

Driver for Matsushita FP-series MEWTOCOL-COM

English

Svenska

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Matsushita FP-series MEWTOCOL-COM

This manual presents installation and handling of the driver Matsushita FP-series MEWTOCOL-COM to the terminals in the E-series.

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

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1 Introduction

This manual describes how the Matsushita FP-series MEWTOCOL-COM 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 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+. 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 Matsushita FP-series MEWTOCOL-COM driver in the project and how to transfer it to the terminal are described in *chapter 3*.

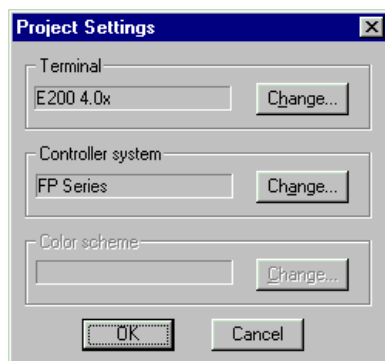
3 Connecting the terminal to the controller

3.1 Settings in the MAC Programmer+

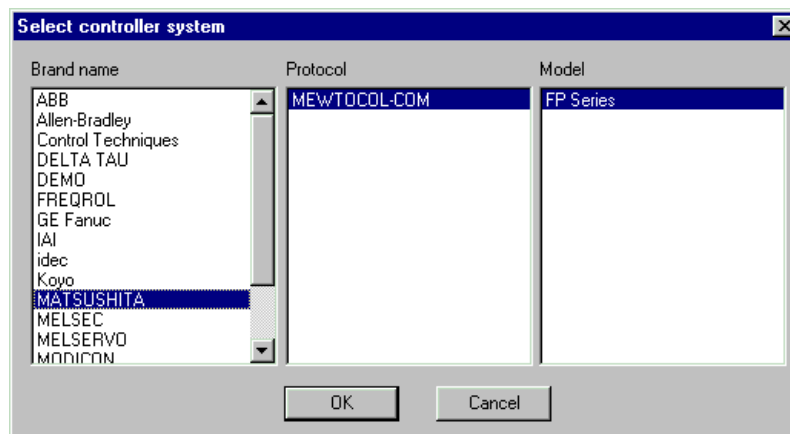
For communication with Matsushita FP-series MEWTOCOL-COM PLC system the following settings must be made in the programming tool MAC Programmer+.

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.

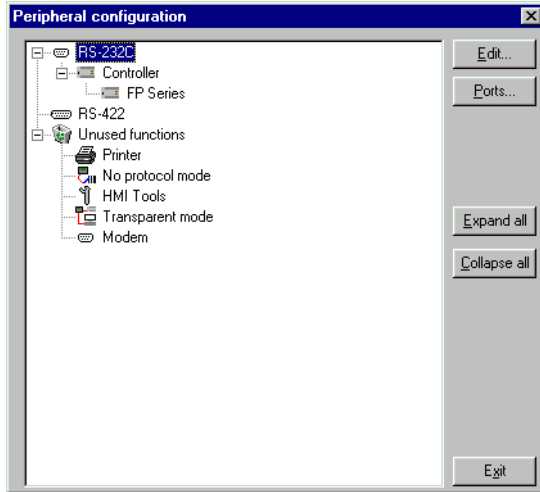


Press **Change...** under **Controller system** to get the choice list of available drivers. Choose **Brand name**, **Protocol** and **Model** and then press **OK**. Press **OK** again to confirm the project settings.



Communication setup

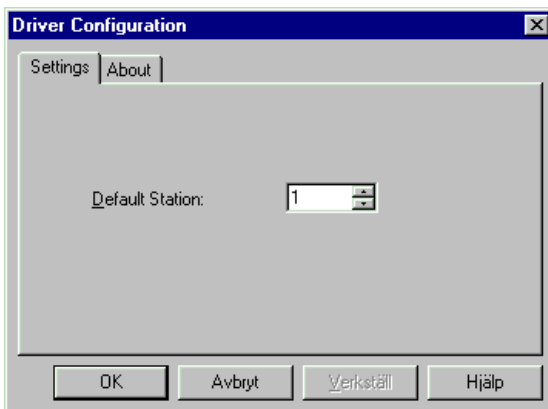
The settings for the communication between the terminal and the controller are done under **Peripherals** in the **Setup** menu. To change which port the controller is connected to, mark and hold left mouse button down and drag to move it to another communication port. Mark the selected communication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



The settings should be:

Parameter	Description
Port	RS-232C or RS-422
Baudrate	9600 or 19200
Data bits	8 or 7
Stop bits	1
Parity	Odd

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.

Project Transfer

Percent complete: 0%

Byte count (Kb): 0

Time elapsed:

Status:

Info:

Retries: 0

Terminal Version:

Test project on send Automatic terminal RUN/TRANSFER switching

Send complete project Check terminal version

Partial send options:

Blocks:

None

All

From: 0 To: 0

Alarms Message library

Symbols Setup

Time channels Function keys

LED's Passwords

Delete:

Trend data

Recipe Data

Download driver:

Never

Always

Automatic

Set terminal glock

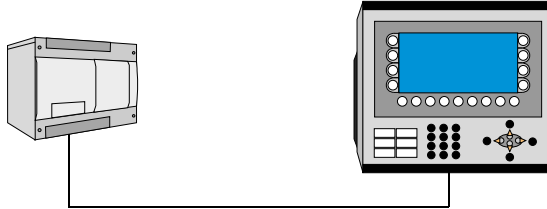
Buttons: Send, Receive, Verify, Stop, Settings..., Exit

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 controller

The connection is of the type “multidrop” (only RS232) or “point to point”.



The cable according to drawing K-03347 in appendix is connected between Matsushita FP0 and the RS-232 port on the terminal.

The cable according to drawing K-03348 in appendix is connected between Matsushita FP1 and the RS-232 port on the terminal.

The cable according to drawing K-03349 in appendix is connected between Matsushita FP3 and the RS-422 port on the terminal. For further information about connections we refer to the manual for the current PLC-system.

4 Addressing

The protocol that is used for Matsushita FP-series is MEWTOCOL-COM. The driver supports a number of different data type which for instance can be found in the programming tool NAIS. There are both 1 bit, 16 bit and 32 bits data types. The driver supports Transparent mode, for further description of Transparent mode we refer to the E-series manual.

The driver can handle the following data types in the PLC system:

Name	Description	Bit-device	Word device (16bit)	DoubleWord device (32bit)	Numerical system
X	External input	X			dec.hex
Y	External output	X			dec.hex
R	Internal relay	X			dec.hex
T	Timer contact	X			dec
C	Counter contact	X			dec
L	Link relay	X			dec.hex
WX	External input		X		dec
WY	External output		X		dec
WR	Internal relay		X		dec
SV	Timer/Counter set value		X		dec
EV	Timer/Counter elapsed value		X		dec
DT	Data register		X		dec
FL	File register		X		dec
WL	Link relay		X		dec
Ld	Link data register		X		dec
DWX	External input			X	dec
DWY	External output			X	dec
DWR	Internal relay			X	dec
DSV	Timer/Counter set value			X	dec
DEV	Timer/Counter elapsed value			X	dec
DDT	Data register			X	dec
DFL	File register			X	dec
DWL	Link relay			X	dec
DLd	Link data register			X	dec

Bit devicer

To address above the first 16 bits you have to state which word and which bit you want to address. The word is stated as an decimal value and the bit as an hexadecimal value.

