

Content

Idec Micro 3-series

Foreword.....	1
1 Introduction	2
2 Install and update driver.....	3
2.1 Installation of driver using Internet.....	3
2.2 Installation of driver from disk	3
3 Connecting the terminal to the PLC system.....	4
3.1 Settings in the MAC Programmer+	4
3.2 Connecting the terminal to the PLC system.....	8
4 Addressing	9
4.1 Connecting the terminal to the PLC system	9
5 Efficient communication	10
5.1 Signals affecting the communication time.....	10
5.2 How to make the communication more efficient	11
6 Appendix.....	13

Foreword

This manual presents installation and handling of the driver Idec Micro 3-series to the terminals in the E-series.

The functionality in the E-terminals and in MAC Programmer+ are described in the E-manual.

© G&L Beijer Electronics AB 1999, MA-00398

G&L Beijer Electronics AB reserves the right to change information in this manual without prior notice. All examples in this manual are used solely to promote understanding of how the program works and its operation. G&L Beijer Electronics AB take no responsibility if these examples are used in real applications.

1 Introduction

This manual describes how the Idec Micro 3-series PLC system is connected to the terminals in the E-series. For information about the PLC system we refer to the manual for the current system.

2 Install and update driver

When installing MAC Programmer+ the drivers available at the time of release are installed too. A new driver can be added into MAC Programmer+ either with MAC Programmer+ using an Internet connection or from diskette. A driver can be updated to a newer version in the same ways.

2.1 Installation of driver using Internet

To update available drivers to the latest version or to install new drivers you can use the function Update terminal drivers, from Internet in the File menu in MAC Programmer+. All projects must be closed before this function is used and the computer must be able to make an Internet connection. You don't need a browser. When the connection is established a list is shown with all drivers that can be downloaded from Internet to the computer. The list shows the version number of available drivers and the version number of installed drivers. Mark the driver/ drivers you want to install in the MAC Programmer+. The function Mark Newer will mark all drivers that are available in a newer version then the one installed and the drivers not installed. Then you select Download. Each drivers is approximately 500 kb and it is ready to use when the download is ready.

2.2 Installation of driver from disk

To update available drivers to the latest version or to install new drivers you can use the function Update terminal drivers, from Disk in the File menu in MAC Programmer+. All projects must be closed before this function is used. Select the folder with the new driver and choose to open the mpd-file. A list is shown with all drivers that can be installed showing the version number of available drivers and the version number of installed drivers. Mark the driver/ drivers you want to install in the MAC Programmer+. The function Mark Newer will mark all drivers that are available in a newer version then the one installed and the drivers not installed. Then you select Install.

How to select the Idec Micro-3 series driver in the project and how to transfer it to the terminal are described in *chapter 3*.

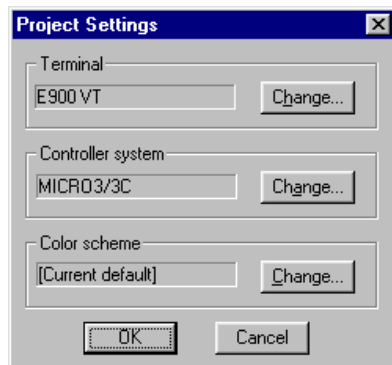
3 Connecting the terminal to the PLC system

3.1 Settings in the MAC Programmer+

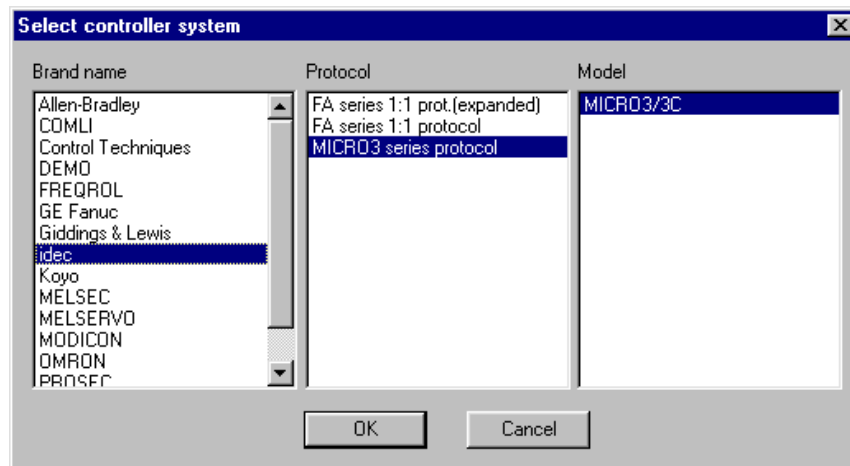
For communication with Idec Micro-3 series PLC system the following settings must be made in the programming tool MAC Programmer+.

