User Manual

Tektronix

K1205 / K1205 Plus Protocol Tester

C73000-B6076-C91-11

This document supports software version 2.50 and above
and the device types 7KK1200-P (K1205)
and 7KK1200-B (K1205 Plus)

CE

WARRANTY

Tektronix warrants that this product will be free from defects in materials and workmanship for a period of one (1) year from the date of shipment. If any such product proves defective during this warranty period, Tektronix, at its option, either will repair the defective product without charge for parts and labor, or will provide a replacement in exchange for the defective product.

In order to obtain service under this warranty, Customer must notify Tektronix of the defect before the expiration of the warranty period and make suitable arrangements for the performance of service. Customer shall be responsible for packaging and shipping the defective product to the service center designated by Tektronix, with shipping charges prepaid. Tektronix shall pay for the return of the product to Customer if the shipment is to a location within the country in which the Tektronix service center is located. Customer shall be responsible for paying all shipping charges, duties, taxes, and any other charges for products returned to any other locations.

This warranty shall not apply to any defect, failure or damage caused by improper use or improper or inadequate maintenance and care. Tektronix shall not be obligated to furnish service under this warranty a) to repair damage resulting from attempts by personnel other than Tektronix representatives to install, repair or service the product; b) to repair damage resulting from improper use or connection to incompatible equipment; c) to repair any damage or malfunction caused by the use of non–Tektronix supplies; or d) to service a product that has been modified or integrated with other products when the effect of such modification or integration increases the time or difficulty of servicing the product.

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General Safety Summary

Review the following safety precautions to avoid injury and prevent damage to this product or any products connected to it. To avoid potential hazards, use this product only as specified.

Only qualified service personnel should perform service procedures.

While using this product, you may need to access other parts of the system. Read the *General Safety Summary* in other system manuals for warnings and cautions related to operating the system.

To Avoid Fire or Personal Injury

Use Proper Power Cord. Use only the power cord specified for this product and certified for the country of use.

Connect and Disconnect Test Leads Properly. Do not connect or disconnect test leads while they are connected to a voltage source.

Ground the Product. This product is grounded through the grounding conductor of the power cord. To avoid electric shock, the grounding conductor must be connected to earth ground. Before making connections to the input or output terminals of the product, ensure that the product is properly grounded.

Observe All Terminal Ratings. To avoid fire or shock hazard, observe all ratings and markings on the product. Consult the *Appendix C* of the *User Manual* for further ratings information before making connections to the product.

Do not apply a potential to any terminal, that exceeds the permitted rating of that terminal.

With some interfaces only voltages corresponding to the default of the relevant connector are applied at the measuring sockets. However, high voltages from the line may occur at some of the measuring sockets. These measuring sockets are protected against accidental contact and are specially labelled.

Use Proper AC Adapter. Use only the AC adapter specified for this product.

Do Not Operate Without Covers. Do not operate this product with covers or panels removed.

Do Not Look into the End of a Fibreglass Cable. Never look into the end of a fibreglass cable or a single fibre which could be connected to a laser source. Laser radiation can damage your eyes because it is invisible and your pupils do not contract instinctively as with normal bright light. If you think your eyes have been exposed to laser radiation, you should have your eyes checked immediately by an eye doctor. The optical output's radiation power in our system corresponds to the laser class 1 in accordance with IEC 825-1, 11.93.

Use Proper Fuse. Use only the fuse type and rating specified for this product.

Avoid Exposed Circuitry. Do not touch exposed connections and components when power is present.

Do Not Operate With Suspected Failures. If you suspect there is damage to this product, have it inspected by qualified service personnel.

Do Not Operate in Wet/Damp Conditions.

Do Not Operate in an Explosive Atmosphere.

Keep Product Surfaces Clean and Dry.

Provide Proper Ventilation. Refer to the manual's installation instructions for details on installing the product so it has proper ventilation.

Certifications and Compliances

Consult the product specifications in the *Appendix C* for certifications and compliances.

Safety Terms and Symbols

Terms in this Manual. These terms may appear in this manual:

⚠ *WARNING. Warning statements identify conditions or practices that could result in injury or loss of life.*

⚠ *CAUTION. Caution statements identify conditions or practices that could result in damage to this product or other property.*

Terms on the Product. These terms may appear on the product:

DANGER indicates an injury hazard immediately accessible as you read the marking.

WARNING indicates an injury hazard not immediately accessible as you read the marking.

CAUTION indicates a hazard to property including the product.

Symbols on the Product. These symbols may appear on the product:

WARNING
High Voltage

Laser Klasse 1

WARNING
Laser Radiation
Laser Class 1

CAUTION
Refer to Manual

Protective Ground
(Earth) Terminal

Electrostatically
Hazardous

Disconnect Power before
Opening the Instrument

WARNING
End of a Fibre-
class Cable

Service Safety Summary

Only qualified service personnel should perform service procedures. Read this *Service Safety Summary* and the *General Safety Summary* before performing any service procedures.

Do Not Service Alone. Do not perform internal service or adjustments of this product unless another person capable of rendering first aid and resuscitation is present.

Disconnect Power. To avoid electric shock, switch off the instrument power, then disconnect the power cord from the mains power.

Use Care When Servicing With Power On. Dangerous voltages or currents may exist in this product. Disconnect power, remove battery (if applicable), and disconnect test leads before removing protective panels, soldering, or replacing components.

Preface

The Protocol Tester K1205 and K1205 Plus analyzes wide area communication networks with SS#7 (CCS#7), ISDN D channel, V5.x, GSM 900, DCS 1800, PCS 1900, CDMA, NMT 900, GPRS and internet protocols.

You can simultaneously monitor up to 16 PCM interfaces and 32 signalling links using this Protocol Tester. It can automatically capture the signalling channels and the framing when monitoring PCM routes. E1/DS1, ISDN BAI S_0, DS0A and U_{2B1Q}, as well as V./X. and Ethernet interface boards are currently available.

Using the approximately 150 implemented WAN communication protocols – including a number of national and manufacturer-specific variants – you can decode and analyze almost all signalling data online as well as offline.

The required protocols can be combined according to your needs using the graphical protocol stack editor. You can trigger and filter the data stream in order to keep data simple for analysis. A series of measuring applications is available for analyses.

The Protocol Tester is designed with the following in mind:

- **Modular form.** The modular design using the VME bus enables optimum adaption to different tasks. The modular concept of the Protocol Tester with four slots for the interface modules makes it extendable for almost any future applications.

- **Easy to operate.** The Windows NT 4.0 provides a familiar and easy-to-operate interface.

- **Easy to transport.** The Protocol Tester is light weight and compact so it's easy to transport. A transport case is available to protect the instrument.

K1205 and K1205 Plus.

The Protocol Tester is available in two variants: The *K1205* is a fairly compact portable device. The *K1205 Plus* is a slightly bigger benchtop device.

If both variants do not differ from each other the term *Protocol Tester* is used throughout this manual. Differences between *K1205 Protocol Tester (device type 7KK1200-P)* and *K1205 Plus Protocol Tester (device type 7KK1200-B)* are marked specially.

K1205 software, applications and Online Help are similar in both variants. Differntiation is not necessary.

Fields of Application

The K1205 / K1205 Plus has been designed for various purposes:

- to detect interferences in individual network segments

- to support the integration of different network elements

- to develop integration tests and to test new software versions

The Protocol Tester is a passive monitoring device which will not interfere with the network.

Due to the **auto restart mechanism**, error-free, long-term measurements are possible after a power outage.

Prerequisites

You should have the following qualifications to work with the Protocol Tester:

- Knowledge of PC and Windows-NT

- Experience with communications test applications

- Familiarity with the safety requirements for electrical equipment for measurement, control and laboratory use

Assistance

To help you use the Protocol Tester, the following documentation is provided:

- The User Manual assists you when starting the Protocol Tester. The User Manual is also available as a PDF online manual.

- The online help system is the detailed K1205 reference documentation. To open the Help window with the context-sensitive descriptions, press <F1> from within an application window.

- The Protocol Assistant is the detailed protocol reference documentation. To open it, press <F2> from within the monitor main window. The Protocol Assistant reflects the tester's software implementation of protocols.

NOTE. The scope of the provided documentation does not necessarily mirror your order but might go beyond to give you a overview of what is available.

- The release notes are delivered separately and contain the latest information on the current software version (readme.txt).

- Microsoft Windows NT is described in the manual *Start Here. Basics and Installation. Microsoft Windows NT Workstation* supplied with the Protocol Tester. On the front cover it shows a Certificate of Authenticity for the Windows NT installation of the Protocol Tester.

  Windows NT online help: Click in the taskbar on `Start: Help`. At the first time you start the Windows NT Help click on the `Find` tab and choose the option `Minimize Database`.

NOTE. The Windows NT installation is an OEM version. Therefore the Microsoft Support cannot be used. The Protocol Tester is supported by Tektronix only.

About the User Manual

The User Manual gives you an overview on how to work with the Protocol Tester:

- The most important part of the introductory chapter is the safety instructions.

- *Getting Started* tells you how to make the device ready for start-up, for example how to set up the device and how to establish the measuring connection, how to exchange modules, how to configure and start applications.

- *Examples* describes some applications step by step. If you follow these steps, you will quickly reach the desired measuring result.

- In the appendices you will find an explanation of the interfaces and boards, a keyboard description and the technical data.

The following text styles and markings have specific meaning in this manual:

Text style	Description
Courier	The Courier font indicates menus and menu functions as well as commands, parameters and examples.
<Key>	Keys or key sequences are in angle brackets.

Training Information

Contact your local sales office or our service support staff for information on training for the communications test technology with the K1205 / K1205 Plus.

Third-Party Products

To offer you complete solutions, it is sometimes necessary to buy products - such as modems and remote operation software - from third-party suppliers, and sell them together with our products.

So, if our products are used in a standard configuration that has not been tested by Tektronix, we kindly ask you for your understanding should we need to refer you to the supplier for support.

Contacting Tektronix

Address	Tektronix Berlin Wernerwerkdamm 5 13629 Berlin GERMANY
Web site	www.tektronix.com
Technical support	For hotline service support, call: +4930-386-22200 (8:00 a.m. – 6:00 p.m. GMT + 01:00) or 1-800-833-9200 (This phone number is toll free in North America. After office hours, please leave a voice mail message. Outside North America, contact a Tektronix sales office or distributor; see the Tektronix web site for a list of offices.)) Or fax: +4930-386-22546 Or contact us by e-mail: mpt.hotline@tek.com

Getting Started

This chapter tells you how to prepare the Protocol Tester for start-up, this means how to set up the device, how to exchange the measuring modules, how to connect the data line, and how to switch on the device.

Information on switching off the device and how to prepare the Protocol Tester for transport is included at the end of this chapter.

NOTE. The device has been delivered according to your requirements.

Please examine the merchandise for visible transport damage and for completeness using the pick slip.

Device Description

Each K1205 and K1205 Plus Protocol Tester consists of a basic device and the individual measuring modules (interface boards) which are for fitting the basic device according to your individual application purposes.

The basic device is equipped with a powerful PC board, a hard disk of ≥ 2 GB and VME bus.

- With K1205 four slots are available for the measuring modules.

- With K1205 Plus seven slots are available for the measuring modules.

Each basic device also features a TFT display (XGA), two PC card slots (type II; also called PCMCIA cards), a 3.5'' floppy disk drive and a removable keyboard with integrated trackball.

External PE GND. On the right side of the device, next to power cord connector, power switch, and fuses you will find an external PE GND screw. You can use this screw terminal to connect a separate protective earth to the K1205.

To do so, use at least an AWG18 cable. Connect the protective earth cable between the screw head and flat washer of the PE GND. Make also a good connection at the point where you connect the other end of the cable.


NOTE. The K1205 is intended to be electrically grounded. The deliverd power cord is equipped with a three-wire grounding plug that has a third grounding pin. Connect this plug to a grounded AC socket.

If you are not sure that your AC socket has a protective ground, you can connect a protective earth separately to the K1205 at the rear PE GND screw terminal.
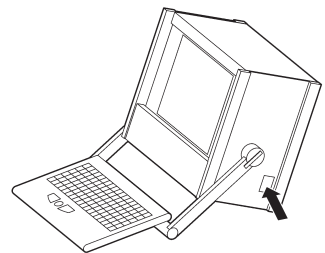

K1205: Setting-up the Device

Proceed as follows when setting up the device:

1. Press in both of the lateral handle hinges (handle variant: push up hinges), fold down the handle and set the device in the desired position.
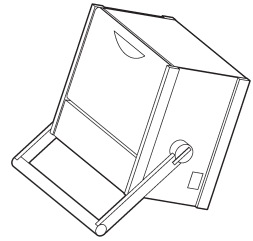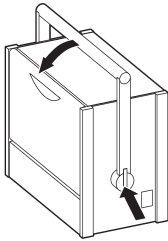
2. Pull the dark grey handle above the logo and lift the keyboard from the device.
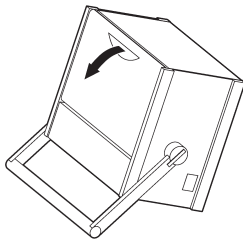
The handle can now be used as keyboard rest.

The mains connector and the ON/OFF switch are both located on the right side of the device. The fuses are located underneath the switch cover.

3. Fold the device cover (top) towards the rear until it locks at the back.

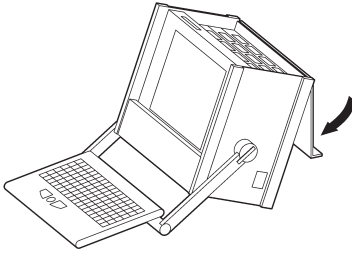The PC board is located in slot 1. The floppy disk drive and two PC card slots are also located underneath the device cover on the left side. You can connect modem or ISDN PC cards for remote control of the Protocol Tester or portable data carriers to the PC card slots.

⚠ **CAUTION.** *To avoid equipment damage, do not insert foreign objects into the disk drive or the PC card slots.*

Insert the 3.5" diskettes into the floppy drive with the label field forward.

The following interfaces are located on the cover of the **PC module** in slot 1:

- Socket for external PS/2 keyboard (KBD)

- Serial interface (COM1)

- Parallel interface (LPT1)

- 10Base-2 and 10Base-T sockets for LAN connection

- Socket for external monitor (VGA)

For further information on the individual interfaces, please refer to *Appendix A: Interfaces*.

To reset the protocol tester in an emergency, use a pointed tool and insert it into the RESET switch located on the cover of the PC module. There is also an LED indicating the operating state of the hard disk (HD).

Slots 2 to 5 are available for the **measuring modules**. For further information on the individual measuring boards, please refer to *Appendix A: Interfaces*.

NOTE. *You will find information on pin assignment of the individual sockets also in Appendix A.*

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4. Push the front cover upwards and fold the cover towards you.
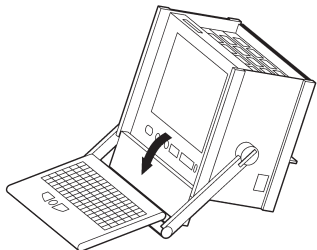
The following interfaces are located behind the front cover and beneath the display:

- K1205 keyboard connection (KEYBOARD): If the keyboard interface on the PC module's cover (KBD) is used with an external keyboard, the KEYBOARD connector must not be plugged in.

- Connections for alarm triggering and for a programmable relay. The synchronizing sockets can be used for data or timestamp synchronization of several K1205s (option).

- Serial interface (COM2)

- SCSI connection (SCSI I/O BUS), for example for an external CD-ROM or CD-RW drive

Furthermore, the LEDs for power supply ⏻ (top) and hard disk access ◎ are located beneath the display.

NOTE. You will find information on pin assignment of the individual sockets also in Appendix A.

Changing the Fuses for K1205. Spare fuses can you find in the delivered accessories box. If the fuses need to be changed, proceed as follows:

1. Switch off the device.

2. Disconnect the power cord.

3. The black fuse tray is placed on the right hand side of the mains switch on the right sight of the device.

   Use an appropriate tool, such as a flat screw-driver, insert it into the slot above the on/off switch. Open the tray, pull the red strip and exchange the broken fuse.

   Make sure to always use two fuses of the proper fuse type and rating.

4. Close the fuse tray.

K1205 Plus: Setting-up the Device

Proceed as follows when setting up the device:

1. Pull the dark-gray release handle above the logo forward and fold the keyboard down.
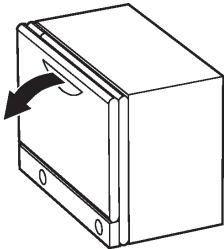
2. Remove the gray cable box from the monitor frame by pulling it away from the device until you hear a loud click: Place both hands at the sides of the cable box and pull the cable box away from the monitor frame. Or place one hand between cable box and monitor frame and press the cable box away from the monitor frame.
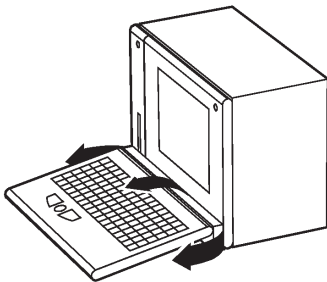
3. Take the cable out of the cable box and fold the cable box underneath the keyboard. The keyboard is now positioned in a working angle in front of you.
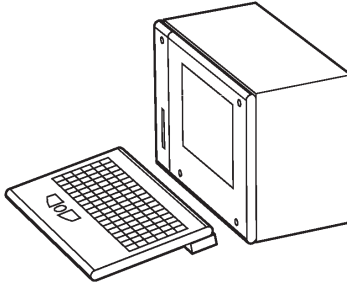
4. Pull on the lower monitor frame to position the monitor in a working angle. The mains cable must be supplied to the non-heating appliance socket on the rear of the K1205 Plus. The mains plug must be plugged into a socket with protective ground.

Changing the Fuses for K1205 Plus. Spare fuses can you find in the delivered accessories box. If the fuses need to be changed, proceed as follows:

1. Switch off the device.

2. Disconnect the power cord.

3. The black fuse tray is placed on the right hand side of the mains switch, on the rear of the device.

Use an appropriate tool, such as a flat screw-driver, insert it into the slot above the on/off switch. Open the tray, pull the red strip and exchange the broken fuse.

Make sure to always use two fuses of the proper fuse type and rating.

4. Close the fuse tray.

CD-RW Drive (Option)

The external CD-RW drive (Plexwriter) from Plextor can be used to write CDs and as a CD-ROM drive. The CD-RW drive is delivered with the original Plextor manual. Read this manual carefully. Pay particular attention to the safety instructions.

For using the CD-RW drive with K1205 Protocol Testers, you should adhere to the following instructions as well:

■ The SCSI-Bus-ID of the CD-RW drive should be set to a value between 2 and 6. We recommend to set the SCSI-Bus-ID to 3 before connecting the device. Then, connect one of the two SCSI interfaces of the CD-RW drive to the SCSI interface of your Protocol Tester using the supplied cable.

■ Do not install the software of the following CDs on your Protocol Tester:

– Recording software Toast 5 lite from Roxio
– Plextor Software Utilities (Plex Tools)

■ If you like to write CDs with the CD-RW drive you need to install the delivered WinOnCD software. The required serial number can be found on the booklet that is supplied with this software. We recommend not to install the optional WinOnCD components:

– Sample Artwork
– Photo Album Backgrounds
– Audio CD Title Database

NOTE. The delivered WinOnCD software is not usable for Windows 3.11 operating systems. Users of Protocol Testers with Windows 3.11 who like to write CDs are asked to upgrade their devices to Windows NT. Please contact the Tektronix hotline.

- Before writing a CD, carefully study the WinOnCD Online Help. We recommend to close all K1205 applications before writing. The running applications or the writing process might be disturbed or interrupted when running simultaneously. Use only high-quality CDs.

- Do not insert CDs with Autostart mechanism into the CD-RW drive during the operation of K1205 applications. Automatically started software may disturb or interrupt your running applications.

Switching Off and Transporting the Device

Before you switch off the Protocol Tester, shut down the operating system, and then switch off the Protocol Tester using the I/O switch.

K1205. For transport purposes fold the cover over the slots.

1. The cover beneath the display is folded upwards and the keyboard is folded back in front of the display to protect it against damage.
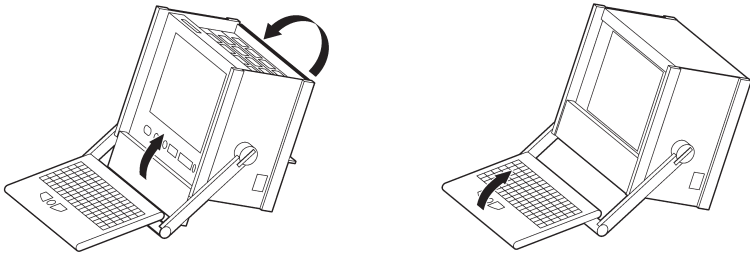
2. Press the lateral handle hinges (variant handle: push up hinges) and put the handle into a vertical position.

