Description of Functions 06/2003 Edition

motion control

information system

TDI Ident Connection
SINUMERIK 840D/840Di/810D

SIEMENS

SIEMENS

Sinumerik 840D/840Di/810D

Motion Control Information System
TDI Ident Connection

Description of Functions

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Valid for

Control	*Software version*
Sinumerik 840D/840Di/810D	1

06.03 Edition

SINUMERIK® Documentation

Printing history

Brief details of this edition and previous editions are listed below.

The status of each edition is indicated by the code in the "Remarks" columns.

Status code in the "Remarks" column:

A .... New documentation.
B .... Unrevised reprint with new order no.
C .... Revised edition with new status.

Edition	Order No.	Remarks
06.03	6FC5297-1AE60-0BP0	A

This manual is also included in the documentation on CD-ROM **(DOCONCD)**

Edition	Order No.	Remarks
11.02	6FC5 298-6CA00-0BG3	C

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Other functions not described in this documentation might be executable in the control. This does not, however, represent an obligation to supply such functions with a new control or when servicing.

We have checked that the contents of this document correspond to the hardware and software described. Nevertheless, differences might exist and therefore we cannot guarantee that they are completely identical. The information given in this publication is reviewed at regular intervals and any corrections that might be necessary are made in subsequent editions. We are thankful for any recommendations or suggestions.

Subject to change without prior notice

Preface

Structure of the documentation

The SINUMERIK documentation comprises three parts:
- General Documentation
- User Documentation
- Manufacturer/Service Documentation

Please consult your local Siemens office for more detailed information about other SINUMERIK 840D/810D as well as the publications that apply to all SINUMERIK controls.

Target group

This documentation is intended for manufacturers of machine tools with the SINUMERIK 840D/810D and SIMODRIVE 611D.

Hotline

If you have any questions, please call the hotline:

A&D Technical Support   Phone: ++49-180-5050-222
                            Fax: ++49-180-5050-223
                            Email: adsupport@siemens.com

Please send any questions about the documentation (suggestions for improvement, corrections) to the following fax number or email address:
                            Fax: ++49-9131-98-2176
                            Email: motioncontrol.docu@erlf.siemens.de

Fax form: See the reply form at the end of the document.

Internet address SINUMERIK

http://www.ad.siemens.de/mc

SINUMERIK 840D powerline

As from 09.2001, the
- SINUMERIK 840D powerline and
- SINUMERIK 840DE powerline

are available with enhanced performance. You will find a list of available **powerline** modules in the following hardware manual:
References: /PHD/ SINUMERIK 840D Configuring Manual

SINUMERIK 810D powerline

As from 12.2001, the
- SINUMERIK 810D powerline and
- SINUMERIK 810DE powerline

are available with enhanced performance. You will find a list of available **powerline** modules in the following hardware manual:
References: /PHC/ SINUMERIK 810D Configuring Manual

Specification of software version

The software versions indicated in the documentation apply to the SINUMERIK 840D and SINUMERIK 810D controls. The software versions are related with each other as shown in Table 0-1.

Tabelle 0-1

SINUMERIK 840D		SINUMERIK 810D	SINUMERIK 810D powerline	SINUMERIK 840Di
6.3 (09.01)	corresponds to	-	6.1 (12.01)	2.1 (07.01)
5.3 (04.00)	corresponds to	3.3 (04.00)	-	1.1 (07.00)
3.7 (03.97)	corresponds to	1.7 (03.97)	-	

Who is this manual intended for?

- Project planning engineers
- Electricians and fitters
- Service and operating personnel

Subject matter of this manual

This publication is the Installation and Start-up Guide for "TDI Ident Connection". The Installation and Start-up Guide describes the functions of the "TDI Ident Connection" software and how it can be used by a PLC program.

!   **Important**

This Installation and Start-Up Guide is valid for:
TDI Ident Connection V1.01

Search aids

For your better orientation, we have provided a list of
- References and an
- Index

in the Appendix.

Danger and warning notices

The following warning notes with varying degrees of severity are used in the documentation:

⚠ **Danger**

Indicates an imminently hazardous situation which, if not avoided, **will** result in death or serious injury or in substantial property damage.

⚠ **Warning**

Indicates a potentially hazardous situation which, if not avoided, **could** result in death or serious injury or in substantial property damage.

⚠ **Caution**

Used with the safety alert symbol indicates a potentially hazardous situation which, if not avoided, **may** result in minor or moderate injury or in property damage.

Caution

Used without safety alert symbol indicates a potentially hazardous situation which, if not avoided, **may** result in property damage.

Notice

Used without the safety alert symbol indicates a potential situation which, if not avoided, **may** result in an undesirable result or state.

Additional notices

!   **Important**

Appears in the documentation wherever an important fact has to be taken into account.

Note

Appears in the documentation wherever further references are made.

Machine manufacturer

This pictorial symbol always appears in this document to indicate that the machine manufacturer can affect or modify the function described. Never ignore information provided by the machine manufacturer!

Additional ordering options

This symbol refers to additional ordering options in the documentation. However, the function can be operated only if the control has the option on it.

Effectiveness of changes

When changing data (e.g. machine data) please also check their effectiveness (e.g. after power ON or IMMEDIATELY). For that reason, time and date are always quoted.

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Contents

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1 System Overview

1.1 The product "TDI Ident Connection"

"TDI Ident Connection" is a module of the **TDI T**ool **D**ata **I**nformation (TDI) package. TDI is part of the "Motion Control Information System" (MCIS) for machine tools.

1.1.1 Motion Control Information System (MCIS)

The **M**otion **C**ontrol **I**nformation **S**ystem (MCIS) is a reliable, versatile, user-oriented information system for mechanical production. It includes interfacing features with numerical controls and programmable controllers allowing networking of machine tools, cells, lines, even whole plants. As an integrated solution covering several task areas, MCIS provides a common control, recording and evaluation platform within the production process.

Various areas of automated production systems:
- Machining centers, CNC series machines
- Flexible lines
- Transfer lines
- Special machines
- Assembly lines
- Loaders and gantries

The MCIS is made up of functional packages that are used both in production planning and directly at the production units. The individual packages are scalable, functionally harmonized, and can be mixed and matched to meet specific functional requirements.

Using these packages as part of the production process makes your production facility an integral part of your IT environment.

The MCIS packages provide a modern solution concept that uses both interna-tionally accepted technologies in the hardware and worldwide standards in the software modules, methods, and interfaces. A range of process interfaces provides ideal support for networking and integration of automation and production equipment. Standardized interfaces in conjunction with standard software ensure investment protection and subsequent expandability.

This information network provides necessary production data and information at workstations at the planning and production level both quickly and always up to date.
This enhances utilization and availability of the machines, increases the efficiency of the plant overall and boosts productivity.

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The following function packages are covered:

Fig. 1-1   Overview of the MCIS function packages

Production Data Acquisition (PDA)

Production data management for acquisition, evaluation, and visualization of machine, part, and order-related data and information.
Benefits: Production transparency.

Direct Numeric Control (DNC)

NC program management for administration, archiving, and transmission of NC programs.
Benefits: Reduced costs for NC program organization.

Tool Data Information (TDI)

Tool management for visualization of the tool stock and timely provision of the necessary tools on the machine.
Benefits: Reduced tool stock in transit and minimization of machine downtimes.

Total Productive Maintenance (TPM)

Productive management to support preventive maintenance on the plant.
Benefits: Increased machine availability.

Remote Control System (RCS)

Service management for worldwide control access and automatic fault notification by e-mail or SMS in service cases.
Benefits: Reduced downtimes by fast response to faults.

1.2 System layout Tool Data Information (TDI)

Objective

Tool data management is one of the central tasks of CNC production. This demands smooth tool handling and a high degree of rationalization.
This is where the MCIS TDI comes into play. It makes this rationalization potential transparent and provides functions that help attain the potential savings revealed.

- For a single machine, flexible transfer line, or for an entire machine park
- For highly-automated NC controls like SINUMERIK 810D/840D/840Di or for controls based on SIMATIC S7
- For integration of tool setting stations or factory-wide tool management systems such as the TDM of Walter

MCIS TDI uses the right connection concepts and functions to provide a complete overview of the tools used and maintain a closed tool data circuit in production.

1.2.1 Module overview

MCIS TDI is a modular system from which you can combine the right modules for every level of automation.

The following modules are available:
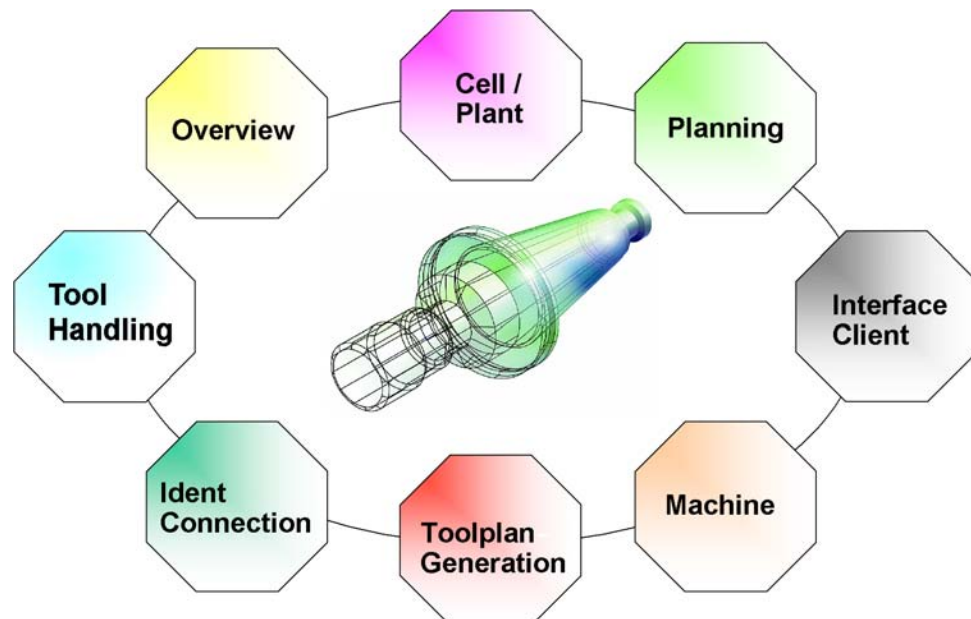
Fig. 1-2   Module overview MCIS-TDI

TDI Cell / Plant

Summary of existing functions on a server and network operation of the client-based interfaces.
- TDI HMI: Additional user interface for TDI Plant on a client PC

TDI Planning

Planning the tool requirement on the basis of the current tool inventory.

TDI Overview

Recording of actual tool data, evaluation options via the current tool inventory per filter and manual modification of actual tool data. (The functions for a unit are included in the standard license of Transline HMI, Version 3.1 and higher).

TDI Interface Client

Connection of external tool management and planning systems.

TDI Tool Handling

User-driven loading/unloading of tools on the SINUMERIK 810D/840D/840Di and automated data transfer in conjunction with the interface to the tool setting station.

TDI Machine

Autonomous, non-networking function package for tool planning and coupling to the tool setting station for transfer of tool data. (This function is not used in Transline projects and is therefore not discussed further).

TDI Ident Connection

Autonomous function package for integrating tool identification systems on SINUMERIK 810D/840D/840Di via Profibus or RS232C for writing/reading tool data and for loading/unloading tools via the PLC or via standard software "ParamTM".

TDI Toolplan Generation

Help module for generating tool plans based on simulation of the corresponding NC programs.

1.2.2   Deployment options

All TDI modules (except for TDI Machine and TDI Ident Connection, which can only be assigned to one machine) are designed to operate both in stand-alone mode and as networked groups.
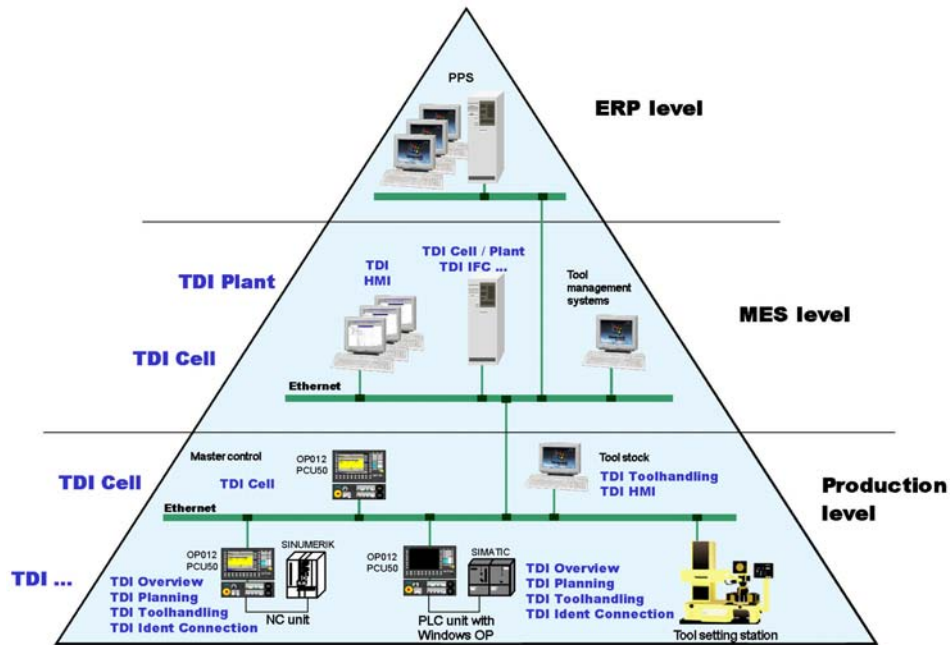
Fig. 1-3   System structure, deployment options

The uncompromized design as a client-server solution and the use of state-of-the-art communication mechanisms based on HTTP/XML allows flexible distribution of the modules in the network and access from all points in the network. This means up-to-date information is accessible wherever it is needed.

Production level

At the production level, all MCIS TDI modules can be used. On the one hand, the modules offer integrated interfaces (IFC) for communication with the controls; on the other, they provide interfaces for collecting all tool data, planning tool deployment and handling tool data.

MES level (Manufacturing Execution System)

Depending on the size of the plant/system, the server functionality (central database, networking capability of all installed TDI modules) can be installed on a computer on this level. Here too, the user can call all the functions of the individual modules (except for TDI Ident Connection, TDI Machine).
Via the MCIS TDI function interface, it is possible to provide interfaces to other MES systems, such as higher-level tool management systems (e.g. TDM of Walter Infosysteme) or order planning systems (MCI PDA).

ERP level (Enterprise Resources Planning)

The ERP level consists of higher-level server systems with a database, e.g. the production planning system (PPS) SAP.
The ERP level handles customer order processing, accounting, production planning, and human resource planning.

Variable user interface design allows user interfaces to run both on a Windows PC and on the operator panels of the SINUMERIK in standard and Transline HMI Pro environments.

1.2.3   Solution variations

In each step, the customizing function (online, as well as offline at the PG/PC) makes for user-friendly basic settings and function enabling.
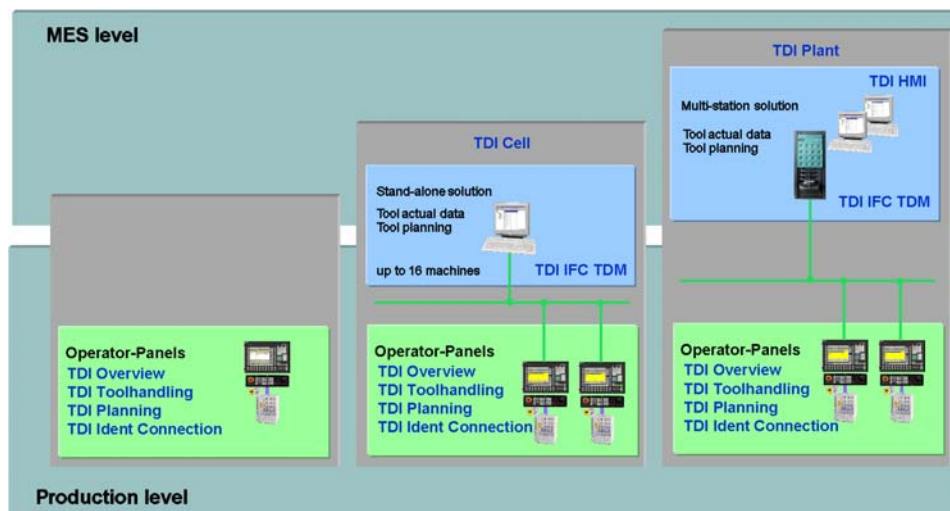
Fig. 1-4   Solution concept with MCIS TDI

Based on the existing TDI modules, the server functions enable networking of all units in such a way that an overview of all tool actual data can be displayed, e.g. on a master control or on a control system.
Furthermore, the functions can be supplemented by the "TDI Interface Client" (IFC) for coupling to other systems.

Two variants of the TDI Cell / Plant module are available:
1. TDI Cell: Stand-alone system for connection of up to 16 machines
2. TDI Plant: Multi-station system with the option of combining several TDI
                    cells

The TDI Cell / Plant functions do not merely provide evaluation and monitoring functions in the foreman's or executive offices; they are available network-wide. Its modular structure permits implementation of small or large systems distributed over several production areas.

In a network solution of this kind, the TDI HMI module can be used under the TDI Plant module to install all the functions installed in the system as a user frontend on further client PCs.

1.2.4   Fundamentals

"TDI Ident Connection" can be used to load/unload tools. The tools can be loaded from the tool cabinet, from the code carrier or from the master computer in the NCK. Furthermore, the tools can be unloaded from the NCK to the tool cabinet, to the code carrier or to the master computer.