Driver selection

Choosing **New** in the **File** menu creates a new project and the dialog **Project Settings** is shown. In an existing project, the dialog is shown by selecting **Project Settings** in the **File** menu.

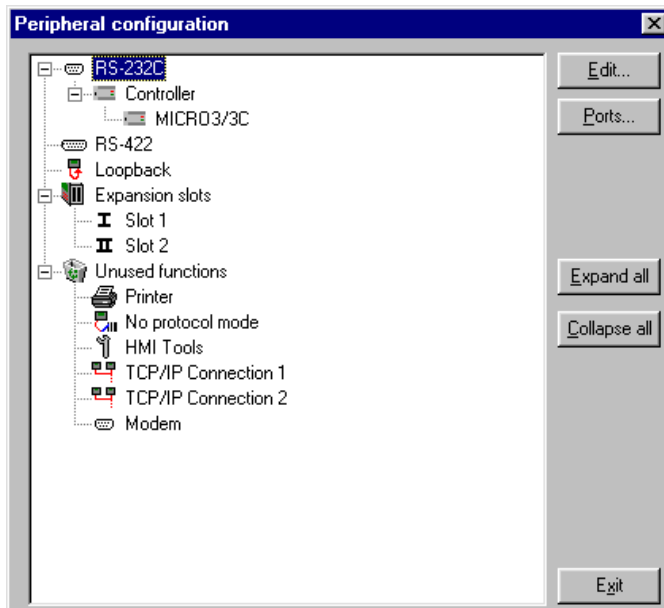


Press **Change...** under **Controller system** to get the choice list of available drivers. Choose **Brand name**, **Protocol** and **Model** and then press **OK**. Press **OK** again to confirm the project settings.



Communication setup

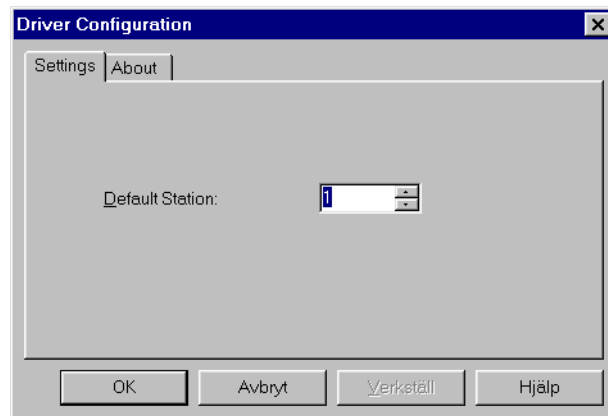
The settings for the communication between the terminal and the PLC-system are done under **Peripherals** in the **Setup** menu. To change which port the PLC system is connected to, mark and hold left mouse button down and drag to move it to another communication port. Mark the selected communication port and press **Edit** to change the other communication settings.



The settings should be:

Parameter	Description
Port	RS-232
Baudrate	9600
Data bits	7
Stop bits	1
Parity	even

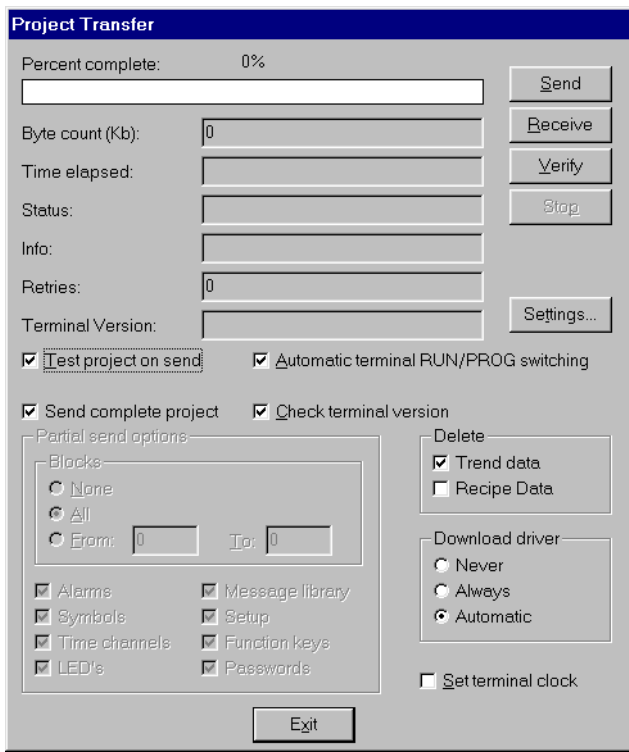
To make specific settings the selected driver, mark the driver name and press Edit.



