

**Preliminary**

# TECHNICAL DESCRIPTION

## **MSX-Box**

Time synchronization of a MSX-Box with the  
Network Time Protocol



### Product information

This manual contains the technical installation and important instructions for correct commissioning and usage, as well as production information according to the current status before printing. The content of this manual and the technical product data may be changed without prior notice. ADDI-DATA GmbH reserves the right to make changes to the technical data and the materials included herein.

### Warranty and liability

The user is not permitted to make changes to the product beyond the intended use, or to interfere with the product in any other way.

ADDI-DATA shall not be liable for obvious printing and phrasing errors. In addition, ADDI DATA, if legally permissible, shall not be liable for personal injury or damage to materials caused by improper installation and/or commissioning of the board by the user or improper use, for example, if the board is operated despite faulty safety and protection devices, or if notes in the operating instructions regarding transport, storage, installation, commissioning, operation, thresholds, etc. are not taken into consideration. Liability is further excluded if the operator changes the board or the source code files without authorisation and/or if the operator is guilty of not monitoring the permanent operational capability of working parts and this has led to damage.

### Copyright

This manual, which is intended for the operator and its staff only, is protected by copyright. Duplication of the information contained in the operating instructions and of any other product information, or disclosure of this information for use by third parties, is not permitted, unless this right has been granted by the product licence issued. Non-compliance with this could lead to civil and criminal proceedings.

### ADDI-DATA software product licence

Please read this licence carefully before using the standard software. The customer is only granted the right to use this software if he/she agrees with the conditions of this licence.

The software must only be used to set up the ADDI-DATA boards.

Reproduction of the software is forbidden (except for back-up and for exchange of faulty data carriers). Disassembly, decompilation, decryption and reverse engineering of the software are forbidden. This licence and the software may be transferred to a third party if this party has acquired a board by purchase, has agreed to all the conditions in this licence contract and the original owner does not keep any copies of the software.

### Trademarks

- ADDI-DATA, MSX-Box and MSX-E are registered trademarks of ADDI-DATA GmbH.
- Turbo Pascal, Delphi, Borland C, Borland C++ are registered trademarks of Borland Insight Company.
- Microsoft .net, Microsoft C, Visual C++, Windows XP, 98, Windows 2000, Windows 95, Windows NT, EmbeddedNT, Windows Vista, Windows Server 2003, Windows Embedded, Windows Server 2000 and MS DOS are registered trademarks of Microsoft Corporation.
- LabVIEW, LabWindows/CVI, DasyLab, Diadem are registered trademarks of National Instruments Corp.
- CompactPCI is a registered trademark of PCI Industrial Computer Manufacturers Group.
- VxWorks is a registered trademark of Wind River Systems Inc.
- RTX is a registered trademark of Ardence
- SIMATIC S7, S7-300, STEP7, CPU313C-2DP and CP343-1 Lean are registered trademarks of Siemens AG

## Warning

The following risks result from improper implementation and from use of the product contrary to the regulations:



Personal injury



Damage to the MSX-Box, board, PC and peripherals



Pollution of the environment

- **Protect yourself, the others and the environment!**
- **Read carefully the safety precautions (yellow leaflet).**

If this leaflet is not with the documentation, please contact us and ask for it.

- **Observe the instructions of the manual.**

Make sure that you do not forget or skip any step. We are not liable for damages resulting from a wrong use of the product.

- **Used symbols**



### **IMPORTANT!**

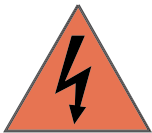
Designates hints and other useful information.



### **WARNING!**

It designates a possibly dangerous situation.

If the instructions are ignored the MSX-Box, board, PC and/or peripheral may be **destroyed**.



### **WARNING!**

It designates a possibly dangerous situation.

If the instructions are ignored the MSX-Box, board, PC and/or peripheral and persons may be **destroyed**.

