



Version 4

DNC Legacy Driver

Manual

Document: **Manual - DNC Legacy Driver**

Created: **2017-10-23**

Last change: **2019-10-31**

Author: **AEgilmez**



COPYRIGHT 2019 BY **FORCAM GMBH**, D-88214 Ravensburg
ALL RIGHTS RESERVED. COPY OR TRANSLATION, ALSO IN EXTRACTS
ONLY WITH WRITTEN PERMISSION BY FORCAM GMBH

Table of Contents

1 Modules	5
1.1 Data Flow.....	6
2 Call Up	7
2.1 DNC Transmission Main Programs	7
2.1.1 DncStat.exe.....	7
2.1.1.1 Button Functions	8
2.1.2 DncService.exe.....	8
2.1.2.1 In Console	9
2.1.2.2 As service	9
2.2 DncMonitor.....	10
2.2.1 Display.....	10
2.2.2 Menu Functions	11
2.2.2.1 File	11
2.2.2.2 Display	12
2.2.2.3 Transmission.....	12
2.2.2.4 Processes	12
2.2.2.5 Question Mark ?	12
2.2.2.6 Button Functions	13
2.3 Configuration of DncStat/DncService.....	14
2.3.1 DBNAME	15
2.3.2 QUALIFIER	15
2.3.3 KSDNCDATEI	15
2.3.4 KSDNCMODUL	15
2.3.5 SERVERPORT	15
2.3.6 MONITORPASSWORD	15
2.3.7 TEMPDIR	15
2.3.8 APLMODUS	16
2.3.9 MNR	16
2.3.10 ONDBOKORDERTYPE	16
2.3.11 ONDBERRORORDERTYPE	16
2.3.12 ONWANOKORDERTYPE	16
2.3.13 ONWANERRORORDERTYPE	17
2.3.14 WANTOCHECK	17
2.3.15 LOCKAFTERTRANSFERNC2PC.....	17

2.3.16 UPLOADPAKETSEARCH	17
2.3.17 NCSENDPLAUSISTATEMENT	18
2.3.18 FTPSERVERPORT	18
2.3.19 FTPUSERS	18
2.3.20 OPTIONALUPLOADFILE	18
2.3.21 ORDERFILEMINSIZE.....	19
2.4 Machine Parameter.....	19
2.4.1.1 USEMNRDEFAULTCONFIG	19
2.5 Configuration Request Program.....	19
2.5.1 General Parameters.....	19
2.5.1.1 DNCAUTORCV	19
2.5.1.2 REQUESTFILEPROGNR	20
2.5.1.3 REQUESTFILEPAKETNAME	20
2.5.1.4 REQUESTPROGNR	21
2.5.1.5 REQUESTPROGNRPROGNAME	21
2.5.1.6 DNCREPLYFILE.....	22
2.5.1.7 SENDMULTIFILESASONE	22
2.5.2 Parameter for Database: ORDERTYPE DB.....	23
2.5.2.1 DNCDOWNLOADTYPE.....	23
2.5.2.2 DNCUPLOADTYPE	23
2.5.2.3 DNCDOWNLOADART	23
2.5.2.4 DNCUPLOADART.....	24
2.5.2.5 NCPAKETFILTER	24
2.5.2.6 UPLOADPAKETSEARCH	24
2.5.2.7 SEARCHELEMENT.....	24
2.5.3 Parameter for File Structure: ORDERTYPE DIRECTORY	24
2.5.3.1 DOWNLOADDIR	24
2.5.3.2 DOWNLOADFILES	24
2.5.3.3 UPLOADDIR.....	25
2.5.3.4 UPLOADFILENAME.....	25
2.6 Program Transfer via ksDnc	25
2.7 DNC with Quinx Box	26
2.7.1 Configuration Quinx Box.....	27
2.7.2 Request with Quinx	28
2.7.3 Retransfer with Quinx.....	29
2.8 Evaluation of NC Programs with Regex	29
3 Configuration - DNCP.CFG.....	30
3.1 NC Archive/DNC-Client with Machine Connection.....	30
3.2 Configuration Parameter	31

3.2.1	For Upload (PC Is Sending, Control Is Receiving).....	31
3.2.2	For Download (Control Is Sending, PC Is Receiving).....	32
3.3	Code Conversion Table	33
3.3.1	Example:	33
4	Revision Sheet	35

1 Modules

Module names

Name	Description
DncStat	DNC transmission main program (variant: GUI)
DncService	DNC-transmission main program (variant: console and service)
DncMonitor	Remote maintenance tool to monitor/control DncStat and DncService
Ksdnc	DNC transmission program

Function

Enables the transmission of files (primarily NC programs) from and to the machine.