In addition, services are avaible for deleting tools from the tool cabinet or exporting them to a file (or importing them from a file to the tool cabinet). It is also possible to delete tools in the NCK and update the data on the code carrier.

"TDI Ident Connection" is configured via a PLC link and the service started. The PLC link is set up via the PLC interface in data block DB19. The structure of the PLC interface is described in Chapter 4.

The service to be executed is defined by the command code entered in the interface data block. The meaning of the various command codes is described in Chapter 5. The services associated with the command codes are explained in Chapter 7. The parameter values required for the individual services must be specified in the interface data block; these are described in Chapter 6.

The procedures for calling and acknowledging the service are described in Chapter 8. Chapter 9 uses examples to illustrate how the parameters can be assigned for the various services.

"TDI Ident Connection" is ready for M:N mode, which means that two controls can address the PLC interface at the same time.

Communication between "TDI Ident Connection" and the host computer is carried out via "SINCOM".

PLC link

Programming knowledge of Step 7 is requried for the PLC link, since the "TDI Ident Connection" communicates via a PLC interface.

The services are configured and started via this interface. Furthermore, the status of the service and error messages are also provided. The interface is described in detail in Chapter 4.

ParamTM interface

"TDI Ident Connection" provides a separate COM interface for the standard software "ParamTM".

This interface allows data to be read/written from/to the codechip of a tool.

■

2

2 Installation

2.1 System requirements

"TDI Ident Connection" can be installed on Siemens SINUMERIK 840D/810D controls MMC103 or on the PCU50. These controls must satisfy different requirements.

The MMC103 provides a link to the Siemens tool management interface (ParamTM) with MMC103 SW 05.03.20 and higher.

The PCU50 provides a link to the Siemens tool management interface (ParamTM) with HMI-Advanced 06.02.10 and higher.

The values specified for storage space needed refer to the requirements for installation. There should still be enough space for Windows® to operate properly.

2.1.1   MMC103

- MMC environment Version 05.03.14 or higher must be installed.
- Approx. 30MB free disk space on drive C:

2.1.2   PCU50

- HMI environment Version 06.00.29 or higher must be installed.
- Approx. 20MB free disk space on drive E:
- Approx. 10MB free disk space on drive F:

2.1.3   Tool management

The SINUMERIK 840D tool management must be installed and configured on the control before "TDI Ident Connection" is installed. The tool management is available as an option for the SINUMERIK 840D and must therefore be purchased separately.

2.1.4   Host services

"TDI Ident Connection" offers services for loading and unloading tools via a host computer. The SINCOM software (V2.0 or higher) is also required for the computer connection. This is not included in the scope of delivery and must therefore be purchased and installed separately in order to utilize the full functionality of the host computer. The installation of SINCOM must also be completed before "TDI Ident Connection" is installed.

2.1.5   Extension of DB19

If PLC data block DB19 is not yet available for "TDI Ident Connection" via the PLC interface, it must be extended prior to the first commissioning of "TDI Ident Connection". An STL file is provided on the CD for this purpose in directory DB19. This file can be used to prepare DB19 for "TDI Ident Connection".

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2.2 Performing installation

2.2.1   Notes concerning the installation

Since most controls do not have a CD-ROM drive, it is recommended that the contents of the installation CD be copied to a separate directory on the hard disk of the control via a PG and started from there. This directory should be deleted again after installation to regain space on the hard disk.

If the control is integrated in a network, the installation can also be started from there.

MMC103

To install, start Windows® in Service mode via the Service menu (Windows® with MMC drivers) and then execute SETUP.EXE on the installation CD.

PCU50

Windows® is started in Service mode and the contents of the installation CD are copied to the D:\Install directory of the PCU50. Windows® is then restarted and Setup is started automatically during booting.

Installation of "TDI Ident Connection" is carried out almost automatically when Setup is started. During installation, it is only necessary to select and configure the code carrier reader used and acknowledge the standard dialog boxes that appear.

The installation path is determined automatically and the version of the installed MMC and HMI environment is checked. If none of the software versions specified in Section 2.1 is installed, Setup is terminated and an appropriate message issued.

2.2.2   Installation sequence

After selecting the setup language and acknowledging the start dialog, installation is performed in the following steps:

1.   Agree to the license conditions.
2.   Register as user.
3.   Determine the installed MMC and HMI environment with subsequent version check.
4.   Select the code carrier reader.
5.   Depending on reader: Select the interface to which the reader is connected or configure the PLC interface (Subsection 2.2.3).
6.   Enter the number of the load/unload place in loading magazine.
7.   Display a summary of the installation data.
8.   Install DCOM95 (on MMC103 only), after which Setup terminates and Windows® shuts down and restarts. Restart must be carried out via the Service menu (not via Start→ShutDown→Restart !!!). After restart in Service mode, Setup is continued automatically.

9. Install the Microsoft® database access components.
10. Install the "TDI Ident Connection" software components and required system files.
11. Update REGIE.INI in the \Add_on directory.
12. Update the installed INI files.
13. Terminate Setup.

When installation is complete, the entries for the selected reader should be checked in the COMTDS.INI file before shutting down Windows® and starting the MMC or HMI environment.

! **Important**

On some systems, a system reset may be performed following installation of the Microsoft® database access components. In this case, Windows® must be started again in Service mode. Setup is then started with the /continue parameter at the point where installation was interrupted.

Sample call: C:\Tmp\CDIdentCon\setup.exe /continue

Note

When a Setup dialog appears on completion of installation prompting to restart Windows®, you should do so. When you confirm this dialog box, Setup automatically restarts Windows®.

2.2.3   Selecting the code carrier reader

The dialog box for selecting the code carrier reader used offers three different types of reader (see Fig. 2-1). On the basis of the reader selected, the software components used by "TDI Ident Connection" are configured during installation.

The interface to which the reader is connected is selected after selection of the code carrier reader if the former is operated via the serial interface. The two serial interfaces COM1 and COM2 are available for selection (see Fig. 2-2).

If the reader is connected to the PLC via Profibus, for example, a dialog box appears for selecting the number of readers used (see Fig. 2-3). A separate dialog box (Fig. 2-4) appears for each reader, in which the PLC data block, the offset and the number of bytes can be specified. The number of bytes depends on the settings in the Wkonvert.txt file, which must also be installed. If there are more than one reader, Setup recommends settings in which the data ranges of the individual readers are continuous in the PLC.

On completion of the Setup routine, you should check the parameters for the reader in the COMTDS.INI file and correct if necessary. This file is located in \Add_on\IdentCon\ and should be checked after restart of the MMC or HMI environment.
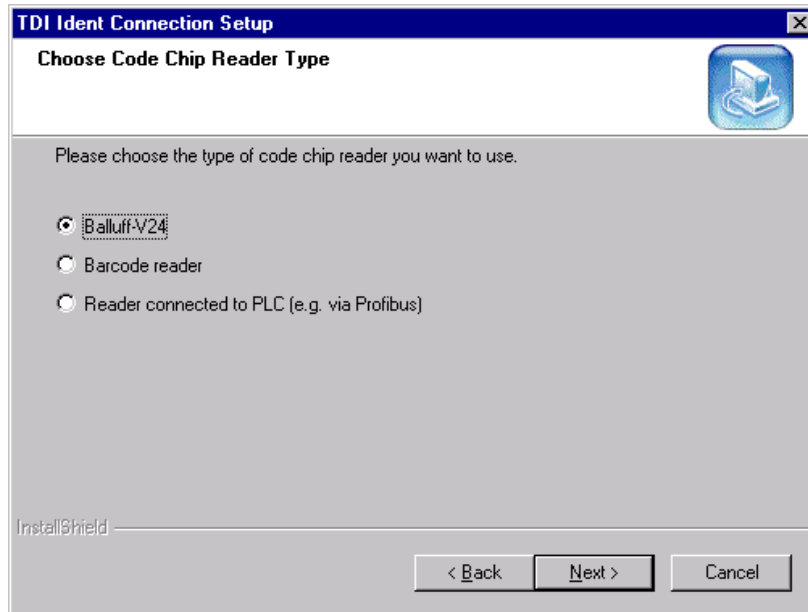
Fig. 2-1   Selecting the code carrier reader
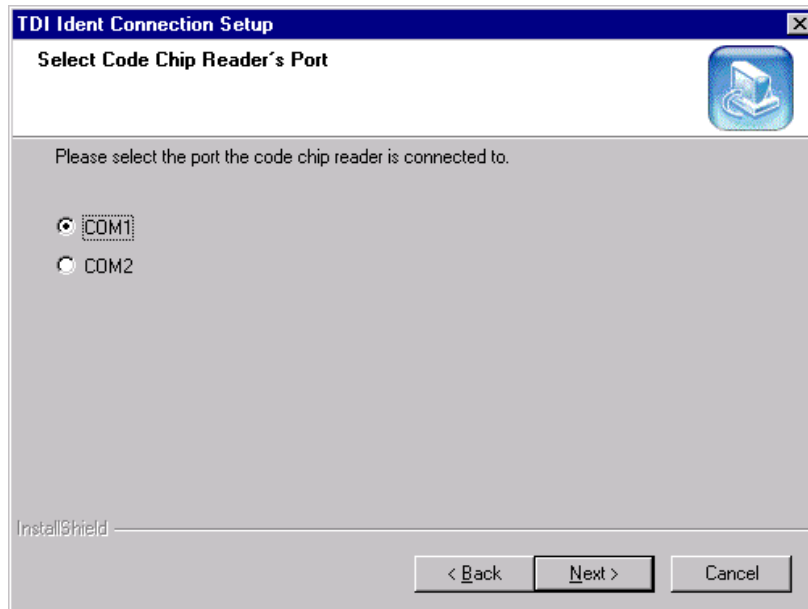
Fig. 2-2   Selecting the reader interface

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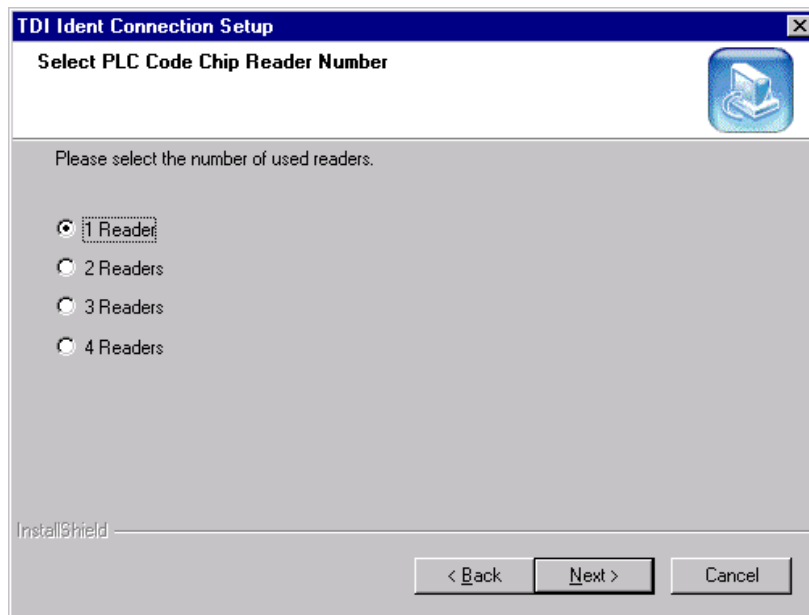
Fig. 2-3   Selecting the number of readers used
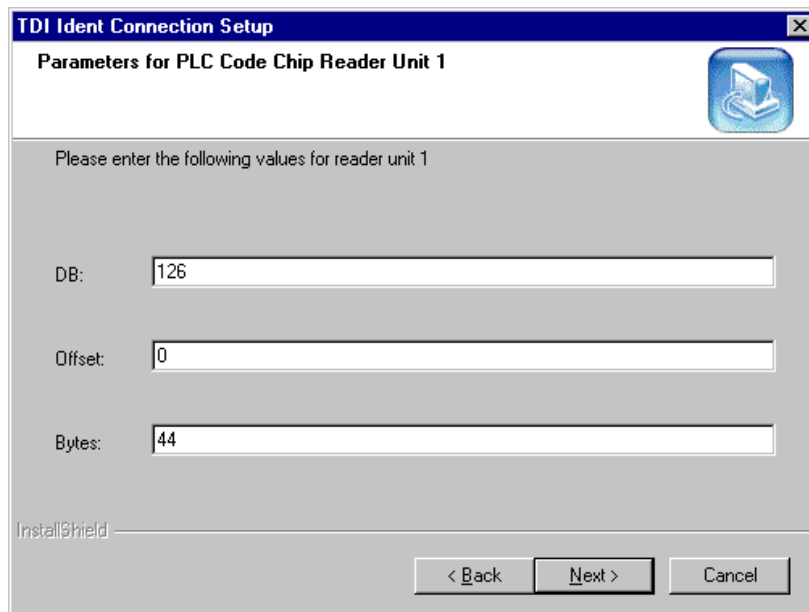
Fig. 2-4   Configuring the PLC reader

2.2.4   Entering the load/unload place number

This dialog box offers two fields for entering the load place number and the unload place number in the loading magazine (see Fig. 2-5). On the basis of the place number specified, the software components used by "TDI Ident Connection" are configured during installation.
These places are used accordingly as source or target for loading or unloading to or from the real magazine.
Correct specification of these data reuqires knowledge of the magazine configuration for the standard tool management (see NCK variables: $TC_MDP1[] in TO_INI.INI). Setup recommends the places with number 1 in each case.
If these values are to be changed later, this can be done manually in the TMS.INI file. The PCU50 or MMC103 must then be restarted.
The following entries are provided:
[Load-Magazine]
LoadPlaceNo=1
UnloadPlaceNo=2
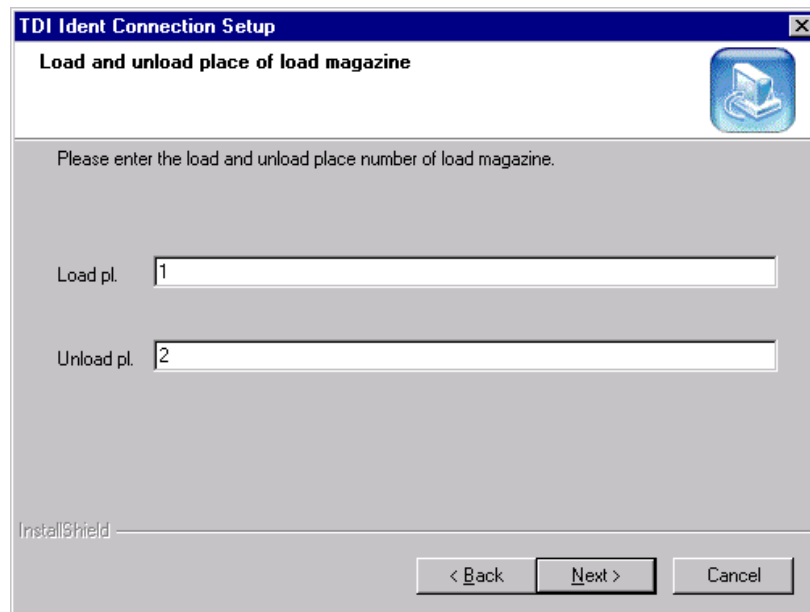
Fig. 2-5   Entering the number of the load/unload place

■

3 Configuration

3

3.1 IdentCon.INI

Configuration of "TDI Ident Connection" takes place via the IdentCon.INI file. This file is located in the \Add_on directory and can be modified using a text editor, for example NOTEPAD. It is divided into various sections that contain different entries. The sections and their entries are described in the table below.

Table 3-1   IdentCon.INI

Section	Entry	Meaning
Global	ServiceTopic	Service topic for DDE connection to NCDDE server, e.g. ncdde
	NCUName	Name of default NCU, e.g. NCU840D
	MmcHome	Root directory of the MMC or HMI software without final backslash (\ ), e.g. C: or F:
	COMTDSHome	Directory for storing the COMTDS component
	TimeOut	Maximum time for execution of a service in seconds
	DisablePLC Interface	Deactivation of the PLC interface, for example if only the ParamTM interface is to be used
	MoveToolPLC	Move tool to reader via PLC program (ParamTM interface)
	MoveToolFirst	Move tool first (ParamTM interface)
	MoveToolCancel	Cancel moving of tool (ParamTM interface)
FileName	Prefix	Prefix of import/export files to which the transfer parameter *FileIndex* is added to produce the full file name, e.g. Tools_
	Extension	Extension for import/export files, e.g. txt
	ToolsHome	Directory for import/export files without final backslash (\ ), e.g. C:\ToolData
DataBlocks	Interface	Data block of PLC interface
	Parameter	Data block of parameter of PLC interface
	InterfaceOffset	Offset of PLC interface in data block
	Parameter Offset	Offset of parameter area in data block
	PLCInterface	Data block of PLC program interface for ParamTM interface
	PLCParameter	Data block of parameter for PLC program (ParamTM interface)
	PLCInterface Offset	Offset of PLC program interface for ParamTM interface
	PLCParameter Offset	Offset of parameter for PLC program (ParamTM interface)

Section	Entry	Meaning
Logging	LogLevel	Mode for logging (0...2) 0: Erros, warnings and messages 1: Trace level 1 2: Trace level 2
	MaxFileSize	Maximum size of log file in Kb

If the services are stopped due to a timeout, use the "TimeOut" entry to specify a longer time. A timeout can occur if the user fails to acknowledge tool loading. The default time for services is 300 milliseconds.

