

MSP1000-NET

Hardware Revision 1



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Introduction

The *MSP1000 NET* Programmer (referred in this document as "Programmer") was designed specially for In-Line Programming applications. To be able to communicate at very high speeds, short communication lines between the Programmer and target MCU are required. The small mechanical dimensions of the Programmer allow it to be placed near the target device to be programmed. The Programmer supports a multiple of common target flash microcontroller programming interfaces (e.g. BDM, JTAG, SPI, SCI, I2C, CAN, LIN, etc). The core processing unit of the Programmer is freescale's very high performance PowerPC MCU, which also facilitates communication to the Host PC via Ethernet. The Programmer's Ethernet interface is compatible to the 10 Base-T/100 Base-TX standards. The Programmer can automatically sense the communication speed (10/100Mbit/s) as well as the communication mode (Full/Half-duplex) on its own. It also has polarity detection capabilities and therefore there is no need for a crossed Ethernet cable.

Application Domain

Using Ethernet as a communication medium allows fast downloads and thereby effectively reducing programming times. Because of the Ethernet communication, it is also possible to place the Programmer very far from the Host PC. The *MSP1000 NET* is ideally suitable for parallel operation. Every Programmer is addressable through its unique IP address. Connection to the target microcontroller is done via a corresponding programming interface. Usually, just few signals of the 20-Pin connector are required for the communication with the target.

Configuration

Since MSP1000 NET is an Ethernet appliance, there is therefore need to assign it with a domain network IP address during first network installation. The MSP1000 NET Programmers generally leave the factory with the IP address "192.168.1.1". To avoid future network conflicts, it is strongly recommended to always assign the MSP1000 NET with a new IP address. To assign a reasonable IP address, you may need to turn to your system administrator. The Host PC (PC where the programming software is running) and the MSP1000 NET must be in the same sub-network. In the network configuration of your Host PC (see Fig. 1-11) you can check in which sub-network your system in assigned. The IP address is composed of 4 numbers. These numbers are typically separated by the dot-notation. Each number is between 0 and 255. For example, "192.168.1.1" is a valid IP address.

The total address range is segmented through the use of a subnet-mask in the network segment (most significant part of the address) and the PC address (least significant part of the address) of the IP address.

The subnet-mask is assigned just like the IP address, although the value should be evaluated in binary. All set bits in the mask denote which part(s) of the address are relevant to calculate the network segment.

Subnet-mask Example: "255.255.255.0"

This mask define that the first three numbers are relevant to calculate the network segment. Applying this to the above example, it means the address range or subnet is 192.168.1.x. This therefore leads to 256 (0...255, last number) addresses being available for PC IP address assignment. The address formed with 255 has a special status (i.e. broadcast address) and can therefore not be used to address individual nodes.

In Windows XP, you find the network connection by selecting the menu "Start/Control Panel" and then "Network Connections". Select the network card/adapter which is connected to the MSP1000 NET and add a TCP/IP address (e.g. 192.168.1.100 with subnet mask 255.255.255.0) to it so that you can be able to able to establish a network connection with the MSP1000 NET.