Parameter	Description
Default station	The station the terminal is testing the communication to at start up. It is also the station to the devices when no station number is stated.

Transfer the driver to the terminal

The selected driver is down-loaded into the terminal when the project is transferred to the terminal. Choose Project in the Transfer menu.



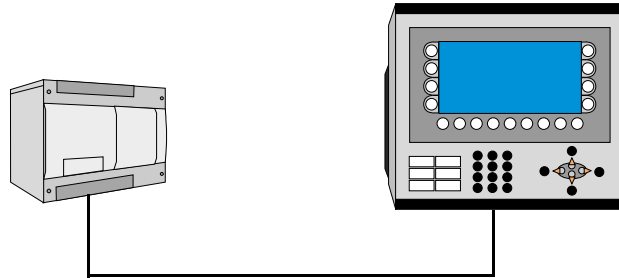
There are three alternatives when the driver is downloaded into the terminal.

Function	Description
Never	The driver is not down-loaded and the existing driver in the terminal is used.
Always	The driver is down-loaded every time the project is transferred.
Automatic	The driver is down-loaded if the driver in the terminal is not the same as the selected driver in the project. If it is the same the driver is not down-loaded.

3.2 Connecting the terminal to the PLC system

The connection is of the type “multidrop” or “point-to-point”.

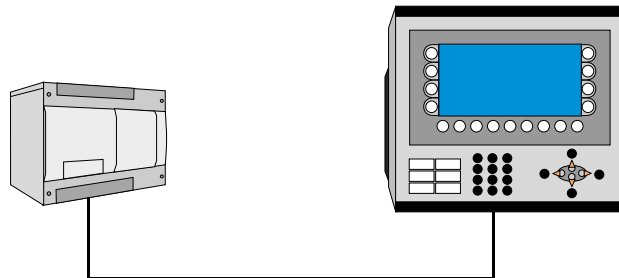
Multidrop connection



Cable according to drawing K-03338

The cable according to drawing K-03338 in appendix is connected between RS-485 port on the PLC system and the RS-422 port on the terminal.

Point-to-point



Cable according to drawing K-03339 or K-03337

The cable according to drawing K-03339 in appendix is connected between the Programming port on the PLC system and the RS-232 port on the terminal.

The cable according to drawing K-03337 in appendix is connected between the Programming port on the PLC system and the RS-422 port on the terminal.

4 Addressing

The terminal can handle the following data types in the PLC system.

Name	Address, Comment	Bit-device	Word-device
I	input (Read-Only)	X	
Q	output (Read-Write)	X	
M	internal relay (Read-Write)	X	
R	shift register (Read-Write)	X	
T	timer (Read-Only)		X
TP	timer preset (Read-Write)		X
C	counter value (Read-Only)		X
CP	counter preset (Read-Write)		X
D	dataregister (Read-Write)		X
HCS	high speed counter value		X
HSCP	high speed counter value preset		X

All bit-devices are addressed with last digit octal.
Remaining devices are addressed decimal.

4.1 Station handling

Under Driver Configuration in Peripherals the **default station** is stated. It is the station the terminal is testing the communication to at startup. It is also the station to the devices when no station number is stated. To communicate with other stations the station number is stated as a prefix to the device.

Example

I3: I37 Input 37 in station 13.

D108 D-register 108 (dec) in the default station.

5 Efficient communication

To make the communication between the terminal and the PLC system quick and efficient the following should be noted about how the signals are read and what that can be done to optimize the reading.

5.1 Signals affecting the communication time

It is only signals to objects in the current block that are read continuously. Signals to objects in other blocks are not read, that is the number of blocks does not affect the communication time.