The entries "DisablePLCInterface", "MoveToolPLC", "MoveToolFirst" and "MoveToolCancel" are relevant for linking to the SINUMERIK standard software "ParamTM". "DisablePLCInterface=true" specifies that the "TDI Ident Connection" is to be addressed only via "ParamTM" per soft key; the PLC interface for activating the services by specifying a command code is then deactivated. The entry "MoveToolPLC=true" is used if the tool has to be transported to the reader before reading/writing the data from/to the code chip. In this case, "TDI Ident Connection" uses the "ParamTM" PLC interface to communicate with the PLC program that performs tool transport. "MoveToolFirst=true" moves the tool to the code chip prior to reading/writing; otherwise, after reading/writing. If the reader is connected to the PLC (e.g. Profibus), the entry "MoveToolFirst" has no effect. In this case, the tool data should be transferred by the PLC program in the interface DB prior to reading and taken from there after writing. MoveToolCancel=true can be used to stop waiting for the end of tool motion immediately without generating the error messages. In this case, the cancel bit (DB19.DBX259.2) is set by "TDI Ident Connection" in the "ParamTM" PLC interface independently of this entry.

The names of the import and export files for importing and exporting tool data are made up of the "Prefix" and "Extension" entries and the transfer parameter "FileIndex". These files are located in the directory specified in "ToolsHome" after exprt and are read from this directory for import. This directory must already exist, since it is not created automatically. An export file could be called "Tools_4711.txt" for example, if the above data are used and specified as "FileIndex 4711".

Normally, the "DataBlocks" need not exist, since "TDI Ident Connection" uses the data blocks and offsets described in the following chapters per default. These are set up in the PLC using the STL file supplied (see Section 2.3).

The higher the "LogLevel" entry, the more messages are stored in the log file IdentCon.Log. This file is used for diagnostics and contains information on incorrect transfer parameters, for example. In parallel with this log file, the error file IdentCon.err is created, which contains only error messages.

3.2 TMS.INI

The entries "MergeDBData" and "MergeNCKData" in the "TMS.INI" file can be used to define whether tool data are to be combined with data from the tool cabinet or from the NCK (tool list), if these data are not supplied with the tool.
With the default setting, tool data that are not present on the data source (code carrier, import file or host computer) are preassigned the default data from the "DefToolDat.txt" data (see Section 3.5).
Furthermore, the entries for loading and unloading place numbers of the loading magazine made during installation can be changed to the entries for "LoadPlaceNo" and "UnloadPlaceNo" (see Subsection 2.2.4).
The "Messaging" entry specifies which messages are stored in the protocol file "TMS.Log". This file is used for diagnostics and contains information on the cause of an error that occurs. In parallel with this protocol file, the error file "TMS.err" is created, which contains only error messages. The setting "Messaging=3" also creates the "TMS.txt" file, which contains the tool data in the familiar NC-$ syntax that were transferred with the "TDI Ident Connection" services.

Note

For performance reasons, the entry "Messaging =3" should not be used in normal mode but only for fault diagnostics.
If necessary, the files "TMS.Log", "TMS.sav", "TMS.txt" and "TMSalt.txt" should be sent to the hotline for diagnostics.

The files "TMS.INI" and "DefToolDat.txt" are located in the directory \Add_on\IdentCon.

! **Important**

For correct operation of "TDI Ident Connection", only the entries described in the table below should be modified.

Table 3-2   Structure of the initialization file TMS.INI

Section	Entry	Meaning
Load magazine	LoadPlaceNo	This place number in the load magazine is used for loading to the real magazine.
	UnloadPlaceNo	This place number in the load magazine is used for unloading from the real magazine.
Uninit tool data	MergeDBData	If this entry is set to "1", tool data not present are initialized with data from the tool cabinet.
	MergeNCKData	If this entry is set to "1", tool data not present are initialized with data from the NCK tool list.

| Trace logging | Messaging | Mode for logging (0..3)
0: Error messages and warnings
1: Additional protocol of called services
2: Additional protocol of internal services
3: Additional tool data in the TMS.txt file |
| | LogFileSize | Maximum size of log file in 10 Kb |

3.3 COMTDS.INI

The "COMTDS.INI" file contains the parameters for the components that communicate with the reader. It is split up into sections that can be configured to match the reader. Not all sections are required for each reader however. This file is also located in the directory \Add_on\IdentCon.

> **!** **Important**
>
> This file normally does not have to be modified, since all default settings are made automatically during installation.

3.3.1   Specifying the code carrier reader used

The "GLOBAL" section defines the type of reader used. This entry defines the section in which the reader parameters are stored. Table 3-3 shows the possible entries for this section.

Table 3-3   Defining the reader used, GLOBAL

Section	Entry	Meaning
GLOBAL	DEVICE	Specifying the reader used Balluff_V24: Balluff-V24 Datalogic-DL910: Barcode reader PLCDATA-DDE: Reader at the PLC

3.3.2   Balluff-V24 reader

The Balluff_V24 section defines the character string that denotes the end of the transferred string. Table 3-4 contains the default values for this entry.

Table 3-4   Defining the reader used, Balluff-V24

Section	Entry	Meaning
Balluff_V24	EOT	End of transferred string Default: EOT = 0x2F2F

The COM interface to which the reader is connected must also be configured for this reader.

3.3.3   Barcode reader

The "Datalogic-DL910" contains data for the end ID of the transferrred character flow (see table below).

Table 3-5   Barcode reader

Section	Entry	Meaning
Datalogic DL910	EOT	End of transferred string Default: EOT = 0x0A0D

The COM interface to which the reader is connected must also be configured for this reader.

3.3.4   Reader at the PLC

The "PLCDATA-DDE" section defines the PLC interface of the reader. A separate area in this interface is reserved for the data of each reader head. The parameters required are shown in the table below.

Table 3-6   Reader at the PLC

Section	Entry	Meaning
PLCDATA-DDE	Units	Number of reader heads used Default: Units = 1
	Linktopic1	LinkTopic for DDE communication Default: Linktopic1 = ncdde|ncu840d
	DataBlock$n$	PLC data block that contains the data of reader head n (n = 1...4)
	Offset$n$	Offset data of reader head n
	MAX_CC_CAPACITYn	Maximum number of data for reader head n in bytes
	EOTn	End ID for transferred character string of reader head n Default: EOTn = 0x2F2F

3.3.5 Configuring the COM interface

For the Balluff-V24 and the barcode reader, the COM interface used must be configured in the "COMPORT" section. The settings required are shown in the table below. The default values are specified for the two types of readers.

Table 3-7   Configuring the COM interface

Section	Entry	Meaning
COMPORT	PORT	Index of the COM interface used 1: COM1 2: COM2 Default: Balluff-V24: PORT = 1 Barcode: PORT = 1
	Baud	Baudrate for data transmission 0: 300 1: 1200 2: 2400 3: 4800 4: 9600 5: 19200 6: 38400 7: 57600 8: 115200 Default: Balluff-V24: Baud = 4 Barcode: Baud = 4
	DataBits	Number of data bits per transferred byte 0: 5 data bits 1: 6 data bits 2: 7 data bits 3: 8 data bits Default: Balluff-V24: DataBits = 3 Barcode: DataBits = 3
	Parity	Specifies the parity checking 0: None 1: Even parity 2: Uneven parity Default: Balluff-V24: Parity = 1 Barcode: Parity = 0

Section	Entry	Meaning
COMPORT	StopBits	Number of stop bits per transferred byte 0: 1 stop bit 1: 2 stop bits Default: Balluff-V24: StopBits = 0 Barcode: StopBits = 0
	FlowControl	Specifies the method of data flow control used 0: None 1: Xon/Xoff 2: RTS/CTS Default: Balluff-V24: FlowControl = 0 Barcode: FlowControl = 2

3.4 Structure of the description file wkonvert.txt

Description file

All data on the code carrier are stored in a particular order. This is defined during commissioning of the code carrier system. A conversion rule in the form of a description file is provided so that the tool management can read or write this data flow. This description file consists of precisely defined tool, cutter and dialog data. Only these dialog data can actually be processed by the tool mangement. No other data on the code carrier may be assigned to dialog variables, since they are not processed by the standard version. The "TDI Ident Connection" offers the option of integrating option software components however. These components implement the adaption of these code carrier data to the SINUMERIK standard. The tool man agement can read and write customer-specific code carrier formats and also imple- ment a special logic in the transport sequences of the tool data (e.g.: consider replacement tools in the NC, create additional cutters, etc.).

Extension of ordering data

If you wish to obtain the extension to the standard version of "TDI Ident Con- nection" with optional components for adaption to your customer-specific code carrier formats or to incorporate special sequences in your tool management, please contact:
"Competence Center for machine tools and special machines"
at the following e-mail address: Info.mc-hmi-oa@siemens.com
or contact your Siemens sales partner.

The description file can be created as an ASCII file using a standard text editor. The path and name of the description file is given in the "TMS.INI" file under the entry "WkonvertFile".

Tool dialog data

The tool dialog data are defined as follows:

Table 3-8   Tool dialog data

Dialog variable	Data type	Designation	Assignment $TC...
T1	String	Tool name, max. 32 characters	$TC_TP2
T2	Integer	Duplo number	$TC_TP1
T3	Integer	Number of cutting edges	$P_TOOLND[tnr] tnr=Tool number
T4	Integer	Tool size left in half locations	$TC_TP3
T5	Integer	Tool size right in half locations	$TC_TP4
T6	Integer	Tool size upper in half locations	$TC_TP5
T7	Integer	Tool size down in half locations	$TC_TP6
T8	String	Magazine place type	$TC_TP7*
T9	Integer	Tool status	$TC_TP8
T10	Integer	Type of tool monitoring	$TC_TP9
T11	Integer	Type of tool search	$TC_TP11
T12**	Integer	Magazine place type	$TC_TP7

*   The character string stored there is an MMC-internal place type that is as
      signed the value in $TC_TP7. This text is defined during commissioning of the
      tool management and is stored in the database.
** The number corresponds to the string from T8 and must be used instead of T8.

Cutting edge dialog data

Table 3-9   Cutting edge dialog data

Dialog variable	Data type	Designation	Assignment $TC...
C1	Integer	Subtype	$TC_DP1
C4	Integer	Length of cutting edge	$TC_DP2
		Geometry tool length correction	
C5	Double	Length 1	$TC_DP3
C6	Double	Length 2	$TC_DP4
C7	Double	Length 3	$TC_DP5
		Geometry tool radius correction	
C8	Double	Length 1	$TC_DP8
C9	Double	Length 2	$TC_DP9
C10	Double	Radius 1	$TC_DP6
C11	Double	Radius 2	$TC_DP7
C12	Double	Angle 1	$TC_DP10
C13	Double	Angle 2	$TC_DP11
		Wear tool length correction	
C14	Double	Length 1	$TC_DP12
C15	Double	Length 2	$TC_DP13

Dialog variable	Data type	Designation	Assignment $TC...
C16	Double	Length 3	$TC_DP14
		Wear tool radius correction	
C17	Double	Length 1	$TC_DP17
C18	Double	Length 2	$TC_DP18
C19	Double	Radius 1	$TC_DP15
C20	Double	Radius 2	$TC_DP16
C21	Double	Angle 1	$TC_DP19
C22	Double	Angle 2	$TC_DP20
		Basic/adapter dimension tool length correction	
C23	Double	Basic length 1	$TC_DP21
C24	Double	Basic length 2	$TC_DP22
C25	Double	Basic length 3	$TC_DP23
C26	Double	Undercut angle	$TC_DP24
C27	Integer	Reverse insert	$TC_DP25
C28	Integer	Cutting edge number for addressing variables	–
C29*	Integer	Downtime in minutes	$TC_MOP2
C30*	Integer	Prewarning limit for downtime in minutes	$TC_MOP1
C31*	Integer	Number of pieces	$TC_MOP4
C32*	Integer	Prewarning limit for number of pieces	$TC_MOP3
C33	Double	Set downtime in minutes	$TC_MOP11
C34*	Integer	Set number of pieces	$TC_MOP13
C35	Double	Prewarning limit for wear	$TC_MOP5
C36	Double	Wear	$TC_MOP6
C37	Double	Set wear	$TC_MOP15
C38*	Double	Downtime in minutes	$TC_MOP2
C39*	Double	Prewarning limit for downtime in minutes	$TC_MOP1
C40*	Double	Number of pieces	$TC_MOP4
C41*	Double	Prewarning limit for number of pieces	$TC_MOP3
C42*	Double	Set number of pieces	$TC_MOP13

The dialog variables C2 and C3 are managed only internally.
* see note below

Note

C38 and C39 can only be used as alternatives for C29 and C30
and C40, C41 and C42 can only be used as alternatives for C31, C32 and C34.

Tool user parameters and the new monitoring parameters are now also used for code carriers. The following new configuration variables are available for the file "wkonvert.txt":

A1 – A10:   User tool data (see $TC_TPCx[t])
U1 – U10:   User cutting edge data (see $TC_DPCx[t,d])
S1 – S10:   User monitoring data (see $TC_MOPCx[t,d])

Data on the code carrier that are not relevant for the tool management but must not be altered when writing to the code carrier, are marked with a dash (–) instead of the dialog variable in the description file (e.g. data gaps).

Data types

The following data types are defined for dialog variables:
- Integer: Value range –32768 to 32767
- Double: Floating-point double exact
- String: String made up of ASCII characters

Keywords

The code carrier description file is used to assign code carrier data to the dialog data. This file is an ASCII file, which can be created and edited using a standard text editor. The code carrier description file is structured line-by-line and each line denoted by one of the following **keywords**:

Quotation marks

The single quotation mark (**'**) marks the beginning of a comment. The characters that follow are skipped.
Example:

```
' This is a comment
```

Note

This format for the beginning of a comment is used only in the description file for code carriers. Otherwise, the beginning of a comment is introduced by a semi-colon (;).

Datalen

DATALEN=CONST | VARIABLE 0x<delimiter>
The following data have a constant (CONST) or a variable (VARIABLE) data length. Data with variable length are terminated with 0x<delimiter>.

Example:

```
DATALEN=VARIABLE 0x0A ' variable data length, delimiter LF
```

Item

> **Item**<n>=<line>
> <n> := consecutive number of code carrier data, in ascending order from 1 without gaps
> <line> := <(max.) length in bytes> <code carrier data format> <dialog variable>
> <code carrier data format> :
> <dialog variable> : Assignment of code carrier to dialog data
>
> If a user keyword is defined immediately before **Item<n>**, <dialog variable> takes the value **<keyword>**
>
> Conversion rule for code carrier data <n>
> Example:

```
Item1  32 ASCII  T3     ’ Convert tool identifier to/from
                        ’ Tool dialog data 3
```

BItem

> **BItem**<n>=<line>
> <n> := consecutive number of code carrier data within block<i>, in ascending order from 1 without gaps
> <line> := analog **Item**<n>
> Conversion rule for code carrier data <n> within a block. If the code carrier data is assigned a tool dialog data T<n>, the dialog data is assigned the first value of the code carrier data in the block.
>
> Example:

```
BItem1   1       BCD    C1
```

Block

> **Block**<n> <repetition rule>
> <n> := consecutive number of block, in ascending order from1 without gaps
> <repetition rule> := * Item<n>
> A block of data **BItem**<n> follows (up to the keyword **End_Block**<n>), which are stored on the code carrier according to the <repetition rule>.

> ---
> **Note**
>
> For block <n> * Item <n>, Item <n> must be defined before block <n>.
> ---

> Example:
> ```
> Block1 * Item6     ’ Repeat Block1 according to the value of Item6
>
> End_Block<n>
> ```

End_Block

> End ID for a data block defined with **Block**<n>.

Code carrier data formats

> The following code carrier data formats are supported:
> (comp. <code carrier data formats> for **Item** / **BItem**)

Table 3-10   Code carrier data formats

Data format	Explanation
ASCII	ASCII character set
INT	16-bit integer (Intel format) • Value range –32768 <= INT <= +32767
FPX2	16-bit integer (SINUMERIK 850) • Value range –32768 <= FPX2 <= +32767 • Least-significant byte at most-significant address (reverse Intel format)
BCD	• Binary-coded decimal number (if necessary, with sign and decimal point) • Non-relevant decades are preassigned the value 0, left-justified
BCD_SIN850	BCD with the following definitions (SINUMERIK 850): • Each BCD number allocates 12 decades • The sign is always in the 3rd decade • 0 = positive / 1 = negative • Non-relevant decades are preassigned to the value 0 • Value range: max. 8 digits with decimal point, max. 9 digits without decimal point

Assignment between code carrier data and dialog data

The conversion rule for **Item\<n\>** or **BItem\<n\>** also contains the assignment to none/one/several dialog variables, if necessary with a conversion that is explained in detail in this section. The general conversion rule for **Item\<n\>** and **BItem\<n\>** is as follows:

(B)Item\<n\>**=\<line\>**

\<n\>   := consecutive number of code carrier data,
                in ascending order without gaps
\<line\>   := \<(max.) length in bytes\>\<code carrier data format\>
                \<dialogvariable\>
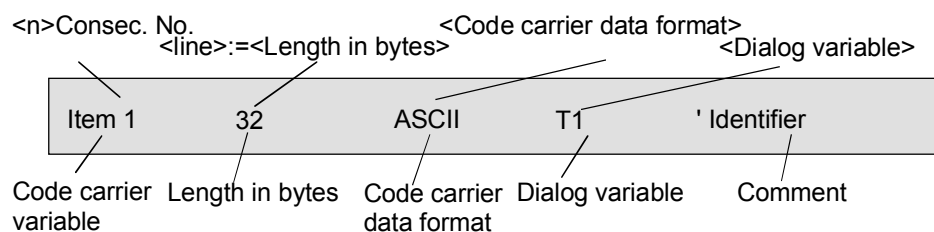
Fig. 3-1   Conversion rule

Dialog variable

<dialogvariable> :=   <dvar1>[=(<uv>)] [, <dvar2>[=(<uv>)] [,<dvar3>
        [&<dvar4>]=(<uv>)] [, <dvarN>[=(<uv>)]
<dvar> :=   T<index> | C<index> | –
        T   = tool data,
        C   = cutting edge data,
        index = index in tool/cutting edge data
        –   = no assignment to a dialog variable
<dvar1>&<dvar2>=<uv> : conversion rule applies to <dvar1> and <dvar2>
uv :=   <Tetn>
        Tetn := n^{th} tetrad in byte sequence
        Byte1, = Tet1 and Tet2
        Byte2, = Tet3 and Tet4

Allocation of the tetrads of code carrier variables (in BCD format) to dialog
variables.
Example:
```
   T5=(Tet1), T6=(Tet2), T7=(Tet3), T8=(Tet4)
```

If the code carrier has the value 0x1234 for example, dialog variable T5 is assigned
the value 1, dialog variable T8 the value 4.