## Contents

<b>Warning</b> .....	<b>3</b>
<b>1 Introduction</b> .....	<b>5</b>
<b>2 Installation</b> .....	<b>6</b>
2.1 Package installation.....	6
2.2 Package removal .....	7
2.3 Files provided in the binary distribution .....	7
<b>3 Configuration</b> .....	<b>8</b>
3.1 System setup.....	8
3.2 Additional notes about system setup.....	8
3.3 NTP service configuration.....	8
<b>4 Copyrights</b> .....	<b>10</b>
<b>5 Building the NTP distribution</b> .....	<b>11</b>
<b>6 Further references</b> .....	<b>12</b>
6.1 Man pages .....	12
6.2 Accompanying HTML documentation.....	12
<b>7 Contact and support</b> .....	<b>13</b>

# 1 Introduction

The Network Time Protocol (NTP) is used to synchronize the time of a computer client or server to another server or reference time source, such as a radio, satellite receiver or modem.

ADDI-DATA has ported on its embedded system the reference software tools suite "The NTP distribution". If these tools are used, **MSX-Boxes** can achieve accuracy down to milliseconds on a LAN network.

This document focuses on the installation and use of the binary distribution provided by ADDI-DATA. The default configuration proves to be sufficient for most networks, but very comprehensive documentation - including a detailed description of all the commands and of the configuration file - is provided as an accompanying archive.

## 2 Installation

### 2.1 Package installation

1. Upload the NTP tools package onto the **MSX-Box**.
2. If this was done from a MS Windows computer, set the execution flag on the copied files:

```
[root@MSXBOX] chmod 700 /tmp/ntp-tools-4.2.0a.mpk
```

3. Run the auto extractible package:

```
[root@MSXBOX:~]# /tmp/ntp-4.2.0a.mpkg install
```

```
This package install the package ntp 4.2.0a
```

```
extracting data in /
```

```
Do you want to create now the link /etc/init.d/S42ntp to /etc/init.scripts/ntpd.sh ?
```

```
( It allows ntp to be automatically started at boot time )
```

```
Note: You can do it later with the following command:
```

```
ln -s /etc/init.d/S42ntp /etc/init.scripts/ntpd.sh
```

```
[yes,no] ?> yes
```

## 2.2 Package removal

1. Upload the NTP tools package onto the **MSX-Box**.
2. If this was done from a MS Windows computer, set the execution flag on the package file:

```
[root@MSXBOX] chmod 700 /tmp/ntp-tools-4.2.0a.mpkg
```

3. Run the auto extractible package:

```
[root@MSXBOX] /tmp/ntp-tools-4.2.0a.mpkg remove
```

4. Remove the symbolic link /etc/init.d/S42ntp:

```
[root@MSXBOX] rm /etc/init.d/S42ntp
```

## 2.3 Files provided in the binary distribution

File	Description	Comment
/sbin/ntpdate	Command line tool that sets the date and time via NTP	Used at boot time for rough synchronization
/sbin/ntpd	Network Time Protocol (NTP) daemon	Should be launched at run time
/sbin/ntpq	The ntpq utility program is used to monitor NTP daemon ntpd operations and determine performance	
/etc/ntp.conf	Network time server configuration file	This is probably the only file that has to be changed.
/etc/init.d/ntpd.sh	NTP management script	Script used to control NTP daemon.