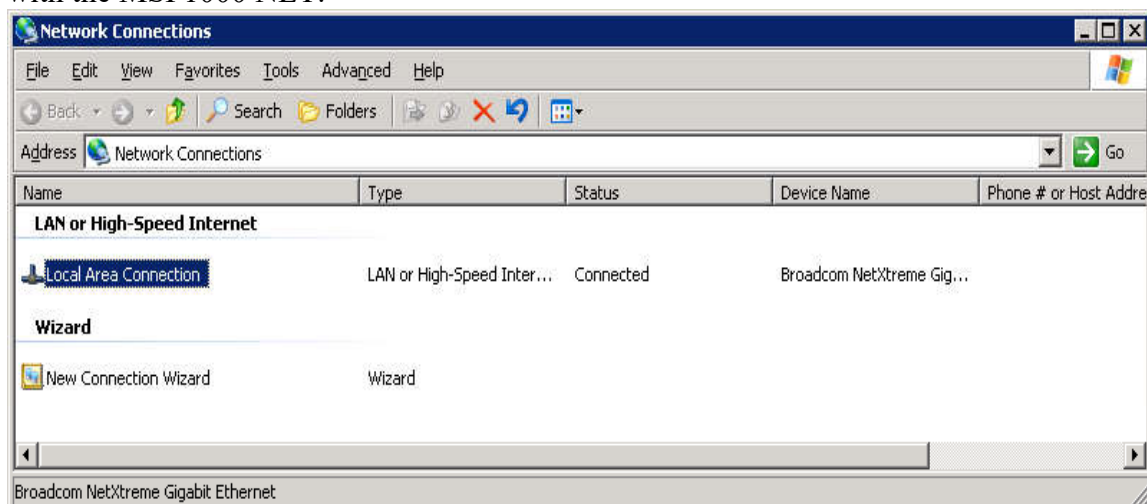


Fig. 1

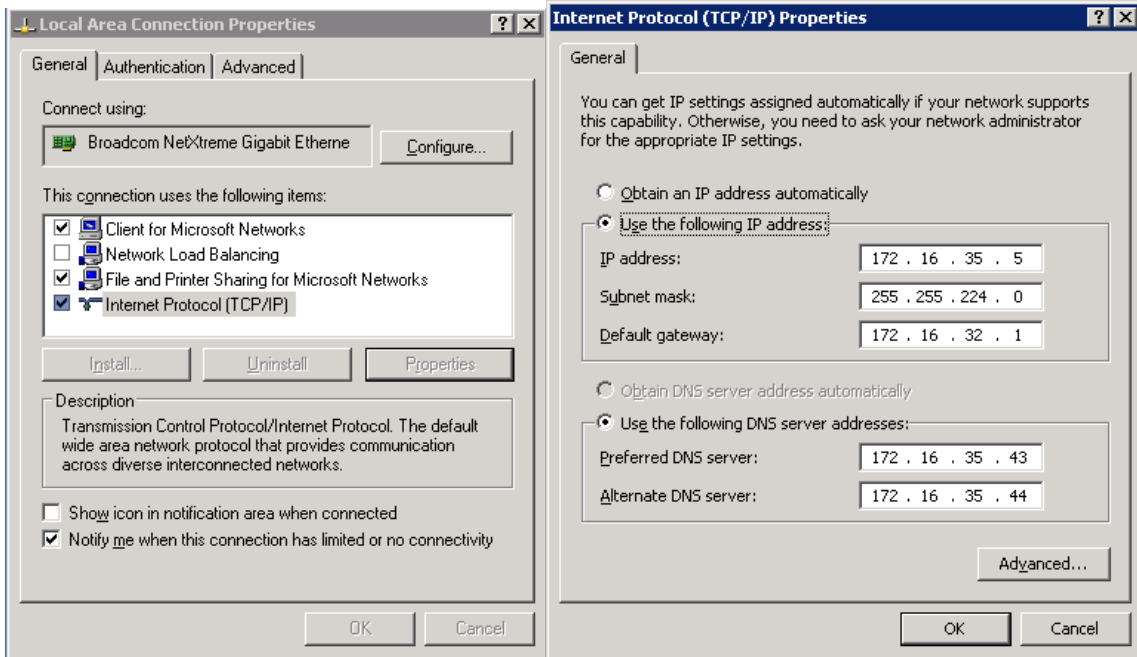


Fig. 2

Fig. 3

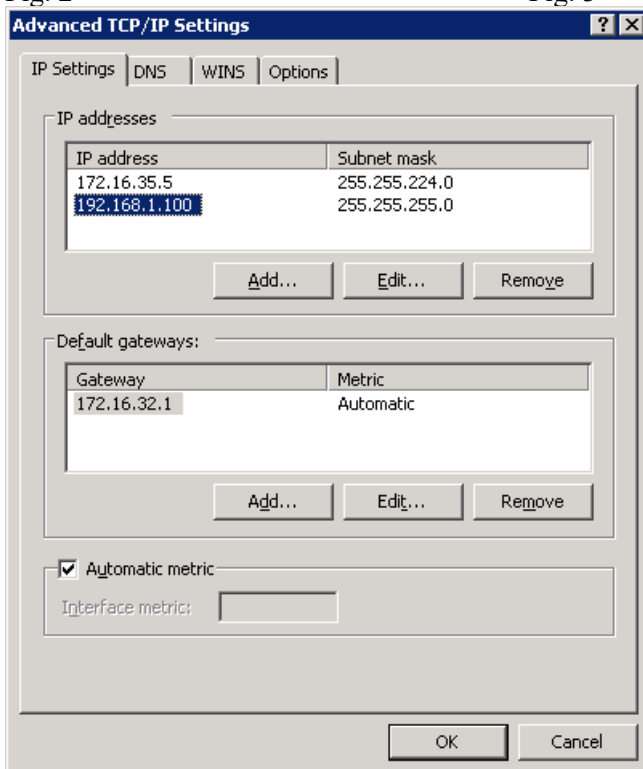


Fig. 4

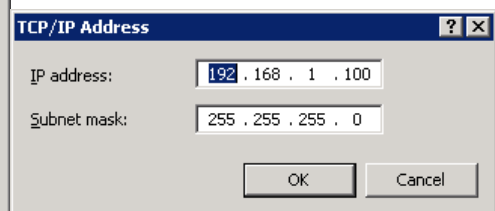


Fig. 5

In Windows 7, you find the network connection by selecting the menu "Start/Control Panel", then "Network and Internet", and finally "Network and Sharing Center". Select the network card/adaptor which is connected to the MSP1000 NET and add a TCP/IP address (e.g. 192.168.1.100 with subnet mask 255.255.255.0) to it so that you can be able to able to establish a network connection with the MSP1000 NET.