Besides the signals to objects in the current block, the terminal is continuously reading the following signals from the PLC:

- Display signals
- Block print-out signals
- LED registers
- Alarm signals
- Remote acknowledge signals on alarms and alarm groups
- Login signal
- Logout signal
- Trend registers at the sample points
- Bargraph registers if using min/max indicators
- New display register
- Buzzer register
- Backlight signal
- Cursor control block
- Recipe control block
- Library index register
- Index registers
- PLC clock register if the PLC clock is used in the terminal
- List erase signal
- No protocol control register
- No protocol on signal

Signals not affecting the communication time

The following signals do not affect the communication time:

- Signals linked to function keys
- Time channels
- Objects in the alarm messages

5.2 How to make the communication more efficient

Group PLC signals consecutively

The signals from the PLC system are read most rapidly if all signals in the list above are consecutive. If for example, 100 signals are defined, it is quickest to read these if they are linked to, for example, M0-M99. If the signals are spread out (e.g. I4, Q82, T40 etc.) the updating is slower.

Efficient block changes

Block changes are carried out most rapidly and efficiently through the block jump function on the function keys or through a jump object. "Display signals" in the block header should only be used when the PLC system is to force the presentation of another block. The "New Display" register can also be used if the PLC system is to change the block. This does not affect communication as much as a larger number of "Display signals".

Use the clock of the terminal

