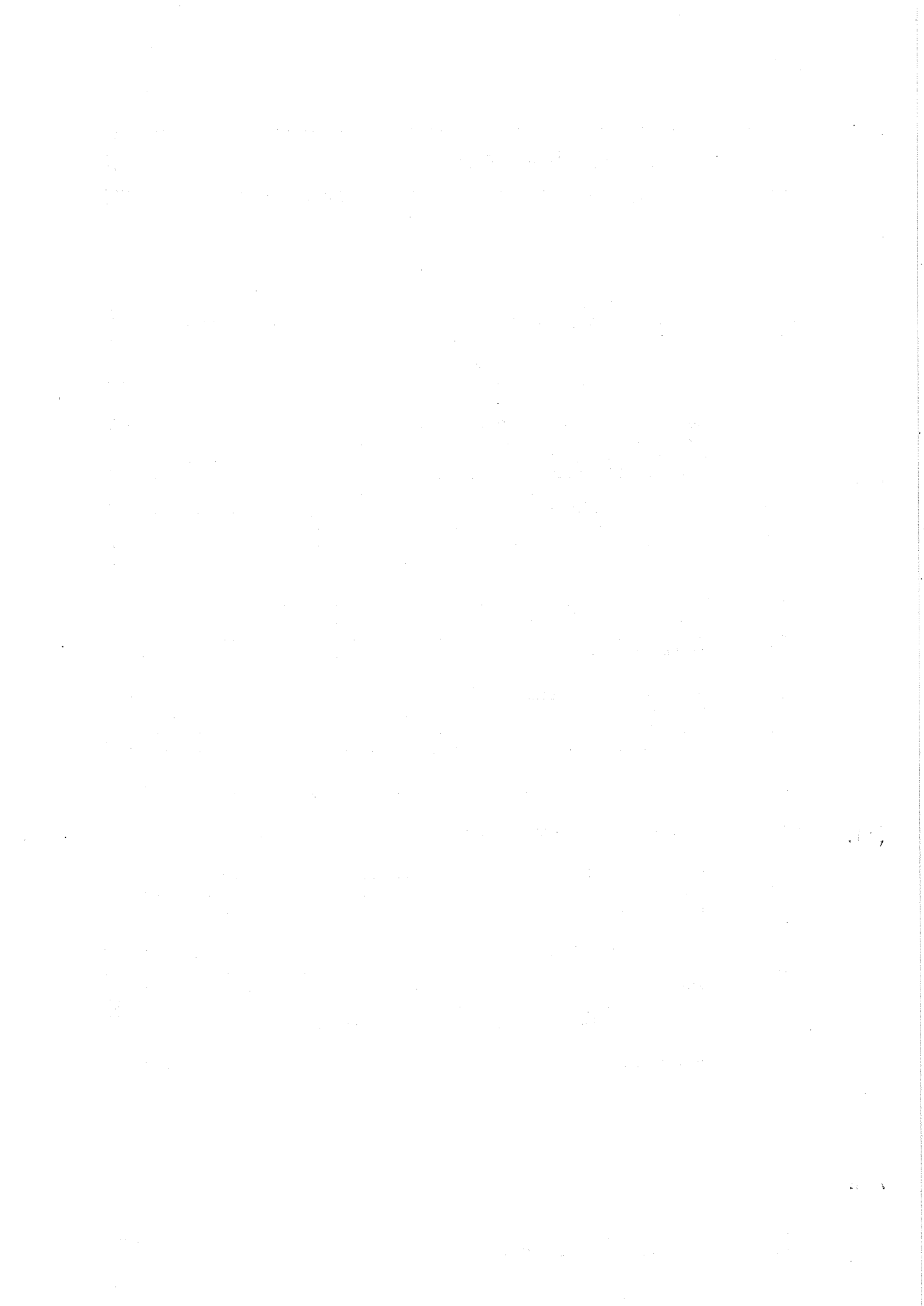
Contact your local Siemens office if you need additional information or if a special problem arises which is not covered in sufficient detail by this manual.

In addition, be aware that the contents of these commissioning instructions do not constitute a part of a previous or existing agreement, promise, or legal relationship and is not intended to alter same.

All obligations on the part of Siemens are based on the respective purchase contract which also contains the complete and sole valid warranty provisions. The TK 858 commissioning instructions neither widen nor restrict these contractual warranties.

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## 1.1 Overview

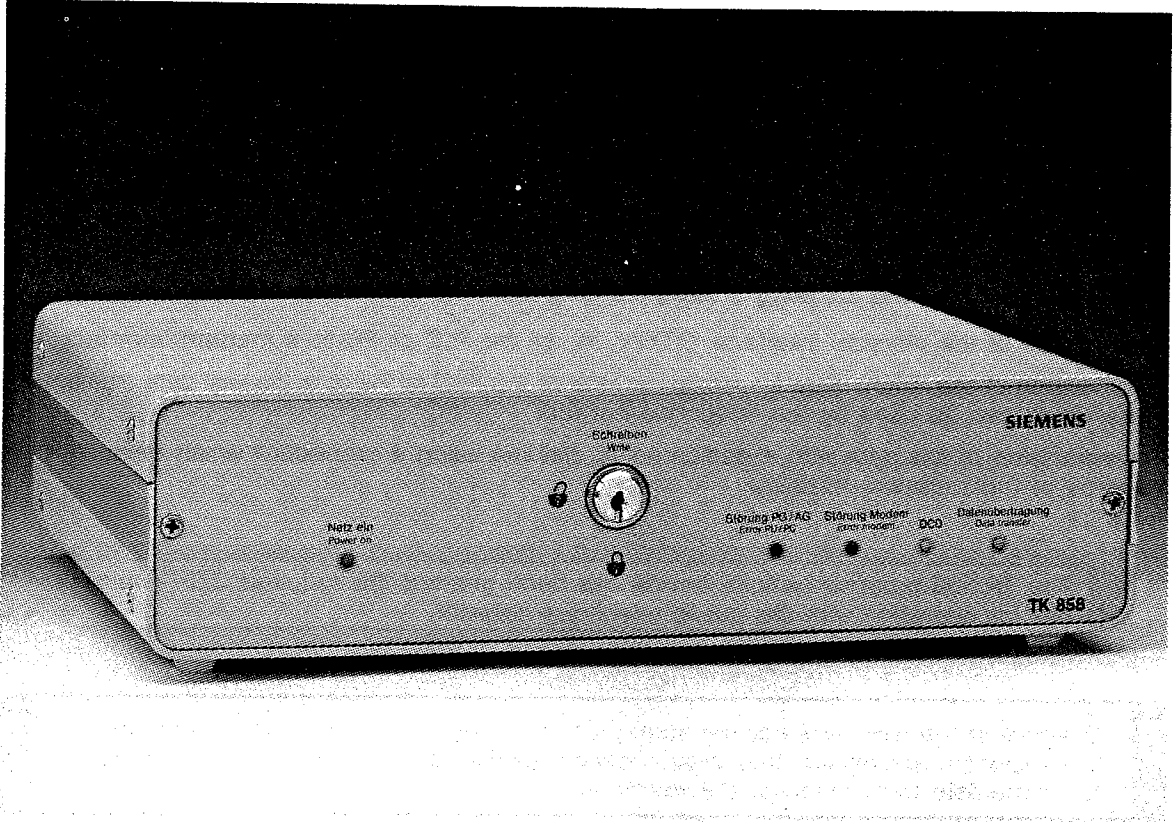


Figure 1.1: Telecommunications device TK 858

### 1.1.1 Function Description



The TK 858 telecommunications device is used for communication by components of the SIMATIC S5 communication system among themselves and with external systems using the public telephone network or private networks.



There are two types of coupling for long-distance data transmission.



- **PU Function**  
Coupling between SIMATIC S5 programmer (PU) and SIMATIC S5 programmable controller (PLC).
- **Computer Coupling**  
Coupling between two programmable controllers (PLCs) or coupling between programmable controllers (PLC).

The TK 858 performs the following 3 tasks for long-distance data transmission:

- Adaptation of the physical interface (TTY/V.24) of the PLC or PU to a modem interface
- Conversion of the (high) data transmission rate of the PLC or PU to a (lower) data transmission rate which can be used by the telephone network
- Transmission of the data with a dedicated or dial line using a procedure which ensures a high degree of transmission reliability

 The TK 858 communications device has been granted the required ZZF<sup>1)</sup> number for operation with the public telephone network. 

 Opening of the device is not necessary when putting the TK 858 into operation! It is explicitly pointed out that unauthorized opening of the device will be grounds for immediate termination of the warranty! 

 To prevent personal injury and property damage, the TK 858 communications device may only be put into operation by qualified personnel who are familiar with the functions of the device! 

1) ZZF = Central Licensing Office for Telecommunications

### 1.1.2 Basic Setup of Long-Distance Data Transmission Lines with the TK 858

The following figures show the basic setup of transmission lines with the TK 858 for the PU function (figure 1.2) and the coupling between two programmable controllers (figure 1.3). For detailed descriptions of putting into operation and functions, please see the respective, correspondingly entitled sections.

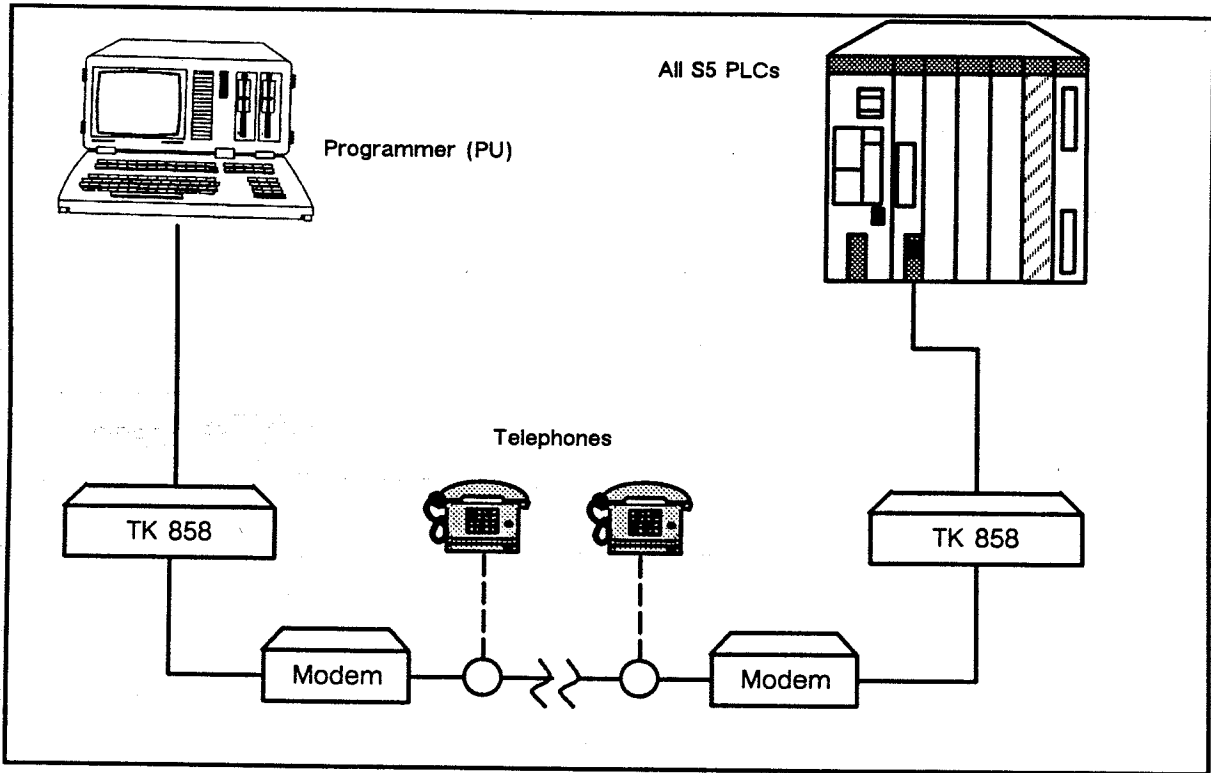


Figure 1.2 PU function

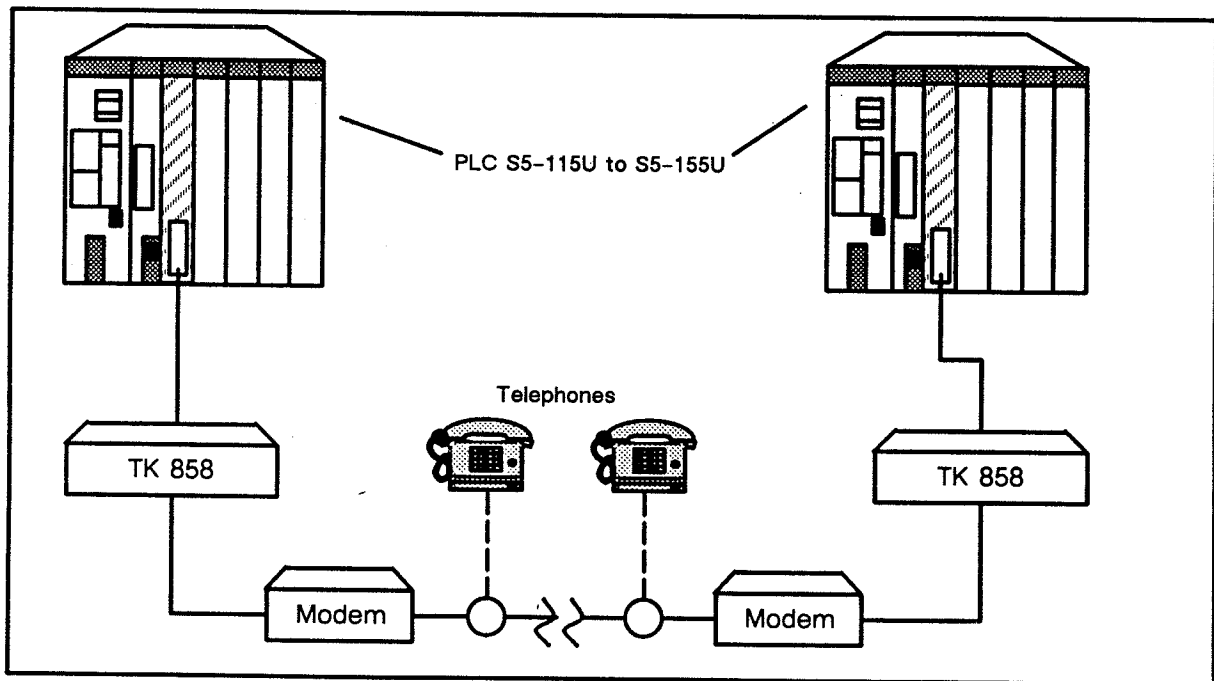


Figure 1.3 Connection between two programmable controllers

### 1.1.3 Block Circuit Diagram

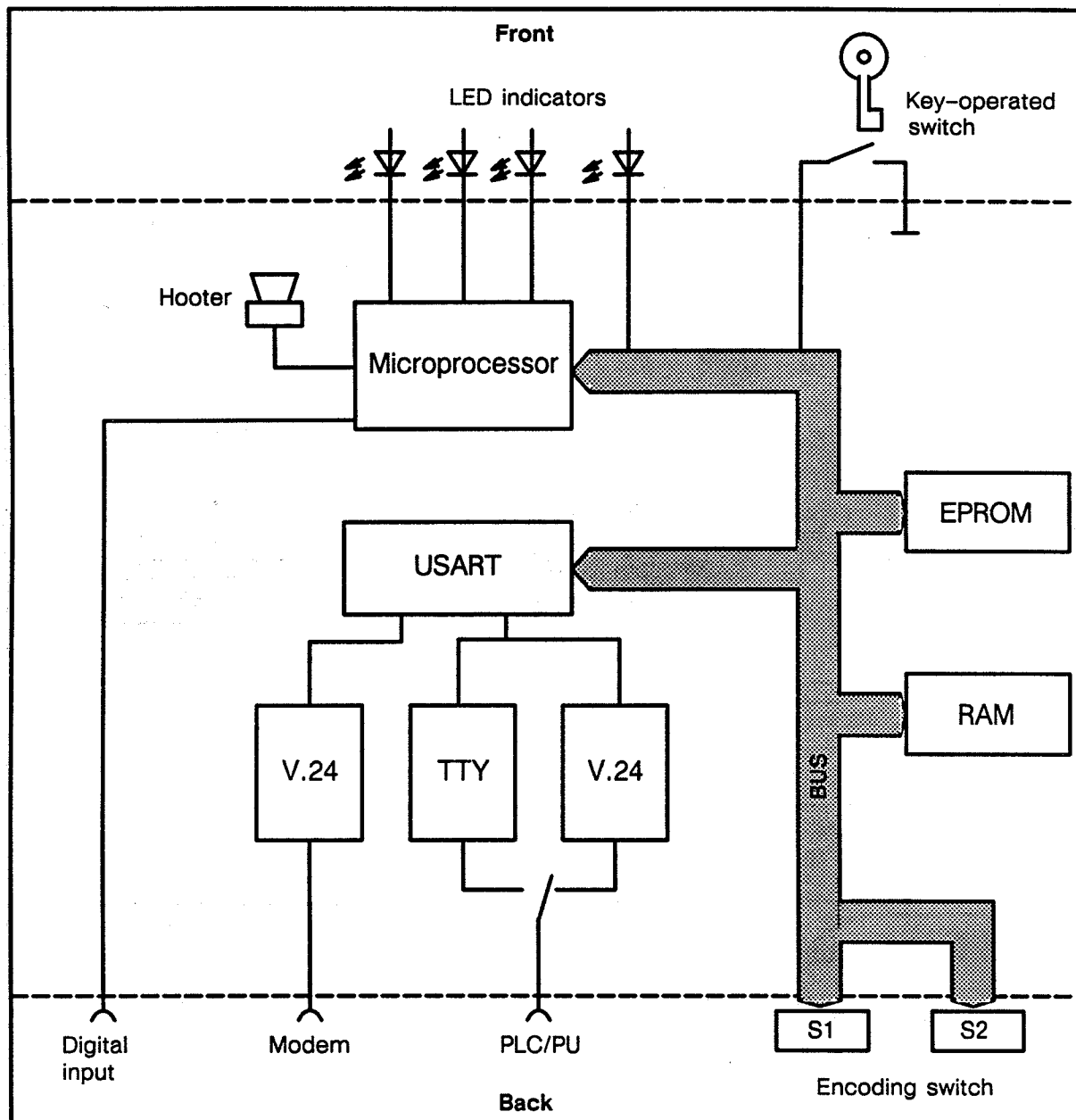


Figure 1.4 Block circuit diagram of communications device TK 858

Microprocessor 80C31 is the nucleus of the TK 858. An 8-bit bus connects it to the EPROM, RAM, and USART. The firmware for operation as either computer coupling or PU function is stored in the EPROM (64 kbytes). The data to be transmitted is stored intermediately in the RAM (32 kbytes). As the interface block, the USART (85C30) converts the data to be transmitted to conform to the transmission type and rate of the connected devices.

The following sections describe the operating, setting, and indicator elements, and the interfaces.



## 1.2 Mechanical Setup - Housing

The TK 858 is a desktop device installed in a 4-part, aluminum, light gray, shell housing with protection degree IP 20.

All operating and indicator elements, and the interfaces are located on the front and back of the housing (see section 1.3). The dimensions of the device are shown in figure 1.5.

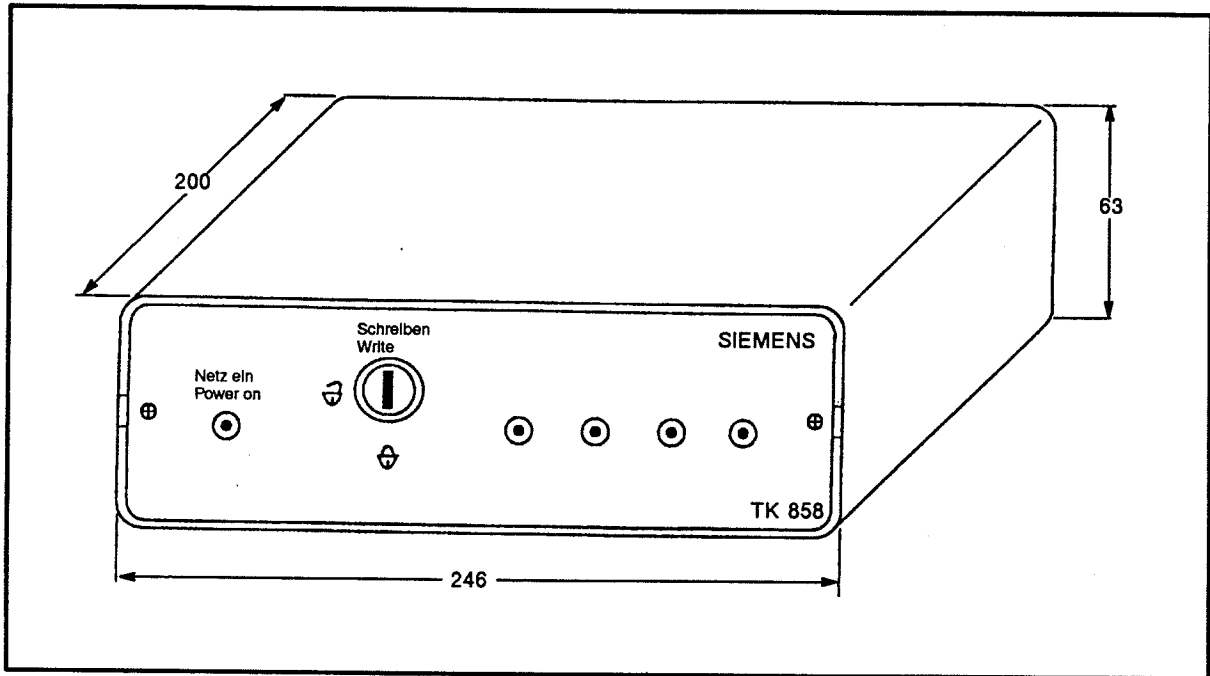


Figure 1.5: Dimensions of the housing

The name plate with device-related information is located on the underside of the device!

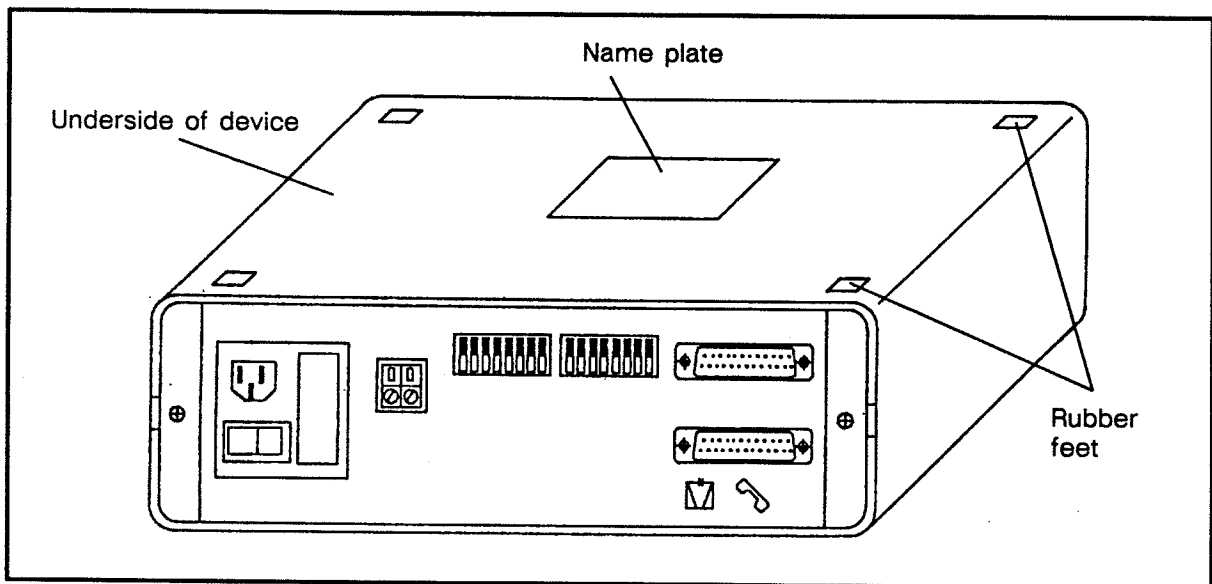


Figure 1.6: Location of the name plate

## 1.3 Operating and indicator Elements

The indicator and operating elements (located on the front and back of the device) which are required for putting into operation and operation are described in the following.

All function and fault indicators on the front of the device are designed as LEDs and labelled accordingly (see figure 1.7).

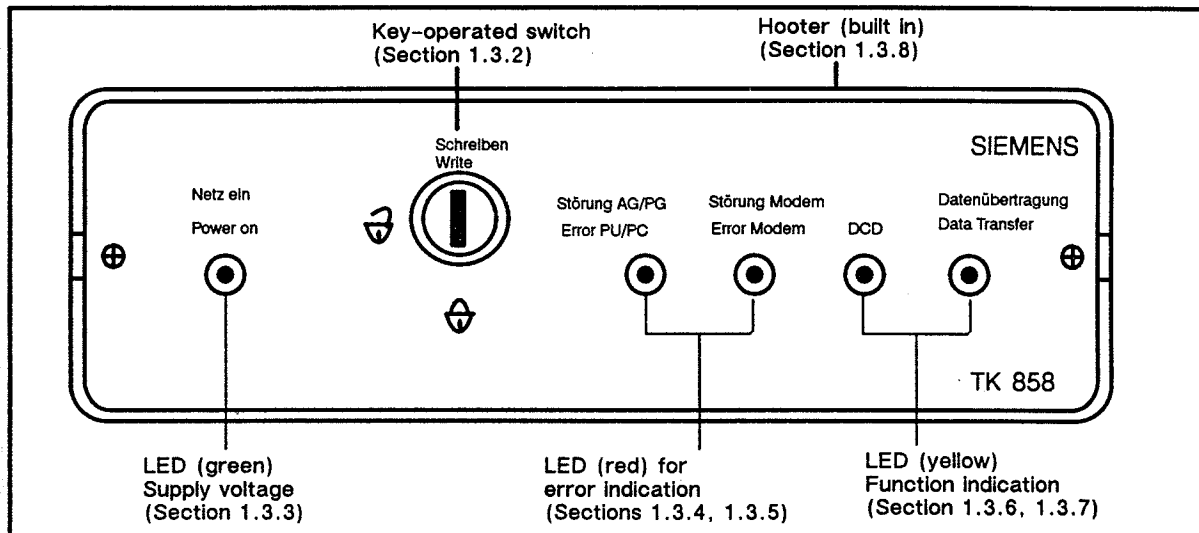


Figure 1.7: Indicator elements and key-operated switch on the front of the device

The power supply connection, the interface for data transmission, and DIP switches S1 and S2 which are required for the hardware adaptation of the interfaces are located on the back of the device.

All settings can be performed from the outside. Do not open the device!

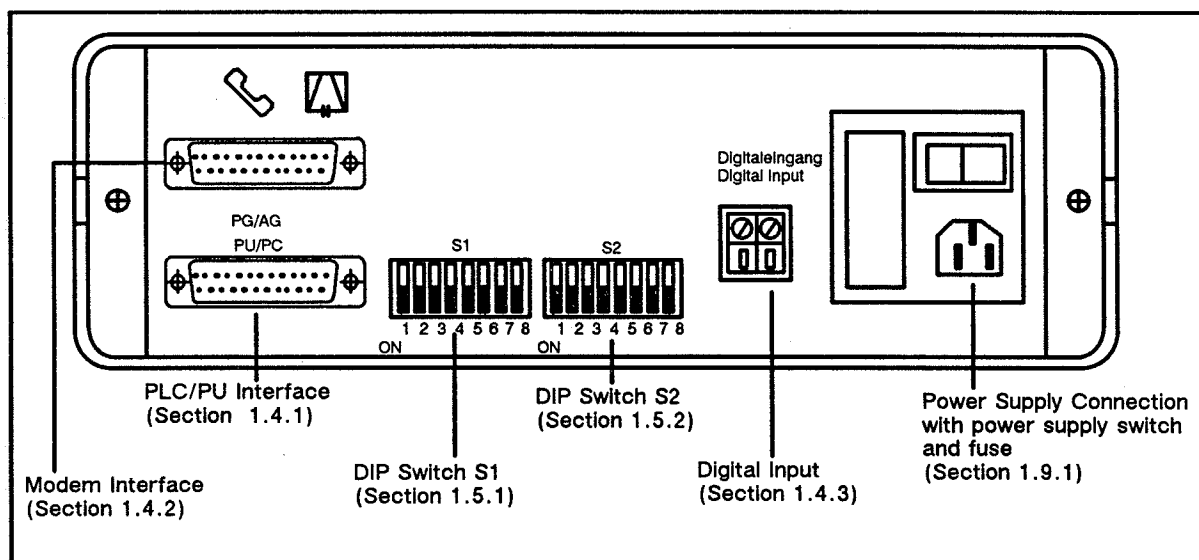


Figure 1.8: Back of the device with interfaces and DIP switches

### 1.3.1 Power Supply Switch

The power supply switch is located on the back of the device above the cold appliance coupler.

### 1.3.2 Key-Operated Switch

The key-operated switch on the front plate prevents unauthorized write procedures from the PLC. (See sections 2.4.4 and 3.4.3).



≅ "open"

= write procedure permitted



≅ "locked"

= write procedure not permitted

### 1.3.3 "Power On" LED (Green)

This LED lights up when the operation voltage (5-V supply) of the device is present.

### 1.3.4 "PLC/PU Fault" LED (Red)

This LED lights up to indicate that a fault on the PLC/PU interface has been detected by the firmware. The error indication is based on the type of operation and is described in the applicable section.

### 1.3.5 "Modem Fault" LED (Red)

This LED lights up to indicate that a fault on the modem interface has been detected by the firmware. The error indication is based on the type of operation and is described in more detail in the applicable section.

### 1.3.6 "DCD" LED (Yellow)

The "data carrier detect" LED corresponds to the DCD indicator (line 109, receiving signal level) of the modem. It lights up as soon as line 109 of the modem becomes active. If the modem is ready for operation, the "DCD" LED lights up as soon as the transmission line is established. The LED goes off when there is a disturbance on the transmission line.

### 1.3.7 "Data Transmission" LED (Yellow)

This LED lights up after the self-test is successfully completed or when the TK 858 contains data which must be transferred to the partner on the other end of the telephone line or to the connected PLC or PU.

For computer coupling: the LED lights up when data is transferred over the modem interface.

### 1.3.8 Hooter (Built-In Beeper)

The hooter sounds when the telephone connection is broken (immediately for computer coupling and after 10 sec for the PU function). It goes off again as soon as the connection is reestablished. The duration of the signal tone is limited to a maximum of 1 minute. You can use switch S2.8 located on the back of the TK 858 to prevent the hooter from sounding.

## 1.4 Interfaces

The TK 858 is equipped with two interfaces for data transmission.

- The PU/PLC interface
- The modem interface

Both are located on the back of the device (see figure 1.9) and are designed as 25-way, D, sub, plug connectors.

▶ Always provide pull relief (i.e., sliding locks on the cable plug connectors) for the plug connectors on the modem and PU/PLC interface! ◀

Also on the back of the device, the digital input is used for automatic connection establishment and disconnection of the telephone connection.

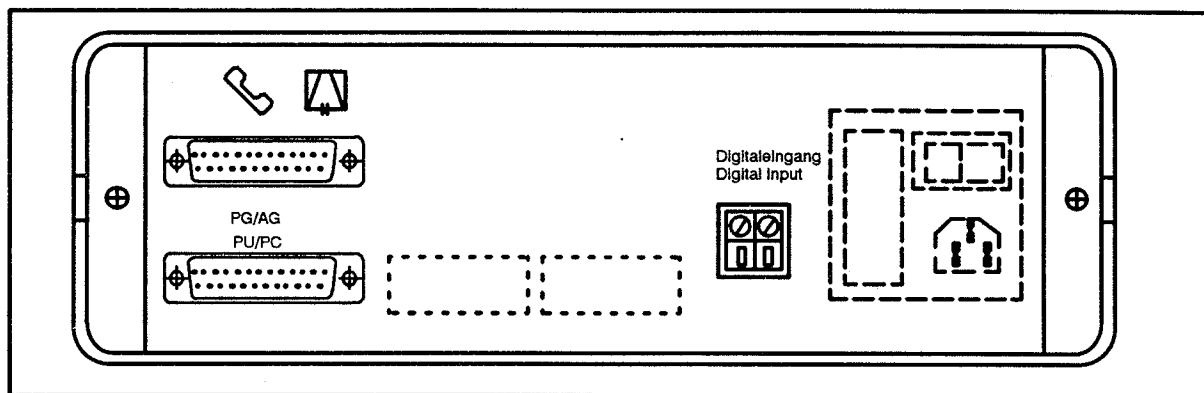


Figure 1.9 Location and designation of the interfaces

### 1.4.1 PU/PLC Interface (V.24/TTY)

The PU/PLC interface is the lower of the two 25-way, D sub, plug connectors (sockets). Use the appropriate connection cable to connect the PU/PLC here. As shown in the table, this interface can be used as a TTY or a V.24 interface. (See section 2.6 or 3.9 for cables).

Connection	Signal (TTY)	Signal (V.24)
1	NC	
2	0 V (GND)	
3	K3	K3
4	K2	K2
5	NC	
6	+RxD	
7	NC	
8	-RxD	
9	NC	
10	+TxD	
11	NC	
12	-TxD	
13	V24_TTY	V24_TTY
14	GND	GND
15		
16	NC	
17	K1	K1
18		RxD_V
19		TxD_V
20	+20 mA/R (Source)	
21	-20 mA/R (Drain)	
22	+20 mA/T (Source)	
23	-20 mA/T (Drain)	
24	Shield	
25	Shield	

Table 1.1 PU/PLC interface

#### V.24-TTY Switchover

V.24-TTY switchover is performed in the plug of the connection cable. A jumper between pin 13 and pin 23 means V.24 transmission; no jumper means TTY transmission.