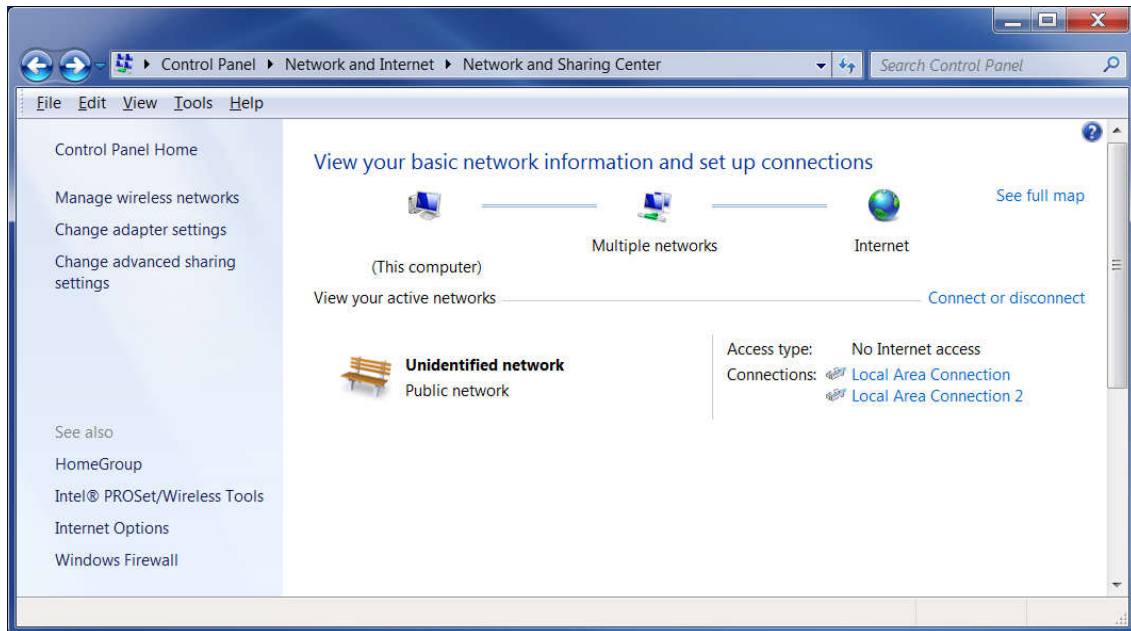


Fig. 6

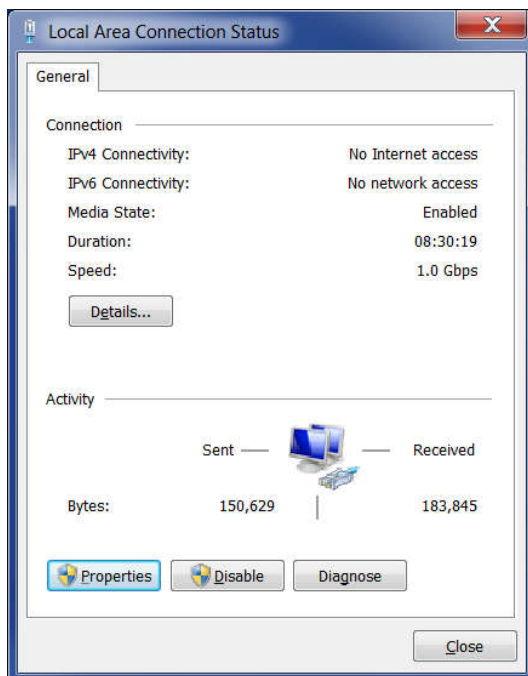


Fig. 7

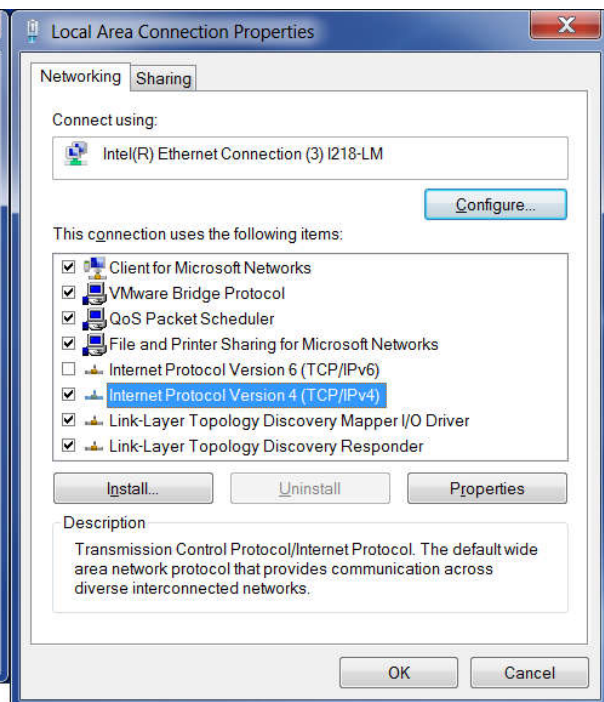


Fig. 8

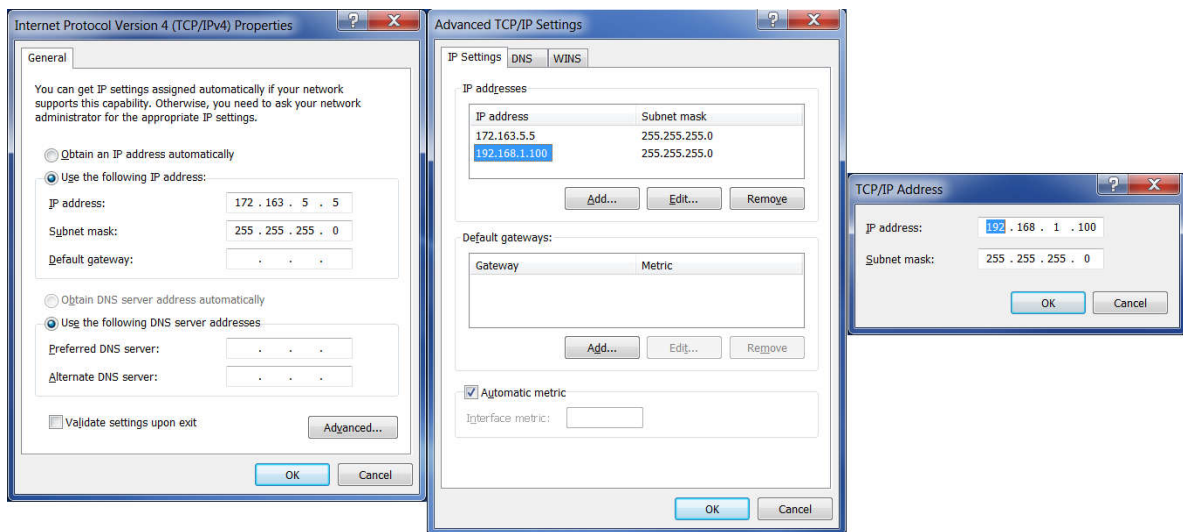


Fig. 9

Fig. 10

Fig. 11

Establishing the network connection

Power the MSP1000 NET and connect it to a PC via a standard CAT5 STP cable.

Important! At this stage, the MSP1000 NET and the PC **should be isolated from your corporate LAN**, unless you are 100 percent sure that the MSP1000 NET preset IP address is not being used by other network nodes.

The fastest way to check the network connection is by using the "ping" command from windows. Under Windows XP this can be done by going to "Start/Run/..", and then entering "cmd" in the field "Open". Under Windows 7 this can be done by going to "Start" and then entering "cmd" in the search field and pressing Enter.

If for example the new assigned IP address is "192.168.164.100", then enter the TCP/IP diagnostic tool "ping" to verify the connection. If the network connection is ok, then the MSP1000 NET answers as shown Fig. 12 below.

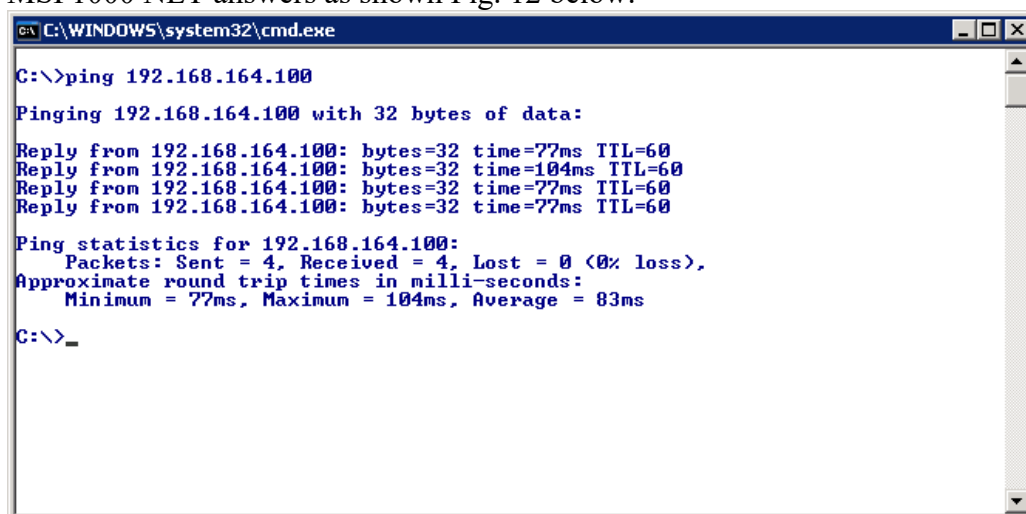


Fig. 12

Assigning a new IP Address to MSP1000 NET

Your MSP1000·NET is usually supplied with PC software which is used for programming your target hardware. Additionally, you also receive a small configuration tool "MSP1Config.exe" with which you can configure your MSP1000·NET as already described above.