An extra load is put on communication if the clock of the PLC system is used since the clock register must be read up to the terminal. Downloading of the clock to the PLC system also creates an extra load. The interval between downloadings should therefore be as long as possible.

Packaging of signals

When the signals are transferred between the terminal and the PLC system, all signals are not transferred simultaneously. Instead they are divided into packages with a number of signals in each package. To decrease the number of packages that have to be transferred and make the communication faster this number has to be considered. The number of signals in each package depends on the used driver. In the driver the number is 50 for analog devices and 400 for digital devices.

To make the communication as fast as possible the number of packages has to be minimized. Consecutive signals require a minimum of used packages but it is not always possible to have consecutive signals. In such cases the so-called waste between two signals has to be considered. The waste is the maximum distance between two signals you can have and still keep them in the same package. The waste depends on the used driver. In the Idec Micro 3-series driver the number is 16 for analog devices and 100 for digital devices.

Signal	1	2	3	4	5	6	7	8	9	10
Used	X	X					X	X	X	

Waste

6 Appendix

Error codes from the PLC system. The code is shown on the display of the terminal.

Comm Error: XX

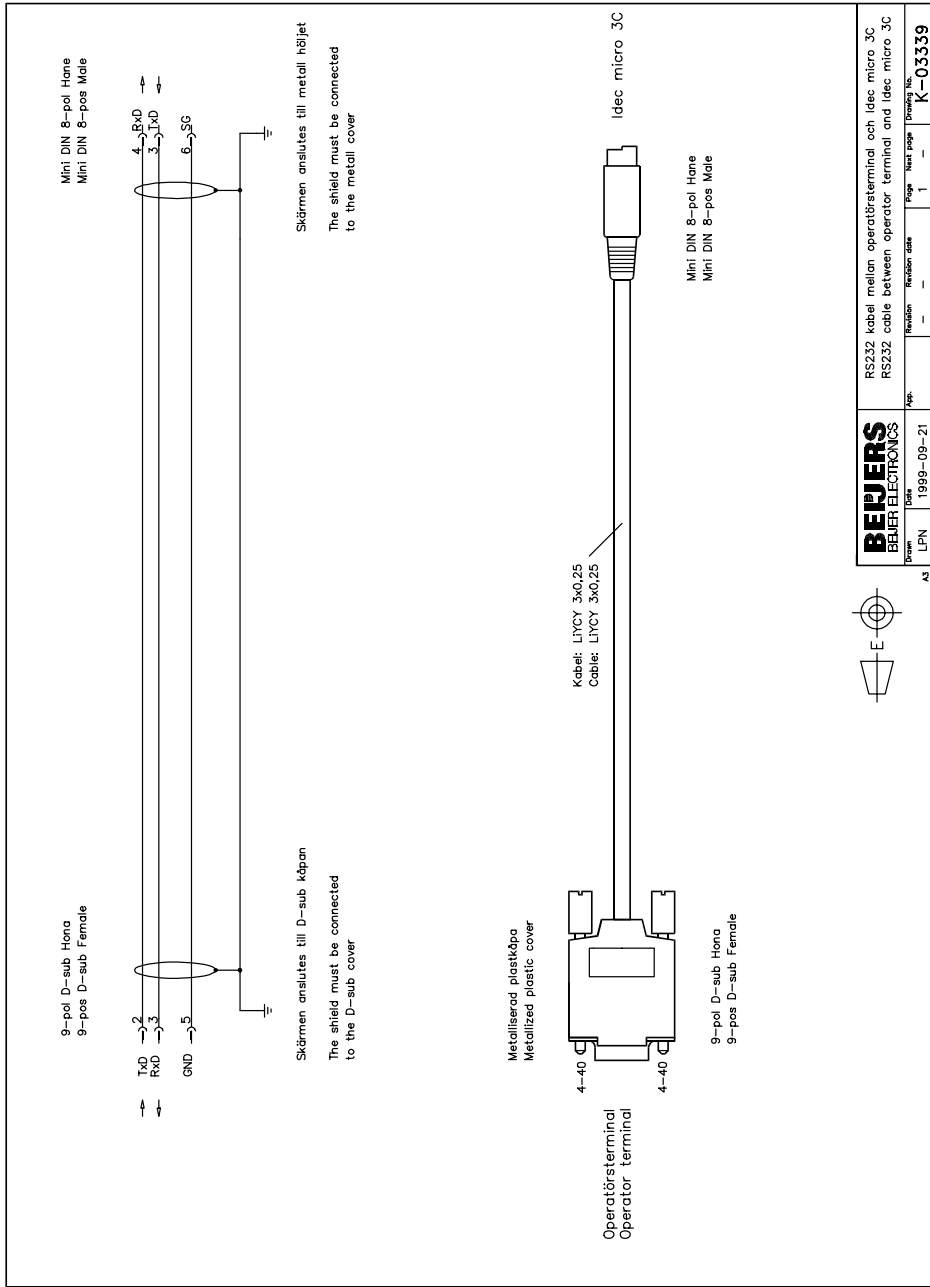
NAK code (YY)	Name	Description
00	BCC error	Appended BCC codes does not match calculated value of received data
01	Frame error	Quantity of received bits differs from the preset value (stop bit is 0 for example)
02	Data send/receive error	Parity error or overrun error occurs
03	Command error	Unsupported request message does not match the expected data (including quantity of data)