Example:

We want to address the 4:th word in the 10:th bit in register X. The result is X4A. This is valid for all bit devices except timers and counters.

Addressing Double-Word device

The following example describes 32 bit devices. As an example we take DT0 and DDT0. The difference between these two 16 bit devices is that DDT0 read and write 2 16 bit devices, DT0 and DT1.

DDT0	
DT0	DT1

If you select a following device, e.g. DDT1 it will look like this.

DDT1	
DT1	DT2

This means that if you write a value to DDT1 this value also will be shown in DDT0. You must remember to use every second number for 32 bit devices.

4.1 Station handling

In **Setup Peripherals** you find "Driver Configuration" with default station – which is the station in the terminal checks communication towards at startup, and it is also the station for the device which is not assigned to any specific station. For communication with the other stations the station number is given as a prefix to the device. This is a fix number for example:

13 : R100 (internal relay in station 13)
 DT108 (D-register 108 in the default station)

Index can also be used in the common way as a suffix when the content of the index register is added to the address.

Allowed station number are: 1-64, i.e. the driver supports station 1-64.

5 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 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 controller:

- 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
- 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, C0-C11. If the signals are spread out 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".

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 Matsushita FP-series MEWTOCOL-COM driver the number is 384 for bitdevices, 24 for Word devices (16 bit) and 12 for Double Word devices (32 bit).

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 Matsushita FP-series MEWTOCOL-COM driver the number is 96 for Bit devices, 6 for Word devices and 3 for Double Word 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.

General errors

"Comm Error" The terminal has lost the communication with the PLC system

"Stn=1:Error: 01" Checksum error

Link error codes

Example: "Stn=9:Error: 21"

Error code Hexadecimal (ASCII HEX)	Name of error	Description	Steps to take
H21 (H32)(H31)	NACK error	Data error such as parity and framing error, occurred	
H22 (H32)(H32)	WACK error	Overflow of the receive-buffer occurred in the local node.	Re-configure the receive-buffer size or send data size.
H23 (H32)(H33)	Source MEWTOCOL station number overlap	Source MEWTOCOL station number overlapped with that for another node, then the communication was shutdown.	Re-configure the MEWTOCOL station number in the network without overlap.
H24 (H32)(H35)	Transmission error	Data not conforming to the transmission protocol format was sent. Or a frame overflow or data error occurred.	Check the protocol format referring to the MEWTOCOL description.
H25 (H32)(H35)	Link unit hardware error	Communication parts of the link unit did not work properly.	Turn OFF the power for the system and then turn it ON again. – If communication goes well, probably an abnormality caused by noise. Check the cable connection and ambient noise level. – If communication cannot be performed well, probably a hardware abnormality. Replace the link unit with a new one.
H26 (H32)(H36)	MEWTOCOL station number setting error	The MEWTOCOL station number set for the source node was outside the specified range (ET-LAN system in the range of 1-64).	Set the MEWTOCOL station number within the specified range for the network.

Error code Hexadecimal (ASCII HEX)	Name of error	Description	Steps to take
H27 (H32)(H37)	Frame-over error	Data over the specified limit was transmitted. Example for MEWTOCOL-COM: 118 characters (using % header) or 2,048 characters (using < header in the high-level link unit.	Check the limitations of the frames for each link unit.
H28 (H32)(H38)	No response error	No response was sent back to the source station from the destination node.	Re-send the same data again.
H29 (H32)(H39)	Buffer close error	Data was transferred to or from the source node when its buffer was closed.	Open the vuffer referring to the manual for each link unit.
H30 (H32)(H30)	Time-out error	Data cannot be transferred.	Re-send the same data again.
H32 (H33)(H32)	Transmission impossible error	Communication was shut-down because of buffer overflow of the source node.	Re-configure send data or buffer size so that the data size is within the limitation.
H33 (H33)(H33)	Communication stop	Network entry switch is OFF.	Turn the network entry switch ON.
H36 (H33)(H36)	No local station error	The source station does not exist in the network.	Check that the specified local station exists and re-send data again.
H38 (H33)(H38)	Other communication errors	Probably a transmission abnormality other than described above.	Redo the communication.

Basic procedure error codes

Error code Hexadecimal (ASCII HEX)	Name of error	Description	Steps to take
H40 (H34)(H30)	BCC error	BCC error occurred in the command data	Check the connection of the cables and ambient noise level.
H41 (H34)(H31)	Format error	The command message does not match the protocol format.	Correct command message and re-send the correct one.
H42 (H34)(H32)	Not-support error	The command not supported by the source or destination node was transmitted.	Check that the command message sent is supported by the source and destination nodes.
H43 (H34)(H33)	Procedure error	Another series of messages was sent to one node when a series of messages in multiple frames was being sent.	Change the program so that another message series is not sent while one series is still in progress.

Processing error codes (errors for the Computer link function)

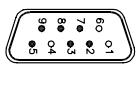
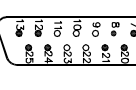
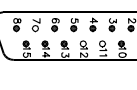
Error code Hexadecimal (ASCII HEX)	Name of error	Description	Steps to take
H50 (H34)(H30)	Link setting error	[Computer link function error] The route number, where no link unit existed, was specified in the computer link function.	Check the route number and set the correct one.
H51 (H35)(H31)	Simultaneous operation error	[Computer link function error] The send-buffer overflowed while sending data to the local node in the computer link function.	Re-send data.
H52 (H35)(H32)	Sending disable error	[Computer link function error] The sending operation to another node cannot be performed in the computer link function.	Turn OFF the power for the system and then turn it ON again. – If communication goes well, probably an abnormality caused by noise. Check the cable connection and ambient noise level. – If communication cannot be performed well, probably a hardware abnormality. Replace the link unit with a new one.
H53 (H35)(H33)	Busy error	[Computer link function error] A new command was received from a local node while processing multiple frames.	Re-send the command again.

Application error codes

Error code Hexadecimal (ASCII HEX)	Name of error	Description	Steps to take
H60 (H36)(H30)	Parameter error	[Computer link function error] The area code specified is not available for the CPU or the command in the computer link function.	Re-set the correct area code.
H61 (H36)(H31)	Data error	[Computer link function error] The specified data format, such as number system, data range, etc., was not correct.	Correct the data format referring to the description for MEWTOCOL-COM format.
H62 (H36)(H32)	Registration error	[Computer link function error] The specified operands used for monitoring were not correct.	Set parameters for correct monitoring referring to the description of MC and MD commands.