3.4.1   Examples for description files

Name of the description file or conversion file

The file name must be entered in ...\user\mmc.ini bei WToolIdSysKonv =
wkonvert.txt.

Standard for SINUMERIK 840D with "TDI Ident Connection"

The name of the file is "**wkonvert.txt**" after installation.

Table 3-11   Wkonvert.txt

Dialog variable	Length (bytes)	Data format	Dialog variable	Comment
Item1	32	ASCII	T1	' Identifier
Item2	3	BCD	T2	' Duplo
Item3	2	BCD	T4=(Tet1),T5=(Tet2),T6=(Tet3), T7=(Tet4)	
'Tool size: left, right, up, down'				
Item4	32	ASCII	T8	' Place type
Item5	2	BCD	T9	' Status
Item6	1	BCD	T3	' No. cutting edges
Item7	1	BCD	T10	' Type of tool monitoring
Item8	1	BCD	T11	' Type of tool search
'Cutting edge data Block1 * Item6				
Bitem1	2	BCD	C1	' Subtype, type
Bitem2	1	BCD	C4	' Cutting edge position

'Tool length correction				
BItem3	4	BCD	C5	' Length 1
BItem4	4	BCD	C6	' Length 2
BItem5	4	BCD	C7	' Length 3
'Tool radius correction				
BItem6	4	BCD	C8	' Length 1
BItem7	4	BCD	C9	' Length 2
BItem8	4	BCD	C10	' Radius 1
BItem9	4	BCD	C11	' Radius 2
BItem10	4	BCD	C12	' Angle 1
BItem11	4	BCD	C13	' Angle 2
'Wear length correction				
BItem12	4	BCD	C14	' Length 1
BItem13	4	BCD	C15	' Length 2
BItem14	4	BCD	C16	' Length 3
'Wear radius correction				
BItem15	4	BCD	C17	' Length 1
BItem16	4	BCD	C18	' Length 2
BItem17	4	BCD	C19	' Radius 1
BItem18	4	BCD	C20	' Radius 2
BItem19	4	BCD	C21	' Angle 1
BItem20	4	BCD	C22	' Angle 2
'Basic dimension length correction				
BItem21	4	BCD	C23	' Basic length 1
BItem22	4	BCD	C24	' Basic length 2
BItem23	4	BCD	C25	' Basic length 3
BItem24	4	BCD	C26	' Undercut angle
BItem25	1	BCD	C27	' Reverse insert
BItem26	2	BCD	C29	' Downtime in minutes
BItem27	2	BCD	C30	' Prewarning limit for downtime
BItem28	2	BCD	C33	' Set downtime in minutes
BItem29	2	BCD	C31	' Pieces
BItem30	2	BCD	C32	' Prewarning limit for pieces
BItem31	2	BCD	C32	' Set number of pieces
End_Block1				

Example with tool and cutting edge OEM data, and data gaps

Table 3-12   Example

Code carrier variable	Length (bytes)	Data format	Dialog variable	Comment
Item1	32	ASCII	T1	' Identifier
Item2	3	BCD	T2	' Duplo
Item3	2	BCD	T4=(Tet1),T5=(Tet2),T6=(Tet3), T7=(Tet4)	
'Tool size: left, right, up, down'				
Item4	32	ASCII	T8	' Place type
Item5	2	BCD	T9	' Status
Item6	1	BCD	T3	' No. cutting edges
Item7	1	BCD	T10	' Type of tool monitoring
Item8	1	BCD	T11	' Type of tool search

Item9	5	ASCII	–	' Tool data gaps
Item10	4	BCD	A1	' Tool OEM data 1
'Cutting edge data Block1 * Item6				
Bitem1	2	BCD	C1	' Subtype, type
Bitem2	1	BCD	C4	' Cutting edge position
'Tool length correction				
Bitem3	4	BCD	C5	' Length 1
BItem4	4	BCD	C6	' Length 2
BItem5	4	BCD	C7	' Length 3
'Tool radius correction				
BItem6	4	BCD	C8	' Length 1
BItem7	4	BCD	C9	' Length 2
BItem8	4	BCD	C10	' Radius 1
BItem9	4	BCD	C11	' Radius 2
BItem10	4	BCD	C12	' Angle 1
BItem11	4	BCD	C13	' Angle 2
'Wear length correction				
BItem12	4	BCD	C14	' Length 1
BItem13	4	BCD	C15	' Length 2
BItem14	4	BCD	C16	' Length 3
'Wear radius correction				
BItem15	4	BCD	C17	' Length 1
BItem16	4	BCD	C18	' Length 2
BItem17	4	BCD	C19	' Radius 1
BItem18	4	BCD	C20	' Radius 2
BItem19	4	BCD	C21	' Angle 1
BItem20	4	BCD	C22	' Angle 2
'Basic dimension length correction				
BItem21	4	BCD	C23	' Basic length 1
BItem22	4	BCD	C24	' Basic length 2
BItem23	4	BCD	C25	' Basic length 3
BItem24	4	BCD	C26	' Undercut angle
BItem25	1	BCD	C27	' Reverse insert
BItem26	2	BCD	C29	' Downtime in minutes
BItem27	2	BCD	C30	' Prewarning limit for downtime
BItem28	2	BCD	C33	' Set downtime in minutes
BItem29	2	BCD	C31	' Pieces
BItem30	2	BCD	C32	' Prewarning limit for pieces
BItem31	2	BCD	C32	' Set number of pieces
BItem32	4	BCD	U1	' Cutting edge OEM data 1
BItem33	3	BCD	-	' Cutting edge data gaps
End_Block1				

3.5 Tool data initialization file DefToolDat.txt

The default values contained in the file "DefToolDat.txt" initialize those tool data that are not present in the data source for the services of "TDI Ident Connection". This situation can occur on reading from code carrier, from an import file or from the host computer.

This file contains the data of a default tool with one cutting edge in familiar NC-$ syntax. After installing "TDI Ident Connection", all optional tool data (i.e. all OEM data, cutting edge monitoring data and local additive offsets) are marked with a comment character (;) and are thereby deactivated.
So the user should always adapt the contents of "DefToolDat.txt". Remove the comment characters in front of the relevant optional tool data to match their number to the existing NCK configuration. The value assigned to these tool data in the file can also be modified to meet user requirements.
If the number of active optional tool data in DefToolDat.txt exceeds the number of relevant data configured in the NC, MMC alarms 121005 to 121009 are generated on start of "TDI Ident Connection".

These alarm numbers are assigned to the individual data groups as follows:
- Alarm No. 121005 – Tool OEM data
- Alarm No. 121006 – Cutting edge OEM data
- Alarm No. 121007 – Cutting edge monitoring data
- Alarm No. 121008 – Cutting edge OEM monitoring data
- Alarm No. 121009 – Cutting edge additive offsets

The texts assigned to these alarms can be defined by the user in the "Alm_xx.com" files.
If the number of these tool and cutting edge data configured in the NC is greater than the number of corresponding active data in DefToolDat.txt, partially invalid negative data values are transferrred to the data target for the services of "TDI Ident Connection". This enables identification of non-initialized tool data.

!   **Important**

Loading a tool to a magazine that contains invalid data of type Double produces NC alarm 1019.

The DefToolDat.txt file is located in the directory \Add_on\IdentCon.

■

3.5 Tool data initialization file DefToolDat.txt

4

4 PLC Interface in DB19

4.1 Layout

The "TDI Ident Connection" is addressed and supplied with data via a PLC interface located in data block DB19 (see Fig. 4-1).

A further area contains the transfer and return parameters for the various services.

In addition, a separate PLC interface is provided for the "ParamTM" interface of the "TDI Ident Connection". It is used to communicate with a PLC program. The parameters for this PLC program and the status bits are also located in this area.
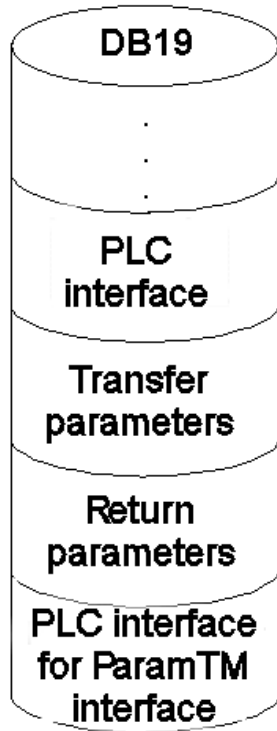
Fig. 4-1   Layout of the PLC interface

4.2 PLC interface assignment by TDI Ident Connection

This interface is active when the entry "DisablePLCInterface=false" is present in the "IdentCon.ini" file.

Table 4-1   PLC interface assignment by "TDI Ident Connection"

PLC data		Identifier	Type	Value range	Meaning
DBX	250.0	Request	BOOL	TRUE, FALSE	Job request
DBB	251	C_Code	BYTE	0...127	Command code
DBX	252.0	Done	BOOL	TRUE, FALSE	Job successfully completed
DBX	252.1	Error	BOOL	TRUE, FALSE	Job terminated with error
DBX	252.2	Active	BOOL	TRUE, FALSE	Job in progress
DBX	252.3	Spare	BOOL	TRUE, FALSE	
DBX	252.4	Spare	BOOL	TRUE, FALSE	
DBX	252.5	Spare	BOOL	TRUE, FALSE	
DBX	252.6	Spare	BOOL	TRUE, FALSE	
DBX	252.7	Spare	BOOL	TRUE, FALSE	
DBB	253	C_CodeError	BYTE	0...127	C code on error
DBW	254	Error_Code	INT	–32768...32767	Error code

During startup of "TDI Ident Connection", the request bit is set to "0" to prevent a service being started inadvertently, for example if the control is deactivated during execution of a service.

If the request bit has already been set, it is reset and the error code 0xFFFF written to the Error_Code word in the PLC.

4.3 Transfer and return parameters of the services

Table 4-2   PLC interface assignment for transfer parameters

PLC data		Identifier	Type	Value range	Meaning
Transfer parameters					
DBW	140	Subtype	INT	–1...32000	Subtype of tool
DBW	142	Duplo	INT	–1...32000	Duplo number of tool
DBB	144	Ident	String	32 characters	Identifier of tool
DBW	178	TNumber	INT	–1...32000	T number of tool
DBW	180	Magazine Place	INT	–1...32000	Magazine place number of tool
DBW	182	Magazine PlaceType	INT	–1...32000	Size of tool (Magazine place type)
DBB	184	ToolSize_ Upper	BYTE	1...127	Tool size upper in half locations

PLC data	Identifier	Type	Value range	Meaning
DBB 185	ToolSize_ Down	BYTE	1...127	Tool size down in half locations
DBB 186	ToolSize_ Left	BYTE	1...127	Tool size left in half locations
DBB 187	ToolSize_ Right	BYTE	1...127	Tool size right in half locations
DBB 188	Channel	BYTE	1...127	Channel number of tool
DBB 189	Loading Place	BYTE	1...127	Number of loading/ unloading place in loading magazine
DBW 190	Magazine	INT	0...32000	Magazine number of tool
DBB 192	Unit	BYTE	1...127	Number of tool code carrier
DBB 193	NCU_Index	BYTE	32 characters	Name of NCU
DBW 194	FileIndex	INT	0...32000	File index for import/ export
DBX 196.0	Active Enable	BOOL	TRUE, FALSE	Hide NCK status bits "T active"
DBX 196.1	Override	BOOL	TRUE, FALSE	Overwrite file if it exists?
DBX 196.2	LoadTool	BOOL	TRUE, FALSE	Load tool after creating
DBX 196.3	DeleteTool	BOOL	TRUE, FALSE	Delete tool after unloading

Table 4-3   PLC interface assignment for return parameters

PLC data	Identifier	Type	Value range	Meaning
Return parameters				
DBW 198	Subtype	INT	–1...32000	Subtype of tool
DBW 200	Duplo	INT	–1...32000	Duplo number of tool
DBB 202	Ident	String	32 characters	Identifier of tool
DBW 236	TNumber	INT	–1...32000	T number of tool
DBW 238	ToolState	INT	–1...32000	Status of tool
DBW 240	Magazine PlaceType	INT	–1...32000	Size of tool (Magazine place type)
DBB 242	ToolSize_ Upper	BYTE	1...127	Tool size upper in half locations
DBB 243	ToolSize_ Down	BYTE	1...127	Tool size down in half locations
DBB 244	ToolSize_ Left	BYTE	1...127	Tool size left in half locations
DBB 245	ToolSize_ Right	BYTE	1...127	Tool size right in half locations

PLC data	Identifier	Type	Value range	Meaning
DBB 246	Magazine	INT	0...32000	Magazine number of tool
DBB 248	Magazine Place	INT	0...32000	Magazine place number of tool

The parameter values permitted for the individual services may vary and are therefore specified separately for each service in Chapter 7.

4.4 Interface of the PLC program (ParamTM-Interface)

This interface is not active until the entry "MoveToolPLC=true" is present in the "IdentCon.ini" file. This does not affect the PLC input bits of DBB259, which are set independently of this entry by "TDI Ident Connection".

Table 4-4   PLC interface assignment by "TDI Ident Connection"

PLC data	Identifier	Type	Value range	Meaning
Interface				
DBX 256.0	Req	BOOL	TRUE, FALSE	Request to PLC program to move the tool to the reader
DBB 257	Spare	BYTE	-128...127	
DBX 258.0	Done	BOOL	TRUE, FALSE	Travel job of PLC successfully completed
DBX 258.1	Error	BOOL	TRUE, FALSE	Travel job of PLC terminated with error
DBX 258.2	Spare	BOOL	TRUE, FALSE	
DBX 258.3	Spare	BOOL	TRUE, FALSE	
DBX 258.4	Spare	BOOL	TRUE, FALSE	
DBX 258.5	Spare	BOOL	TRUE, FALSE	
DBX 258.6	Spare	BOOL	TRUE, FALSE	
DBX 258.7	Spare	BOOL	TRUE, FALSE	
DBX 259.0	Read	BOOL	TRUE, FALSE	The tool data are read by the code carrier
DBX 259.1	Write	BOOL	TRUE, FALSE	The tool data are written to the code carrier
DBX 259.2	Cancel	BOOL	TRUE, FALSE	Read/write operation aborted by user
DBX 259.3	Spare	BOOL	TRUE, FALSE	
DBX 259.4	Spare	BOOL	TRUE, FALSE	
DBX 259.5	Spare	BOOL	TRUE, FALSE	
DBX 259.6	Spare	BOOL	TRUE, FALSE	
DBX 259.7	Spare	BOOL	TRUE, FALSE	
DBW 260	Error_Code	INT	-32768...32767	Error number of PLC
Transfer parameters				
DBW 262	PMagazine	INT	0...32000	Magazine number of tool

PLC data		Identifier	Type	Value range	Meaning
DBW	264	PMagazine Place	INT	0...32000	Magazine place number of tool
DBW	266	PTnumber	INT	0...32000	T number of tool

The values for the magazine, magazine place and T number of the tool are only written to this PLC interface of the "TDI Ident Connection" when writing to the code carrier (e.g. when unloading the tool with "ParamTM").

■

5

5 Command Codes

5.1 Description

Table 5-1   Description of command codes

C code	Description
0	Load from code carrier
1	Unload to code carrier
2	Load from tool cabinet
3	Unload to tool cabinet
4	Load from host computer
5	Unload to host computer
6	Unload all tools to tool cabinet
7	Load tool
8	Unload tool
9	Search for empty location
10	Clear tool in NCK
11	Clear tool in database
12	Export tool data
13	Import tool data
14	Update code carrier
15	Read data from code carrier
16	Store tool data in NCK

■

6

6 Parameters

6.1 Description

Table 6-1   Description of parameters

Parameter	Description
ActiveEnable	Transfer of the tool status bit from the database to the NCK (TRUE) / Hide the status bit during transfer (FALSE)
Channel	Channel number
DeleteTool	Delete tool after unloading (TRUE) / do not delete (FALSE)
Duplo	Duplo number
FileIndex	Index of file to be used for import/export. The file name extended by the index can be specified in the INI file.
Ident	Tool name
LoadingPlace	Number of load/unload place in loading magazine
LoadTool	Load tool after reading (TRUE) / do not load (FALSE)
Magazine	Magazine number
MagazinePlace	Magazine place number of tool
MagazinePlaceType	Magazine place type
NCU_Index	Index of the NCU to be addressed for the job. The following values are permissible: 0 → NCU name from IdentCon.INI 1 → NCU1 2 → NCU2 >2 → MachineSwitch The names for NCU1 and NCU2 are determined from the NETNAMES.INI file.
Override	Overwrite export file (TRUE) / extend (FALSE)
Subtype	Subtype or type
TNumber	T number
ToolSize_Down	Tool size down in half locations
ToolSize_Left	Tool size left in half locations
ToolSize_Right	Tool size right in half locations
ToolSize_Upper	Tool size upper in half locations
ToolState	Tool state
Unit	Code carrier unit (reader/writer) to be read or written. Depending on unit: 1..4

■

7 Services

7

7.1 Loading from code carrier

Reads the tool data from the code carrier; the unit is specified in "unit". The tool is then created if it is not yet available in the NCK. It is also loaded if "LoadTool" was set. The number of the load place in the load magazine is used to do this if "LoadPlace" > 0. If "LoadPlace" = 0 is set, however, the value of the keyword "LoadPlaceNo" in the file "TMS.INI" is used as load place number.
The index of the NCU, the channel number and the magazine number must be specified.

