



Gateway Manual

Protocol Conversion

TCP/IP to 3964R

on the netTAP

NT 40-EN-RS

NT 40-RS-EN

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1 Introduction

1.1 About this Manual

This manual describes the linkage between devices with TCP/IP and 3964R protocol, based on the netTAP Gateway. The protocol conversion described here can be used with the following devices:

- NT 40-EN-RS2\CCE
- NT 40-EN-RS2\D9F
- NT 40-EN-RS2\D9M
- NT 40-EN-RS4\CCE
- NT 40-EN-RS4\D9F
- NT 40-EN-RS4\D9M
- NT 40-EN-RS12\CCE
- NT 40-EN-RS12\D9F
- NT 40-EN-RS12\D9M
- NT 40-EN-RS14\CCE
- NT 40-EN-RS14\D9F
- NT 40-EN-RS14\D9M
- NT 40-RS-EN

The Gateway supports up to 4 TCP/IP connections. In the following communication references these are called (CR0, CR1, CR2 and CR3).

The properties of these communication references can be parameterized independently. It is necessary to parameterize different timeouts, the Port number as well as the type of connection build-up (Client or Server, or active or passive connection build-up) for each communication reference used.

With an active connection build-up it is also necessary to have the IP address of the device with which the Gateway is to be connected.

For each connected communication reference it is also necessary to parameterize whether TCP/IP data is to be received and/or transmitted.

If data is to be transmitted over this communication reference, then all the data from the 3964R coupling partner are transmitted transparently to the corresponding TCP/IP device.

If data is to be received over this communication reference, then all the data received from the TCP/IP device are transmitted transparently to the corresponding 3964R coupling partner.

The method of functioning of the ASCII protocol is described in the protocol manual *3964R-Protocol*.

The parameterizing and diagnostic program provided is used for the configuration. This tool is described in its own manual.

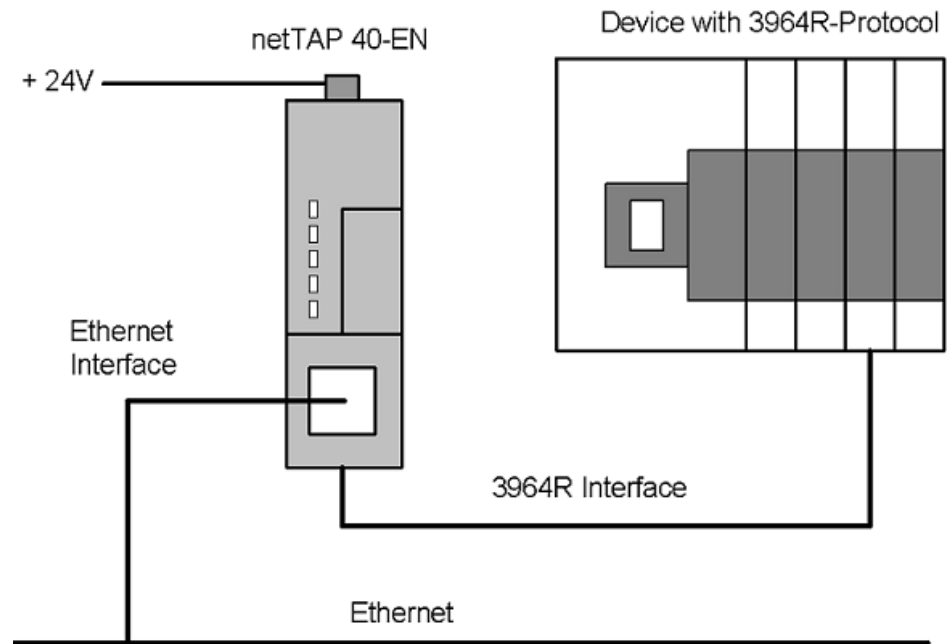


Figure 1: Connection of the devices to the netTAP 40-EN

Values with an "h" letter appended to it are written in hexadecimal form. Values without an appended letter are written in decimal form (example: 1Eh = 30).

2 Start-up Guideline

2.1 General

The following sequence must be adhered to for starting up the Gateway:

- A Firmware must be loaded onto the Gateway respectively already loaded.
- A valid configuration file must be stored on the Gateway.
- Connect the Gateway to the Ethernet.
- The 3964R coupling partner must be connected. Please use the device manual for configuring the physical interface and the making of the cable.
- The LED RDY and RUN must light up and must not blink.

Notes: With a defective device, it is possible that continuous access of the Watchdog monitoring, can also cause cyclic blinking of the RDY LED.

3 Communication Mechanism

3.1 General

Various types of communication between the Gateway and its coupling partners are possible.

For data exchange between the 3964R coupling partner and the Gateway, a decision must be made between single-directional and bi-directional communication and.

The following descriptions will clarify the different communication mechanisms. The assumption, in this case, is of a single linked communication reference. The data exchange for this communication reference is made for both directions.

In the case that several communication references are linked and configured for transmission, then the telegrams received from the 3964R coupling partner are transmitted to all corresponding TCP/IP devices.

In the case that several communication reference are linked and configured for receiving, then the data received from the corresponding TCP/IP devices are transmitted to the 3964R coupling partner. These data are transmitted in the sequence to the 3964Rcoupling partner in which they were received from netTAP.

3.2 Possibilities for Data Transmission

- Possibility 1:** The data transmission is uni-directional, it flows from the TCP/IP device to the 3964R coupling partner. The TCP/IP device thus initiates the data transmission to the Gateway (1). The Gateway then sends a telegram to the 3964R coupling partner (2).