Location

Factory Framework application server

1.1 Data Flow

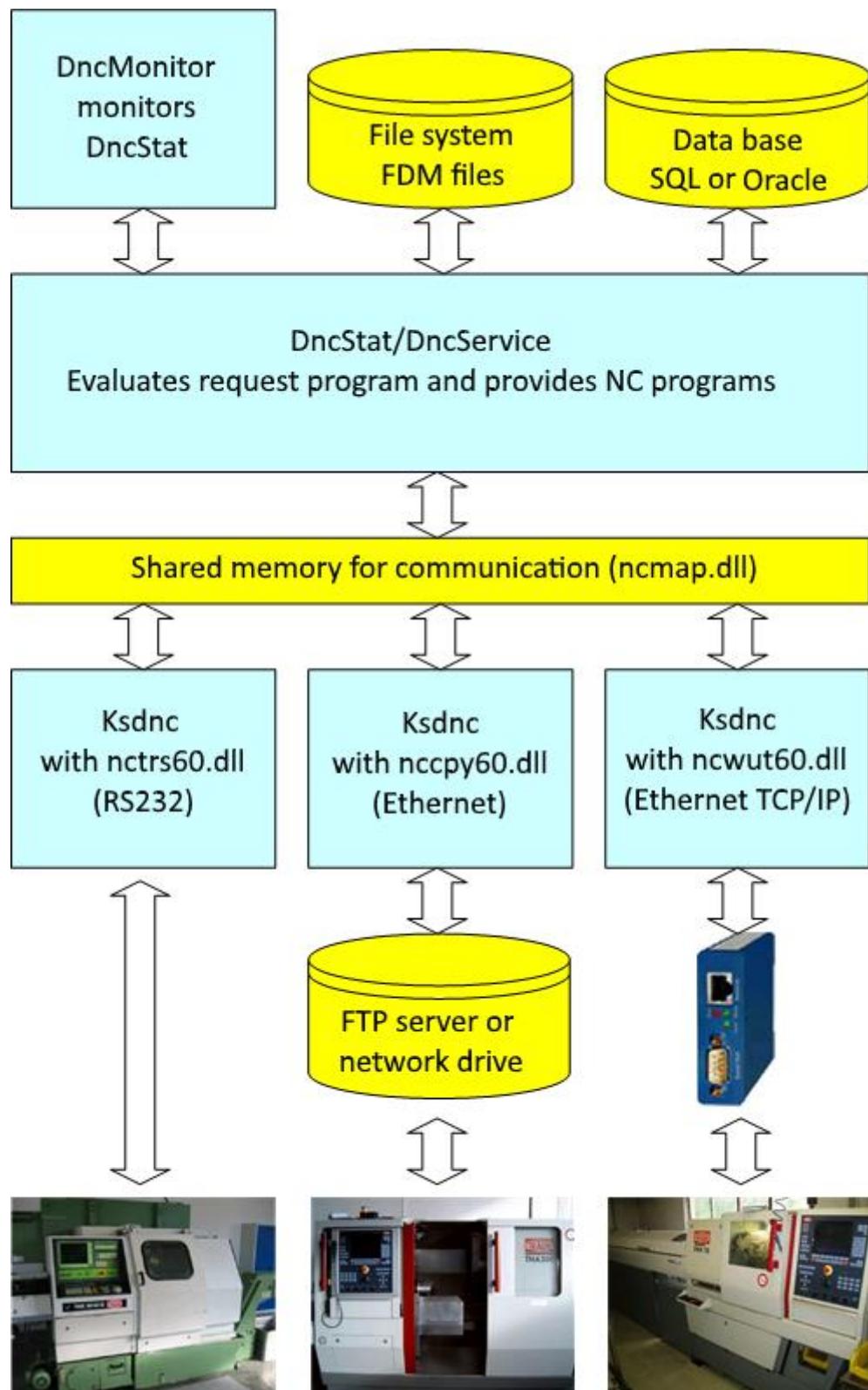


Figure 1: Transmission of NC programs to the machine with FORCAM FORCE™ and back

2 Call Up

2.1 DNC Transmission Main Programs

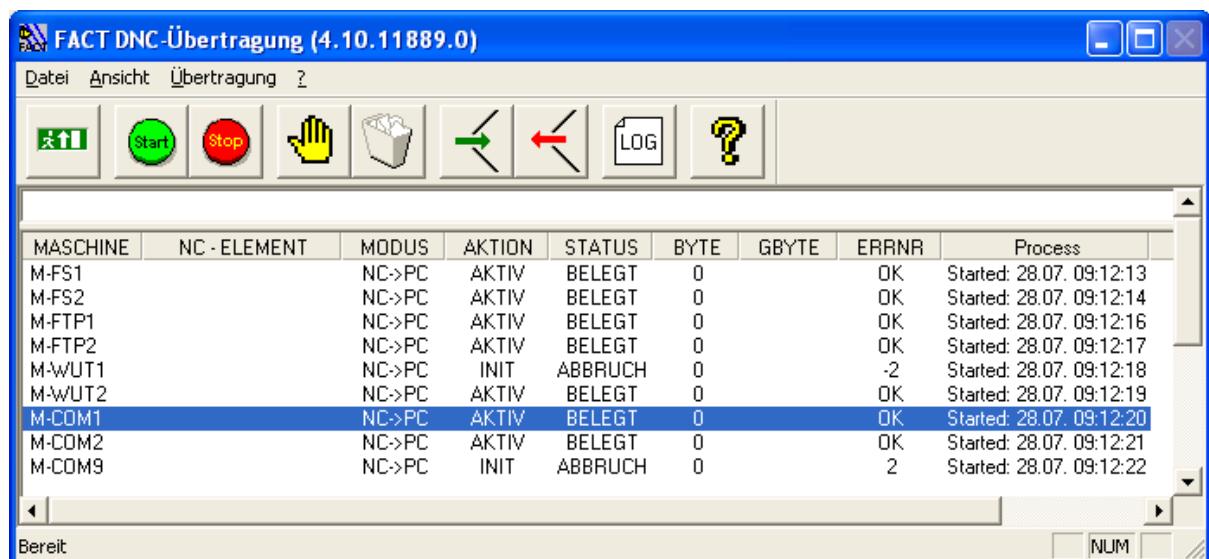
There are two variants, whereby only one is permitted to be run at a time.

2.1.1 DncStat.exe

First variant of the DNC transmission program.

- With graphic interface
- Does not run as a service

Call up: DncStat



2.1.1.1 Button Functions

Button	Function
 Escape	Minimizes the application
 Start transmission	Press if a transmission has to be started manually
 End transmission	Press if a transmission was finished, but is not recognized as such
 Abort transmission	Abort the current transmission
 Delete transmission	Delete the current transmission
 Send file	Send file to the machine
 Receive file	Receive file from the machine
 Show log files	Display log files, is followed by file selection
 ?	Display information on the application

2.1.2 DncService.exe