Pin	V.24	TTY
13	Soldered jumper inserted	Open
23		

Table 1.2 V.24-TTY switchover

### 1.4.2 Modem Interface (V.24)

The modem interface is the upper of the two, 25-way, D sub plug connectors (pins). Use the included connection cable to connect the modem here. The following table shows the allocation of the pins. (See section 2.6 or 3.9 for the cable.)

Connection	DIN 66020	Signal Name	
		CCITT V.24	Meaning
1	E1	101	Shield
2	D1	103	TxD
3	D2	104	RxD
4	S2	105	RTS
5	M2	106	CTS
6	M1	107	DSR
7	E2	102	0 V
8	M5	109	DCD
9	+12 V	+12 V	+12 V
10			
11			
12	M4	112	DSRS
13			
14			
15	T2	114	TxC
16			
17	T4	115	RxC
18	PS3	141	PS3
19			
20	S1.2	108	DTR
21	+5.2 V	+5.2 V	+5.2 V
22	M3	125	RI
23	S4	111	DTE
24	T1	113	T1
25	PM1	142	PM1

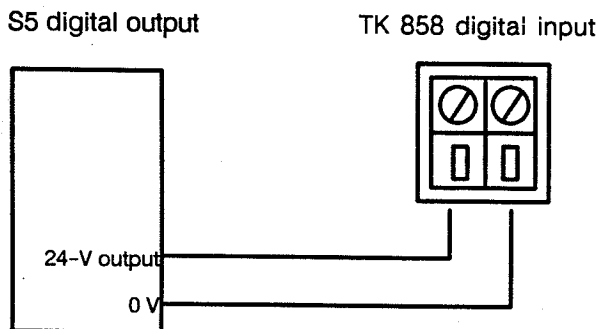
Table 1.3: Modem interface

### 1.4.3 Digital Input (24 V)

The digital input is a 2-way screw terminal. It is used for the hardware-controlled, automatic establishment and disconnection of a telephone connection. If you want to use this function, connect an S5 digital output (24 V) with the screw terminal on the TK 858 using a separate line.

DIP switch S2.6 (on the TK 858) is used to specify whether a rising or falling edge of the digital signal is to be evaluated. The active level must be present for at least 100 msec.

#### Connection Diagram:



## 1.5 Setting Elements and Settings

Use DIP switches S1 and S2 to perform all presettings on the TK 858 required for data transmission. Under normal circumstances, these settings do not need to be changed again after the device is put into operation.



The DIP switch settings are not taken over until power OFF/ON.



Always check the setting of the power voltage before turning the TK 858 on for the first time. (See section 1.5.3).





### 1.5.1 DIP Switch S1

DIP switch S1 is the lefthand switch block on the back of the device. Use this switch to set the modem interface.

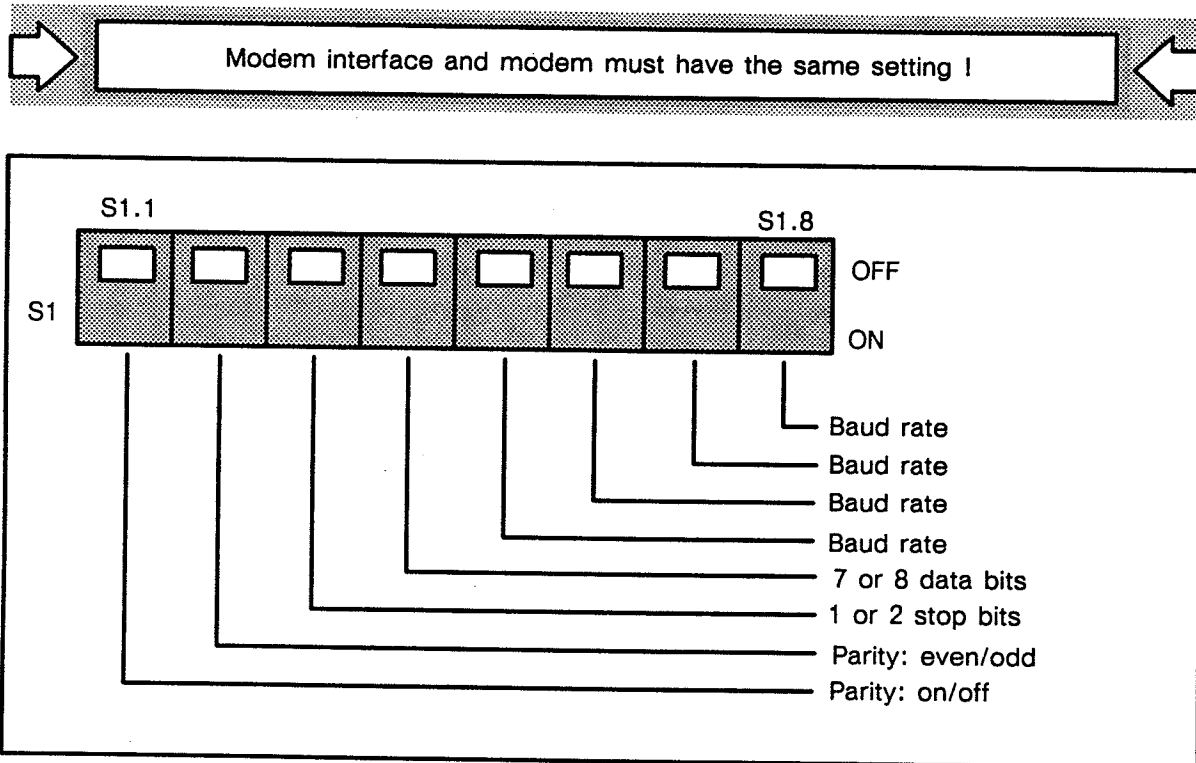


Figure 1.10 Meaning of DIP switches S1.1 to S1.8

#### Explanation of the Switch Settings

##### Switch 1.1:

- ON : Transmission with parity bit (recommended because of transmission reliability)
- OFF : Transmission without parity bit

##### Switch 1.2:

- ON : Even parity
  - OFF : Odd parity
- } Disregard unless switch S1.1 is "ON"

##### Switch 1.3:

- ON : 1 stop bit (recommended because of transmission speed)
- OFF : 2 stop bits

##### Switch 1.4:

- ON : 7 data bits
- OFF : 8 data bits

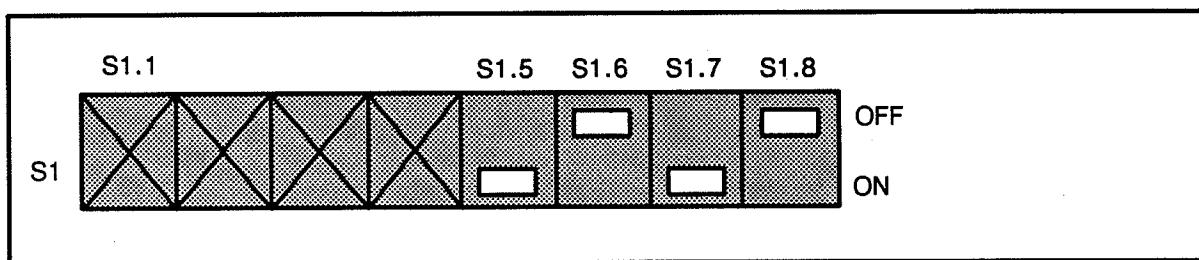
**Switches 1.5 to 1.8:**

Use these switches to set the transmission speed on the modem.

Switch Position				Baud Rate
S1.5	S1.6	S1.7	S1.8	
OFF	OFF	OFF	OFF	Not allocated (50)
ON	OFF	OFF	OFF	110
OFF	ON	OFF	OFF	300
ON	ON	OFF	OFF	600
OFF	OFF	ON	OFF	1200
ON	OFF	ON	OFF	2400
OFF	ON	ON	OFF	4800
ON	ON	ON	OFF	9600
OFF	OFF	OFF	ON	External clock pulse
ON	OFF	OFF	ON	19200 (for computer coupler only)
OFF	ON	OFF	ON	Not allocated
ON	ON	OFF	ON	Not allocated
OFF	OFF	ON	ON	Not allocated
ON	OFF	ON	ON	Not allocated
OFF	ON	ON	ON	Not allocated
ON	ON	ON	ON	Self-test 1)

1) See section 1.6.

Example: setting the transmission speed to 2400 baud rate



## 1.5.2 DIP Switch S2

DIP switch S2 is the righthand switch block on the back of the TK 858.

The settings which you perform here concern the PLC/PU interface (S2.1, S2.4, S2.5), the modem interface (S2.2, S2.3), and TK 858 internal functions (S2.6, S2.7, S2.8).

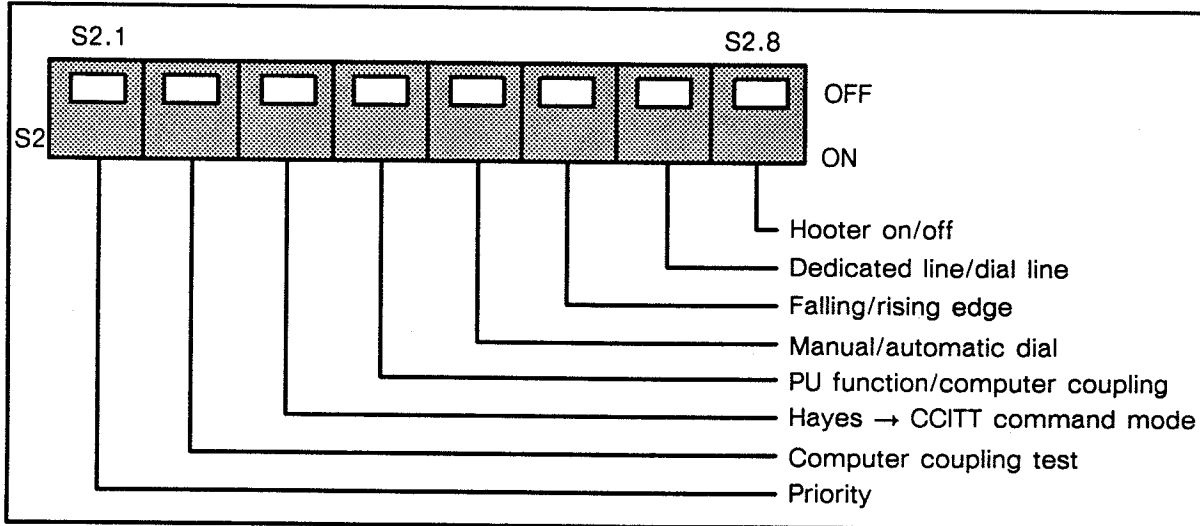


Figure 1.11 Meaning of DIP switches S2.1 to S2.8

### Explanation of the Switch Settings

#### Switch 2.1:

- ON : High priority
- OFF : Low priority

For the computer coupling, use this switch to set the priority which the partner on the other end of the telephone line has.

We recommend the following setting for PU function:

- TK 858 on PLC side = ON
- TK 858 on PU side = OFF

The communicating TK 858s must always have different S2.1 switch settings. This prevents collisions in data traffic on the modem line.

#### Switch 2.2:

- ON : } Must always be in "OFF" position (test switch, reserved for
- OFF : } maintenance and service)

#### Switch 2.3:

- ON : Hayes command mode (not yet realized at present)
- OFF : CCITT command mode

Disregard this switch position since the CCITT procedure is permanently set when delivered.

**Switch 2.4:**

- ON : PU function
- OFF : Computer coupling (RK 512)

Use this switch to set the operating mode. The firmware operates with the assigned protocol as designated by the switch setting.

**Switch 2.5:**

Switch S2.5 is set in combination with switch S2.7. The following applies when switch S2.7 is set to the "OFF" position (dial line):

- ON : Manual dialing
- OFF : Automatic dialing

Combination with S2.7 "ON" (dedicated line) is also possible with computer coupling. Switch S2.5 then has the following meaning:

- ON : Modern is controlled via line 108.
- OFF : Line 108 is permanently on.

**Switch 2.6:**

- ON : Falling edge
- OFF : Rising edge

Specify here whether the establishment of a connection is initiated by a rising or a falling edge of an S5 digital output on the TK 858 digital input.

**Switch 2.7:**

- ON : Dedicated line
- OFF : Dial line

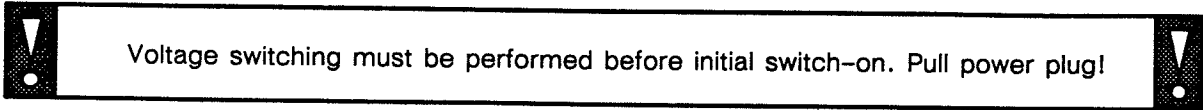
Slide this switch to the "ON" position if you have installed a (telephone) dedicated line for data traffic to the partner.

**Switch 2.8:**

- ON : Hooter off
- OFF : Hooter on (maximum of 60 sec)

The software recognizes the position of the switch and operates the hooter only if the switch is in the "hooter on" position.

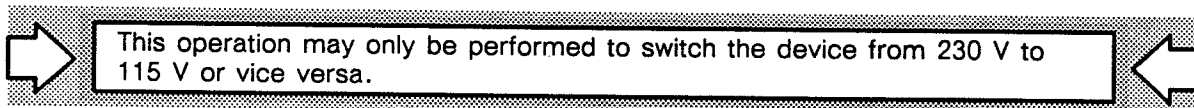
### 1.5.3 Power Voltage Switching and Monitoring



If necessary, you can switch the power voltage with the power filter on the back of the TK 858. A glance at the observation window on the insert (i.e., plug-in unit) of the power filter will show you which voltage is set. If the arrow indicates the desired voltage, do not change anything, and continue with putting the device into operation.

If a voltage switch is necessary, perform the following steps carefully.

- Use a suitable tool (e.g., screwdriver) to lift out the insert (containing voltage selector and fuses) from the small cutout on the left.
- Pull out the insert (figure 1.12).
- Lift the black housing casing slightly (arrow marking) and pull out the green voltage selector (figure 1.13).
- Turn the voltage selector to the desired voltage (this must face forward towards the observation window) and slide the voltage selector back in again until it snaps into place.
- Check: The arrow which is visible through the window must point to the desired voltage which is engraved on the housing.
- Slide insert back into the filter combination. Plug in power plug.



Switching the Power Voltage and Changing Fuses

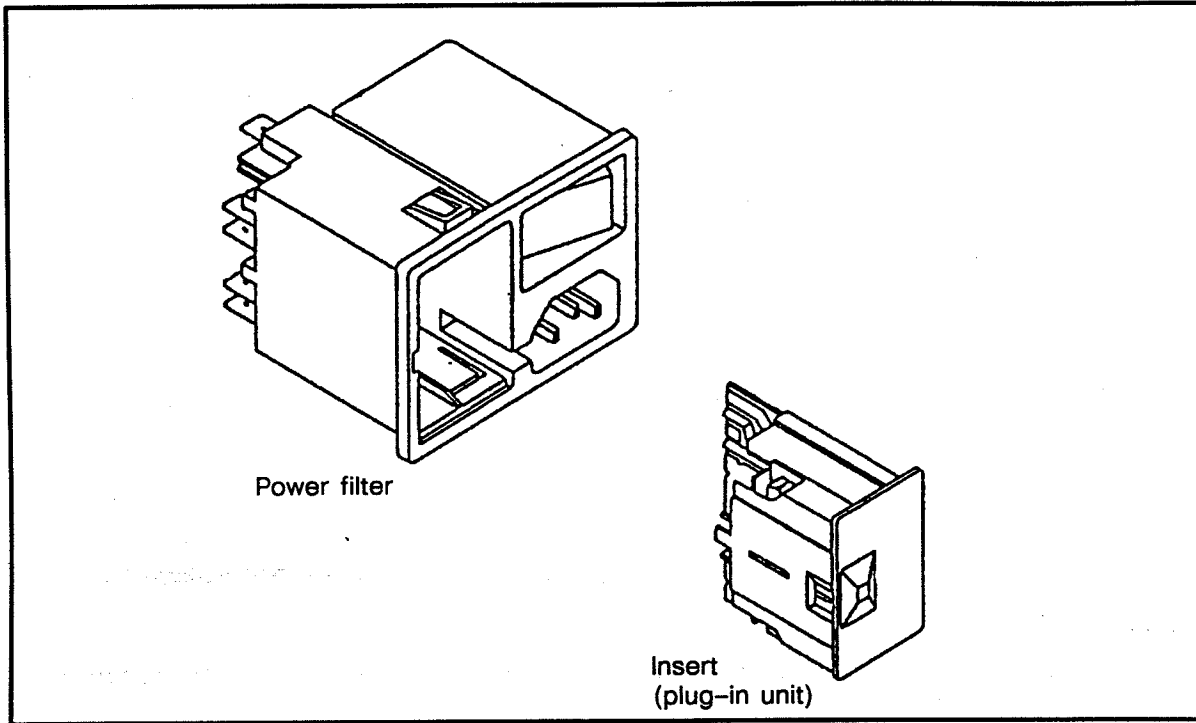


Figure 1.12 Power filter/insert

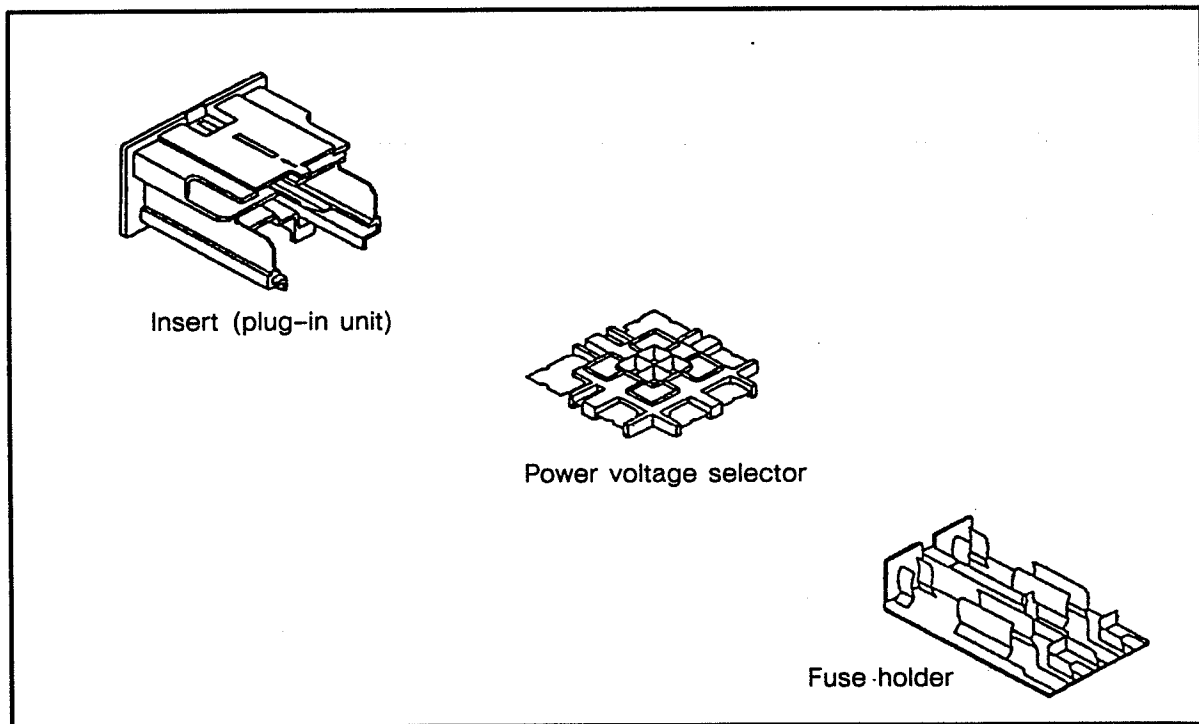


Figure 1.13 Insert/power voltage selector/fuse holder

## 1.6 Self-Test

The self-test allows you to check the functionality of the device at all times. Proceed as follows:

- Turn off the device and disconnect all interface cables. If the device was already in operation, jot down the DIP switch settings.
- Then slide DIP switches S1.5 to S1.8 to the "ON" position and turn on the device.

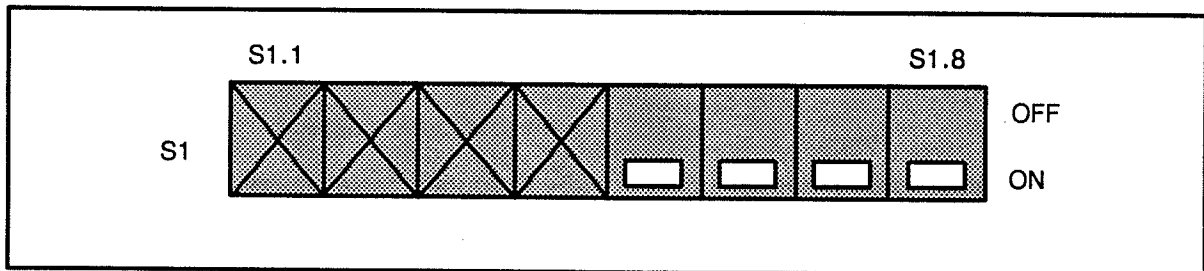


Figure 1.14 Setting of DIP switch S1 for the self-test

- The self-test routine now checks:
  - CPU
  - RAM
  - EPROM
  - USART
- The "data transmission" indicator lights up if the test was successful; the "error" LEDs light up in case of errors (see section 2.5 or 3.7.2).
- If the TK 858 is in good working order, perform the following in the order specified.
  - Turn off the device.
  - Reset DIP switches to their original positions.
  - Connect the cables.
  - Turn on the device again.
- In case of errors, return the TK 858 for repairs.

## 1.7 Guidelines for Putting into Operation

1. Unpack the TK 858 device and check for transportation damage.
2. Check the delivery to see that all parts are included.
3. Check the set power voltage of the TK 858 (change if necessary!).
4. Perform a self-test of the TK 858.
5. Assemble the components necessary for operation. The following is required for each side of the long-distance transmission.

### For PU function:

- 1 programmer/programmable controller
- 1 TK 858 telecommunications device
- 1 modem
- 1 telephone connection
- Several connection cables
- 1 power supply connection

### For computer coupling:

- 1 programmable controller with CP 524/525
- 1 TK 858 telecommunications device
- 1 modem
- 1 telephone connection
- Several connection cables
- 1 power supply connection

6. Prepare the components for connection.
  - Set DIP switches on the TK 858.
  - Parameterize modem.
  - Lay the cables.
7. Connect the components (turned off) at the selected location.
8. Turn on the devices.
9. Build up and break the connection either manually or automatically. Pay particular attention to the operating indicators of the TK 858.
10. Check to see that disturbance-free data traffic is possible in both directions. Observe the error messages if errors do occur.

The DIP switch settings are not taken over until a power OFF/ON is performed.

### Be aware of the following:

The TK 858 telecommunications device can be damaged by improper handling, operating, and/or incorrect circuiting. In addition, personal injury or property damage can be caused on your system if erroneous programs are transmitted and executed. For this reason, always comply with safety regulations. We make the assumption that the TK 858 will only be operated by qualified personnel who are familiar with the contents of these operating instructions.



## 1.8 Maintenance and Care

The TK 858 device requires no maintenance. In case of malfunction, ship the TK 858 to the repair and spare parts center in Fürth.

### 1.8.1 Changing Fuses

- Disconnect power plug of the device.
- Use a suitable tool (e.g., screwdriver) to lift the insert (plug-in unit) containing the voltage selector and the fuse holder out of the small cutout on the left.
- Pull out the insert (figure 1.12).
- A snap-on hook is located in the middle of the back of the insert. Lift this hook and pull out the fuse element (figure 1.13).
- Remove defective fuse
- Install a new fuse (size 5 x 20 mm or 6.35 x 31.8 mm)

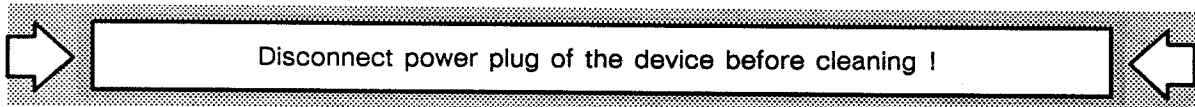
**Caution:** Due to the differences in power supplies, use only the following microfuses:

For 220 V/50 Hz Networks	Medium delay 0.063 A/250 V
In USA	Delayed 0.125 A/110 V

- Snap in fuse element.
- Slide insert back into filter combination.
- Connect power plug.

### 1.8.2 Cleaning

Clean the TK 858 with a damp cloth and a mild household cleaner (no abrasives).



## 1.9 Technical Specifications

### 1.9.1 Power Connection

Configuration: Cold appliance coupler with on/off switch, power filter, voltage selector, and fuse holder for 2 fuses

Supply voltage: 230/115 V +5%/-15%

Frequency range: 48 to 63 Hz

Current consumption: 60 mA at 115 V  
30 mA at 230 V

Delivery status: 230 V  
(115 V when delivered in USA)

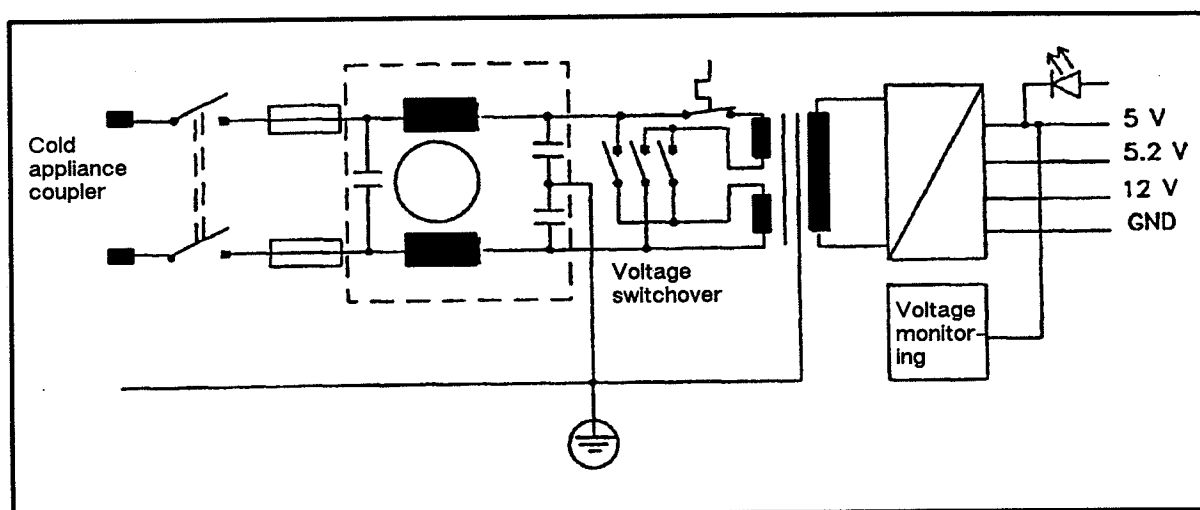


Figure 1.15 Voltage supply (block circuit diagram)

### 1.9.2 Interfaces

Maximum baud rates

TTY interface: 9600 baud  
V.24 interface: 19200 baud

Type of transmission: serial, full duplex

Asynchronous transmission with:  
5 to 8 bit  
1 or 2 stop bits per character  
parity setting

### 1.9.3 Environmental Conditions

Operating temperature:	0° C to 55° C
Storage temperature:	-40° C to 70° C
Humidity:	Class F, no condensation
Vibration stress:	Class 10 in accordance with SN 29010/1
Altitude rating:	S in accordance with DIN 40040
Degree of protection:	IP20
Insulation class as per VDE 0110:	C

### 1.9.4 Mechanical Specifications

Housing:	Shell housing
Material:	Aluminum
Dimensions:	246 x 63 x 200 mm
Color:	Light gray
Weight:	2.2 kg

The device complies with VDE 0805/0806 DIN IEC 435 regulations.

## 1.10 Ordering Data

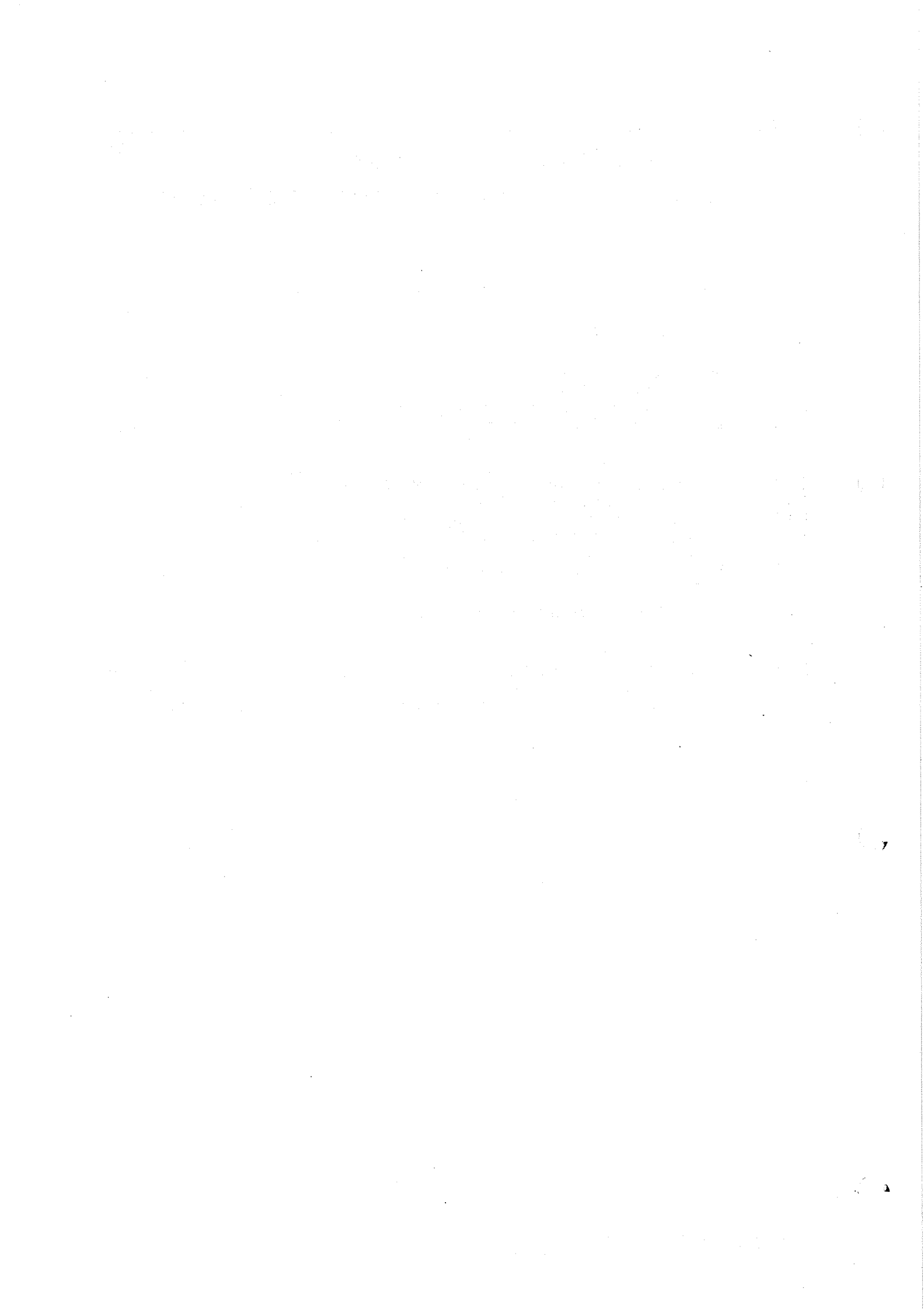
Component	Order Number	Supply Location
TK 858 including power supply cable and TK 858 modem plug-in line	6ES5 858-0AA11 (for 220 V/50 Hz networks) 6ES5 858-0AB11 (for USA and Canada)	WKF
TK 858 Operating Instructions, (German, English, French)	6ES5 998-0CM01	WKF; included with the TK 858

Connection Cable	Length	Order Number	Supply Location
TK 858 – PU 635/675/685	10 m	6ES5 731-4CB00	WKF
	3.2 m	6ES5 731-4BD20	WKF
TK 858 – PU 750/PC 16-20	10 m	6ES5 730-8CB00	WKF
	3.2 m	6ES5 730-8BD20	WKF
TK 858 – PC/CPU		PU-PLC plug-in line	GWK Karlsruhe
TK 858 – CP 524/CP 525 (V.24)	10 m	6ES5 724-0CB00	WKF
	3.2 m	6ES5 724-0BD20	WKF
TK 858 – CP 524/CP 525 (TTY)	10 m	6ES5 724-1CB00	WKF
	3.2 m	6ES5 724-1BD20	WKF

Spare Part	Order Number	Supply Location
Microfuse, 0.063 A/250 V medium delay	417 60 289	WKF; included with the TK 858
Microfuse, 0.125 A/110 V, delayed	417 62 125	WKF;
Power cable, 2.5 m (220 V)	672 40 137	included with the TK 858
Power cable, 2.5 m (110 V)	672 40 006	
TK 858 modem 0.9-m connection cable	672 40 207	WKF; included with the TK 858

## 2 PU Function Via Telephone Network

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## 2.1 Function Description

When operated in "PU function" mode, the TK 858 is used to connect programmable controllers (PLCs), communication processors (CPs), or intelligent I/O modules (IPs) with a programmer (PU) for remote diagnosis over the public telephone network.

Transmission is performed with a modem. The TK 858 device performs all technical functions offered by the existing teleservice TS 758 device.

For transmission, the data is divided into blocks which are enclosed in control characters and whose lengths are based on the frequency of transmission errors on the modem side. Transmission is protected by a special acknowledgement procedure.