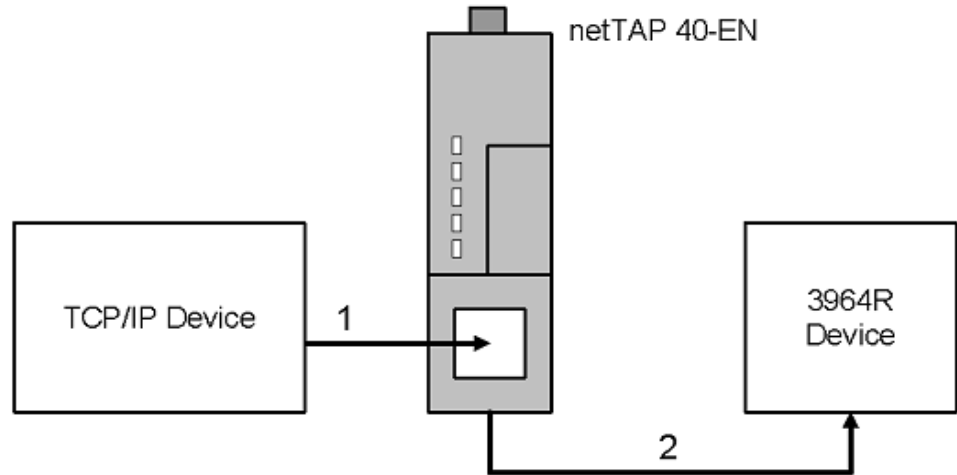


Figure 2: Uni-irectional data transmission TCP/IP → 3964R

- Possibility 2:** The data transmission is uni-directional, it flows from the 3964R coupling partner to the TCP/IP device. The the 3964R coupling partner thus initiates the data transmission with a telegram to the Gateway (1). The Gateway then sends the data to the TCP/IP device (2).

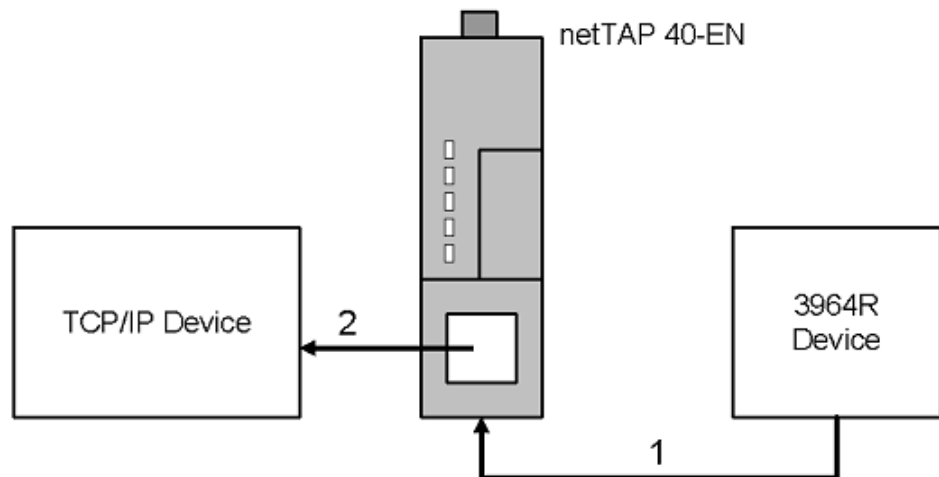


Figure 3: Uni-directional data transmission 3964R → TCP/IP

- Possibility 3:** The data transmission is bi-directional. The TCP/IP device thus initiates the data transmission to the Gateway (1). The Gateway then sends a telegram to the 3964R coupling partner (2). The 3964R coupling then sends the answering telegram to the TCP/IP device (3). The Gateway sends the answering telegram to the TCP/IP device (4).

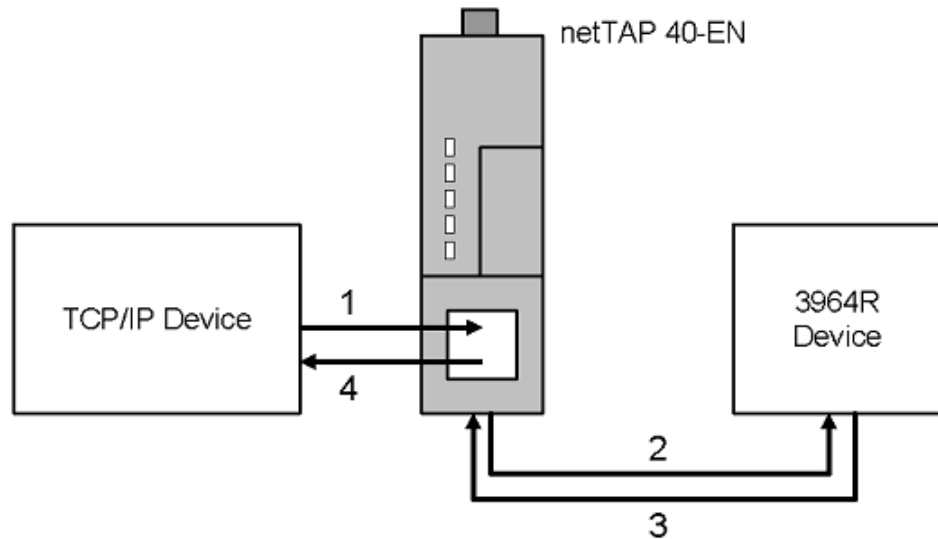


Figure 4: Bi-directional data transmission TCP/IP → 3964R → TCP/IP

- Possibility 4:** The data transmission is bi-directional. The 3964R coupling partner thus initiates the data transmission with a telegram to the Gateway (1). The Gateway then sends the data to the TCP/IP device (2). The TCP/IP device now sends new data to the Gateway (3). The Gateway then sends an answer telegram to the 3964R coupling partner (4).