Second variant of the DNC transmission program.

- Console program
- Also runs as a service

2.1.2.1 In Console

dncservice –debug [modulename]

Module name is optional, default is DNCSTAT.

The module name defines the associated configuration section (PARAGRAPH).

```

d:\FactoryFramework\Fact\bin\DncService.exe
Starting debug mode.
LOGDIR=D:\FactoryFramework\Fact\LOG\XPMU LOGFILE=DNCSTAT.log
DNCSTAT 4.10.0.0 <Jul 28 2008 02:06:20> [d:\FactoryFramework\Fact\bin\DncService.exe 4.10.11889.0] startet.
vorbelegung() DNCSTAT 4.10.0.0 <Jul 28 2008 02:06:20>
modname =DNCSTAT<
trace =0
timerdelay =0
Config: DBNAME = fact/fact@synthes
Config: QUALIFIER =
Config: MODUS = HIER
Config: KSDNCDATEI = KSDNC.EXE
Config: KSDNCMODUL = KSNCA
Config: TEMPDIR = d:\ncarchiv\temp\
Config: RECEIVESUCCESSSTCO = KSTOUCH
Config: SENDSUCCESSSTCO = KSTOUCH
Config: MNR = M-FS1
Config: MNR = M-FS2
Config: MNR = M-FTP1
Config: MNR = M-FTP2
Config: MNR = M-WUT1
Config: MNR = M-WUT2
Config: MNR = M-COM1
Config: MNR = M-COM2
Config: MNR = M-COM9