3. Use the transport case in which the device has been delivered to transport the Protocol Tester over longer distances. Put the device into the transport case as shown below:
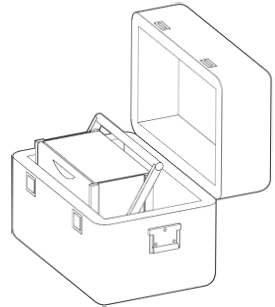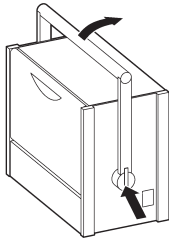
Before closing the transport case make sure that the handle is pointed toward the rear edge of the device.

K1205 Plus. When folding the keyboard up, keyboard and cable box must be connected and the cable must be completely inside the cable box.

1. First put the keyboard into the holding pins which are located at the top of the monitor frame (a); then press the two locking buttons on the cable box until you hear them click (b).

a.   b.
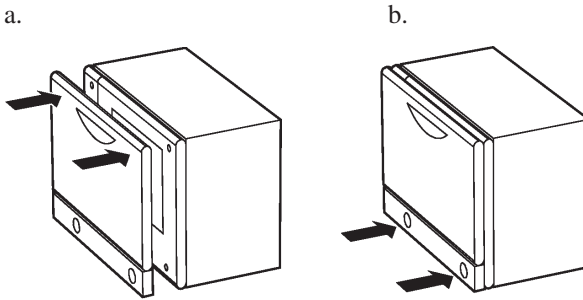
Use the optional transport case to transport the device over longer distances.

Exchanging Measuring Modules

E1/DS1, DS0A, ISDN BAI S_0, and U_{2B1Q}, as well as V./X. and Ethernet interface boards are available as measuring modules. ATM modules will be available in the future.

You can easily install and remove the measuring modules from slots 2 to 5 (behind the PC board). You can control the individual measuring modules and the interface sockets via applications.

⚠ *CAUTION. The device must be switched off completely. All modules contain electrostatically sensitive components. Observe the necessary precautions and ESD safety instructions.*

Make sure the VME bus address on the new module is set correctly (see page 27).

Which Board into which Slot?

The measuring boards and the slots are marked with different colors. So exchanging the measuring modules is made easy for you. The colors of the boards have the following meaning:

■ GREEN stands for all measuring boards for WAN interfaces such as E1/DS1, DS0A, S_0, U_{2B1Q}, V.X, Ethernet. Put green boards into green slots.

■ YELLOW stands for the AP-4 Board. You can put yellow boards in either green or transparent slots.

■ TRANSPARENT stands for the PC board. Put transparent boards into transparent slots.

⚠ *CAUTION. If you put a "wrong" board into a slot, you could damage the board and the instrument.*

Slot 0 and 1 are reserved for the PC boards only. Do not put the PC board into other slots and do not put other boards into slots 0 and 1.

The following color assignment matrix gives you an overview of which measuring board you can put into which slot:

Table 1: Which board into which slot?

Slot Board	GREEN	TRANSPARENT
GREEN	yes	no*
YELLOW	yes	yes
TRANSPARENT	no**	yes

* Restrictions could occur with some applications due to the P2 backplane adapter.

** The "transparent" Ethernet board can be installed in a "green" slot.

The following figures give you an example which measuring board you can put into which slot:

K1205. Possible Board Combination

5	4	3	2	1	0
E1/DS1 Board	Ethernet Board	DS0A Board	AP-4 Board	PC Board	PC Board
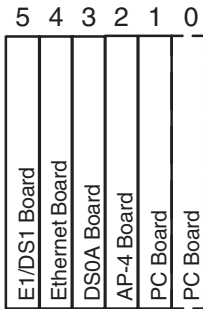
K1205 Plus. Possible Board Combination

8	7	6	5	4	3	2	1	0
E1/DS1 Board	E1/DS1 Board	E1/DS1 Board	E1/DS1 Board	AP-4 Board	BAI S_0 Board	BAI S_0 Board (Power Feeding)	PC Board	PC Board
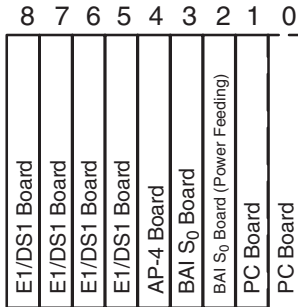
NOTE. *K1205 and K1205 Plus. For each interface board a cable is delivered free of charge. Thus you are able to work right away with your Protocol Tester. Furthermore, we offer a wide range of cables and adapters, which you can order. For further information please take a look at our data sheet or contact your local sales partner.*

Setting the VME Bus Address

You must adhere to the correct setting of the VME bus address using the hex switch when installing measuring modules. To avoid conflicts during initialization, the addresses must be clear. The same hex switch scale number must not appear more than once.
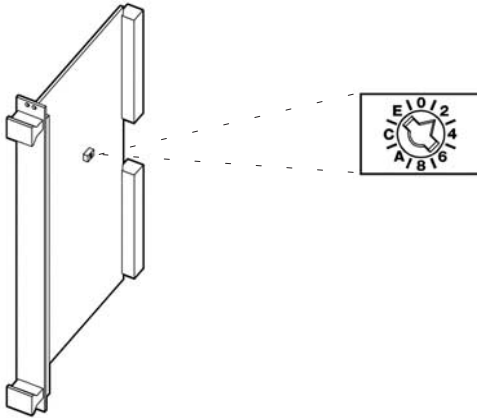
The hex switch is yellow with the scale from 0 to F around it and it is located in the center of the upper third of the modules. The display can be set to the desired value using an appropriate tool.

Before setting the hex switch, check which settings are already used for other boards. Therefore, open the K1205 Status Window via the appropriate button in the tool bar.
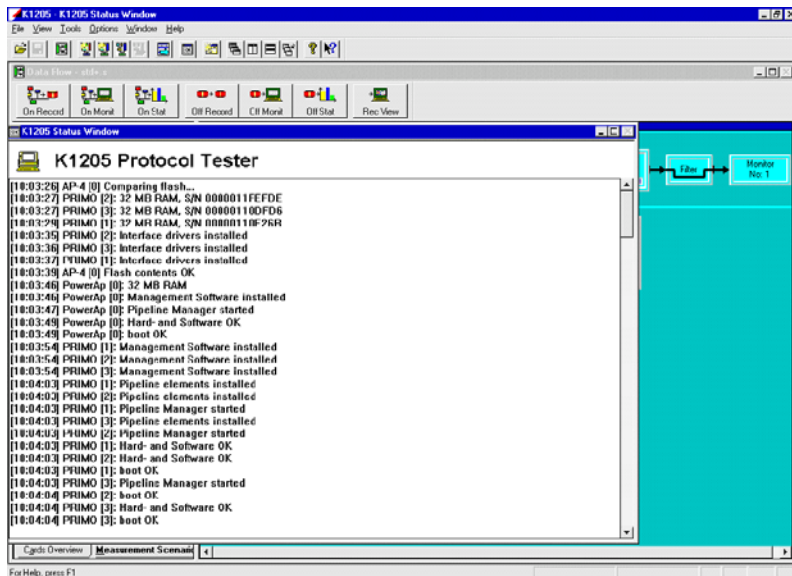
The hex switch of one board must be set on value 1. The values 0 and F are reserved for the AP-4 board. Do not use the values 0 and F for other boards and do not change the AP-4 settings.

K1205. Make sure that the hex switches are set as follows:

Table 2: Setting the VME bus address

Board	Slot	Hex switch number
PC board	1	9
AP-4 board	2	–
Interface board 1	5	1
Interface board 2	4	2
Interface board 3	3	3

K1205 Plus. Make sure that the hex switches are set as follows:

Table 3: Setting the VME bus address

Board	Slot	Hex switch number
PC board	1	9
AP-4 board	2	0
Interface board 1	8	1
Interface board 2	7	2
Interface board 3	6	3
Interface board 4	5	4
Interface board 5	4	5
Interface board 6	3	6

Installing Modules

⚠ **CAUTION.** *Make sure the VME bus address on the new module is set correctly (see page 27).*

If you install modules, proceed as follows:

1. Switch the device off and unplug the mains plug.

2. Remove the cover if necessary and put the module on the guide rails of the relevant slot.

3. Push the module completely into the slot.

4. Tighten the module with the two cross-head screws.

NOTE. *If you have to install a new E1/DS1 board and/or an AP-4 board, the Protocol Tester reprograms the boot Flash-PROM of this new board.*

Reprogramming is done automatically during the start-up sequence of the application and takes much more time than the normal start-up sequence. Therefore just be patient. You must not switch off or shut down the Protocol Tester during this time.

The reprogramming is finished as soon as the LEDs of the new boards are off and the Protocol Tester shows the Data Flow Window. Although the tester is then ready to work, you have to close all K1205 applications and start them (only the applications, not Windows NT) again.

Removing Modules

If you remove modules, proceed as follows:

1. Switch the device off and unplug the mains plug.

2. Unscrew the two cross-head screws of the module's front cover. The screws must be completely loosened.

3. Use your thumbs to simultaneously press outwards the levers located beneath the screws.

4. Then pull the module carefully out of the device. Make sure that the spring strip on the long side of the module cover is not being damaged.

5. If the two springs located behind the screws on the internal side of the module's front cover catch when removing the module, press the springs carefully back using an appropriate tool. Then pull the module completely out of the device.

Connecting to the Data Line

The Protocol Tester can be connected to the data line in the on or off state using the cables available as accessories.

1. Plug the right plug on the one end of the cable into a socket of the measuring module. In the K1205 the sockets of the measuring modules are located underneath the cover of the Protocol Tester. In the K1205 Plus they are located on the rear of the device.

The individual cables available as accessories are listed in the data sheet. Or ask your local sales partner about them.

We recommend that the cable length be less than 3 m.

You can control the individual measuring modules and the interfaces (sockets) via the K1205 application.

⚠ *CAUTION. Please pay attention to possible impedance differences. The Protocol Tester is set to high impedance as default. For low input impedance you must set the tester accordingly. This is done via the K1205 application.*

Switching on the Device

Make sure that the keyboard cable is connected to the keyboard interface, the mains cable is supplied to the non-heating appliance socket and the mains plug is plugged into a socket with protective ground.

1. Switch the device on using the ON/OFF switch.

2. The Protocol Tester is set ready-to-run upon delivery. The device automatically boots after switching on. The operating system is loaded and the application is then started automatically.

NOTE. *Please observe the security functions offered by Windows NT. If you start Windows NT for the first time, you are automatically logged in as administrator with the following information:*

```
User name: User
Password: user
```

To improve data protection you can change the password directly after the first login. Information on how to proceed is given in the Windows NT online help under Start:Help, keyword "user manager" or "passwords".

Reprogramming of Flash-PROMs

During the first start after installation the Flash-PROM of your interface boards may be reprogrammed. This may take some time. Do not switch off the K1205 during the reprogramming process.

After reprogramming is completed you may have to close and restart the K1205 application. Depending on the type and number of interface cards this procedure might have to be repeated once for each interface card.

Expired Licenses

The K1205 software will not start if a product license has expired. To help you avoid this situation, product license information is available from the Licenses option in the Help Menu in the Data Flow window. Product expiration warnings will also be displayed after the system start for products that have licenses, which will expire in 21 days or less. If a license does expire however, you can use the normal K1205 setup program to either uninstall the expired product or update the license key file.

K1205 Application

The K1205 application is started with an initial screen which shows the version number of your application on top of the screen and information on the load state of the software at the bottom.

Data Flow Window. If you start the autoconfiguration, the autoconfiguration feature automatically detects the signalling channels and the framing of the connected data lines. After the autoconfiguration has been carried out, the active signalling channels are available and you can start the measurement: the *Data Flow Window* appears.

There are two different tabs for setting parameters of interface modules, links and measurement scenarios: *Cards Overview* and *Measurement Scenarios*.

Cards Overview. The *Cards Overview* tab provides an overview of the connected interface modules. Here you can define the setup settings of modules and ports or change existing configuration settings. These are assigning symbolic names to the ports and defining frame types and line codes.
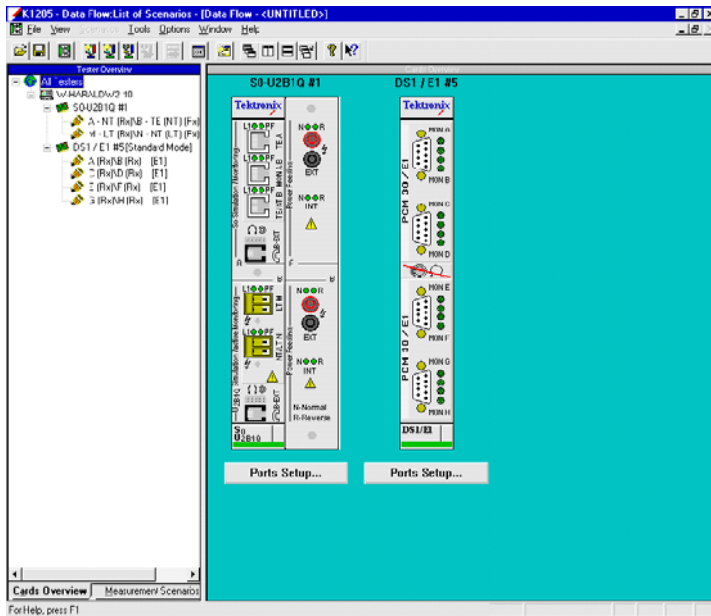
The left pane, *Tester Overview*, displays the interface modules, ports and the line configurations currently set. The right pane, *Cards Overview*, shows the individual sockets on the cards including module designation.

Measurement Scenarios. In the `Measurement Scenarios` tab of the `Data Flow Window`, configure your measurement task by defining data sources and parameters for the measurement. The `Measurement Scenarios` tab keeps you informed about the currently active parameter settings and system status at all times.

The grey boxes in the pipelines represent measurement modules (processing elements) with the connecting lines indicating the data flow between the modules.
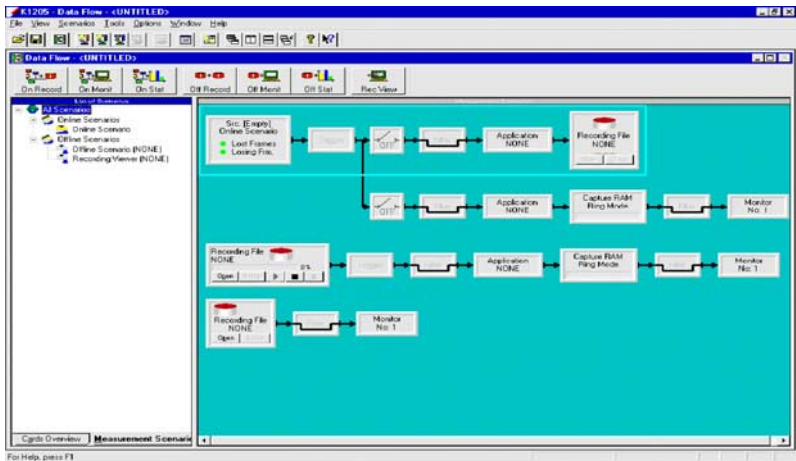
The left pane, `List of Scenarios`, displays the available measurement tasks (scenarios) as well as the measurement tasks currently configured and the outline sources. On the right, the `Measurement Scenarios` pane displays the pipelines assigned to the measurement tasks.

NOTE. *As soon as you are in the K1205 application, the K1205 online help is available: simply click* `Help` *in an application window using the trackball or mouse or press* `<F1>`*.*

The online help gives you context-sensitive assistance.

Software Installation

Important Hints

The Protocol Tester is ready for use upon delivery. Windows NT and the K1205 application have already been installed.

Base software, application programs, updates, and upgrades are supplied on CD-ROM, with a setup program and a readme.txt file located directly under the root directory of the CD-ROM. You should read the readme file before installing the software.

Device-specific software keys protect the CD-ROM software against unauthorized access. To enable the software on your protocol tester, you also receive an additional *Software Keyfile / License Information Disk* (key disk).

Mixing Different Software Versions. Software products from different CD versions are NOT designed to be mixed. The Setup program has a security mechanism that will ensure that such version mixes cannot be installed:

After having selected your software products from this CD, you will be warned about older software products in your existing configuration that will be removed.

- If you confirm with *Yes*, the Setup program removes the old products automatically and proceeds with the installation of the new products.

- If you want to keep an old product, cancel the Setup program, backup the software as described below, and then restart the Setup program again.

If you want to install software products from different CD versions, first perform a complete backup of the existing software. This will ensure you the best control about the software configuration on your system and possible dependencies with other software packages you might have installed.

Types of Installation. You have two options to install protocol tester software:

■ Installation of additional software packages: Install further software packages in addition to the already installed software version such as protocols, emulations, application programs.

■ Installation of a new software version: Install a complete new version of the base software and additional software packages.

NOTE. The K1205 Protocol Tester has been pre-configured with Microsoft Windows NT and therefore provides you with all possibilities offered by this industrial standard. This enables you to choose from a variety of available software products for the analysis and evaluation of your measurement results. Such programs can be installed and used directly on your protocol tester.

Within this context, please observe the following: The installation of additional software reduces the disk space required for saving measurement results. During the course of a measurement, only Protocol Tester applications should be run in order to ensure the exclusive availability of the disposable CPU performance for the measurement task.

User Data. It is important to always save user data to an appropriate back up system before performing any installation. Detailed instructions for the back up are given in the appropriate section.

User data are files and directories:

■ not provided by Tektronix

■ stored under the installation path of the Protocol Tester

NOTE. If you modify files and directories provided by Tektronix, it is necessary to save them under a different name. Otherwise a subsequent installation might fail or become incomplete, or your data might be overwritten.

Pre-Installation Checks

3. Ensure that the system date and time have been set to the actual date and time. Failure to do so may result in a situation where the software cannot be started.

4. Ensure that your boards meet the following memory requirements:

- E1/DS1 Monitoring boards: 16 MB RAM minimum

- BAI boards: 8 MB RAM minimum

At least 16 MB (recommended 32 MB) of memory are required for interface boards that are installed with VME bus address 1. (See chapter "Setting the VME Bus Address").

NOTE. Cards that do not meet these requirements are NOT booted and CANNOT be operated. A message will appear in the K1205 Status Window if memory is not sufficient. If a RAM upgrade is required, please contact your technical support representative.

5. Check your Microsoft NT Service Pack.

The K1205 is delivered with Microsoft NT 4.0 Service Pack 5. You will find the Service Pack 5 on your Tools CD in case you have to re-install it.

NOTE. We strongly recommend that SP5 is installed prior to using the K1205 software. Service Pack 6 is not supported by the K1205 software.

6. Remove the content of the directory `C:K1205\bin`

The installation of a new K1205 software over an existing K1205 software can cause problems with non-existing licenses. To avoid this problem remove the content of the directory `C:\K1205\bin` of the exiting software version before you install the new version. This can be done with the Windows Explorer or on the command line with
`del c:\K1205\bin\*.*`

Pre-Installation Checks for K1205 PC Software. The K1205 PC Monitoring Software is supported for Win NT 4.0 Service Pack 5 and Win 2000. It requires a dongle (aka. Aladdin Software Hardlock). For information on obtaining and configuring this special version contact your Tektronix representative. When using this version with the dongle please observe the following guidelines:

- Never attempt to attach the dongle to the parallel port (LPT1) without first shutting the PC or Laptop down. This may damage the dongle or the hardware to which it was attached.

- Never attempt to detach the dongle from the parallel port (LPT1) without first shutting the PC or Laptop down. This may damage the dongle or the hardware to which it was attached. If the dongle is removed while the K1205 software is running, the software will terminate.

Installation of Additional Software Packages

If you have purchased additional software packages you need to install them on top of your existing software installation. Therefore, do not remove the existing software or change its installation path (by default `C:\K1205`).

NOTE. There are logical dependencies between single software packages and the base software package. Such information are provided in the order information and will be checked during the setup process. Only matching combinations can be installed.

Missing Destination Drives. The Setup program warns you, if products cannot be installed on your system because of missing destination drives. The affected products are reported in a warning dialog box; they will NOT be listed in the "List of Available Products" of the Setup program.

1. If such a warning appears, create the necessary destinations drive outside of the Setup program. Refer to the Microsoft Windows Online Help on how to do this.

2. Restart the Setup program. The affected products will now become accessible in the "List of Available Products".

To install additional software packages, proceed as follows:

1. Close all applications.

2. Connect the optional external CD drive directly to your Protocol Tester or create an access to a network CD drive.

If you install the software from a CD network drive, do not browse the network neighborhood to access this location. Map the share containing the CD to an unused drive letter instead, such as "E:" or "F:"

3. Insert the key disk into the floppy disk drive of the Protocol Tester. The key disk contains a serial number, which must be the same as the nameplate fabrication code (*Ser.-No.*) on the back of the device.