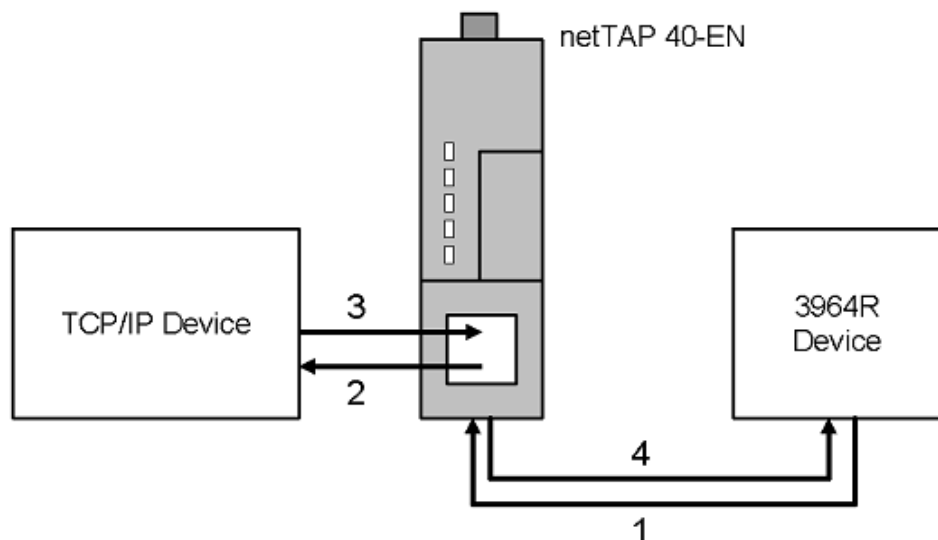


Figure 5: Bi-directional data transmission 3964R → TCP/IP → 3964R

4 Settings - Parameterizing - Configuration

4.1 Transmission Parameters

The transmission parameters of the two protocols are determined by the configuration:

- **3964R**

The parameters of the *3964R* table must be entered. This defines the whole behavior of the 3964R protocol.

- **ALI**

The parameters of the *ALI_SETUP* table must be entered. This defines the behavior of the Application Layer Interface Task. These are responsible for the connection build-up between the Gateway and the individual TCP/IP devices.

- **Ethernet**

For configuring the Ethernet, the own IP address, the network mask as well as the IP address of the Gateway must be set. The parameterizing is carried out in the *IP_SETUP* table.

4.2 Editing the 3964R Table

In the table 3964R the parameters of the 3964R protocol are configured. The default values are characterized by an underline:

Parameter	Meaning	Range of Value
Interface and RTS	With this parameter the serial physics of the gateway as well as the RTS control are configured. If the RTS control is switched on, then the control lines RTS and CTS are served by an RS232C interface or by an RS485/RS422 interface that switches through the data drivers only while sending. This does not alter the protocol sequence. Thereby the protocol expiration does not change. With a RS485 interface the RTS control must always be switched on.	<u>RS232 RTS OFF</u> RS232 RTS ON RS422 RTS OFF RS422 RTS ON RS485 RTS ON
Baud rate	Specifies the transmission rate.	50 Baud 100 Baud 110 Baud 150 Baud 200 Baud 300 Baud 600 Baud 1200 Baud 2400 Baud 4800 Baud <u>9600 Baud</u> 19200 Baud 38400 Baud
Data bits	Defines the quantity of data bits.	7, <u>8</u>
Stop bits	Specifies the number of stop bits. By the gateway only one stop bit is supported, therefore the value is not editable.	<u>1</u>
Parity	Defines the parity bit.	none <u>even</u> odd
Priority	Which device resets the sending telegram in the case of an initialization conflict.	low <u>high</u>
Wait time [ms]	Waiting time in milliseconds before starting a telegram repeat.	<u>0</u> .. 10.000
Receive mode	Gives the type of receiving data. Caution: Word telegrams with an uneven number of data Bytes lead to receiving errors	Word telegram MSB/LSB Word telegram LSB/MSB <u>Byte telegram</u>
Send mode	Defines how Word telegrams are sent on the line.	<u>Word telegram MSB/LSB</u> Word telegram LSB/MSB

Table 1: Parameterizing of the 3964R protocol

4.3 Editing the ALI_SETUP Table

The properties of the individual communication references are set in this table. Some parameters are not used, depending on the type of connection (Client or Server or active or passive connection build-up).

Each communication reference can be configured independently of the others. The following table describes the configuration of the first communication reference CR0. The other communication references, CR1, CR2 and CR3 are parameterized correspondingly.

Parameter	Meaning	Value range
CR0 Connection type	<u>Connection type</u> Unused Active connection build-up Passive connection build-up	<u>Unused</u> , Client, Server
CR0 IP Address (Byte 0)	First (lowest value Byte) of the IP address of the TCP/IP device with which the netTAP is to be connected. This parameter is only used for Client connections.	0 .. 255
CR0 IP Address (Byte 1)	Second Byte of the IP address of the TCP/IP device with which the netTAP is to be connected. This parameter is only used for Client connections	0 .. 255
CR0 IP Address (Byte 2)	Third Byte of the IP address of the TCP/IP device with which the netTAP is to be connected. This parameter is only used for Client connections.	0 .. 255
CR0 IP Address (Byte 3)	Fourth Byte of the IP address of the TCP/IP device with which the netTAP is to be connected. This parameter is only used for Client connections.	0 .. 255
CR0 Port number	Client connection: Port number on the TCP/IP device for which the connection with netTAP is waiting. Server connection Port number for which the netTAP is waiting for the connection with the TCP/IP device.	0 .. 65535

CR0 Send timeout [100ms]	Monitoring time for transmitting TCP/IP telegrams in steps of 100 milliseconds If the value of 0 is set for this parameter, then a time of 31 seconds is used.	0 .. 65000
CR0 Connect timeout [100ms]	Monitoring time for the connection build-up with the TCP/IP device in steps of 100 milliseconds This parameter is only used for Client connections If the value of 0 is set for this parameter, then a time of 31 seconds is used.	0 .. 65000
CR0 Close timeout [100ms]	Monitoring time for closing the connection in steps of 100 milliseconds If the value of 0 is set for this parameter, then a time of 13 ***seconds is used.	0 .. 65000
CR0 Retry time [10ms]	With this parameter, the time in steps of 10 milliseconds is configured which is waited for between two attempts to build up a connection with the TCP/IP device This parameter is only used for Client connections	Server: 0 Client: 1 .. 255