```

2.1.2.2 As service

Install service:

dncservice –install [modulename]

Start and end:

```
net start dncstat
net stop dncstat
```

Uninstall

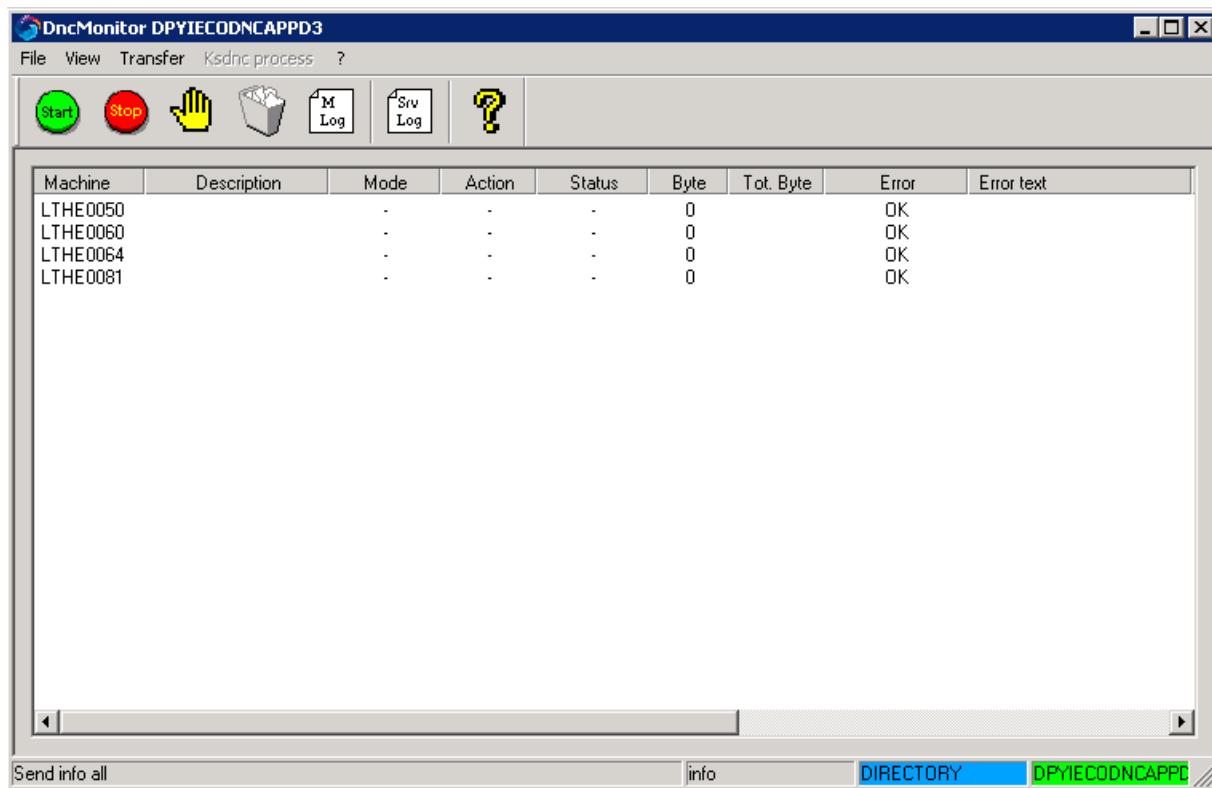
dncservice –remove [modulename]

2.2 DncMonitor

The application DncMonitor is used to monitor the current status of DNC transmissions.

Call up: DncMonitor

Connect with DNC transmission main program via file > connect.



2.2.1 Display

One line per machine status information is shown in the list:

Machine	Machine name (MNR entry)
Machine	Name of the machine (MNR entry)
NC element	File name of the just transmitted NC program
Mode	Current operating mode: NCA -> PC waiting for request program or opt. program, respectively NC -> PC: transmission from the machine PC -> NC: transmission to the machine
Action	AKTIV INIT: interface is initiated
Status	Busy

