

Driver for MELSERVO MR-J2-C-S100

English manual

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MELSERVO MR-J2-C-S100

This manual presents installation and handling of the driver MELSERVO MR-J2-C-S100 to the terminals in the E-series.

The functionality in the E-terminals and in MAC Programmer+/SW-MTA-WIN are described in the E-manual.

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1 Introduction

This manual describes how the MELSERVO MR-J2-C-S100 is connected to the terminals in the E-series.

For information about the MELSERVO MR-J2-C-S100 we refer to the manual for the servo controller.

2 Install and update driver

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

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+/SW-MTA-WIN. All projects must be closed before this function is used and the computer must be able to connect to Internet. You do not 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+/SW-MTA-WIN. The function **Mark newer** will mark all drivers that are available in a newer version than the one installed and the drivers not installed. Then select **Download**. Each driver 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+/SW-MTA-WIN. 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 displays 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+/SW-MTA-WIN. The function **Mark newer** will mark all drivers that are available in a newer version than the one installed and the drivers not installed. Then select **Install**.

How to select the MELSERVO MR-J2-C-S100 driver in the project and how to transfer it to the terminal are described in *chapter 3*.

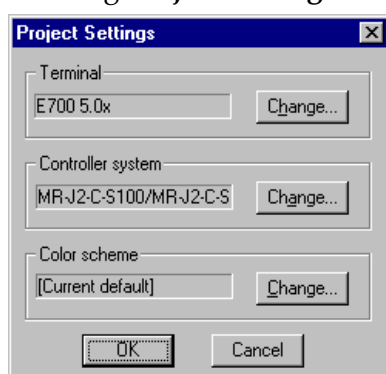
3 Connection

3.1 Settings in the MAC Programmer+/SW-MTA-WIN

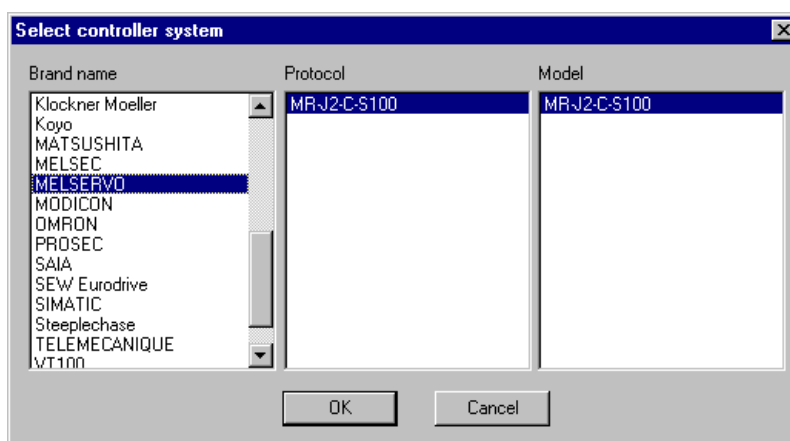
For communication with the Melservo MR-J2-C-S100 controller the following settings must be made in the programming tool MAC Programmer+/SW-MTA-WIN.

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.

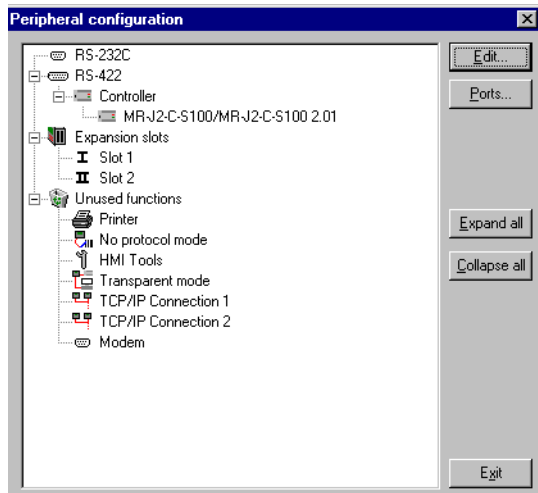


Press **Change...** under Controller System to get the choice list of available drivers. Choose **Brand name**, **Protocol** and then press **OK**. Press **OK** again to confirm the project settings.