Table 2: ALI_SETUP parameters list

4.4 Editing the BRIDGE Table

In der folgenden Table wird das Sende- und Empfangsverhalten der einzelnen Kommunikationsreferenzen parametrisiert. Es müssen nur die Eigenschaften der in der Table ALI_SETUP parametrisierten Kommunikationsreferenzen editiert werden:

Parameter	Meaning	Value range
Error LED	The error LED is set for a recognized communication error and is extinguished with the next error-free data transmission The error LED is set for a recognized communication error and can only be extinguished by a re-initialization of the Gateway.	<u>Set/Clear</u> Only set
Receive CR0 enabled	Received data over CR0 are not transmitted to the ASCII coupling partner. Received data over CR0 are transmitted to the ASCII coupling partner.	<u>No</u> Yes
Receive CR1 enabled	Received data over CR1 are not transmitted to the ASCII coupling partner. Received data over CR1 are transmitted to the ASCII coupling partner.	<u>No</u> Yes
Receive CR2 enabled	Received data over CR2 are not transmitted to the ASCII coupling partner. Received data over CR2 are transmitted to the ASCII coupling partner.	<u>No</u> Yes
Receive CR3 enabled	Received data over CR3 are not transmitted to the ASCII coupling partner Received data over CR3 are transmitted to the ASCII coupling partner.	<u>No</u> Yes
Send CR0 enabled	Received data from ASCII coupling partner are not transmitted via the CR0. Received data from ASCII coupling partner are transmitted via the CR0 when this is connected.	<u>No</u> Yes
Send CR1 enabled	Received data from ASCII coupling partner are not transmitted via the CR1. Received data from ASCII coupling partner are transmitted via the CR1 when this is connected.	<u>No</u> Yes
Send CR2 enabled	Received data from ASCII coupling partner are not transmitted via the CR2. Received data from ASCII coupling partner are transmitted via the CR2 when this is connected.	<u>No</u> Yes
Send CR3 enabled	Received data from ASCII coupling partner are not transmitted via the CR3. Received data from ASCII coupling partner are transmitted via the CR3 when this is connected.	<u>No</u> Yes

Table 3: BRIDGE parameter list

4.5 Editing the IP_SETUP Table

This table is used to set the general IP parameters. The default values are shown underlined:

Parameter	Meaning	Value range
Flag 0	See Figure <i>Definitions of the Flag 0</i>	0 .. <u>7</u> .. 255
Flag 1	See Figure <i>Definitions of the Flag 1</i>	0 .. <u>2</u> .. 255
IP address Byte 0	First (lowest value) Byte of the own IP address.	<u>0</u> .. 255
IP address Byte 1	Second Byte of the own IP address.	<u>0</u> .. 255
IP address Byte 2	Third Byte of the own IP address.	<u>0</u> .. 255
IP address Byte 3	Fourth (highest value) Byte of the own IP address.	<u>0</u> .. 255
Net mask Byte 0	First (lowest value) Byte of the own network mask.	<u>0</u> .. 255
Net mask Byte 1	Second Byte of the network mask.	<u>0</u> .. 255
Net mask Byte 2	Third Byte of the network mask.	<u>0</u> .. 255
Net mask Byte 3	Fourth (highest value) Byte of the network mask.	<u>0</u> .. 255
Gateway Byte 0	First (lowest value) Byte of the IP address of the Gateway.	<u>0</u> .. 255
Gateway Byte 1	Second Byte of the IP address of the Gateway.	<u>0</u> .. 255
Gateway Byte 2	Third Byte of the IP address of the Gateway.	<u>0</u> .. 255
Gateway Byte 3	Fourth (highest value) Byte of the IP address of the Gateway.	<u>0</u> .. 255

Table 4: IP_SETUP parameter list

The parameter flag 0 is a Bit-coded Byte with the following meaning:

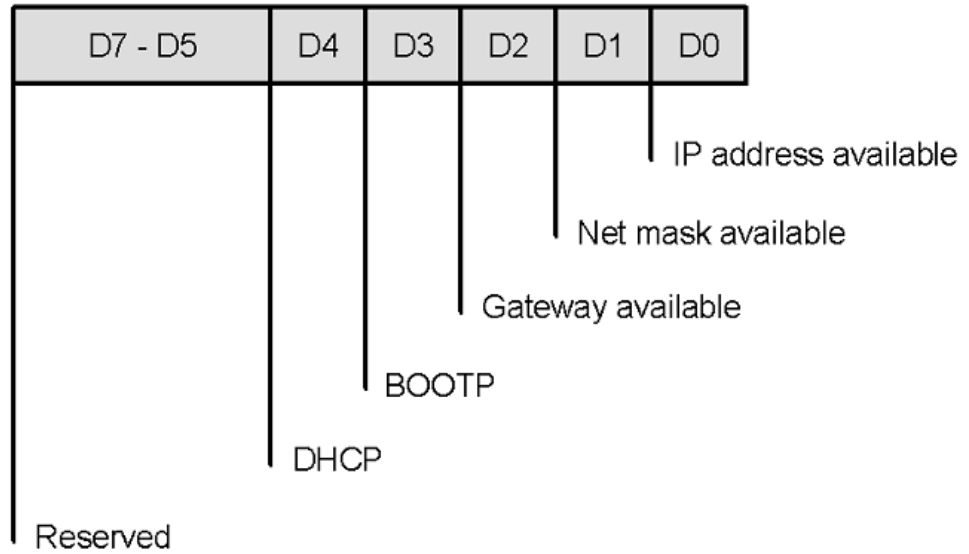


Figure 6: Definitions of the parameter Flag 0

Parameter	Meaning
IP address available	When this Bit is set, the contents of the parameters "IP address Byte 0" to "IP address Byte 3" are evaluated.
Net mask available	When this Bit is set, the contents of the parameters "Network mask Byte 0" to "Network mask Byte 3" are evaluated.
Gateway available	When this Bit is set, the contents of the parameters "Gateway Byte 0" to "Gateway Byte 3" are evaluated.
Enable BOOTP	The device receives the IP parameters from a BOOTP Server
Enable DHCP	The device receives the IP parameters from a DHCP Server