Byte	Number of transmitted Bytes
GByte	Total number of transmitted Bytes
Errnr	OK or error with error number Frequent error numbers: 2: File not found 3: Path not found 5: Access error (no rights) Further error codes can be queried from the console (cmd) per net helpmsg {error number}. System error codes: http://msdn.microsoft.com/en-us/library/ms681381(VS.85).aspx WinInet error codes (12001 to 12156) http://support.microsoft.com/kb/193625
Process	Start or end time, respectively, of the ksdcn process

Status line:

- 1st column: Command to DNC server
- 2nd column: Answer from DNC server
- 3rd column: Current operating mode of the DNC server: standby, DB or DIRECTORY
- 4th column: Connected to DNC server (green=connected, red=disconnected)

2.2.2 Menu Functions

2.2.2.1 File

- Connect: Connect to DNC server
- Disconnect: Disconnect from DNC server



Server name	Name or IP-address of the computer, on which the DNC-main transmission program is running (DncService)
Port	TCP port (default is 2000)
Refresh	The machine list is updated after this time in milliseconds.
Lines	The last lines of a log file are displayed.
Password	Password for admin functions (start and end ksdnc process)

2.2.2.2 Display

- Symbol bar: show or hide
- Status bar: show or hide
- View log file (or M log icon):
The log file of the ksdnc process of the selected machine is displayed (last 40 lines)
- View server log file (or Srv log icon)
The log file of the DNC server is displayed (last 40 lines)

2.2.2.3 Transmission

These functions refer to running transmissions to or from the DNC machine. They are usually rarely needed but if, then only with serially connected machines.

- Start (or start icon)
Press if a transmission has to be started manually
- Finish (or stop icon):
Press if a transmission was finished, but is not recognized as such
- Abort (or hand icon)
Abortion of the current transmission
- Delete (or trash bin icon)
Deletion of the current transmission

2.2.2.4 Processes

- Start:
The ksdnc process to the selected machine is started (reasonable with configuration changes)
- End:
The ksdnc -process to the selected machine is finished

2.2.2.5 Question Mark ?

Display information on the application

2.2.2.6 Button Functions

Functions

Button	Function
 Start transmission	Press if a transmission has to be started manually
 End transmission	Press if a transmission was finished, but is not recognized as such
 Abort transmission	Abort the current transmission
 Delete transmission	Delete the current transmission
 Machine log file	The log file of the ksdnc process of the selected machine is displayed (last 40 lines)
 Server log file	The log file of the DNC server is displayed (last 40 lines)
	Display information on the application

2.3 Configuration of DncStat/DncService

Configuration Template

```

PARAGRAPH      = DNCSTAT
; General parameters
DBNAME          = %DBNAME%           ; Database name
QUALIFER        = %QUALIFER%         ; Database qualifier
KSDNCDATEI     = ksdnc.exe          ; KsDnc file name
KSDNCMODUL     = KSNCA              ; KSNCA paragraph name (ksnca.dll)
TEMPDIR         = %TEMP%             ; Temp. directory for transmission

APLMODUS        = HIER               ; Workplace hierarchy (allocation machine to
workplace group) (e.g.: HIER)
DBCOLOPTZEILE   =
(in CNca:::DncToNca) (e.g.: NCOPTZEILE) ; DB column in APL_EBENE1 for optimization line
DBCOLPRGANFZEICHEN =
(in CNca:::DncToNca) (e.g.: NCPRGANFZEICHEN) ; DB column in APL_EBENE1 for optimization line
LOCKAFTERTRANSFERNC2PC = 2           ; Block opt. program element after reading in:
0=deactivated, 1=opt only, 2=all PAKETCOLAPL
                                     =                               ; column name in
NC_PAKET for workplace (e.g.: USER2)
UPLOADPAKETSEARCH = "PAKET_NAME='unknown' AND USER3='{APLGRP}'" ; If no packet can be
assigned in case of a retransfer, these search criteria are used. (part of a SQL statement,
variables, PAKET_NAME, PROGNR, APL, APLGRP)

WANTOCHECK      =
\\server\dnc-share) ; Network drive to be checked (e.g.:
ONDBOKORDERTYPE = DB                ; Switch to this order type if DB connection is
established (DB, DIRECTORY or STANDBY)
ONDBERRORORDERTYPE = DIRECTORY       ; Switch to this order type if there no DB con-
nection anymore (DB, DIRECTORY or STANDBY)
ONWANOKORDERTYPE =                   ; Switch to this order type if WAN connection is
established
ONWANERRORORDERTYPE =                ; Switch to this order type if there no WAN con-
nection anymore

SERVERPORT      = 2000              ; Socket server: TCP port (default=2000) for
access with DncMonitor or telnet, respectively

RECEIVESUCESSTCO =
KSTOUCH)          ; Queue name for reception confirmation (e.g.:
SENDSUCESSTCO   =
KSTOUCH)          ; Queue name for reception confirmation (e.g.:
successful       ; TCO_SEND_SUCCESS = 9525: TCO when sending
erroneous        ; TCO_SEND_ERROR      = 9526: TCO when sending
successful       ; TCO_RECEIVE_SUCCESS = 9527: TCO when reception
erroneous        ; TCO_RECEIVE_ERROR   = 9528: TCO when reception

; DncStat only
READREGIT      = N                 ; Read column config for list control from reg-
istry (Y/N)
EDITOR          = NOTEPAD           ; Editor to view log files
TAIL            = NOTEPAD           ; Viewer to display the just transferred file
DEFAULTDIR     = %FACTROOT%        ; Directory with NC programs
DEFAULTFILETYPE = NCP              ; File extension
FOREGROUND      = Y                 ; Bring application to foreground when transmit-
ting (Y/N)

; List of connected machines (further configuration in machine paragraphs)
MNR            = DEMOMNR           ; machine name (one line per machine)
MNR            = _COM1
MNR            = _COM3

PARAGRAPH=