Fig. 13 below shows the graphic user interface you see after starting the configuration tool for the first time.

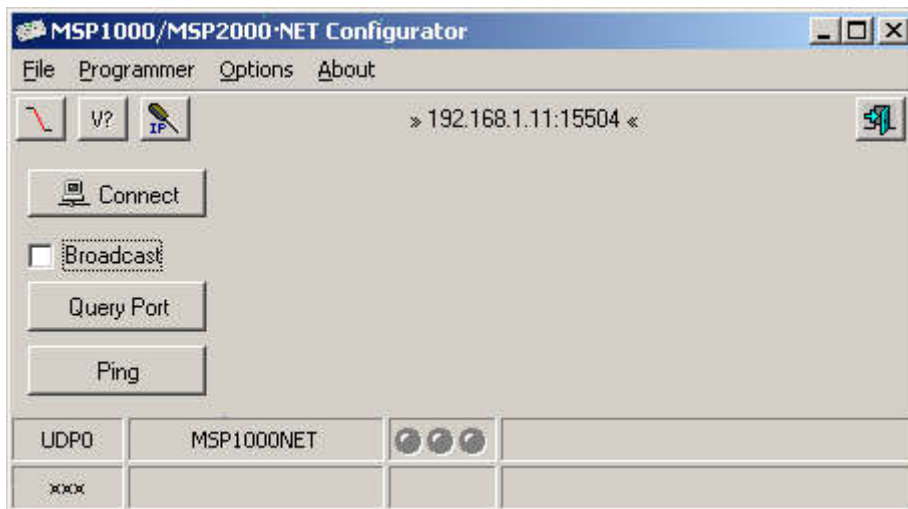


Fig. 13

After the MSP1000·NET is has been delivered with the IP address 192.168.1.1 and port 15504, all you need to do to connect to the Programmer is to click on the "Connect" button. As already mentioned, the prerequisite is however that your PC is configured for the 192.168.1 subnet.

Fig. 14 below is the graphic user interface of a successful connection.

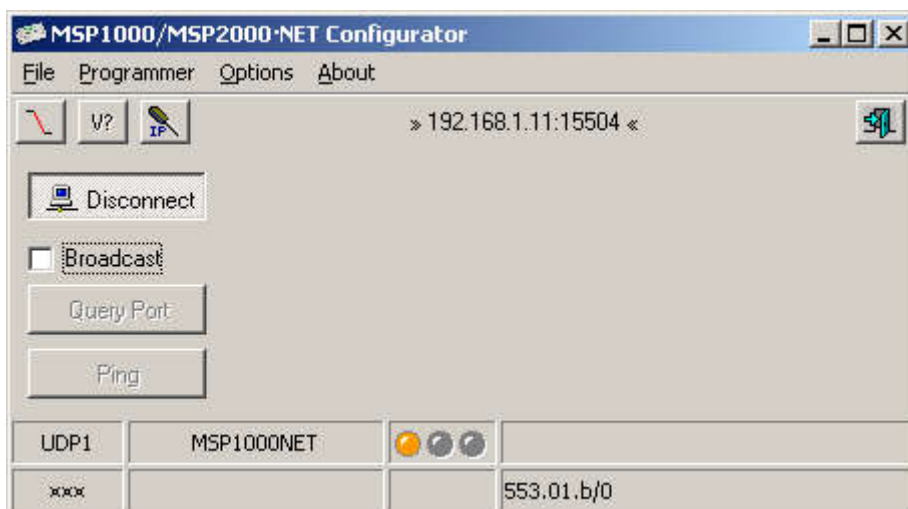



Fig. 14

The orange/yellow LED signalizes that an active connection is present. The present version number of your MSP1000·NET can be seen on the bottom right side of the status fields.

To now assign a new IP address, click on the tool button  or go to the menu Options/Config. In the configuration dialog window, you can now enter the desired IP in the field "IP-Address" and another port-number (allowed range is 1024...65535). After doing this, finally click on the button "set param". At this moment, the configuration information is sent to the Programmer. The old connection is terminated, and a new one is established using the new configuration. It can take a small while (as long as the sand clock is running) until a new connection has been established.

In case a connection with the new configuration parameters could not be established, then a corresponding error message will be displayed.

A possible reason for this could be that the assigned IP address outside the area of the network configuration.