4. Insert the installation CD into the CD drive. The *K1205 Setup Guide* starts automatically.

Select *K1205 Protocol Tester Software*.

If the installation does not start automatically, double-click `RunIntro.bat` from the CD root directory.

Follow the setup program instructions. Read the enclosed license agreement carefully and respond to the prompts.

5. Specify a valid keyfile within the keyfile selection dialog box, if you do not want to use the `keyfile.txt` on the key disk in the floppy disk drive.

In the subsequent dialog boxes, click `Next`.

6. In the product selection dialog box, installed software packages are indicated by their version numbers in the column `State`.

   DO NOT deselect any installed products.

   Check that all additional software packages that shall be installed are selected. Their selection might fail if:

   a. an incorrect or incomplete keyfile was selected before or

   b. not all necessary software packages were purchased or installed.

   In case **a.** choose the correct keyfile using the button that indicates the currently used keyfile.

   In case **b.** install all software packages that you have purchased for this system. Therefore, you might need to access all keyfiles you have received in all deliveries for this software version for this system. If you cannot proceed, contact the technical support.

   Press `Next` to test your selection against the provided keys.

   NOTE. *The* `Next` *button may be disabled. One possible reason is that not enough space is available on the hard disk. In that case, try to save space until the setup program displays at least 20 % free disk space.*

   Press `Start` when the key check finished successfully.

   CAUTION. *Do not interrupt the installation program once you have clicked* `Start`.

   If the program is inadvertently interrupted, rename the file:
   `C:\WINNT\UNINSTALL.K1205.INI.BAK` *to*
   `C:\WINNT\UNINSTALL.K1205.INI.`
   Start the installation program again.

   ---

7. After the installation is complete, remove the key disk from the floppy disk drive and reboot your protocol tester.

Installation of a New Software Version

Software products from different product CDs are NOT designed to be mixed. The Setup program has a security mechanism that will ensure that such version mixes cannot be installed.

If you install a new software version on top of an existing software version, the existing version will be automatically removed.

If you want to install software products from different CD versions in parallel on one protocol tester, first perform a complete backup of the existing software.

Back Up the Software. If you want to back up your existing K1205 installation, proceed as follows:

1. Close all applications.

2. Use the Windows NT Task Manager to end the process *dio.exe*.

3. Rename the original K1205 directory *C:\K1205* (for example, *C:\K1205.v220*), or move the directory to a different partition.

4. Rename the file *C:\WINNT\UNINSTALL.K1205.INI* (for example, *C:\WINNT\UNINSTALL.K1205.INI.v220*) before you install the new K1205 software.

⚠ **CAUTION.** *If you do not rename this file before installing the new software, the software will not start.*

⚠ **CAUTION.** *If you create multiple installation sets on your hard disk by such back up operations, keys for different software versions will remain in your keyfile* C:\winnt\keyfile.txt. *The KeyManager program will not be able to identify each back up. A subsequent call of this tool might announce keys of back up installations erroneously as "obsolete". Do not delete "obsolete" keys, as a restored installation will not run without its keys. To overcome such possible problems rename the keyfile accordingly (for example* C:\winnt\keyfile.txt.v220*).*

Installing the Software. To install a new software version, proceed as follows:

1. Close all applications.

2. Connect the optional external CD drive directly to your Protocol Tester or create an access to a network CD drive.

   If you install the software from a CD network drive, do not browse the network neighborhood to access this location. Map the share containing the CD to an unused drive letter instead, such as "E:" or "F:"

3. Insert the key disk into the floppy disk drive of the Protocol Tester. The key disk contains a serial number, which must be the same as the nameplate fabrication code (*Ser.-No.*) on the back of the device.

4. Insert the installation CD into the CD drive. The *K1205 Setup Guide* starts automatically.

   Select *K1205 Protocol Tester Software.*

   If the installation does not start automatically, double-click `RunIntro.bat` from the root directory of the CD.

   Follow the setup program instructions. Read carefully the enclosed license agreement and respond to the prompts.

   Specify a valid keyfile within the keyfile selection dialog box, if you do not want to use the `keyfile.txt` of the key disk in the floppy disk drive.

   In the subsequent dialog boxes, click `Next`.

NOTE. *The Setup program warns you, if products cannot be installed on your system because of missing destination drives. The affected products (such as Conformance Tests which require a D: disk drive) are reported in a warning dialog box; they will NOT be listed in the "List of Available Products" of the Setup program.*

If such a warning appears, proceed as described on page 42.

---

5. In the product selection dialog, check that all software packages that shall be installed are selected. Their selection might fail if:

>   **a.** an incorrect or incomplete keyfile was selected before or

>   **b.** not all necessary software packages were purchased or installed.

In case **a.** choose the correct keyfile using the button that indicates the currently used keyfile.

In case **b.** install all software packages that you have purchased for this system. Therefore, you might need to access all keyfiles you have received in all deliveries for this software version for this system. If you cannot proceed contact the technical support.

6. Press *Next* to test your selection against the provided keys.

> **NOTE**. *The* Next *button may be disabled. One possible reason is that not enough space is available on the hard disk. In that case, try to save space until the setup program displays at least 20 % free disk space).*

7. Press *Start* when the key check finished successfully.

> **CAUTION.** *Do not interrupt the installation program once you have clicked* Start.
>
> *If the program is inadvertently interrupted, rename the file:*
> `C:\WINNT\UNINSTALL.K1205.INI.BAK` *to*
> `C:\WINNT\UNINSTALL.K1205.INI.`
> *Start the installation program again.*

8. After the installation is complete, remove the key disk from the floppy disk drive and reboot your Protocol Tester.

Removing the Software

To remove K1205 software, proceed as follows:

1. Close all applications.

2. Start the Tektronix K1205 remove program by selecting:
   Start / Settings / Control Panel / Add/Remove Programs: Tektronix K12xx Protocol Tester
   and press *Add/Remove.*

   Remove the K1205 software by selecting dedicated or all entries in the list of installed components.

   User Data will be preserved.

3. Reboot the system after removing has been completed successfully.

Operating System

The Protocol Tester is delivered completely configured. The following software components have already been pre-installed:

- Windows NT, Version 4.0 (Build 1381: Service Pack 5)

⚠️ *CAUTION. This Windows NT installation is incomparable with the standard Windows NT installation for PCs. Therefore, do not install a new Windows NT in case of failure.*

- Acrobat Reader 4.0

- Internet Explorer 5.5

- Software components for initializing the basic device

- Measurement applications as ordered

Optional components (printers or network protocols for example) can be added with the help of Windows NT binaries which are available under *...\SETUP.ETC\I386*. Thus it is possible to add components without having the CD drive attached. The path is automatically set and has to be entered manually only in some special cases.

Automatic Logon, Preconfigured Accounts

Table 4: Account data

Username	Password
Administrator	(none, left blank)
Guest	(none, left blank)
Setup	setup
User	user

This pre-configuration has been chosen for a stand-alone system without enhanced security requirements for ease of operation.

All accounts except *Guest* have an administrative privilege.

The predefined *Guest* account should be used for part time guest connections over the network. The *Guest* account is activated in the Protocol Tester; in Windows NT it is disabled by default. Do not set an individual password on the *Guest* account instead disable it, if you want to meet enhanced security requirements.

When connecting more than one Protocol Tester to a larger enterprise network, you should install individual user accounts and passwords on your Protocol Testers. In this case good knowledge about the concept of user accounts and user groups in Windows NT is required. Be sure to define an individual password for the *Administrator* and *User* accounts.

⚠ **CAUTION.** *If you change the pre-configured* User *account, you should adapt the automatic logon too. Choose* Start: Settings: Control Panel: Tweak UI: Network *tab. The fulfillment of enhanced security requirements is your responsibility.*

Desktop Icons

The following predefined icons are built in to Windows NT on the desktop: *My Computer*, *Network Neighborhood*, *Inbox*, *Internet Explorer*, *Recycle Bin*, *My Briefcase*.

The use of the *Inbox* is currently not supported; this icon contains no functionality related to the use of the Protocol Tester. The Internet Explorer is pre-installed for offline reading of HTML documents in future releases.

Desktop Settings

Windows NT Explorer, *My Computer* and *Network Neighbourhood* are configured with certain view options. Change these options only if you are accustomed to working with other preferences.

My Computer will browse a single window. Registered file extensions will not be hidden. Compressed files and folders will be displayed in varying colors.

MS-DOS Prompt

For those who are accustomed to working with an MS-DOS window, the Windows NT command prompt can be started as follows:

1. Click on *Start: Programs: Command Prompt*

The command prompt that is started with this link is pre-configured with certain settings.

For all command prompts, the *path completion* feature is activated. The feature works with all paths and filenames. By repeating the *TAB* key you can scroll through all existing paths or filenames in the current directory.

NOTE. *To close the MS-DOS window, type* exit *and press <ENTER>.*

Installing Printers

Two printer drivers are pre-installed. Do not delete them. If you want to add others, proceed as follows:

1. Connect the printer or establish a network connection to the print server.

2. Make sure that the printer is operational.

3. Click on *Start: Settings: Printer*

4. Double-click on *Add Printer*

5. The Wizard will assist you during installation.

6. Select port LPT1 if the printer is connected directly with a parallel cable to the Protocol Tester.

Remote Operation

The Protocol Tester can be remotely operated with the help of optional software. For details, contact Service Support.

If you use the remote operation features via a network, you can use the built-in network adapter. No extra network card is required.

Security Requirements

Observe and follow the hints of the following Caution statement.

⚠ *CAUTION. To ensure rapid applicability and easy restart after power failure, your Protocol Tester is supplied with a standard user account and password upon delivery. This provides no particular security measures. Therefore, you should implement an access control for your Protocol Tester and limit access to a specific person subgroup in order to prevent misuse of your data by unauthorized persons.*

Protocol Testers in an individual LAN:
If you concentrate your Protocol Testers within an individual LAN network, then protect this network against access from other PCs.

Access via a company-wide Intranet:
If your Protocol Tester is being applied within an Intranet, then implement an extended user administration and employ up-to-date virus scanners and firewalls.

Access via Internet or modem:
If you want to access your Protocol Tester via the Internet, you can, for example, implement additional security measures with the help of virtual private networks (VPNs).

The implementation of such extended security measures is your sole responsibility and is realized at customer's own risk and without liability to Tektronix.

Examples

The following chapter guides you step by step through the different aspects of working with the Protocol Tester. These are common applications relevant to many users.

NOTE. The following chapter should help you get started by explaining the basic principles of the Protocol Tester in a clear and simple fashion.

Online Monitoring in a Network

You can use the Protocol Tester and E1/DS1 interface boards (PRIMO) to test the signalling in the following type of situations:

- In mobile networks at A_{bis} interfaces between base station controller (BSC) and base transceiver station (BTS) or at A interfaces between mobile switching center (MSC) and base station controller (BSC)

- In fixed networks between switching systems or between subscriber and switching system.

Preliminary Steps

1. Connect the Protocol Tester's PRIMO interface boards to the measuring sockets of the data line, using the appropriate cables.

   The interfaces on the PRIMO boards are 9-pin Sub-D sockets (refer to the previous chapter, section *Connecting to the data line* and to *Appendix A*, Section *E1/DS-1 Interface Board*).

2. Switch the device on.

   The operating system boots automatically (refer to the previous chapter, section *Switching on the K1205*). The K1205 application is started automatically.

   The `Status Window` shows status messages for the individual modules. If the modules boot without errors, the message "K1205 boot OK" will be displayed.

3. The following dialog appears for loading the configuration:
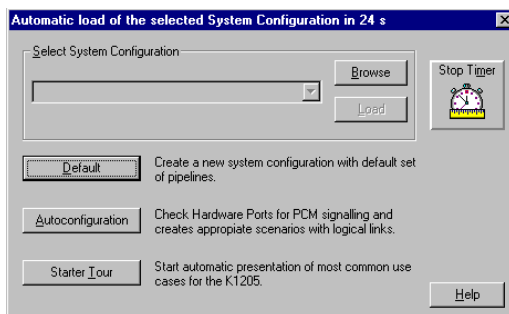
4. Click *Autoconfiguration*.

The autoconfiguration feature automatically detects the signalling channels and the framing of the connected data lines.
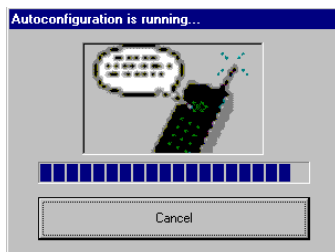
After the autoconfiguration has been carried out, the active signalling channels are available and you can start the measurement: the *Data Flow Window* appears. Make sure you are in the *Measurement Scenarios* pane.

> **NOTE.** *The data line has not been connected properly, if the following message appears: "The initialization of PCM Check has been terminated! The previous configuration will be loaded." In this case, check the connection between the Protocol Tester and the data line measuring sockets.*
>
> *If you get the message "No signalling detected on any ports", please restart the autoconfiguration. Start it now via the menu* `Tools: Autoconfiguration`.
>
> *Furthermore, take into account, that the autoconfiguration for LAP-based protocols depends on the received data amount during a measurement interval.*

Starting Measurements

The autoconfiguration feature automatically defines an online data source (*Scenario*) and generates an online measurement scenario as a pipeline which contains several branches for individual measurement tasks. An online data source is a group of logical links. A logical link consists of a channel and a channel data interpretation rule (assigned protocol).

The settings for each data source, as detected by the autoconfiguration feature, are displayed in the expanded left part of the window under *List of Scenarios* (to expand, click "*+*"):
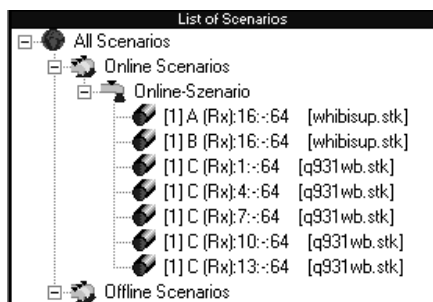
The following information is provided:

```
[1]D(Rx):16:-:64 [Whibisup.stk]            (example)
```

1:	first board
A:	port MON A
(Rx)	direction, here: Receive
16:-:64	timeslot 16, no subchannel (-), with 64 kbit/s
Whibisup.stk	detected protocol setting, here: the stack for SS#7 White Book according to ITU-T

The right side of the window *Measurement Scenarios* contains the online measurement scenario as a pipeline with the two branches *Monitor* and *Recording File*.
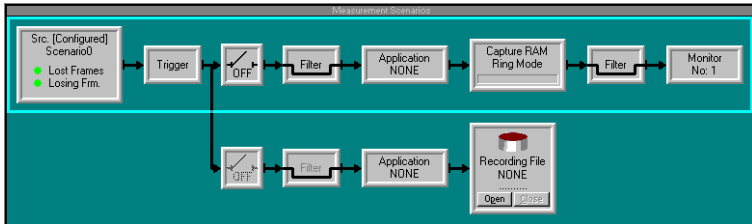
5. To start online monitoring, click the ON/OFF switch of the *Monitor* pipeline branch to *ON*.
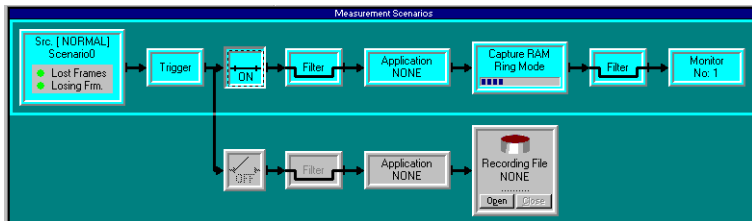
The pipeline of the activated data flow is now green: the measurement is running.

6. To view the signalling data of the activated data flow switch to the monitor main window by clicking the processing element *Monitor* at the right end of the pipeline.

Online Monitoring

The monitor main window consists of three views (see each title bar). The Short View is shown in the upper part the window, the Frame View in the middle and the Packet View in the lower part. These three views display the data flow at different levels of complexity.

```
                                                          Short View
 Time             From                  2. Prot      2. MSG      3. Prot
 11:25:12,404,792  1/H/16               ISUP         REL
 11:25:12,430,285  1/G/16               ISUP         RLC
⇨11:25:12,496,673  1/H/16               ISUP         IAM
 11:25:12,526,534  1/G/16               ISUP         ACM
 11:25:12,530,285  1/G/16               ISUP         ANM
 11:25:13,099,410  1/G/16               ISUP         REL
 11:25:13,124,167  1/H/16               ISUP         RLC
                                                            Frame View
 BITMASK              ID Name                    Comment or Value
 11:25:12,496,673    1/H/16   ISUP   IAM
MTP Level 2 (MTP-L2)
-0101001  Backward Sequence Number        41
1-------  Backward Indicator Bit          1
-0101101  Forward Sequence Number         45
1-------  Forward Indicator Bit           1
--010101  Length Indicator                21
00------  Spare                           0
----0101  Service Indicator               ISDN User Part
--00----  Sub-Service: Priority           Spare/priority 0 (U.S.A. only)
10------  Sub-Service: Network Ind        National message
**b14***  Destination Point Code          00-7-13-0
**b14***  Originating Point Code          01-7-10-0
ITU-T WHITE BOOK ISDN User Part (ISUP)   IAM (= Initial Address)
Initial Address
0000----  Signalling Link Selection       0
**b12***  Circuit Ident Code              026-19
0000----  Spare                           0
00000001  Message Type                    1
------00  Satellite Indicator             No satellite circuit
----00--  Continuity Chk Indicator        Cont Check not required
                                                            Packet View
 HEX   0  1  2  3  4  5  6  7  8  9  A  B  C  D  E  F
   0  A9 AD 15 85 E8 03 F4 01 53 03 01 00 20 01 0A 00
  10  02 00 05 03 10 21 43 65
For Help, press F1
```

The data in each view is constantly updated. In **Live Mode** (indicated in the main window title bar), you can read the data as it is measured. This mode is set by default when you switch to the monitor main window.

If you click on a view and scroll the contents using the arrow keys ($\downarrow$ and $\uparrow$), the system automatically switches into **Freeze Mode** (indicated in the main window title bar). The continuous display of new data frames is then suppressed. In the background, the measuring goes on, until the available storage is full. Then you receive the following error message:
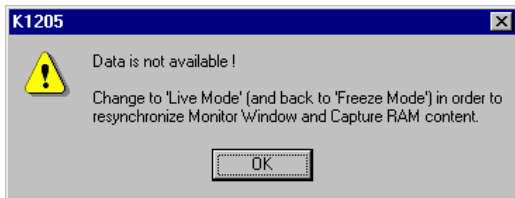
Click the *Live Mode* button to return to live mode.

The **Short View** provides an overview and lists the detected data packets row by row in summary form.

You can choose which infomation is important for your own overview. Select *Monitor:Column Setup:Short View*.

The **Frame View** decodes the protocol parameters of a frame selected in Short View bit by bit and displays the results in plain text. The protocol parameters displayed depend on which protocol stacks are loaded.

You can choose how detailed the information should be displayed. Select *Monitor:Column Setup:Frame View*.

The **Packet View** displays the protocol parameters of a frame selected in Short View in hexadecimal, ASCII or EBCDIC.

Recording and Reviewing Monitoring Data

The signalling data of the active data flow can be recorded in a special recording file for subsequent evaluation and/or offline analysis. This recording feature can be used in conjunction with or as an alternative to online monitoring.

Preliminary Steps

The Protocol Tester has been properly connected to the data line and turned on. The modules booted without errors and the application has been started.

Once the autoconfiguration has terminated successfully, the `Data Flow Window` appears (refer to "Preliminary Steps" in the previous section). Make sure you are in the `Measurement Scenarios` pane.

Start Recording

The right side of the window `Measurement Scenarios` contains a pipeline branch with the processing element `Recording File` at the right end of the pipeline, which displays a file icon. `NONE` signifies that no recording file has been created.
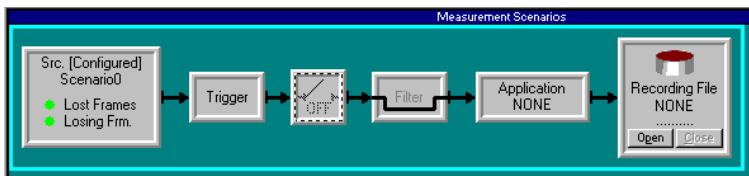
1. Click the processing element *Recording File* to create a recording file. The following window appears:

Choose one of the indicated files or create a new one by writing a name in `File name`. The following dialog box appears:
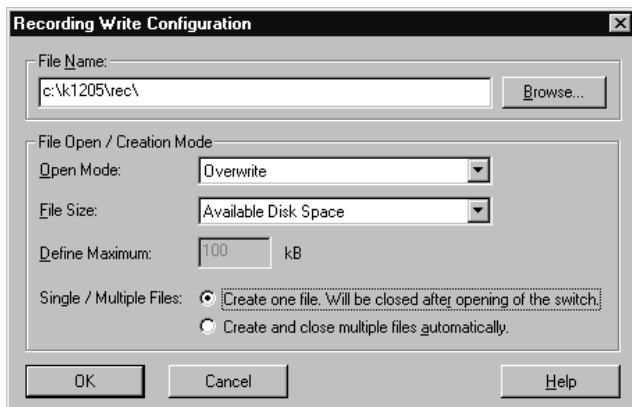
Storing all your recording files in `c:\k1205\rec\` facilitates the search for individual files later on.