```

2.3.1 DBNAME

Database name in format **User/Password@Instancename**

Example: DBNAME = **fact/secret@fact**

2.3.2 QUALIFIER

Database qualifier

2.3.3 KSDNCDATAI

Name of ksdc application. Should always be ksdc.exe.

Example: KSDNCDATAI = ksdc.exe

2.3.4 KSDNCMODUL

Name of configuration paragraph for ksnca60.dll.

Example: KSDNCMODUL = KSNCA

2.3.5 SERVERPORT

Socket server: TCP Port (default=2000) for access with Dnc monitor or telnet, respectively.

Example: SERVERPORT = 2000

2.3.6 MONITORPASSWORD

Is needed by the DNC monitor to start and finish ksdc processes.

Example: MONITORPASSWORD = "secret"

2.3.7 TEMPDIR

DncStat uses this directory for temporary files.

Files have the names {machinename}.tmp. A directory of the same name is created per machine.

Example: TEMPDIR = c:\FactoryFramework\temp

2.3.8 APLMODUS

For the type of workplace hierarchy. Allocation of machine to workplace group via table APL_EBENENCFG.

Example: APLMODUS = HIER

2.3.9 MNR

Indicates, which machines should be operated by DncStat. There is a separate line for each machine in the configuration.

Example: MNR = TRAUB

MNR = DECKEL

The DNC transmission main program (DncStat.exe or DncService.exe, respectively) verifies this list cyclically. If it is noticed that a new machine was added, a new ksdnc-process is started for that machine. If a machine is removed, nothing is done.

This way, new machines can be configured additionally, without the need of restarting the application. However, all other configuration parameters require a restart.

2.3.10 ONDBOKORDERTYPE

If the connection to the database (DBNAME) was successfully established, it is shifted to this mode. The variants are

- DB
FDM data are located in the database
- DIRECTORY
FDM data are located in a file system (directory)
- STANDBY
DNC transmission deactivated.

Example: ONDBOKORDERTYPE = DB

2.3.11 ONDBERRORORDERTYPE

If the application loses the connection to the database (DBNAME), it is switched to this mode.

Example: ONDBERRORORDERTYPE = DIRECTORY

2.3.12 ONWANOKORDERTYPE

If the connection to a network drive (WANTOCHECK) was successfully established, it is shifted to this mode.

Example: ONWANOKORDERTYPE = STANDBY

2.3.13 ONWANERRORORDERTYPE

If it not possible to establish a connection to a network drive (WANTOCHECK), this mode is used.

Example: ONWANERRORORDERTYPE = DIRECTORY

2.3.14 WANTOCHECK

Indicates, which network drive is checked with ONWANOKORDERTYPE and ONWANERRORORDER-TYPE.

Example: WANTOCHECK = \\server\\fdm-data

2.3.15 LOCKAFTERTRANSFERNC2PC

After reading an optimized NC program, the status can be set to **locked**.