Table 5: Definitions of the parameter Flag 0

The parameter flag 1 is a Bit-coded Byte with the following meaning:

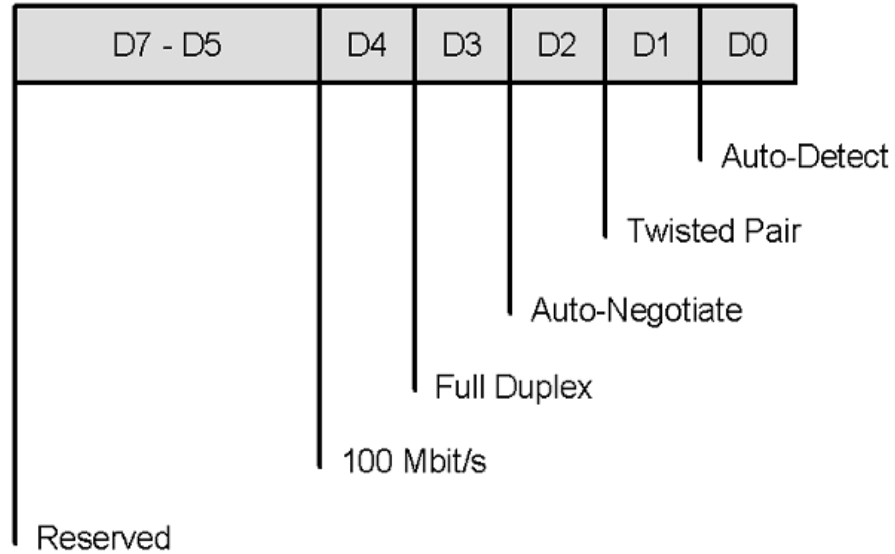


Figure 7: Definitions of the parameter Flag 1

Parameter	Meaning
Auto-Detect	When this Bit is set, there follows an automatic recognition of the Ethernet interface.
Twisted Pair	When this Bit is set, the Twisted Pair is selected as Ethernet interface, otherwise AUI
Auto-Negotiation	When this Bit is set, the device automatically negotiates the duplex mode and the transfer rate with the Hub or Switch.
Full Duplex	When this Bit is set, the device works in full duplex, otherwise in half duplex operation.
100 Mbit/s	When this Bit is set, the device works with a transfer rate of 100 Mbit/s, otherwise with 10 Mbit/s.

Table 6: Definitions of the parameter Flag 1

If more than one configuration path is activated (e.g. DHCP and manually entered IP parameters), then the device attempts to work off the various configuration paths in sequence. As soon as one of the paths has received an IP configuration, the device will start with these parameters.

5 Diagnostic

5.1 LEDs

The LEDs at the casing display the common status of the gateway:

LED	Zustand	Bedeutung
RDY	On	netTAP NT 40-EN-RS / NT 40-RS-EN is ready
	Flashing cyclic (5 Hz)	Firmware download is in progress
	Flashing cyclic (1 Hz)	B Device is in bootloader mode and is waiting for firmware download
	Flashing irregular (*)	Hardware or heavy runtime error detected
	Off	Device has no power supply or hardware defect
RUN	On	Communication is running
	Flashing cyclic (5 Hz)	No connection established
	Flashing irregular (*)	Configuration missing or faulty, device needs commissioning
	Off	No communication
ERR	On	Communication error
	Off	No error
STA	-	LED has no function
ACT	On	A connection to the Ethernet exists
	Flashing	The device sends/receives Ethernet frames
	Off	The device has no connection to the Ethernet

Table 7: LEDs on the Gateway

(*) 3 times fast at 5 Hz, 8 times between 0.5 Hz and 1 Hz.

5.2 Extended Task Status

An extended task status can be displayed in the diagnostic and parameter program. From this, there can be taken the current processing condition of the protocols or the Bridge and statistic information on the previous protocol sequences. This information are always updated by the coupling protocols and the Bridge

5.2.1 Extended Task State of the 3964R Protocol Task

5.2.1.1 3964R Protocol

The following task status contains general status, statistical and error information.

State	Meaning
Task state	Current condition of the protocol procedure. The state is described in the following table <i>Definition of the task condition</i> .
Send telegrams	Gives the number of error-free sent telegrams.
Receive telegrams	Gives the number of error-free received telegrams.
Send retries	Gives the number how often the send telegram was repeated before it was transferred error-free or before the maximum number of repeats was reached.
Receive retries	Gives the number how often the receiving telegram was rejected before it was transferred error-free or before the maximum number of repeats was reached.
Send errors	Gives the number how many send tasks have been lost because of syntax or transference errors.
Receive errors	Gives the number how many receiving tasks have been lost because of syntax or transference errors.
Error bits [HEX]	Allocates every incoming error to an error class and shows this by placing a bit .A display only comes about when, despite repeats, this has led to a loss of telegram. For definition see figure <i>Figure 8: Definition of the error bit</i> .
Last Error	Gives the number of the last incoming error. A display only comes about when, despite repeats, this has led to a loss of telegram. The error numbers are described in section <i>Error Handling of the 3964R Protocol Task</i> .

Table 8: Definition of the extended task status of the 3964R Protocol

Task State	Meaning
0	Protocol not initialized.
1	Basic condition, i.e. waiting for send task or receiving telegram.
10	Telegram opening send direction, sends STX and waits for DLE.
11	Telegram transmission, sends telegram and waits for DLE.
12	Sends NAK.
13	Waiting time elapsed.
20	Telegram opening receiving direction, sends DLE and waits for receiving data.
21	Sends DLE.
22	Waits for character delay time.
23	Sends NAK and waits for telegram repeat.
24	Sends NAK.
25	Waits for preparedness of the application.
26	Waits for a memory segment.