The TK 858 is connected to the programmable controller like a PU, and to the programmer like a PLC (except that the latter requires a special cable). Standard transmission rate is 9600 baud (4800 baud for PU 685).

See section 2.3.3 for operation with PU 750.

Each TK 858 is connected by a V.24 interface to the modem.

**!** Remember that you will usually not be able to see the programmable controller during remote programming. Since you can perform all programming functions, make absolutely sure that the system meets all safety-related regulations to prevent damage to machines or even personal injury in case you make an operating error. **!**

## 2.2 Connection Diagram

The following figure shows the setup of a transmission line for PU function with modems via the public telephone network.

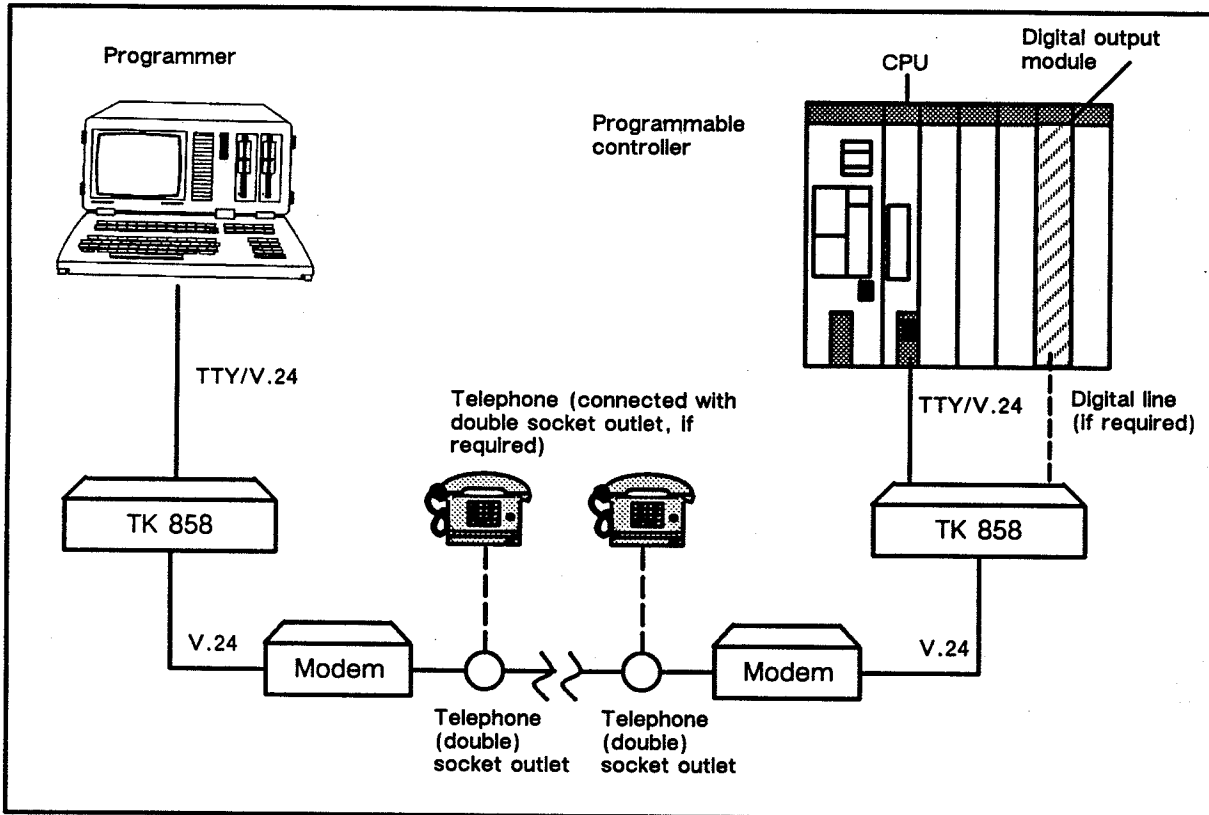


Figure 2.1 PU function via telephone network

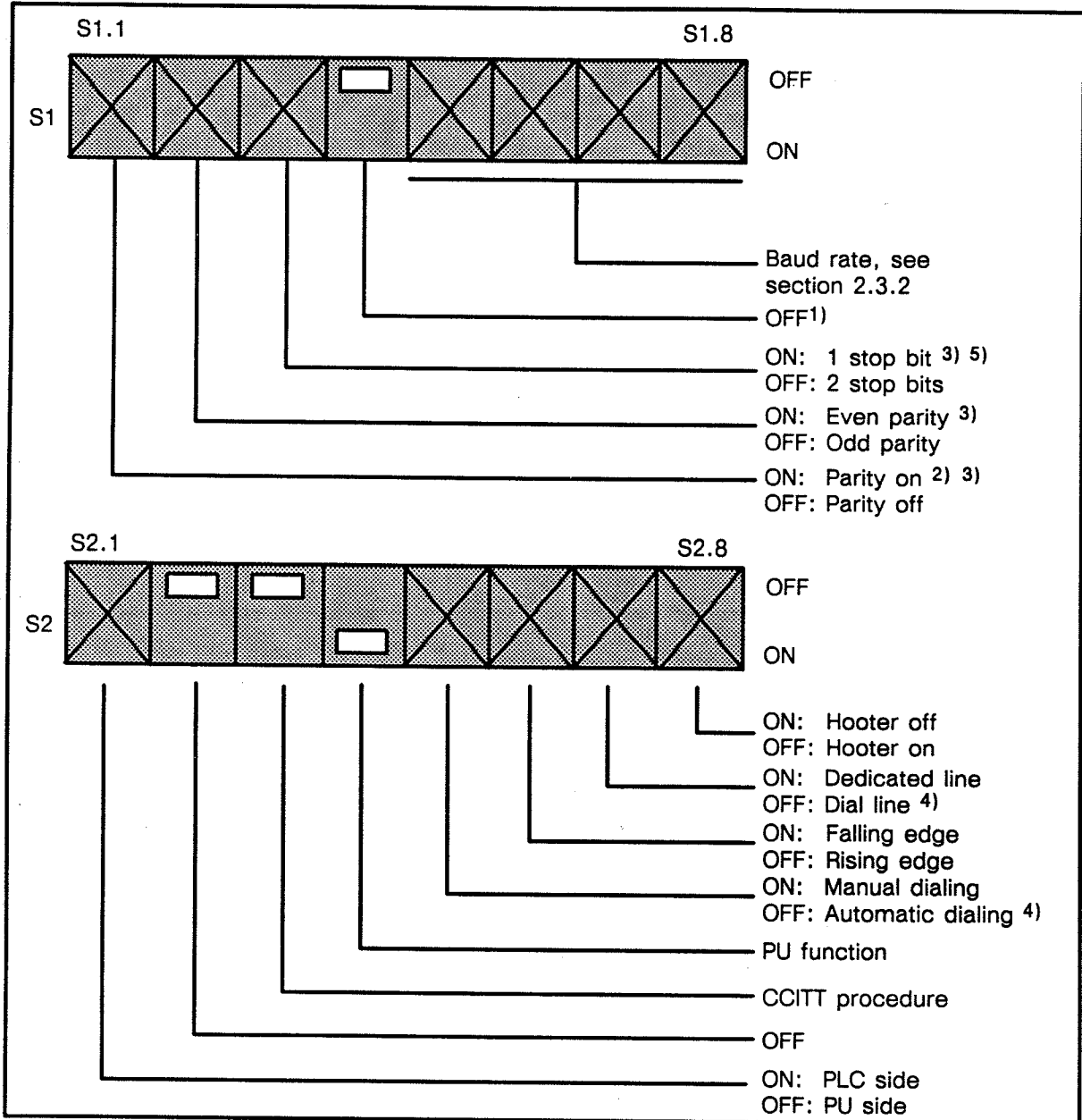
You will require the following when using modems:

- 1 programmable controller
- 1 programmer
- 2 TK 858 devices
- 2 modems (e.g., 2425B DX)
- 2 telephone double socket outlets (if desired)
- 1 cable, TK 858 to PLC
- 1 cable, TK 858 to PU
- 2 cables, TK 858 to modem
- Digital line, TK 858 to digital output module (if desired)



## 2.3 Settings on the TK 858

### 2.3.1 Setting the DIP Switches



- 1) A fixed data length of 8 bits is used.
- 2) Recommended setting (transmission reliability)
- 3) S1.1 to S1.3 "ON": applies to communication with TS 758H teleservice devices
- 4) S2.5 and S2.7 "OFF": manual establishment of connection not possible
- 5) Recommended setting (transmission rate)

Figure 2.2 DIP switches S1 and S2

### 2.3.2 Setting the Transmission Rate for the Modem

Set the baud rate on DIP switch S1 (on the back of the housing) as shown in the below table.

Switch Setting				Baud Rate	Transmission Procedure
S1.5	S1.6	S1.7	S1.8		
OFF	OFF	OFF	OFF	Not allocated (50)	
ON	OFF	OFF	OFF	110	
OFF	ON	OFF	OFF	300	
ON	ON	OFF	OFF	600	
OFF	OFF	ON	OFF	1200	V.22
ON	OFF	ON	OFF	2400	V.22bis <sup>1)</sup>
OFF	ON	ON	OFF	4800	
ON	ON	ON	OFF	9600	
OFF	OFF	OFF	ON	External clock pulse	
ON	OFF	OFF	ON	Not allocated	
OFF	ON	OFF	ON	Not allocated	
ON	ON	OFF	ON	Not allocated	
OFF	OFF	ON	ON	Not allocated	
ON	OFF	ON	ON	Not allocated	
OFF	ON	ON	ON	Not allocated	
ON	ON	ON	ON	Self-test <sup>2)</sup>	


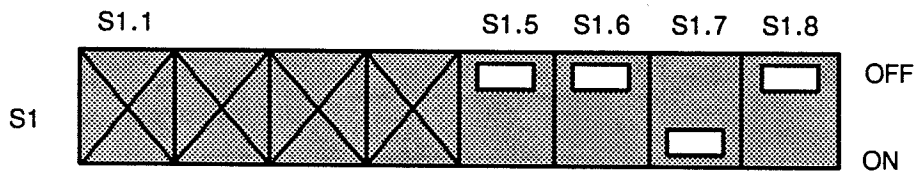
 Standard setting for the connection of a modem

Table 2.1 Transmission speed on the modem side

Example: 1200 baud



1) If, during transmission procedure V.22 bis, for example, with modem 2425B DX, the transmission speed is to be 1200 bd instead of 2400 bd, then set

- 1200 bd on the modem
- 2400 bd on the TK 858

(The modem switches the TK 858 over automatically.)  
The same applies to modems which are to be operated with 4800 bd or 2400 bd.

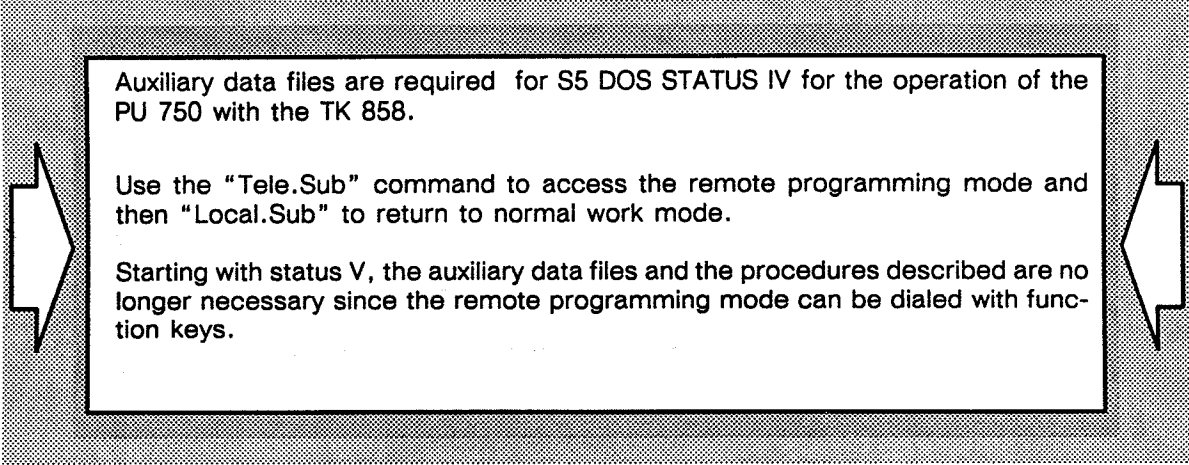
2) See section 1.6.

### 2.3.3 Setting the Transmission Rate between PU and TK 858

The transmission rate between TK 858 and PU is permanently set at the factory in the connection cable.

For PU 750/PC 16–200: Pins 3,4 and 17 are jumpered with 0 V (pin 2).

For PU 635/675/685: . Pins 3 and 17 are jumpered with 0 V (pin 2).  
Pin 4 is open (see also sections 1.4.1 and 2.7.2).



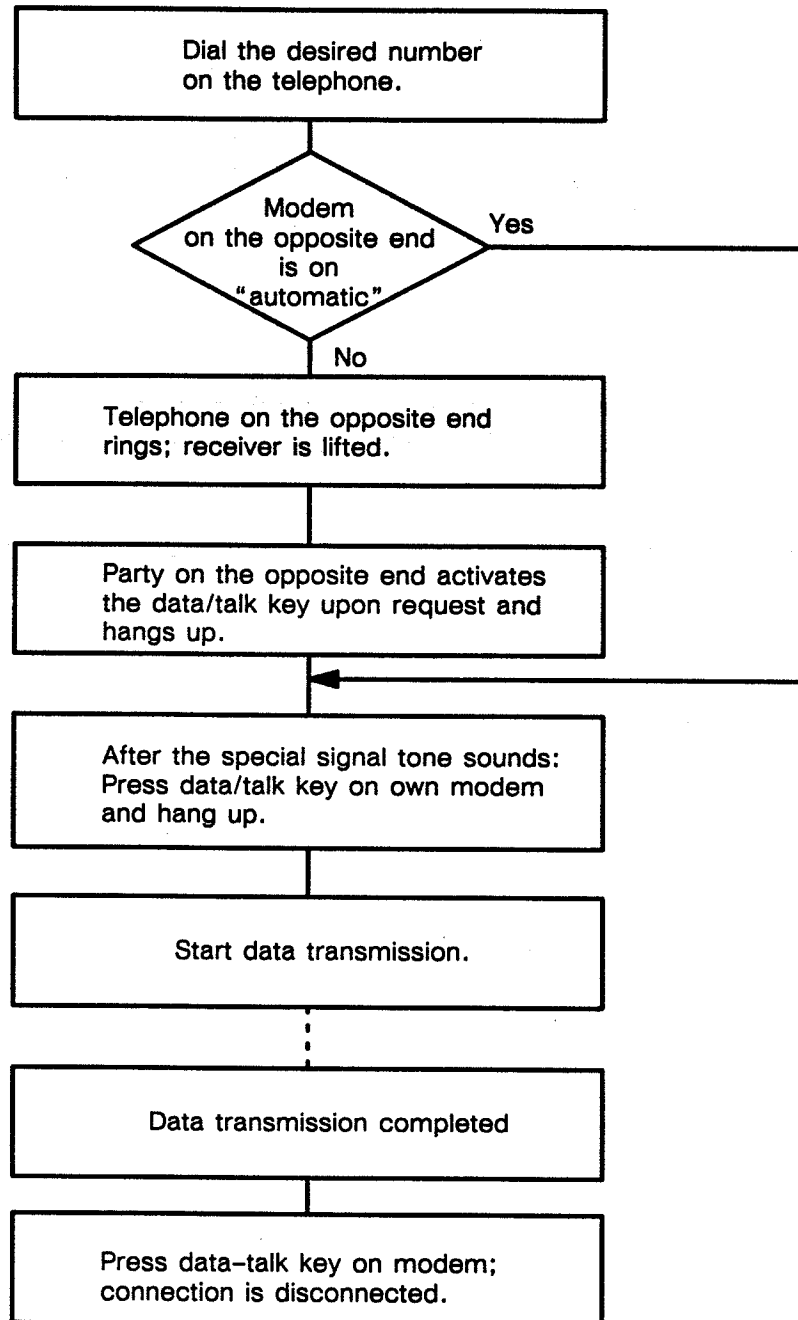
Auxiliary data files are required for S5 DOS STATUS IV for the operation of the PU 750 with the TK 858.

Use the "Tele.Sub" command to access the remote programming mode and then "Local.Sub" to return to normal work mode.

Starting with status V, the auxiliary data files and the procedures described are no longer necessary since the remote programming mode can be dialed with function keys.

**2.4 Operation with Modem**

**2.4.1 Manual Establishment and Disconnection of a Connection**



⚠ Manual establishment of a connection is not possible when DIP switches S2.5 and S2.7 are in "OFF" position (i.e., dial line and automatic dial). ⚠

## 2.4.2 Automatic Establishment of a Connection

The "digital input" connection (screw terminal) is located on the back of the device. Connect the 24-V output of an S5 digital output card here. Depending on the parameterization (see sections 1.4.3 and 1.5.2) of the TK 858, a rising or falling edge on this S5 output causes the modem to be activated and a previously stored telephone number is dialed.

If the connection is not made, the number is redialed automatically every 60 seconds for a maximum of two times.

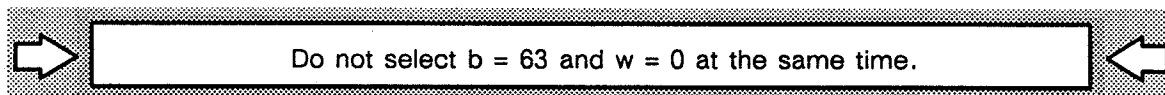
The connection must be disconnected manually.

## 2.4.3 Automatic Dialing for Signal on the Digital Input

As an alternative to the method described in section 2.4.2 in which the telephone number is stored in the modem, the telephone number to be dialed can also be stored in the PLC. With the exception of making two entries in data blocks of the PLC and setting "mode 108.2" on Siemens modems 2425B DX and 2425M DX (see section 6.3 and item 11 of the setting list in section 6.4), setting of these modems is the same as that for automatic dialing of the telephone number stored in the modem. See section 6.5 for the setting of the DATALINK V.32M modem.

### How to Proceed

- Starting at any data word DW  $w$  ( $w \leq 254$ ), store the telephone number to be dialed (including a prefix and suffix) in any DB with the number  $b$  ( $b \leq 255$ ).



- The prefix (in KS or C format, "TEL.") starts in data word  $w$ . The telephone number follows in the same format (up to 19 characters). In addition to the digits "0" to "9", one or more of the following special characters are usually used.

":"	Dial tone recognition
"<"	Dial pause, 1 sec
"="	Dial pause, 3 sec
"P"	Switchover to pulse dial procedure (only for DATALINK V.32M modems and only as the 1st call character)
"T"	Switchover to multi-frequency dial procedure (only for DATALINK V.32M modems (default setting) and only as the 1st call character)

See section 3.6.1 for the use of special characters ":", "<" and "=". The telephone number is then followed by the suffix (".END" in written format).

#### Example:

To dial the telephone number 0911/30894000 from an extension line (i.e., "0" must be dialed for an outside line), enter the character string "TEL.=0:091130894000.END" in KS format starting at data word DW  $w$ .

- Then enter a reference to data word DW  $w$  from data block  $b$ , in data word DW 0 of DB 63 by writing the value from  $b$  in the lefthand byte of DW 0 and the value of  $w$  in the righthand byte of DW 0.

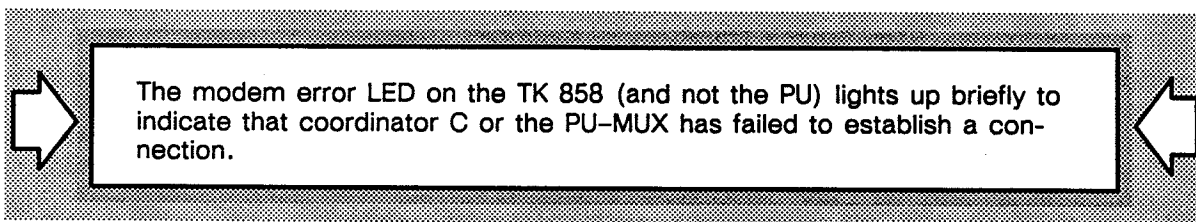
**Example:**

You have stored the telephone number including prefix and suffix in DB 54 starting at DW 8. Then enter the value 54.8 in KY format in DW 0 of DB 63.

The TK 858 assumes that the modem is set to automatic dialing of the telephone number stored in the modem and attempts to activate the modem as described in section 2.4.2, if one of the following occurs:

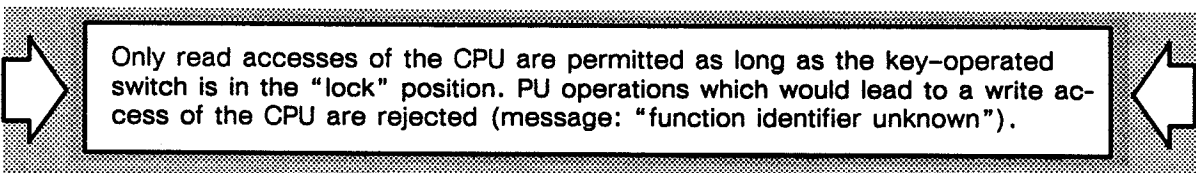
- Read access to DB 63 or the telephone number data block is not successful due to a malfunction in communication between TK 858 and PLC.
- One of the two data blocks does not exist or is too short.
- The format (described above) of the stored telephone number is not adhered to.

**2.4.4 Working with Coordinator C or PU-MUX**



**2.4.5 Write Protection Function**

**PLC side:**



The key-operated switch on the PLC must be in the "open" position during a circuit selection via the bus selection utility routine. The same applies to the programming of communication processors with COM packages.

**PU side:**

The key-operated switch must always be in the "open" position!

**2.4.6 Maximum Data Quantities Transmittable**

The maximum amount of data which can be transmitted per block is restricted on the PU 685 to the following maximum data rates:

- 2.4 kbytes at 300 bd
- 9.6 kbytes at 1200 bd
- 19.2 kbytes at 2400 bd

Similar limits apply to the other S5-DOS PUs.

Exception: The PU 675 with version STUDOS does not have character delay time monitoring on the PU side. In theory, this makes it possible to transmit an unlimited amount of data.

## 2.5 Faults – Their Causes and Remedy

Indicated State of Oper. Indicator on TK 858 (PU side)					Possible Cause	Remedy
Power On	Fault		DCD	Data Transmission		
	PLC PU/	Mo-dem				
Off	Off	Off	Off	Off	Power cable not connected Defective fuse No voltage in the power outlet	Connect power cable. Replace fuse.
On	On	Off	Off	Off	PU cable not connected PU not turned on PU not set to online	Connect PU cable and/ or check. Turn on PU. Set PU to online.
On	Off	On	Off	Off	Modem not turned on Modem cable not connected Modem of other party not connected Modem cable of other party not connected TK 858 of other party not turned on PLC cable of other party not connected PLC not turned on	Turn on modem Connect modem cable and/ or check. Have modem turned on. Have modem cable connected and/or checked. Have TK 858 turned on. Have PLC cable connected and/or checked. Have PLC turned on.
On	Off	On or Off	Off	Off	Carrier (DCD) missing	Check connection to partner modem.
					In test mode (S1.5 to 11.8 on back of device in "ON" position)	
On	Off	Off	Off	On	Device okay	
On	On	On	Off	Off	Device defective	Send device for repairs.

If the function "status block" is used for an instruction which is not being processed it may occur that the PU 685 does not accept input for approx. 2 minutes.

The modem error LED can also light up for the following reason:  
Interface/error on the PU/PLC interface of the TK 858 partner device.

## 2.6 Connection Cables

### 2.6.1 TK 858 – PLC Connection Cable

To connect the programmable controller (PLC) to the TK 858, use the standard cable (see section 1.10 for the order number) which is also used to connect the programmable controller (PLC) with the programmer (PU). Connect the cable to the PU/PLC interface of the TK 858.

### 2.6.2 TK 858 – PU Connection Cable

Use the PU/PLC interface to connect the programmer to the TK 858. The appropriate cable (varies for different PUs) is available in two lengths (see section 1.10).

See figure 2.3 for pin assignment of the cable for PU 750/PC16–20.

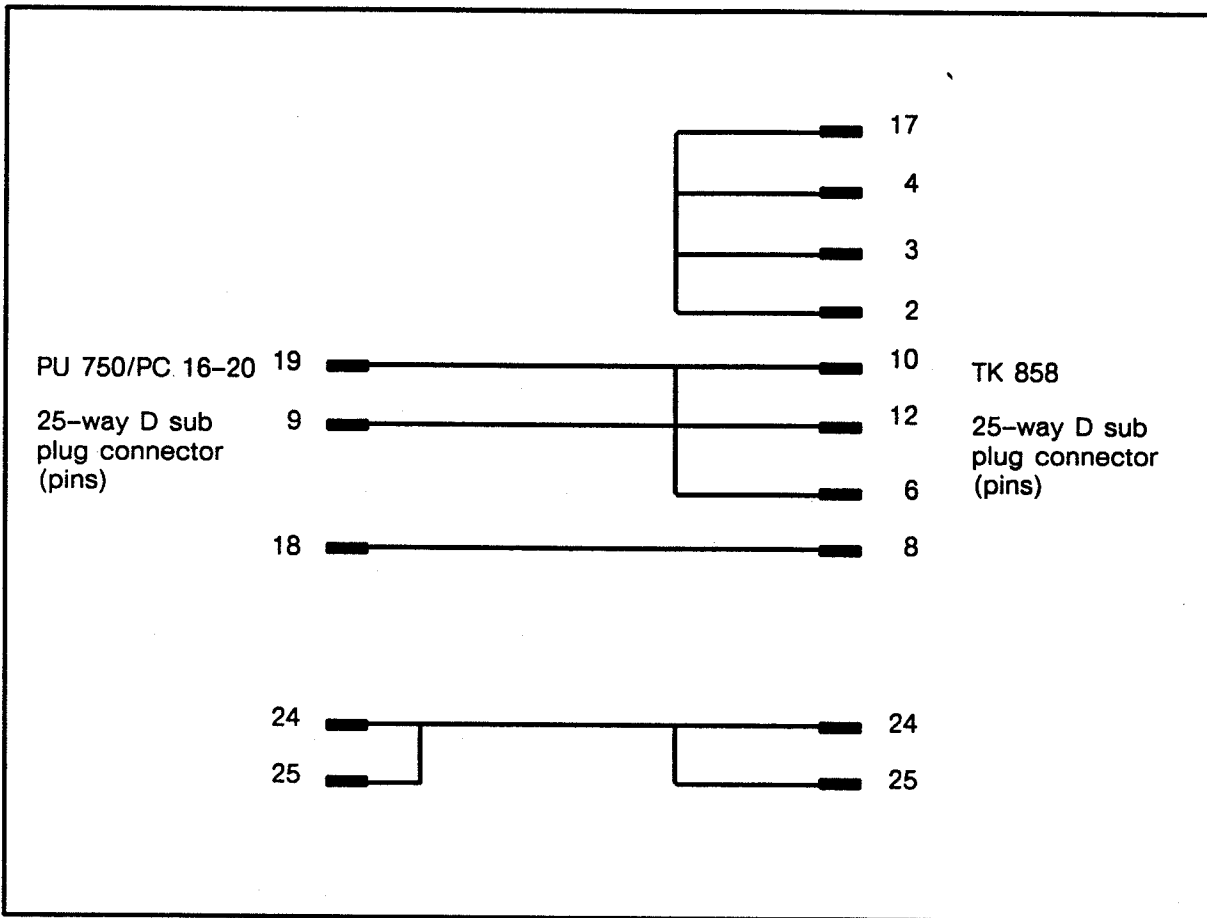


Figure 2.3 Connection cable, TK 858 – PU 750/PC 16-20



Programmers PU 635, PU 675, and PU 685 are connected to the TK 858 with the following cable (figure 2.4).

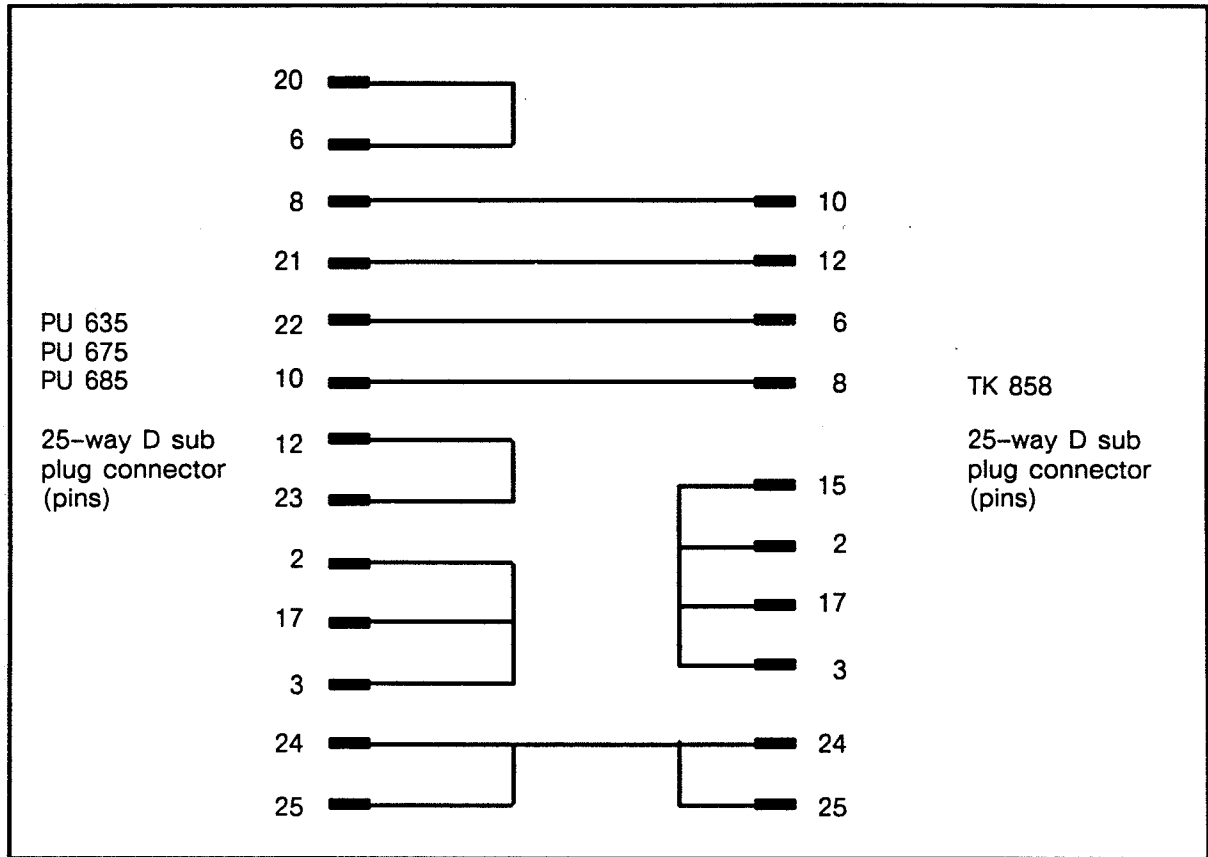



Figure 2.4 Connection cable, TK 858 - PU 635/PU 675/PU 685

### 2.6.3 TK 858 - Modem Connection Cable

This data cable is included with the TK 858. It is also available as a spare part (see sect.1.10). The cable is plugged into the connector on the TK 858 marked with the symbols .

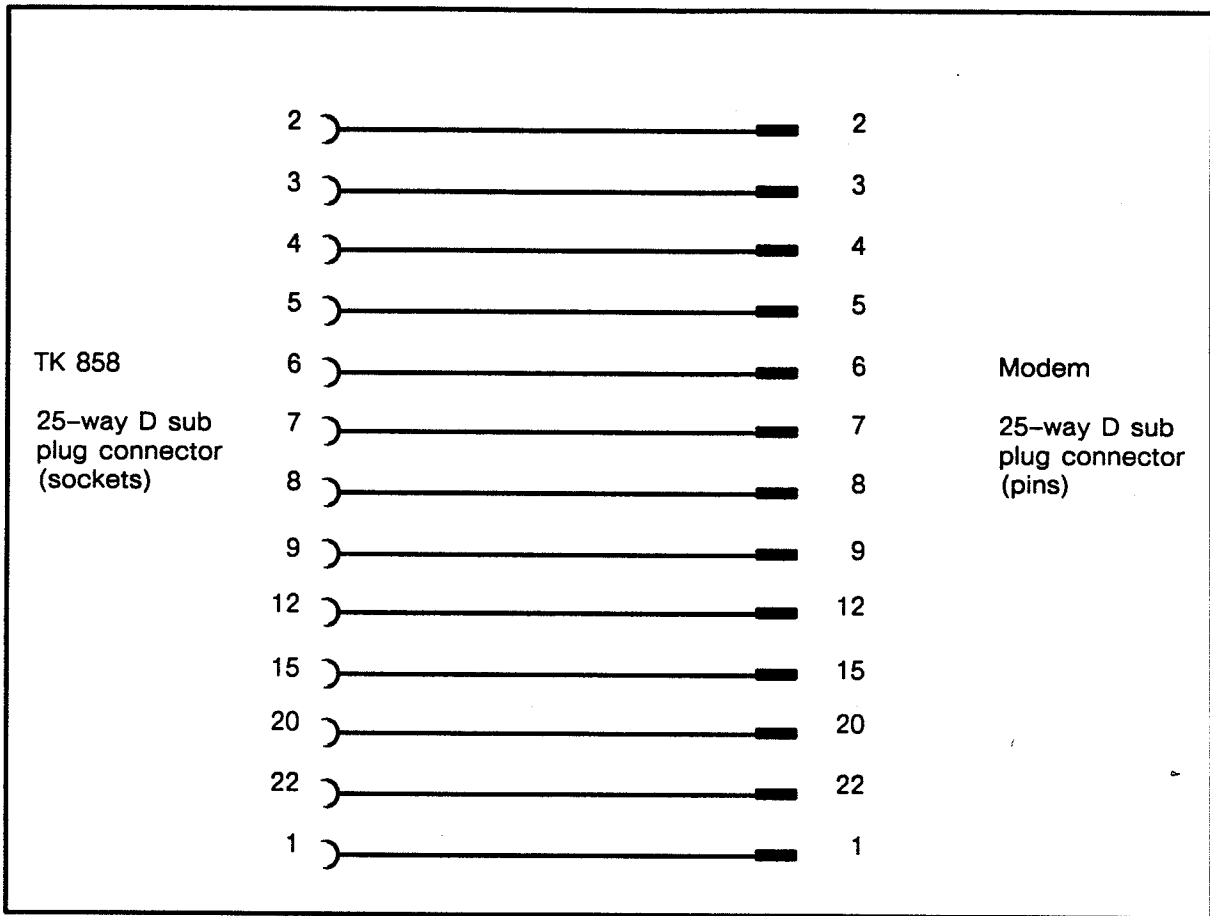


Figure 2.5 Connection cable, TK 858-modem

## 3 Computer Link with the Telephone Network

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### 3.1 Function Description

The TK 858 is used here for long-distance data transmission between two programmable controllers of the SIMATIC S5 system.