Error code Hexadecimal (ASCII HEX)	Name of error	Description	Steps to take
H63 (H36)(H33)	Mode error	[Computer link function error] In the current operation mode of the programmable controller, operation of the command cannot be performed.	Change the operation mode.
H65 (H36)(H35)	Protect error	[Computer link function error] The program was written to the programmable controller when writing to memory was prohibited.	It is impossible to write program into the programmable controller when the memory is protected.
H66 (H36)(H36)	Address error	[Computer link function error] The address setting format, such as number system, address limitations, etc., was not correct.	Correct the address format referring to the description of the MEW-TOCOL-COM format.
H67 (H36)(H37)	No data error	[Computer link function error] The area without data was specified for reading	Specify the correct area for reading.
H72 (H37)(H32)	Time-out error	[Computer link function error] The CPU could not receive the answer within the specified time	Re-send data.
H73 (H37)(H33)	Time-out error	[Computer link function error] The receive-buffer did not become available within the specified time.	Re-send data
H74 (H37)(H34)	Time-out error	[Computer link function error] The response could not be received within the specified time.	Re-send data

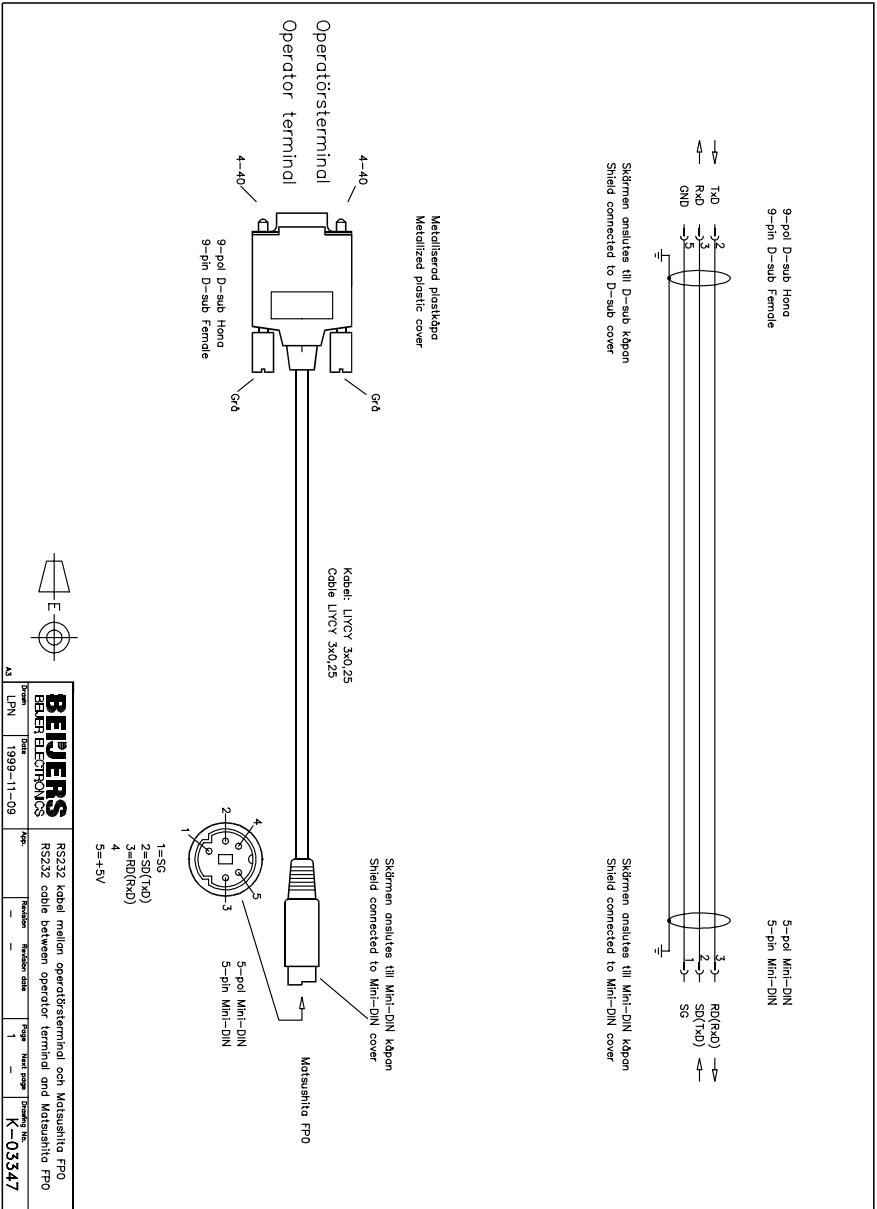
7 Drawings

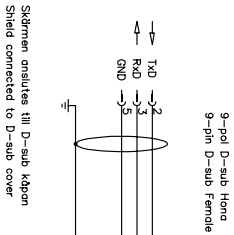
<p style="text-align: center;">RS-232 MAC 50/90/Exxx, MTA-250/GI/Exxx MAC 10/CM, CM10</p>  <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Pin no</th> <th>Name</th> <th>Signal direction MAC ←→ XXX</th> </tr> </thead> <tbody> <tr><td>2</td><td>TXD</td><td>→</td></tr> <tr><td>3</td><td>RxD</td><td>←</td></tr> <tr><td>5</td><td>0V</td><td></td></tr> <tr><td>7</td><td>CTS</td><td>→</td></tr> <tr><td>8</td><td>RTS</td><td>→</td></tr> <tr><td>9*</td><td>+5V <5mA</td><td>→</td></tr> </tbody> </table> <p style="font-size: small;">* E1 i E-serien Not in E-series</p>	Pin no	Name	Signal direction MAC ←→ XXX	2	TXD	→	3	RxD	←	5	0V		7	CTS	→	8	RTS	→	9*	+5V <5mA	→	<p style="text-align: center;">RS-422 MAC 40+/Exxx, MTA-100/Exxx MAC 10/CM, CM10</p>  <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Pin no</th> <th>Name</th> <th>Signal direction MAC →→ XXX</th> </tr> </thead> <tbody> <tr><td>2</td><td>+TXD</td><td>→</td></tr> <tr><td>15</td><td>-TXD</td><td></td></tr> <tr><td>3</td><td>+RxD</td><td>→</td></tr> <tr><td>16</td><td>-RxD</td><td></td></tr> <tr><td>4</td><td>+RTS</td><td>→</td></tr> <tr><td>17</td><td>-RTS</td><td></td></tr> <tr><td>5</td><td>+CTS</td><td>→</td></tr> <tr><td>18</td><td>-CTS</td><td></td></tr> <tr><td>20</td><td>1)</td><td></td></tr> <tr><td>21</td><td>1)</td><td></td></tr> <tr><td>7,8</td><td>0V</td><td></td></tr> <tr><td>14</td><td>2) +5V</td><td>→</td></tr> <tr><td>12,13</td><td><50mA</td><td></td></tr> <tr><td>24,25</td><td>3) +5V >200mA</td><td>→</td></tr> </tbody> </table>	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	→	12,13	<50mA		24,25	3) +5V >200mA	→
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1) Stift 20 är anslutet till stift 21 internt i MAC'en.
Pin no 20 connected to pin no 21 internal in MAC/MTA.