Communication setup

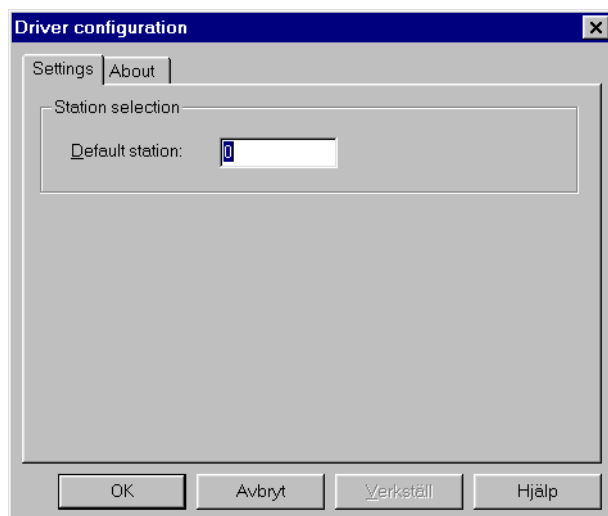
The settings for the communication between the terminal and the Controller are changed under **Peripherals** in the **Setup** menu. To change which port the Controller is connected to, mark and hold left mouse button down and drag to move it to the wanted position. Mark the selected connection and press **Edit** to change the other communication settings.



The settings should be:

Parameter	Description
Port	RS-422 or RS-232C
Baudrate	4800 - 19200
Data bits	8
Stop bits	1
Parity	Even

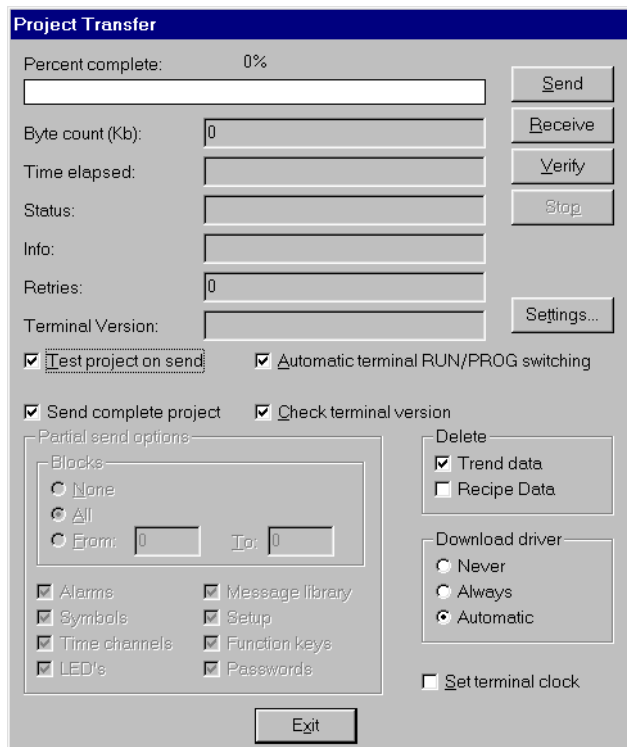
To make specific settings for the selected driver mark the driver name and press **Edit**.



Parameter	Description
Default station	0-31

Transfer the driver to the terminal

The selected driver is downloaded 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 downloaded . The existing driver in the terminal is used.
Always	The driver is downloaded every time the project is transferred.
Automatic	The driver is downloaded 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 downloaded.

3.2 Settings in the MELSERVO

For information about settings in the servo we refer to the manuals for the servo controller.

Parameter	Name	Default	Description
16	COM BAUDRATE SELECTION	0100	RS-232, 9600 bps
		0000	RS-422, 9600 bps

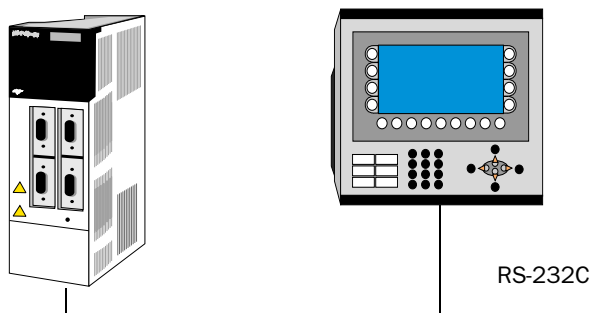
Note!