Press *Browse*, if you want to locate an existing file.

You do not need to enter the file extension ".rf5" for the recording files when entering the file name. The program appends it automatically.

The remaining settings are optional.

2. Confirm your entries with *OK*. The name of the recording file appears in the processing element *Recording File*.

3. To start recording, click the ON/OFF switch of the *Recording* pipeline branch to *ON*.
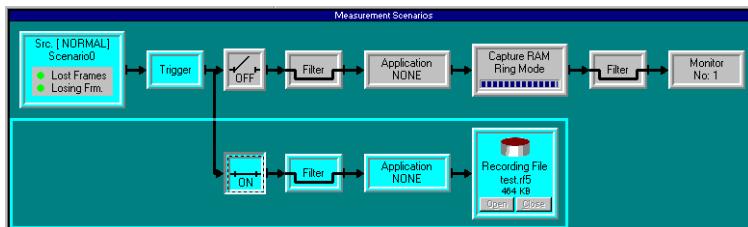
The signalling data of the activated data flow are written to the recording file until the file is full or until you terminate the process. The data in the recording file can be read after the current measurement is complete.

You can stop recording by clicking the ON/OFF switch of the *Recording* branch to *OFF*.

NOTE. *In most cases, data are recorded and reviewed at different times. It is however possible to check the contents of the recording file immediately after recording data. A description on how to review recorded data you find on the following pages.*

Reviewing Recorded Data

Proceed as follows to view the signalling data stored in a recording file with the record viewer.

1. Start the record viewer by clicking the `Rec View` icon in the pipeline selection toolbar and and drag it in the green measurement scenario window . The pipeline of the Record Viewer appears in the `Measurement Scenarios:`
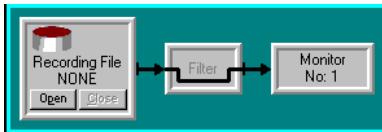

2. Click the left processing element (pipeline element) `Recording File` in the Record Viewer pipeline. The following dialog box appears:
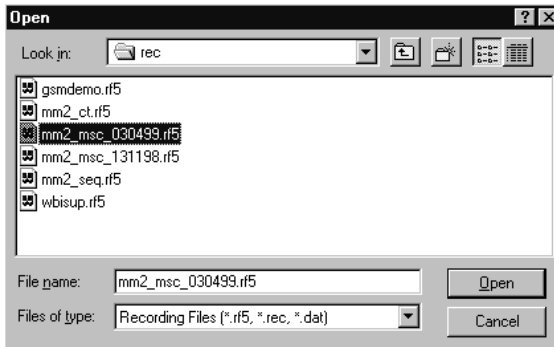
Select the recording file you want to work with by double-clicking it. K1205 recording files end with ".rf5". K1103 recording files end with ".rec". K1297 and K1197 recording files end with ".dat".

3. With the following dialog box you can then change the protocol stacks assigned to the logical links.
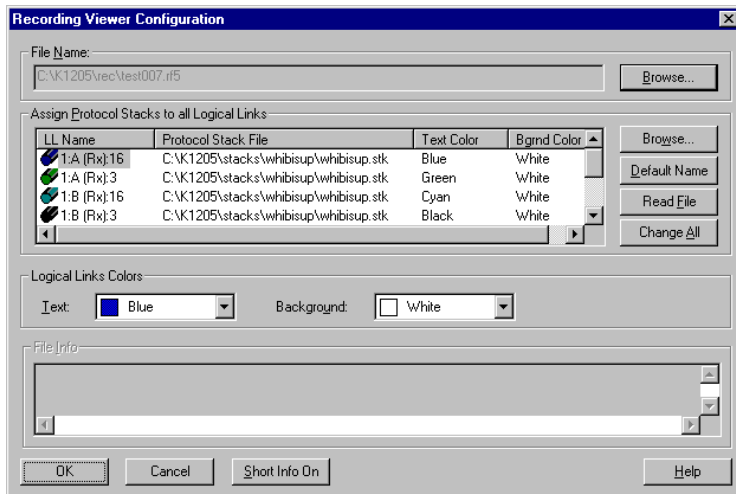
Confirm your selection with *OK*. The name of the recording file is entered automatically into the *Recording File* processing element. The pipeline of the activated data flow is now green.

4. If you want to filter the signalling data according to certain criteria, such as error events, proceed as follows: First click the pipeline processing element `Filter`, then within the `Filter Setup` window click `Error Event`. The following figure shows the `Filter Setup` dialog for the `Display` Filter.
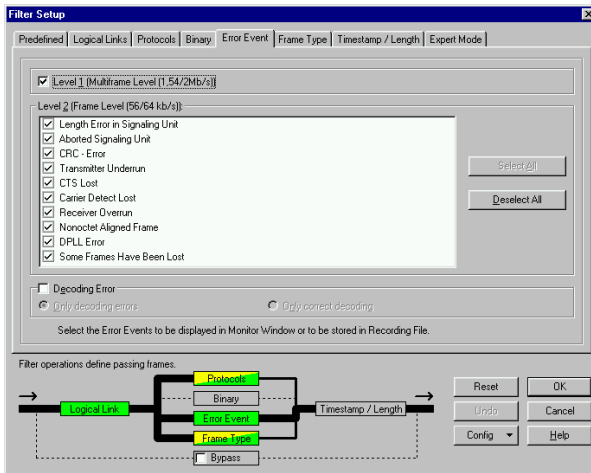
Proceed with your settings and confirm your selection with *OK*.

5. To view the signalling data switch to the monitor main window by clicking the processing element `Monitor` at the right end of the pipeline. The monitor main window with the three views appears. You can scroll through the recorded data flow using the arrow keys (↓ and ↑) in the individual views.

Calltrace

The Calltrace application can detect and trace one or several calls on the basis of complete or partial phone numbers. Calltrace analyzes protocol-specific data and produces a text output for any found hit. The Calltrace can be run in the following three modi:

Calltrace only Mode. In this mode the calltrace searches for a frame that matches the user selected parameters. The analysis and the result can be seen at once.

Sequenced Calltrace Mode. In this mode all messages of one call will be collected (stored) until the CT can make a decision whether the current call matches the parameters or not. This representation is more focussed, because it is related to one call.

Sequence only Mode. This mode works just like the sequenced Calltrace mode, apart from the fact, that no numbers can be entered. All messages are simply sequenced, i.e. sorted by calls and then displayed if the call has been released. A search criteria is not possible here.

Calltrace applications are offered for a variety of protocols. All applications are operating according to the same principles. In this section, the ISUP Calltrace is given as an example.

Preliminary Steps

The Protocol Tester has been properly connected to the data line and turned on. The modules booted without error and the application has been started.

Once the autoconfiguration has terminated successfully, the `Data Flow Window` appears (refer to "Preliminary Steps" in the previous section). Make sure you are in the `Measurement Scenarios` pane.
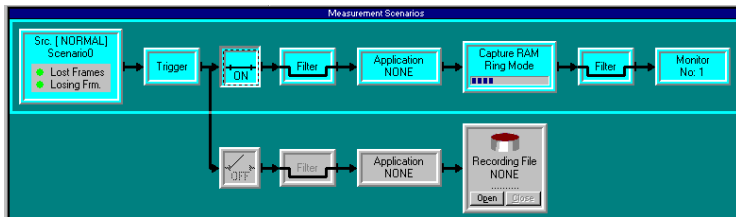
Preparing and Starting a Calltrace

1. Click the processing element *Application* in the pipeline, which you will find either in the monitor branch or in the recording branch. The following dialog box appears:
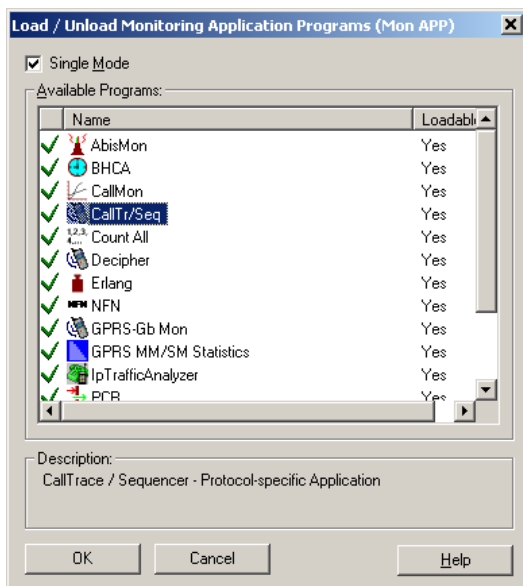

2. Select *CallTr/Seq* from the list of available applications and confirm your selection with *OK*.

Calltrace analyzes the data traffic of a variety of protocols. Therefore, you have to select the protocol to be tested before starting Calltrace. The *Calltr/Seq_1* window appears.

3. Select the protocol from the protocol list on the basis of which the calltrace is to be performed.
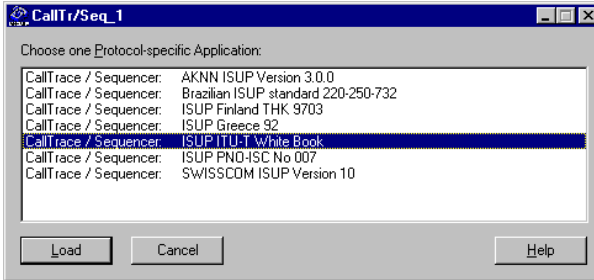
4. Confirm your selection with `Load`. The `CallTr/Seq_1: ISUP ITU-T White book` window then appears (example). Depending on the Calltrace selected this window can slightly vary.
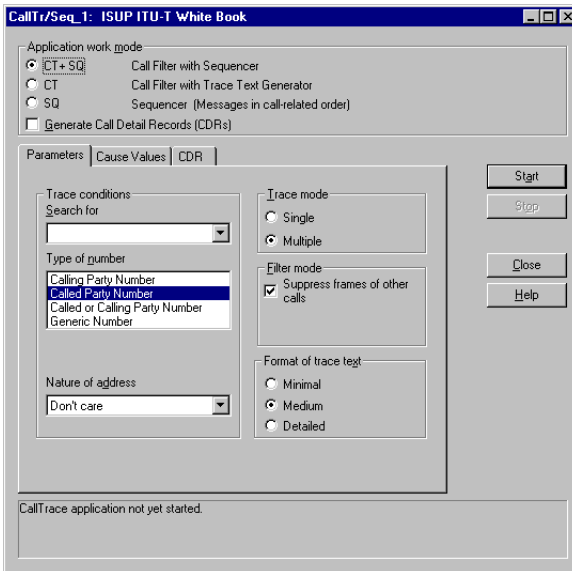
5. Enter the phone number you are looking for under `Search for`. You can enter up to four numbers divided by commas (,). The following wildcards for digits are allowed: + for exactly one digit or no digit, * for any number of digits, ? for exactly one digit.

You can enter more than one asterisk (*) within a calling number (for example `*123*678`). One asterisk is always automatically entered at the end of the number. Thus, numbers that are too long can be found. If calling numbers are initiated by + or * the filter mode starts working only after the number is confirmed by an ACM (Address complete) or an ANM (Answer message). That means that all messages are transmitted until then, because they belong to a call with a corresponding number.

If you are looking for numbers with prefixes (for example international area code) at one and the same time, you will get more specific outputs by entering the exact numbers (for example `4930386,30386`) than by entering numbers initiated by "+" or "*" (`++30386,*30386`).

6. Specify whether the phone number designates a `Calling Party` or a `Called Party` in the `Type of number` field.

7. Specify whether it is a `National`, an `International` or a `Subscriber` number without a national/international area code in the `Nature of Address` field. Select `don't care` to include all numbers.

8. For protocols you can specify `Cause Values` as additional search criteria. The Calltrace application then searches for calls that contain the desired number *and* one of the selected cause values (reason for the end of call).

9. Specify the number of calls to be traced in the `Trace mode` field: one (`Single`) or any number of matching phone numbers (`Multiple`).

If you activate the filter mode, only the calltrace messages will be displayed. Other messages will be suppressed. The asterisk (*) at the beginning leads to more detailed infomation.

10. Click *Start* to start Calltrace.

The results are displayed in the monitor main window.

11. Switch to the monitor main window by clicking the processing element *Monitor* at the right end of the pipeline under *Measurement Scenarios* in the *Data Flow Window*.

Viewing the Results

Click the Short View in the monitor window. Use the arrow keys (↓ and ↑) to scroll through the recorded data flow in the individual views.

Detailed information is displayed in plain text in the Frame View on the right.

Calltrace outputs the word *text* in the *2. Protocol* column (Short View) and displays detailed information in the data frame context.

Examples. The number you were tracing was found:

```
                                           Short View
 Time           From           2. Prot      2. MSG         3. Prot       3. MSG
  11:25:54,588,926   1/G/16        text      ===========  ===========  ===========
  11:25:54,588,926   1/G/16        text      === START of  call 1 [2]
⇨ 11:25:54,588,926   1/G/16        text      === Number f ound.
  11:25:54,588,926   1/G/16        text      === Informat ion for this  connection:
  11:25:54,588,926   1/G/16        text      === CIC = 91 2  (PCM: 28  Channel:16)
  11:25:54,588,926   1/G/16        text      === Called   number = 123 456
  11:25:54,588,926   1/G/16        ISUP      IAM
  11:25:54,619,913   1/H/16        ISUP      ACM
  11:25:54,622,789   1/H/16        ISUP      ANM
  11:25:54,622,789   1/H/16        text      === CONNECTI ON establish ed.
  11:25:55,192,788   1/H/16        ISUP      REL
                                          Frame View
 BITMASK            ID Name                  Comment or Value
 11:25:54,588,926   1/G/16    text  === Number f  ound.
=== Number found.
```

You have been connected to the number you were tracing:

```
                                           Short View
 Time           From           2. Prot      2. MSG         3. Prot       3. MSG
  11:25:54,588,926   1/G/16        text      === Number f ound.
  11:25:54,588,926   1/G/16        text      === Informat ion for this  connection:
  11:25:54,588,926   1/G/16        text      === CIC = 91 2  (PCM: 28  Channel:16)
  11:25:54,588,926   1/G/16        text      === Called   number = 123 456
  11:25:54,588,926   1/G/16        ISUP      IAM
  11:25:54,619,913   1/H/16        ISUP      ACM
  11:25:54,622,789   1/H/16        ISUP      ANM
⇨ 11:25:54,622,789   1/H/16        text      === CONNECTI ON establish ed.
  11:25:55,192,788   1/H/16        ISUP      REL
  11:25:55,192,788   1/H/16        text      === CONNECTI ON is beeing  released
  11:25:55,192,788   1/H/16        text      === CIC = 91 2  (PCM: 28  Channel:16)
  11:25:55,192,788   1/H/16        text      === Release  Cause:  Norm al call clea
  11:25:55,217,406   1/G/16        ISUP      RLC
  11:25:55,217,406   1/G/16        text      === CONNECTI ON finished   (ISUP releas
  11:25:55,217,406   1/G/16        text      === Call dur ation (ANM < -> REL):  0.
  11:25:55,217,406   1/G/16        text      === END of c all 1 [2]
                                          Frame View
 BITMASK            ID Name                  Comment or Value
 11:25:54,622,789   1/H/16    text  === CONNECTI  ON establish  ed.
=== CONNECTION established.
```

The connection has been cleared down (released):

```
                                           Short View
 Time           From           2. Prot      2. MSG         3. Prot       3. MSG
  11:25:55,192,788   1/H/16        ISUP      REL
  11:25:55,192,788   1/H/16        text      === CONNECTI ON is beeing  released
  11:25:55,192,788   1/H/16        text      === CIC = 91 2  (PCM: 28  Channel:16)
  11:25:55,192,788   1/H/16        text      === Release  Cause:  Norm al call clea
  11:25:55,217,406   1/G/16        ISUP      RLC
⇨ 11:25:55,217,406   1/G/16        text      === CONNECTI ON finished   (ISUP releas
  11:25:55,217,406   1/G/16        text      === Call dur ation (ANM < -> REL):  0.
  11:25:55,217,406   1/G/16        text      === END of c all 1 [2]
  11:25:55,283,788   1/H/16        text      ===========  ===========  ===========
  11:25:55,283,788   1/H/16        text      === START of  call 2 [2]
  11:25:55,283,788   1/H/16        text      === Number f ound.
  11:25:55,283,788   1/H/16        text      === Informat ion for this  connection:
  11:25:55,283,788   1/H/16        text      === CIC = 91 3  (PCM: 28  Channel:17)
  11:25:55,283,788   1/H/16        text      === Called   number = 123 456
  11:25:55,283,788   1/H/16        ISUP      IAM
  11:25:55,314,531   1/G/16        ISUP      ACM
                                          Frame View
 BITMASK            ID Name                  Comment or Value
 11:25:55,217,406   1/G/16    text  === CONNECTI  ON finished    (ISUP releas  ed)
=== CONNECTION finished (ISUP released)
```
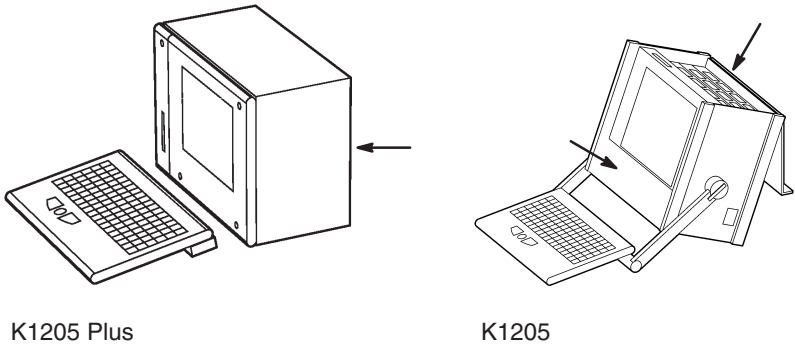
Ending Calltrace

You end the Calltrace application by clicking the processing element *Application* in the pipeline in the monitor window. The window *CallTr/Seq-1: ISUP ITU-T White book* appears. Click *Close*.

Appendix A: Interfaces

K1205 and K1205 Plus. The location of the interfaces is shown in the following figure.

K1205 Plus   K1205

→   Location of interfaces

K1205. Interfaces are on the PC module front panel and on the front panels of the measuring modules on top of the device underneath the device cover. Further interfaces are located behind the front cover beneath the display.

K1205 Plus. Interfaces are on the rear of the device, on the PC module front panel and on the front panels of the measuring modules.

The individual interfaces are described in detail in the following sections.

System Unit

The system unit contains the system processor PC as its main component. The processor coordinates control and sequence of the user processes. Further components are: keyboard, monitor, diskette and an optional CD-RW drive. A switched mode mains power supply and regulated fans serve for supply and ventilation of the modules.

⚠ *CAUTION. Two green LEDs on the front of device indicate the active operating state of the system processor and the SCSI connection. In alarm state (fan or cooling alert), the LED turn red. In this case switch off the device immediately and contact the service support.*

PC-3 Board

The Pentium system processor on the PC board is mounted on a VME backplane.

The PC-3 board features the following characteristics:

- Flash EPROM (BIOS)

- VGA graphics card supports flat screen and external monitor

- Standard connections for AT peripherals (keyboard connections, parallel and serial interfaces, diskette drive)

- Ethernet (10Base-2) and twisted pair connections (10Base-T)

- VME bus interface

- Two PC-Card (PCMCIA) slots

Reset. To reset the Protocol Tester in an emergency, use a pointed tool and insert it into the RESET switch located on the cover of the PC board. There is an LED indicating the operating state of the hard disk (HD).

In addition, the K1205 Plus operates with a PC backplane. This bus system offers the possibility to mount up to three ISA cards, such as an ISDN PC card for remote control or even for other applications, such as a multimedia card. The length of the additional cards is designed for two thirds of AT card format.

PC-4 Board / PC-5 Board

The Celeron system processor on the PC-4 or PC-5 board is mounted on a VME backplane. Depending on the display, the K1205 is equipped with either a PC-4 (for NEC displays) or a PC-5 board (for Hyundai displays).