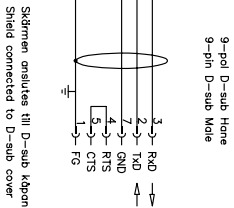
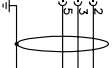
2) Endast i E-serien och med serie nr 9901 eller senare
Only for E-series and with serial no 9901 or later

3) Endast E100/MAC40+/MTA-100
Only for E100/MAC40+/MTA-100

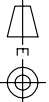
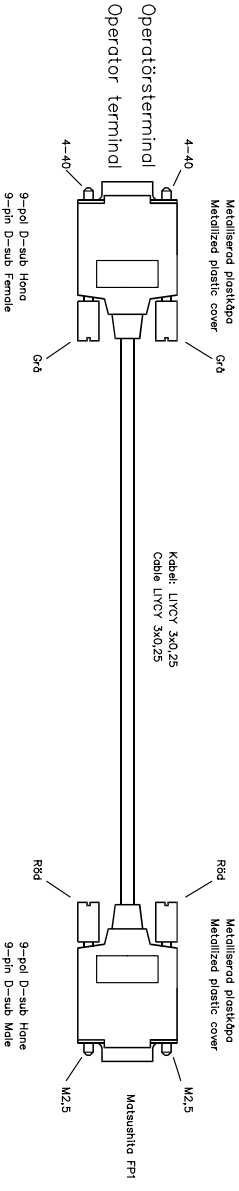




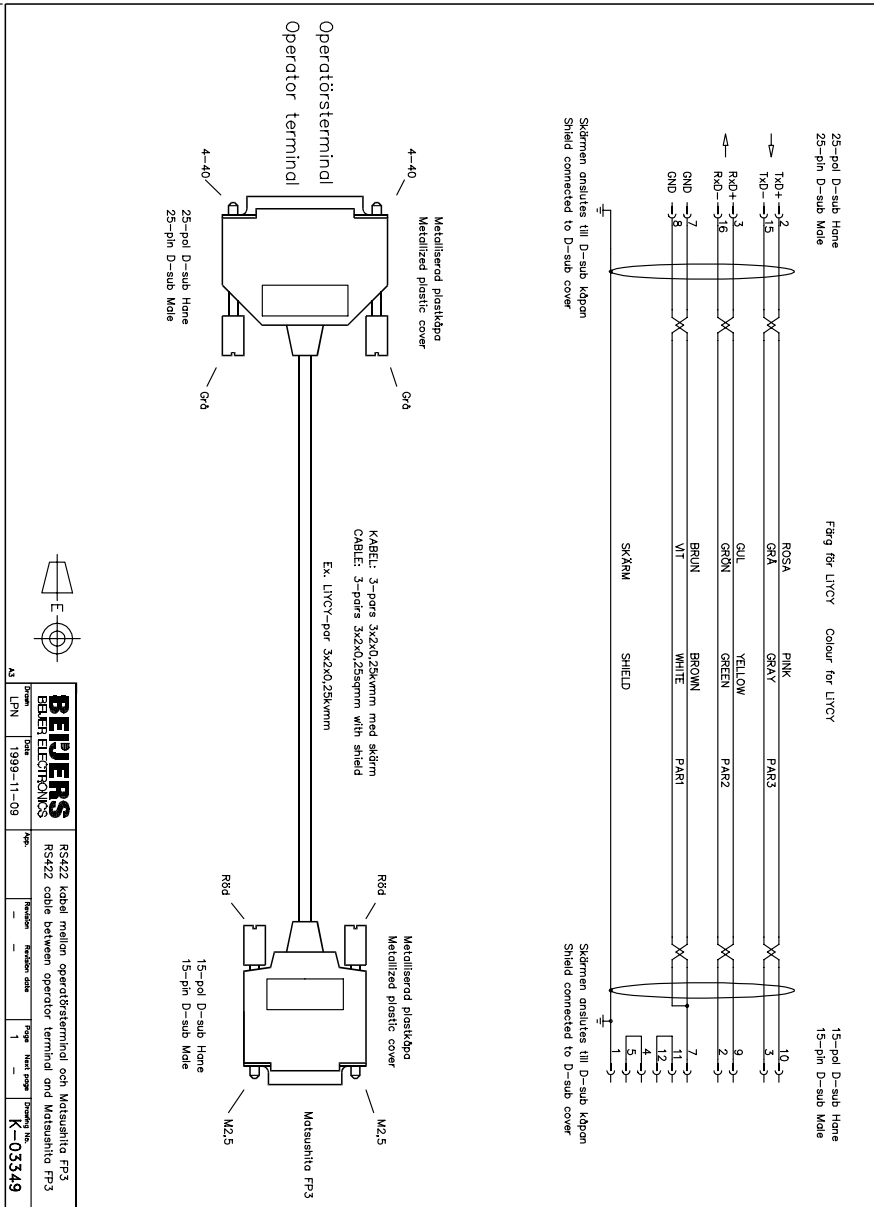
Skärm anslutes till D-sub kåpan
Shield connected to D-sub cover



Skärm anslutes till D-sub kåpan
Shield connected to D-sub cover



BEIJERS BEIJERS ELECTRONICS		RS232 kabel mellan operatorsterminal och Matsushita FPI	
Order FPN	1939-11-09	Part	RS232 cable between operator terminal and Matsushita FPI
Rev		Revision	
QTY	1	Part	K-03348



Matsushita FP-series MEWTOCOL-COM

Denna manual är en installations- och hanteringsmanual till drivrutinen Matsushita FP-series MEWTOCOL-COM till operatörsterminalerna i E-serien.

Funktionaliteten i terminalerna och i MAC Programmer+ är beskriven i E-seriemmanualen.

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G&L Beijer Electronics AB reserverar sig mot att informationen i denna manual kan komma att ändra sig utan föregående varning. Alla exempel i denna i denna manual används endast för att öka förståelsen om hur programmen arbetar. G&L Beijer Electronics AB tar inget ansvar för att dessa fungerar i verkliga applikationer.

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1 Introduktion

Manualen beskriver hur Matsushita FP-serien MEWTOCOL-COM PLC-system ansluts till operatörsterminalerna i E-serien. För information om PLC-systemet refereras till manualen för aktuellt system.

2 Installation och uppdatering av drivrutin

Tillgängliga drivrutiner installeras samtidigt som MAC Programmer+ installeras. En ny drivrutin kan läggas till i MAC Programmer+ antingen med hjälp av MAC Programmer+ och en Internet anslutning eller från diskett. En drivrutin kan bli uppdaterad till nyare version på samma sätt.

2.1 Installation av drivrutin med Internet

För att uppdatera tillgängliga drivrutiner till senaste version eller för att installera nya drivrutiner används funktionen Update terminal drivers, from Internet i menyn File i MAC Programmer+. Alla projekt måste stängas innan funktionen används och datorn måste kunna göra en Internet anslutning. Någon browser behövs inte. När anslutningen är etablerad visas en lista med alla drivrutiner som kan laddas ner via Internet till datorn. I listan visas versionsnummer på tillgängliga drivrutiner och versionsnumret på installerade drivrutiner i MAC Programmer+. Markera de drivrutiner som ska installeras i MAC Programmer+. Funktionen Mark Newer markerar alla drivrutiner som finns tillgängliga i en senare version och de som inte är installerade. Välj därefter Download. Varje drivrutin är ungefär 500 kb stor och de är färdiga att använda när nedladdningen är klar.

2.2 Installation av drivrutin från disk

För att uppdatera tillgängliga drivrutiner till senaste version eller för att installera nya drivrutiner används funktionen Update terminal drivers, from Disk i menyn File i MAC Programmer+. Alla projekt måste stängas innan funktionen används. Välj den katalog som innehåller den nya drivrutinen och välj att öppna mpd-filen. En lista visas med alla drivrutiner som kan installeras. I listan visas versionsnummer på tillgängliga drivrutiner och versionsnumret på installerade drivrutiner i MAC Programmer+. Markera de drivrutiner som ska installeras i MAC Programmer+. Funktionen Mark Newer markerar alla drivrutiner som finns tillgängliga i en senare version och de som inte är installerade. Välj därefter Install.

Hur man väljer Matsushita FP-serien MEWTOCOL-COM drivrutinen i projektet och hur man överför den till terminalen beskrivs i *kapitel 3*.