With multidrop network all servos require unique serial addresses. This address is set in parameter 15.

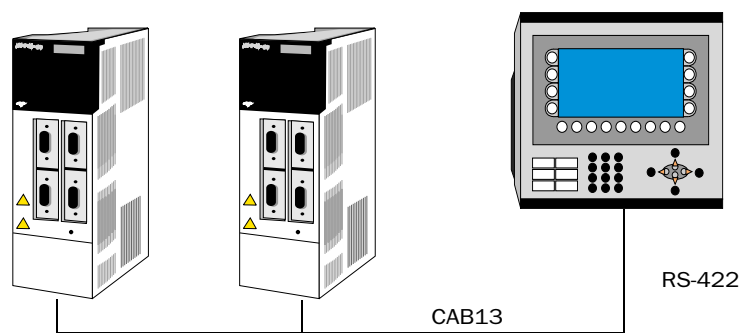
3.3 Connecting the terminal to the MELSERVO

The connection to the terminal can either be of the type “ point to point ” or “ multidrop ”.

RS-232



RS-485



To connect the terminal to the PLC system the programming cable and cable CAB13 are used. CAB13 is a standard cable that can be ordered from Beijer Electronics AB.

4 Addressing

4.1 Station addressing

When the network addressing is used the station number is added to the address according to Station number: Pxx

The default station stated in **Driver configuration** is used if nothing is declared.

Example

Addressing parameter 8 with station number 11 is done by writing 11: P8

4.2 Parameters

The terminal can handle the following parameters according to the notation Pxx where xx is the parameter number.

Example

Addressing parameter 19 is done by writing P19.

The parameters P0-P68 can be used in the terminal.

Analog signal	Description
P0-19	Basic parameters (see MELSERVO manual)
P20-68	Special parameters (see MELSERVO manual)

4.3 Diagnostics devices

Analog signal	Description
V0	Accumulated power on hours
V1	Power on times
V2	Tuning pos ctrl gain 1
V3	Tuning speed ctrl gain 1
V4	Tuning pos ctrl gain 2
V5	Tuning speed ctrl gain 2
V6	Tuning speed int.comp
V7	Tuning load inertia ratio
V8	Running step no

4.4 Display devices

Analog signal	Description
S0	Current position
S1	Commanded position
S2	Commands remaining distance
S3	Program number
S4	Feedback pulse accumulation
S5	Motor speed
S6	Droop pulse
S7	Override
S8	Torque limit common voltage
S9	Regeneration load factor
S10	Effective load factor
S11	Peak load factor
S12	Position within one rotation
S13	ABS counter
S14	Load/inertia ration

4.5 Digital I/O

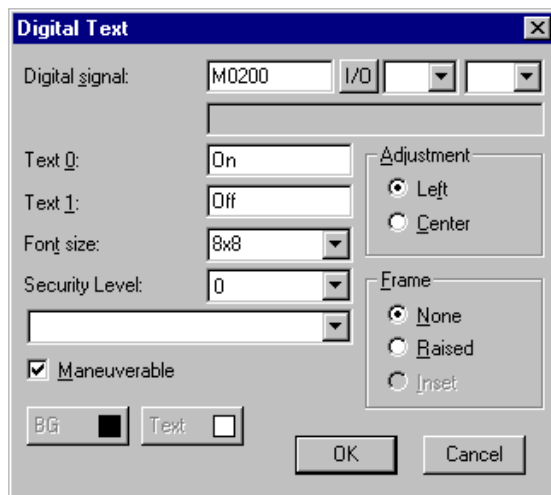
Digital signal	Group	Servo Signal	Description
M0	Input device	SON	Servo on
M1	Input device	LSP	Forward stroke end
M2	Input device	LSN	Reverse stroke end
M3	Input device	TL	External torque limit selection
M4	Input device	TL2	Internal torque limit selection
M5	Input device	PC	Proportional control
M6	Input device	RES	Reset
M11	Input device	ST1	Forward start
M12	Input device	ST2	Reverse start
M16	Input device	EMG	Emergency stop
M17	Input device	MDO	Automatic / Manual
M18	Input device	DOG	Proximity
M19	Input device	PS0	Program No.selection 1
M20	Input device	PS1	Program No.selection 2
M21	Input device	PS2	Program No.selection 3
M22	Input device	PS3	Program No.selection 4
M23	Input device	OVR	Override selection
M24	Input device	STP	Temporary stop / Restart
M25	Input device	TPO	Manual pulse generator multiplier 1
M26	Input device	TP1	Manual pulse generator multiplier 2
M27	Input device	PI1	Program input 1
M28	Input device	PI2	Program input 2
M29	Input device	PI3	Program input 3