Table 9: Definition of the task condition

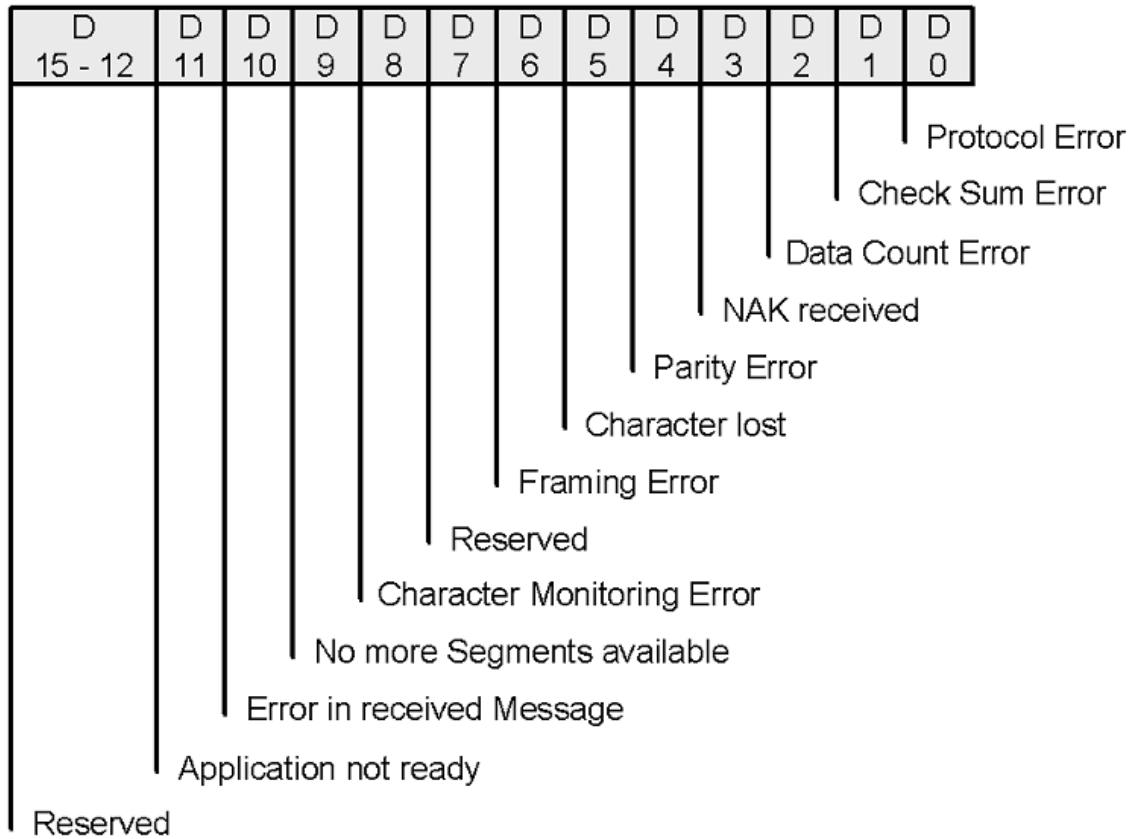


Figure 8: Definition of the error bit

The corresponding bit is set for each error. Deletion occurs only after a renewed starting of the device.

5.2.2 Extended Task State of the Bridge TCPNVR

5.2.2.1 TCPNVR Task Information

The following task status contains general condition, statistics and error information.

Status	Meaning
Conversion	<u>Conversion of the Bridge task</u> TCP <-> 3964R
Serial send count	Number of transmitted serial telegrams.
Serial receive count	Number of received serial telegrams.
TCP send count	Number of telegrams transmitted over TCP/IP.
TCP receive count	Number of telegrams received over TCP/IP.
TCP open count	Number of the opened TCP/IP links.
TCP close count	Number of the closed TCP/IP links.
TCP discard count	Number of the discarded TCP/IP telegrams as the corresponding communication reference is not configured for data reception.
Last error	Gives the number of the error reported last. The error numbers are described in the section on <i>Error Messages of the Bridge TCPNVR</i> .
Error count	Number of recognized errors.
Add. detail	Additional information on the last recognized error.

Table 10: Definition of the extended TCPASC task status task information

5.2.2.2 TCPNVR Setup

The following task statuses contain information on the current configuration of the Bridge Task.

Status	Meaning
Error LED	Only set: The error LED is set by a recognized error and not reset again. Set/Clear: The error LED is set by a recognized error and reset with the next error-free data transfer.
Receive CR 0 enabled	No: The data reception over CR0 is not released Yes: The data reception over CR0 is released.
Receive CR 1 enabled	No: The data reception over CR1 is not released. Yes: The data reception over CR1 is released.
Receive CR 2 enabled	No: The data reception over CR2 is not released. Yes: The data reception over CR2 is released.
Receive CR 3 enabled	No: The data reception over CR3 is not released. Yes: The data reception over CR3 is released.
Send CR 0 enabled	No: Data are not transmitted over CR0. Yes: Data are transmitted over CR0.
Send CR 1 enabled	No: Data are not transmitted over CR1. Yes: Data are transmitted over CR1.
Send CR 2 enabled	No: Data are not transmitted over CR2. Yes: Data are transmitted over CR2.
Send CR 3 enabled	No: Data are not transmitted over CR3. Yes: Data are transmitted over CR3.

Table 11: Definition of the extended TCPASC task status set-up

5.2.3 Extended Task status of the Application Interface Layer Task

5.2.3.1 ALI Task Information

The following task status contains general condition, statistics and error information.

Status	Meaning
Task state	<u>Condition of the task</u> 0 = Task is not initialized 1 = Task running 2 = Task initialized 3 = Task reports error in initialization 4 = Waiting for TCP Task
Error count	Number of recognized errors.
Last error	Gives the number of the error reported last. The error numbers are described in the section on <i>Error Messages of the Application Layer Interface Task</i> .
Connection state	Gives the status of the individual communication references as Bit-coded word. The meaning of the Bits is described in the following Figure <i>Definition connection state</i> .
Messages transmitted to TCP	Gives the number of messages transmitted to TCP Task.
Messages received from TCP	Gives the number of messages received from TCP Task.
Messages transmitted to bridge	Gives the number messages transmitted to TCPASC Task.
Messages received from bridge	Gives the number of messages received from TCPASC Task.