You will not be able to establish the network connection with the old parameters as long as the MSP1000·NET has already taken over the new ones. In this case, you have to manually reset the MSP1000 NET. Therefore simply unplug (power-off) and re-plug (power-on) the MSP1000·NET.

In case there is no error which occurred, you can permanently store the new parameters in the MSP1000·NET. To do this, click on the button "store param". This action stores the new parameters in the non-volatile memory section of the Programmer such that this information is not lost even after powering the appliance down.

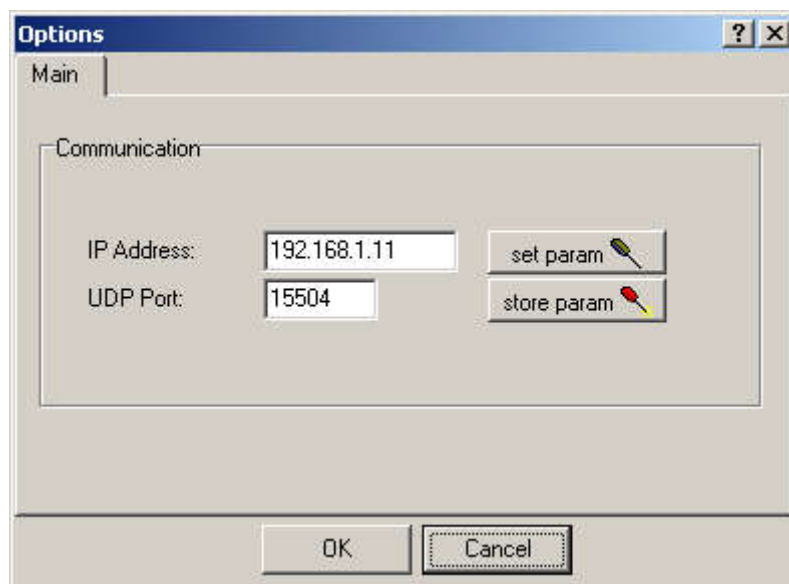


Fig. 15

Tipp: For reference's sake, note down the IP address now assigned to your MSP1000 NET.

What do you do, if you forget which IP address you assigned to your MSP1000·NET?
In this situation, the configuration tool can help you. Via a broadcast message, there is a possibility to request your MSP1000·NET to supply you this information.

To do this, make sure your MSP1000·NET is connected directly to your PC and isolated from your corporate network.

Activate the checkbox "Broadcast" und then click on the "Connect" button.

Transaction of the broadcast message is done via port number 1024. If the connected Programmer answers, you will see the graphic interface shown below, Fig. 16.

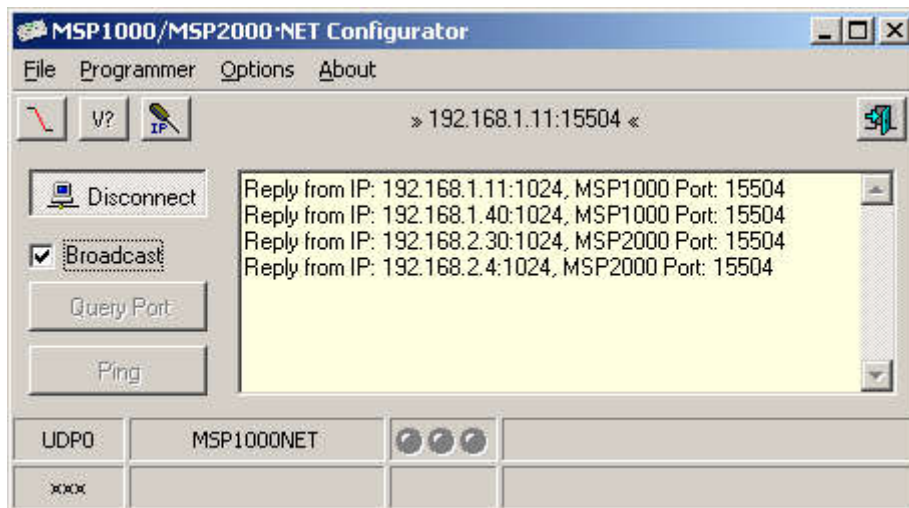


Fig. 16

The reply text can be interpreted as following: The Programmer with the IP address 192.168.1.1 answered its UDP Port is set to 15504 (Server-Port). If case many Programmers could be addressed through this broadcast process, then the reply text would correspondingly contain multiple entries in this format.

Enter this information in the configuration dialog box as already described above and deactivate the "Broadcast" checkbox. By clicking on the button "Connect", you can establish a connection to corresponding MSP1000·NET Programmer.

Tipp: When you are not immediately successful, repeat several times the broadcast call process. It should however be noted that whether or not you can basically address the MSP1000·NET via broadcast also depends on the network configuration of your PC.