The following programmable controllers can be used (with communication processor CP 524 or CP 525):

- PLC S5-115U (CPU 941 to CPU 944)
- PLC S5-135U (CPU 922/CPU 928)
- PLC S5-150U
- PLC S5-155 (CPU 946/947)

The TK 858 is connected to the CP module at the PLC end.

Data exchange is performed via the standard computer link, logical computer link protocol RK 512 (telegram level). Procedure 3964R (procedure level) is subordinate to the computer link. See volume 1, index 7 of COM 525 Manual for more details.

The TK 858 uses a modem to establish the computer link via telephone networks in accordance with CCITT recommendation V.22bis. With the modem the TK 858 can be used for telephone dial lines or 2-wire, dedicated telephone lines.

Automatic dial and automatic call answering are performed in accordance with CCITT recommendation V.25bis.

Either a TTY or a V.24 interface is used to connect the TK 758 with the PLC.

A V.24 interface is used for the connection with the modem.

Only a TK 858 can be used for a PLC-PLC link via the public networks of the German Bundespost since only the TK 858 (and not the S5 programmable controllers) has been granted the required ZZF approval number.

### 3.2 Connection Plan

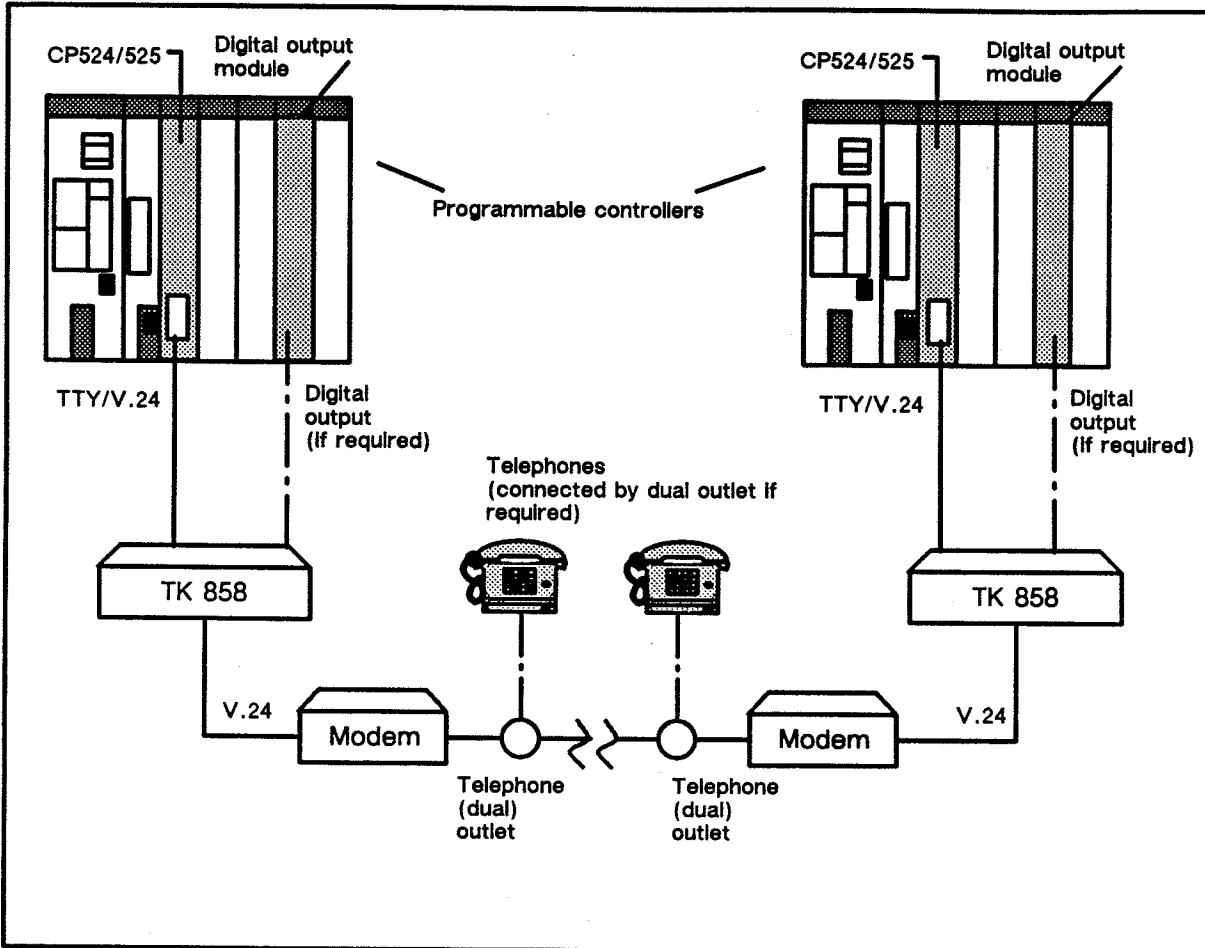


Figure 3.1 Computer link via telephone network

You will require the following for the connection of two S5 programmable controllers:

- 2 PLCs configured with CP524/525
- 2 DQ modules, V.24 (if desired)
- 2 TK 858 telecommunications devices
- 2 modems (e.g., 2425B DX or 2425M DX)
- 2 telephone dual outlets (if desired)
- 2 cables (PLC to TK 858)
- 2 cables (TK 858 to modem)
- Digital line for the TK 858 digital output module (if desired)

### 3.3 Settings on the TK 858

#### 3.3.1 DIP Switch Settings

Use DIP switch S1 to set the interface to the modem.

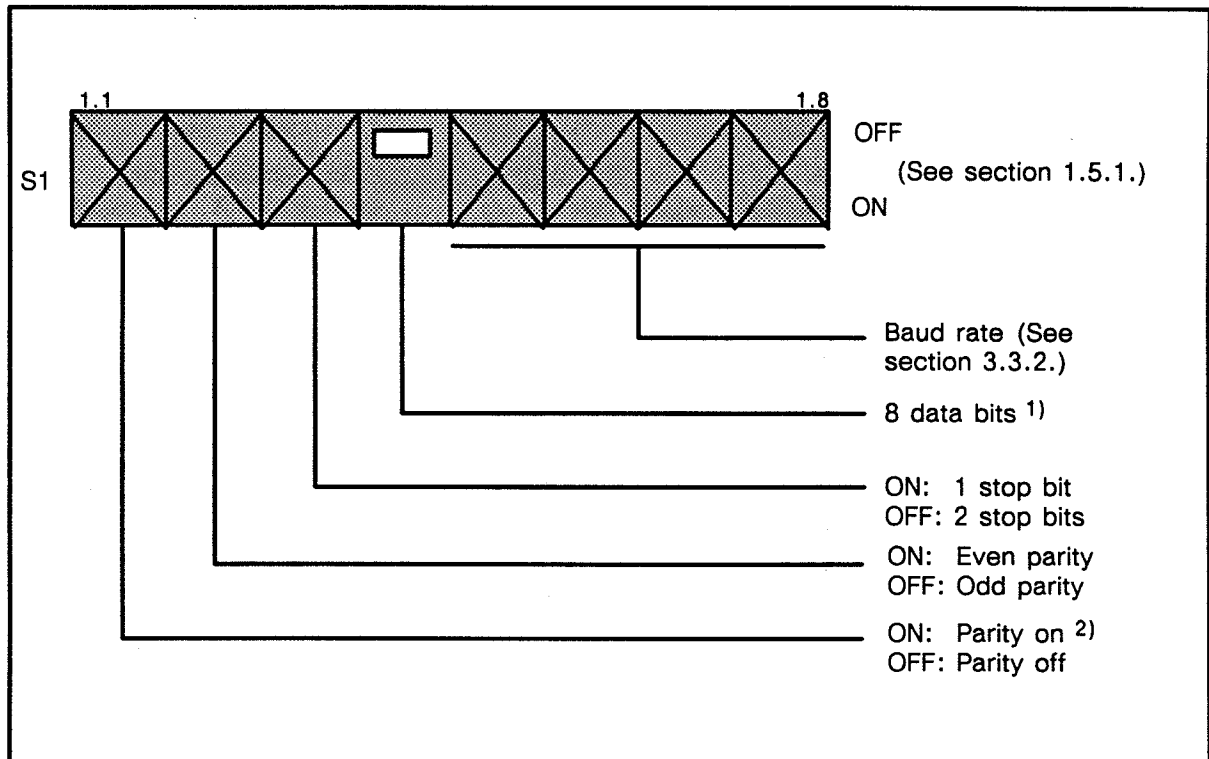


Figure 3.2: Setting of DIP switch S1

- 1) A fixed data length of 8 bits is used.
- 2) Recommended setting (transmission reliability)

Use DIP switch S2 to perform the TK 858 operating settings.

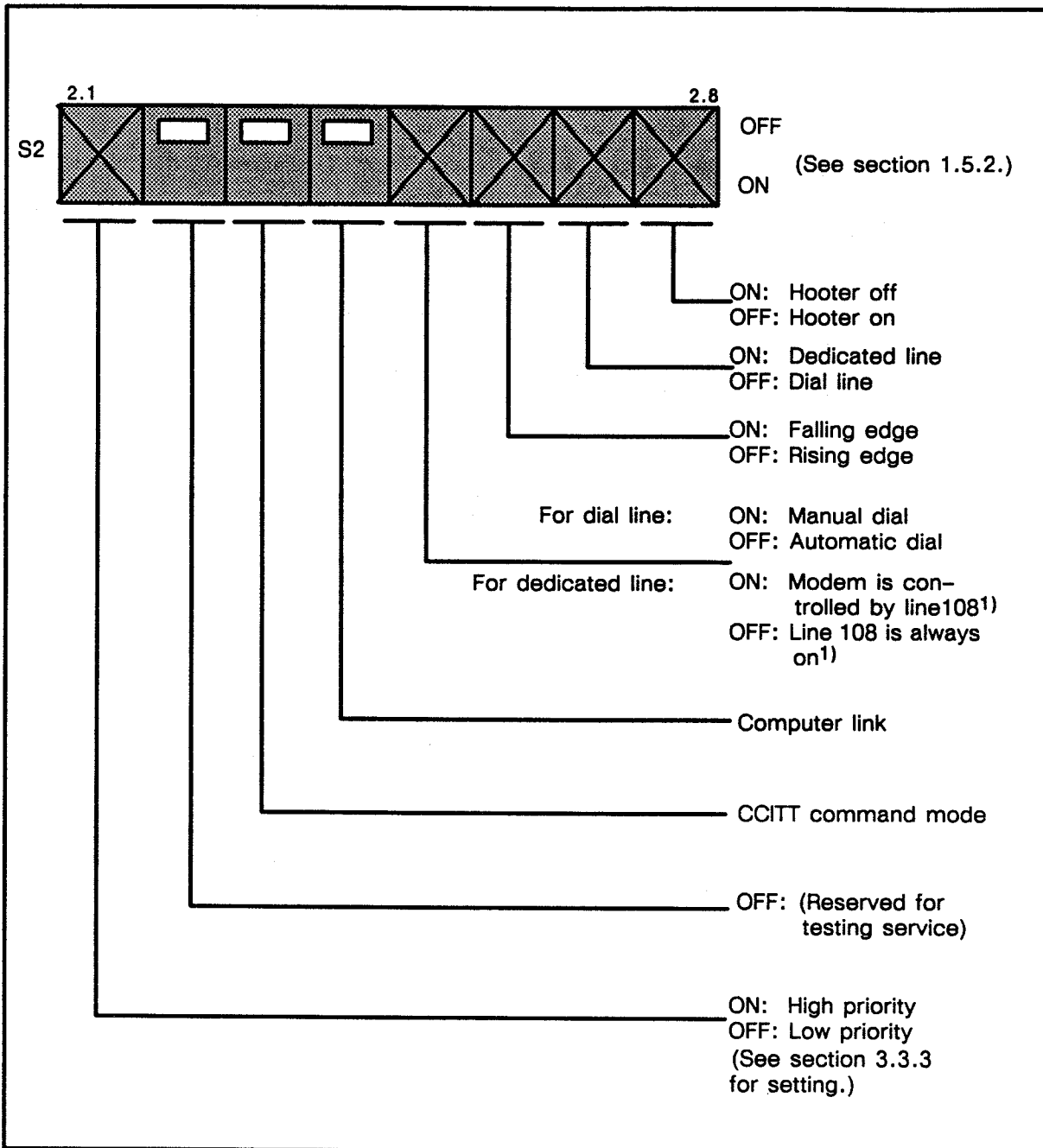


Figure 3.3: Setting of DIP switch S2


1) For dedicated line modems which cannot be controlled by line 108: S2.7 ON and S2.5 OFF




### 3.3.2 Setting of the Transmission Speed on the Modem Side

As shown in the table, use DIP switch S1 (on the back of the housing) to set the same baud rate as on the modem.

Switch Setting				Baud Rate	Transmission Procedure
S1.5	S1.6	S1.7	S1.8		
OFF	OFF	OFF	OFF	Not assigned (50)	
ON	OFF	OFF	OFF	110	
OFF	ON	OFF	OFF	300	
ON	ON	OFF	OFF	600	
OFF	OFF	ON	OFF	1200	V.22
ON	OFF	ON	OFF	2400	V.22bis
OFF	ON	ON	OFF	4800	
ON	ON	ON	OFF	9600	
OFF	OFF	OFF	ON	External clock pulse	
ON	OFF	OFF	ON	19200	
OFF	ON	OFF	ON	Not assigned	
ON	ON	OFF	ON	Not assigned	
OFF	OFF	ON	ON	Not assigned	
ON	OFF	ON	ON	Not assigned	
OFF	ON	ON	ON	Not assigned	
ON	ON	ON	ON	Automatic test 1)	

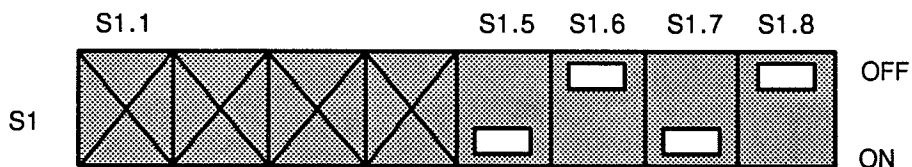
 Standard settings for the connection of a modem

 Do not use for computer link RK 512

1) See section 1.6.

Table 3.1: Transmission speeds on the modem side

Example: 2400 baud



### 3.3.3 Setting of the Priority

For the computer link with RK 512 between two programmable controllers of the S5 SIMATIC system, one device is assigned a high priority and the other a low priority (see index 7, volume 1 of COM 525 Manual).

Based on the assignment of the priorities, that priority is set on the TK 858 which the partner device on the other side of the telephone line has.

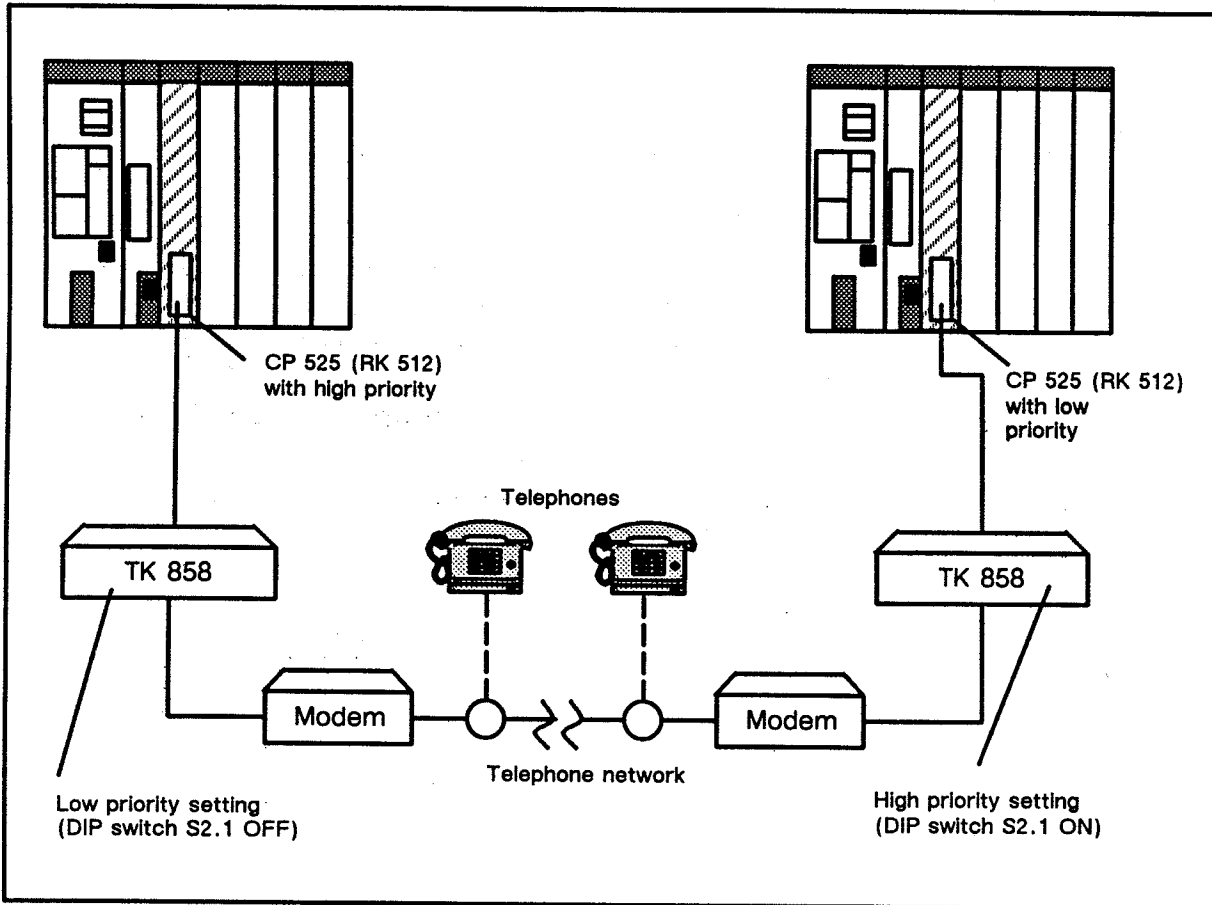


Figure 3.4: Example of priority setting on the TK 858

### 3.3.4 Setting of the Transmission Speed on the PLC Side

The plug connector of the connection cable at the TK end is used to set the transmission speed between TK 858 and PLC (see table 3.2).

A baud rate of 9600 is set at the factory (pins 3,4, and 17 are jumpered against 0 V). No changes are required here if your programmable controllers also transmit at 9600 baud.

Baud Rate in Bit/Sec	Connection Cable		TK 858-PLC		(Plug Connector Shell)	
	Pin 3	K3	Pin 4	K2	Pin 17	K1
300	Jumpered to 0 V		Jumpered to 0 V		Open	
600	Open		Jumpered to 0 V		Open	
1200	Jumpered to 0 V		Open		Open	
2400	Open		Jumpered to 0 V		Jumpered to 0 V	
4800	Jumpered to 0 V		Open		Jumpered to 0 V	
9600	Jumpered to 0 V		Jumpered to 0 V		Jumpered to 0 V	
19200	Open		Open		Jumpered to 0 V	


 Do not use with computer link RK 512.

Table 3.2: Transmission speeds on the PLC side

### 3.3.5 Possible System Configurations

As indicated in figure 3.5, various baud rates can be set (at the PLC end). Under normal circumstances, the setting of identical transmission speeds is recommended.

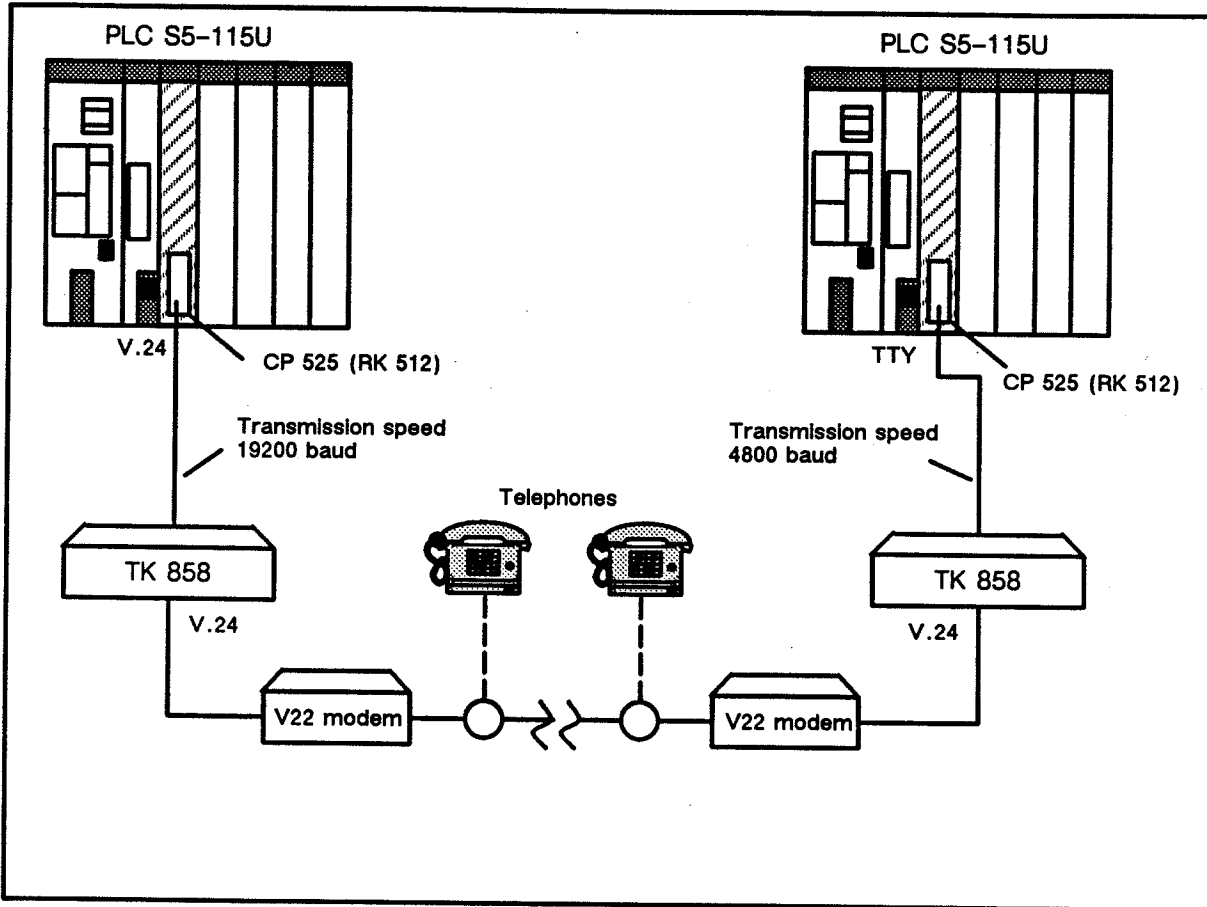
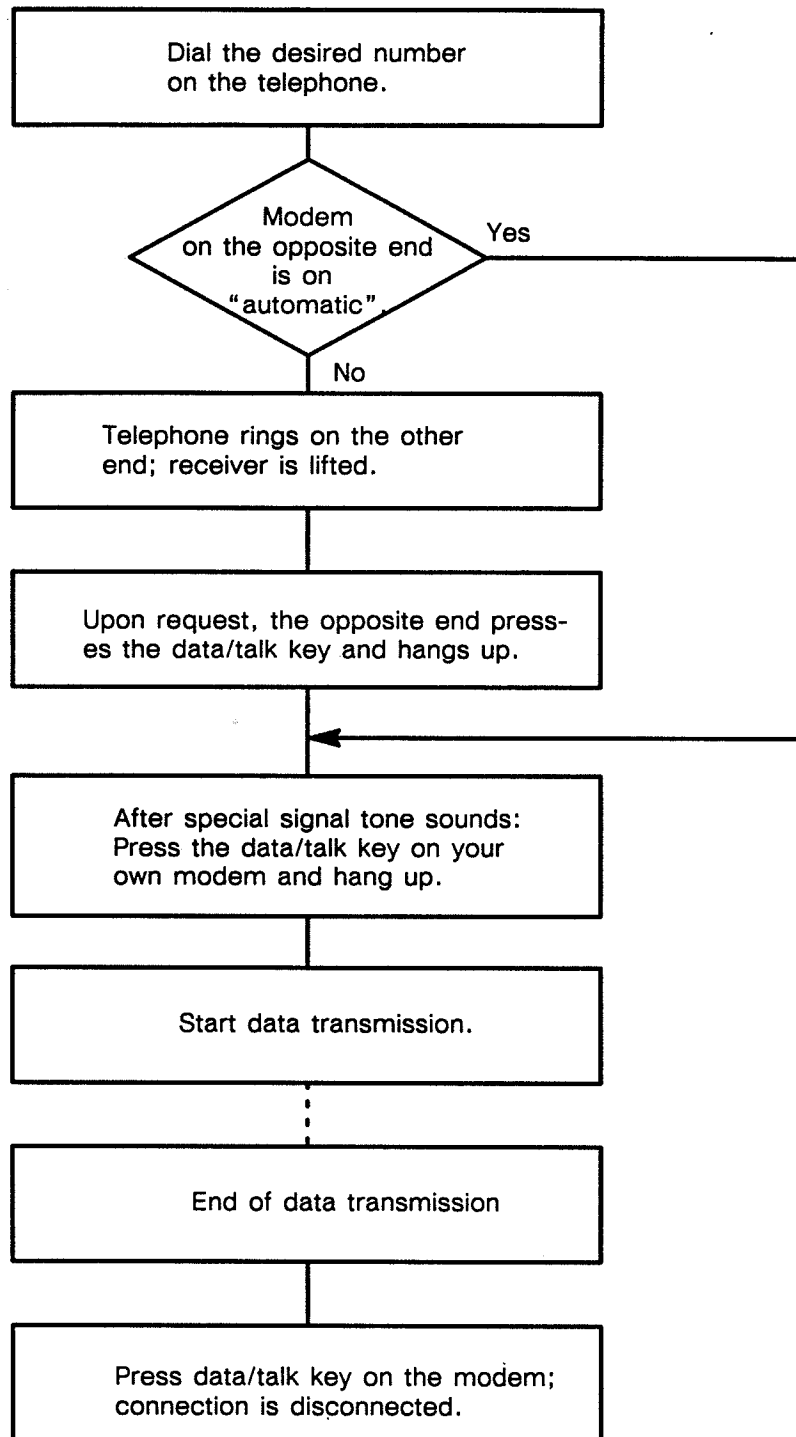


Figure 3.5: Example of a possible system configuration with TK 858

## 3.4 Operation

### 3.4.1 Manual Establishment and Disconnection of the Connection



### 3.4.2 Automatic Establishment and Disconnection of the Connection

#### Hardware-controlled via separate 24-V line

The connection "digital input" (screw terminal) is located on the back of the device. Connect the 24-V output of an S5 digital output card here. Depending on the parameterization of the TK 858 (see sections 1.4.3 and 1.5.2), a rising or falling edge at this S5 output causes the modem to be activated, and a previously stored telephone number is dialed.

The connection remains established as long as the level is maintained. The connection is disconnected as soon as a change in the falling or rising edge occurs.

#### Software-controlled via special telegram:

The establishment and disconnection of a connection can be initiated with a special telegram (section 3.6). The desired telephone number is transferred to the special telegram during establishment of the connection.

### 3.4.3 Write Protection Function

The write telegrams on the modem interface are not forwarded to the PLC when the key-operated switch on the front panel is in "lock" position. This prevents unauthorized writing. Error message 04H is entered in the response telegram and sent back to the sending PLC (see section 3.6.3). Read telegrams are processed.

### 3.5 Data Transmission with Computer Link RK 512

Data transmission is performed via the standard computer link (i.e., logical computer link protocol RK 512 (telegram level)). Procedure 3964R (procedure level) is subordinate to the computer link.

The following contains a description of portions of the primary telegram setup.

See index 7, volume 1 of COM 525 Manual for additional information.

#### 3.5.1 Setup and Contents of a Command Telegram (SEND Telegram/FETCH-Telegram)

A SEND telegram consists of a telegram header and data while a FETCH telegram only consists of a telegram header.

The telegram header consists of **10 bytes**, and contains the data destination for SEND telegrams and the data source for FETCH telegrams.

Byte

1	2	3	4	5	6	7	8	9	10
000H (FFH)	00H	Command		High	Low	High	Low	CPU/no./coord.flag	
				Destination/source		Amount			

**Meaning of the bytes:**

- 1 : Telegram identifier (00H or FFH for successive command telegram)
- 2 : Telegram identifier (00H)
- 3 : Command, SEND ("A" or "0") or FETCH ("E")
- 4 : Command type (i.e., type of data to be transferred)  
 "D" = data block "X" = expanded DB  
 "E" = input byte "A" = output bytes  
 "M" = flag bytes "P" = peripheral bytes  
 "Z" = counter locations "T" = time locations  
 "S" = absolute addresses "B" = system addresses  
 "Q" = expanded periphery
- 5 and 6 : Destination address for SEND or source address for FETCH  
 (e.g., byte 5 = DB no. and byte 6 = DW no.)
- 7 and 8 : Amount of user data to be transferred in bytes or words  
 depending on the type
- 9 : Byte number of the coordination flag. This is FFH if no CF is given.
- 10 : Bits 0 to 3: Bit number of the coordination flag (CF)  
 This is FH if no CF is given.  
 Bits 4 to 7: CPU number as a number from 1 to 4  
 This is 0H when a coordination flag is given but  
 no CPU no. Byte 10 contains FFH if neither CPU no.  
 nor CF is given. The partner can use all CPUs in  
 either case.

The letters given in bytes 3 and 4 are ASCII characters.

The telegram header of the successive command telegram consists of only bytes 1 to 4.

After the command telegram is transferred, the interpreter expects a response telegram from the partner within the monitoring time. The monitoring time length depends on the transmission speed (i.e., the baud rate).

**Table of monitoring times implemented in the CP 525:**

192000 - 1200 bd	= approx.	5 seconds
600 bd	= approx.	7 seconds
300 bd	= approx.	10 seconds
150 bd	= approx.	15 seconds
110 bd	= approx.	20 seconds

Tolerance: +/- 500 msec



**Setup and contents of the response telegram:**

The response telegram consists of 4 bytes and contains data concerning the state of the job.

Byte

1	2	3	4
00H/FFH	00H	00H	Error number

Meaning of the bytes:

- 1: Telegram identifier (00H or FFH for successive response telegrams)
- 2: Telegram identifier (00H)
- 3: Assigned 00H
- 4: Error number of the partner (see section 3.7.4)

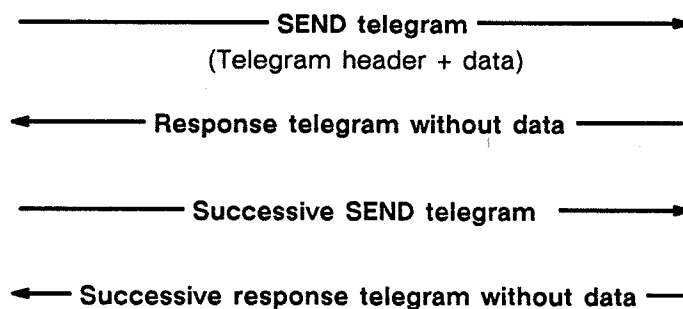
**3.5.2 Sending of Data**

**SEND job:**

CP525 (1) sends data to CP 525 (2).