3 Anslutning av terminalen till PLC-systemet

3.1 Inställningar i MAC Programmer+

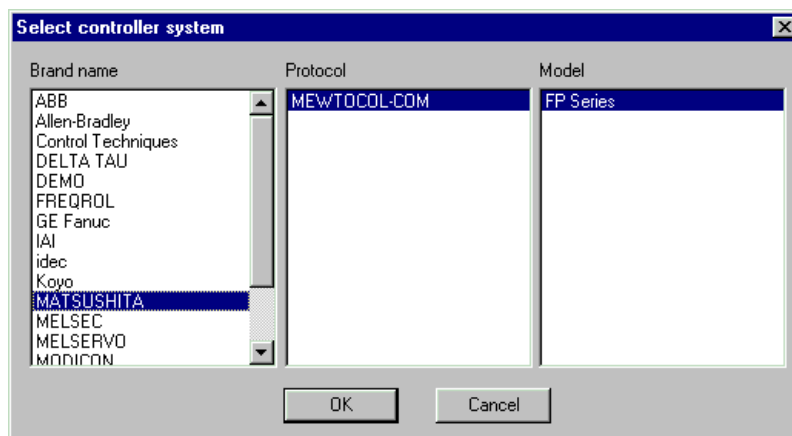
För kommunikation med SIMATIC S5 PLC-systemet via protokollet 3964R måste följande inställningar göras i programmeringsverktyget MAC Programmer+.

Val av drivrutin

Välj **New** i **File** menyn. Då skapas ett nytt projekt och dialogen **Project Settings** visas. I ett befintligt projekt, visas dialogen genom att man väljer **Project Settings** i **File** menyn.

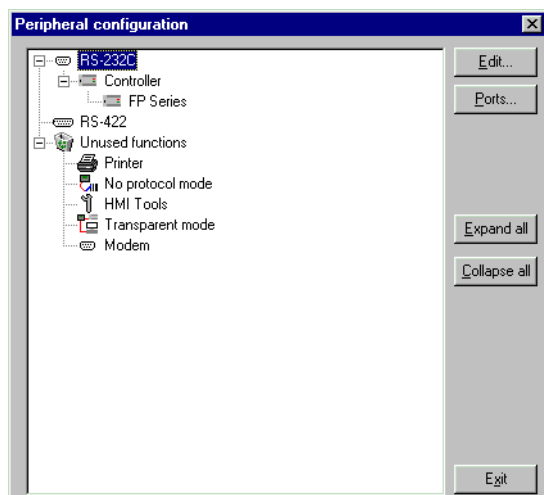


Tryck på **Change...** under **Controller system** och välj i listan över tillgängliga drivrutiner. Välj fabrikat, protokoll och modell och tryck på **OK**. Tryck på **OK** igen och bekräfta projektinställningarna.



Kommunikationsinställning

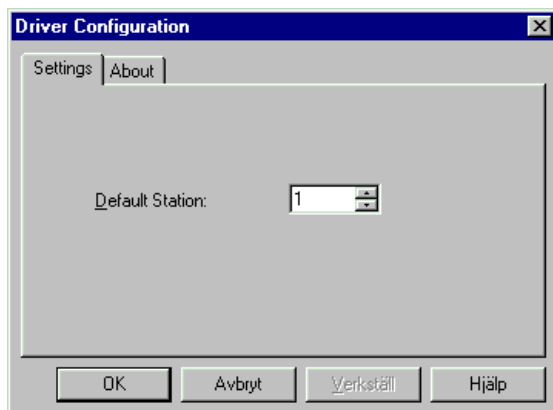
Inställningarna för kommunikationen mellan terminalen och PLC systemet utföres under **Peripherals** i **Setup** menyn. För att ändra vilken port PLC systemet är anslutet till markera Controller och håll vänster musknapp nere och drag till en annan ny kommunikationsport. Markera den valda kommunikationsporten och tryck **Edit** för att ändra den nya kommunikationsinställningen.



Inställningarna skall vara:

Parameter	Beskrivning
Port	RS-232C eller RS-422
Baudrate	9600 eller 19200
Data bits	7 eller 8
Stop bits	1
Parity	Odd

För att göra specifika inställningar i vald drivrutin markerar du namnet på drivrutinen och trycker Edit.



Parameter	Beskrivning
Grundinställd station	Den station terminalen testar kommunikationen till vid uppstart. Det är även den station som adresseras då inget stationsnummer anges.

Överföra drivrutinen till terminalen

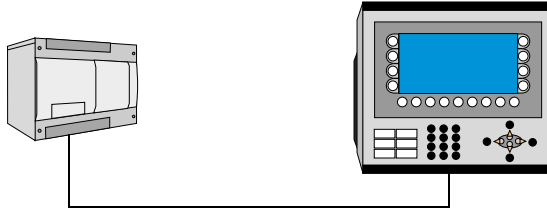
Drivrutinen laddas ner till terminalen när hela projektet överförs till terminalen. Välj **Project** i **Transfer** menyen.

Det finns tre olika alternativ när drivrutinen laddas ner till i terminalen.

Funktion	Beskrivning
Never	Drivrutinen laddas aldrig, befintlig drivrutin i terminalen används.
Always	Drivrutinen laddas varje gång projektet överföres.
Automatic	Drivrutinen laddas om drivrutinen i terminalen inte är samma som i projektet. Om samma drivrutin finns laddas den inte.

3.2 Koppla in terminalen till PLC-systemet

Anslutningen är av typen "point-to-point" eller "multidrop" (endast RS-232).



Kabeln enligt ritning K-03347 i appendix ansluts mellan Matsushita FP0 och RS-232 porten på terminalen.

Kabeln enligt ritning K-03348 i appendix ansluts mellan Matsushita FP1 och RS-232 porten på terminalen.

Kabeln enligt ritning K-03349 i appendix ansluts mellan Matsushita FP3 och RS-422 porten på terminalen. För utförligare information om anslutningsmöjligheter hänvisas till manualen för det aktuella PLC-systemet.

4 Adressering

Protokollet som används till Matsushita FP-series heter MEWTOCOL-COM. Drivrutinen stödjer ett antal olika datatyper som bl a återfinns i programmeringsverktyget NAIS. Det finns både 1 bit, 16 bitar och 32 bitars datatyper. Drivrutinen stödjer Transparent mode, för information om Transparent mode hänvisas till manualen för E-terminalerna.

Terminalen kan hantera följande signaltyper i PLC-systemet:

Namn	Beskrivning	Bit-device	Word-device (16bit)	DoubleWord-device (32bit)	Talsystem
X	External input	X			dec.hex
Y	External output	X			dec.hex
R	Internal relay	X			dec.hex
T	Timer contact	X			dec
C	Counter contact	X			dec
L	Link relay	X			dec.hex
WX	External input		X		dec
WY	External output		X		dec
WR	Internal relay		X		dec
SV	Timer/Counter set value		X		dec
EV	Timer/Counter elapsed value		X		dec
DT	Data register		X		dec
FL	File register		X		dec
WL	Link relay		X		dec
Ld	Link data register		X		dec
DWX	External input			X	dec
DWY	External output			X	dec
DWR	Internal relay			X	dec
DSV	Timer/Counter set value			X	dec
DEV	Timer/Counter elapsed value			X	dec
DDT	Data register			X	dec
DFL	File register			X	dec
DWL	Link relay			X	dec
DLd	Link data register			X	dec

För bit devicer gäller

Att adressera över de första 16 bitarna kräver att man anger vilket ord och vilken bit som skall adresseras. Ordet anges i decimal talform och biten i hexadecimal.