- 0: No change
- 1: Only the just read element is locked, meaning type and version is considered.
- 2: All elements with the same ID are blocked, independent from type and version.
- 3: Packet is locked after reading

Example: LOCKAFTERTRANSFERNC2PC = 2

2.3.16 UPLOADPAKETSEARCH

If no packet can be assigned in case of a retransfer, these search criteria are used (part of a SQL statement, variables, PAKET_NAME, PROGNR, APL, APLGRP).

Example: UPLOADPAKETSEARCH = "PAKET_NAME='Unbekannt'(unknown) AND USER3='{APLGRP}'"

An opt. program is retransferred from workplace 93393. No NC packet can be found to the packet name ,SM_987654' (from NC program header) or the NC packet is not permitted for this workplace. The workplace group of 93393 is 0001.

The SQL statement for the search is then:

```
SELECT PAKET_ID FROM NC_PAKET WHERE PAKET_NAME='Unbekannt'(unknown) AND USER3='0001'
```

2.3.17 NCSENDPLAUSISTATEMENT

Additional conditions in the SQL statement when searching packet ID.

Variables which can be used: APL, PAKET_ID, QUALIFIER.

This parameter is not entered into the k_config.cfg, but is stored in table PARAMETER_CFG.
SYSTEM / FDM / NCSENDPLAUSISTATEMENT.

Example:

The validation is done via the machine type. It is written in NC_PAKET.USER3 and corresponds to the machine's machine group (WPL).

```
user3 = (select ebene1 from apl_ebenencfg where ebene0='@|APL|@' and modus='HIER')
```

2.3.18 FTPSERVERPORT

The TCP port of the integrated FTP server.

FTP servers usually run on port 21.

0 has to be selected to deactivate.

Example: FTPSERVERPORT = 21

2.3.19 FTPUSERS

User accounts are needed to access the FTP server.

Format: User, Password, Pfad

Example: FTPUSERS = "dnc,dnc,O:\DNC\MachineDir"

2.3.20 OPTIONALUPLOADFILE

An option in case of a retransfer of NC-programs is, to copy the file into a directory parallel to the FDM.

Machine group and machine can be used as variables (APLGRP and APL) for the path. The directories are created automatically if needed.

Further variables:

FILENAME: File name without extension

FILEEXT: File extension of file name

PROGNUM: recognizes program number from NC programs

Example:

```
OPTIONALUPLOADFILE = "%FACTROOT%\DNC\Opt\{APLGRP}\{APL}\{FILENAME}.opt"
```

2.3.21 ORDERFILEMINSIZE

Minimal size of a request program. The file is processed only from this size on.
Even if the file too small for processing, a Log entry is created:

```
2010-02-08 14:41:06.80 [5064] M-FS1: rc=0 : Request program received.  
file=C:\Users\MVeser\AppData\Local\Temp\FACT\DncService\M-FS1\no_name.tmp, size=1  
2010-02-08 14:41:09.41 [5064] M-FS1: rc=0 : Request program is too small to be pro-  
cessed (ORDERFILEMINSIZE=6)
```

2.4 Machine Parameter

Each machine can be configured separately. The adjustments are stored in the so-called machine paragraph (the paragraph has the same name as the machine).

2.4.1.1 USEMNRDEFAULTCONFIG

With these parameters it is possible to define default adjustments for all machines in the DNCSTAT paragraph.

At first, the configuration of a machine is read with USEMNRDEFAULTCONFIG = Y from the DNCSTAT paragraph. Then it is read from the machine paragraph and the configurations are overwritten, if necessary.

2.5 Configuration Request Program

This configuration is not adjusted in the DncStat paragraph, but separately for each machine.

2.5.1 General Parameters

2.5.1.1 DNCAUTORCV

This parameter has to be activated to check the existence of a request program.
Example: DNCAUTORCV = Y

2.5.1.2 REQUESTFILEPROGNR

Indicates, where the program number is located in the NC program. Depending on the program number in the request program a different processing is done:

- program number = Parameter REQUESTPROGNR: Request via packet name
- program number = Parameter REQUESTPROGRNRPROGNAME: Request via program name
- Otherwise: It is an optimized program, which is retransferred.

Format: Line number, list of regular terms, separated by pipe sign (,|').
If a line number 0 is indicated, the first hit is used.

Example

NC program:

```
%  
:0500  
(CNC SE 002462 / INDEX AD)  
(CLAMPING SCREW M6*18)  
(STAR SV32-2) (50117765)  
(SM 103007)  
(DATE) (30.05.2006)  
...
```

The program number is written in the second line after a colon.