If the "Magazine" parameter is assigned the value "0", the tool is loaded to the magazine that has an empty location.

If the value for "MagazinePlace" > 0, an attempt is made to load the tool to this magazine place.

Table 7-1   Parameters for "Loading from code carrier"

PLC data	Identifier	Type	Value range	Meaning
Transfer parameters				
DBW 180	MagazinePlace	INT	0...32000	Magazine place number
DBB 188	Channel	BYTE	1...127	Channel number
DBB 189	LoadPlace	BYTE	1...127	Load place number
DBW 190	Magazine	INT	0...32000	Magazine number
DBB 192	Unit	BYTE	1...127	Number of reader
DBB 193	NCU_Index	BYTE	0...127	Index of NCU
DBX 196.2	LoadTool	BOOL	TRUE, FALSE	Load tool after creating?
Return parameters				
DBW 198	Subtype	INT	1...32000	Subtype
DBW 200	Duplo	INT	0...32000	Duplo number
DBB 202	Ident	String	32 chars	Tool identifier
DBW 236	TNumber	INT	0...32000	T number
DBW 238	ToolState	INT	0...32000	Status of tool
DBW 240	MagazinePlace Type	INT	0...32000	Magazine place type
DBB 242	ToolSize_Upper	BYTE	1...127	Tool size upper in half locations
DBB 243	ToolSize_Down	BYTE	1...127	Tool size down in half locations
DBB 244	ToolSize_Left	BYTE	1...127	Tool size left in half locations
DBB 245	ToolSize_Right	BYTE	1...127	Tool size right in half locations
DBW 246	Magazine	INT	0...32000	Magazine number
DBW 248	MagazinePlace	INT	0...32000	Magazine place number

7.2 Unloading from code carrier

Unloads the tool with the identifier specified in "Ident". The magazine number, channel number, Duplo number and the index of the NCU must be specified. If "DeleteTool" is set, the tool is deleted from the NCK.

If the "Magazine" parameter is assigned the value 0, the tool is unloaded from any one of the magazines.

If the "Magazine" and "MagazinePlace" parameters are set > 0", an attempt is made to unload the tool located at this place. The "Duplo" and "Ident" parameters are not considered.

The number of the unload place in the unload magazine is used to do this if "LoadPlace" > 0. If "LoadPlace" = 0 is set, however, the value of the keyword "UnloadPlaceNo" in the file "TMS.INI" is used as unload place number.

Table 7-2   Parameters for "Unloading from code carrier"

PLC data	Identifier	Type	Value range	Meaning
Transfer parameters				
DBW 142	Duplo	INT	1...32000	Duplo number
DBB 144	Ident	String	32 characters	Tool identifier
DBW 180	Magazine-Place	INT	0...32000	Magazine place number
DBB 188	Channel	BYTE	1...127	Channel number
DBB 189	LoadPlace	BYTE	1...127	Unload place number
DBW 190	Magazine	INT	0...32000	Magazine number
DBB 192	Unit	BYTE	1...127	Number of reader
DBB 193	NCU_Index	BYTE	0...127	Index of NCU
DBX 196.3	DeleteTool	BOOL	TRUE, FALSE	Delete tool after unload?
Return parameters				
None				

7.3 Loading from the tool cabinet

This service is mainly suitable for use in conjunction with the "Read from code carrier" service (Section 7.16) when only partial information are contained on the code chip.

This is generally the case when low-cost, read-only code chips are used.

Reads the tool data from the database and creates the tool in the NCK if it does not already exist. The "Subtype", "Duplo" and "Ident" parameters need not be assigned. If "Subtype" and "Duplo" are not assigned, they must be specified as "-1". "Ident" is specified as a blank string if it is not to be assigned.

If "Subtype", "Ident" or "Duplo" are not assigned uniquely, several tools can be found in the database.

If the T number is specified as "0", the T number is assigned by the NCK. If a T number greater than "0" is specified, an attempt is made to create the tool with this number and load it. If this T number cannot be used, the T number is assigned by the NCK.

If several selected tools are to be loaded using this service and the T number is specified greater than "0", the desired tool number is incremented successively. It is not checked whether these incremented tool numbers are free in the NCK.

The "TNumber" parameter has no effect if the tool already exists in the tool list.

The "ActiveEnable" parameter defines how the tool status bit "T active" is handled. If this parameter is set (TRUE), this status bit is taken into the NCK unchanged from the database. If "ActiveEnable" is FALSE, however, this status bit is hidden on reading from the database and is therefore not entered as set in the NCK.

If the magazine number is specified as "0", the tool/s is/are loaded to the magazine that has an empty location if LoadTool is set. The number of the load place in the unload magazine is used to do this if "LoadPlace" > 0. If "LoadPlace" = 0 is set, however, the value of the keyword "LoadPlaceNo" in the file "TMS.INI" is used as load place number.

If the value for "MagazinePlace" > 0, an attempt is made to load the tool to this magazine place.

The parameters for this service are shown in the table below. Depending on the parameter value, several tools can be loaded to the NCK from the database at the same time. An overview of the possible parameters is given in Table 7-4.

Table 7-3   Parameters for "Loading from the tool cabinet"

PLC data	Identifier	Type	Value range	Meaning
Transfer parameters				
DBW 140	Subtype	INT	-1, 1...32000	Subtype
DBW 142	Duplo	INT	-1...32000	Duplo number
DBB 144	Ident	String	32 chars	Tool identifier
DBW 178	TNumber	INT	0...32000	T number
DBW 180	Magazine-Place	INT	0...32000	Magazine place number
DBB 188	Channel	BYTE	1...127	Channel number
DBB 189	LoadPlace	BYTE	1...127	Load place number
DBW 190	Magazine	INT	0...32000	Magazine number
DBB 193	NCU_Index	BYTE	0...127	Index of NCU
DBX 196.0	ActiveEn-able	BOOL	TRUE, FALSE	Hide NCK status bits "T active"?
DBX 196.2	LoadTool	BOOL	TRUE, FALSE	Load tool after creating?
Return parameters				
DBW 198	Subtype	INT	1...32000	Subtype
DBW 200	Duplo	INT	0...32000	Duplo number
DBB 202	Ident	String	32 chars	Tool size identifier
DBW 236	TNumber	INT	0...32000	T number
DBW 238	ToolState	INT	0...32000	Status of tool
DBW 240	Magazine-PlaceType	INT	0...32000	Magazine place type
DBB 242	ToolSize_Upper	BYTE	1...127	Tool size upper in half locations
DBB 243	ToolSize_Down	BYTE	1...127	Tool down in half locations
DBB 244	ToolSize_Left	BYTE	1...127	Tool size left in half locations
DBB 245	ToolSize_Right	BYTE	1...127	Tool size right in half locations
DBW 246	Magazine	INT	0...32000	Magazine number
DBW 248	Magazine-Place	INT	0...32000	Magazine place number

Table 7-4   Parameter combinations for "Loading from the tool cabinet"

PLC data		Identifier	Value	Meaning
DBW	140	Subtype	-1	Several tools may be found in the database.
			>0	Tools with this subtype are laoded.
DBW	142	Duplo	-1	Several tools may be found in the database.
			>0	Tools with this Duplo number are loaded.
DBW	144	Ident	" "	Several tools may be found in the database.
			Name	Tools with this name are laoded.
DBW	178	TNumber	0	The NCK assigns a free T number.
			>0	An attempt is made to create the tool with this T number and load it.
DBW	180	Magazine-Place	0	The tool is loaded to a free magazine place specified by the NCK.
			>0	An attempt is made to load the tool to the specified magazine place.
DBW	190	Magazine	0	The tool/s is/are loaded to any magazine.
			>0	The tool/s is/are loaded to the specified magazine.

7.4 Unloading to the tool cabinet

This service is mainly suitable for use in conjunction with the "Read data from code carrier" service (Section 7.16) when only partial information are contained on the code chip.

This is generally the case when low-cost, read-only code chips are used.

Unloads the tool identified by "Ident" from the NCK to the tool cabinet. The "NCU", "Channel", "Ident", "Duplo" and "Magazine" parameters must be assigned.

If the magazine number is specified as "0", the tool is unloaded from any magazine.

If the value for "MagazinePlace" > 0, an attempt is made to unload the tool from this magazine place.

The number of the unload place in the unload magazine is used to do this if "LoadPlace" > 0. If "LoadPlace" = 0 is set, however, the value of the keyword "UnloadPlaceNo" in the file "TMS.INI" is used as unload place number.

The tool in the NCK is deleted after successful unloading if "DeleteTool" was set.

Table 7-5   Parameters for "Unloading from tool cabinet"

PLC data	Identifier	Type	Value range	Meaning
Transfer parameters				
DBW 142	Duplo	INT	1...32000	Duplo number
DBB 144	Ident	String	32 characters	Tool identifier
DBW 180	Magazine-Place	INT	0...32000	Magazine place number
DBB 188	Channel	BYTE	1...127	Channel number
DBB 189	LoadPlace	BYTE	1...127	Unload place number
DBW 190	Magazine	INT	0...32000	Magazine number
DBB 193	NCU_Index	BYTE	0...127	Index of NCU
DBX 196.3	DeleteTool	BOOL	TRUE, FALSE	Delete tool after unload?
Return parameters				
None				

7.5 Loading from host computer

Requests data for the tool identified per "Ident" from the host computer and creates it in the NCK if it does not already exist. The "NCU_Index", "Channel", "Ident", "Duplo" and "Magazine" must be assigned.

If the magazine number is specified as "0", the tool is loaded to the magazine that has an empty location if LoadTool is set. The number of the load place in the un-load magazine is used to do this if "LoadPlace" > 0. If "LoadPlace" = 0 is set, however, the value of the keyword "LoadPlaceNo" in the file "TMS.INI" is used as load place number.
If the value for "MagazinePlace" > 0, an attempt is made to load the tool to this magazine place.

Table 7-6   Parameters for "Loading from host computer"

PLC data	Identifier	Type	Value range	Meaning
Transfer parameters				
DBW 142	Duplo	INT	1...32000	Duplo number
DBB 144	Ident	String	32 characters	Tool identifier
DBW 180	Magazine-Place	INT	0...32000	Magazine place number
DBB 188	Channel	BYTE	1...127	Channel number
DBB 189	LoadPlace	BYTE	1...127	Load place number
DBW 190	Magazine	INT	0...32000	Magazine number
DBB 193	NCU_Index	BYTE	0...127	Index of NCU
DBX 196.2	LoadTool	BOOL	TRUE, FALSE	Load tool after creating?
Return parameters				
DBW 198	Subtype	INT	1...32000	Subtype
DBW 200	Duplo	INT	0...32000	Duplo number
DBB 202	Ident	String	32 characters	Tool identifier
DBW 236	TNumber	INT	0...32000	T number
DBW 238	ToolState	INT	0...32000	Status of tool
DBW 240	Magazine-Place Type	INT	0...32000	Magazine place type
DBB 242	ToolSize_Upper	BYTE	1...127	Tool size upper in half locations
DBB 243	ToolSize_Down	BYTE	1...127	Tool size down in half locations
DBB 244	ToolSize_Left	BYTE	1...127	Tool size left in half locations
DBB 245	ToolSize_Right	BYTE	1...127	Tool size right in half locations
DBW 246	Magazine	INT	0...32000	Magazine number
DBW 248	Magazine-Place	INT	0...32000	Magazine place number

7.6 Unloading to host computer

Unloads the tool identifed by "Ident" from the NCK and trasfers the data to the host computer. The "NCU_Index", "Channel", "Ident", "Duplo" and "Magazine" must be assigned.

If the magazine number is specified as "0", the tool is unloaded from any magazine and then deleted if "DeleteTool" is set.

If the value for "MagazinePlace" > 0, an attempt is made to unload the tool from this magazine place.

The number of the unload place in the unload magazine is used to do this if "LoadPlace" > 0. If "LoadPlace" = 0 is set, however, the value of the keyword "UnloadPlaceNo" in the file "TMS.INI" is used as unload place number.

Table 7-7   Parameters for "Unloading to tool cabinet"

PLC data	Identifier	Type	Value range	Meaning
Transfer parameters				
DBW 142	Duplo	INT	1...32000	Duplo number
DBB 144	Ident	String	32 characters	Tool identifier
DBW 180	Magazine-Place	INT	0...32000	Magazine place number
DBB 188	Channel	BYTE	1...127	Channel number
DBB 189	LoadPlace	BYTE	1...127	Unload place number
DBW 190	Magazine	INT	0...32000	Magazine number
DBB 193	NCU_Index	BYTE	0...127	Index of NCU
DBX 196.3	DeleteTool	BOOL	TRUE, FALSE	Delete tool after unload?
Return parameters				
None				

7.7 Unloading all tools to the tool cabinet

This service provides the user with the simplest method of emptying a magazine and saving the tools in the tool cabinet.

The data of all loaded tools in the specified magazine are read from the NCK and written to the database. The tools are then unloaded from the magazine and deleted.
The "NCU_Index", "Channel "and "Magazine" parameters must be assigned.

If the magazine with number "0" is specified, all the loaded tools are unloaded from all magazines present in the NCK; the spindle magazine is also considered. The order for unloading corresponds to the order in which the tools were loaded.

Table 7-8   Parameters for "Unloading all tools from tool cabinet"

PLC data	Identifier	Type	Value range	Meaning
Transfer parameters				
DBB 188	Channel	BYTE	1...127	Channel number
DB 190 W	Magazine	INT	0...32000	Magazine number
DBB 193	NCU_Index	BYTE	0...127	Index of NCU
Return parameters				
None				

7.8 Loading a tool

A tool present in the tool list is loaded to a magazine place.

The tool specified by "Channel", "Duplo" and "Ident" is loaded to the tool magazine specified by "Magazine". "NCU_Index" specifies the NCU.

If "0" is specified as the magazine number, the next free magazine place that can be used for the tool is located.

If the value for "MagazinePlace" > 0, an attempt is made to load the tool to this magazine place.

The number of the load place in the unloading magazine is used to do this if "LoadPlace" > 0. If "LoadPlace" = 0 is set, however, the value of the keyword "LoadPlaceNo" in the file "TMS.INI" is used as load place number.

Table 7-9   Parameters for "Loading a tool"

PLC data		Identifier	Type	Value range	Meaning
Transfer parameters					
DBW	142	Duplo	INT	1...32000	Duplo number
DBB	144	Ident	String	32 characters	Tool identifier
DBW	180	Magazine-Place	INT	0...32000	Magazine place number
DBB	188	Channel	BYTE	1...127	Channel number
DBB	189	LoadPlace	BYTE	1...127	Load place number
DBW	190	Magazine	INT	0...32000	Magazine number
DBB	193	NCU_Index	BYTE	0...127	Index of NCU
Return parameters					
None					

7.9 Unloading a tool

The tool specified by "Channel", "Duplo" and "Ident" is unloaded from the
magazine and then deleted if the parameter "DeleteTool" is set.

If the value for "MagazinePlace" > 0, an attempt is made to unload the tool from
this magazine place.

The number of the unload place in the unload magazine is used to do this if
"LoadPlace" > 0. If "LoadPlace" = 0 is set, however, the value of the keyword
"UnloadPlaceNo" in the file "TMS.INI" is used as unload place number.

Table 7-10   Parameters for "Unloading a tool"

PLC data	Identifier	Type	Value range	Meaning
Transfer parameters				
DBW 142	Duplo	INT	1...32000	Duplo number
DBB 144	Ident	String	32 characters	Tool identifier
DBW 180	MagazinePlace	INT	0...32000	Magazine place number
DBB 188	Channel	BYTE	1...127	Channel number
DBB 189	LoadPlace	BYTE	1...127	Unload place number
DBW 190	Magazine	INT	0...32000	Magazine number
DBB 193	NCU_Index	BYTE	0...127	Index of NCU
DBX 196.3	DeleteTool	BOOL	TRUE, FALSE	Delete tool after unload?
Return parameters				
None				

7.10 Location search

Searches in the specified magazine for a free tool place for the tool specified with "TNumber" or "Ident" and "Duplo".

When the "TNumber" is specified, the requried tool data are fetched from the tool list and a free tool place is loacted.

If the magazine is assigned the value "0", the next free tool place is searched for in all magazines.