Table 12: Definition of the extended ALI Task Status task information

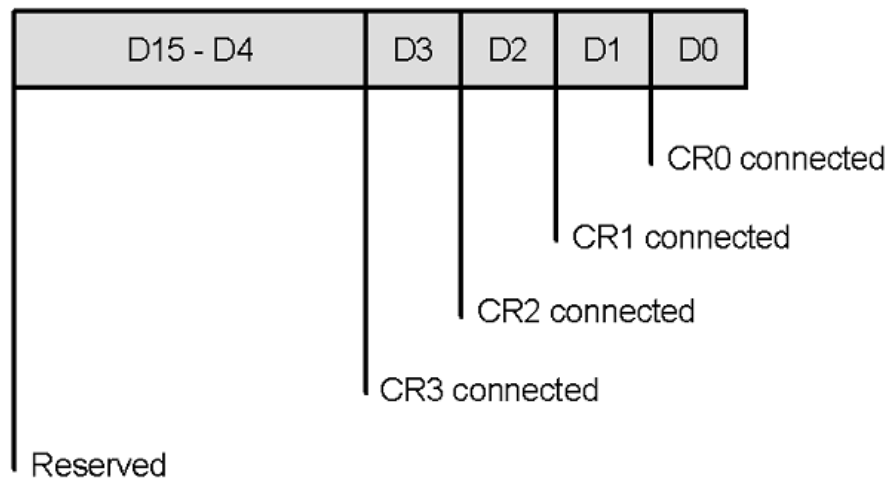


Figure 9: Definition connection state

5.2.3.2 ALI Com Ref State

The following task status contains condition information on the individual communication references. In the following table the conditions of the first communication reference CR0 are described. The conditions of the other communication references are displayed accordingly.

Status	Meaning
State CR0	Status of the communication reference: Deinit = CR0 not used Wait open = CR0 waiting for Handle Wait set option = CR0 waiting for confirmation of the Socket setting Wait connect = CR0 waiting for connection Wait answer = CR0 waiting for confirmation of data command Close = CR0 is closed Open = CR0 is open and ready for receipt and transmission Cyclic open = CR0 is opened in cyclic event Cyclic close = CR0 is closed in the cyclic event
Retry Connect CR0	Gives the remaining time till the next attempt for connection build-up. This status is only effective at the client of active connection build-up.

Table 13: Definition of the extended ALI Task Status Com Ref State

5.2.3.3 ALI TCP Msg Count

The following task status contains information on the communication between ALI Task and TCP_UDP Task.

Status	Meaning
Open commands	Number of transmitted "Open Socket" commands.
Open answers	Number of received "Open Socket" answers.
Set socket option commands	Number of transmitted "Set Socket Option" commands.
Set socket option answers	Number of received "Set Socket answers" answers.
Close commands	Number of transmitted "Close Socket" commands.
Close answers	Number of received "Close Socket" answers.
Send commands	Number of transmitted "Send Data" commands.
Send answers	Number of received "Send Data" answers.
Connect commands	Number of transmitted "Connect Socket" commands.
Connect answers	Number of received "Connect Socket" answers.
Wait connect commands	Number of transmitted "Wait Connect Socket" commands.
Wait connect answers	Number of received "Wait Connect Socket" answers.
Receive commands	Number of received "Receive Data" commands.

Table 14: Definition of the extended ALI TCP Msg. count task status

5.2.4 Extended Task State of the TCP_UDP Protocol Task

5.2.4.1 TCP_UDP Task Information

State	Meaning
Task state	Task state of the Task: 0 = Task not initialized 1 = Task is running 2 = Task initialized 3 = Task reports an error by initialization
Error count	Number of appeared errors
Last error	Last appeared error (Description see belonging protocol manual)

Table 15: Definition of the extended task state - TCP_UDP Task Information

5.2.5 Extended Task State of the IP Protocol Task

5.2.5.1 IP Task Information

State	Meaning
Task state	State of the Task: 1 = Task is running 2 = initialization is running 3 = initialization has failed
Error count	Counter for appeared errors
Last error	Last appeared error
IP address	IP-Address of the device
Net mask	Net mask of the device
Gateway	Gateway of the device

Table 16: Definition of the extended task state - IP Task Information

5.2.5.2 IP Ethernet State

State	Meaning
MAC address (hex)	MAC address of the device
Interface	Actual known Ethernet interface
Speed	Transmission rate
Duplex mode	Shows the actual Duplex mode: Half-/Full duplex
Twisted pair link	State of the Twisted Pair connection

Table 17: Definition of the extended task state - IP Ethernet State

6 Error messages

6.1 General

The following table shows the error messages of the individual protocols. These can be displayed with the aid of the supplied parameterizing and diagnostic program. Errors are also displayed by the error LED on the Gateway.

6.2 Error Handling of the 3964R Protocol Task

6.2.1 Initialization Errors

Error number	Meaning
10	<u>Serial interface occupied.</u> The serial interface has already been initialized by another task.
11	<u>Sum of all baudrates to high</u> The sum of all Baud rates on all initialized interfaces is too great.
12	<u>Error 'Communication line'</u> Parameterized interface at the device not available.
13	<u>Error 'Baudrate'</u> Invalid value for the initialization parameter 'Baudrate' initialization parameter.
14	<u>Error 'Parity'</u> Invalid value for the initialization parameter 'Parity'.
15	<u>Error 'Databits'</u> Invalid value for the initialization parameter 'Data bits'.
16	<u>Error 'Stopbits'</u> Invalid value for the initialization parameter 'Stop bits'.
17	<u>Error 'RTS-Control'</u> Invalid value for the initialization parameter 'RTS-Control'.
50	<u>Error 'Priority'</u> Invalid value for the initialization parameter 'Priority'.
52	<u>Error 'Receive mode'</u> Invalid value for the initialization parameter 'Receive mode'.
53	<u>Error 'Send mode'</u> Invalid value for the 'Send mode'.