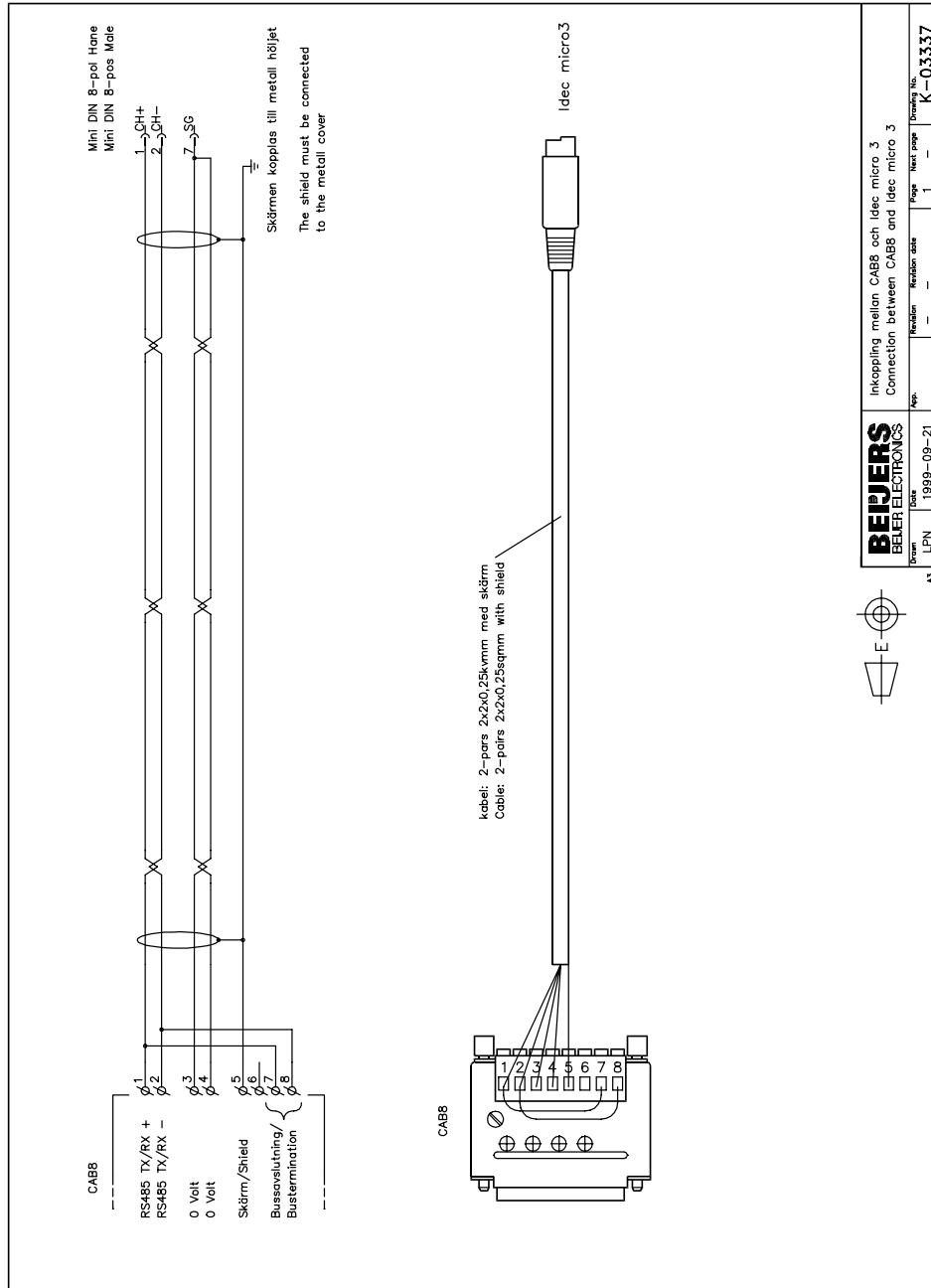
PLC error response

"Error XX Stn:nn", nn corresponds to the current station number.

See the Computer Link Function operation.


Error code (XX)	Name	Description
00	Expansion station error	Communication attempt to expansion station
01	Program size error	
02	Protect error	Protected against write and read
03	RUN error	Writing user program attempt while Micro is running
04	CRC error	User program CRC code not matched
06	Data range error	Invalid data range designed
07	Timer/counter preset value change error	Preset value change attempted to timer or counter with preset value designed by data register
08	Calendar/clock data error	Invalid value written to calendar clock
09	Data clear error	Designed data cannot be cleared
10	Data error	Invalid data other than 0-9 or A-F





RS-232
MAC 60/90/Exxx, MTA-260/G1/Exxx
MAC 10/CM, CM10

Pin no	Name	Signal direction MAC ↔ XXX
2	TxD	↗
3	RxD	↘
5	0V	
7	CTS	↘
8	RTS	↗
9*	+5V <5mA	↗

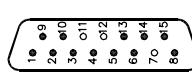


D-sub
9-pin Hona
9-pin Male

* E1 i E-serien
Not in E-series

RS-422
MAC 50/90, MTA-260/G1

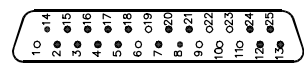
Pin no	Name	Signal direction MAC ↔ XXX
2	+TxD	↗
1	-TxD	
4	+RxD	↘
3	-RxD	
6	+RTS	↗
5	-RTS	
10	+CTS	↘
9	-CTS	
8,15	0V	
13,14	+5V <20mA	↗



D-sub
15-pin Hona
15-pin Female

RS-422
MAC 40+/Exxx, MTA-100/Exxx
MAC 10/CM, CM10

Pin no	Name	Signal direction MAC ↔ XXX
2	+TxD	↗
15	-TxD	
3	+RxD	↘
16	-RxD	
4	+RTS	↗
17	-RTS	
5	+CTS	↘
18	-CTS	
20	1)	
21	1)	
7,8	0V	
14	2) +5V <50mA	↗
12,13	3) +5V	
24,25	>200mA	↘



D-sub
25-pin Hona
25-pin Female

- 1) Stift 20 är anslutet till stift 21 internt i MAC'en.
Pin no 20 connected to pin no 21 internal in MAC/MTA.
- 2) Endast i E-serien och med serie nr 9901 eller senare
Only for E-series and with serial no 9901 or later
- 3) Endast E100/MAC40+/MTA-100
Only for E100/MAC40+/MTA-100

BEIJERS
BEIJER ELECTRONICS

MAC/MTA RS-232/RS-422

BL.E. | Date | 1993-09-07 | Rev. | 1 | Page | 1 | Part no. | S-00724