Table 7-11   Parameters for "Location search"

PLC data		Identifier	Type	Value range	Meaning
Transfer parameters					
DBW	142	Duplo	INT	1...32000	Duplo number
DBB	144	Ident	String	32 characters	Tool identifier
DBW	178	TNumber	INT	0...32000	T number
DBB	188	Channel	BYTE	1...127	Channel number
DBW	190	Magazine	INT	0...32000	Magazine number
DBB	193	NCU_Index	BYTE	0...127	Index of NCU
Return parameters					
DBW	198	Subtype	INT	1...32000	Subtype
DBW	200	Duplo	INT	0...32000	Duplo number
DBB	202	Ident	String	32 characters	Tool identifier
DBW	236	TNumber	INT	0...32000	T number
DBW	238	ToolState	INT	0...32000	Status of tool
DBW	240	MagazinePlace Type	INT	0...32000	Magazine place type
DBB	242	ToolSize_ Upper	BYTE	1...127	Tool size upper in half locations
DBB	243	ToolSize_Down	BYTE	1...127	Tool size down in half locations
DBB	244	ToolSize_Left	BYTE	1...127	Tool size left in half locations
DBB	245	ToolSize_Right	BYTE	1...127	Tool size right in half locations
DBW	246	Magazine	INT	0...32000	Magazine number
DBW	248	MagazinePlace	INT	0...32000	Magazine place number

7.11 Deleting a tool in the NCK

Deletes the tool in the NCK defined by the "TNumber" or with "Ident" and "Duplo" if it is not loaded.
If a T number greater than "0" is specified, an attempt is made to delete the tool with this number.
If "TNumber = 0" is set, an attempt is made to delete the tool with the specified "Ident" and "Duplo" in the NCK.

Table 7-12   Parameters for "Deleting a tool in the NCK"

PLC data	Identifier	Type	Value range	Meaning
Transfer parameters				
DBW 142	Duplo	INT	1...32000	Duplo number
DBB 144	Ident	String	32 characters	Tool identifier
DBW 178	TNumber	INT	0...32000	T number
DBB 188	Channel	BYTE	1...127	Channel number
DBB 193	NCU_Index	BYTE	0...127	Index of NCU
Return parameters				
None				

7.12 Deleting a tool in the database

Deletes the data of a tool in the database. When deleting, it is checked whether tools of the selected area are loaded in the NCK. The data of tools that are loaded are not deleted in the database.

The "Subtype", "Ident" and "Duplo" parameters need not be assigned. If "Subtype" and "Duplo" are not assigned, they must contain the value "-1". "Ident" is specified as a blank string if no particular tool is to be deleted.

If "Subtyp" is not assigned, several tools may be deleted.

If "Duplo" is not assigned, all tools with the relevant identifier and subtype are deleted in the database. If the "Duplo" number is specified as "0", both the master data and application data are deleted.

If "Duplo" and "Ident" are not specified, all tools of the relevant subtype are deleted in the cabinet.

If the subtype < 10 and "Duplo" and "Ident" are not assigned, the tool type is deleted. For example, all milling tools are deleted for the value "1".

With "Subtype -1", if a blank string is specifed for the identifier and "-1" for the "Duplo" number, the entire tool cabinet is deleted.

If the subtype is "-1", the identifier a blank string and the "Duplo" number = "0", the entire tool catalog and tool cabinet are deleted.

Table 7-13   Parameters for "Deleting a tool in the database"

PLC data		Identifier	Type	Value range	Meaning
Transfer parameters					
DBW	140	Subtype	INT	-1, 1...32000	Subtype
DBW	142	Duplo	INT	-1...32000	Duplo number
DBB	144	Ident	String	32 characters	Tool identifier
Return parameters					
None					

Table 7-14   Parameter combinations for "Deleting a tool in the database"

PLC data		Identifier	Value	Meaning
DBW	140	Subtype	>0	Deletes the tools with the relevant subtype and name
DBW	142	Duplo	-1	
DBB	144	Ident	Name	
DBW	140	Subtype	>0	Deletes master data andapplication data
DBW	142	Duplo	0	
DBB	144	Ident	Name	
DBW	140	Subtype	>0	Deletes all tools of this subtype
DBW	142	Duplo	-1	
DBB	144	Ident	""	
DBW	140	Subtype	<10	Deletes tool type
DBW	142	Duplo	-1	
DBB	144	Ident	""	
DBW	140	Subtype	-1	Deletes the entire tool cabinet
DBW	142	Duplo	-1	
DBB	144	Ident	""	
DBW	140	Subtype	-1	Deletes the entire tool cabinet and tool catalog
DBW	142	Duplo	0	
DBB	144	Ident	""	

7.13 Exporting tool data

Exporting tool data from the database to a file in "NCK-INITIAL.INI" format.

The "Subtype", "Ident" and "Duplo" parameters need not be assigned. If "Subtype" and "Duplo" are not assigned, they must contain the value "-1". "Ident" is specified as a blank string if no particular tool is to be exported.

If "Duplo" is not specified, all tools with the relevant identifier and subtype are exported.

If "Duplo" and "Ident" are not specified, all tools of the relevant subtype are exported.

If the "Subtype" is less than "10" and "Duplo" and "Ident" are not assigned, the entire tool type is exported. For example, all mill types are exported if the value is "1".

If the "Subtype" is less than "10" and "Duplo" and "Ident" are not assigned, the entire tool type is exported. For example, all mill types are exported if the value is "1".

All tools in the selected range are saved in the file whose index is specified in FileIndex. It should be checked whether some of the tools whose data are to be exported are loaded in the NCK. The current data from the loaded tools are read from the NCK and updated in the database before these data are written to the file.

Table 7-15   Parameters for "Exporting tool data"

PLC data	Identifier	Typ	Value range	Meaning
Transfer parameters				
DBW 140	Subtype	INT	-1, 1...32000	Subtype
DBW 142	Duplo	INT	-1...32000	Duplo number
DBB 144	Ident	String	32 characters	Tool identifier
DBW 194	FileIndex	INT	0...32000	File index for export
DBX 196.1	Override	BOOL	TRUE, FALSE	Overwrite file if it exists?
Return parameters				
None				

Table 7-16   Parameter combinations for "Exporting tool data"

PLC data	Identifier	Value	Meaning
DBW 140	Subtype	>0	Exports the tools with the relevant subtype and name
DBW 142	Duplo	-1	
DBB 144	Ident	Name	
DBW 140	Subtype	>0	Exports the tools with the relevant subtype and name
DBW 142	Duplo	-1	
DBB 144	Ident	""	
DBW 140	Subtype	<10	Exports the entire tool type
DBW 142	Duplo	-1	
DBB 144	Ident	""	
DBW 140	Subtype	-1	Exports the entire database
DBW 142	Duplo	-1	
DBB 144	Ident	""	

7.14 Importing tool data

Imports from a file in "NCK-INITIAL.INI" file format to the database.

Only the index of the file from which the data are to be imported is specifed as parameter in the file "FileIndex".

The import is only made to the tool cabinet as a rule. If a tool is not yet known in the database, it is also imported to the catalog.

If tools from those to be imported are already loaded in the NCK, import of the record for these tools is rejected with an error message and an alarm triggered via the alarm server. The relevant records are skipped in the import file.

Table 7-17   Parameters for "Importing tool data"

PLC data	Identifier	Type	Value range	Meaning
Transfer parameters				
DBW 194	FileIndex	INT	0...32000	File index for import
Return parameters				
None				

7.15 Updating the code carrier

Updates the data on the code carrier.

The data of the tool specified by the "NCU_Index", "Channel", "Duplo", "Ident", "Magazine" and "MagazinePlace" are read from the NCK and written to the code carrier of the tool. The code carrier is defined via Unit.

If "0" is transferred for magazine, the tool is searched for in all magazines. If "MagazinePlace = 0" is also specified, the tool specified with "Duplo" and "Ident" is only searched for in the tool list.

If the "Magazine" and "MagazinePlace" parameters are set > 0", an attempt is made to unload the data of the tool located at this place. The "Duplo" and "Ident" parameters are not considered in this case.

Table 7-18   Parameters for "Updating the code carrier"

PLC data	Identifier	Type	Value range	Meaning
Transfer parameters				
DBW 142	Duplo	INT	1...32000	Duplo number
DBB 144	Ident	String	32 characters	Tool identifier
DBW 180	MagazinePlace	INT	0...32000	Magazine place number
DBB 188	Channel	BYTE	1...127	Channel number

DBW	190	Magazine	INT	0...32000	Magazine number
DBB	192	unit	BYTE	1...127	Number of reader
DBB	193	NCU_Index	BYTE	0...127	Index of NCU
Return parameters					
None					

7.16 Reading data from the code carrier

Reading tool data from the code carrier and writing the return parameters to the PLC. The code carrier is defined via "Unit".

This makes it possible to read the two data of a code chip on which only the "Duplo" number and tool identifier are stored. The load/unloaded services, for example, can then be called from the tool cabinet (Sections 7.3 and 7.4).

In this way, low-cost "readonly" code chips can also be used.

Table 7-19   Parameters for "Reading data from the code carrier"

PLC data		Identifier	Type	Value range	Meaning
Transfer parameters					
DBB	192	unit	BYTE	1...127	Number of reader
Return parameters					
DBW	198	Subtype	INT	1...32000	Subtype
DBW	200	Duplo	INT	0...32000	Duplo number
DBB	202	Ident	String	32 characters	Tool identifier
DBW	236	TNumber	INT	0...32000	T number
DBW	238	ToolState	INT	0...32000	Status of tool
DBW	240	MagazinePlace Type	INT	0...32000	Magazine place type
DBB	242	ToolSize_Upper	BYTE	1...127	Tool size upper in half locations
DBB	243	ToolSize_Down	BYTE	1...127	Tool size down in half locations
DBB	244	ToolSize_Left	BYTE	1...127	Tool size left in half locations
DBB	245	ToolSize_Right	BYTE	1...127	Tool size right in half locations
DBW	246	Magazine	INT	0...32000	Magazine number
DBW	248	MagazinePlace	INT	0...32000	Magazine place number

7.17 Storing tool data in the NCK

Creates the tool in the NCK that was read previously from the code carrier. The index of the NCU and the channel number must be specified.
If "LoadTool" is set, the tool is also loaded. The number of the load place in the unload magazine is used to do this if "LoadPlace" > 0. If "LoadPlace" = 0 is set, however, the value of the keyword "LoadPlaceNo" in the file "TMS.INI" is used as load place number.

If the "Magazine" parameter is assigned the value "0", the tool is loaded to the magazine that has an empty location.
If the value for "MagazinePlace" > 0, an attempt is made to load the tool to this magazine place.
After executing the service, the current tool data are returned in the Return parameters.

Table 7-20   Parameters for "Storing tool data in the NCK"

PLC data		Identifier	Type	Value range	Meaning
Transfer parameters					
DBW	180	MagazinePlace	INT	0...32000	Magazine place number
DBB	188	Channel	BYTE	1...127	Channel number
DBB	189	LoadPlace	BYTE	1...127	Load place number
DBW	190	Magazine	INT	0...32000	Magazine number
DBB	193	NCU_Index	BYTE	0...127	Index of NCU
DBX	196.2	LoadTool	BOOL	TRUE, FALSE	Load tool after creating?
Return parameters					
DBW	198	Subtype	INT	1...32000	Subtype
DBW	200	Duplo	INT	0...32000	Duplo number
DBB	202	Ident	String	32 chars	Tool identifier
DBW	236	TNumber	INT	0...32000	T number
DBW	238	ToolState	INT	0...32000	Status of tool
DBW	240	MagazinePlace Type	INT	0...32000	Magazine place type
DBB	242	ToolSize_ Upper	BYTE	1...127	Tool size upper in half locations
DBB	243	ToolSize_Down	BYTE	1...127	Tool size down in half locations
DBB	244	ToolSize_Left	BYTE	1...127	Tool size left in half locations
DBB	245	ToolSize_Right	BYTE	1...127	Tool size right in half locations
DBW	246	Magazine	INT	0...32000	Magazine number
DBW	248	MagazinePlace	INT	0...32000	Magazine place number

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8

8 Starting Services

8.1 Executing services via the PLC interfaces

The services are executed in the following order via the PLC interface:

1. Specify command code
2. Set request bit
3. Wait until done bit is set
4. Check error code
5. Reset request bit

This sequence is illustrated in a pulse diagram in the figure below. It shows the bits that are set and reset during execution of the service by "TDI Ident Connection".
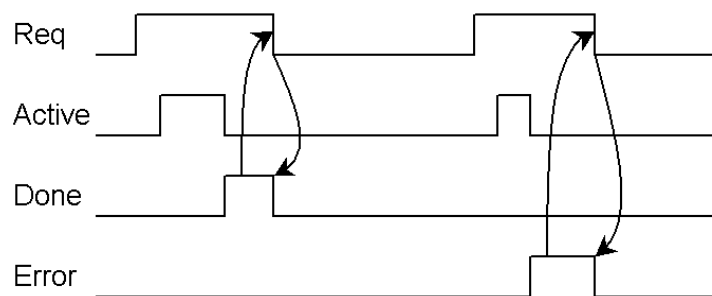
Fig. 8-1   Pulse diagram

Setting the request bit (Req) starts the service specified via the command code. Then the active bit is set to show that the job is being processed. When success-fully completed, the "Done" bit is set and the "Active" bit reset.

In the event of an error, the "Error" bit is set and an error message written to the relevant PLC word; the "Active" bit is also reset in this case.

After the PLC has reset the "Request" bit, the "Done" or "Error" is reset again. In addition, the "Error" word is set ot "0", i.e. the PLC must evaluate the error mes-sage before resetting the request bit.

! **Important**

While executing the service, the "Request" bit must not be reset by the PLC. A reset is only possible when the "Active" bit of "TDI Ident Connection" has been reset and the "Done" or "Error" bit is set.

8.2 Executing services via standard tool management

With HMI Advanced SW 06.02.10 and MMC103 SW 05.03.20, the Siemens standard tool management (ParamTM) offers the option of initiating the services of "TDI Ident Connection" for reading and writing the tool data from/to code carrier per soft key operation.

These service are also called by "ParamTM" via the user interface of the standard tool management in conjunction with loading tools from the code carrier and un-loading tools on the code carrier.

The communication with the PLC user program required by "TDI Ident Connection" is handled via the "ParamTM" interface (see Section 4.4).

The associated operational sequences and relevant pulse diagrams are explained using examples in Subsections 9.3.3 and 9.3.4.

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9

9 Examples

9.1 Loading from code carrier via PLC interface

In this example, the data of an imaginary tool "WZ_Test13" are read from a code carrier, the tool created in the NCK and loaded. The tool is to be loaded in magazine "1" of the standard NCU in channel "1". The procedure is to be handled via Loading place "1" of the magazine.

The transfer parameter required for this service is shown in Table 9-1. The return parameter from "TDI Ident Connection" is shown in Table 9-2.

Before executing the service, the PLC writes the value "0" in the command code byte (C_Code) of the PLC interface in data block DB19. This service is then started by setting the "Request" bit. If the "Active" bit is reset and the "Done" bit set, the error byte can be evaluated by the PLC. The "Request" must be reset again. This sequence is illustrated in Table 9-3.

Table 9-1   Transfer parameters for "Loading from code carrier"

PLC date		Identifier	Value
DBW	180	MagazinePlace	0
DBB	188	Channel	1
DBB	189	LoadingPlace	1
DBW	190	Magazine	1
DBB	192	Unit	1
DBB	193	NCU_Index	0
DBX	196.2	LoadTool	TRUE

Table 9-2   Return parameters for "Loading from code carrier"

PLC date		Identifier	Value
DBW	198	Subtype	120
DBW	200	Duplo	1
DBB	202	Ident	WZ_Test13
DBW	236	TNumber	289
DBW	238	ToolState	14
DBW	240	MagazinePlaceType	1
DBB	242	ToolSize_Upper	1
DBB	243	ToolSize_Down	1
DBB	244	ToolSize_Left	1
DBB	245	ToolSize_Right	1
DBW	246	Magazine	1
DBW	248	MagazinePlace	1

Table 9-3   Sequence "Loading from code carrier"

TDI Ident Connection	PLC
...waits for request from PLC (request bit from 0->1)	
	...writes command code "0" in PLC interface byte C_Code
	...sets request bit of PLC interface (request bit = "1")
	...waits until active bit is set (active bit from 0->1)
...receives request from PLC and starts service if a valid command code is specified. Otherwise, the error bit is set and an error message written to the error_code word.	
...sets active bit (active bit = "1")	
	...waits until active bit is reset (active bit from 1->0)
...reads the data from the code chip or from the PLC data block (depending on reader)	
...loads the tool in the NCK	
...waits for acknowledgement of the PI service from PLC	
	...acknowledges PI service
...writes error code in the error_code word of the PLC interface (in event of error, not equal to 0)	
...sets the done or error bit (done bit = "1" or error bit = "1")	
...resets active bit (active bit = "0")	
...waits for end of request (request bit from 1->0)	
	...evaluates done and error bits and, if necessary error_code
	...resets request bit (request bit = "0")
...receives end of request (request bit = "0")	
...resets done and error bits (done bit = "0" and error bit = "0")	
...deletes error code (error_code word = "0")	
...waits for request from PLC (request bit from 0->1)	
:	:

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9.2 Unloading to code carrier via PLC interface

The tool loaded in the previous example is to be unloaded and the current data written to the code carrier. The tool in the NCK is deleted after unloading. The procedure is to be handled via unloading place "2" of the magazine.

The transfer parameters required are shown in Table 9-4. This service does not return any parameters, so there are no new values in the return parameters of the PLC interface.

Before executing the service, command code "1" must be written to the relevant PLC byte (C_Code). The procedure for starting the service and further handling is equivalent to Section 9.1. The sequence is illustrated in Table 9-5.