Exempel:

Vi vill adressera det 4:e ordet i den 10:e biten i register X. Resultatet blir X4A. Detta gäller för alla bit-devicer utom tidkretsar och räknare.

Adressering av Double-Word device

Följande exempel förklarar 32 bit device. Som exempel tar vi DT0 och DDT0, vilka egentligen är samma 16 bit device med den skillnaden att vid DDT0 läses och skrives 2 16 bit device, dvs DT0 och DT1.

DDT0	
DT0	DT1

Om man väljer ett efterföljande device t ex DDT1 får vi följande utseende.

DDT1	
DT1	DT2

Detta betyder att om man skriver ett värde till DDT1 kommer detta att visas även i DDT0. Man måste alltså tänka på att endast använda vartannat nummer för 32 bit device.

4.1 Stationshantering

Under Driver Configuration i Peripherals anges grundinställd station. Det är den station som terminalen testar kommunikationen till vid uppstart. Det är också den station som adresseras då inget stationsnummer anges. För att kommunicera med andra stationer måste stationsnumret anges som prefix till adressen.

Exempel

13: R100 Internt relä i station 13

DT108 D-register 108 i grundinställd station.

Index kan också användas på vanligt sätt som ett suffix när innehållet i indexregistret adderas till adressen.

Tillåtna stationsnummer är: 1-64, d v s drivrutinen stödjer station 1-64.

5 Effektiv kommunikation

För att göra kommunikationen mellan terminalen och PLC systemet snabb och effektiv bör följande noteras om hur signalerna läses och vad som kan göras för att optimera detta.

5.1 Signaler som påverkar kommunikationstiden

Det är endast signalerna till objekten i aktuellt block som läses kontinuerligt. Signalerna till objekten i de andra blocken läses inte och antalet block påverkar därför inte kommunikationstiden.

Förutom signalerna till objekten det i aktuella blocket, läser terminalen hela tiden följande signaler från PLC-systemet:

- Display signaler
- Blockutskriftsignaler
- LED register
- Larmsignaler
- Fjärrkivering till larm och larmgrupper
- Login signal
- Logout signal
- Trendregister vid samplingspunkterna
- Register till stapelobjekten om min/max indikatorer används
- New displayregistret
- Summerregistret
- Registret som styr bakgrundsbelysningen
- Kontrollblocket för markören
- Kontrollblocket för recept i PLC systemet
- Indexregistret till biblioteket
- Indexregister
- Registren till PLC klockan om PLC klockan används i terminalen
- Signalen som styr radering av larmlistan
- Kontrollregistret för No protocol
- Kontrollsignalen som styr om No protocol skall vara aktivt

Signaler som inte påverkar kommunikationstiden

Följande signaler som påverkar inte kommunikationstiden:

- Signaler kopplade till funktionstangenterna
- Tidkanalerna
- Objekt i larmtexter

5.2 Hur man kan göra kommunikationen effektivare

Gruppera PLC-signalerna i en följd

Signalerna från PLC systemet läses snabbast om signalerna i listan ovan är i en följd. Till exempel om 100 signaler är definierade, läses dessa snabbast om de grupperas, till exempel C0-C11. Om signalerna sprides ut går uppdateringen långsammare.

Effektiva blockbyten

Blockbyte sker effektivast via blockhoppfunktionen på funktionstangenterna eller via hoppobjekt. "Display signals" i blockhuvudet bör endast användas då PLC systemet ska tvinga fram en annat block. Ska PLC-systemet byta bild kan även "New Display" -registret användas. Det belastar inte kommunikationen lika mycket som ett större antal "Display signals".

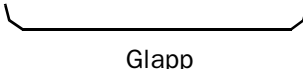
Packning av signaler

När signalerna skall överföras mellan terminalen och PLC-systemet, överförs inte alla signalerna samtidigt. De delas istället in i paket med ett antal signaler i varje. För att minska antalet paket som skall överföras och för att göra kommunikationen snabbare måste man ta hänsyn till detta. Antalet signaler i varje paket beror på drivrutinen. I Matsushita FP-series MEWTOCOL-COM drivrutinen är antalet 384 för bit-devicer, 24 för ord-devicer (16 bitar) och 12 för dubbla ord-devicer (32 bitar).

För att göra kommunikation så snabb som möjligt måste antalet paket minimeras. Signaler i en följd behöver ett minimalt antal paket men det är kanske inte alltid nödvändigt. I sådana fall blir det sk glapp mellan två signaler. Glappet är det maximala avståndet mellan två signaler där de fortfarande kan hållas inom samma paket.

Glappet beror på vilken drivrutin du använder. I Matsushita FP-series MEWTOCOL-COM drivrutinen är antalet 96 för bit-devicer, 6 för ord-devicer (16 bitar) och 3 för dubbla ord-devicer (32 bitar).

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



Glapp

6 Appendix

Felkoder från PLC systemet. Koden visas på terminalens display.

Generella fel

"Comm Error" Terminal har tappat kontakten med PLC systemet

"Stn:1:Error:01 Checksumma fel

Link felkoder

Exempel: "Stn:1:Error:21"

Felkod Hexadecimal (ASCII HEX)	Felets namn	Beskrivning	Åtgärder
H21 (H32)(H31)	NACK error	Data error such as parity and framing error, occurred	
H22 (H32)(H32)	WACK error	Overflow of the receive-buffer occurred in the local node.	Re-configure the receive-buffer size or send data size.
H23 (H32)(H33)	Source MEWTOCOL station number overlap	Source MEWTOCOL station number overlapped with that for another node, then the communication was shutdown.	Re-configure the MEWTOCOL station number in the network without overlap.
H24 (H32)(H35)	Transmission error	Data not conforming to the transmission protocol format was sent. Or a frame overflow or data error occurred.	Check the protocol format referring to the MEWTOCOL description.
H25 (H32)(H35)	Link unit hardware error	Communication parts of the link unit did not work properly.	Turn OFF the power for the system and then turn it ON again. – If communication goes well, probably an abnormality caused by noise. Check the cable connection and ambient noise level. – If communication cannot be performed well, probably a hardware abnormality. Replace the link unit with a new one.
H26 (H32)(H36)	MEWTOCOL station number setting error	The MEWTOCOL station number set for the source node was outside the specified range (ET-LAN system in the range of 1-64).	Set the MEWTOCOL station number within the specified range for the network.

Felkod Hexadecimal (ASCII HEX)	Felets namn	Beskrivning	Åtgärder
H27 (H32)(H37)	Frame-over error	Data over the specified limit was transmitted. Example for MEWTOCOL-COM: 118 characters (using % header) or 2,048 characters (using < header in the high-level link unit.	Check the limitations of the frames for each link unit.
H28 (H32)(H38)	No response error	No response was sent back to the source station from the destination node.	Re-send the same data again.
H29 (H32)(H39)	Buffer close error	Data was transferred to or from the source node when its buffer was closed.	Open the vuffer referring to the manual for each link unit.
H30 (H32)(H30)	Time-out error	Data cannot be transferred.	Re-send the same data again.
H32 (H33)(H32)	Transmission impossible error	Communication was shutdown because of buffer overflow of the source node.	Re-configure send data or buffer size so that the data size is within the limitation.
H33 (H33)(H33)	Communication stop	Network entry switch is OFF.	Turn the network entry switch ON.
H36 (H33)(H36)	No local station error	The source station does not exist in the network.	Check that the specified local station exists and re-send data again.
H38 (H33)(H38)	Other communication errors	Probably a transmission abnormality other than described above.	Redo the communication.