Both boards feature the following characteristics:

■ Flash EPROM (BIOS)

■ VGA graphics card supports flat screen and external monitor

■ Standard connections for AT peripherals (keyboard connections, parallel and serial interfaces, diskette drive)

■ Ethernet, twisted pair connections (100BaseTx)

■ VME bus interface

■ Two PC-Card (PCMCIA) slots for type II

■ Headphone sound port

Table A–1: Pin assignment for the USB interface

Pin	Assignment	Pin	Assignment
1	5 V	3	USB_P0+
2	USB_P0-	4	Ground

NOTE. The USB interface on the board is not supported when using Windows NT.

Reset. To reset the Protocol Tester in an emergency, use a pointed tool and insert it into the RESET switch located on the cover of the PC board. There is also an LED indicating the operating state of the hard disk (HD) and an LED indicating network operation.

In addition, the K1205 Plus operates with a PC backplane. This bus system offers the possibility to mount up to three ISA cards, such as an ISDN PC card for remote control or even for other applications, such as a multimedia card. The length of the additional cards is designed for two thirds of AT card format.

NOTE. Use a headphone with a ferrit part in order to fulfill EMC regulations.

Keyboard Interface (KEYBOARD)

K1205. The K1205 KEYBOARD interface is behind the bottom cover of the device.

K1205 Plus. The K1205 Plus KEYBOARD interface is accessible from the bottom of the device. It is covered by a metal sheet which you have to remove first.

NOTE. If the additional keyboard interface (KBD) is used with an external keyboard, the keyboard connector must not be plugged in.
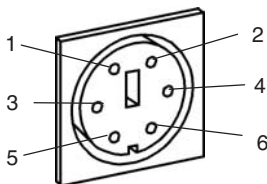

Table A–2: Pin assignment for the KEYBOARD interface (PS/2 interface)

Pin	Assignment	Pin	Assignment
1	Keyboard data	4	+ 5 V
2	PS/2 Mouse data	5	Keyboard clock
3	Ground	6	PS/2 Mouse clock

Additional Keyboard's Interface (KBD)

K1205. The interface of the external keyboard is on top of the device on the PC module front panel.

K1205 Plus. The interface of the external keyboard is on the rear of the device on the PC module front panel.

NOTE. If the additional keyboard interface KBD is used with an external keyboard, the KEYBOARD connector must not be plugged in.
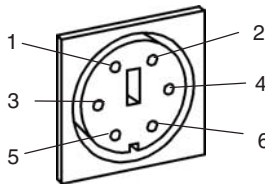

Table A–3: Pin assignment for interface KBD (PS/2 interface)

Pin	Assignment	Pin	Assignment
1	Keyboard data	4	+ 5 V
2	PS/2 Mouse data	5	Keyboard clock
3	Ground	6	PS/2 Mouse clock

Serial Interface (COM1)

K1205. The serial interface COM1 is on top of the device on the PC module front panel.

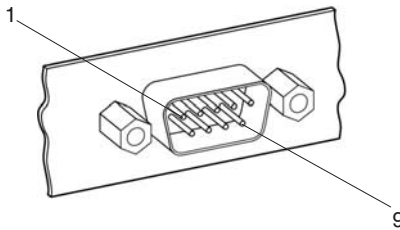**K1205 Plus.** The serial interface COM1 is on the rear of the device on the PC module front panel.

Table A–4: Pin assignment for interface COM1

Pin	Assignment	Pin	Assignment
1	DCD	6	DSR
2	RxD	7	RTS
3	TxD	8	CTS
4	DTR	9	RI
5	Ground		

Parallel Interface (LPT1)

K1205. The parallel interface is on top of the device on the PC module front panel.

K1205 Plus. The parallel interface is on the rear of the device on the PC module front panel.
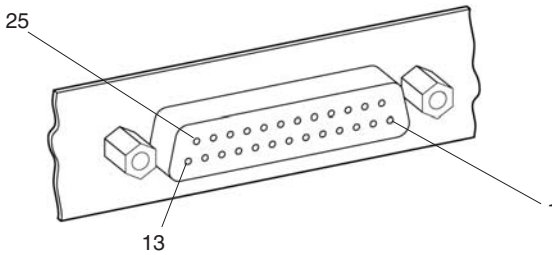

Table A–5: Pin assignment for interface LPT1

Pin	Assignment	Pin	Assignment
1	STROBE	14	Auto feed
2	DB0	15	Error
3	DB1	16	Initialize
4	DB2	17	Select input
5	DB3	18	Ground
6	DB4	19	Ground
7	DB5	20	Ground
8	DB6	21	Ground
9	DB7	22	Ground
10	ACK	23	Ground
11	BSY	24	Ground

Table A–5: Pin assignment for interface LPT1 (Cont.)

Pin	Assignment	Pin	Assignment
12	Paper end	25	Ground
13	Select		

Ethernet BNC Interface (10Base-2)

K1205. The ethernet BNC socket is on top of the device on the PC module front panel.

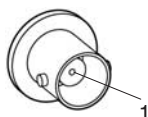**K1205 Plus.** The ethernet BNC socket is on the rear of the device on the PC module front panel.

Table A–6: Pin assignment for interface 10Base–2

Pin	Assignment	Pin	Assignment
1	RXI/TXo	2	CDS (Signal ground)

Ethernet Twisted Pair Interface (10Base-T)

K1205. The ethernet twisted pair interface is on top of the device on the PC module front panel.

K1205 Plus. The ethernet twisted pair interface is on the rear of the device on the PC module front panel.
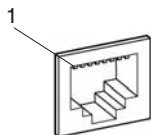

Table A–7: Pin assignment for interface 10Base-T

Pin	Assignment	Pin	Assignment
1	TxD +	5	Not connected
2	TxD –	6	RxD –
3	RxD +	7	Not connected
4	Not connected	8	Not connected

External Monitor's Interface (VGA)

K1205. The interface for an external VGA monitor is on top of the device on the PC module front panel.

K1205 Plus. The interface for an external VGA monitor is on the rear of the device on the PC module front panel.

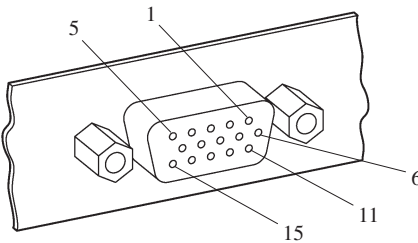The External Monitor's Interface supports a resolution of up to 1024x768 with 60 Hz.

Table A–8: Pin assignment for interface VGA

Pin	Assignment	Pin	Assignment
1	Red	9	Not connected
2	Green	10	Ground
3	Blue	11	Not connected
4	Not connected	12	Monitor data
5	Ground	13	HSY
6	Ground	14	NC
7	Ground	15	Monitor data
8	Ground		

Serial Interface (COM2)

K1205. The serial interface (COM2) is behind the front cover beneath the display.

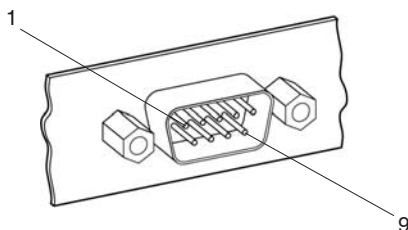**K1205 Plus.** The serial interface (COM2) is on the rear of the device next to the PC module front panel.

Table A–9: Pin assignment for interface COM2

Pin	Assignment	Pin	Assignment
1	DCD	6	DSR
2	RxD	7	RTS
3	TxD	8	CTS
4	DTR	9	RI
5	Ground		

USB (Universal Serial Bus)

K1205. The USB interface is on top of the device on the PC module front panel.

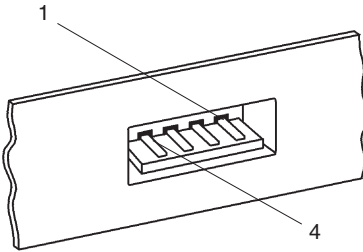**K1205 Plus.** The USB interface is on the rear of the device on the PC module front panel.

Table A–10: Pin assignment for the USB interface

Pin	Assignment	Pin	Assignment
1	Vcc	3	Data+
2	Data-	4	Ground

NOTE. The USB interface is not supported when using Windows NT.

Alarm and Synchronising Option (RELAIS and CLK I/O)

K1205. The alarm and synchronising sockets are behind the front cover beneath the display.

K1205 Plus. The alarm and synchronising sockets are on the rear of the device in the left bottom corner.

The following voltages are the maximum turn-off voltages that you may apply:

42 V AC peak with maximum turn-off current 5 A or
30 V DC with maximum turn-off current 5 A or

60 V DC with maximum turn-off current 1.5 A resistive load or
60 V DC with maximum turn-off current 0.5 A non-resistive load.

The maximum relay ratings are:

250 V AC with 5 A or
30 V DC with 5 A or

60 V DC with 1.5 A resistive load or
60 V DC with 0.5 A non-resitive load .

The synchronizing sockets can be used for data or timestamp synchronization of several Protocol Tester and for clock synchronization of interface boards.
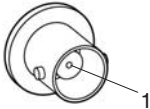

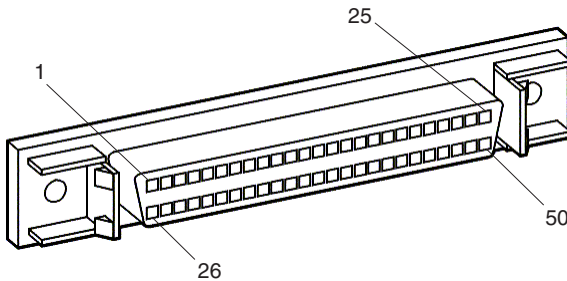**Table A–11: Pin assignment for interface CLK I/O**

Pin	Assignment	Pin	Assignment
1	Rx	2	CDS (Signal ground)

NOTE. *The described options will need to be enabled by the appropriate software.*

SCSI Interface (SCSI I/O BUS)

K1205. The SCSI interface is behind the front cover beneath the display.

K1205 Plus. The SCSI interface is on the rear of the device in the right bottom corner.

Up to six peripheral devices can be connected to the controller of the system processor via the SCSI socket. Each peripheral device must be assigned an individual address (SCSI ID). The controller occupies address 7 as standard. Since the controller boots from the device with the lowest address, the internal hard disk of the Protocol Tester is set to address 1. When not connected with a peripheral device the SCSI socket is terminated automatically.

The interface is single ended.

NOTE. *Assign one of the free addresses 2 - 6 to the devices that you want to operate via the external SCSI connection. Do not assign address 1, if you want to boot from an external device. Set the SCSI address to 0. Switch on the Protocol Tester first and before switching on the SCSI connected device.*

Table A–12: Pin assignment for interface SCSI I/O

Pin	Assignment	Pin	Assignment
1	Ground	26	D0
2	Ground	27	D1
3	Ground	28	D2
4	Ground	29	D3
5	Ground	30	D4
6	Ground	31	D5
7	Ground	32	D6
8	Ground	33	D7
9	Ground	34	DP
10	Ground	35	Ground
11	Ground	36	Ground
12	Ground	37	Ground
13	Ground	38	TERMPWR
14	Ground	39	Ground
15	Ground	40	Ground
16	Ground	41	ATN
17	Ground	42	Ground
18	Ground	43	BSY
19	Ground	44	ACK
20	Ground	45	RST
21	Ground	46	MSG
22	Ground	47	SEL
23	Ground	48	C/D
24	Ground	49	REQ
25	Ground	50	I/O

Connecting Wide SCSI-3 Devices (68 Pins)

It is possible to connect a wide SCSI-3 device (68 pins) to the K1205 Protocol Tester using the delivered SCSI adapter.

The SCSI interface of your Protocol Tester is wired like a SCSI-1 interface. To connect a wide SCSI-3 device (68 pins) you need this specially qualified 50-to-68 pins SCSI adapter.

CAUTION. Some commercially-made adapters may cause a short circuit between TERMPWR and GROUND if they connect pins 12, 13 and 37 of the 50 pins SCSI interface to pins 17, 18 and 51 of the wide 68 pins SCSI interface. Such an internal wiring will cause the failure of the SCSI connection.

Use only the SCSI adapter delivered with your Protocol Tester.

The following table shows the crucial pin connections of the qualified Tektronix 50-to-68 pin SCSI adapter:

Table A–13: Correct internal pin assignment of 50-to-68 pin SCSI adapter

Pin of 50-pin SCSI interface	Required internal connection	Pin of 68-pin SCSI interface
12	Not connected	17
13	Not connected	18
37	Not connected	51

PC Card Slots

K1205. The PC card slots are on top of the K1205.

K1205 Plus. Two PC card slots (for type I or II or PCMCIA cards) are on the rear of the device on the PC module front panel.

You can connect modem or ISDN PC cards to the PC card slots for remote operation of the Protocol Tester or even portable data carriers using the appropriate plug.

⚠️ **CAUTION.** *The power input of the PC card must not exceed 600 mA (with +5 V) or 60 mA (with +12 V).*

Please read the documentation for the PC card and follow the PC card manufacturer's instructions.

Do not forcibly install or remove a PC card. To avoid equipment damage, do not insert foreign objects into the PC card slots.

AP-4 and AP-4/256 Board

AP stands for Application Processor. The application processor board processes the data streams, which are received by the interface modules.

Figure A–1: AP-4, AP-4/256 Board

AP-4 and AP-4/256 boards provide the following features:

- 64 or 256 MB Memory Capacity

- 1 MB Memory L2 Cache

- 140 MHz Memory Cache Bus Clock Frequency

- 350 MHz Processor Clock Frequency

- Serial interface via RJ45 front panel connector

- Ethernet interface (10-BaseT/100-BaseTx) via RJ45 front panel connector

- Two PCI Mezzanine card slots

NOTE. *AP-4/256 boards require software version K1205 V2.30 or above.*

K1205. For the K1205 the AP-4 or AP-4/256 board is optional.

K1205 Plus. For the K1205 Plus the usage of an AP-4 or AP-4/256 board depends on the number of interface boards.

For configurations with 1 or 2 interface boards an AP-4 or AP-4/256 board will only be needed for heavy demanding applications. Using an AP-4 or AP-4/256 board speeds up decoding approximately by factor 10. The disk throughput performance raises by at least factor 2.

For configurations using 3 and 4 interface boards we recomment using an appropriate processor also for lighter loads.

For configurations with 5 and 6 interfaces the AP-4 or AP-4/256 board is mandatory.

NOTE. *Keep in mind that using an additional application processor in the K1205/K1205 Plus housing needs an additional VME bus slot.*

⚠ **CAUTION.** *Before installing a new board ensure that the VME bus address is set correctly (cf. chapter Getting Started, section Exchanging Measuring Modules).*

Defining new CPU numbers must be performed at an ESD approved workplace. Electrostatic discharge can permanently destroy components that have to be temporarily removed from your device.

The SERIAL interface (RJ45 connector) can be used as asynchronous serial debug port for service purposes.
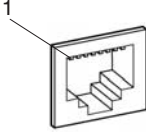
1

Table A–14: Pin assignment for the SERIAL interface

Pin	Assignment	Pin	Assignment
1	DTR	5	TXD
2	CTS	6	Ground
3	Ground	7	RTS
4	RXD	8	DCD

In addition an RJ45 10-BaseT/100-BaseT connector is provided on the AP-4 or AP-4/256 front panel (for future use, not yet supported).
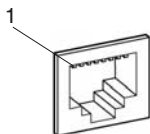

Table A–15: Pin assignment for the 10Base-T/100Base-Tx interface

Pin	Assignment	Pin	Assignment
1	TD +	5	Not connected
2	TD –	6	RD –
3	RD +	7	Not connected
4	Not connected	8	Not connected

The two switches on the front panel have the following function:

ABT Abort (for future use, not yet software supported)
RST Reset all onboard devices

⚠ *CAUTION. ABT and RST are for future use. They are not yet supported. Please do not touch.*

The four status LEDs on the front panel have the following meaning:

BFL Board failure
CPU CPU is accessing the bus
PMC Top PCI mezzanine card, if installed, is active
PMC Bottom PCI mezzanine card, if installed, is active

BAI Board

The BAI board (Basic Access Interface) is required for measurements on ISDN lines and connections. The BAI board can be fitted with up to two interface modules depending on the purpose of application. The interface modules establish the necessary different circuits dependent on the interface standard.

NOTE. *EN 60950, IEC 950, UL 1950: The interface boards are designed for connecting to a telecommunication network (TNV-1 circuits); the appropriate interfaces are provided.*

The supply voltage necessary for supplying power to the terminal equipment to be tested is supplied by a separate supply module, which is plugged on the interface board and connected to the base module.

⚠ **WARNING.** *High voltages may occur on the following supply connectors and sockets: under "S_0 Simulation / Monitoring" with "TE A" or "TE M", "MON A B" or "MON M N", "TE/NT B" or "TE/NT N"; under "U_{2B1Q} Simulation / active Monitoring" with "LT A" or "LT M" and "NT/LT B" or "NT/LT N".*

With older front panels the following supply connectors and sockets are concerned: "to NT", "S-BUS MON", "to TE(NT)", "to LT", "to NT(LT)". These older terms are marked in the following with old.
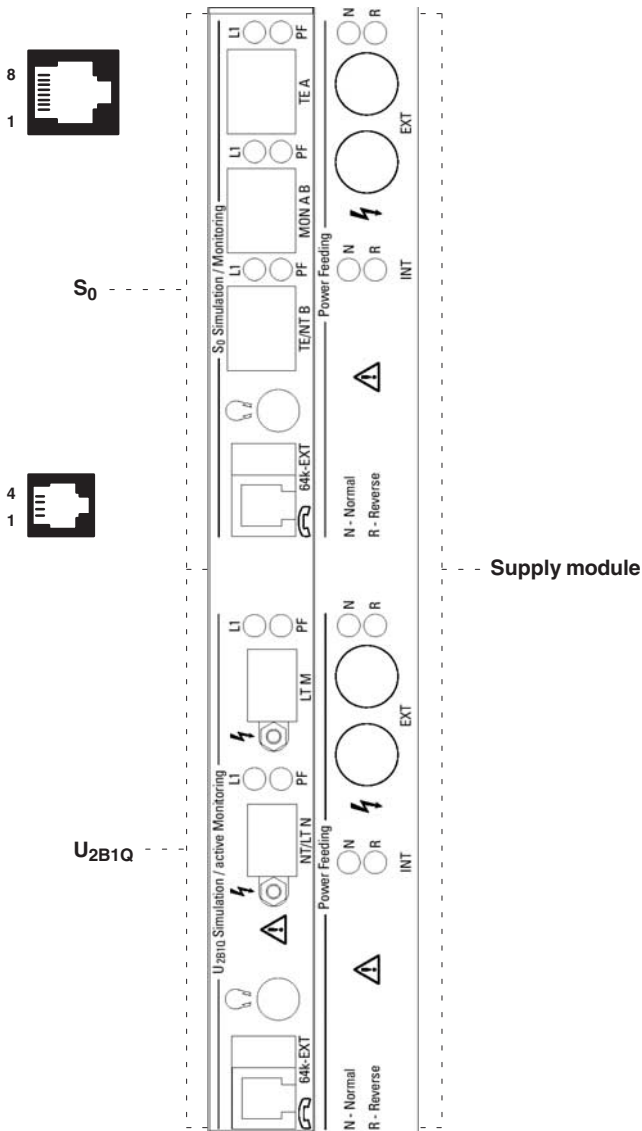
Figure A–2: BAI board with S_0 and U_{2B1Q} Interface

S$_0$ Interface Module

The S$_0$ interface module provides three RJ45 connectors for line connection, which are designated as follows:

- "TE A" or "TE M" (old: "to NT")

- "MON A B" or "MON M N" (old: "S-BUS MON")

- "TE/NT B" or "TE/NT N" (old: "to TE(NT")

Modes of Operation. To monitor lines with the S$_0$ interface module, proceed as follows:

1. Deactivate the line and connect the S bus with connector "MON A B"/ "MON MN".

2. Activate the line from the NT or TE.

⚠ *CAUTION. Make sure to only use the "MON A B"/"MON M N" connector when connecting the S bus.*

Line status. Two LEDs, "L1" (Layer 1 activated) and "PF" (Power Feeding), are assigned to each line connector. The LEDs indicate the line status, as shown in the following table.