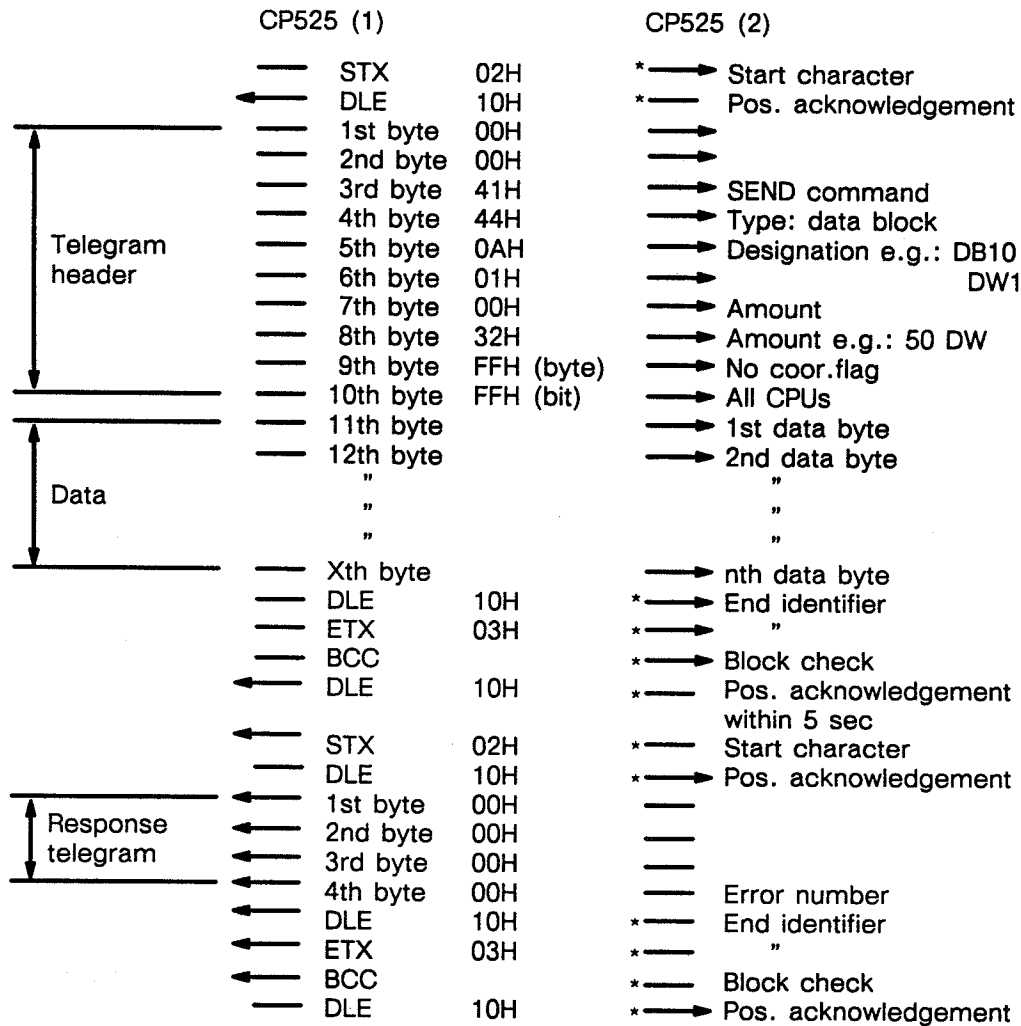
CP 525 (1)  
Interpreter <-> Procedure

CP 525 (2)  
Procedure <-> Interpreter



Successive SEND telegrams and successive response telegrams are sent as soon as the amount of user data exceeds **128 bytes**.

Processing of a SEND telegram in detail:

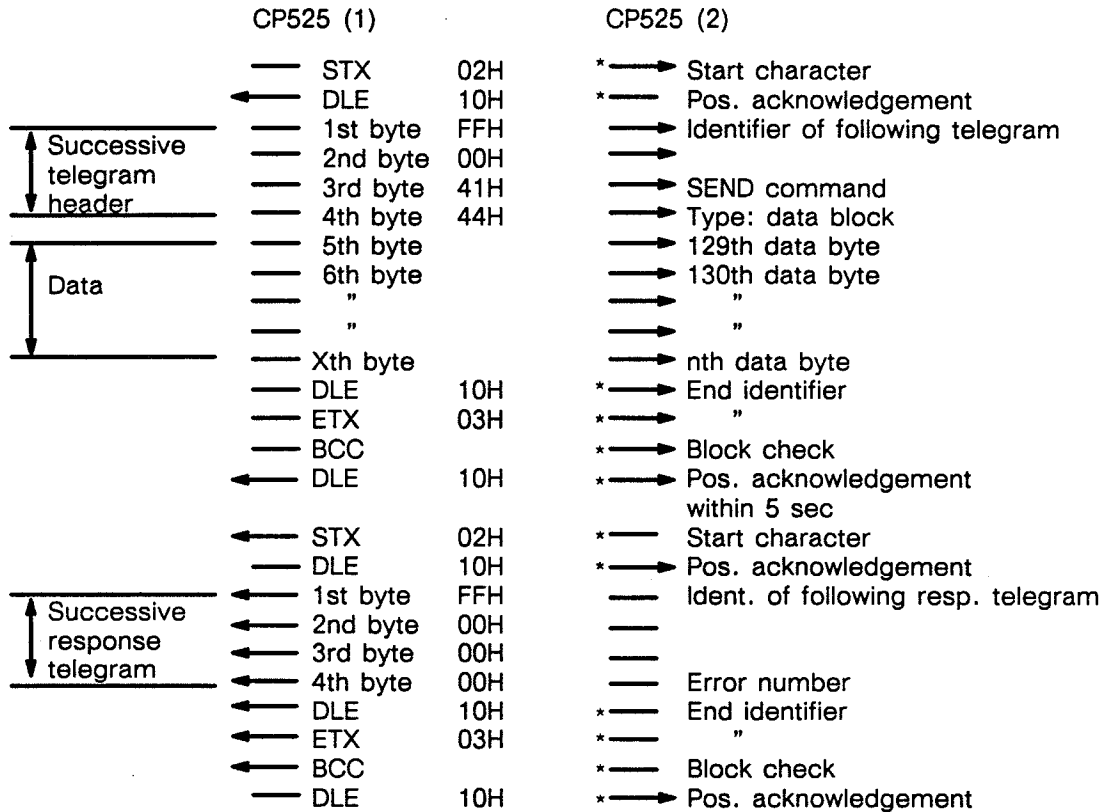


The characters marked with an "\*" are added by procedure 3964R to the data block with telegram header during the transmission.

This completes telegram traffic for a trouble-free SEND telegram whose length is less than 129 bytes (the 4th byte in the response telegram does not contain an error number).

**Successive SEND telegram:**

A successive SEND telegram is initiated as soon as the amount of data exceeds **128 bytes**. Processing is the same as the SEND telegram.



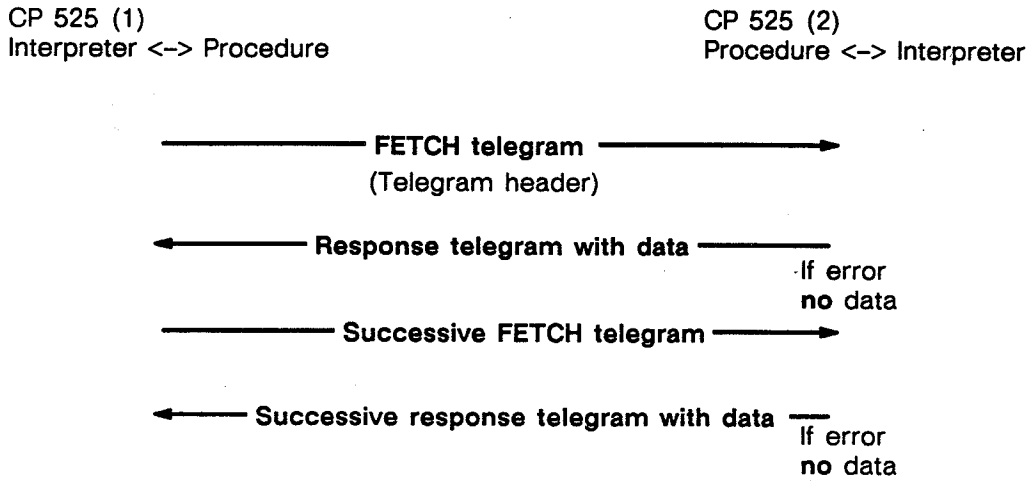
The characters marked with an "\*" are added by procedure 3964R to the data block with telegram header during the transmission.

Another successive SEND telegram is initiated if more than 256 bytes are to be transferred.

### 3.5.3 Fetching of Data

The **FETCH** job:

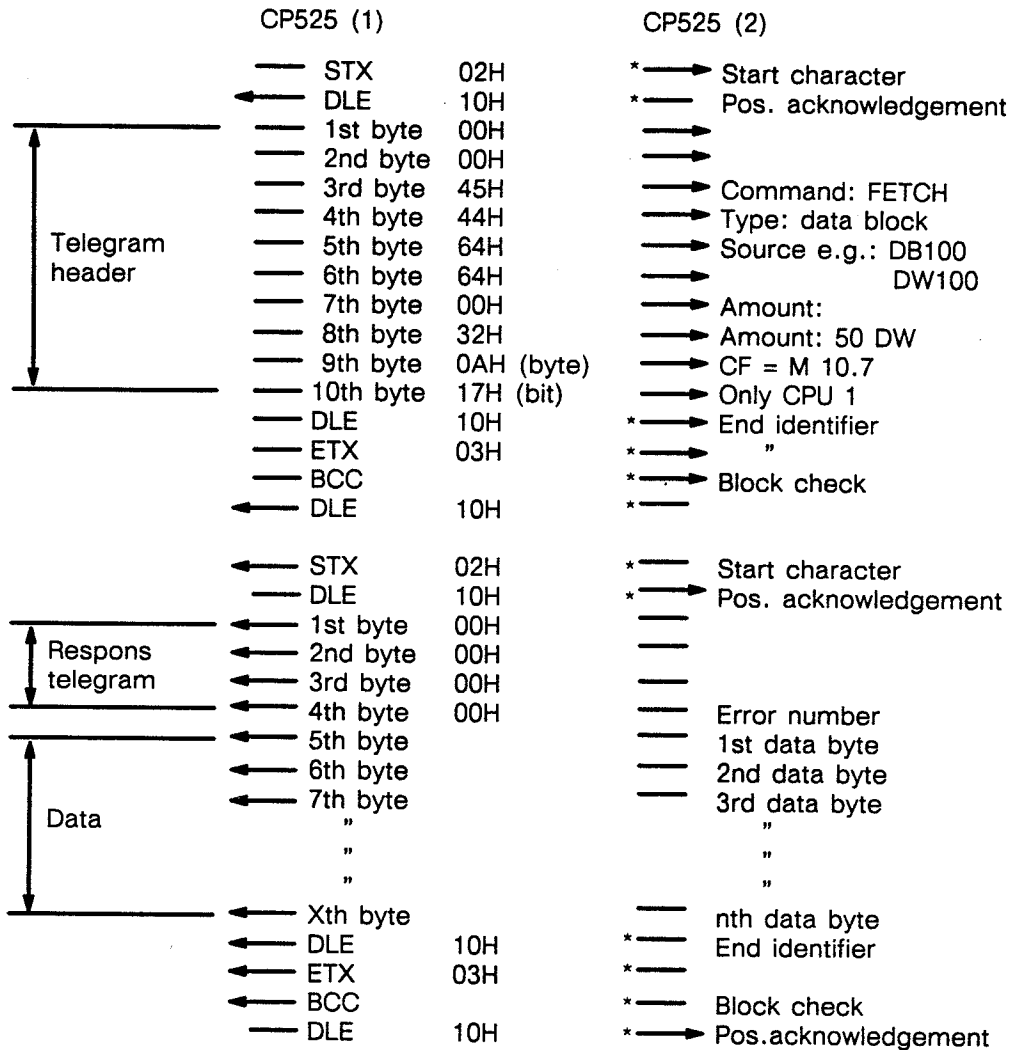
CP525 (1) requests data from CP 525 (2).



Successive **FETCH** telegrams and successive response telegrams with data are not sent unless the amount of user data exceeds **128 bytes**.

Data is not added when an error number in the 4th byte of the response telegram does not equal 0.

**Processing of a FETCH telegram (i.e., request telegram) in detail:**

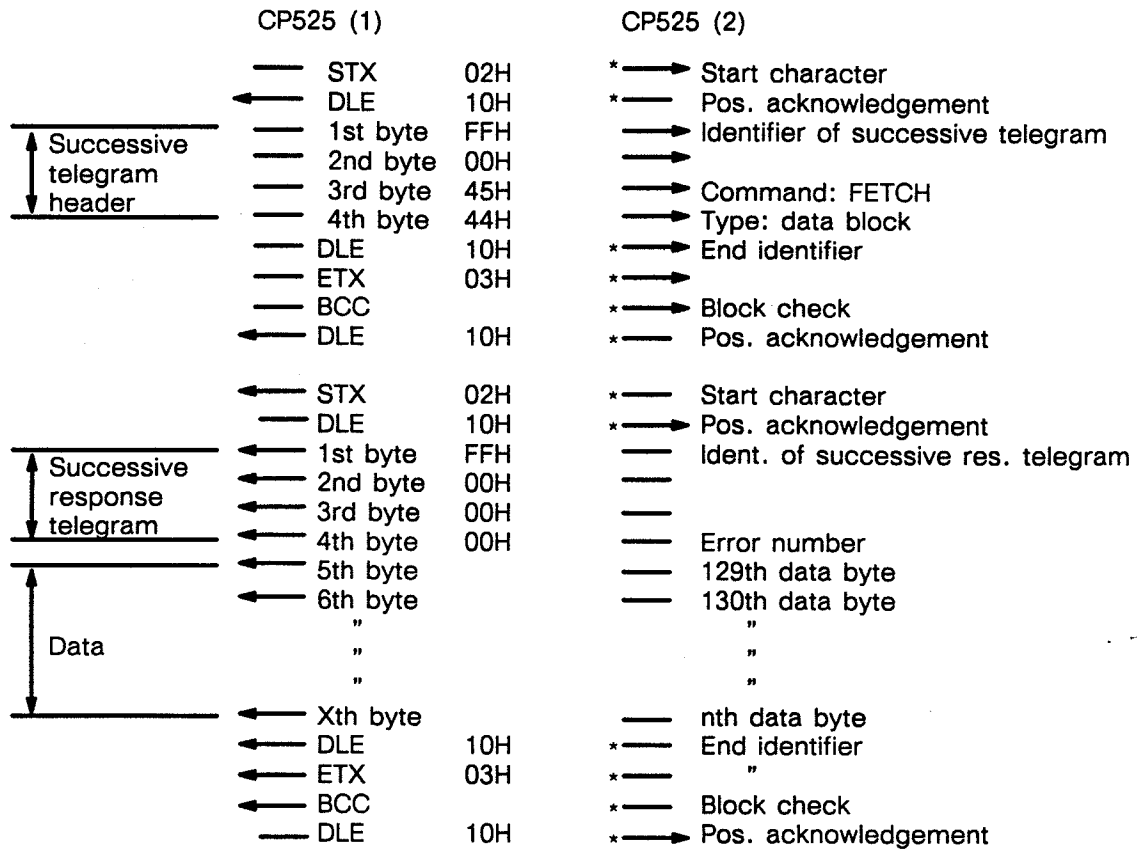


The characters marked with an "\*" are added by the 3964R procedure to the data block with telegram header during transmission.

This constitutes the processing of a trouble-free FETCH telegram whose length is less than 129 bytes.

If more than 128 bytes are requested, these are automatically fetched with one or more successive telegram(s).

**Successive FETCH telegram with successive response telegram:**



The characters marked with an "\*" are added by procedure 3964R to the data block with telegram header during transmission.

Another successive FETCH telegram is initiated as soon as the amount of user data exceeds 256 bytes.

**3.5.4 Procedure-Related Monitoring Times**

The following monitoring times apply to the 39964R procedure:

- Character delay time = 220 msec
- Acknowledgement delay time = 2000 msec
- Response telegram – monitoring time = approx. 5 sec (at 19200 to 4800 bd)

### 3.6 Special Telegrams (Different from the RK 512)

Any SEND-DIRECT job in the S5 user program can be used to trigger special telegrams for the automatic establishment and/or disconnection of connections for the telephone line (only for self-dialing modems). In addition, a FETCH job can be used to read the connection status.

Using the COM 525 parameterization software, you must set up a job block for the job number in the SEND-DIRECT job. Specify the destination block DB 255 here under "DB-No". All telegrams with destination address DB 255 are recognized by the TK 858 as special telegrams and are processed as such. They are not forwarded to the partner PLC.

The generation of these special telegrams will now be described.

This description pertains to those particular entries and specifications necessary and/or required for the special telegrams. See volumes 1 and 2 of the COM 525 manual for further information.

#### 3.6.1 Establishment of a Special Telegram Connection

Proceed as follows to establish a special telegram connection.

- Call a SEND-DIRECT (HTB) handling block in the S5 user program.
- Specify an auxiliary data block and the amount of user data to be transferred (i.e., 18 DW).

Example of the parameterization of the HTB SEND-DIRECT:

SSNO	0
A-NO	1
ANZW	FW12
OTYP	DB
DBNO	20
QANF	10
QLAE	18
PAFE	FY11

Interface number is 0.  
 Job number is 1.  
 Indicator word is flag word 12.  
 Source is the auxiliary data block with the number 20 and starting address 10.  
 18 DWs must be sent if parameterization error FY11 is selected.

 Fixed specification is required !

- In addition, you must also call the HTB SEND ALL that transfers the data from the PLC to the CP.
- Set up the auxiliary data block for the transfer of call number and identification number (see next page).

**Auxiliary Data Block DBx**

n = the starting address specified under "QANF" in the handling block  
 x = the data block number specified under "DBNO" in the handling block

	DL	DR
DW n		
DW n+1		
DW n+2		
DW n+9		
DW n+10		
DW n+11		
DW n+18		

This data area is reserved for the call number (max. of 18 characters)\*).

This data area is reserved for the identification number (max. of 16 characters)\*).

\*) See next page for entry of the call and identification numbers in the auxiliary DB.



### Call number

The call number to be entered in the auxiliary DB is a dial character string, starting with the dial tone recognition, followed by the actual call number (maximum of 18 characters), and concluded by the "end of call number" character (i.e., ";").

If the call number is shorter than the reserved area, it is recommended that the remaining data words be filled with "00".

The following table shows the coding for the individual characters:

Characters	Meaning	To Be Entered in the Auxiliary DB
0	0	30 H
1	1	31 H
2	2	32 H
3	3	33 H
4	4	34 H
5	5	35 H
6	6	36 H
7	7	37 H
8	8	38 H
9	9	39 H
:	Dial tone recognition (300 Hz) *)	3A H
<	Dial pause, 1 sec *)	3C H
=	Dial pause, 3 sec *)	3D H
;	End of call number	3B H

1

Table 3.3 Coding of the call number

### Examples of call numbers

1. Exclusive exchange line with connection via "direct exchange line":

: 1 2 3 7 8 9 ;

2. Extension line with connection via "direct exchange line"

= 0 : 6 5 4 3 2 1 ;

3. Extension line with connection via "internal line":

= 1 2 3 4 ;

\*) To meet the requirements of various telephone dialing networks, a long call number can be broken up by pauses of various lengths and dial tone recognition characters.



**DB 20**

	DL	DR	
DW 10	3A H	30 H	Telephone number
DW 11	39 H	31 H	
DW 12	33 H	31 H	
	31 H	32 H	
	33 H	34 H	
	35 H	3B H	
	00 H	00 H	
	00 H	00 H	
	00 H	00 H	
DW 19	00 H	00 H	
DW 20	30 H	36 H	Identification number
DW 21	30 H	39 H	
	31 H	31 H	
	35 H	34 H	
	33 H	32 H	
	0D H	0A H	
	00 H	00 H	
	00 H	00 H	
DW 28	00 H	00 H	

Use the COM 525 parameterization software to set up a job block for the job number specified in handling block SEND-DIRECT. Enter destination data block DB 255 and destination word address 01H (among other things) here.

-> SELECTION -> JOB BLOCK ->		SIMATIC S5 / COM525					
J O B	P R O G R.						
DRIVE: B PROGRAM: RK512AG1 COMPONENTS: RK							
J O B							
Job no.:	001						
Job:	SEND						
Job type:	DATA BLOCK						
CPU no.:							
DB no.:	255						
Destination - word address:	00001D	0001H					
Or with coordination flag:							
F1 ON PRINTER	F2 PAGE. DOWN	F3 PAGE UP	F4	F5 DELETE JOB	F6 ACCEPT JOB	F7 HELP	F8 EXIT

 Fixed specification is required.

### 3.6.2 Disconnection of a Special Telegram Connection

Proceed as follows to disconnect a special telegram connection:

- Call a SEND-DIRECT (HTB) handling block in the S5 user program.
- Specify an auxiliary data block and the amount of user data to be transferred (i.e., 2 DWs).

Example of the parameterization of the HTB SEND-DIRECT:

SSNO	0
A-NO	2
ANZW	FW12
QTYP	DB
DBNO	20
QANF	4
QLAE	2
PAFE	FY11

Interface number is 0.

Job number is 2.



Indicator word is flag word 12.

Source is the auxiliary data block with the number 20 and starting address 4.

2 DWs must be sent if parameterization error FY11 is selected.

 Fixed specification is required !

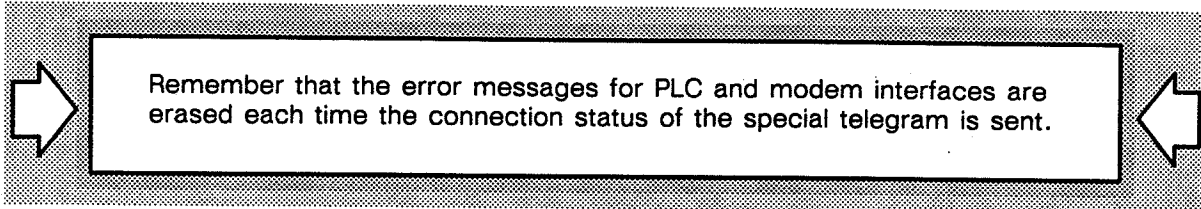
- In addition, you must also call the SEND ALL HTB that transfers the data from the PLC to the CP.
- The data words required in the auxiliary data block ought to be preassigned with 00.

 You can use the same auxiliary DB here as you used for the establishment of a special telegram connection (set up free data area). 

- Use the COM 525 parameterization software to set up a job block for the job number specified in the SEND-DIRECT handling block. Among other things (see section 3.6.1), enter destination data block DB 255 and destination word address 01H here.

### 3.6.3 Connection Status of the Special Telegram

The connection status of the special telegram can be used to scan the actual status of the telephone line on the TK 858. In addition, information concerning the PLC and modem interface errors which occurred last is also available.



Section 3.7.3 contains a list of the error and status messages.

Proceed as follows to generate the connection status for a special telegram:

- Call a FETCH handling block (HTB) in the S5 user program.
- Specify an auxiliary data block and the amount of user data to be received (i.e., 2 DWs).

Example of the parameterization of the HTB FETCH:

SSNO	0
A-NO	3
ANZW	FW34
ZTYP	DB
DBNO	21
ZANF	0
ZLAE	2
PAFE	FY33

Interface number is 0.  
 Job number is 3.  
 Indicator word is flag word 34.  
 Destination is the auxiliary data block with the number 21 and the starting address 0.  
 Fetch 2 DWs (i.e., 4 bytes) if parameterization error FY33 is selected.

Fixed specification is required !

- In addition, you must call the RECEIVE ALL HTB that transfers the data from the CP to the PLC.
- Setup of the auxiliary data block in which the connection status is entered:  
 n = the starting address specified in the FETCH HTB

DLn	Status number	DRn	PLC error
DLn+1	Modem error	DRn+1	00H

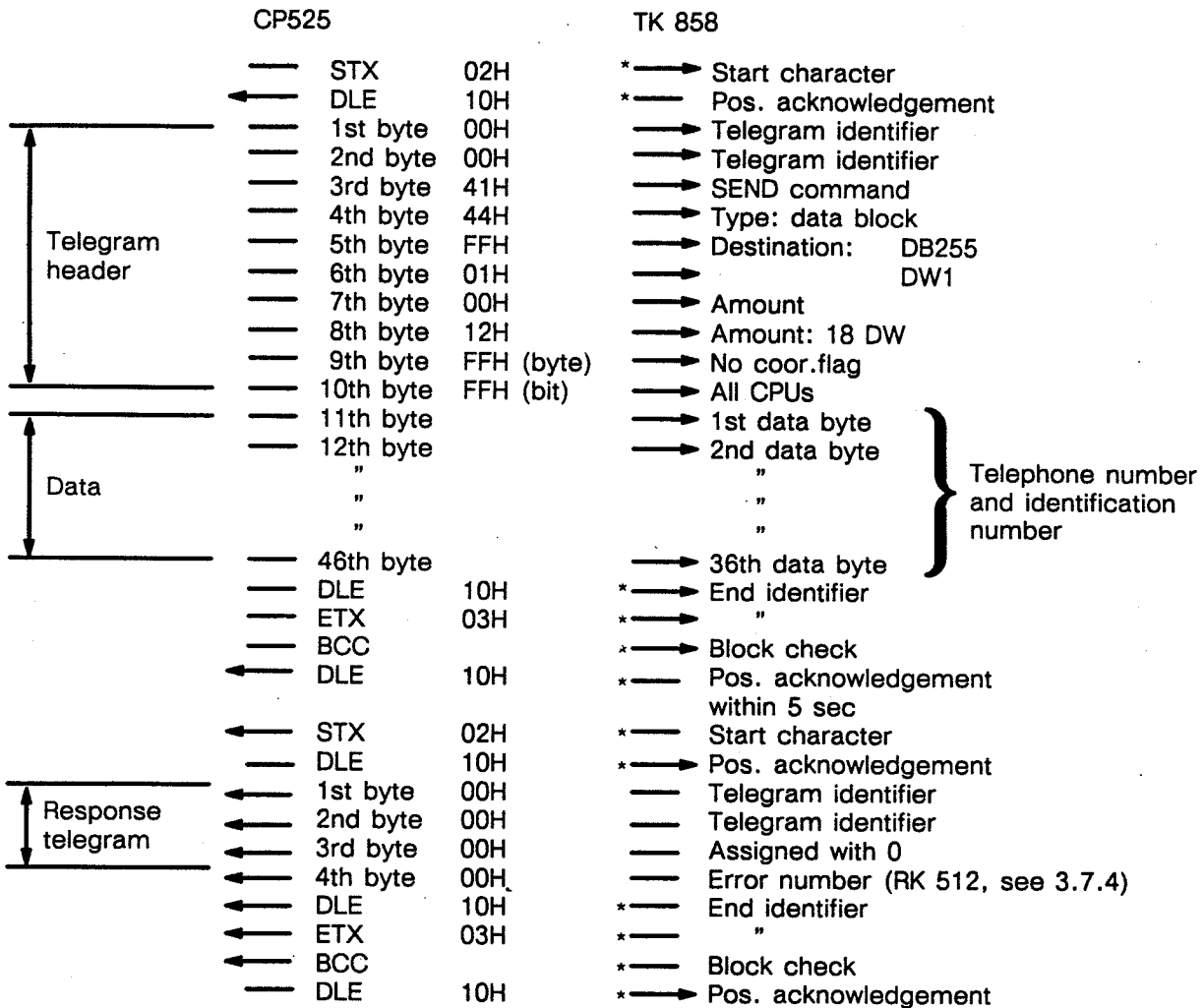
Use the COM 525 parameterization software to set up a job block for the job number specified in the FETCH handling block. Enter source data block DB 255 and source word address 01H (among other things) here.

-> SELECTION -> JOB BLOCK ->		SIMATIC S5 / COM525					
J O B	P R O G R.						
DRIVE: B PROGRAM: RK512AG1 COMPONENTS: RK							
J O B							
Job no.:	001						
Job:	FETCH						
Job type:	DATA BLOCK						
CPU no.:							
DB no.:	255						
Destination - word address:	00001D	0001H					
Or with coordination flag:							
F 1 ON PRINTER	F 2 PAGE DOWN	F 3 PAGE UP	F 4	F 5 DELETE JOB	F 6 ACCEPT JOB	F 7 HELP	F 8 EXIT

 Fixed specification is required.

### 3.6.4 How the Special Telegram Looks During Serial Transmission

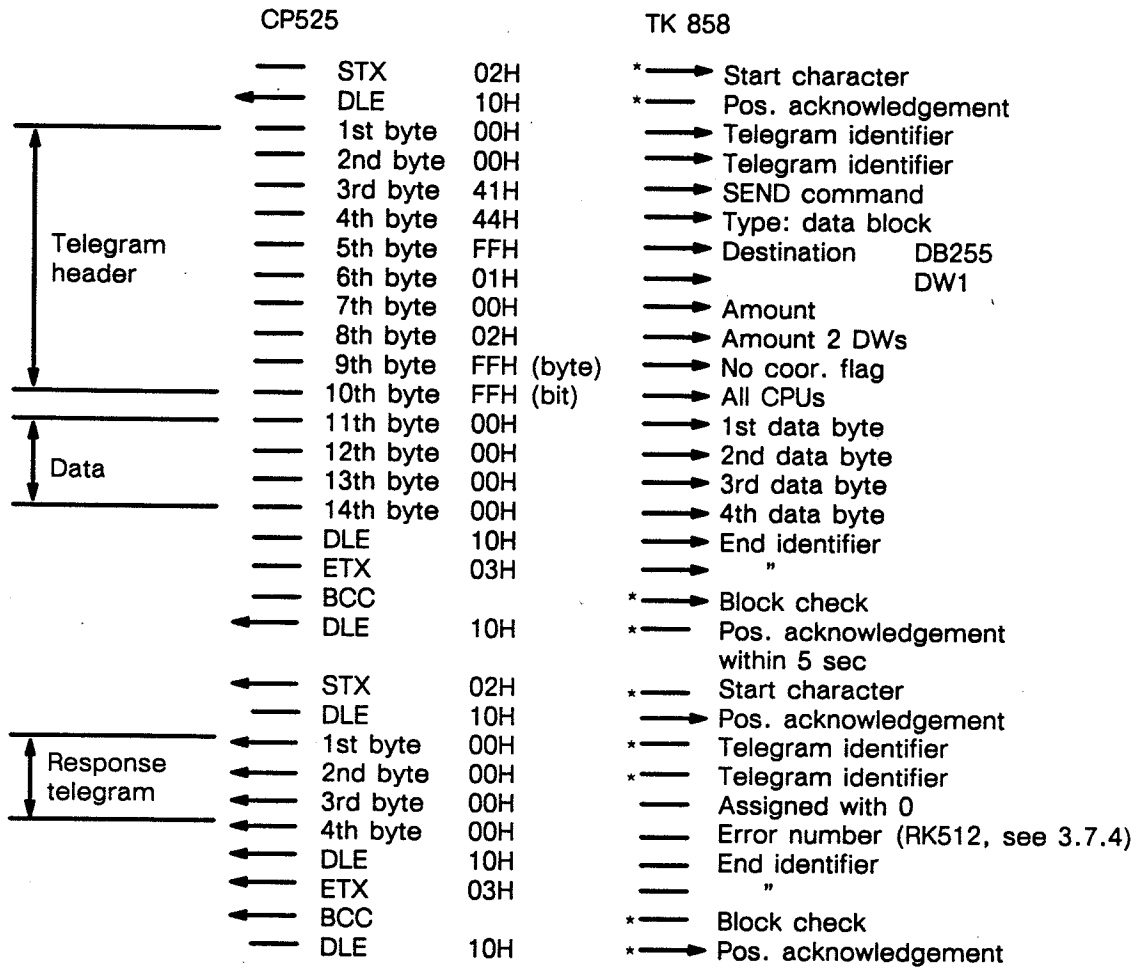
Processing of the establishment of the special telegram connection in detail:



The characters marked with an "\*" are added by the 3964R procedure to the data block with telegram header during transmission.

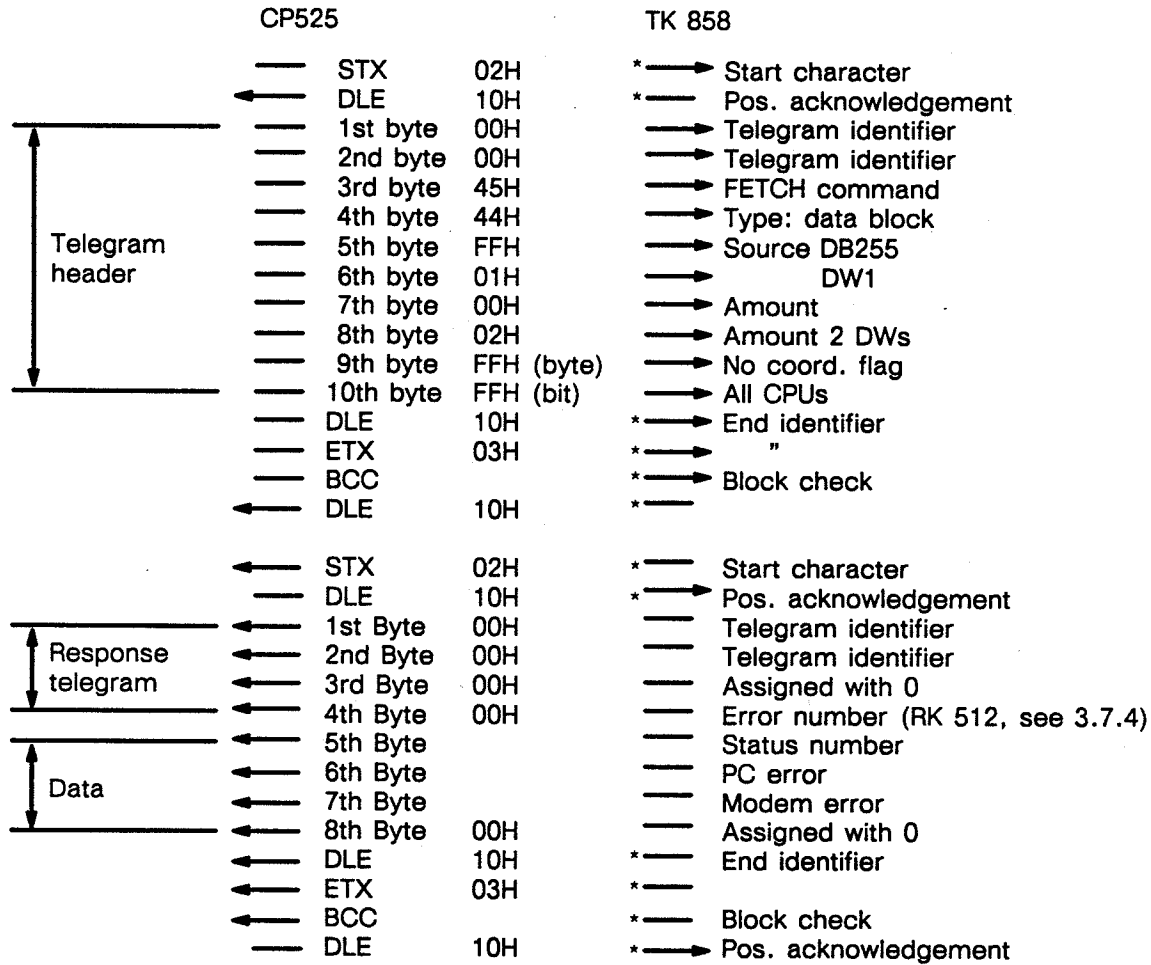


**Processing of the disconnection of the special telegram connection in detail:**



The characters marked with an "\*" are added by the 3964R procedure to the data block with telegram header during transmission.