Outputs

Digital signal	Group	Servo Signal	Description
M300	Output device	RD	Ready
M303	Output device	TLC	Torque limit in effect
M307	Output device	WNG	Warning output
M308	Output device	ALM	Alarm
M310	Output device	MBR	Electromagnetic brake
M311	Output device	DRB	Dynamic brake
M315	Output device	BWNG	Battery warning
M317	Output device	ZP	Z-phase
M318	Output device	POT	Position range
M319	Output device	PUS	Temporary stopping
M320	Output device	OUT1	Program output 1
M321	Output device	OUT2	Program output 2
M322	Output device	OUT3	Program output 3
M323	Output device	SOUT	SYNC synchronous
M324	Output device	PED	Movement complete

Forcing the Input devices

These signals can be turned ON / OFF forcible. It will be “OR” logic with the external input signals. The object **Digital text** in MAC Programmer+/SW-MTA-WIN can for example be used to force these signals.



The following devices can be forced:

Digital signal	Group	Servo Signal	Description
M200	Input device	SON	Servo on
M201	Input device	LSP	Forward stroke end
M202	Input device	LSN	Reverse stroke end
M203	Input device	TL	External torque limit selection
M204	Input device	TL2	Internal torque limit selection
M205	Input device	PC	Proportional control
M206	Input device	RES	Reset
M211	Input device	ST1	Forward start
M212	Input device	ST2	Reverse start
M216	Input device	EMG	Emergency stop
M217	Input device	MDO	Automatic / Manual
M218	Input device	DOG	Proximity
M219	Input device	PS0	Program No.selection 1
M220	Input device	PS1	Program No.selection 2
M221	Input device	PS2	Program No.selection 3
M222	Input device	PS3	Program No.selection 4
M223	Input device	OVR	Override selection
M224	Input device	STP	Temporary stop / Restart
M225	Input device	TP0	Manual pulse generator multiplier 1
M226	Input device	TP1	Manual pulse generator multiplier 2
M227	Input device	PI1	Program input 1
M228	Input device	PI2	Program input 2
M229	Input device	PI3	Program input 3

Reading the Input and Output pins

The MR-J2-C-S100 has a number of external inputs and outputs. They can be read from the following digital devices.

Inputs

Digital signal	Group	External input
M100	Input pins	CN1B-16
M101	Input pins	CN1B-17
M102	Input pins	CN1B-15
M103	Input pins	CN1B-5
M104	Input pins	CN1B-14
M105	Input pins	CN1A-8
M106	Input pins	CN1B-7
M107	Input pins	CN1B-8
M108	Input pins	CN1B-9
M109	Input pins	CN1A-19

Outputs

Digital signal	Group	External input
M400	Output pins	CN1A-19
M401	Output pins	CN1A-18
M402	Output pins	CN1B-19
M403	Output pins	CN1B-6
M404	Output pins	CN1B-4
M405	Output pins	CN1B-18

4.6 Internal registers

I1 - I7 are internal index registers for indirect addressing of all parameters. Refer to manual for E-terminals for details about index registers. They are reset each time the terminal is restarted.

I8 is reserved for station selection for alarm and programming in networks.

I.e. if I8 = 2 alarms and programs monitored for servostation 2.

4.7 Indirect addressing

The terminals can handle the four indirect registers. These are assigned as follows:

Analog signal	Stored in	
	RAM	EEPROM
D1 - 2	X	
R1 - 2	X	
E1 - 2		X

E1 - 2 is the same as R1 - 2, but the value is stored in EEPROM instead of RAM.