Table A–16: Line status S_0 interface module

L1	PF	Meaning
on	on	After booting: Reset of the interface. Else: Activated, normal power feeding
alternating with PF	alternating with L1	Port is initialized and deactivated: Activate. Internal: deactivated, no power feeding
on	off	Activated, no power feeding
off	on	Deactivated, normal power feeding
off	blinking	Deactivated, restricted power feeding
on	blinking	Activated, restricted power feeding
off	off	Port not active

Pin Assignment. The connectors of the S_0 interface module have the following pin assignment:

Table A–17: Pin assignment for connectors TE A and TE M

Pin	Assignment	Pin	Assignment
1	Not connected	5	Rx–
2	Not connected	6	Tx–
3	Tx+	7	Not connected
4	Rx+	8	Not connected

Table A–18: Pin assignment for connectors MON A B and MON M N

Pin	Assignment	Pin	Assignment
1	Not connected	5	Rx TE–
2	Not connected	6	Rx NT–
3	Rx NT+	7	Not connected
4	Rx TE+	8	Not connected

Table A–19: Pin assignment for connectors TE/NT B and TE/NT N

Pin	Assignment	Pin	Assignment
1	Not connected	5	Tx–
2	Not connected	6	Rx–
3	Rx+	7	Not connected
4	Tx+	8	Not connected

U$_{2B1Q}$ Interface Module

The U$_{2B1Q}$ interface module provides two connectors for line connection, which are designated as follows:

- "LT A" or "LT M" (old: "to LT")

- "NT/LT B" or "NT/LT N" (old: "to NT(LT)")

Modes of Operation. To monitor lines with the U$_{2B1Q}$ interface module, proceed as follows:

1. Deactivate the line concerned and separate it.

2. Connect the network to the socket labelled "LT A"/"LT M" and connect the NT to the socket labelled "NT/LT B"/"NT/LT N". The interface module responds in the line like a U-repeater.

Line status. Two LEDs, "L1" (Layer 1 activated) and "PF" (Power Feeding), are assigned to each line connector. The LEDs indicate the line status, as shown in the following table.

Table A–20: Line status U$_{2B1Q}$ interface module

L1	PF	Meaning
on	on	After booting: Reset of the interface. Else: Activated, normal power feeding
alternating with PF	alternating with L1	Port is initialized and deactivated: Activate. Internal: deactivated, no power feeding
on	off	Activated, no power feeding
off	on	Deactivated, normal power feeding
off	blinking	Deactivated, restricted power feeding
on	blinking	Activated, restricted power feeding
off	off	Port not active

Pin Assignment. The connectors of the U_{2B1Q} interface module have the following pin assignment:

Table A–21: Pin assignment for connectors LT A and LT M

Pin	Assignment	Pin	Assignment
1	TIP*	2	RING*

Table A–22: Pin assignment for connectors NT/LT B and NT/LT N

Pin	Assignment	Pin	Assignment
1	TIP*	2	RING*

* Either polarity is possible.

Auxiliary Connections

The modules also provide the following auxiliary connections:

- Headphones: A 3.5-mm stereo jack is used as headphone connector. Software has not been not implemented yet but is coming soon: a B channel can be monitored bidirectionally via the stereo headphones.

NOTE. Use a headphone with a ferrit part in order to fulfill EMC regulations.

- B channel connection "64k EXT": The B channels can be accessed externally with the appropriate setting in the configuration menu (also see below *B Channel Access Adapter*).
- Supply module, auxiliary connection "EXT", red and black, for supply voltage: Two 4-mm banana jacks are provided for measuring the supply voltage (red: normal + and black: normal –) supplied by the NT (with S_0) or the LT (with U_{2B1Q}) when monitoring.

⚠ *CAUTION. Due to EMC reasons, use only high quality, shielded cables!*

B Channel Access Adapter. B channel data is extracted using an optional accessories adapter cable, which features two connectors: a 10-pin mini plug for the interface module ("64k EXT") on one end and a female 15-pin D-Sub plug on the other end with the following pin assignment.
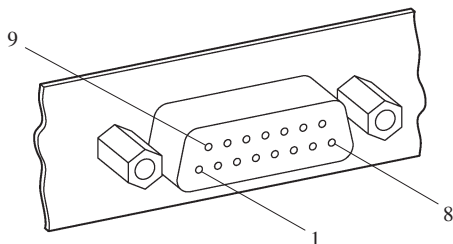
Figure A–3: B channel connection

Table A–23: Pin assignment for B channel connection

Pin	Assignment	Pin	Assignment
1	Output RxD/B1 from network-side when monitoring	9	Output RxD/B2 from user-side when monitoring
2	Not connected	10	Output RxD/B2 from network-side when monitoring
3	Output RxD/B1 from user-side when monitoring	11	Not connected
4	Input TxD/B2	12	Input TxD/B1
5	Not connected	13	Output TxC (64 kHz inverted to RxC)
6	Output RxC (64 kHz)	14	Not connected
7	Output frame signal B1 (8kHz)	15	Digital Ground
8	Output frame signal B2 (8kHz)		

The signals are TTL level with an impedance of 75 Ω.
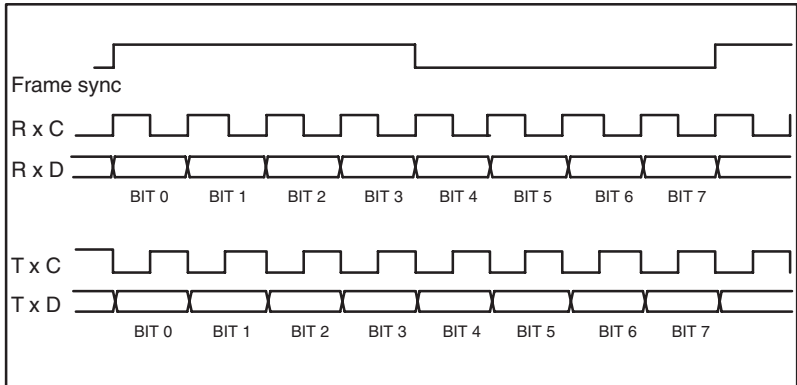
Figure A–4: Time diagrams

V./X. Board

The V./X. interface module contains two socket connectors per V./X. interface for line connection, which are designated as follows:

- "to DCE"

- "to DTE"

The interface standards V.24, X.21 and V.35 are supported.

The connection to the various interfaces is made with a special adapter cable. Since the V./X. board can be used in K1205 und K1297 applications it is shipped with monitoring and simulation cables. Be sure to use only the monitoring cables for V.35, X.21 and X.24 (see figures in the appropriate sections).

Figure A–5: V./X. board

Each terminal socket is equipped with two LEDs for displaying the line status. Each of the line connectors labelled "to DTE" and "to DCE" are assigned two LEDs. These display the line status as shown in the following table.

Table A–24: Line status: V./X. interface module

S0	S1	Meaning
on	on	While booting: Reset of the interface
off	off	After booting: Port not in operation
alternating with S1	alternating with S0	Port initialized. No adapter cable connected (operational state)
on	off	Port initialized. Adapter cable connected (operational state)
on	on	Port initialized. Data traffic is possible (operational state): **Case 1:** – with V.35 or V.24 cable to DTE – receiver ready – line status Data Terminal Ready has been reached **Case 2:** – with V.35 or V.24 cable to DCE – and receiver ready – line status Data Set Ready has been reached **Case 3:** – with X.21 cable to DTE – and receiver ready – if line status Control has been reached **Case 4:** – with X.21 cable to DCE – receiver ready – if line status Indication has been reached

Adapter Cables and Adapter Cable Interfaces

V.35 Monitor Adapter Cable.
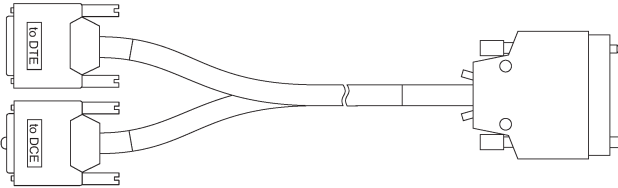
V.35 Monitor Adapter Cable Interface.
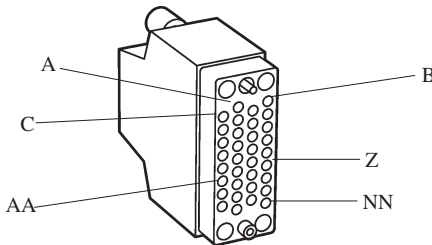
Table A–25: V.35 Monitor

Pin	Assignment	Pin	Assignment
A	101 Cable shield (connected with the connector housing)	V	115 Rx Clk A (IN) —–X
B	102 Signal ground	W	113 Tx ext clk B (IN)
C	105 RTS (IN)	X	115 Rx Clk B (IN)
D	106 CTS (IN)	Y	114 Tx Clk A (IN) —–AA
E	107 DSR (IN)	Z	Not connected

Table A–25: V.35 Monitor (Cont.)

Pin	Assignment	Pin	Assignment
F	109 carrier detect (IN)	AA	114 Tx Clk B (IN)
H	108 DTR (IN)	BB	Not connected
J	125 ring detect (IN)	CC	Not connected
K	Not connected	DD	Not connected
L	Not connected	EE	Not connected
M	Not connected	FF	Not connected
N	Not connected	HH	Not connected
P	103 send data A (IN) ⸺S	JJ	Not connected
R	104 Rx data A (IN) ⸺T	KK	Not connected
S	103 send data B (IN)	LL	Not connected
T	104 Rx data B (IN)	MM	Not connected
U	113 tx ext clk A (IN) ⸺W	NN	Not connected

⸺n   Reference to a symmetrical pair

X.21 Monitor Adapter Cable
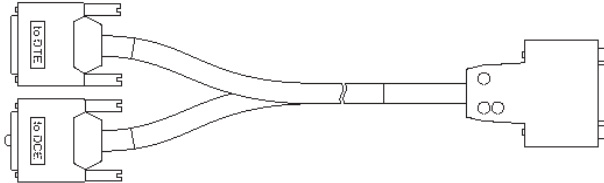
X.21 Monitor Adapter Cable Interface
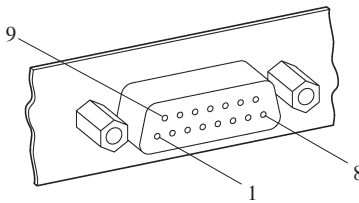
Table A–26: X.21 Monitor

Pin	Assignment	Pin	Assignment
1	Cable shield (connected with the connector housing)	9	B lead (IN)
2	T Tx data A (IN) ——9	10	B lead (IN)
3	C Control A (IN) ——10	11	B lead (IN)
4	R Rx data A (IN) ——11	12	B lead (IN)
5	I indic. A (IN) ——12	13	B lead (IN)

Table A–26: X.21 Monitor (Cont.)

Pin	Assignment	Pin	Assignment
6	S tx clk A (IN) —–13	14	Not connected
7	Not connected	15	Not connected
8	G-Signal ground		

—–n   Reference to a symmetrical pair

V.24 Monitor Adapter Cable
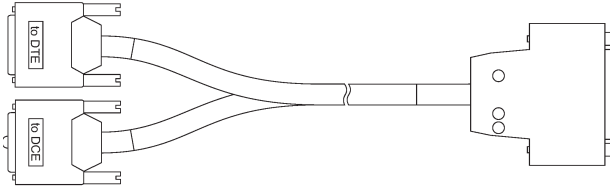
V.24 Monitor Adapter Cable Interface
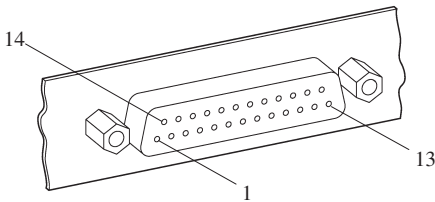
Table A–27: V.24 Monitor

Pin	Assignment	Pin	Assignment
1	Cable shield (connected with the connector housing)	14	Not connected
2	103 send data (IN)	15	114 send data clk (IN)
3	104 receive data (IN)	16	Not connected
4	105 request to send (IN)	17	115 rec data clk (IN)
5	106 clear to send (IN)	18	141 local loopback (IN)
6	107 data set ready (IN)	19	Not connected
7	102 signal ground	20	108 data term ready (IN)
8	109 carrier detect (IN)	21	110 signal quality detect (IN)

Table A–27: V.24 Monitor (Cont.)

Pin	Assignment	Pin	Assignment
9	Not connected	22	125 ring indicate (IN)
10	Not connected	23	111 clk select (IN)
11	116 select DCE STDBY (IN)	24	113 ext. clock (IN)
12	Not connected	25	142 test indicator (IN)
13	Not connected		

E1/DS1 Monitoring Board

Each E1/DS1 monitoring board (PRIMO: primary rate monitoring) has four independent PCM monitor interfaces and can receive eight signalling links with HDLC data. The Protocol Tester can be extended to simultaneously monitor 16 PCM interfaces and 32 signalling links.

NOTE. EN 60950, IEC 950, UL 1950: The interface boards are designed for connecting to a telecommunication network (TNV-1 circuits); the appropriate interfaces are provided.

The following overview shows the supported framing formats and the electrical specifications:

E1   Framing Format

E1 2.048 MBIT/S

PCM30 HDB3

CRC4 ON/OFF HDB3

Receiver input: 0 - 36 dB
                         75 ohms / 120 ohms / >650 ohms

DS1   Framing Format

DS1 1.544 MBIT/S

F4 AMI / B8ZS

F12 D3/D4 AMI / B8ZS

ESF CRC6 ON/OFF AMI / B8ZS

F72 AMI / B8ZS

Receiver input: 0 - 36 dB
                         75 ohms / 100 ohms / >650 ohms
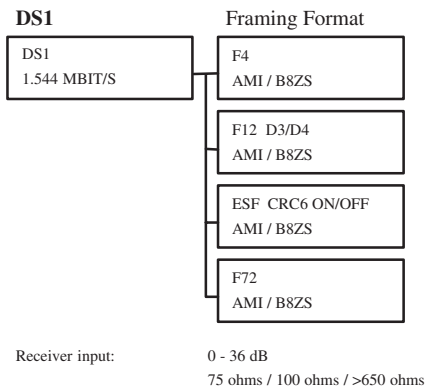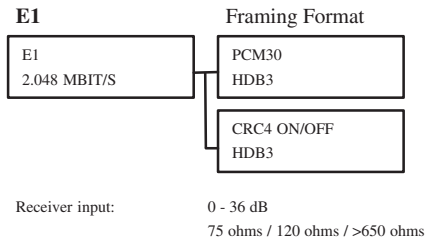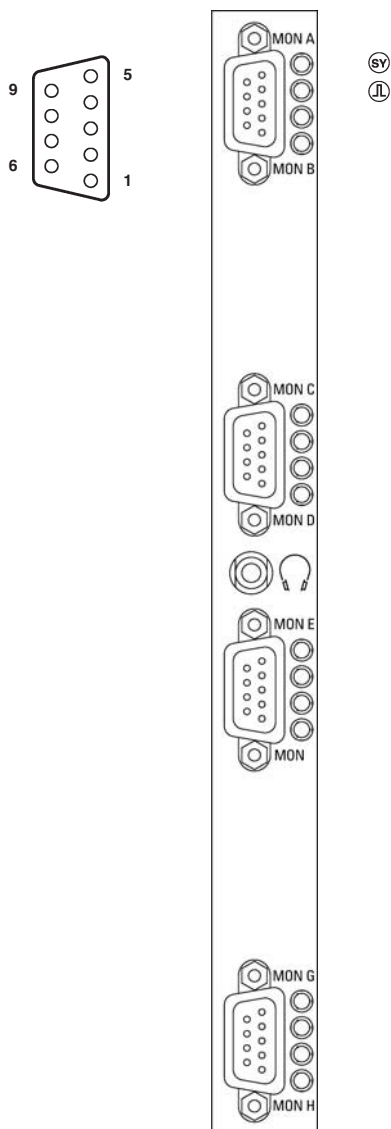
Figure A–6: E1/DS1 monitoring board (PRIMO)

9-pin D-Sub connectors are available as interfaces.

Table A–28: Pin assignment D-Sub connectors

Pin	Assignment	Pin	Assignment
1	RX– MON A, C, E, G	6	RX+ MON A, C, E, G
2	Not connected	7	Not connected
3	Not connected	8	Not connected
4	Not connected	9	RX+ MON B, D, F, H
5	RX– MON B, D, F, H		

In addition a headphone connector with a mini jack is provided for listening to audio data.

NOTE. Use a headphone with a ferrit part in order to fulfill EMC regulations.

The status LEDs on the front panel have the following meaning:

(SY)	Synchronous: Receive frame recognized, if LED is on.
(JL)	Signal ok: Receive signal recognized, if LED is on.
Blinking LED	Port is configured for data receiving, but no valid signal is received
Off	Port has not yet been configured
On	Board is beeing booted (after reset) or port is configured and valid signal is received.

DS0A Monitoring Board

With the DS0A board you can monitor interfaces according to the Bellcore Standard "Digital Signal Zero 'A' (DS–0A 64kbit/s) Systems Interconnection" (Bellcore Technical Reference TR TSY–000458).

Each DS0A board can monitor up to 4 DS0A interfaces with their corresponding Rx and Tx lines.

**NOTE.** *Note: EN60950, IEC 950, UL 1950: The interface boards are designed for connecting to a telecommunication network (TNV–1 circuits) and for application in an area where the nominal AC MAINS SUPPLY voltage does not exceed 130 V; the appropiate interfaces are provided.*
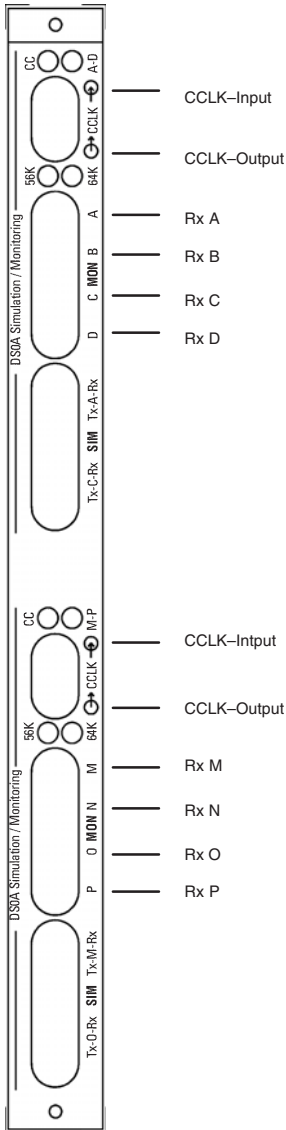
Figure A–7: DS0A board

The connection to the various interfaces is established via cables with bantam jacks. These cables are delivered as accessoires.

Each module of an DS0A has four LEDs, two for group Clock (CC), two for group Data (A-D/M-O).

Table A–29: Clock status: DS0A interface module

Clock CC	Data	Meaning
on	on	After booting: Reset of the interface
blinking	off	CC–Clock synchronization configurated, but not ok
off	blinking	Data synchronization configurated, but not ok
on	off	CC–Clock synchronization ok
off	on	Data Clock synchronization ok
off	off	Port not active

Table A–30: Data status: DS0A interface module

Data 56K	64K	Meaning
on	on	After booting: Reset of the interface
on	off	Ready to receive 56 Kbit data
off	on	Ready to receive 64 Kbit data
off	off	Port not active

Clock Modes

When using the DS0A interface it is required to select the right clock mode. All inputs of one half are using the same clock. You can either provide composite clock input on a module half or you can let the board generate its own clock:

1. Using the composite clock (CCLK) input:

You can use composite clock (CCLK) from the central switch. Connect the composite clock signal to the input CCLK_IN. You can choose between termination or high impedance of the input.

If further DS0A interfaces have to be synchronized with CCLK you have to connect the CCLK_Output of the first interface to the CCLK_input of the next interface.

The bit position (8-bit data stream) of CCLK input and output can be edited via the GUI.

2. Using no clock input:

In this case, the clock is derived from the data stream of one port. The port can be selected via the GUI. The selected port has to be connected.

- At a data rate of 64 Kbit/s the clock can be derived in any cases.

- At a data rate of 56 Kbit/s the clock can only be derived from data if the data stream contains 'FISUs' as e.g. in SS#7 data streams. In this special case, synchronizing can last up to 10 seconds.

Ethernet Board

The set of Ethernet boards is equipped with two Ethernet single-wide PCI mezzanine modules for special applications such as GPRS and IP.

The Ethernet modules comply with the IEEE 802.3 for 10 BaseT and 100 BaseTx. Both full duplex and half duplex modes are supported.