Processing of the connection status of the special telegram in detail:



The characters marked with an "\*" are added by the 3964R procedure to the data block with telegram header during transmission.

### 3.6.5 Example of Application

The below listed organization, function, and data blocks are used for startup and establishment of the connection.

#### OB20

```
NETWORK 1      0000
0000          : JU  FB10
0001 NAME    : ANLAUF
0002          : BE
```

#### OB21

```
NETWORK 1      0000
0000          : JU  FB10
0001 NAME    : ANLAUF
0002          : BE
```

#### OB22

```
NETWORK 1      0000
0000          : JU  FB10
0001 NAME    : ANLAUF
0002          : BE
```

#### FB10

```
NETWORK 1      0000
NAME: ANLAUF

0005          : JU  FB125
0006 NAME    : SYNCHRON
0007 SSNR    :      KY 0,0
0008 BLGR    :      KY 0,0
0009 PAFE    :      FY 10
000A         : JU  FB125
000B NAME    : SYNCHRON
000C SSNR    :      KY 0,1
000D BLGR    :      KY 0,0
000E PAFE    :      FY 11
000F         :
0010         : AN  F  10.0
0011         : AN  F  11.0
0012         : BEC
0013         : STP
0014         : BE
```

Synchronization

No error for synchronous

#### OB1

```
NETWORK 1      0000
0000          : JU  FB 100
0001 NAME    : AUFBAU
0002          : JU  FB 111
0003 NAME    : ALL
0004          : BE
```

Establishment of connection

SEND-ALL, RECEIVE-ALL

## FB 100

```

NETWORK 1      0000
NAME: AUFBAU

0005      : C   DB 100
0006      :
0007      : A   F 100.0
0008      : AN  F 100.1
0009      : =   F 100.1
000A      : A   F 100.1
000B      : R   F 100.0
000C      : JU  FB 120
000D NAME : SEND
000E SSNO :    KY 0,0
000F A-NO :    KY 0,3
0010 ANZW :    FW 102
0011 QTYT :    KS DB
0012 DBNO :    KY 0,100
0013 QANF :    KF +0
0014 QLAE :    KF +18
0015 PAFE :    FY 106
0016      :
0017      : A   F 103.1
0018      : BEC
0019      :
001A      : A   F 103.3
001B      : JC  FB 14
001C NAME : FEHLER
001D      :
001E      : AN  F 108.1
001F      : JU  FB 122
0020 NAME : FETCH
0021 SSNO :    KY 0,0
0022 A-NO :    KY 0,4
0023 ANZW :    FW 107
0024 ZTYP :    KS DB
0025 DBNR :    KY 0,100
0026 ZANF :    KF +20
0027 ZLAE :    KF +2
0028 PAFE :    FY 111
0029      :
002A      : A   F 108.3
002B      : JC  FB 14
002C NAME : FEHLER
002D      :
002E      : AN  F 108.2
002F      : BEC
0030      :
0031      : L   DL 20
0032      : L   KH 000A
0034      : I=F
0035      : S   F 100.7
0036      :
0037      : TAK
0038      : L   KH 001A
003A      : I=F
003B      : S   F 100.7
003C      :
003D      : BE

Trigger by flag 100.0
Edge evaluation

Job 3: destination is DB255, DW1

Phone no. and ident no.
in DB100 from DW0
Length spec. telegram, 18 words

Job running

Job finished with errors
Error evaluation

Job not running yet

Job 4: Source is DB255, DW1

Connection status in DB100 from
DW20
Length, spec. telegram, 2 words

Job finished with errors
Error evaluation

Job not finished, without errors

Connection status
Connection set up!

Sending enabled

Connection set up, incoming
call was accepted !
Sending enabled

Further scanning of status

```



## 3.7 Behavior During Disturbance

### 3.7.1 General

The TK 858 distinguishes between three types of errors for each interface (PLC interface or modem interface):

Interface errors, internal errors, and protocol or procedure errors

The occurrence of an error is indicated for a period of 5 seconds by the error LED of the corresponding interface (PLC/PU fault or modem fault), and transferred to the "connection status" in the special telegram (see section 3.7.3).

The type of error is indicated by the blinking rhythm of the error LED (i.e., 1 blink for interface errors, 2 blinks for internal errors, or 3 blinks for protocol or procedure errors). When several errors occur at the same time on one interface, the error with the highest priority is indicated first.

The types of errors are governed by the following priority of indication:

Highest priority:	Interface errors
•	
•	Internal errors
•	
Lowest priority	Protocol or procedure errors

In addition to the optical indication of the interface error, the hooter is also activated for a period of one minute when the connection line is interrupted (break status) or the connection is disconnected on the modem interface. Hooter activation can be prevented by setting DIP switch S2.8 to switch position "hooter off" (see section 1.5.2). The modem interface error which occurred last and the status of the telephone connection are transferred to the "connection status" in the special telegram (see section 3.7.3).

An existing connection on the modem interface is disconnected as soon as a line is interrupted (break status) on the PLC interface. The interface error is then indicated by the "disturbance PLC/PU" error LED.

Transmission errors (i.e., parity errors, frame errors, BCC errors) and delay errors (i.e., acknowledgement delay, character delay) cause the 3964R procedure of the PLC interface to repeat the transmission block. The "disturbance PLC/PU" error LED indicates transmission errors as interface errors and delay errors as protocol or procedure errors. The procedure aborts after 6 unsuccessful attempts to transmit a block. The "connection status" in the special telegram (see section 3.7.3) contains the error of the PLC interface which occurred last.

Transmission errors (i.e., parity errors, frame errors, BCC errors) and delay errors (i.e., acknowledgement delays, character delays) cause the transmission procedure of the modem interface to repeat the transmission block. The "disturbance modem" error LED indicates transmission errors as interface errors, delay errors and protocol or procedure errors. The transmission procedure aborts after a total of 3 unsuccessful attempts to transmit a block. The "connection status" in the special telegram (see section 3.7.3) contains the error of the modem interface which occurred last.

### 3.7.2 Optical Error Indicators

Disturb. PLC/PU Error-LED on PC Side	Error Which Occurred	Possible Causes
1 blink	Interface error: Parity error Frame error BCC error Line interruption (break)	PLC-TK 858 connection cable not inserted Faulty PLC-TK 858 connection cable Unlike baud rate setting between PLC and TK 858 Baud rate setting not permitted
2 blinks	Internal error: Hardware error (self test)	TK 858 defective
	Buffer overflow (in operational state)	Sending of the special telegram is too frequent. Status, telegram structure not in accordance with RK 512
3 blinks	Protocol or procedure error: Acknowledgement delay Character delay Abortion of telegram traffic	Character loss Error resulting from interface error Bad telephone line quality

Disturb. Modem Error-LED on Modem Side	Error Which Occurred	Possible Causes
1 blink	Interface error: Parity error Frame error BCC error Line interruption (break) Connection disconnected	Faulty TK 858-modem connection cable Unlike baud rate setting between modem and TK 858 Unlike parity setting between modem and TK 858 Baud rate setting not permitted 8-bit data length not set Bad telephone line quality
2 blinks	Internal error: Hardware error (self test)	TK 858 defective
	Buffer overflow (in operational state)	Telegram structure not in accordance with RK 512
3 blinks	Acknowledgement delay Character delay Data transmission disconnected	Character loss Error resulting from interface error Bad telephone line quality

### 3.7.3 Connection Status (Special Telegrams)

The "connection status" special telegram is described in section 3.6.3. The individual error numbers are stored in the corresponding bytes. The errors for the PLC interface and the modem interface are deleted each time the "connection status" of the special telegram is sent.

#### Status number:

00 H Connection establishment

Connection establishment was aborted because:

- 01 H Modem not ready to dial
- 02 H Reply tone not received
- 03 H Busy signal
- 04 H Call aborted
- 05 H Prohibited call
- 06 H Telephone number not in memory
- 07 H Call collision
- 08 H Wrong telephone number
- 09 H Manual dial or dedicated line set
- 10 H Connection establishment for outgoing or incoming call unsuccessful

Connection establishment required:

- 0A H Connection is set up
- 1A H Connection is set up after call collision  
(Incoming call was accepted.)

No connection set up:

- 0B H Connection disconnected  
(Connection disconnected or no request after startup)
- 0C H Establishment of connection not possible since connection is set up already.
- FF H Connection aborted

#### PLC error:

- 00 H No error
- 01 H Interface error
- 02 H Internal error
- 03 H Protocol or procedure error

#### Modem error:

- 00 H No error
- 01 H Interface error
- 02 H Internal error
- 03 H Protocol or procedure error
- 04 H Key-operated switch of the partner TK 858 is in "write protection" position.



### 3.7.4 Telegram-Related Errors (RK 512) (Excerpt from COM 525 Manual)

No. for RESPTTEL	No. for SYSTAT	Description	Remedy
0CH	02H	<p><b>Parameterization errors recognized by the CPU of the PLC which are reported to the CP:</b></p> <p>a) Data type non existent or illegal</p>	<ul style="list-style-type: none"> <li>- Check parameterization on CPU and CP; set up block if necessary.</li> <li>- Partner supplies wrong parameters in telegram header. See job tables for legal data types.</li> </ul>
	03H	<p>b) Area too small (starting address + length) &gt; area</p>	<ul style="list-style-type: none"> <li>- Check parameterization on CPU and CP; check block/area if necessary, or</li> <li>- Partner supplies wrong parameters in telegram header.</li> </ul>
	46H	<p><b>Error in partner's command telegram. A response telegram with the specified error number in the 4th byte is sent to the partner:</b></p> <p>a) Error in the 5th command byte: starting address too high</p>	See job tables for legal starting addresses.
	48H	<p>b) Error in 9th and 10th command bytes: Specification of a coordination flag is illegal for this data type or the bit number of the coordination flag is too high. (valid value range = 0 to 7)</p>	Fundamental error in setup of header of the partner. See job tables for when a coordination flag is permitted.
	49H	<p>c) Error in 10th command byte: CPU no. too large (valid value range = 0, 1, 2, 3, 4, F)</p>	Fundamental error in setup of header of the partner
10H	40H	<p>d) Error in 1st command byte: not equal to 00H or FFH</p>	Fundamental error in setup of header of the partner. If necessary, use interface test device ("FOXPG"), which is cut in to the transmission line, to establish erroneous behavior of the partner device.

No. for RESPTTEL	No. for SYSTAT	Description	Remedy
10H	43H	e) Error in 4th command byte: wrong command letter	Fundamental error in setup of header of the partner and/or a command sequence was requested which is illegal for CP 525. See command tables for legal commands. If necessary, use interface test device ("FOXPG"), which is cut in to the transmission line, to establish erroneous behavior of the partner device.
	44H	f) Error in 4th command byte for successive telegram: command letter not same as for 1st command telegram	Fundamental error in setup of header of the partner. If necessary, use interface test device ("FOXPG"), which is cut in to the transmission line, to establish erroneous behavior of the partner device.
12H	4AH	g) System command "XM" not permitted	System command can only be used for AS512C.
14H	02H	<p><b>Parameterization errors recognized by the CPU of the PLC, which are reported to the CP:</b></p> <p>a) DB/DX non existent and/or illegal (e.g., DB0, DB1, DX0)</p>	<ul style="list-style-type: none"> <li>- Check parameterization on CPU and CP; set up block if necessary.</li> <li>- Partner supplies wrong parameters in the telegram header.</li> </ul> <p>See job tables for legal data types.</p>
	03H	b) DB/DX too short: (starting address + length) > area	<ul style="list-style-type: none"> <li>- Check parameterization on CPU and CP; check block/area if necessary, or</li> <li>- Partner supplies wrong parameters in telegram header.</li> </ul>
	45H	<p><b>Error in the command telegram of the partner. A response telegram with the specified error number in the 4th byte is sent to the partner:</b></p> <p>a) Error in 5th command byte: illegal DB/DX no. (e.g., 00)</p>	See job tables for legal DB/DX numbers.

No. for RESPTTEL	No. for SYSTAT	Description	Remedy
16H	41H	b) Error in 3rd command byte: command letter is not "A" or "O" or "E" or "X"	Fundamental error in setup of header of the partner. If necessary, use interface test device ("FOXPG"), which is cut in to the transmission line, to establish erroneous behavior of the partner device.
	42H	c) Error in 3rd command byte in successive telegram: 1st command letter not same as 1st command telegram	Fundamental error in setup of header of the partner. If necessary, use the interface test device ("FOXPG"), which is cut in to the transmission line, to establish erroneous behavior of the partner device.
2AH	4EH	<p><b>Additional errors during processing of the partner job:</b></p> <p>a) CP received command telegram while operation mode selection switch was in STOP/PGR.</p>	Set operation mode selector switch to RUN.
	4FH	b) Command telegram was received but the CPU of the PLC still has not performed HTB "SYNCHRON".	In the STEP-5 program, HTB "SYNCHRON" calls must be programmed in the organization blocks (OB20, OB21, OB22). A cold restart must then be performed (if necessary, the PAFE byte at HTB "SYNCHRON" must be evaluated) !!!
32H	52H	DB/DX is inhibited by coordination flag.	<p>In own STEP-5 program: Reset coordination flag after last transmission data has been processed.</p> <p>In partner program: Repeat the job.</p> <p>For initial putting into operation: Be sure that the coordination flags are distributed among the individual processors, CPs, IPs, and the coordinator; that the jumper assignments have been adjusted; and that the coordination flags which were used in the startup OBs (OB20, OB21, OB22) have been reset. (See also operating instructions for CP 524/CP 525.)</p>

No. for RESPTTEL	No. for SYSTAT	Description	Remedy
34H	47H	<p><b>Error in the command telegram of the partner. A response telegram with the specified error number in the 4th byte is sent to the partner:</b></p> <p>a) Error in 7th and 8th command bytes: specified length too long</p>	See job tables for legal lengths.
	4BH	b) Send telegram was longer than expected (i.e., more data was received including successive telegrams if appropriate than was specified in the telegram header).	Correction required on partner device
	4CH	c) Send telegram was too short and/or < 128 bytes (i.e., less data was received than was specified in the telegram header).	Correction required on partner device
	4DH	d) Fetch telegram with user data received	Correction required on partner device
	5FH	A correct telegram with a length > 128 bytes was received. The telegram cannot be evaluated. The job being processed is aborted.	If necessary, use interface test device ("FOXPG"), which is cut in to the transmission line, to establish erroneous behavior of the partner device.
36H	51H	<p><b>Additional errors during processing of the partner job:</b></p> <p>a) - Synchronization error of the partner since a new (successive) telegram arrived although previous (successive) command telegram has not yet been sent by the CP 525; or - A normal command telegram was received although a successive command telegram was expected; or - A successive command telegram arrived although a command telegram was expected.</p>	<p>This error can be reported after a cold restart of your own PLC in case of long telegrams or during a cold restart of the partner. In such cases, you do not need to correct anything since normal startup behavior of the system is involved.</p> <p>During running operation, the error can also be the result of previous error states which can only be detected by the partner. Otherwise you must assume that the error is being caused by the partner device. The error may not occur for jobs of less than 128 bytes.</p>

No. for RESPTTEL	No. for SYSTAT	Description	Remedy
0CH	02H	<p>Parameterization errors recognized by the CPU of the PLC which are reported to the CP:</p> <p>a) Data type non existent and/or illegal</p>	<ul style="list-style-type: none"> <li>- Check parameterization on CPU and CP; set up block if necessary.</li> <li>- Partner supplies wrong parameters in telegram header. See job tables for legal data types.</li> </ul>
	03H	<p>b) Area too short (starting address + length) &gt; area</p>	<ul style="list-style-type: none"> <li>- Check parameterization on CPU and CP; if necessary, check block/area or</li> <li>- Partner supplies wrong parameters in telegram header.</li> </ul>

### 3.8 Data Transmission Times

In order to keep within the monitoring times of the computer link, the telegrams which are sent by the CP are immediately acknowledged by the TK 858.

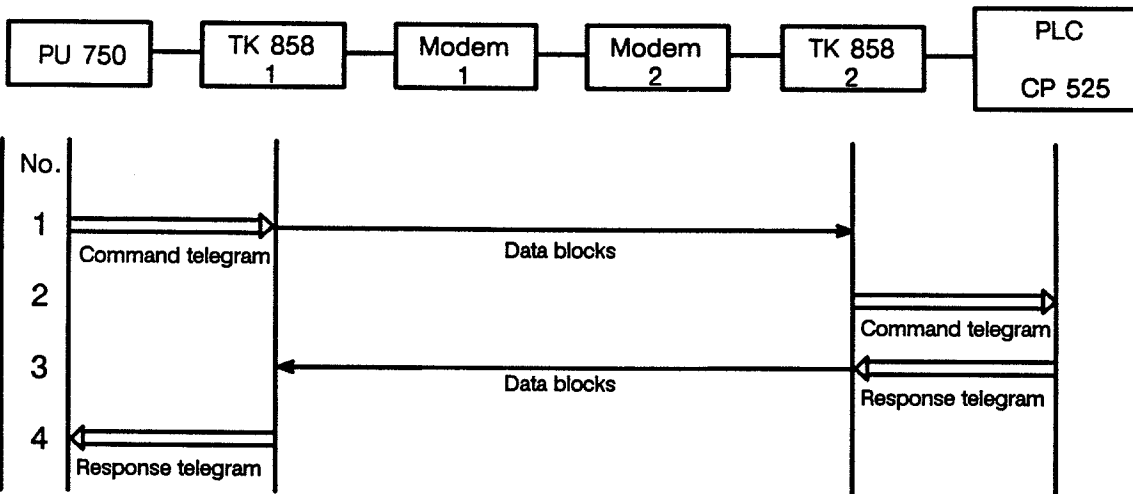
The first data block is sent over the modem interface as soon as the first 35 characters of the telegram are received, followed by the second telegram after the next 35 characters.

The character delay time of the computer link requires that the receiving, second TK 858 not relay the telegram to the PLC until the entire telegram has been received over the modem interface.

Telegram traffic is aborted if the response telegram monitoring time is exceeded.

Maintaining telegram traffic requires that the data transmission times, including the response times (two TK 858s and partner PLC), do not exceed the response telegram monitoring time.

**Example: PU 750-CP 525 computer link**



**Explanation:**

1. The PU 750 sends a command telegram. The PU 750 starts its response telegram monitoring time after acknowledgement by TK1.
2. The command telegram is transferred to the CP 525 after TK2 has received the entire telegram.
3. The CP 525 sends the response telegram to TK2.
4. The response telegram is transferred to the PU 750 after TK1 has received the entire response telegram.

**Data transmission times including response times (two TK 858s and partner PLC):**

In our example, the PU 750 uses a SEND telegram as the command telegram, and sends a SEND telegram with 128 bytes of user data. The data transmission time is based on the amount of time it takes for the PU 750 to receive the response telegram after the command telegram has been sent.

Baud Rate RK 512	Baud Rate Modem	Data Transmission Time
4800	1200	4.3 sec
	2400	2.7 sec
9600	1200	4.1 sec
	2400	2.5 sec
	9600	0.5 sec

### 3.9 Connection Cables

#### 3.9.1 CP524/CP525 – TK 858 (V.24) Connection Cable

The cable shown here (see section 1.10 for order numbers) is used for the V.24 link between TK 858 and CP 524 or CP 525.

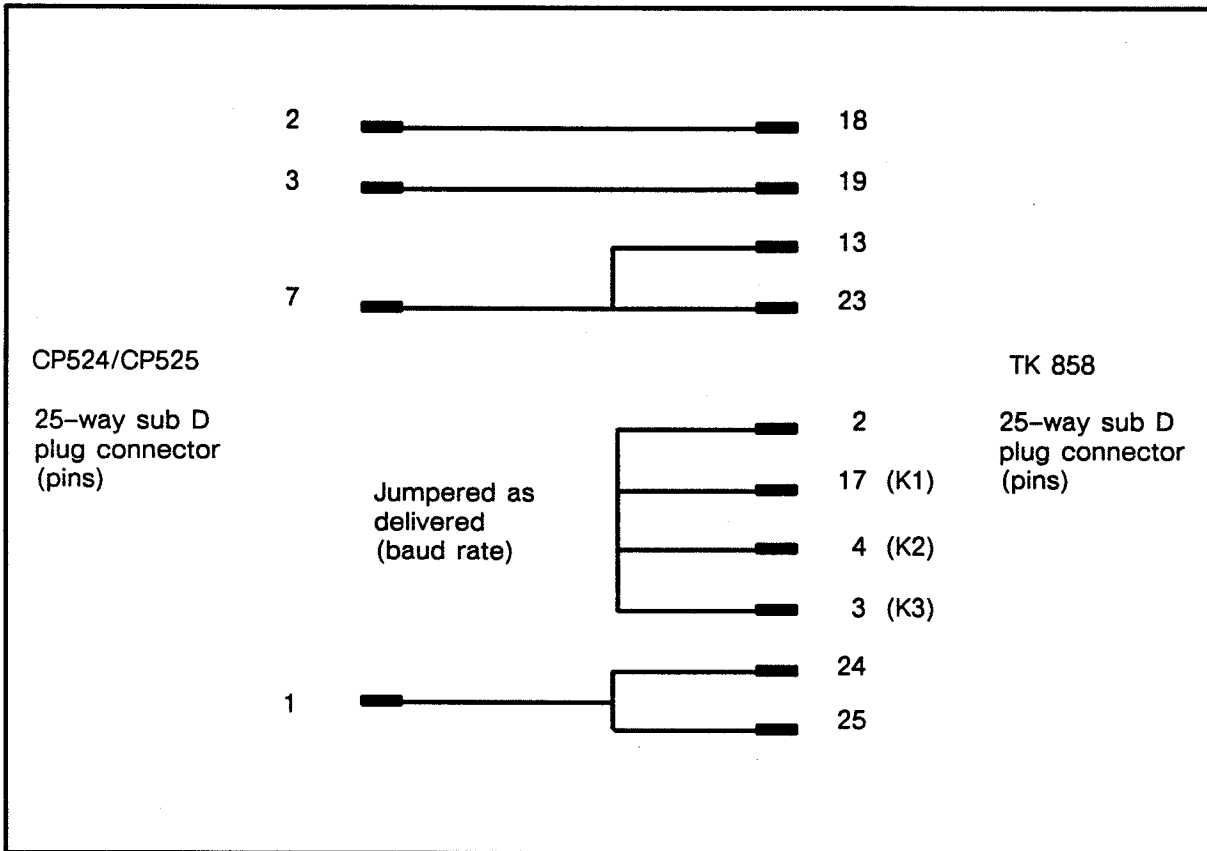


Figure 3.6 CP524/525 – TK 858 (V.24) connection cable

➔ The baud rate to the CP is set in the plug shell on the TK 858 side. As delivered, a baud rate of 9600 has been set (see section 3.3.4). The plug connectors are labelled. ➔



### 3.9.2 CP524/CP525 – TK 858 (TTY) Connection Cable

The cable shown here (see section 1.10 for order numbers) is used for the TTY link between TK 858 and CP 524 or CP 525.

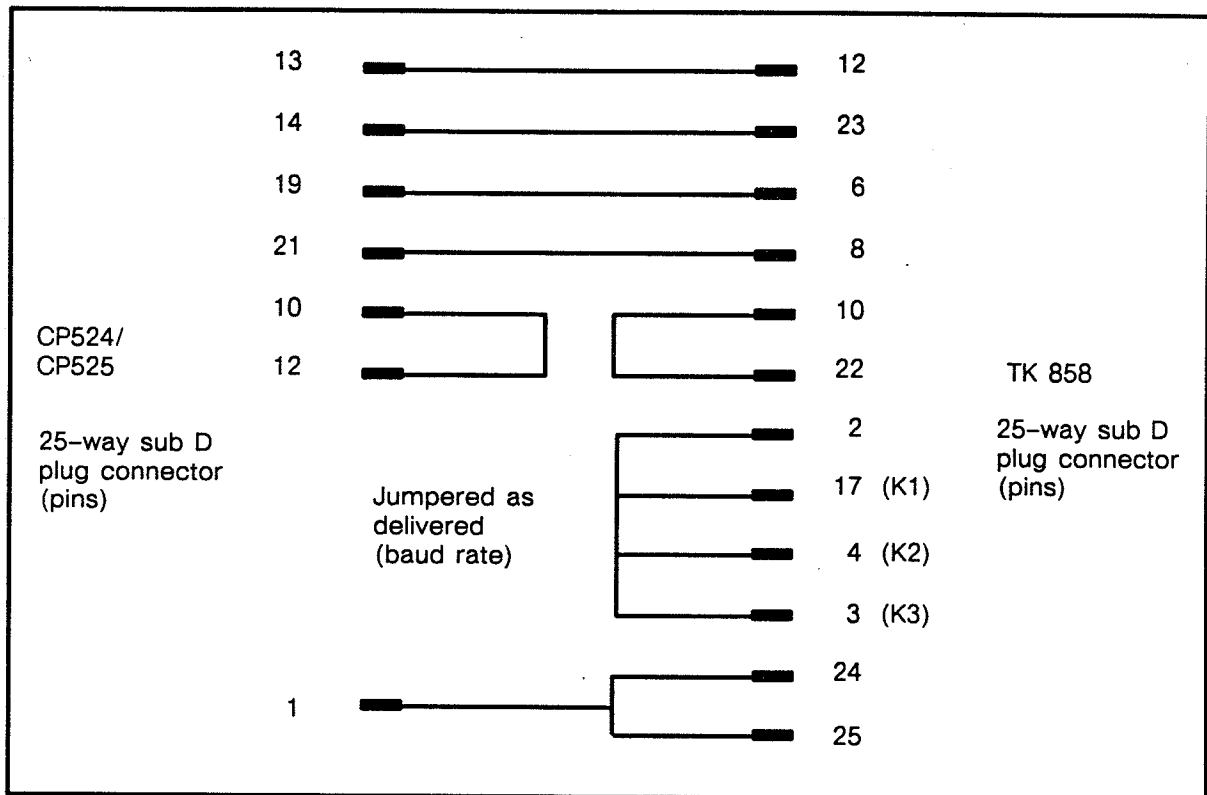




Figure 3.7 CP524/525 – TK 858 (TTY) connection cable


 The baud rate to the CP is set in the plug shell on the TK 858 side. As delivered, a baud rate of 9600 has been set (see section 3.3.4).  
 The plug connectors are labelled.
 

The interfaces are wired as follows when the TTY connection cable (figure 3.7) is used:

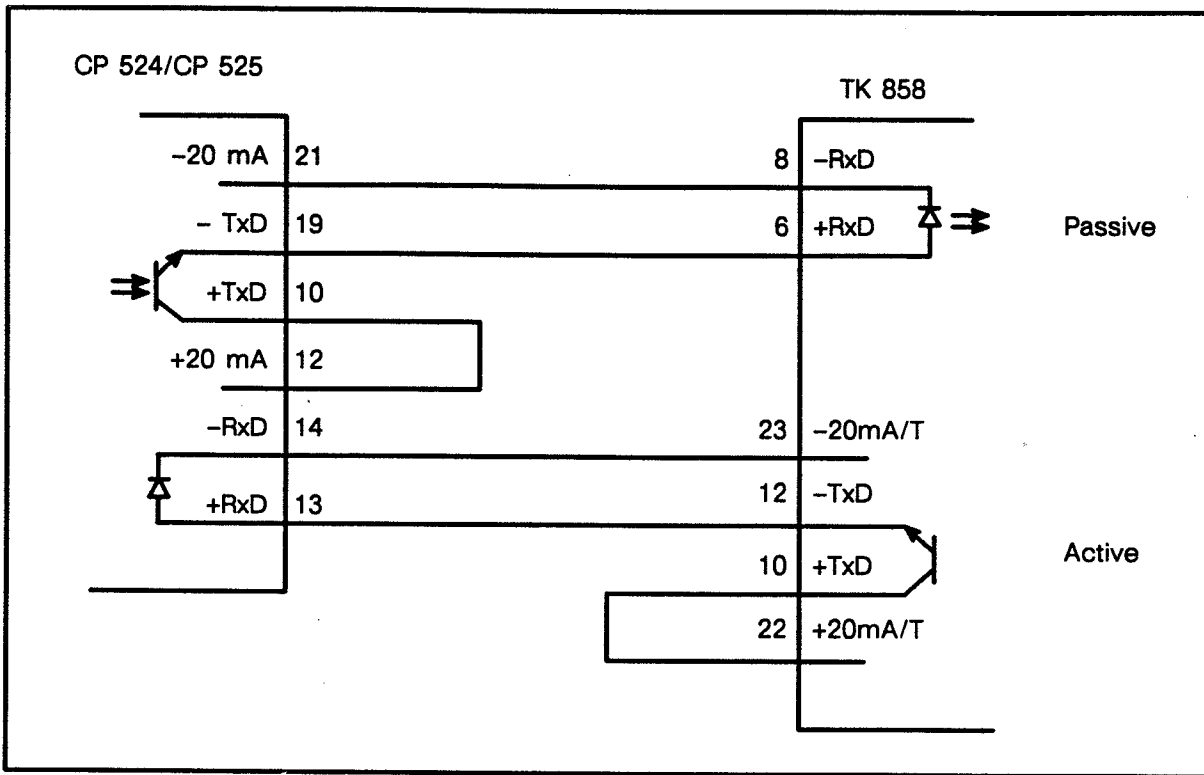




Figure 3.8 CP524/CP 525 - TK 858 (TTY) connection

### 3.9.3 TK 858 - Modem Connection Cable

Although this data cable is included with the TK 858, it is also available as a spare part (see section 1.10). The cable is connected on the TK 858 side at the terminals marked with the symbols  and .