5 Editing the MR-J2-C-S100 servo program

Only valid in E100, E200, E300 and E600

The MR-J2-C-S100 can handle up to 8 programs with 60 steps in total.

All editing is made in the special block 995.

Create a block jump to block number 995.

If several servos are connected in network, index register I8 can be used to select which station to edit the program in.

Note!

It is not possible to: 1. Create the block 995 2. See the block 995 in MAC Programmer+/SW-MTA-WIN 3. Add any text or objects into block 995. Block 995 is an internal block in the terminals.

When entering block 995 **■READING PROGRAM■** will be shown together with xx % completed.

```

  ■READING PROGRAM■
    57 % completed
  
```

In block 995 it is possible to choose program number, insert line, delete line and add commands.

>SPN(1000)	P01	-Program number
STA(200)	S01	-Step number
STB(300)	T07	-Total number of steps used
PRG NO■INS	LN■DEL	

The program number P, program step S and total steps T are shown to the left on the display.

Use the function keys to choose program number, insert or delete a line. To add a new command press the ENTER key.

The servo commands are shown in a list. Use the cursor keys to move up and down and press ENTER to select command.

```

  >NOP
  STOP
  TIM
  SELECT■          ■EXIT
  
```

To exit block 995 in E100, press NUM and ENTER.

Available commands

NOP (No operation)	OUTOF
STOP	SPN
TIM	STC
TIMES	STA
TRIP	STB
COUNT	MOV
SYNC	MOVA
OUTON	ZRT

Please refer to the MELSERVO-J2-C-S100 manual for descriptions.

Press MAIN to leave the editing area.

If any changes are made to the program it will automatically be downloaded to the servo when exiting.

■ WRITING PROGRAM ■
15 % completed

6 Servo alarm handler

Only valid in E200, E300 and E600.

The E200 uses the built in alarm handling in the MR-J2-C-S100. Up to 6 alarms are stored in the servo.

When an alarm occurs the ■ALARM■ message is shown in the upper corner.

```

                                ■ALARM■
Speed    0 rpm
Position 13 mm
```

To view the alarms press the LIST key.

The current alarm is displayed with C as prefix.

```
>C Encoder error 2
  1 Encoder error 2
  2 No alarm
RESET■TIME■EXIT
```

Use the function keys to view the alarm time or to reset an alarm.

The servo power needs to be switched OFF and ON to clear a reset alarm in the Melservo.

If several servos are connected in network, index register I8 can be used to select which station to display the alarm list from.

7 Efficient communication

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

7.1 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

7.2 How to make the communication more efficient

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 Controller is to force the presentation of another block. The **New Display** register can also be used if the Controller 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 Controller is used since the clock register must be read up to the terminal. Downloading of the clock to the Controller also creates an extra load. The interval between downloadings should therefore be as long as possible.

8 Drawings

RS-232		
MAC 50/90/Exxx, MTA-250/G1/Exxx		
MAC 10/CM, CM10		
Pin no	Name	Signal direction MAC a-b-XXX
2	TxD	↑
3	RxD	↓
5	0V	
7	CTS	↓
8	RTS	↑
9*	+5V <5mA	↑

D-sub
9-pin Male

* E1 i E-serien
Not in E-series

RS-422		
MAC 40+/Exxx, MTA-100/Exxx		
MAC 10/CM, CM10		
Pin no	Name	Signal direction MAC a-b-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 Female