Table 9-4   Transfer parameter for "Unloading to code carrier"

PLC date		Identifier	Value
DBW	142	Duplo	1
DBB	144	Ident	WZ_Test13
DBW	180	MagazinePlace	1
DBB	188	Channel	1
DBB	189	LoadingPlace	2
DBW	190	Magazine	1
DBB	192	Unit	1
DBB	193	NCU_Index	0
DBX	196.3	DeleteTool	TRUE

Table 9-5   Sequence of "Unloading from code carrier"

TDI Ident Connection	PLC
...waits for request from PLC (request bit from 0->1)	
	...writes command code "1" in PLC interface byte C_Code
	...sets request bit of PLC interface (request bit = "1")
	...waits until active bit is set (active bit from 0->1)
...receives request from PLC and starts service if a valid command code is specified. Otherwise, the error bit is set and an error message written to the error_code word.	
...sets active bit (active bit = "1")	
	...waits until active bit is reset (active bit from 1->0)
...reads the data on the code chip or in the PLC data block (depending on reader)	
...unloads the tool from the NCK	

	...acknowledges PI service
...writes error code in the error_code word of the PLC interface (in event of error, not equeal to 0)	
...sets the done or error bit (done bit = "1" or error bit = "1")	
...resets active bit (active bit = "0")	
...waits for end of request (request bit from 1->0)	
	...evaluates done and error bits and, if necessary error_code
	...resets request bit (request bit = "0")
...receives end of request (request bit = "0")	
...resets done and error bits (done bit = "0" and error bit = "0")	
...deletes error code (error_code word = "0")	
...waits for request from PLC (request bit from 0->1)	
:	:

9.3 Loading/unloading with code carrier via Profibus

In this example, the tool data are interchanged between "TDI Ident Connection" and the code carrier (e.g.: Moby E) via the appropriately dimensioned DB126 according to the length of the data configured in "wkonvert.txt".
It is assumed that the code carrier is to be moved to the reader by the PLC prior to reading/writing.
Loading/unloading the tools via "TDI Ident Connection" is possible both from the PLC and via the standard tool interface.
The two options are illustrated below:

- Loading/unloading via PLC interface
- Loading/unloading via "ParamTM" (tool interface)

9.3.1 Loading from code carrier via PLC interface

The tool data must be entered in DB126 by the PLC program prior to initiating of the loading procedure.

Sequence of operations
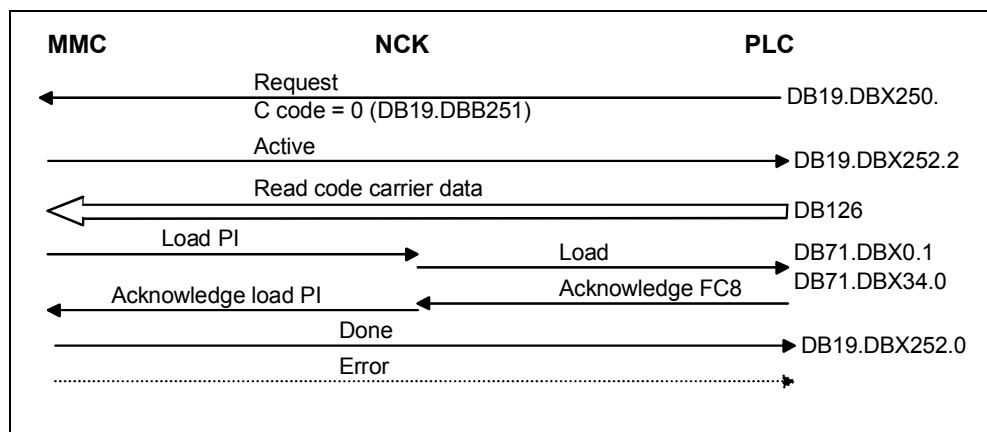
Fig. 9-1   Sequence of operations, loading
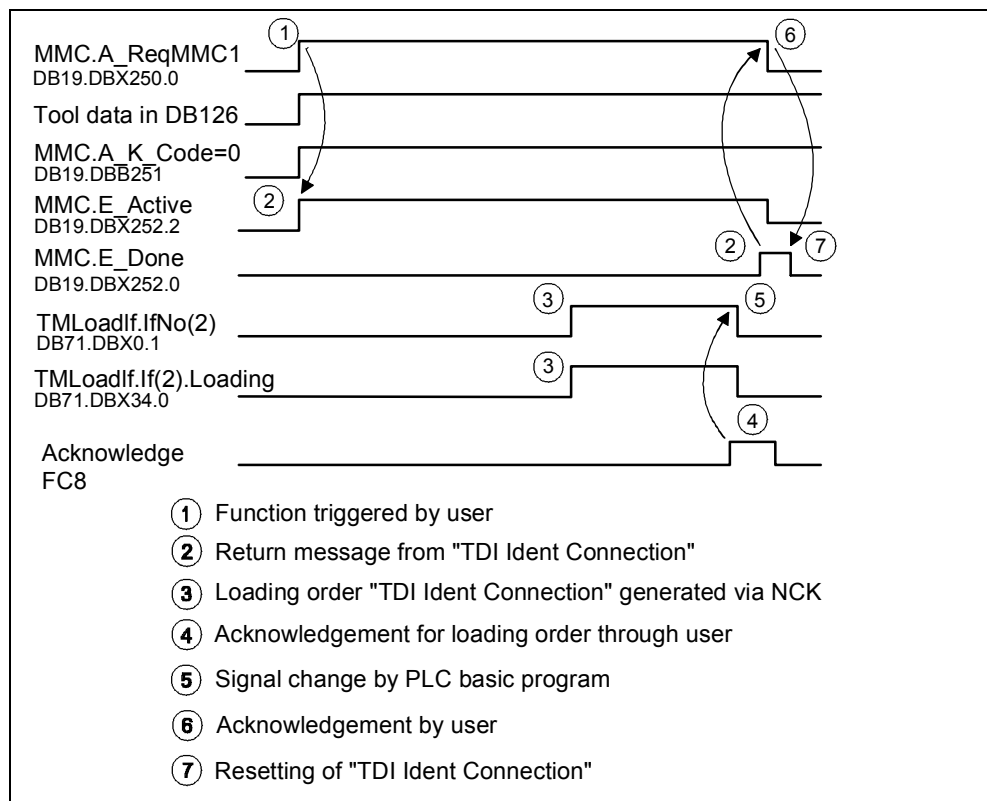
Fig. 9-2   Pulse diagram, loading

9.3.2   Unloading from code carrier via PLC interface

When unloading, the data are entered in DB126 after the "TDI Ident Connection" job is started.

Sequence of operations
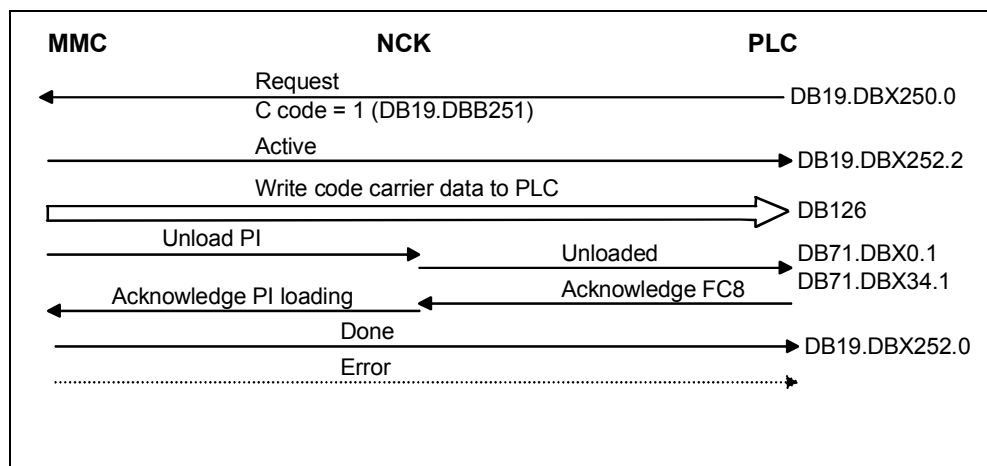
Fig. 9-3   Sequence of operations, unloading

Pulse diagram

Fig. 9-4   Pulse diagram, unloading

The diagram contains the following signals:

- MMC.A_ReqMMC1 (DB19.DBX250.0)
- Tool data in DB126 (writes IdenCon)
- MMC.A_K_Code=1 (DB19.DBB251)
- MMC.E_Active (DB19.DBX252.2)
- MMC.E_Done (DB19.DBX252.0)
- TMLoadIf.IfNo(2) (DB71.DBX0.1)
- TMLoadIf.If(2).Loading (DB71.DBX34.1)
- Acknowledge FC8

1. Function triggered by user
2. Return messag from "TDI Ident Connection"
3. Loading order of "TDI Ident Connection" generated via NCK
4. Acknowledgement for loading order through user
5. Signal change by PLC basic program
6. Acknowledgement by user
7. Resetting of "TDI Ident Connection"
8. "TDI Ident Connection" reads tool data and writes it in DB

9.3.3 Loading via standard tool management interface (ParamtTM)

With HMI Advanced SW 06.02.10 or MMC103 SW 05.03.20 and higher, tool loading can be initiated by the code carrier per soft key from the standard tool management interface. The magazine place to be loaded in this case can be determined via the standard tool management interface. These load operations are output to the PLC via a separate interface in DB19 ("ParamTM" interface).

Sequence of operations
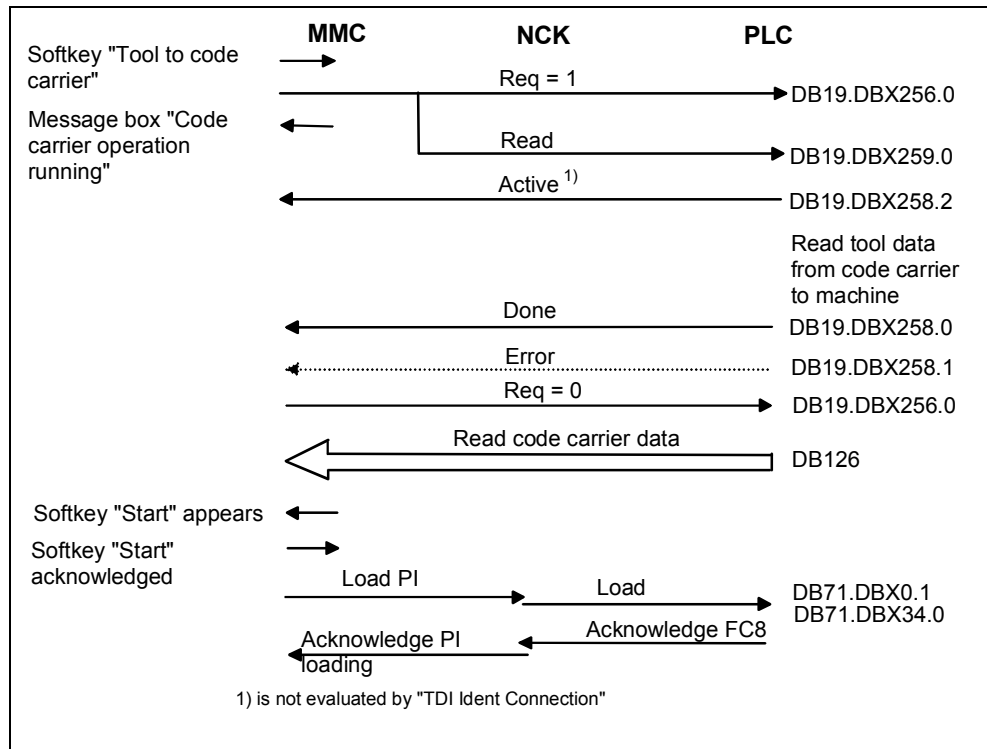
Fig. 9-5   Sequence diagram, loading via standard tool management

Pulse diagram

	Description
(1)	Function triggered by "TDI Ident Connection"
(2)	User action
(3)	Positive acknowledgement from PLC: Code carrier read and tool data provided
(4)	Signal change by "TDI Ident Connection"
(5)	Resetting of acknowledgement after signal change
(6)	Loading order of "TDI Ident Connection" generated via NCK
(7)	Acknowledgement for loading order through user
(8)	Signal change by PLC basic program

Fig. 9-6   Pulse diagram, loading via standard tool management

9.3.4 Unloading via standard tool management interface (ParamtTM)

With HMI Advanced SW 06.02.10 or MMC103 SW 05.03.20 and higher, tool unloading can be initiated on the code carrier per soft key from the standard tool management interface. The tool place to be unloaded can be determined via the standard tool manangement interface in this case. When unloading, the desired tool is selected in the magazine list and unloaded on the code carrier. These unloading procedures are output to the PLC via the separate interface in DB19 ("ParamTM" interface).

Sequence of operations
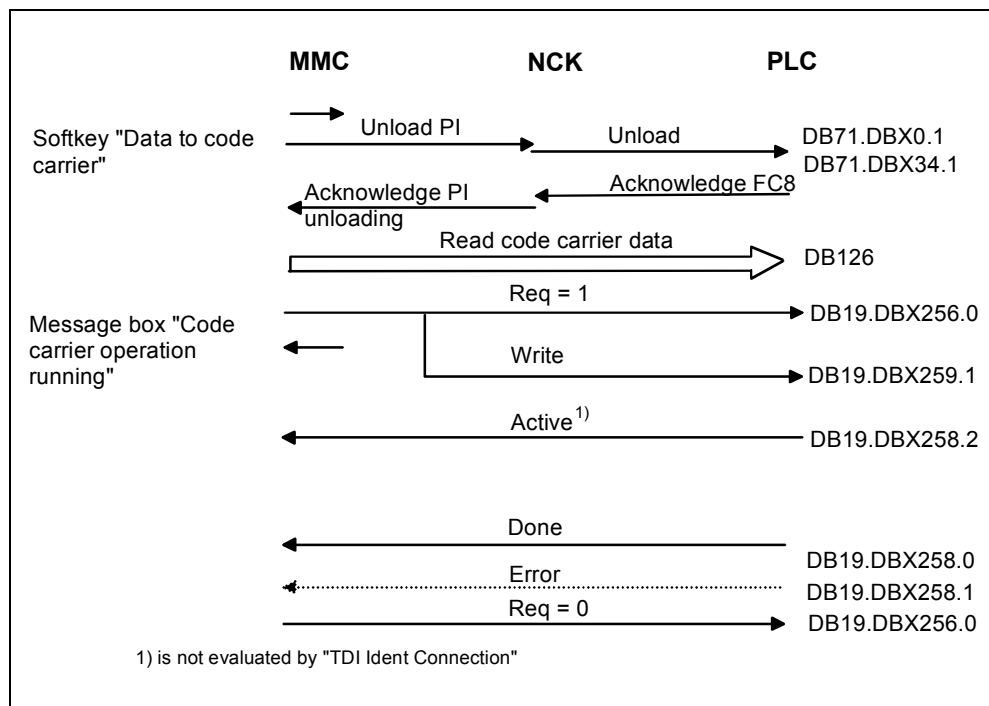
Fig. 9-7   Sequence diagram, unloading via standard tool management

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Pulse diagram

①	Unloading order of "TDI Ident Connection" generated via NCK
②	Acknowledgement for loading order through user
③	Signal change by PLC basic program
④	Function triggered by "TDI Ident Connection"
⑤	User action
⑥	Positive acknowledgement from PLC: Tool data fetched and written to code carrier
⑦	Signal change by "TDI Ident Connection"
⑧	Resetting of acknowledgement after signal change

Fig. 9-8   Pulse diagram, unloading via standard tool management

A

A Appendix

A.1 Error codes

The error codes that are stored in the PLC byte "C_CodeError" or in the PLC word "Error_Code" of the PLC interface are available in hexadecimal format and indicate the position where the execution of the job was aborted with an error.

Should the error code be displayed in decimal format, it must be converted to the hexadecimal format in order to be able to find the cause of the error in tables A-1 to A8.

The error code in "C_CodeError" identifies the command code, where the error occurred.

Table A-1   Command codes of the job in the case of an error

C_Code Error	Service
00	No error
01	Load from code carrier
02	Unload to code carrier
03	Load from tool cabinet
04	Unload to tool cabinet
05	Load from host computer
06	Unload to host computer
07	Unload all tools in the tool cabinet
08	Load tool
09	Unload tool
0A	Search empty location
0B	Delete tool in the NCK
0C	Delete tool in the database
0D	Export tool data
0E	Import tool data
0F	Update code carrier
10	Read data from the code carrier
11	Store tool data in the NCK
...	Spare
F0	Invalid command code
...	Spare

The error codes "Error_Code" are formed by a High-Byte and a Low-Byte, which have different meanings. The High-Byte (XX) identifies the type-of-error group, in which the error occurred. The Low-Byte (YY) indicates the error cause, which is responsible for job abortion.

Format von Error_Code

XX	YY

The contents of XX = 00 and YY = 00 indicate that no error occurred.