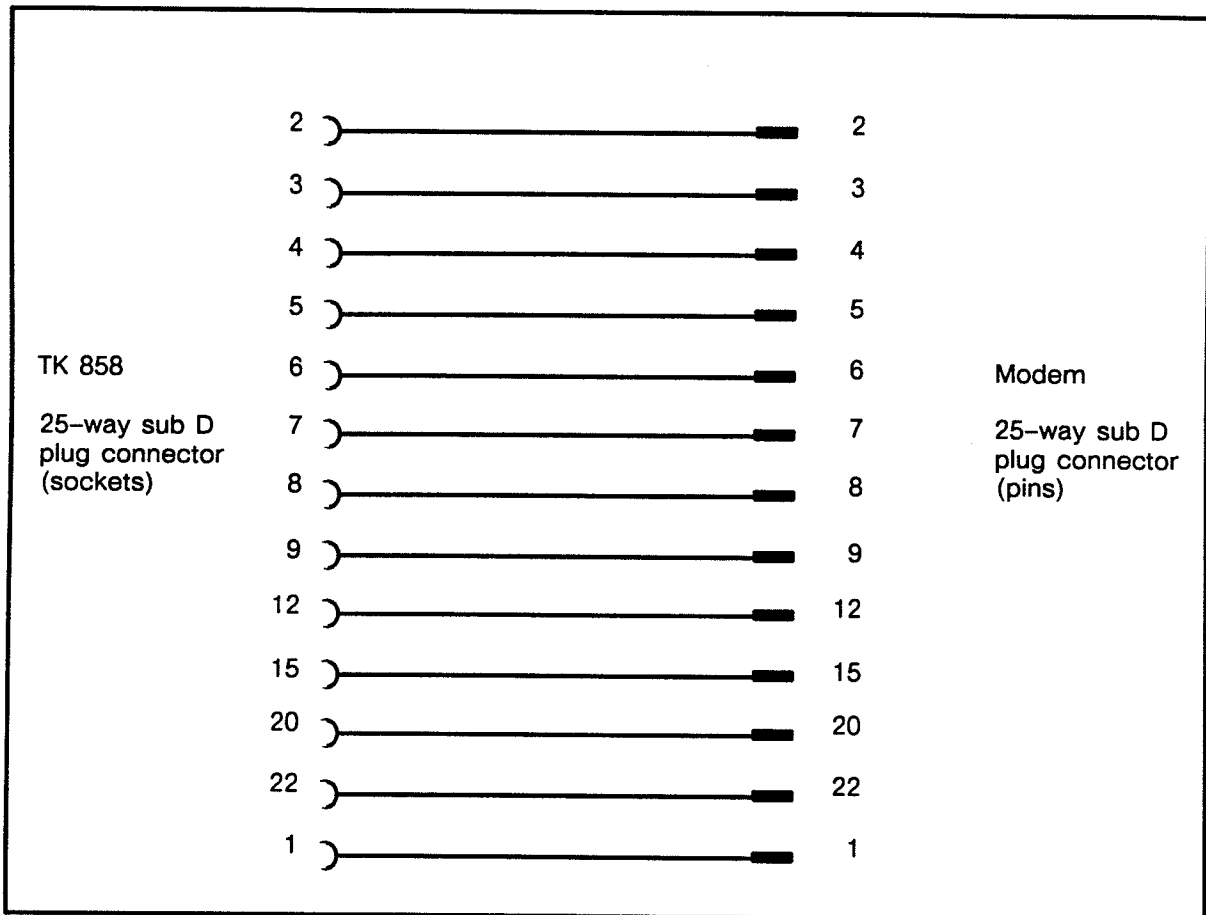


Figure 3.9 TK 858-modem connection cable

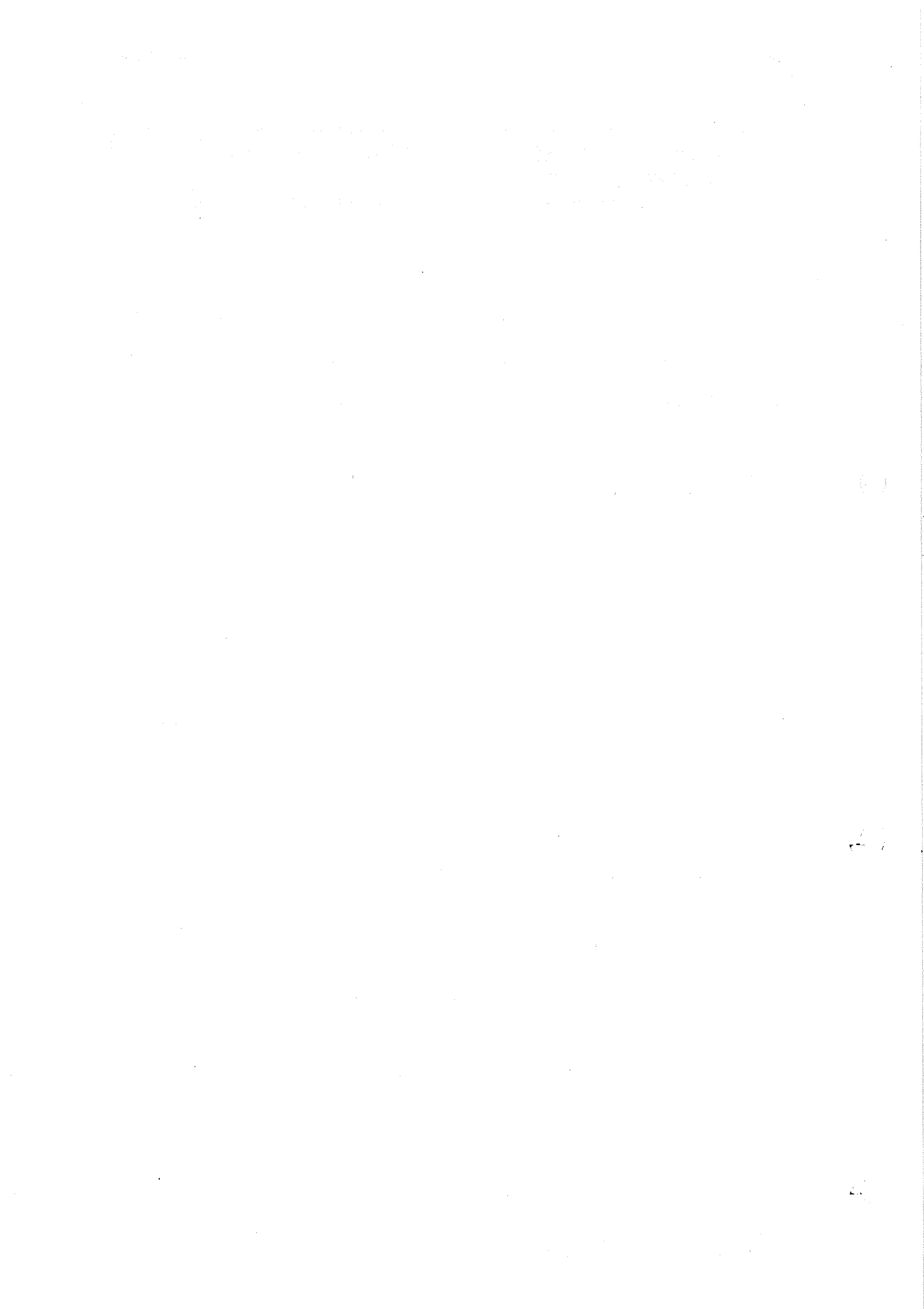
1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100.

1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100.

1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100.

## 4 Transferring Telephone Number from PU/PC with PRODAVE

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| 4.2 | PRODAVE DOS 511 ..... | 4 - 1 |
| 4.3 | PRODAVE DOS 64R ..... | 4 - 2 |



## 4.1 Introduction

The PRODAVE Toolbox provides a series of standard PRODAVE tools for process data communication between the SIMATIC S5 and the PU/PC. These tools must be integrated into a C or Pascal program by the programmer.

## 4.2 PRODAVE DOS 511

Using the AS511 protocol, PRODAVE DOS 511 can be used to implement a telecommunications link between the PU/PC (XT/AT or compatible with the MS-DOS operating system) and a SIMATIC programmable controller.

### Required Components

#### On the PU/PC Side:

- PRODAVE DOS 511 Toolbox (order no. 6ES5 886-2MP01)
- TK 858
- Modem

#### On the Partner (PLC) Side:

- TK 858
- Modem

When the telephone number is transferred from the PU/PC with PRODAVE DOS 511, both the TK 858 and the modem must be set in the same manner as for the automatic dialing of a telephone number stored in the PLC after a signal on the digital input of the TK 858 (see section 2.4.3).

DIP switch S2.1 must be set to "OFF" on the PU/PC side (see section 2.3.1).

Transmission of the telephone number is performed by the PU/PC with the **dial\_no** PRODAVE function. The TK 858 connection is automatically established via the connected modem.

When the connection has been successfully established, all PRODAVE functions can be executed via the telephone network.

The connection delink is also triggered by the PU/PC with the **telephone\_end** PRODAVE function.

When automatic dialing by the PLC via the TK 858 is used, the call recognition is performed directly in the PU/PC.

See the PRODAVE manual for details concerning data transmission with PRODAVE DOS 511 in connection with the TK 858.

### 4.3 PRODAVE DOS 64R

Using standard computer link RK512 or the 3964(R) procedure, PRODAVE DOS 64R can be used to implement a telecommunications link between the PU/PC (XT/AT or compatible with the MS-DOS operating system) and a SIMATIC programmable controller. The connection to communications processors CP 524 or CP 525, or to the CPU 928B is performed in the programmable controller.

#### Required Components

##### On the PU/PC Side:

- PRODAVE DOS 64R Toolbox (order no. 6ES5 897-2UD11)
- TK 858
- Modem

##### On the Partner (PLC) Side:

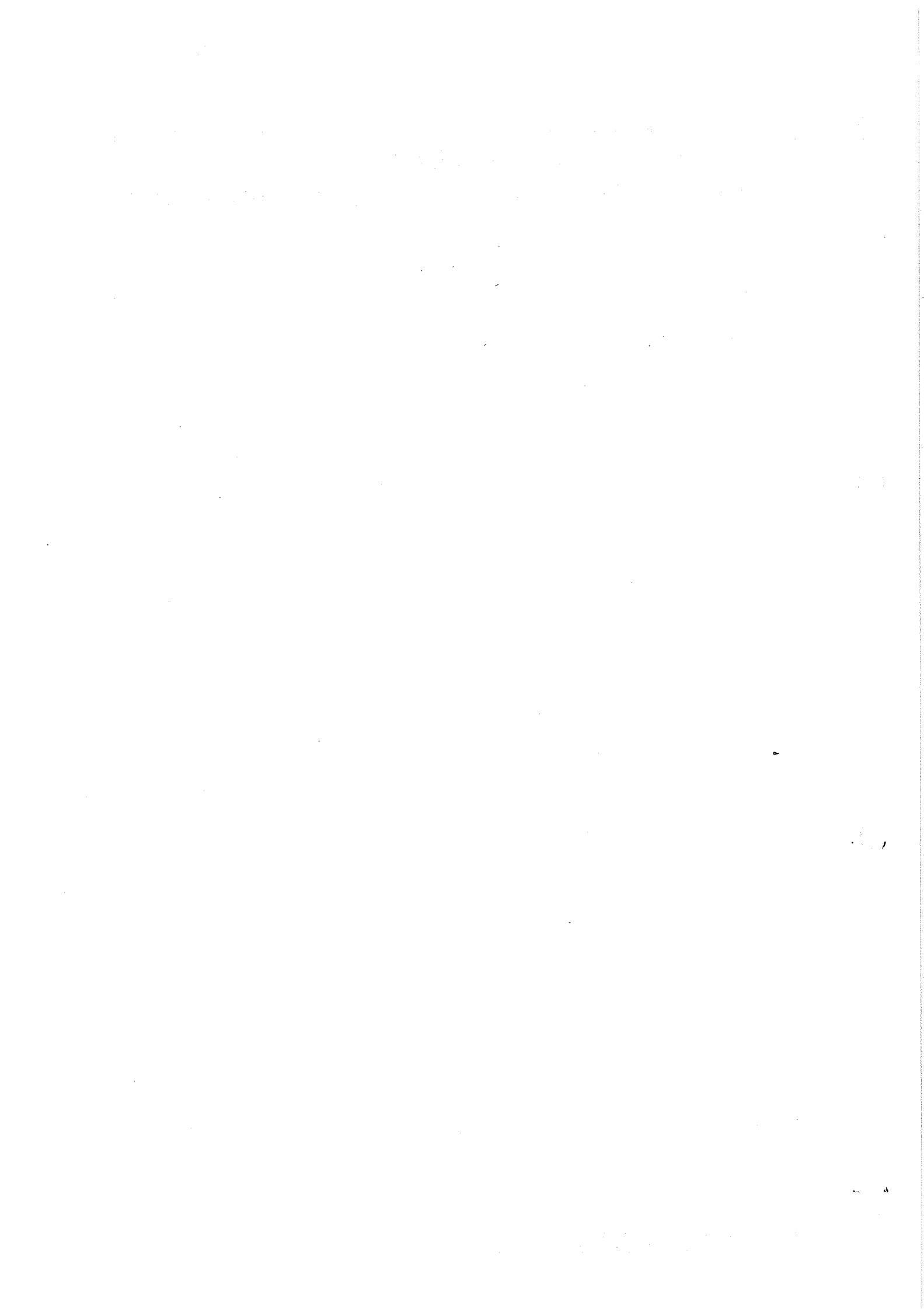
- CP 524 (order no. 6ES5 524-3UA13) or
- CP 525 (order no. 6ES5 525-3UA21)
- TK 858
- Modem

To use PRODAVE DOS 64R, proceed as described in section 3. The PC behaves as a communications processor.

See PRODAVE DOS 64R Operating Instructions for further details concerning PRODAVE DOS 64R.



## **5 Reserved for Future Expansion**



## Summary of parameter assignement for modem DATALINK V.32

(valid from V 4.40)

### 1. Execute "Factory-Default"

This loads the modem's factory preconfiguration.

### 2. Execute Quick Setup "2-W Dial Hayes"

### 3. The following parameters must be entered:

- V.42 -> DTE-Speed: 9600 Baud

- V.42 -> Flow control -> DTE->DCE: S2 ON/OFF

- V.42 -> Flow control -> DCE->DTE: M2 ON/OFF

- Auto Answer: Disabled/enabled optional

- Data format -> length: 11 Bit

- Data format -> Parity: even

- EIA -> M1: Norm

- Modem -> Ans/Org Originate -> local

Answer -> site

The option "Answer" should only be chosen for the "site".

- Modem -> Spkvol: Low

### 4. Execute Modem Reset

After entering all required parameters execute "Reset" in the "Main Menu" to save the parameters.

### Checking setup:

The correct setup of the modem can be checked in a short readable summary with "Summary Setup"  
(Modem manual:P.4-6ff)

### Checksum with Auto Answer

enable:

disable:

13B3

13C2

with DTE-Speed= 9600, Originate

13AB

13BA

with DTE-Speed= 9600, Answer

**Summary of parameter assignment for modem 2425M DX**

(valid from version A16)

1. Execute **FACTORY SETTING**  
This loads the modem's factory preconfiguration.
2. For entering additional parameters only bold faced parameters must be changed.

|       |                              |                              |
|-------|------------------------------|------------------------------|
| P01   | RATE SEL. PERM               |                              |
| P02   | MODE ASYNCHRON               |                              |
| - P03 | <b>CHAR. FORM 11</b>         |                              |
| P04   | RATE-TOL. NORMAL             |                              |
|       | LOOP OFF                     |                              |
| P09   | PSTN                         |                              |
| - P10 | <b>AUTOMATIC ANSWER/DIAL</b> | optional                     |
| P11   | MODE 108.2                   |                              |
| - P12 | <b>DISC 10 SEC</b>           |                              |
| P13   | NO GUARDTON                  |                              |
| P14   | WITH AT                      |                              |
| P18   | MODE 105                     |                              |
| - P20 | <b>ECHO OFF</b>              |                              |
| - P21 | <b>ESCAPE OFF</b>            |                              |
| - P22 | <b>ERRORCORRECT</b>          | optional                     |
|       | NO                           | <b>YES</b>                   |
|       | DTE-Speed fixed              | DTE-Speed freely selectable  |
|       | on 2400 Baud                 | the character frame must be  |
|       |                              | entered.                     |
|       |                              | - P23 <b>NO DATACOMPRESS</b> |
|       |                              | P24 FLOW CONTROLL YES        |
|       |                              | RTS/CTS                      |
|       |                              | - P25 <b>DTE-SPEED</b>       |
|       |                              | 300/600/1200/2400/4800/9600  |
|       |                              | optional                     |
|       |                              | - P26 <b>DTE 8DATA BITS</b>  |
|       |                              | P27 DTE WITH PARITY          |
|       |                              | P28 DTE EVEN PARITY          |
| P29   | AUTO. DIAL                   |                              |
| - P30 | <b>MODE IPC/MFC</b>          | optional                     |
| - P31 | <b>TIMEOUT 40/60 SEC</b>     | optional                     |
| P32   | MODE 109                     |                              |
| P33   | NO AUTO.CALL REPEAT          |                              |
| P34   | DISPLAY DIAL                 |                              |
| - P35 | <b>V25BIS-MODE</b>           |                              |

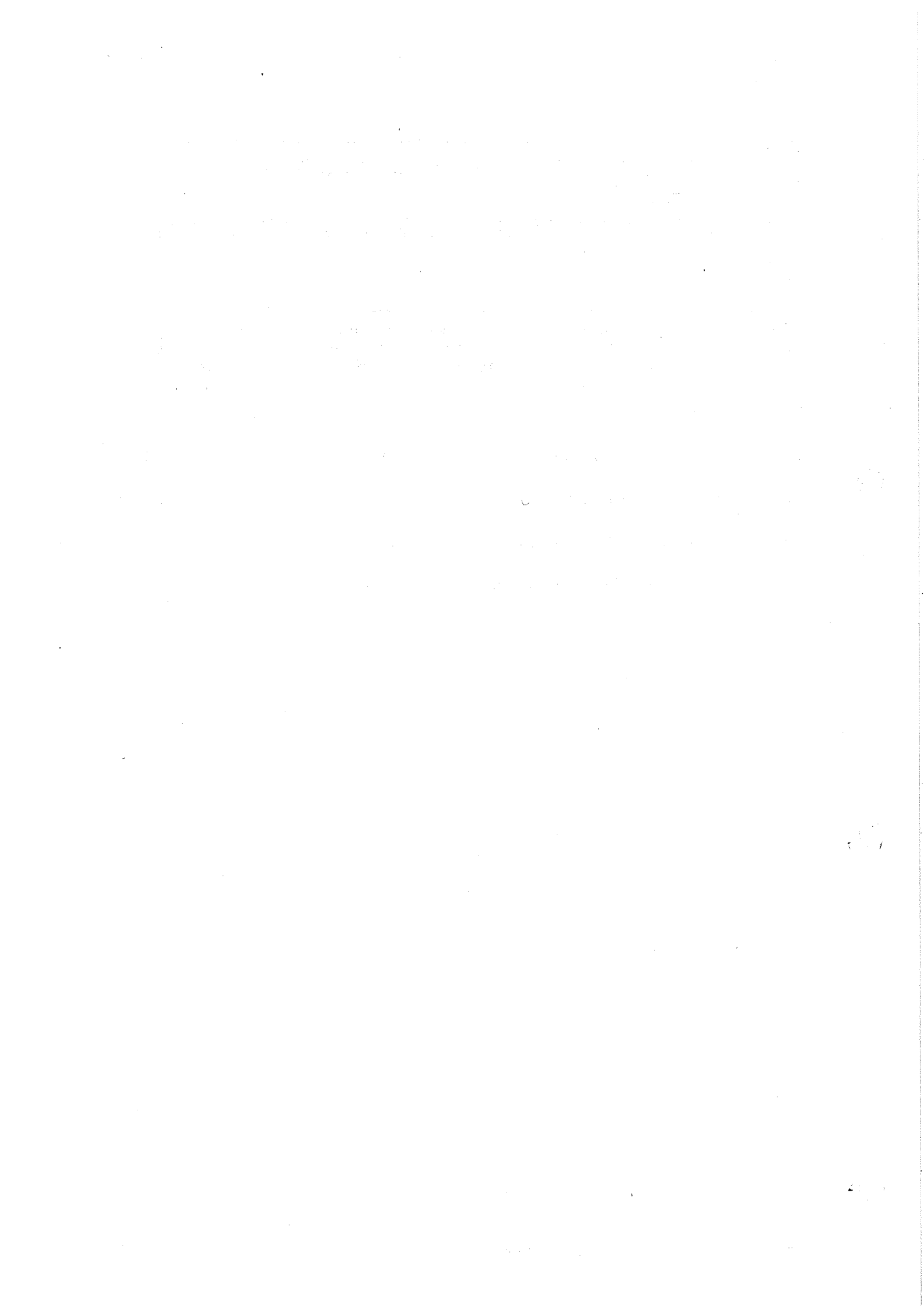
## 6 Examples of Connecting and Setting a Modem



Completed modifications or further development of the modem cannot be taken into consideration after this equipment manual is published.



|     |  |        |
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| 6.3 | Setting the 2425B DX Modem .....                   | 6 - 5  |
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## 6.1 General

### 2425B DX and 2425M DX

The most important technical feature of modem 2425B DX (starting with FW status 8D) and modem 2425M DX, which we recommend for use with the TK 858, is the capability of asynchronous, full-duplex, data transmission (V.22bis) at rates of up to 2400 bits/sec. They can be used for either manual or automatic operation. In addition, these modems also offer many other capabilities which cannot be covered here, however. Instead, the basic settings which will enable you to commission the modem will be specified here. Be sure that the transmission rate is also set correctly on the TK 858. The settings on the modem must agree with the settings on the modem interface of the TK 858 (DIP switch). Exception for PU function: When transmitting at 1200-baud, the TK 858 must be set to 2400 baud (the modem switches the TK 858 internally to 1200 baud).

### DATALINK V.32M

The DATALINK V.32M modem can be operated at baud rates between 300 and 14400 bits/sec. The full-duplex modem uses the public telephone network or 2/4-wire dedicated lines. It operates at 9600 and 4800 baud in accordance with CCITT recommendation V.32, and switches back automatically to V.22bis (2400 baud), V.22 (1200 and 600 baud), V.21 (300 baud) or V.23 (1200/75 baud). Asynchronous or synchronous operation is possible at speeds of 600 baud and higher; the transmission mode is always asynchronous at 300 baud and 1200/75 baud. The preset maximum transmission rate on the transmission line (e.g., telephone line) is 14400 baud. The default transmission speed (DTE SPEED) on the V.24/V.28 serial interface is 38400 baud. It can be used for either manual or automatic operation.

Over 50 adjustable parameters allow optimum configuration of the DATALINK V.32M to your application. All parameters can be set in the operating field of the modem. A QUICK SETUP function can be used to call parameter sets for preset configurations.

## 6.2 Connecting the Modem Parallel to a Telephone

You can connect the modem, together with a telephone, to a single, already existing telephone line. This permits either normal telephone conversation, or, after a button is pressed on the modem, data communication. All that is required is a double or triple plug receptacle which is equipped with a cable to your telephone outlet in the wall.

Two kinds of plug systems – the ADO8 and the TAE6 – are used most frequently. Older devices (modems, telephones) are equipped with 8-way, ADO8 plug connectors. An ADO8, double plug receptacle is wired in such a manner that a common cable leads to the wall outlet. The modem is plugged into one socket while the telephone is plugged into the other. Figure 6.1 shows the wiring of the double plug receptacle.

**!** Remember that only personnel authorized by the German Bundespost may make modifications to public telephone connections. **!**

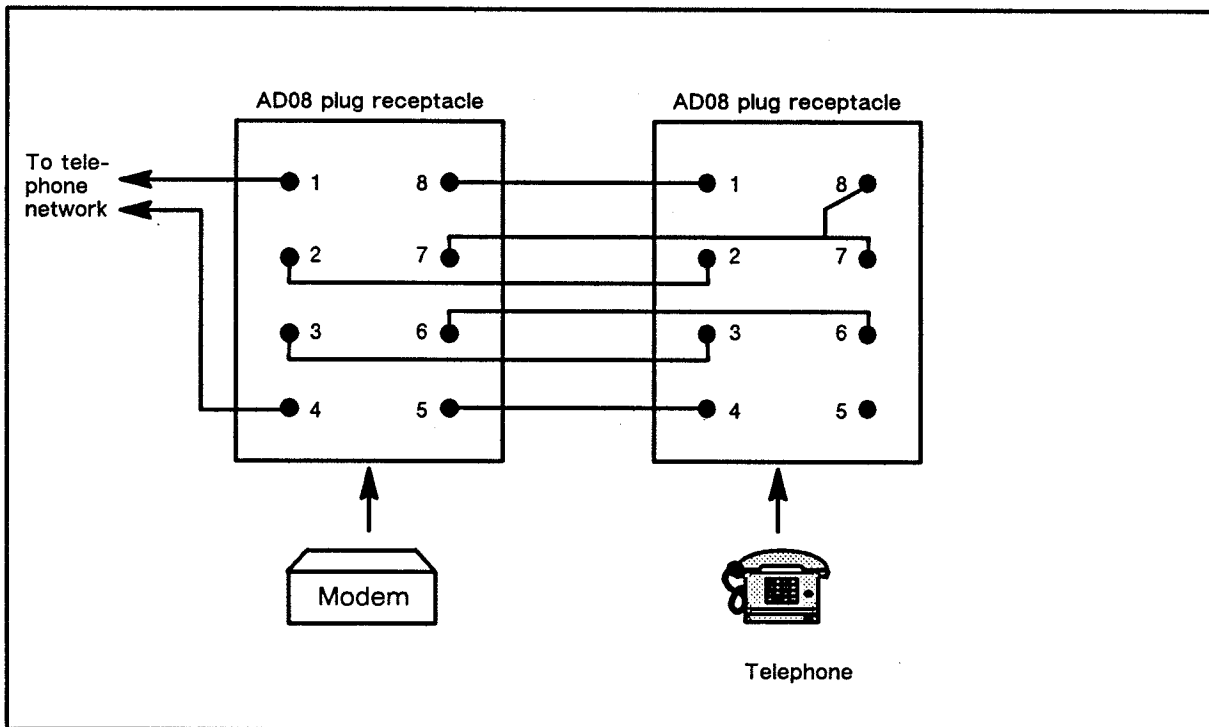


Figure 6.1 Double telephone plug receptacle ADO8



The new TAE6 plug connectors and plug receptacles have been in use for both modems and telephones since July 1, 1989.

The standardized, triple plug receptacle "NFF", consisting of 3 TAE6 plug receptacles (1 TAE6N and 2 TAE6Fs), is to be used for the connection to the telephone line. The modem is connected to the TAE6N socket and the telephone to one of the two TAE6F sockets (the second TAE6F socket is usually not used). The wiring of the "NFF" socket is shown in figure 6.2 (for information purposes). As with the ADO8, the connection line to the telephone network also contains 2 wires.

Should the devices (modem, telephone) have different connectors (e.g., the modem has TAE6 while the telephone has ADO8), we recommend the following solution:

Use the "NFF" socket, and use an "ADO8 - TAE6" adapter (available commercially or through the German Bundespost) for the ADO8 plug connector.

**When modem and telephone are connected with multi-plug receptacle:**

Alternating between speaking and modem operation is performed by simply pressing the DATA/TALK key on the modem. The key must be activated on both modems when changing from speaking to modem operation.

Only applicable to PU function:

Activation of the key on one side is sufficient when changing from modem operation to speaking operation. If the person on the opposite end does not notice that data transmission has been interrupted, he or she will be made aware of the fact when the hooter on the TK 858 activates after approximately 10 seconds. The key must be activated again to resume the data connection.

Remember that only personnel authorized by the German Bundespost may make modifications to public telephone connections.

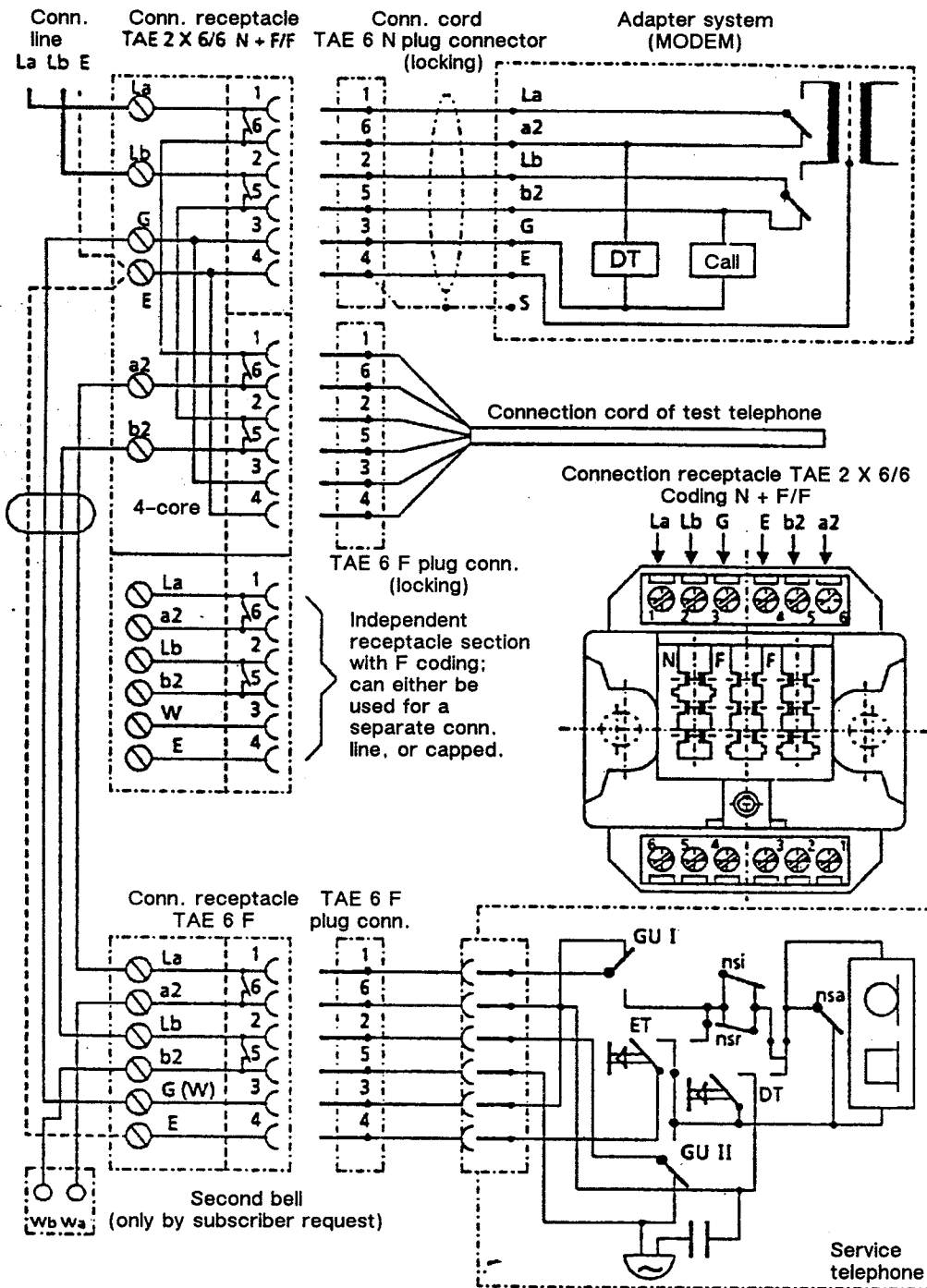


Figure 6.2 Triple telephone plug receptacle TAE6 "NFF"

### 6.3 Setting the 2425B DX Modem

After the modem is turned on, it can be set with the ROLL and SET keys.

First, press the ROLL key continuously for several seconds until you see the first line of the setting menu. The setting menu then advances by one line each time this key is activated. Each line shows the value to be set and two possible alternatives. The selected alternative flashes. Use the SET key to switch to the other alternative. The settings are described on the following pages. See also the instruction manual of your modem. The line numbers correspond to the numbers in this manual. Line 10 requires some explanation. When AUT.ANSW-MAN is set, this means that, during operating, the voice connection is established first and then a switchover to data operation is performed manually with the DATA/TALK key. If AUT.ANSW-AUT is selected in line 10, the subscriber's telephone whom you have called only rings once. The modem then switches on automatically. The caller then presses the DATA/TALK key as soon as he hears a whistle tone.

Select AUT.ANSW = AUT in line 10 for both communicating modems if the call and the call answering are to be performed automatically. Operating personnel are not required during automatic operation of the modems.

**List of settings for the SIMATIC S5:**

(The underlined settings apply.)

**Transmission rate**

1 

|      |             |   |     |
|------|-------------|---|-----|
| RATE | <u>PERM</u> | - | 111 |
|------|-------------|---|-----|

The transmission rate is set permanently and is switched by the data terminal equipment (DTE) over interface line 111. The modem switches to the high transmission rate when interface line 111 is ON.

When one modem is set to 2400 baud and the partner modem is set to 1200 baud, both modems operate with 1200 baud (automatic switchover).

2 

|      |       |   |              |
|------|-------|---|--------------|
| RATE | 1.2 K | - | <u>2.4 K</u> |
|------|-------|---|--------------|

The transmission rate is permanently set to 1.2 kbaud or 2.4 kbaud.

**Asynchronous or synchronous operation**

3 

|      |             |   |     |
|------|-------------|---|-----|
| MODE | <u>ASYN</u> | - | SYN |
|------|-------------|---|-----|

The connected data terminal equipment supplies asynchronous or synchronous data.

6 

|         |      |   |             |
|---------|------|---|-------------|
| CH.FORM | 8/10 | - | <u>9/11</u> |
|---------|------|---|-------------|

Preselection of the character length during asynchronous operation. The character length including start and stop bits is 8/10 bits or 9/11 bits.

7 

|         |    |   |           |
|---------|----|---|-----------|
| CH.FORM | 09 | - | <u>11</u> |
|---------|----|---|-----------|

The character length including start and stop bits for asynchronous data is 9 or 11 bits.

**Speed tolerance in asynchronous operation**

8 

|           |             |   |            |
|-----------|-------------|---|------------|
| RATE - T. | <u>NORM</u> | - | <u>EXP</u> |
|-----------|-------------|---|------------|

The permissible deviation from the nominal transmission rate is +1%,/-2.5% (NORM) or +2.3%/-2.5% (EXP).

**Selecting the transmission route**

9 

|      |      |   |    |
|------|------|---|----|
| MODE | PSTN | - | LL |
|------|------|---|----|

 Choice of one

The modem is used on the public switched telephone network (PSTN) or on a dedicated line (LL).

**Connecting the transmission line**

10     

|          |     |   |     |
|----------|-----|---|-----|
| AUT.ANSW | MAN | - | AUT |
|----------|-----|---|-----|

     Choice of one

For use with public switched telephone network:

Use this parameter to select whether the modem answers an incoming call automatically or manually (i.e., press data/talk key).

11     

|      |       |   |       |
|------|-------|---|-------|
| MODE | 108.1 | - | 108.2 |
|------|-------|---|-------|

     Choice of one

For PU function

The following setting is recommended for manual dialing:

Line 11 = set 108.2

Line 26 = set NO

(On the TK 858, S2.5 must be set to ON and S2.7 to OFF.)

Line 108 is activated by the digital input of the TK 858 (e.g., PLC side) for automatic dialing.

Line 11 = set 108.1

Line 26 = set DIAL

The number stored in line 35 is then dialed. (On the TK 858: S2.5 and S2.7 OFF) The type of call answering is set in line 10.

For computer link

In the public switched telephone network, the modem is controlled by interface line 108.1 ("connect transmission line") or by interface line 108.2 ("data terminal ready").

In operating mode 108.1, the modem immediately switches to the telephone line when interface line 108 goes ON. The modem immediately dials the stored number (see line 35) when "automatic dialing" is set in line 26.

In operating mode 108.2, the modem does not switch to the telephone line until the DATA/TALK key is pressed after interface line 108 goes ON, or until a call arrives, or until the telephone number is transmitted during automatic dialing.

**Automatic disconnection**

12     

|      |      |   |           |
|------|------|---|-----------|
| DISC | 250M | - | <u>10</u> |
|------|------|---|-----------|

If the line is interrupted (interface line 109 OFF) for more than 250 msec or 10 sec, the modem is automatically disconnected from the line.

**Guard tone**

13      

|         |     |   |           |
|---------|-----|---|-----------|
| GUARDT. | 550 | - | <u>NO</u> |
|---------|-----|---|-----------|

Operation with or without a 550-Hz guard tone

14      

|         |      |   |           |
|---------|------|---|-----------|
| GUARDT. | 1800 | - | <u>NO</u> |
|---------|------|---|-----------|

Operation with or without a 1800-Hz guard tone

In some countries a special signal tone called a guard tone is transmitted along with the data signal, and evaluated by the central office. When communicating with modems in such countries you must therefore have the guard tone switched on (e.g., 1800 for Great Britain).