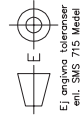
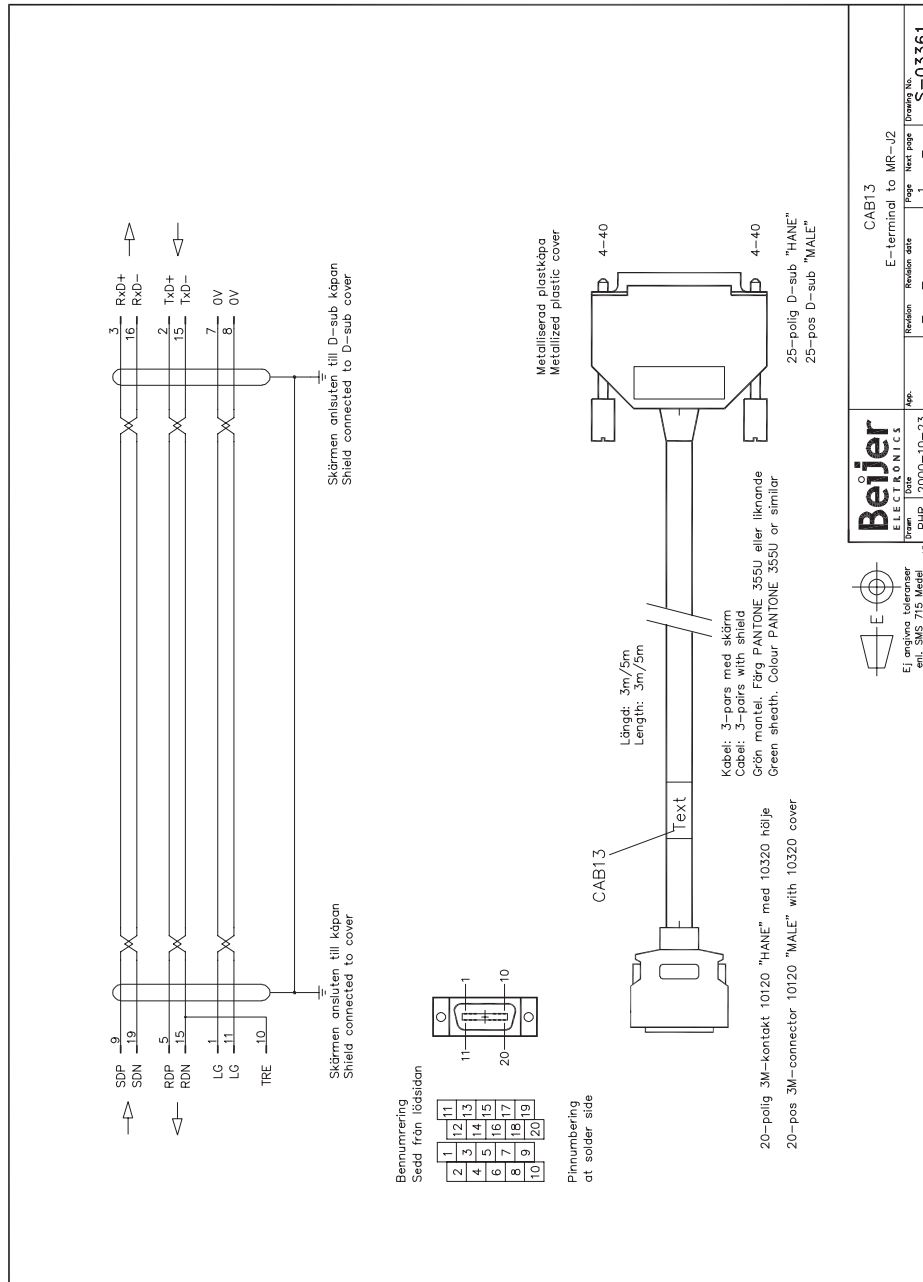
1) Stift 20 är anslutet till stift 21 internt i MAC'en.
Pin no 20 connected to pin no 21 internal in MAC/MTA.
2) Endast i E-serien och med serie nr 9901 eller senare
Only for E-series and with serial no 9901 or later
3) Endast E100/MAC40+/MTA-100
Only for E100/MAC40+/MTA-100

RS-422		
MAC 50/90, MTA-250/G1		
Pin no	Name	Signal direction MAC a-b-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 Female

Pin no	Name	Signal direction MAC a-b-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	↓

Part No.	Revision	Production date
E100 BLE	1993-09-07	2000-07-28
Beijer ELECTRONICS	MAC/MTA RS-232/RS-422	Page 1
Total	App.	Next page
1	1	1
		Drawing No. S-00724



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CAB13
E-terminal to MR-U2

PHR 2000-10-23
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Revision 1
Part No. S-03361