NOTE. *EN 60950, IEC 950, UL 1950: The interface boards are designed for connecting to a telecommunication network (TNV-1 circuits); the appropriate interfaces are provided.*
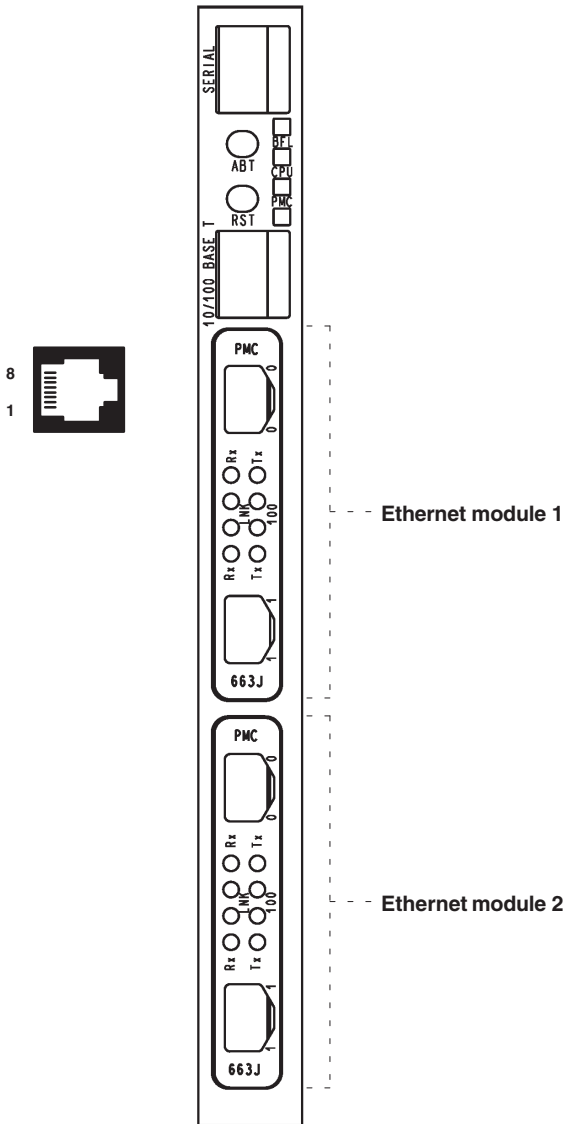
Figure A–8: ETH board with two Ethernet PCI mezzanine modules

The SERIAL interface (RJ45 connector) can be used as asynchronous serial debug port for service purposes.
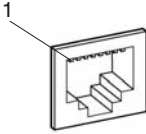
Table A–31: Pin assignment for the SERIAL interface

Pin	Assignment	Pin	Assignment
1	DTR	5	TXD
2	CTS	6	Ground
3	Ground	7	RTS
4	RXD	8	DCD

In addition an RJ45 10-BaseT/100-BaseT connector is provided on the front panel (for future use, not yet supported).

Table A–32: Pin assignment for the 10-BaseT/100-BaseT interface

Pin	Assignment	Pin	Assignment
1	TX +	5	Not connected
2	TX –	6	RX –
3	RX +	7	Not connected
4	Not connected	8	Not connected

The two switches on the front panel have the following function:

ABT   Abort (for future use, not yet software supported)
RST   Reset all onboard devices

The four status LEDs on the front panel have the following meaning:

BFL   Board failure
CPU   CPU is accessing the bus
PMC   Top PCI mezzanine card, if installed, is active
PMC   Bottom PCI mezzanine card, if installed, is active

Ethernet Modules

Two independant high performance Fast Ethernet interface controller ports (RJ45 connectors) are on an Ethernet module.
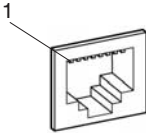
Table A–33: Front Panel I/O Pin Assignment

Pin	Signal	Pin	Signal
1	TX +	5	Not connected
2	TX –	6	RX –
3	RX +	7	Not connected
4	Not connected	8	Not connected

Each Ethernet port provides a set of four LED status indicators on the front panel with the following information:

Rx   Traffic is sensed on the network.
Tx   A data packet is sent.

The LEDs have the following meaning:

LINK   Link integrity: LED is on means, link is good in either 10 or 100 Mbps mode.
                  LED is off means, link is bad.

100   Speed: LED is on means, the data rate is 100 Mbps. LED is off means, the data rate is at 10 Mbps. LED retains its last known state when the link is down.

Defining CPU Numbers

The following section describes how to define CPU numbers (VME bus addresses) if you work with a second Ethernet board consisting of a Power-PC board plus hooked up mezzanines. Only an experienced service technician should perform this setting procedure.

⚠️ *CAUTION. The following steps must be performed at an ESD approved workplace. Electrostatic discharge can permanently destroy components that have to be temporarily removed from your device.*

In order to operate several Ethernet boards within one K1205, the default CPU numbers of the second (third, fourth) board have to be changed.

1. Check that the address is set correctly for each board. Typical addresses are as follows:

Table A–34: Ethernet boards: address settings

Board	Address
1st Ethernet board	07 (with 08 implicitly); no changing necessary
2nd Ethernet board	05 (with 06 implicitly)
3rd Ethernet board	03 (with 04 implicitly)

NOTE. Only select odd numbers when changing the address for an additional Ethernet board, and follow the recommended settings as listed in the table above.

The CPU numbers being stored within NVRAM of the Ethernet board are an integral part of the CPU's bootline. You can modify this bootline as described in the following.

2. Start the Protocol Tester with no new boards installed.

Watch for the blue screen during the Windows NT boot phase. Write down the CPU numbers displayed during boot in order to identify which numbers are free for addressing.

Not all displayed and existing CPU numbers are free for defining new CPU numbers. Additional restrictions are listed in the Caution statement below.

CPU #7 is the currently installed Ethernet board.

3. Wait until the booting process is completed.
Now you can change the default CPU number for example to #3 by entering the following command via *Start: Run:*

```
ntterm 7
```

This command will open a window that gives you basic access to the VxWorks operating system. Enter the command `bootChange` and press the return key until you see:

```
processor number : 7
```

Enter 3 on the same line and press the return key until the prompt (–>) reappears.

```
->
```

⚠️ **CAUTION.** *Due to hardware restrictions it is not possible to use odd numbers on a ETH-100 board if the number + 1 is used in the system. In other words, do not use #7 if there is a #8 CPU in the system.*

The same applies to the PC-Board CPU, which is CPU #9; #10 cannot be used for any board!

Example:
If there is no board with #3 or #4, you can use #3 or #4 for ETH-100.

Now you have changed the default CPU number. Therefore #7 and #8 are no longer in use and you may insert your new ETH-100 board, which will now become the new CPU #7.

Appendix B: Keyboard

After the device is switched on, the keyboard LEDs light up twice; the keyboard is now ready for operation.

All keys are repeat-action keys; the character repeats automatically if you hold down the key.

The keyboard features several key groups and key rows with the following:

- Alphanumeric keys

- Function keys

- Cursor keys

- Integrated numeric keypad (with K1205 the numeric keys are part of the alphanumeric keypad)

The different key groups are described in detail on the following pages. Further information on language support, the trackball and how to connect an external mouse are also provided.

Alphanumeric Keypad

The largest keypad is the alphanumeric keypad with keys for letters, numbers and special characters. The character arrangement mainly corresponds to a normal typewriter keyboard. In addition there are some keys that have certain special functions.

The keyboard is international and labeled in localized form.
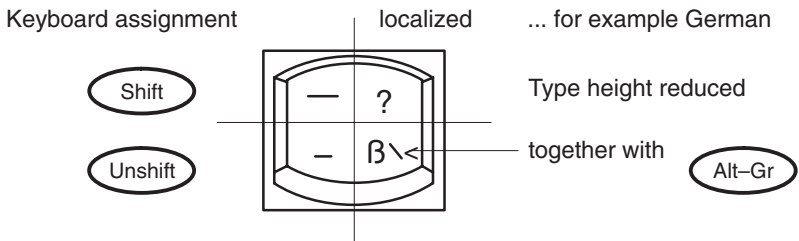
The functions of the special keys in the alphanumeric keypad are described in Table B-1.

The special keys in the alphanumeric keypad have the following functions:

Table B–1: Special keys

Key	Function
`|<-` `->|`	The tabulators move the cursor to the left or right according to the tabulator positions.
CAPS LOCK	If the caps lock key is pressed, an LED display lights up. Capital letters are used; all other characters remain normal. If you want to enter lowercase letters, you must press the SHIFT key.
CTRL	This control key is used only in combination with other keys; CTRL+ALT+DEL for example restarts the operating system. The online help describes situations in which CTRL is used.
Fn	This key activates the special function of a multi-labelled key. The special function, for example Num, is printed in rimmed form on the key.
ALT	This key is used only in combination with other keys: for example, you can enter the hex value of an ASCII character (as well as additional special characters) in combination with the numeric keypad.
ALT-GR	This key is used only in combination with other keys to generate further key codes.
`<-`	The backspace key moves the cursor by one position to the left and deletes the character.
`<-/`	The RETURN or ENTER key is mainly used to end a command line. This means the command entered is carried out after pressing this key.
PRINT	This key is used to print the current screen on a connected printer.

Table B–1: Special keys (Cont.)

Key	Function
PAUSE	This key holds up the program session in most of the applications.
NUM	K1205 Plus: The numeric keypad switches from cursor control to numeric keys via this key; an LED lights up. Pressing the key again clears this function.

Function Keys

Twelve programmable function keys are arranged in the top row of the keyboard. The assignment of these keys depends on the software.

The key combination *CTRL+ALT+DEL* does not automatically reboot the PC. Instead a secure attention sequence (SAS) occurs which allows you to logoff, reboot, change the password, start the task manager, or lock the PC.

The following overview shows possible key combinations:

Table B–2: Function keys and key combinations

Keys	Function
CTRL+ALT+DEL	This key combination triggers a warm start.
Fn+<Tilde key>	This key combination switches the trackball on or off.

Cursor Keys

The following cursor keys are available:

Table B–3: Cursor keys

Key	Function
HOME	This key moves the cursor to the beginning.
PAGE	This key scrolls backwards and forwards.
END	This key moves the cursor to the end.
<Arrow keys>	These keys moves the cursor: up, down, left, right.

Numeric Keypad, Numeric Keys

To switch on the integrated numeric keys, press *Fn+Num*. Press any other key, to clear this function.

Language Support

The device is pre-configured with two selectable keyboard layouts:

■ EN English (United States), Layout: US

■ DE German (Standard), Layout: German, IBM

In the corner opposite of the *Start* button of the taskbar you either see *EN* or *DE* for the active keyboard layout.

The German IBM layout is different from the usual German PC keyboard layout. The *<CAPS-LOCK>* key only shifts the alphabetic character keys and no decimal digits or punctuation characters.

You can temporarily change the keyboard layout by pressing *<ALT>+<LEFT-SHIFT>*. To change the keyboard layout permanently, proceed as follows:

1. Click on *Start: Settings*.

2. Click on *Control Panel*.

3. Double-click on *Keyboard*.

4. Click on the tab *Input Locales*.

5. Select from the list and press *Set as Default*.

Trackball

The trackball is used to control the cursor and the menu. The cursor can be moved to any position on the screen by moving the trackball.

Characters or words are highlighted by pressing the left trackball key. The assignment of the right trackball key depends on the user program. Using the trackball, you can select objects, edit menus and trigger functions.

The trackball is covered by a housing that usually protects the ball and the transmission mechanism from dust. However, the ball should be cleaned at regular intervals. Proceed as follows:

1. Remove the cover from the ball housing by turning it counter-clockwise. You can use a pair of tweezers, for example, which you put into the holes on the ring. Then you can take the ball out of the housing.

2. Clean the ball with tap water and a mild detergent. Blow the remaining dust out of the ball housing and put the ball back in.

3. Then put the cover back on and tighten it.

Switching the Trackball Off or On (PC-3 Board only)

⚠️ **CAUTION.** *In the following you find descriptions on how to change certain parameters of the PC BIOS of the Protocol Tester if you are using a PC-3 board). Follow the instructions and do not change other parameters in the PC BIOS as the device might become unusable or the performance might degrade. If you have opened a menu that is not described here, press the <ESC> key immediately in order to leave the menu.*

If you want to switch off the trackball so that only the external mouse is functional, you must change the PC BIOS.

Change the PC BIOS as follows (the procedure can also be used to switch the trackball on again):

1. Switch on the device. A blue framed screen appears with a title that starts with:

Power Bios

2. Press *<CTRL>+<ALT>+<ESC>* as fast as possible.

A window appears titled *Award Software International, Inc. Power BIOS 1.00 Setup*

3. Now use the *<CURSOR DOWN>* key in order to move to the menu item called *Peripherals*

4. Press the *<ENTER>* Key. Press the *<TAB>* key until the value for the *PS/2 Mouse* item is highlighted.

5. Use the *<CURSOR-DOWN>* key to change to select the appropriate value:

Enabled
Disabled

6. Press *<ENTER>*, *<ESC>* and *<ENTER>* to save the change. The device will restart.

Connecting an External Mouse

If you want to connect an external mouse (serial mouse) and use it instead of the built-in trackball, proceed as follows:

1. Shut down and switch off the device.

2. Connect the external mouse to the COM1 interface.

3. Switch on the device.

   After starting Windows NT, a window is opened titled:

   ```
   ......New Hardware found
   Searching for drivers
   ```

   A bit later the following dialog appears:

   ```
   System Settings change
   Do you want to restart your computer now?
   Yes / No
   ```

4. Select *Yes*.

The system restarts.
PC-3 board only: During this restart you can switch off the trackball, proceed as described in the section *Switching the Trackball Off or ON*.

NOTE*. Do not change the mouse driver via the Control Panel applet. This could make the keyboard unusable.*

Deactivating an External Mouse

If you connected an external mouse and you want to use the trackball again, proceed as follows:

1. Shut down and switch off the device.

2. Disconnect the mouse from the serial port.

3. **PC-3 board only:** Switch the device on and make sure that the trackball is enabled in the PC BIOS as described above (section *Switcing the Trackball Off or On*). If you forget this step, there will be no pointing device at the next start of Windows NT; press *<CTRL>+<ALT>+<Delete>* on the keyboard and select *Shutdown* to repeat the cycle.

4. Restart the device.

   At the next start of Windows NT the following warning message appears:

   Service Control Manager
   At least one service or driver failed during
   system startup. Use event viewer to examine the
   event log for details.

5. Click *OK*.

6. In order to follow this warning, do the following:

   Start...
   Settings...
   Control Panel...
   Devices

7. Scroll down the list until you see:

   Serial Mouse Driver

⚠ **CAUTION.** *Be careful when selecting the appropriate entry from the devices applet of the control panel. Selecting the wrong entry can make the device unusable. Follow the instructions.*

---

8. Select the *Startup* Button. Then select *Disabled* from the list of radio buttons.

9. Select *OK* and ignore the following warning by selecting *Yes*. Select *Close.*

Appendix C: Specifications

The K1205/K1205 Plus Protocol Tester is a portable protocol analyzer with integrated TFT color display and keyboard.

The K1205 consists of an AT compatible PC system and a VME bus system in a single housing. Various measurement interface modules can be plugged to the VME bus system.

Table C–1: Environmental conditions

Ambient temperature	+23°C with ≥ ± 5% (with 55% humidity)
Operating range	+4 to +40° C (less than 85% humidity, without condensation)
Transportation/storage	-20°C to +55°C
Barometric pressure	101.3 kPa (1013 mbar)
Altitude	4300 m, maximum operating
Working range	up to 2200 m: 70 to 106 kPa (700 to 1060 mbar)
Limit range of operation	up to 4300 m: 53.3 to 106 kPa (533 to 1060 mbar)
Pollution degree	Pollution degree 2 (as defined in IEC 1010-1) Note – Rated for indoor use only

Table C–2: Power supply

Line adapter	Safety class 1, (protective grounding)
Line voltage	Rated range of use 100 .. 240 V, ± 10%, automatic changeover
Line frequency	Rated range of use 50/60 Hz, -6% to +5%
Power consumption	**K1205:** Maximum value 460 VA **K1205 Plus:** Maximum value 650 VA

Table C–3: K1205. Overall dimensions and weight

Width	288 mm (without handle)
Height	344 mm (without handle)
Depth	190 mm (without handle)
Weight	8 to 10 kg (depending on equipment)

Table C–4: K1205 Plus. Overall dimensions and weight

Width	400 mm
Height	321 mm
Depth	275 mm
Weight	Approximately 14 to 18 kg (depending on configuration level)

Table C–5: Hardware

Central computer	Intel Pentium CPU $\geq$ 133 MHz $\geq$ 64 MB RAM
Connections	2 x serial 1 x parallel (Centronics) Keyboard SCSI VGA (external monitor) With Pentium Processor PC card: Ethernet (10Base-2, 10Base-T) or With Celeron Processor PC card: Ethernet (10BaseT), USB
Display	TFT (Thin Film Transistor) External screen interface
Mass memory	SCSI hard disk drive ($\geq$ 1 GByte formatted total capacity, access time < 11ms or better) 3.5" floppy disk drive (1.44 MB formatted overall capacity) External CD-RW drive (option)
Keyboard	PS/2 compatible keyboard, Trackball

Table C–6: Interface boards

VME-bus backplane	Layers with automatic daisy chain and 5 VME slots: slot 1, system computer; slots 3, 4, 5, interface modules
Interface modules (except Ethernet)	CPU 68EC040 (25 MHz) with up to 32 MByte RAM With E1/DS1: 4 additional RISC processors 68360 (QUICC) for I/O tasks
Application Processor AP–4	Power PC 750, 350 MHz, 1 MB L 2 Cache, 64 MB RAM with the following connectors: 1 x RJ45 Serial 1 x RJ45 10-BaseT/100-BaseTx Ethernet
Application Processor AP–4/256	Power PC 750, 350 MHz, 1 MB L 2 Cache, 256 MB RAM with the following connectors: 1 x RJ45 Serial 1 x RJ45 10-BaseT/100-BaseTx Ethernet
BAI	Interface module for performing measurements on ISDN S_0 and U_{2B1Q} lines with the following connectors: 2 x monitoring (duplex)
E1/DS1 (PRIMO)	Interface module for performing measurements on PCM-24 and PCM-30 lines with the following connectors: quadruple monitoring (duplex)
V./X.	Interface module for performing measurements on V.24, X.21 or V.35 lines with the following connectors: 2 x monitoring (duplex)
DS0A	Interface module for performing measurements according to the Bellcore Standard "Digital Signal Zero 'A' (DS–0A 64kbit/s) Systems Interconnection" (Bellcore Technical Reference TR TSY–000458): 8 x monitoring duplex

Table C–6: Interface boards (Cont.)

Ethernet	The Ethernet modules comply with the IEEE 802.3 for 10BaseT and 100BaseTx: $\geq$ 64 MB RAM 2 x emulation / simulation 2 x monitoring (duplex) or 4 x monitoring (half-duplex)

NOTE. EN 60950, IEC 950, UL 1950: The interface boards are designed for connecting to a telecommunication network (TNV-1 circuits); the appropriate interfaces are provided.

Table C–7: Certifications and compliances

Category	Standards or description
EC Declaration of Conformity – EMC*	Meets intent of Directive 89/336/EEC for Electromagnetic Compatibility. Compliance was demonstrated to the following specifications as listed in the Official Journal of the European Communities:
	EN 61326 — EMC requirements for Class A electrical equipment for measurement, control and laboratory use.
	IEC 61000-4-2 — Electrostatic discharge immunity (Performance Criterion B)
	IEC 61000-4-3 — RF electromagnetic field immunity (Performance Criterion A)
	IEC 61000-4-4 — Electrical fast transient / burst immunity (Performance Criterion B)
	IEC 61000-4-5 — Power line surge immunity (Performance Criterion B)
	IEC 61000-4-6 — Conducted RF immunity (Performance Criterion A)
	IEC 61000-4-11 — Voltage dips and interruptions immunity (Performance Criterion B)
	EN 61000-3-2 — AC power line harmonic emisions
Australia / New Zealand Declaration of Conformity – EMC	Complies with EMC provision of Radiocommunications Act per the following standard(s):
	AS/NZS 2064.1/2 — Industrial, Scientific, and Medical Equipment: 1992
FCC Compliance	Emissions comply with FCC Code of Federal Regulations 47, Part 15, Subpart B, Class A Limits.

Table C–7: Certifications and compliances (Cont.)

Category	Standards or description
EC Declaration of Conformity – Low Voltage	Compliance was demonstrated to the following specification as listed in the Official Journal of the European Communities: Low Voltage Directive 73/23/EEC as amended by 93/68/EEC EN 61010-1/A2: 1995 Safety requirements for electrical equipment for measurement, control, and laboratory use
U.S. Nationally Recognized Testing Laboratory Listing	Only for devices with UL symbol on the back of the housing: UL 3111.1-1: Standard for electrical measuring and test equipment
Canadian Certification	Only for devices with UL symbol on the back of the housing: CAN/CSA C22.2 No. 1010.1: Safety requirements for electrical equipment for measurement, control and laboratory use
Installation (Over-voltage) Category	Overvoltage Category II (as defined in IEC 61010-1, Annex J) Local-level mains (wall sockets). Equipment at this level includes appliances, portable tools, and similar products. Equipment is usually cord-connected.
Pollution Degree	Pollution Degree 2 (as defined in IEC 61010-1). Note: Rated for indoor use only. Normally only dry, nonconductive pollution occurs. Occasionally a temporary conductivity that is caused by condensation must be expected. This location is a typical office/home environment. Temporary condensation occurs only when the product is out of service.
Equipment Type	Test and measuring
Safety Class	Class 1 (as defined in IEC 61010-1, Annex H) – grounded product

EMC Compliance was achieved under the following conditions: Shielded cables on all external I/O ports; front panel screws properly tightened; conductive chassis rails of the boards connected to chassis ground; cable shields connected to chassis ground via metal shell connectors bonded to a conductive module front panel; all peripherals conformed.