**Communicating with Bell 212-A modems**

15      

|      |      |   |           |
|------|------|---|-----------|
| MODE | 212A | - | <u>NO</u> |
|------|------|---|-----------|

The 2425B DX modem can be used or not used with Bell 212-A specification modems.

**Clamping**

16      

|       |             |   |    |
|-------|-------------|---|----|
| DELAY | <u>V.24</u> | - | NO |
|-------|-------------|---|----|

Clamping of V.24 interface lines 106 and 109 can be cancelled with or without delay after a handshake procedure is completed.

**Answer tone**

17      

|      |             |   |    |
|------|-------------|---|----|
| MODE | <u>W.AT</u> | - | NO |
|------|-------------|---|----|

Operation with or without an answer tone. Thus, line 18 has no function during dial line operation (automatic channel assignment).

**Selecting the channel for dedicated (leased) lines or for operation without answer tone**

18      

|      |      |   |      |
|------|------|---|------|
| MODE | CALL | - | ANSW |
|------|------|---|------|

      Choice of one

Sending on the low channel and receiving on the high channel, or sending on the high channel and receiving on the low channel. For dedicated lines, one modem must be set to CALL and the other modem to ANSW.

**Controlling interface line 108 on dedicated (leased) lines**

19      

|      |            |   |      |
|------|------------|---|------|
| MODE | <u>108</u> | - | PERM |
|------|------------|---|------|

Interface line 108 can be controlled by the DTE or can be permanently held ON.

**How the carrier works on a dedicated (leased) line**

20      

|       |      |   |             |
|-------|------|---|-------------|
| CARR. | CTR. | - | <u>PERM</u> |
|-------|------|---|-------------|

CCITT recommendation V.22bis requires that a carrier signal (permanent carrier = PERM) be continuously transmitted during 2400-bit/sec transmission on dedicated lines. A fixed procedure synchronizes the receiver. For test purposes, however, it is helpful when the sending signal can be switched on and off by interface line 105 (controlled carrier = CTR).

Either operation mode can be used without restrictions at 1200 baud.

**Controlling interface line 105**

21      

|      |            |   |      |
|------|------------|---|------|
| MODE | <u>105</u> | - | PERM |
|------|------------|---|------|

Interface line 105 can be controlled by the DTE or be held permanently ON.

**Controlling the modem with a personal computer (PC)**

22      

|      |    |   |           |
|------|----|---|-----------|
| WITH | PC | - | <u>NO</u> |
|------|----|---|-----------|

The modem can be controlled by a personal computer or not.

23      

|      |            |   |    |
|------|------------|---|----|
| ECHO | <u>OFF</u> | - | ON |
|------|------------|---|----|

When ON, the modem transmits the send data coming from the PC on line 103 back to the PC on line 104 "receive data" (in command mode).

24      

|       |      |   |              |
|-------|------|---|--------------|
| COMP. | HAYS | - | <u>V25.B</u> |
|-------|------|---|--------------|

The data transmission procedure between PC and modem is compatible with the Hayes command set or corresponds to the expanded V.25bis procedure.

25      

|        |    |   |            |
|--------|----|---|------------|
| ESCAPE | ON | - | <u>OFF</u> |
|--------|----|---|------------|

If this parameter is ON, there are two ways to switch from data transmission mode to command input mode (e.g., to insert a test loop):

- Controlled by a definite character string (e.g., +++) on interface line 103 or
- Controlled by interface line 108 being OFF for 25 msec

**Automatic dialing**

26 

|        |      |   |    |
|--------|------|---|----|
| AUTOM. | DIAL | - | NO |
|--------|------|---|----|

 Choice of one

For use in the public telephone network:  
Set NO for manual establishment of the connection.  
Set DIAL for automatic establishment of the connection (see line 11).

**Methods of dialing**

27 

|      |     |   |     |
|------|-----|---|-----|
| MODE | IPC | - | MFC |
|------|-----|---|-----|

 Choice of one

Select from 2 dialing methods: pulse dialing or multi-frequency dialing.

**Timeout**

28 

|         |    |   |    |
|---------|----|---|----|
| TIMEOUT | 30 | - | 60 |
|---------|----|---|----|

 Choice of one

30-sec or 60-sec timeout. The time spent waiting for answer tone from the other party (e.g., 60 sec for long telephone numbers when calling foreign countries)

**Displaying the dialed characters**

31 

|        |             |   |    |
|--------|-------------|---|----|
| DISPL. | <u>DIAL</u> | - | NO |
|--------|-------------|---|----|

During dialing, the dialed characters can be indicated on the display or not indicated.

**Activating the test loops**

33 

|       |    |   |            |
|-------|----|---|------------|
| LOOPS | ON | - | <u>OFF</u> |
|-------|----|---|------------|

Interface lines 140 and 141 for controlling test loop PS2 and/or PS3 can be activated via the V.24 plug connector of the DTE (ON).  
(If not used: OFF)

34 

|      |     |   |             |
|------|-----|---|-------------|
| MODE | 109 | - | <u>PERM</u> |
|------|-----|---|-------------|

**Identification and call number (only for 108.1 operation, see line 11)**

35 

|            |       |
|------------|-------|
| 0000000000 | IDENT |
|------------|-------|

 Choice of one

An identification number of up to 16 characters can be input.

36 

|            |      |
|------------|------|
| 0000000000 | CALL |
|------------|------|

 Choice of one

A call number of up to 19 characters can be input.



## 6.4 Setting the 2425M DX Modem

After the modem is turned on, it can be set with the ROLL and SET keys.

First, press the ROLL key continuously for several seconds until you see the first line of the setting menu. The setting menu then advances by one line each time this key is activated. Each line shows the value to be set and two possible alternatives. The selected alternative flashes. Use the SET key to switch to the other alternative. The settings are described on the following pages. See also the instruction manual of your modem. The line numbers correspond to the numbers in this manual. Line P10 requires some explanation. When ANSWER-MAN is set, this means that, during operating, the voice connection is established first and then a switchover to data operation is performed manually with the DATA/TALK key. If ANSWER-AUTO is selected in line P10, the subscriber's telephone whom you have called only rings once. The modem then switches on automatically. The caller then presses the DATA/TALK key as soon as he hears a whistle tone.

Select ANSWER-AUTO in line P10 for both communicating modems if the call and the call answering are to be performed automatically. Operating personnel are not required during automatic operation of the modems.

**List of Settings for the SIMATIC S5:**

(The preferred settings are underlined.)

Parameters P01 to P08 are used to set data communication between terminal and modem.

**Transmission rate**

P01 

|           |             |   |     |
|-----------|-------------|---|-----|
| RATE SEL. | <u>PERM</u> | - | 111 |
|-----------|-------------|---|-----|

The transmission rate is permanently set (PERM) or is switched by the data terminal equipment (DTE) on interface line 111. When interface line 111 is ON, the modem switches to the higher transmission speed. Interface line 111 only takes effect when the setting is V.22/1200 (1200/600 bits/sec) or V.22bis/2400 (2400/1200 bits/sec).

In PCs, interface line 111 is normally not connected so you should select a fixed transmission rate (PERM). The setting "RATE SEL. 111" disables automatic fallback.

**Asynchronous operation (start-stop) or synchronous operation**

P02 

|      |                  |   |          |
|------|------------------|---|----------|
| MODE | <u>ASYNCHRON</u> | - | SYNCHRON |
|------|------------------|---|----------|

The connected DTE provides asynchronous or synchronous data.

**Asynchronous format:**

Most PCs work asynchronously with a character length of 10 bits: 7-bit ASCII plus parity bit or extended ASCII with 8 data bits and no parity bit. In asynchronous operation, no common timing is required.

**Synchronous format:**

Synchronous operation does require timing.

**Character format for asynchronous operation**

P03 

|                |   |   |   |   |    |   |           |
|----------------|---|---|---|---|----|---|-----------|
| CHARACTER.FORM | 8 | - | 9 | - | 10 | - | <u>11</u> |
|----------------|---|---|---|---|----|---|-----------|

Selecting the character length for asynchronous operation: The character length including start and stop bits is 8, 9, 10, or 11 bits.

The character length setting is of no consequence if you are using the error correction facility. Note that in V.25bis or Hayes mode, the character length is limited. The character length set here is then only relevant to data transmission.

**Speed tolerance in asynchronous mode**

P04 

|             |        |   |                 |
|-------------|--------|---|-----------------|
| RATE - TOL. | NORMAL | - | <u>EXTENDED</u> |
|-------------|--------|---|-----------------|

The permissible variation from the nominal transmission rate is  $\pm 1\%/-2.5\%$  (NORMAL) or  $\pm 2.3\%/-2.5\%$  (EXTENDED).

**Timing for synchronous operation**

P05      TIMING                    INT 114   -   EXT 113   -   EXT 115

If timing is provided internally, the clock used for sending the synchronous data from the DTE is the modem's own Transmit Clock (interface line 114) (TIMING INT 114).

If timing is supplied externally, the transmit data can be accepted with

- the Transmit Clock from the DTE, provided to the modem through interface line 113 (TIMING EXT 113) or
- the Receive Clock of the modem, provided to the DTE through interface line 115 and 114 (clock loop) (TIMING EXT 115).

**Character code in synchronous operation**

P06      CHAR.FORM                    EBCDIC   -   ASCII

In synchronous operation there is a choice between EBCDIC and ASCII. PCs and small computers use ASCII code (7-bit); mainframes use EBCDIC code (8-bit).

**Data transmission between modem and DTE**

P07      MODE                            HDLC   -   BSC

In synchronous mode with the extended V.25bis protocol, the commands are transmitted between the DTE and the modem in HDLC format (High Level Data Link Control) or BSC format (Binary Synchronous Communication).

**Activating the test loops**

P08      LOOP                            ON   -   OFF

Interface lines 140 and 141, which control the LP2 and LP3 test loops, can be activated (ON) or prevented (OFF) by the DTE via the V.24 plug connector.

The DTE will often not provide lines 140 and 141. In such cases, be sure to set LOOP OFF.

Parameters P09 to P15 specify the way the modem is connected to the exchange line.

**Selecting the transmission route**

P09      MODE                            PSTN   -   LL

The modem is used on a public switched telephone network (PSTN) or on a leased line (LL).

**Connecting to the transmission line**

P10      ANSWER                      MAN                      -                      AUTO      Choice of one

The modem is manually connected to the telephone line using the data key or it automatically answers incoming calls (only when used on the telephone network).

P11      MODE                      108.2                      -                      108.1

In the telephone network, the modem is controlled through interface line 108.1 "connect to transmission line" or through interface line 108.2 "data terminal ready". In 108.1 mode the modem connects to the telephone line immediately when interface line 108 is ON. If line P29 is set to "auto dial" and at the same time an identification number is stored, the modem will immediately dial the stored number (see line P37).

In 108.2 mode, the modem does not connect to the telephone line until the DATA/TALK button is pressed with interface line 108 ON, or until a call comes in.

You will normally want to select mode 108.2. Mode 108.1 is only used in a few special cases (e.g., when controlling line 108.1 by an alarm encoder). In the event of an alarm the stored number will automatically be dialed and a prepared message sent.

**Automatic disconnection**

P12      DISC                      10 SEC                      -                      250 MSEC

If the line is interrupted (interface line 109 OFF) for more than 250 msec or 10 sec, the modem is automatically disconnected from the telephone line.

**Guard tone**

P13      GUARDTON                      NO                      -                      1800HZ                      -                      550HZ

**Operation with or without guard tone**

In some countries a special signal called a guard tone is transmitted along with the data signal, and evaluated in the central office. When communicating with modems in such countries you must therefore have the guard tone switched on (e.g., the guard tone is 1800 Hz in Great Britain).

**Answer tone**

P14      MODE                      WITH AT                      -                      NO AT

**Operation with or without an answer tone**

(MODE NO AT is only used in special exceptions.)

Parameters P15 and P16 are for dedicated (leased) lines.

#### Controlling interface line 108 on dedicated (leased) lines

|     |      |     |   |          |
|-----|------|-----|---|----------|
| P15 | MODE | 108 | - | 108 PERM |
|-----|------|-----|---|----------|

Interface line 108 can be controlled by the DTE or held permanently ON.

#### How the carrier works on a dedicated (leased) line

|     |         |     |   |      |
|-----|---------|-----|---|------|
| P16 | CARRIER | CTR | - | PERM |
|-----|---------|-----|---|------|

CCITT recommendation V.22bis requires that a carrier signal (permanent carrier = PERM) be continuously transmitted during 2400-bit/sec transmission on dedicated lines. A fixed procedure synchronizes the receiver. For test purposes, however, it is helpful when the sending signal can be switched on and off by interface line 105 (controlled carrier = CTR).

Either operation mode can be used without restrictions at 1200 baud.

#### Channel selection on a dedicated (leased) line or in operation with no answer tone

|     |      |      |   |        |
|-----|------|------|---|--------|
| P17 | MODE | CALL | - | ANSWER |
|-----|------|------|---|--------|

Transmit on the low channel and receive on the high channel (CALL) or transmit on the high channel and receive on the low channel (ANSW). The channel allocation is automatic on the telephone network.

Parameters P18 to P21 specify data communication between the data terminal (e.g., PC) and the modem.

#### Controlling interface line 105

|     |      |            |   |          |
|-----|------|------------|---|----------|
| P18 | MODE | <u>105</u> | - | 105 PERM |
|-----|------|------------|---|----------|

Interface line 105 can be controlled by the DTE or held permanently ON.

#### Delaying interface line 106

|     |            |      |   |       |
|-----|------------|------|---|-------|
| P19 | RESP. TIME | 30MS | - | 240MS |
|-----|------------|------|---|-------|

Interface line 106 responds 30 msec or 240 msec after interface line 105 is switched off.

This only applies to modem setting V.23.

**Echoing text on the screen**

P20 

|      |    |   |     |
|------|----|---|-----|
| ECHO | ON | - | OFF |
|------|----|---|-----|

If this parameter is set to ON, the modem transmits the sending data coming from the PC on interface line 103 back to the PC on interface line 104 "receive data". The ECHO ON setting only takes effect during auto dialing. The commands sent by the PC to the modem on interface line 104 "receive data" are displayed on the monitor screen of the PC, allowing the PC user to check that he has entered the command correctly.

**Interrupting data transmission**

P21 

|        |    |   |     |
|--------|----|---|-----|
| ESCAPE | ON | - | OFF |
|--------|----|---|-----|

If this parameter is set to ON, there are two ways of switching from data transmission to command input (e.g., to perform a test loop):

- Controlled by a specific character string on interface line 103, or
- Controlled by interface line 108 being OFF for 25 msec

Parameters P22 to P28 are only displayed in asynchronous operation with the error correction or data compression option included.

**Switching on error correction**

P22 

|               |     |   |    |
|---------------|-----|---|----|
| ERRORCORRECT. | YES | - | NO |
|---------------|-----|---|----|

**Switching on data compression**

P23 

|               |     |   |    |
|---------------|-----|---|----|
| DATACOMPRESS. | YES | - | NO |
|---------------|-----|---|----|

**Setting FLOW CONTROL**

P24 

|              |     |   |    |
|--------------|-----|---|----|
| FLOW CONTROL | YES | - | NO |
|--------------|-----|---|----|

**Setting the terminal device baud rate**

P25 

|     |     |   |     |   |      |   |      |   |      |   |         |
|-----|-----|---|-----|---|------|---|------|---|------|---|---------|
| DTE | 300 | - | 600 | - | 1200 | - | 2400 | - | 4800 | - | 9600bps |
|-----|-----|---|-----|---|------|---|------|---|------|---|---------|

**Setting the data format**

|     |              |                           |   |    |
|-----|--------------|---------------------------|---|----|
| P26 | DTE DATABITS | 7                         | - | 8  |
| P27 | DTE PARITY   | WITH                      | - | NO |
| P28 | DTE PARITY   | EVEN - ODD - MARK - SPACE |   |    |

Parameters P29 to P36 concern auto dialing.

**Automatic dialing**

|     |            |     |   |    |               |
|-----|------------|-----|---|----|---------------|
| P29 | AUTO. DIAL | YES | - | NO | Choice of one |
|-----|------------|-----|---|----|---------------|

In the public switched telephone network: Operation with or without auto dialing

The following parameters must be set for automatic dialing after a signal on the digital input with telephone numbers stored in the modem.

```
P11 MODE      108.1
P29 AUTO. DIAL YES
```

The following parameters must be set for automatic dialing after a signal on the digital input with telephone numbers stored in the PLC.

```
P11 MODE      108.1
P29 AUTO. DIAL YES
```

If auto dialing is selected you must set the following parameters to match your modem peripherals. If you connect your modem to the line with the data key, you need no further parameters.

**Methods of dialing**

|     |      |     |   |     |
|-----|------|-----|---|-----|
| P30 | MODE | IPC | - | MFC |
|-----|------|-----|---|-----|

Select from two dialing methods: pulse dialing and multi-frequency dialing.

If your modem display shows that a number has been dialed but you cannot establish a connection, the reason may be that your telephone system uses a different dialing method. Trying the other method to see if it works (and remaining ready to call) cannot cause any damage.

**Timeout**

|     |         |        |   |        |
|-----|---------|--------|---|--------|
| P31 | TIMEOUT | 40 SEC | - | 60 SEC |
|-----|---------|--------|---|--------|

40-sec or 60-sec timeout: the time spent waiting for an answer tone from the remote terminal after auto dialing

**Controlling interface line 109**

P32      

|      |     |   |          |
|------|-----|---|----------|
| MODE | 109 | - | 109 PERM |
|------|-----|---|----------|

Interface 109 can be ON (PERM) or OFF (109) when the modem is in command status.

After the dialing and handshake protocol, its status depends on the level of the received signal.

**Automatic redialing**

P33      

|                |     |   |    |
|----------------|-----|---|----|
| AUT. CALL REP. | YES | - | NO |
|----------------|-----|---|----|

If the remote terminal is busy, the number is automatically redialed (up to 3 times), or not redialed.

**Displaying the dialed string**

P34      

|              |     |   |    |
|--------------|-----|---|----|
| DISPLAY DIAL | YES | - | NO |
|--------------|-----|---|----|

Operation with or without the dial string displayed during dialing

**Select protocol**

P35      

|      |       |   |        |
|------|-------|---|--------|
| MODE | HAYES | - | V25BIS |
|------|-------|---|--------|

The protocol for data transmission between the PC and the modem is compatible with the Hayes protocol or complies with the extended V.25bis protocol.

**Controlling interface line 107**

P36      

|      |     |   |          |
|------|-----|---|----------|
| MODE | 107 | - | 107 PERM |
|------|-----|---|----------|

Interface line 107 can be held permanently ON in command status (PERM), or is only ON when the modem is connected to the telephone line.

Parameters P37 to P44 deal with 108.1 dialing.

**Setting a call number and identification number (108.1 mode only)**

P38      

|                  |
|------------------|
| 0000000000000000 |
|------------------|

**Call number:**

You can enter a number with up to 19 digits and special characters in line 38 of the menu (if you want auto dialing in 108.1 mode). When the 17th, 18th and 19th positions are stored, the 1st, 2nd and 3rd positions shift to the left and are no longer shown on the display.



## 6.5 Setting the DATALINK V.32M Modem

The QUICK SETUP function can be used to preset all modem parameters with one of the preset configurations in the QUICK SETUP menu. Which QUICK SETUP you select depends on the line configuration and the application for which you want to use the DATALINK V.32.M modem. Following a QUICK SETUP, you can always reconfigure individual parameters which do not suit your application.

To select QUICK SETUP, press ENT to obtain MAIN MENU <1>. Then press the righthand arrow key to access MAIN MENU <2>. Press key 1 to bring up the SETUP menu. Press key 1 again to select QUICK. You are now in the QUICK SETUP menu. Use the arrow keys if necessary to access the QUICK SETUP page which shows the mode you want. Then press key 2 (in this case, this is the only key which will have an affect) to set the mode. The function selected in the bottom line starts to flash. The parameters are not loaded from the EPROM until parameterization mode is exited by pressing the ENT key several times.

### Setting for SIMATIC S5

First, use the QUICK SETUP function to put the modem in the V.25bis/asynchronous setting. Then change the following parameters.

| Parameter            | Value                                       |
|----------------------|---|
| SPEED, MIN           | 1200  |
| DTE SPEED            | 9600 (maximum, depending on TK 858 setting) |
| FLOW CONTROL DTE-DCE | S2 ON/OFF                                   |
| FLOW CONTROL DCE-DTE | M2 ON/OFF                                   |
| CHAR LENGTH          | 11 (maximum, depending on TK 858 setting)   |
| PARITY               | Depends on TK setting (e.g., EVEN)          |
| M2 TO EIA            | NORMAL                                      |

Before proceeding further with setting the DATALINK V.32M modem, you must distinguish between three different operating modes.

- Manual dialing
- Automatic dialing of the number stored in the modem after a signal on the TK 858 digital line
- Automatic dialing of the number stored in the PLC after a signal on the TK 858 digital line

Set the following parameters depending on the operating mode you selected.

| Operating Mode                                    | Parameters    |           |
|---|---------------|-----------|
|   | DIALER MODE   | M5 TO EIA |
| Manual dialing                                    | OFF           | NORMAL    |
| Automatic dialing<br>(telephone no. in the modem) | S1/DTR        | NORMAL    |
| Automatic dialing<br>(telephone no. in the PLC)   | V.25BIS/ASYNC | TRUE      |

Contrary to the setting described above, the MNP MODE parameter must also be set to OFF if you require data transmission at 300 baud.

You can also change a series of additional parameters as desired. For example, you can turn off automatic call answering by setting the AUTO ANSWER parameter to DISABLE. You can also vary the loud speaker settings as desired.

## QUICK SETUP Configurations

| Parameter           | Hayes Mode | V.25bis Async Mode 1) | Dumb Mode | 2-Wire Leased | 4-Wire Leased | V.33     | BELL 208 |
|---------------------|------------|-----------------------|-----------|---------------|---------------|----------|----------|
| LINE TYPE           | 2W-D       | 2W-D                  | 2W-D      | 2W-LL         | 4W-LL         | 4W-LL    | 2W-D     |
| SPEED, MAX          | 14400      | 14400                 | 14400     | 14400         | 14400         | 14400    | 4800     |
| SPEED, MIN          | 300        | 300                   | 300       | 4800          | 4800          | 12000    | 4800     |
| SPEED LIMIT TYPE    | V.32       | V.32                  | V.32      | V.32          | V.32          | V.33     | 208      |
| MNP MODE            | Auto       | Auto 1)               | Auto      | Auto          | Auto          | OFF      | OFF      |
| MNP CLASS (LIMIT)   | 5          | 5                     | 5         | 5             | 5             | 5        | 5        |
| V.42/MNP PROTOCOL   | LAPM/MNP   | LAPM/MNP              | LAPM/MNP  | LAPM/MNP      | LAPM/MNP      | LAPM/MNP | LAPM/MNP |
| V.42bis             | Disable    | Disable               | Disable   | Disable       | Disable       | Disable  | Disable  |
| MNP BREAK           | NDT/NEXP   | NDT/NEXP              | NDT/NEXP  | NDT/NEXP      | NDT/NEXP      | NDT/NEXP | NDT/NEXP |
| BUFFER              | Enable     | Enable 1)             | Enable    | Enable        | Enable        | Disable  | Disable  |
| DTE SPEED           | 38400      | 38400                 | 38400     | 38400         | 38400         | 38400    | 38400    |
| FLOW CTL DTE-DCE    | DC1/DC3    | DC1/DC3               | DC1/DC3   | DC1/DC3       | DC1/DC3       | DC1/DC3  | DC1/DC3  |
| FLOW CTL DCE-DTE    | DC1/DC3    | DC1/DC3               | DC1/DC3   | DC1/DC3       | DC1/DC3       | DC1/DC3  | DC1/DC3  |
| FLYBACK BUFFER      | Disable    | Disable               | Disable   | Disable       | Disable       | Disable  | Disable  |
| PASS-THRU FLOW-CTRL | Disable    | Disable               | Disable   | Disable       | Disable       | Disable  | Disable  |
| GROUP, UNIT ADDRESS | 999.999    | 999.999               | 999.999   | 999.999       | 999.999       | 999.999  | 999.999  |
| DIALER MODE         | Hayes      | V24bis Async 1)       | OFF       | OFF           | OFF           | OFF      | OFF      |
| AUTO-ANSWER         | Enable     | Enable                | Enable    | Disable       | Disable       | Disable  | Disable  |
| DATA FORMAT         | Async      | Async                 | Async     | Sync          | Sync          | Sync     | Sync     |
| CHAR LENGTH         | 10         | 10                    | 10        | 10            | 10            | 10       | 10       |
| PARITY              | None       | Even                  | None      | None          | None          | None     | None     |
| RX SPACE DISCT      | Enable     | Enable                | Enable    | Enable        | Enable        | Enable   | Enable   |

Continued on next page

**QUICK SETUP Configurations (Continued)**

| Parameter             | Hayes Mode      | V.25bis Async Mode | Dumb Mode       | 2-Wire Leased        | 4-Wire Leased        | V.33                 | BELL 208             |
|-----------------------|-----------------|--------------------|-----------------|----------------------|----------------------|----------------------|----------------------|
| TX SPACE DISCT        | Enable          | Enable             | Enable          | <i>Enable</i>        | <i>Enable</i>        | <i>Enable</i>        | <i>Enable</i>        |
| CARRIER DISCT         | Enable          | Enable             | Enable          | <i>Enable</i>        | <i>Enable</i>        | <i>Enable</i>        | <i>Enable</i>        |
| LINE CURR DISCT       | Enable          | Enable             | Enable          | <i>Enable</i>        | <i>Enable</i>        | <i>Enable</i>        | <i>Enable</i>        |
| RTS DISCT             | OFF             | OFF                | OFF             | OFF                  | OFF                  | OFF                  | OFF                  |
| DSR DURING ALB        | ON              | ON                 | ON              | ON                   | ON                   | ON                   | ON                   |
| REMOTE TEST           | Enable          | Enable             | Enable          | Enable               | Enable               | Enable               | Enable               |
| M2 TO EIA             | True            | True               | Normal          | Normal               | Normal               | Normal               | Normal               |
| M5 TO EIA             | Normal          | Normal             | Normal          | Normal               | Normal               | Normal               | Normal               |
| M1 TO EIA             | True            | Normal             | Normal          | True                 | True                 | True                 | Normal               |
| S1 FROM EIA           | Normal          | Normal             | Normal          | True                 | True                 | True                 | Normal               |
| ALBT DTE CTRL'ED      | Disable         | Disable            | Disable         | Disable              | Disable              | Disable              | Disable              |
| RDLT DTE CTRL'ED      | Disable         | Disable            | Disable         | Disable              | Disable              | Disable              | Disable              |
| TM TO EIA             | Normal          | Normal             | True            | True                 | True                 | True                 | True                 |
| CD LEVEL, LEASED      | -26dBm          | -26dBm             | -26dBm          | -26dBm               | -26dBm               | -26dBm               | -26dBm               |
| TX LEVEL, LEASED      | -6dBm           | -6dBm              | -6dBm           | -6dBm                | -6dBm                | -6dBm                | -6dBm                |
| TX LEVEL, DIAL        | Permis. -6dBm   | Permis. -6dBm      | Permis. -6dBm   | <i>Permis. -6dBm</i> | <i>Permis. -6dBm</i> | <i>Permis. -6dBm</i> | <i>Permis. -6dBm</i> |
| CD LEVEL, DIAL        | -51dBm          | -51dBm             | -51dBm          | <i>-51dBm</i>        | <i>-51dBm</i>        | <i>-51dBm</i>        | <i>-51dBm</i>        |
| SIGNAL QUAL LEVEL     | 10 <sup>3</sup> | 10 <sup>3</sup>    | 10 <sup>3</sup> | 10 <sup>3</sup>      | 10 <sup>3</sup>      | 10 <sup>3</sup>      | 10 <sup>3</sup>      |
| COMPRIMISE EQUALIZERS | OFF             | OFF                | OFF             | OFF                  | OFF                  | OFF                  | OFF                  |
| TRELLIS CODE          | Enable          | Enable             | Enable          | Enable               | Enable               | Enable               | Enable               |

Continued on next page

## QUICK SETUP Configurations (Continued)

| Parameter             | Hayes Mode      | V.25bis Async Mode            | Dumb Mode   | 2-Wire Leased  | 4-Wire Leased  | V.33           | BELL 208       |
|-----------------------|-----------------|-------------------------------|-------------|----------------|----------------|----------------|----------------|
| TRANSMIT CLOCKING     | Internal        | Internal                      | Internal    | Internal       | Internal       | Internal       | Internal       |
| T1 TIMER              | 0.8 sec         | 0.8 sec                       | 0.8 sec     | 0.8 sec        | 0.8 sec        | 0.8 sec        | 0.8 sec        |
| AUTO-RETRAIN          | Enable          | Enable                        | Enable      | Enable         | Enable         | Enable         | Enable         |
| ANS/ORG DEFAULT       | ORIG            | ORIG                          | ORIG        | ORIG or ANS    | ORIG or ANS    | ORIG           | ORIG           |
| FRONT PANEL           | Enable          | Enable                        | Enable      | Enable         | Enable         | Enable         | Enable         |
| ANSW TONE             | 2100 Hz         | 2100 Hz                       | 2100 Hz     | 2100 Hz        | 2100 Hz        | 2100 Hz        | 2100 Hz        |
| SPEAKER CONTROL       | Till-CD         | Till-CD                       | Till-CD     | <i>Till-CD</i> | <i>Till-CD</i> | <i>Till-CD</i> | <i>Till-CD</i> |
| SPEAKER VOLUME        | High            | High                          | High        | <i>High</i>    | <i>High</i>    | <i>High</i>    | <i>High</i>    |
| GUARD TONES           | OFF             | OFF                           | OFF         | <i>OFF</i>     | <i>OFF</i>     | <i>OFF</i>     | <i>OFF</i>     |
| V.13 OPERATION        | OFF             | OFF                           | OFF         | OFF            | OFF            | OFF            | OFF            |
| CARRIER               | <i>Switched</i> | <i>Switched</i> <sup>2)</sup> | Switched    | Switched       | Switched       | Constant       | Switched       |
| M2                    | S2              | <i>S2</i> <sup>2)</sup>       | S2          | S2             | S2             | ON             | S2             |
| S2-M2-DELAY           | 0               | <i>0</i> <sup>2)</sup>        | 0           | 0              | 0              | 0              | 150ms          |
| AUTO-RECV SELECT      | <i>None</i>     | <i>None</i>                   | <i>None</i> | None           | None           | None           | None           |
| AUTO-RECV RETURN      | OFF             | OFF                           | OFF         | OFF            | OFF            | OFF            | OFF            |
| LCD INTENSITY         | 3               | <i>3</i>                      | 3           | 3              | 3              | 3              | 3              |
| AUTO-RECV TEST INT'VL | 20 min          | <i>20 min</i>                 | 20 min      | 20 min         | 20 min         | 20 min         | 20 min         |

1) The synchronous V.25bis configurations (character or bit-oriented) are identical to the asynchronous V.25bis configurations with the following exceptions:

- MNP MODE - OFF
- BUFFER - disable
- DATA FORMAT - sync
- DIALER MODE - V25bis/sync\_c for character-oriented mode  
- V25bis/sync\_b for bit-oriented mode

2) Only effective in synchronous operation

*The entries in italics are set for the respective mode but have no affect.*

## 7 General Information Concerning the Use of Modems

Many of the models available on the market can generally be connected.

Should you decide not to use the devices recommended by us which have been tested with the TK 858, keep the following points in mind:

- The TK 858 telecommunications device is equipped with a standardized interface to the modem. This interface also supplies two additional voltages (i.e., 5.2 V and 12 V). The exact allocation of the plug connectors is given in the equipment manual.

Be sure that the interface to your modem is free of conflict.

- The TK 858 operates with a character frame of 10, 11 or 12 bits. Your modem must be able to operate with this character frame (i.e., you may have to make appropriate adjustments).
- The TK 858 operates with asynchronous, full-duplex data transmission. Your modem must be able to handle this procedure.
- Be sure that you continue to comply with the operating instructions of the modem.

Remember that SIEMENS cannot guarantee error-free functioning if you decide to use models not recommended by us.

In addition, when selecting your modem, try if at all possible to pick a modem which, although more expensive, offers the advantages of a significantly higher transmission rate and better interference immunity.

Modems with the following features can be used:

Transmission procedure and rate: V21 (300 baud)  
 V22 (1200 baud)  
 V22bis (2400 baud)  
 V32 (4800 baud)  
 V32 (9600 baud)

Type of transmission: Asynchronous

Transmission format: 10, 11 or 12 bits (start bit, 8 data bits,  
 with/without parity bit, 1 or 2 stop bit(s))

Speed tolerance: +2.3%/-2.5%

Call number memory: Yes

[The page contains extremely faint, illegible text, likely bleed-through from the reverse side of the document. The text is too light to transcribe accurately.]

**To**  
**Siemens AG**  
**AUT WKF**  
**B1.2-T1**  
**Siemensstr. 2**  
  
**D-8510 Fürth/Bay.**

|   |   |
|---|---|
| <p>From<br/>Name _____<br/><br/>Company/department _____<br/><br/>Address _____<br/><br/>Telephone                      /</p> | <p>Suggestions<br/>Corrections</p> <hr/> <p><b>For instructions or manual:</b></p> <p><b>Title</b> _____<br/>_____</p> <p><b>Order No.</b> _____</p> <p>If you find typographical errors while reading this document, please use this form to let us know.</p> <p>Your suggestions, remarks and ideas are welcome.</p> <p><b>Please fill in the order no. of the applicable document or manual.</b></p> |
|---|---|

**Suggestions or/and corrections:**