LED Displays

When the MSP1000 NET is connected to other active Ethernet appliances (e.g. network hub/ network switch, or network card of your PC) then the green "Link/Act" LED as well as the yellow/orange "Dulpex" LED should be on. If the communication can be established with 100Mbit/s then the yellow/orange SPD 100 LED should be on. When the MSP1000 NET cannot establish any Ethernet connection, then the red "Error" LED switches on.



MSP1000 NET signals the target programming operation through activating the yellow/orange "Busy" LED, and the module voltage to the target through the green "U_Module" LED.

Manually Operation Buttons

The MSP1000·NET has no operation buttons.

Mechanical Dimensions

Size: appr. 122 x 29 x 69 (B x H x T),
 with Mounting area 145 x 29 x 69
Weight: appr. 160 g

Electrical Data

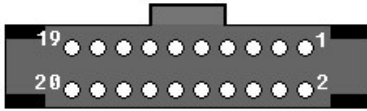
Power Supply: 15 Vdc
Current consumption: appr. 130 mA
Temperature Range: 0 – 40°C

Programming "Target" Interface

Module Supply Voltage: 2,8 – 5,5V; adjustable
Max. Supply Current: 500 mA (to supply target MCU)
Max. Current from UPP: 30 mA
Max. allowed voltage
on analog Input: 0 – 5,5V
I/O Voltage for the digital
In-/Outputs adjustable from: 3,0 – 5,0V

Notes! In Hardware Revision 0 the programmer is powered by 6Vdc. The power plugs of the 6V and the 15V power supply units are not compatible, they have different inner diameter sizes. Please take note that you don't use the wrong power supply unit! The reset button, which was available in Hardware Revision 0 and accessible through a small opening of the casing cover, has been removed.

Programming Interface Pin-Out



Connector viewed from the top.

Pin 1	GND
Pin 3	TDI/BKGD
Pin 5	GND
Pin 7	TDO
Pin 9	GND
Pin 11	TCLK
Pin 13	UPP
Pin 15	CAN TX
Pin 17	CAN RX
Pin 19	ADIN1

Pin 2	GPIO
Pin 4	UMOD
Pin 6	GND
Pin 8	CLKE
Pin 10	TMS
Pin 12	RESET
Pin 14	TDEB
Pin 16	UMOD
Pin 18	TRSTB
Pin 20	ADIN0

Signal Description

GND Ground
 UMOD Supply Voltage (2,8 – 5,5V) for the target MCU
 UPP high Programming voltage (5 – 13V);

TDI/BKGD, TDO, are all communication signals, relevant signals depend on target
 TCLK, TMS, TDEB,
 TRSTB, GPIO,
 CLKE

ADIN0, ADIN1 Analog inputs for measuring the supply voltage of the target MCU.
 To be able to measure higher voltages (> 5,5V) a external series resistor
 should be connected. The internal resistance of each inputs is appr. 7,2 kΩ