## 3 Configuration

### 3.1 System setup

The script `/etc/init.scripts/ntpd.sh` performs the following tasks:

- Calls **ntpdate**, using the addresses of the servers defined in `/etc/ntp.conf`
- Launches the NTP daemon **ntpd**

Your system should be configured to run this script when booting up. To do this, create a symbolic link in `/etc/init.d/`

```
[root@MSXBOX] ln -s /etc/init.script/ntpd.sh /etc/init.d/S42ntp
```

### 3.2 Additional notes about system setup

- The installation package will offer to create the link.
- The ordinal given above (42) can be freely selected. But should you wish to set another one, please note that the NTP service must be launched after the network script is called.
- You can always edit the launch script to meet your requirements. (`[root@MSXBOX] vi /etc/init.script/ntpd.sh`). Please note that reinstalling the package will overwrite your changes.
- This script can also be used from a shell session. To restart the NTP sub-system (after a change in the `ntp.conf` file, for example ) you may type:

```
[root@MSXBOX:~]# ntpd.sh restart  
Restarting ntpd daemon: stopped /sbin/ntpd (pid 342).  
ntpd.
```

### 3.3 NTP service configuration

The configuration is set in the file `/etc/ntp.conf`. The parameters set up by default should be useful for most simple networks, but you still need to specify one parameter: the name of the NTP server that your local network uses.

Most of it is quite basic. You have to specify the NTP server you want to use on your network. To do that, carry out the following steps:

1. Edit<sup>1</sup> /etc/ntp.conf

```
[root@MSXBOX:~]# vi /etc/ntp.conf
```

2. Search the following lines:

```
# You do need to talk to an NTP server or two (or three).  
#server 192.168.99.99
```

3. Uncomment the last line and change it according to your requirements.

For example:

```
# You do need to talk to an NTP server or two (or three).  
server 99.99.99.99
```

**Note:**

If you need more detailed information, please read the NTP distribution documentation.

---

<sup>1</sup>The editor provided on the **MSX-Box** is a clone of vi. Most new users will find it difficult to use. If this is you, a search on the Internet for "using vi" should give you most of the required information.  
<http://www.google.com/search?q=using+vi>

## 4 Copyrights

This documentation is copyrighted 2005 by ADDI-DATA, which has adapted the distribution provided by the Debian project to the **MSX-Box** architecture.

The original NTP tools distribution source and documentation is distributed under the licence below. Please refer to the accompanying documentation for the complete Copyright Notice.

Copyright (c) David L. Mills 1992-2003

Permission to use, copy, modify, and distribute this software and its documentation for any purpose and without fee is hereby granted, provided that the above copyright notice appears in all copies and that both the copyright notice and this permission notice appear in supporting documentation, and that the name University of Delaware not be used in advertising or publicity pertaining to distribution of the software without specific, written prior permission. The University of Delaware makes no representations about the suitability of this software for any purpose. It is provided "as is" without express or implied warranty.

## 5 Building the NTP distribution

You can get the source code of this project from ADDI-DATA. The following instructions are about how to build the binary and documentation archives.

1. Decompress the source code archive on your development computer
2. Go into the directory **ADDI-DATA**
3. Type: **make**

This will automatically:

- Configure the source code tree for cross-compiling for the **MSX-Box** architecture
- Compile all the distribution
- Generate the mpkg file for installation on the **MSX-Box**

Other available commands include:

- Make clean
- Make config

## 6 Further references

### 6.1 Man pages

On a Linux system where the NTP distribution is already installed, you can get online information (man pages) on:

- Both commands `nptd` and `ntpdate` (*man nptd*, *man ntpdate*)
- The `ntp.conf` configuration file (*man ntp.conf*)

### 6.2 Accompanying HTML documentation

We provide an archive that contains the full HTML documentation of the NTP distribution. This is the original (reference) documentation and has not been modified by ADDI-DATA. Please refer to this if you want more information.

This file is called **ntp-4.2.0a-doc-tar.gz**.

## 7 Contact and support

**Do you have any questions? Write to us or phone us:**

Address: ADDI-DATA GmbH  
Airpark Business Center  
Airport Boulevard B210  
77836 Rheinmünster  
Germany

E-mail: [info@addi-data.com](mailto:info@addi-data.com)

Phone: +49 7229 1847-0

Fax: +49 7229 1847-200

**Manual and software download on the internet:**

[www.addi-data.com](http://www.addi-data.com)