Table 18: Initialization Errors 3964R

6.2.2 Errors when Sending and Receiving Data

Error Number	Meaning
100	<u>Parity error</u> The interface controller has detected a parity error.
101	<u>Framing error</u> The interface controller has detected a 'framimngerror' error.
102	<u>Overrun error</u> The interface controller has detected an "overrun" error..
103	<u>To much/less data received</u> More data has been received than can be accommodated in the receiving buffer or too little to make a proper telegram testing possible.
104	<u>BCC-Error</u> A BCC error has been determined in the received telegram.
105	<u>Character monitoring error.</u> The coupling partner did not answer within the projected monitoring time or e. g. no telegram end has been detected.
106	<u>Protocol error</u> The protocol procedure is incorrect.
107	<u>Wrong character</u> The communication partner has not answered with DLE, NAK or STX.
108	<u>NACK-telegram received</u> The couple partner had answered with a NACK-telegram.

Table 19: Protocol Errors 3964R

6.2.3 Internal System Errors

Error Number	Error
202	<u>Memory segment occupied</u> There are no memory segments for storing the receiving telegram available.
203	<u>Application not ready</u> The application has indicated that it is not ready to accept receiving telegrams.
210	<u>Error by opening the data base</u> The parameter database is not available.
212	<u>Error by reading the data base</u> The parameter database is inconsistent.
213	<u>System error 'RcsPutStructure'</u> Internal error.
217	<u>Incorrect system configuration</u> Internal error.

Table 20: Internal System Errors 3964R

6.3 Error Messages of the Bridge TCPNVR

6.3.1 Initialization Errors

Error Number	Error
50	<u>3964R Task</u> The Token of the 3964R Task was not found.
51	<u>ALI Token</u> The Token of the ALI Task was not found.

Table 21: Initialization Errors TCPNVR

6.3.2 Runtime Errors

Error number	Error
154	<u>Error "Message command"</u> Error found in message command.
158	<u>Error "Message command running"</u> A message command has already been started.
161	<u>Error "Data address"</u> Invalid data address received in message.
165	<u>Error "Data count"</u> invalid data count received in message.
167	<u>Error "Function"</u> invalid function received in message.
170	<u>Error "Sender"</u> Unknown sender of a message.
171	<u>Transmission error ASCII</u> Transmission error received from ASCII Task.
172	<u>Send error ALI</u> Send error received from ALI Task.
173	<u>Error "Data loss"</u> Data loss due to buffer overflow.

Table 22: TCPNVR runtime errors

6.3.3 Internal System Errors

Fehler- nummer	Fehler
200	<u>Task not initialized</u> Task has not been initialized yet.
202	<u>Segment not available</u> No memory segments available.
210	<u>Error while opening the database</u> The parameter database is not available.
212	<u>Error while reading the database</u> The parameter database is inconsistent.
213	<u>System error "RscOutStructure"</u> internal error.
217	<u>System error</u> General system error.
218	<u>Error "Memory allocation"</u> Error in internal memory allocation.

Table 23: Internal TCPNVR system errors

6.4 Error Messages of the Application Layer Interface Task

6.4.1 Initialization Errors

Error number	Error
50	<u>Configuration error CR0</u> Configuration error for component reference 0 recognized.
51	<u>Configuration error CR1</u> Configuration error for component reference 1 recognized.
52	<u>Configuration error CR2</u> Configuration error for component reference 2 recognized.
53	<u>Configuration error CR3</u> Configuration error for component reference 3 recognized.
66	<u>TCP_UDP Task</u> The token of the TCP_UDP Task was not found.
67	<u>Initialization errors</u> General initialization error.
68	<u>Invalid operating mode</u> Invalid operating mode.

Table 24: ALI initialization errors

6.4.2 Runtime Errors

Error number	Error
111	<u>Status communication reference</u> Invalid condition of the communication reference for received message.
112	<u>TCP_UDP Task not ready</u> The TCP_UDP Task is not ready.
113	<u>Unknown communication reference</u> Telegram for unknown communication reference received.
115	<u>IP initialization</u> Telegram cannot be processed as IP Task is being initialized.
116	<u>Transmission error</u> Data could not be transmitted.
117	<u>Communication reference not ready</u> Communication reference is not ready to transmit data.
150	<u>Error "Message header"</u> Error recognized in message header.
151	<u>Error "Message length"</u> invalid length of message received.
152	<u>Error "Message command"</u> Invalid or unknown message received.
156	<u>Error "Message sequence"</u> Invalid message sequence recognized.
158	<u>Error "Message command running"</u> A message command has already been started.
161	<u>Error "Data address"</u> Invalid data address received in message.
165	<u>Error "Data address"</u> Invalid data address received in message.
166	<u>Error "Data type"</u> Invalid data type received in message.
167	<u>Error "Function"</u> Invalid function in message received.

Table 25: Runtime errors ALI

6.4.3 System Errors

Error number	Error
200	<u>Task not initialized</u> Task has not been initialized yet.
202	<u>Segment not available</u> No memory segments available.
210	<u>Error while opening the database</u> The parameter database is not available.
212	<u>Error while reading the database</u> The parameter database is inconsistent.
213	<u>System error "RscOutStructure"</u> Internal error.
217	<u>System error</u> General system error.

Table 26: ALI System errors

7 Technical Data

7.1 NT 40-EN-RS / NT 40-RS-EN with TCP/IP to 3964R

TCP/IP interface	Value
Ethernet transfer rate	10 MBit/s or 100 MBit/s
Ethernet duplex mode	Half or full duplex

Table 27: Technical data TCP/IP (conversion TCP/IP to 3964R)

3964R interface	Value
3964R Baud rate	50 Baud .. 38,4 kBaud
3964R Data Bits	7, 8
3964R Stop Bits	1
User data length	Max. 240 Byte transmission and receipt data per telegram

Table 28: Technical data 3964R (conversion TCP/IP to 3964R)

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