XX = 01 : Group of general errors

Table A-2   Low-Byte (YY) of the general error code

	Error cause
01	Error while reading the parameters from DB19
02	Error while calling the internal service
03	Timeout during execution of the service
04	No tool data have been defined so far
05	Error while executing the internal service
...	Spare
	Error in transfer parameter
10	Subtype
11	Duplo
12	Ident
13	TNumber
14	MagazinePlace
15	MagazinePlaceType
16	ToolSize_Upper
17	ToolSize_Down
18	ToolSize_Left
19	ToolSize_Right
1A	Channel
1B	Magazine
1C	unit
1D	NCU_Index
1E	FileIndex
1F	ActiveEnable
20	Override
21	LoadTool
22	DeleteTool
23	Length of Ident
...	Spare

XX = 02:   Group of code carrier errors

Table A-3   Low-Byte (YY) of code carrier error code

	Error cause
	Balluff error
01	No code carrier available
02	Error while reading from code carrier
03	Reading aborted since code carrier was removed
04	Error while writing to code carrier
05	Writing aborted since code carrier was removed
06	Interface error detected by tool ident system
07	Message frame error to tool ident system
08	Checksum error between server and tool ident system
09	Cable breakage of the read/write head
0A	Language DLL (error texts) could not be loaded
0B	COM port cannot be opened
0C	Unknown command string
0D	Impermissible number of bytes
0E	Non-BCD characters found in written data received
0F	COM port cannot be closed
10	Error while assigning COM port parameters
11	Error while receiving from COM port
12	Error while sending to COM port
13	Start address + number of bytes > MAX_CC_CAPACITY in Comtds.ini
	End Balluff error
14	CMD ACK timeout
15	Write ACK timeout
16	Hardware error in reader head
17	Invalid data
18	Device not available
19	Timeout
1A	Hardware error
1B	Invalid head number
1C	Reader head not connected
1D	Parity error at the serial interface
1E	Only reading from device possible
1F	General read error
20	General write error
28	Unknown error
	Bilz error
65	Initial address AA too large
66	Required length LN in byte 13,14 of BIK = 0
67	Length LN is too large for the initial address selected
68	No data carrier recognized (reading/writing, first page)
69	No data carrier recognized (reading/writing, following page)
6B	Check digit error (reading, first page, wrong check digit)
6C	Check digit error (reading, following page, wrong check digit)
6D	No data carrier recognized (writing, first pages)
6E	No data carrier recognized (reading before writing)
6F	No data carrier recognized (writing, last page)
70	Comparison error while writing

		Error cause
	71	Check digit error (reading before writing)
	72	Comparison error (writing, last page)
	73	Non-BCD characters found in written data received
	74	Non-BCD characters found on data carrier
	75	Unknown command, not from the scope of 'I', 'O'
	76	Desired initial address for Code 2 not found
	77	The specified length could not be read
	78	The specified length could not be written
	79	End identifier \264//\264 not found (DB format)
	7A	End identifier \264//\264 not found. Length not read
	7B	Unknown identifier in protocol D header
	7C	Data end identifier '/' not found, data length > 31
	7D	Address end identifier ',' not found, address length > 31
	7E	Requested address not found (reading)
	7F	Format conflict, target field was too short
	80	Conditionally requested data were not written
	81	Data could not be written because of insufficient space
	82	Unconditionally requested data not found (writing)
	83	Fixed-code data are too long, format change not possible
	84	F24 occurred after F20
	85	Address length too large
	86	Format parameter error
	87	Format ID error
	88	Sign error in formats without sign
	89	AFA = 0 found (number of following address format blocks)
	8A	No address or data end identifier found after F20
	8B	Protocol D is not installed
	8C	Non-decimal digit found in decimal field
	8D	Incorrect access to data carrier
	8E	Data on data carrier incomplete
	8F	Address error, access to address >= 122 for TDTI256
	90	Unknown function identifier for protocol 0
	91	Data length error, TZVI response message frame is too short
	92	No data carrier available
	93	High-frequency error TZVI
	94	Syntax error in CISCP command message frame
	95	Other T no. on data carrier (CISCP protocol)
	96	Write-protected field addressed (CISCP protocol)
	B4	TDS station sends too many STX without DLE as response
	B5	Message frame collision between control and TDSE

XX = 05 :   Group of NCK errors

Table A-4   Low-Byte (YY) of NCK error code

	Error cause
00	Connection to required NCU could not be established
05	Reading of NCK configuration failed
0A	An invalid channel number was specified in the job
3C	An invalid magazine number was specified in the job
3E	An invalid magazine place number was specified in the job
3F	An invalid cutting edge OEM monitoring parameter number was specified in the job
41	MMC semaphore for Create/Search tool already assigned
46	The tool indicated with identifier and duplo number could not be found in the NCK
47	The tool indicated with T number could not be found in the NCK
48	No tools found in the magazine specified
49	No tool has been loaded to the magazine place specified
4A	Number of tools found could not be read in the NCK
4B	Number of tools found could not be read in the NCK
50	The tool indicated with identifier and duplo number has not been created in the NCK
55	The tool indicated has already been loaded to the magazine
5A	The tool cutting edge with the number specified has not been created in the NCK
5B	The tool cutting edge with the number specified has not been deleted in the NCK
5C	The cutting edge indicated is not available in the NCK
5D	Invalid tool cutting edge number
5E	The cutting edge indicated exists already in the NCK
5F	Tool status could not be read in the NCK
64	MMC semaphore for empty location search already assigned
69	An empty magazine place could not be found in the NCK during loading
6E	Negative acknowledgement for checking of the specified magazine loading place
73	MMC semaphore for Load/Unload tool already assigned
78	Magazine blocked or not released for loading
7D	Tool loading was terminated with an error
82	The magazine number of the tool could not be read in the NCK
87	The tool indicated has not been loaded in the NCK
8C	The tool indicated has been loaded in another magazine
8E	The tool indicated has been loaded in another magazine place
91	Magazine status could not be read in the NCK
96	Magazine not in loading position or not released for unloading
9B	Tool unloading was terminated with an error
A0	The tool could not be deleted in the NCK

	Error cause
A5	The tool indicated has been loaded in the NCK! The tool could not be deleted in the NCK
D2	The tool indicated has been loaded in the NCK! The tool has not been deleted in the DB

XX = 07 : Group of database errors

Table A-5   Low-Byte (YY) of database error code

	Error cause
00	The tool exists already in the DB but its data cannot be updated
05	The tool exists already in the DB but its OEM data cannot be updated
0A	The cutting edge exists already in the DB but its data cannot be updated
0F	The cutting edge exists already in the DB but its OEM data cannot be updated
11	The cutting edge exists already in the DB but its OEM monitoring data cannot be updated
12	The tool has not been entered in the DB! Tool with identical name and other subtype exists already in the DB
14	No data could be found in the DB for the tool selected
19	No OEM data could be found for the tool read from the DB
1E	No cutting edge data could be found in DB for the tool read from the DB
23	No OEM cutting edge data could be found for the tool read from the DB
28	No OEM monitoring data could be found for the tool read from the DB
2D	The cutting edge OEM monitoring data specified for the tool is not available in the NCK
32	The cutting edge OEM monitoring data specified for the tool could not be read or written in the NCK

XX = 08 : Group of TDS errors

Table A-6   Low-Byte (YY) of TDS error code

	Error cause
00	Error during conversion, reading or writing of tool data from the COM-TDS server
05	No valid tool data available on the COM-TDS server

XX = 09 :   Group of host computer errors

Table A-7   Low-Byte (YY) of host computer error code

	Error cause
00	Status of the SINCOM server could not be read
05	Data transfer from SINCOM server still active! Job aborted
0A	T_DATA_H command could not be executed by the SINCOM server
0F	Status of data transfer could not be set in the NCDDE server
14	Data transfer could not be terminated or was terminated with an error
19	Tool data file name could not be read or determined on the SINCOM server
1E	Tool data file could not be opened
23	Tool data file is empty
2D	No tool data available in the host computer file
32	R_DATA_H command could not be executed by the SINCOM server

XX = 0A :   Group of file errors

Table A-8   Low-Byte (YY) of file error code

	Error cause
00	No file name available for import or export job
05	Tool data file could not be opened
0A	Tool data file is empty
0F	Tool data file could not be created
14	The tool data file specified exists already and is not empty
19	Writing to tool data file was not possible

A.2 PLC data types

Table A-3 describes the PLC data types used and how they are interpreted by "TDI Ident Connection".

Table A-9   PLC data types used

Data type	Value range	Comments
BOOL	TRUE, FALSE	Is used if individual bits in the PLC are to be set. (TRUE: Bit = 1, FALSE: Bit = 0)
BYTE	-128...127	PLC byte
INT	-32768...32767	PLC word, the first byte of which contains the High-Byte and the second byte the Low-Byte. Example: PLC word 140 is composed of the two PLC bytes 140 and 141 and is to be assigned the value 120. Byte 140: 0 Byte 141: 120
String	xx characters	Strings occupy xx+2 bytes in the PLC, since the first two bytes contain the maximum length and the current length of the string. Therefore, the actual string commences only with the 3rd byte. The individual characters are stored as ASCII code in the corresponding bytes. PLC strings must not be terminated with zero, since the current length is always supplied in the 2nd byte of the string. Example: "Hello" is to be stored in a string which commences with PLC byte 144 and has a maximum length of 32 characters. This results in the following byte assignment: Byte 144 = 32 max. length of the string Byte 145 = 5 current length of the string Byte 146 = 72 H Byte 147 = 97 e Byte 148 = 108 l Byte 149 = 108 l Byte 150 = 111 o

A.3 Abbreviations

ASCII	American Standard Code for Information Interchange
CD	Compact Disc
COM	Communications
COM	Component Object Model (Programming Model Microsoft®)
DB	Data Block
DCOM	Distributed Component Object Model
HMI	Human Machine Interface
INT	Integer
MB	Mega Byte
MMC	Man Machine Communication
NC	Numerical Control
NCK	Numerical Control Kernel
NCU	Numerical Control Unit
ParamTM	SINUMERIK Standard Tool Management
PCU	Personal Computer Units
PG	Programming Device
PLC	Programmable Logic Controller
ROM	Read Only Memory
SINCOM	Sinumerik Communication
TDI	Tool Data Information System
TDS	Tool Data System
TM	Tool Management
VB	Visual Basic
VC	Visual C++

A.4 References

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/BU/ SINUMERIK & SIMODRIVE, Automation Systems for Machine Tools
Catalog NC 60
Order No.: E86060-K4460-A101-A9-7600

/IKPI/ Industrial Communication and Field Devices
Catalog IK PI
Order No.: E86060-K6710-A101-B2-7600

/ST7/ SIMATIC
Products for Totally Integrated Automation und Micro Automation
Catalog ST 70
Order No.: E86060-K4670-A111-A8-7600

/Z/ MOTION-CONNECT
Cable, Connectors & System Components for SIMATIC, SINUMERIK,
Masterdrives und SIMOTION
Catalog NC Z
Order No.: E86060-K4490-A001-B1-7600

Electronic Documentation

/CD1/ The SINUMERIK System   (11.02 Edition)
DOC ON CD
(includes all SINUMERIK 840D/840Di/810D/802 and
SIMODRIVE publications)
Order No.: 6FC5298-6CA00-0BG3

User Documentation

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                   User's Guide **Tool Data Information**
                   Order No.: 6FC5297-6AE01-0BP0

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                     Operator's Guide **CAD-Reader**
                     Order No.: (included in online help)

/DA/   SINUMERIK 840D/840Di/810D   (11.02 Edition)
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/PI/   PCIN 4.4
                     Software for Data Transfer to/from **MMC Module**
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                     Order from: WK Fürth

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Manufacturer/Service Documentation

a) Lists

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             Lists
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TE2   Analog Axis
TE3   Master-Slave for Drives
TE4   Transformation Package Handling
TE5   Setpoint Exchange
TE6   MCS Coupling
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                       DM1   Calculation of Motor/Power Section Parameters and Controller
                               Data
                       DS1   Current Control Loop
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                         Installation Guide (enclosed with POSMO CD/CA)

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                         Installation Manual **Technological Functions**
                         -        Reference Manual: CPU Data (Hardware)
                         -        Reference Manual: Module Data
                         Order No.: 6ES7398-8AA03-8BA0

/S7HT/   SIMATIC S7-300   (03.97 Edition)
                         Manual: **STEP 7, Fundamentals, V. 3.1**
                         Order No.: 6ES7810-4CA02-8BA0

/S7HR/   SIMATIC S7-300   (03.97 Edition)
                         Manual: **STEP 7, Reference Manuals, V. 3.1**
                         Order No.: 6ES7810-4CA02-8BR0

/S7S/   SIMATIC S7-300   (04.02 Edition)
                         FM 353 Positioning Module **for Stepper Drive**
                         Order together with configuring package

/S7L/   SIMATIC S7-300   (04.02 Edition)
                         FM 354 Positioning Module **for Servo Drive**
                         Order together with configuring package

/S7M/   SIMATIC S7-300   (01.03 Edition)
                         FM 357.2 Multimodule for Servo and Stepper Drives
                         Order together with configuring package

/SP/	SIMODRIVE 611-A/611-D **SimoPro 3.1** Program for Configuring Machine-Tool Drives Order No.: 6SC6111-6PC00-0BA❑ Order from: WK Fürth	
d) Installation **and Start-up**		
/BS/	SIMODRIVE 611 analog Description **Start-Up Software for Main Spindle and** **Ansynchronous Motor Modules Version 3.20** Order No.: 6SN1197-0AA30-0BP1	(10.00 Edition)
/IAA/	SIMODRIVE 611A **Installation and Start-Up Guide** Order No.: 6SN1197-0AA60-0BP6	(10.00 Edition)
/IAC/	SINUMERIK 810D **Installation and Start-Up Guide** (incl. description of SIMODRIVE 611D start-up software) Order No.: 6FC5297-6AD20-0BP1	(11.02 Edition)
/IAD/	SINUMERIK 840D/SIMODRIVE 611D digital **Installation and Start-Up Guide** (incl. description of SIMODRIVE 611D digital start-up software SIMODRIVE 611D) Order No.: 6FC5297-6AB10-0BP2	(11.02 Edition)
/IAM/	SINUMERIK 840D/840Di/810D **Installation and Start-Up Guide HMI/MMC** Order No.: 6FC5297-6AE20-0BP2	(11.02 Edition)

        AE1   Updates/Supplements
        BE1   Expanding the Operator Interface
        HE1   Online Help
        IM2   Starting up HMI Embedded
        IM4   Starting up HMI Advanced
        TX1   Creating Foreign Language Texts

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Sinumerik 840D/840Di/810D TDI Ident Connection (FBIC) – 06.03 Edition

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W

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To
Siemens AG

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P.O. Box 3180

D-91050 Erlangen

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Fax: ++49-(0)9131-98-2176 [Documentation]

Email: motioncontrol.docu@erlf.siemens.de

From

Name:

Company/Dept.

Address: _____

_____

Phone: _____ / _____

Fax: _____ / _____

Suggestions

Corrections

For Publication/Manual:

Sinumerik 840D/840Di/810D

Motion Control Information System
TDI Ident Connection

Manufacturer Documentation

Description of Functions

Order No.:   6FC5297-1AE60-0BP0
06.03 Edition

Should you come across any printing errors
when reading this publication, please notify us
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Suggestions and/or corrections

Overview of SINUMERIK 840D/840Di/810D Documentation (06.2003)

General Documentation

SINUMERIK 840D/810D
Brochure
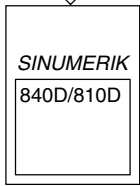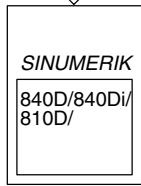
SINUMERIK 840D/840Di/810D/
Catalog Ordering Info. NC 60 *)

SINUMERIK SIROTEC SIMODRIVE Accessories
Catalog Accessories NC-Z

User Documentation
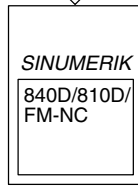
SINUMERIK 840D/810D/FM-NC
AutoTurn
– Short Guide
– Programming/Setup

SINUMERIK 840D/840Di/810D
Operator's Guide **– HT 6**

SINUMERIK 840D/840Di/810D
Diagnostics Guide *)
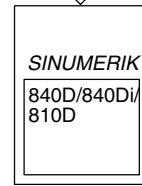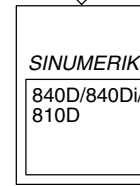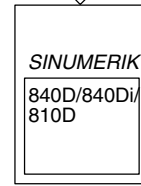
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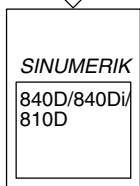
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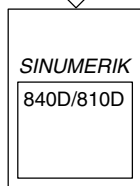
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Manufacturer/Service Documentation
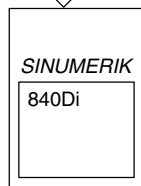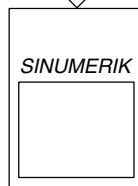
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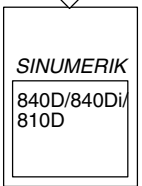
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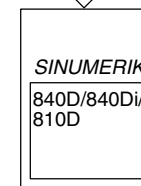
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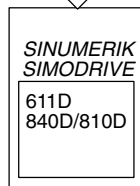
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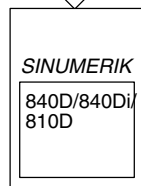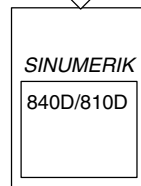
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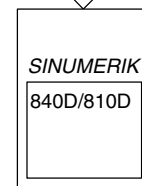
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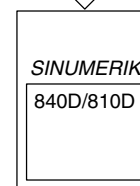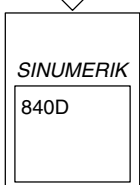
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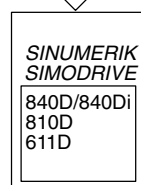
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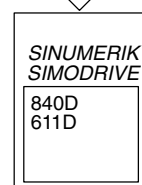
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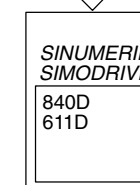
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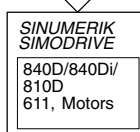
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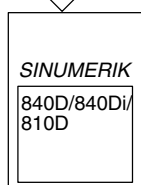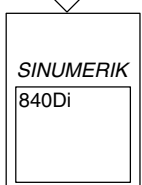
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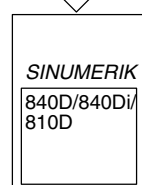
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Manual @Event

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*) These documents are a minimum requirement