Procedurfelkoder

Felkod Hexadecimal (ASCII HEX)	Felets namn	Beskrivning	Åtgärder
H40 (H34)(H30)	BCC error	BCC error occurred in the command data	Check the connection of the cables and ambient noise level.
H41 (H34)(H31)	Format error	The command message does not match the protocol format.	Correct command message and re-send the correct one.
H42 (H34)(H32)	Not-support error	The command not supported by the source or destination node was transmitted.	Check that the command message sent is supported by the source and destination nodes.
H43 (H34)(H33)	Procedure error	Another series of messages was sent to one node when a series of messages in multiple frames was being sent.	Change the program so that another message series is not sent while one series is still in progress.

Bearbetningsfelkoder (fel för Computer link funktionen)

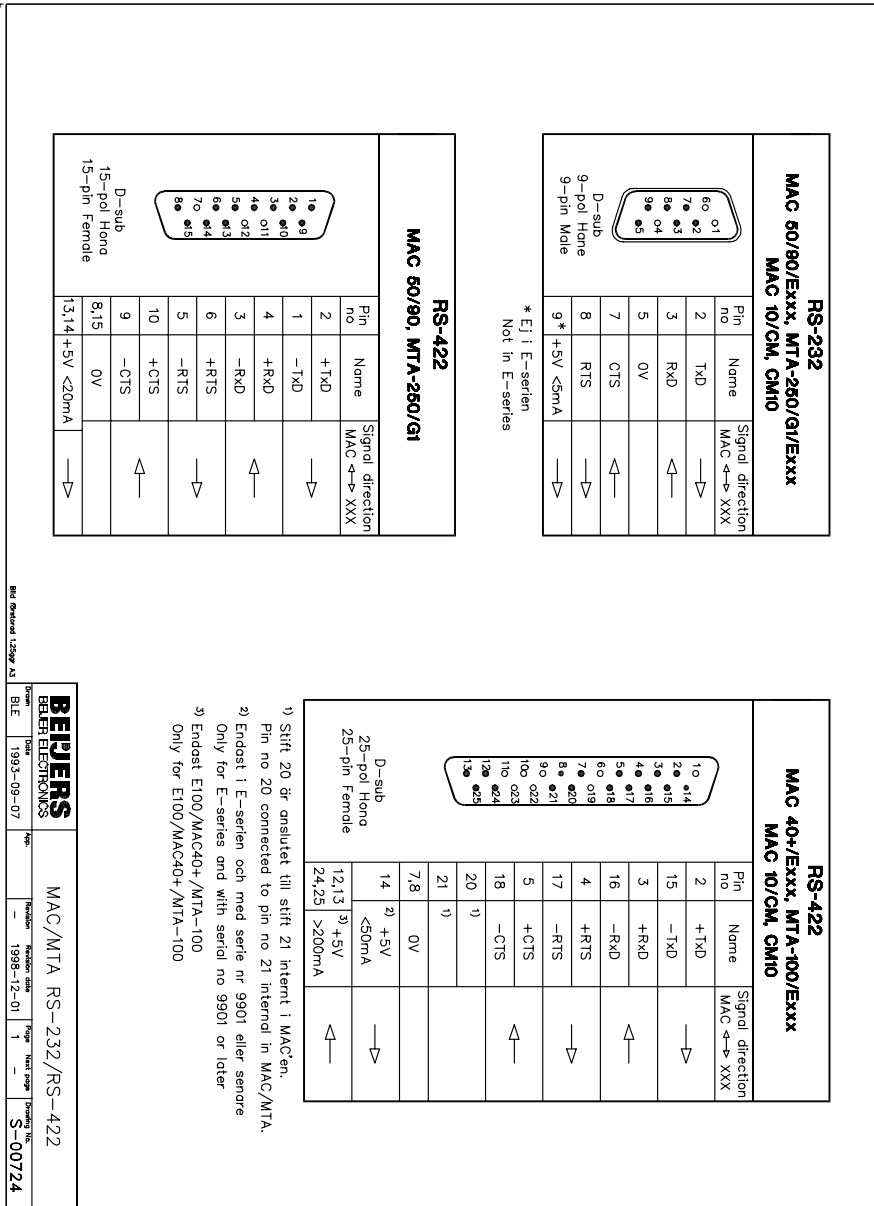
Felkod Hexadecimal (ASCII HEX)	Felets namn	Beskrivning	Åtgärder
H50 (H34)(H30)	Link setting error	[Computer link function error] The route number, where no link unit existed, was specified in the computer link function.	Check the route number and set the correct one.
H51 (H35)(H31)	Simultaneous operation error	[Computer link function error] The send-buffer overflowed while sending data to the local node in the computer link function.	Re-send data.
H52 (H35)(H32)	Sending disable error	[Computer link function error] The sending operation to another node cannot be performed in the computer link function.	Turn OFF the power for the system and then turn it ON again. – If communication goes well, probably an abnormality caused by noise. Check the cable connection and ambient noise level. – If communication cannot be performed well, probably a hardware abnormality. Replace the link unit with a new one.
H53 (H35)(H33)	Busy error	[Computer link function error] A new command was received from a local node while processing multiple frames.	Re-send the command again.