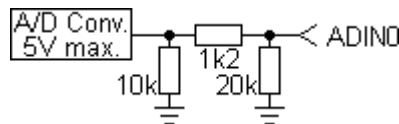




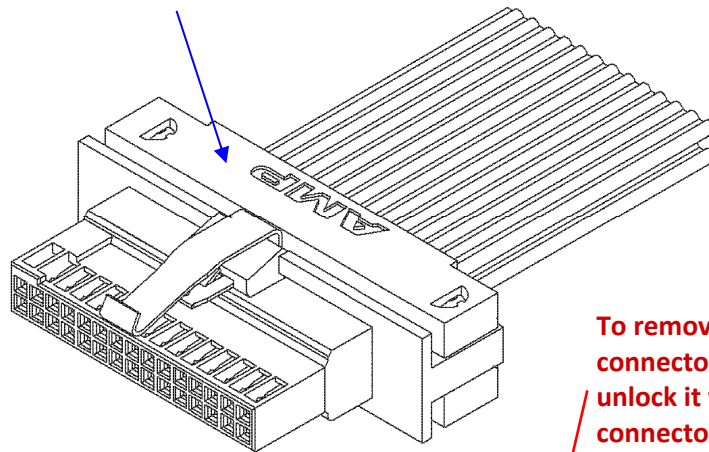
Fig. 17 Front View



Fig. 18 Back View

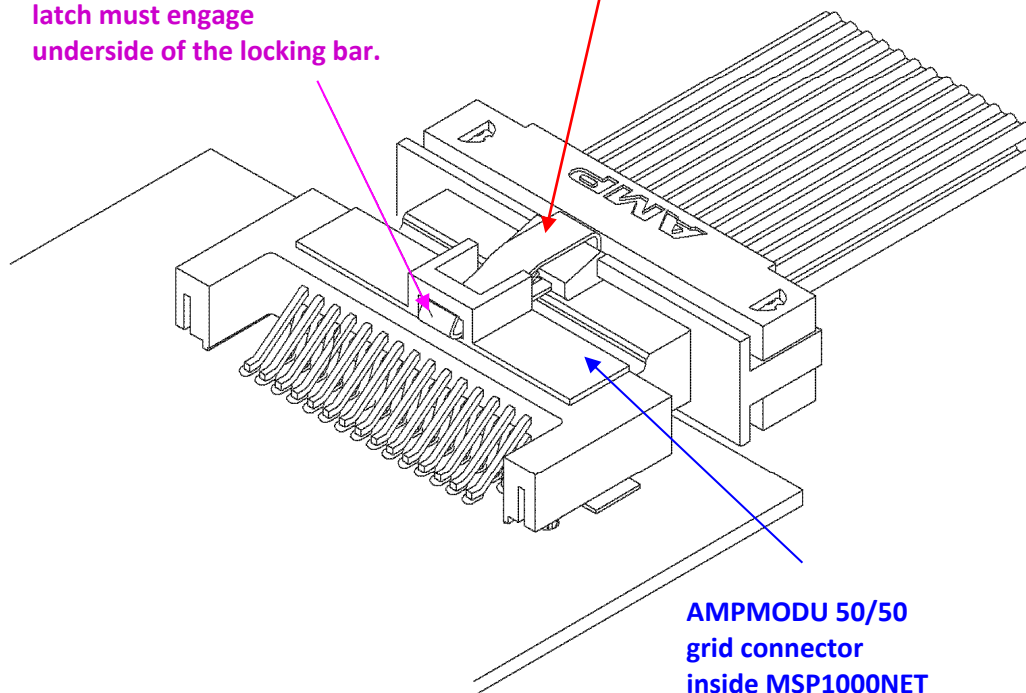
Mounting the Programming Connector

Programming Connector
AMPMODU 50/50



To remove the programming connector press on the latch to unlock it while pulling the connector out.

For a safe connection the locking latch must engage underside of the locking bar.

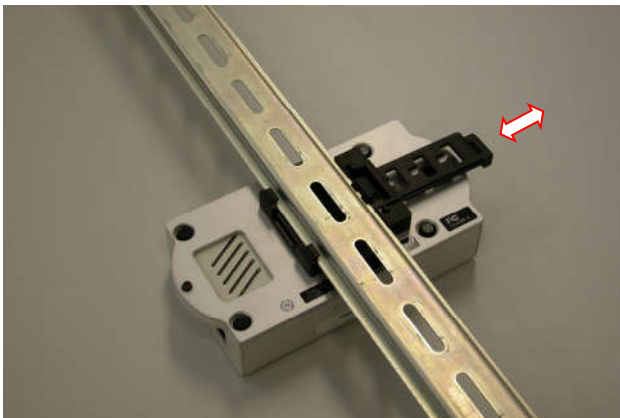


AMPMODU 50/50
grid connector
inside MSP1000NET
(Programming Interface)

Optional DIN Rail Mounting Kit



Pull the tab to quickly disconnect the MSP from the DIN rail.



Pull the tab to quickly attach the MSP to the DIN rail.

FCC Compliance Statement

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.

Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment under FCC rules.

 EC Declaration of Conformity			
Südwestpark 100	DE 90449 Nürnberg	Telefon +49 911 25 26 65 - 0	Fax: +49 911 25 26 65 - 66

Manufacturer's Name: ProMik GmbH
Manufacturer's Address: Südwestpark 100
90449 Nürnberg
Germany

Declares, that the product:

- Product Name:
- a) MSP1000NET
 - b) MSP2000NET
 - c) MSP2100NET
 - d) MSP2150NET
 - e) MSP2160NET
 - f) PSU2000-6
 - g) PS2000

Product Options: This declaration covers all options of the above product(s).

Conforms with the following European Directives:

The product herewith complies with the requirements of the EMC Directive 2014/30/EU (including 93/68/EEC) and carries the CE Marking accordingly.

Applied EU Regulations and Norms:

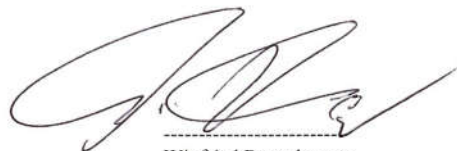
EC Low Voltage Regulations	2014/35/EU EN 60950-1:2014-08
EC Electromagnetic Compatibility Regulations (EMC)	2014/30/EU
Threshold values for the Interference of Data Machines	EN 55022:1998+A1:2000+A2:2003-Class A
Limits of harmonic current emission	EN 61000-3-2:2000
Limits of voltage fluctuation and flicker	EN 61000-3-3:1995+A1:2001
Restriction of certain Hazardous Substances "RoHS"	2011/65/EU

Signed for, and on behalf of the Manufacturer:

ProMik GmbH
Südwestpark 100
90449 Nürnberg

21-11-2019

Date



Winfried Rosenberger
Managing Director

CE_MSP1000/2000/2100