For minimum RF emissions, it is essential that the conditions above be implemented. Failure to do so could compromise the EMC compliance of the equipment containing the board.

Ferrite sleeves on all headphone or headset cables. The ferrite sleeve with hinged plastic housing is included in the accessory box, in a plastic bag. It has to be mounted on the cable near the termination that is connected to the headphone interface. The cable has to be turnt twice around the ferrite before closing the ferrite.

⚠ *WARNING.* EN 55022: This is a class A product. In a domestic environment, this product may cause radio interference in which case the user may be required to take adequate measures.

Appendix D: TCP/IP Installation

The following pages provide information on how to install the TCP/IP protocol. You need the TCP/IP installation to remotely run trigger functions from the statistics application.

The installation of the Protocol Tester software does not automatically include the TCP/IP protocol stack. It has to be installed manually.

NOTE. Ask your network administrator, if you already work with TCP/IP. In this case you can skip the following pages.

To work with the network installation, you furthermore need a physical ethernet connection to your LAN.

Installation of the TCP/IP Protocol

To install the TCP/IP protocol, proceed as follows:

1. Close all applications.

2. Right-click on the `Network Neighborhood` icon and select `Properties`.

3. Select the `Protocols` tab in the `Network` dialog box.

    Click the `Add...` button.
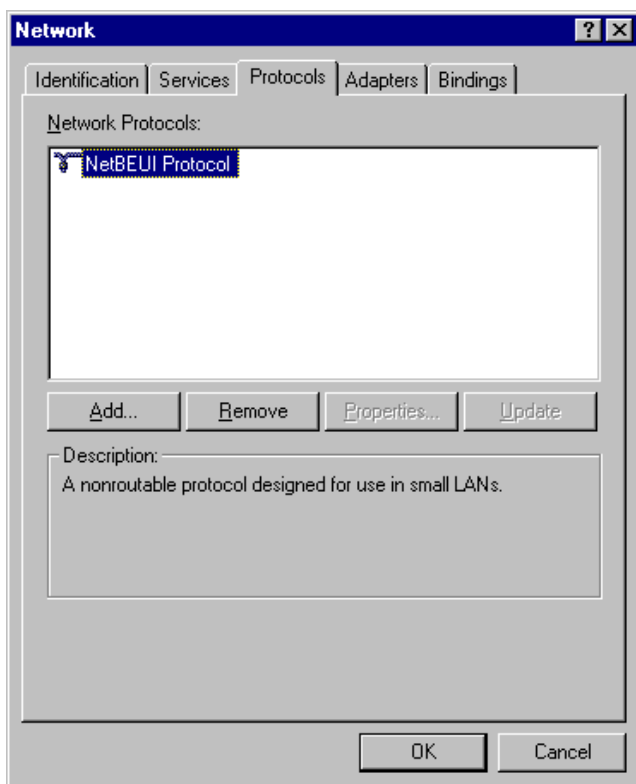
4. The `Select Network Protocol` box appears.

Select `TCP/IP Protocol` and press `OK`.
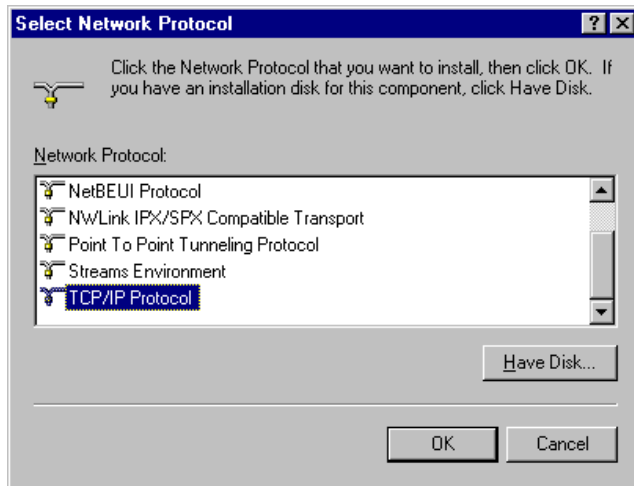
5. A warning concerning DHCP (a server for automatic IP assignment) appears.
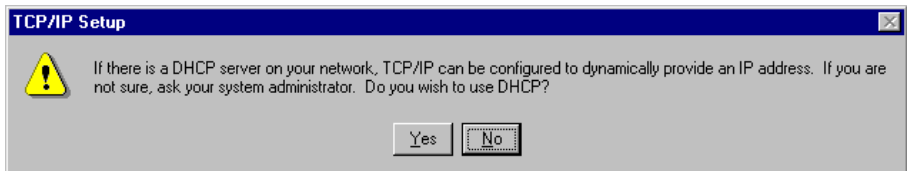
If there is a DHCP server on your network, click on `Yes`.

If there is no DHCP server on your network, click on `No`.

6. The `Windows NT Setup` dialog appears.

Make sure that specified location is set correctly to the path shown in the picture below or to `<CD drive>:\I386`

Press `Continue`.
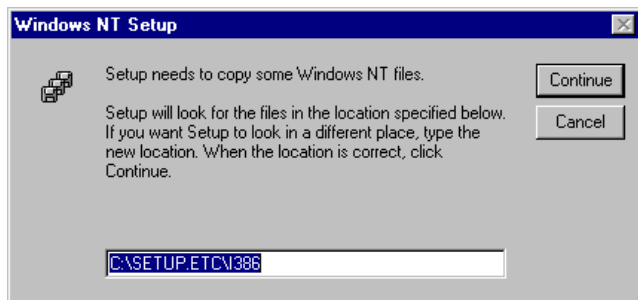
7. The TCP/IP Protocol appears on the list.

Click on Close.
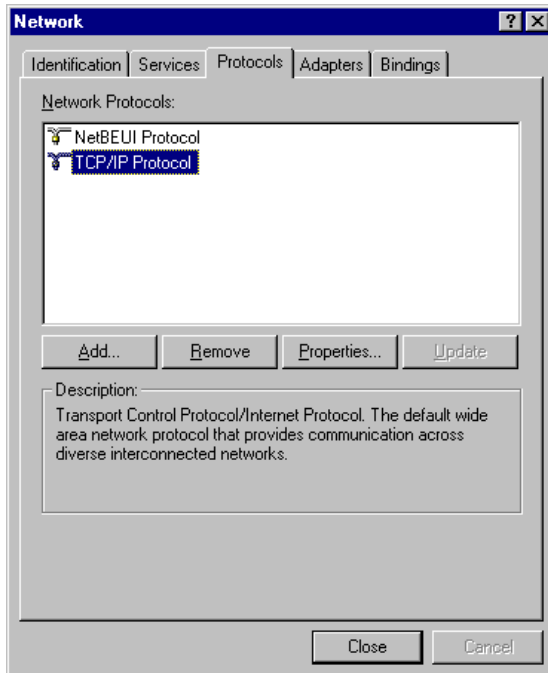
If there is a DHCP server on your network and you answered the TCP/IP Setup warning concerning DHCP use (see further above) with Yes, the installation of the TCP/IP protocol is now completed. You will be asked to restart the system. Answer with Yes to restart the system.

If there is no DHCP server on your network, you have to proceed with the next step.

Without DHCP Server. Only if you have no DHCP server on your network:

8. The IP Address tab appears. Enter an IP address and a Subnet Mask. Ask your network administrator for an address, the subnet mask entry, and for further details if necessary.

The picture below shows the IP Address tab for PC-3 board with sample entries. For the PC-4/PC-5 board the Adapters list box will show "[1] Intel 21143 based 10/100 mpbs Ethernet Controller".
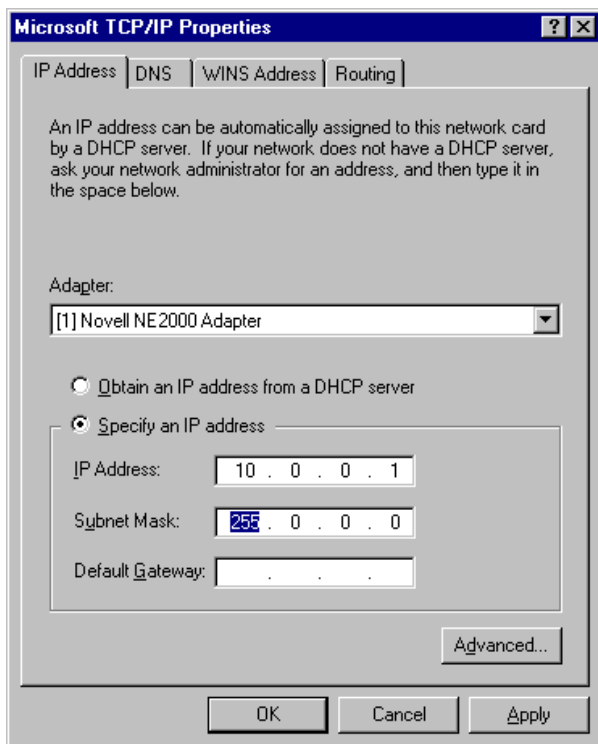
Press OK. You will then be asked to restart the system. Answer with Yes to restart the system.

Appendix E: Troubleshooting

The following chapter provides an overview on troubleshooting measures. It describes how the fuses can be changed and how to repair or reinstall a damaged Windows NT installation on the Protocol Tester. For general Windows NT troubleshooting tips read the Windows NT help.

Changing the Fuses

K1205.

If the fuses need to be changed, proceed as follows:

1. First, plug off the power cord.

2. Use an appropriate tool, such as a flat screw-driver, insert it into the slot above the on/off switch.

3. Pull the cover towards you, then pull the red strip.

K1205 Plus.

Spare power fuses can be found on the K1205 Plus chassis under the top cover. If the fuses need to be changed, proceed as follows:

1. Remove the top cover first – the fixing screws for the cover are covered by four corner latches: Push the latches upward, unhinge the corner latches, loosen the screws and remove the cover.

2. The black fuse tray is placed on the right hand side of the mains switch 0/I on the rear of the device: Open the tray and exchange the broken fuse.

⚠ **CAUTION.** *Interventions into the device should only be done by experienced sercice technicans. Before changing the fuses make sure that the mains plug is not connected.*

Windows NT Troubleshooting

To repair or reinstall a damaged Windows NT installation on the Protocol Tester do this:

1. Click on *Start: Help*

Emergency Repair Disk (ERD)

With this Protocol Tester you will find an individual Emergency Repair Disk (ERD) which contains the state of the device at the time of production. With this Emergency Repair Disk you can reproduce the user accounts and the driver configuration that existed when the device was produced. The reproduction of the user accounts is necessary if the passwords have been lost (after being changed).

Please keep the Emergency Repair Disk in a safe place. Do not overwrite the original Emergency Repair Disk that you received with the Protocol Tester.

You should create a new Emergency Repair Disk whenever you change the user accounts or install new or different device drivers ("Devices"). You can update this Emergency Repair Disk whenever your system is stable. Read Windows NT help for more information.

Repair

Under rare circumstances, the Protocol Tester may not start (boot). These circumstances include:

1. Installation of faulty third-party drivers

2. Erroneous changes in the Registry

3. Deleting or replacing system files by mistake

In these circumstances the NT boot process might crash with a "blue-screen".

Another problem occurs when the passwords of all accounts have been changed and have been forgotten. In this case the device starts, but does not log on automatically and no one can log on manually.

In all these instances the Windows NT installation repair process must be carried out.

NOTE. Before you begin you should read the complete description of the repair process.

Do not carry out the repair process before you have made sure that there is no other troubleshooting method.

Prerequisites

Passwords Lost

If the passwords lost, no one can log on to the Protocol Tester Windows NT. The following is required:

- *Setup Disk 1* and *Setup Disk 3* of the Windows NT package

- *Setup Disk 2 (Service Pack 5) english*

- *Symbios Drivers for Windows NT* disk

- *Emergency Repair Disk (ERD)*

Other Damages

For the repair of other damages the following is needed in addition:

- A SCSI CD-RW drive to be attached to the SCSI interface of the K1205

- Windows NT CD-RW

Starting the Repair

Passwords Lost

Start as follows:

1. Switch off the device.

2. Insert *Setup Disk 1* to the diskette drive of the Protocol Tester.

3. Switch on the device and wait for the Protocol Tester to boot from that disk.

Other Damages

Start as follows:

1. Switch off the device.

2. Connect the CD-RW drive to the SCSI interface of the Protocol Tester.

3. Switch on the CD-RW drive.

4. Insert the *Microsoft Windows NT Workstation* CD into the CD-RW drive.

5. Insert *Setup Disk 1* to the diskette drive of the device.

6. Switch on the device.

7. Watch the BIOS boot process and check whether the CD-RW drive is displayed in addition to the hard disk drive.

   If not, switch off device and the CD-RW drive. Check the SCSI connection and the CD-RW drive (address jumper or the like) and start again.

8. Wait for the Protocol Tester to boot from the disk.

Continuation of the Repair

1. When you are prompted to insert *Setup Disk 2*, use *Setup Disk 2 (Service Pack 5) english* instead.

   Press *<ENTER>*.

2. After a while the *Welcome to Setup* screen appears.

   Select option *R* (Repair).

3. In the next screen you are asked to select which parts of the installation should be checked. By default all options are selected. Usually you should not perform such a procedure. If only the passwords have been lost, only select *Inspect registry files*.

   The options *Inspect startup environment* and *Inspect boot sector* are required only if the system does not start up. In this case the system stops with a black screen or with certain messages such as *... ntldr not found...*

   The option *Verify Windows NT system files* is required only if system files have been deleted or changed by mistake. Under these circumstances the system is usually unstable with unpredictable errors.

4. Move the highlighted line down and press *<ENTER>*.

5. In the next screen select *S* to skip mass storage detection.

6. In the next screen you will see *<none>* to indicate that no mass storage driver has been loaded. Select *S* for *Specifying Additional Device*.

7. In the next screen press *<ENTER>* for *Other (requires...)*.

8. Now you are asked to insert the following disk: *Manufacturer-supplied hardware support disk*.

9. Insert the disk labeled *Symbios Drivers for Windows NT* and press *<ENTER>*.

10. In the next screen you will see a list containing one item: *Symbios Logic PCI (53c8XX)*.

    Press *<ENTER>*; the driver will be loaded.

11. In the next screen you will see the following message:

    Setup has recognized... Symbios Logic PCI...

    Press *<ENTER>*.

12. Insert *Setup Disk 3* when prompted.

13. In the next screen you will be asked whether you have an Emergency Repair Disk.

14. Press *<ENTER>* to affirm. You will then be prompted to insert a disk labeled *Windows NT-Emergency Repair Disk*. If you have created a new Emergency Repair Disk, this will probably be labeled differently. Insert the Emergency Repair Disk and follow the instructions.

15. `Repair Options`
You will be prompted with a screen that contains a couple of choices.
Most problems will be solved by selecting *SYSTEM* and *SECURITY.*
If the passwords have been lost, only select *SECURITY.* Make your
choice and then select *<CONTINUE>.*

16. If the repair option *Verify Windows NT system files* has
been selected, you will be prompted with the fact that *ntldr* is not
the original file. Select *A* to repair all files.

17. Wait until you are prompted with:

Setup has completed repairs and follow the instructions.

18. Now the K1205 should be able to boot. There may be a warning that
the system could not log you on. In this case enter the User Name
Administrator in the logon dialog and leave the password field
empty. Or if you had changed the password before creating the
Emergency Repair Disk use the appropriate password.

If that does not work, repeat the whole repair process again, but in the
step labeled *Repair Options* now select all options.

19. If the repair option *Verify Windows NT system files* has
been selected, perform the following steps after logging on.

If the K1205 main program or other programs start automatically after
logging on has been completed, close these programs and reapply the
NT Service Pack as delivered on the *Tools* CD.

Changing the Boot Sequence

⚠ **CAUTION.** *This section tells how to change certain parameters of the PC BIOS of the Protocol Tester. Follow the instructions and do not change other parameters in the PC BIOS because the device might become unusable or the performance might degrade. If you have opened a menu that is not described here, press the* `<ESC>` *key immediately in order to leave the menu.*

PC-3: How to Change the Boot Sequence in the PC BIOS

As a protection against certain computer viruses (boot sector viruses) the boot sequence in the PC BIOS has been changed so that the device will not start from a floppy disk.

Under certain circumstances, however, it may be necessary to start from a floppy disk. For example it becomes necessary if you want to repair a damaged Windows NT installation.

In order to start from a floppy disk, proceed as the follows:

1. Switch on the device.

    A screen with a blue frame appears. Its title starts with `Power Bios`.

2. Press `<CTRL>+<ALT>+<ESC>` as fast as possible.

    A window appears titled `Award Software International, Inc. Power BIOS 1.00 Setup`

3. Use the `<CURSOR DOWN>` key in order to move to the menu item called: `Boot Features`.

4. Press the `<ENTER>` key. Use the `<CURSOR UP>` or `<CURSOR DOWN>` keys to select the desired feature.

5. To protect against boot sector viruses, use `C:, A:`

6. To be able to boot from floppy disk, use `A:, C:`

7. Press `<ENTER>` when you have selected the desired option. Then press `<ESC>` and `<ENTER>` to save the change. The device will be restarted.

PC-4/PC-5 Board: How to Change the Boot Sequence in the PC BIOS

As a protection against certain computer viruses (boot sector viruses) the boot sequence in the PC BIOS has been changed so that the device will not start from a floppy disk.

Under certain circumstances, however, it may be necessary to start from a floppy disk. For example it becomes necessary if you want to repair a damaged Windows NT installation.

Proceed as the follows:

1. Switch on the device.

    A black screen titled *Award Modular* appears.

2. Press *<DEL>* to perform the PC BIOS.

    A window appears titled as follows (first line might be slightly different):

    CMOS SETUP UTILITY .

3. Use the *<CURSOR DOWN>* key in order to move to the menu item called: *BIOS Features Setup*. Confirm with *<ENTER>*.

4. Use the *<CURSOR DOWN>* key in order to move to the menu item called: *Boot Sequence*. Use the *<PAGE UP>* or *<PAGE DOWN>* keys to select the desired feature:

    To start from hard disk, select:
    C, A, SCSI

    To start from floppy disk, select:
    A, C, SCSI

5. To quit the *BIOS Features Setup*, press *<ESC>*. To take over the changed settings, press *<F10>* for *Save & Exit Setup*.

6. Confirm the SAVE to CMOS and EXIT dialog with *Y.*
    The device will be restarted.

Abbreviations

ATM
    Asynchronous transfer mode

ATS
    Abstract test suite

BSC
    Base station controller

BSS
    Base station subsystem

BSSAP
    BSS Application part

BTS
    Base transceiver station

CIC
    Circuit identity code

EIR
    Equipment identification register

ETSI
    European telecommunications standards institute

GMSC
    Gateway mobile service switching center

GPRS
    General radio packet service

GSM
    Global system for mobile communication

HLR
Home location register

IMSI
International mobile subscriber identity

IN
Intelligent network

INAP
Intelligent network application part

IP
Internet protocol

ISDN
Intergrated serviced digital network

ISO
International standards organization

ISUP
ISDN User part

ITU TS
International telecommunication union, telecommunication standards section

LU
Location update

MAP
Mobile application part

MOC
Mobile originating call

MS
Mobile station

MSC
  Mobile services switching center

MSISDN
  Mobile subscriber ISDN address

MSRN
  Mobile station roaming number

MTC
  Mobile terminating call

MTP
  Message transfer part (SS#7)

O&M
  Operation and maintenance

OMC
  Operation and maintenance center

OSI
  Open systems interconnection

PCM
  Pulse code modulation

PDU
  Protocol data unit

PLMN
  Public land mobile network

PRIMO
  Primary rate monitoring: E1/T1 interface board

PSTN
  Public switched telephone network

SMS
Short message service

SPC
Signalling point code

SS#7
Signalling system number 7, also:
Common channel signalling system number 7; ITU Q.700 series

SSN
Subsystem number

SSP
Service switching point

SSS
Switching subsystem

TCAP
Transfer capability application part

TMSI
Temporary mobile station identity

TUP
Telephone user part

V..., X...
CCITT Interfaces

VLR
Visitor location register

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