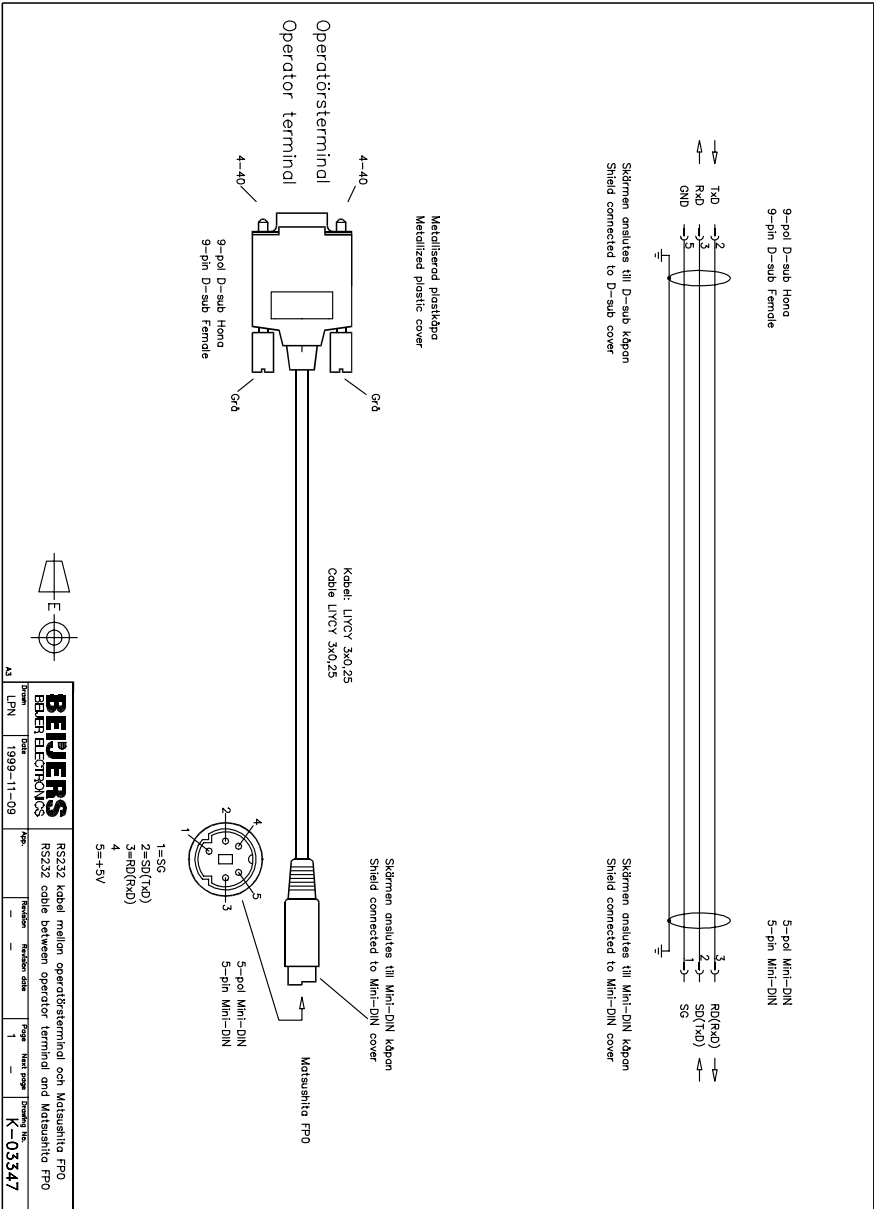
Tillämpningsfelkoder (applikation error codes)

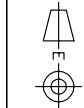
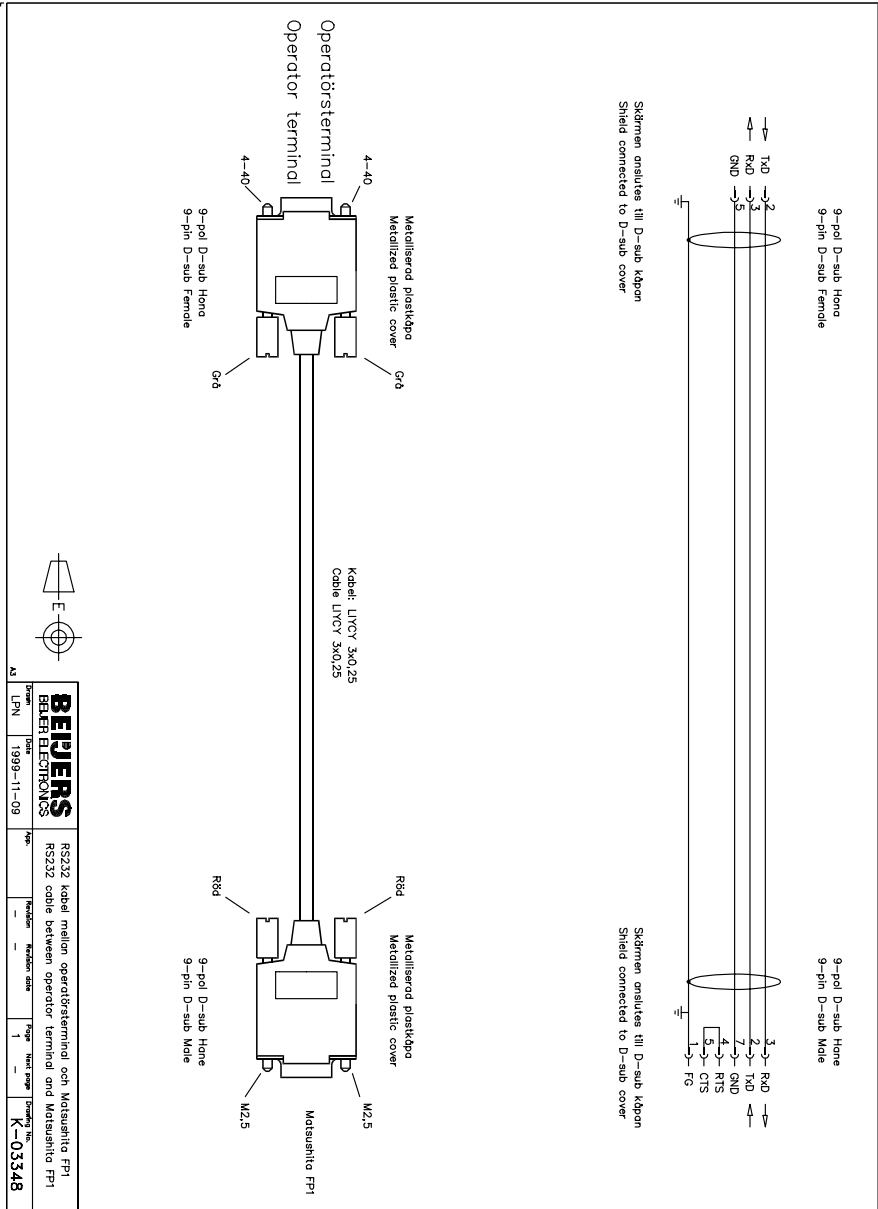
Felkod Hexadecimal (ASCII HEX)	Felets namn	Beskrivning	Åtgärder
H60 (H36)(H30)	Parameter error	[Computer link function error] The area code specified is not available for the CPU or the command in the computer link function.	Re-set the correct area code.
H61 (H36)(H31)	Data error	[Computer link function error] The specified data format, such as number system, data range, etc., was not correct.	Correct the data format referring to the description for MEWTOCOL-COM format.
H62 (H36)(H32)	Registration error	[Computer link function error] The specified operands used for monitoring were not correct.	Set parameters for correct monitoring referring to the description of MC and MD commands.

Felkod Hexadecimal (ASCII HEX)	Felets namn	Beskrivning	Åtgärder
H63 (H36)(H33)	Mode error	[Computer link function error] In the current operation mode of the programmable controller, operation of the command cannot be performed.	Change the operation mode.
H65 (H36)(H35)	Protect error	[Computer link function error] The program was written to the programmable controller when writing to memory was prohibited.	It is impossible to write program into the programmable controller when the memory is protected.
H66 (H36)(H36)	Address error	[Computer link function error] The address setting format, such as number system, address limitations, etc., was not correct.	Correct the address format referring to the description of the MEWTOCOL-COM format.
H67 (H36)(H37)	No data error	[Computer link function error] The area without data was specified for reading	Specify the correct area for reading.
H72 (H37)(H32)	Time-out error	[Computer link function error] The CPU could not receive the answer within the specified time	Re-send data.
H73 (H37)(H33)	Time-out error	[Computer link function error] The receive-buffer did not become available within the specified time.	Re-send data
H74 (H37)(H34)	Time-out error	[Computer link function error] The response could not be received within the specified time.	Re-send data

7 Ritningar







BEIJERS		RS232 kabel mellan operatörsterminal och Matsushita FPI		1		K-03348	
BEIJERS ELECTRONICS		RS232 cable between operator terminal and Matsushita FPI		1		K-03348	
Order FPN	1939-11-09	Rev.		Page	1	Issue	1