REQUESTFILEPROGNR = "2,^:(\d+).*\$"

The term in parentheses is viewed as the program number.

^ marks the beginning of a line.

: is a colon.

\d+ stands for any amount of numbers (0-9).

.* stands for 0 to any number of signs.

\$ marks the end of a line.

2.5.1.3 REQUESTFILEPAKETNAME

Indicates, where the packet name is located in the NC program.

The configuration looks as follows for the above example:

REQUESTFILEPAKETNAME= "3,^.*(S[EM]).*\$|_.|^.*S[EM].*(\d+).*\$"

The packet name is composed of 3 parts:

1. „^.*(S[EM]).*\$“ yields „SE“
2. „_“ yields underscore _
3. „^.*S[EM].*(\d+).*\$“ yields „002462“

2.5.1.4 REQUESTPROGNR

The request program is identified based on this program number. The packet name is used to access.
Example: REQUESTPROGNR = 7999

NC program for SM_600211

```
0 BEGIN PGM 7999 MM
1 ; 600211
2 END PGM 7999 MM
```

Configuration to this

REQUESTPROGNR	= 7999 ; program number for request via packet name
REQUESTFILEPROGNR	= "1,^.*PGM\s+([A-Z_0-9]+)\s*.*\$"
REQUESTFILEPAKETNAME	= "2,S__ ^.*(\d+).*\$"

Extracted from request program (bold)

```
0 BEGIN PGM 7998 MM
1 ; 600211
2 END PGM 7998 MM
```

Then it is searched for the packet name per SQL „like 'S__600211' “. Thus returns hits with SE_600211 and SM_600211.

2.5.1.5 REQUESTPROGNRPROGNAME

Program number in request program for request via program name.

Multiple NC programs are contained in the packet, which is found with UPLOADPAKETSEARCH. Based on the program name it is then searched for a NC program in the packet.

Example: REQUESTPROGNRPROGNAME = 7998

NC program:

```
0 BEGIN PGM 7998 MM
1 ; 1545
2 END PGM 7998 MM
```

Configuration to this

REQUESTPROGNRPROGNAME	= 7998 ; program number for request via program name
REQUESTFILEPROGNR	= "1,^.*PGM\s+([A-Z_0-9]+)\s*.*\$"
REQUESTFILEPROGNAME	= "2,^.*(\d+).*\$"

Extracted from request program (bold)

```
0 BEGIN PGM 7998 MM
1 ; 1545
2 END PGM 7998 MM
```

2.5.1.6 DNCREPLYFILE

Send answer to request program. Is configured per machine.

The specified file is used as template. The term {ERRORTEXT} is replaced by the current error text.

Example:

DNCREPLYFILE = %DPATH%\reply.ncp

File content of reply.ncp:

```
%  
:7998  
({ERRORTEXT})  
M30
```

The term {ERRORTEXT} is replaced and retransferred to the machine.

File content now:

```
%  
:7998  
(PACKET SE_001211 DOES NOT EXIST IN THE ARCHIVE)  
M30
```

2.5.1.7 SENDMULTIFILESASONE

When requesting via request programs it can happen, that multiple NC programs (files) that should be transferred exist in one packet.

Normally one transmission order for ksdnc is created for each of these NC programs.

With this SENDMULTIFILESASONE = Y it is now possible, to bundle all NC programs in one file and transfer it as one NC program.

When using Quinx boxes, this parameter has to be activated.

There are further parameters in order for the created NC program to be recognized by the control.

SENDMULTIFILESASONESTART = %	; Add this string to beginning of file
SENDMULTIFILESASONEEND = %	; Add this string to end of file
SENDMULTIFILESASONEREMOVE = %	; Remove this string

Example: Two NC programs.

First NC program:

```
%  
:0329  
(CNC SE 001457 / INDEX AB)  
...  
M30  
%
```

Second NC program:

```
%  
:0349  
M10  
M150  
...  
M99  
%
```

When both NC programs are bundled in one file, the percent signs between the single NC programs are interfering:

```
%  
:0329  
(CNC SE 001457 / INDEX AB)  
...  
M30  
%  
%  
:0349  
M10  
M150  
...  
M99  
%
```

This problem can be solved with the above parameters.

All lines that contain a percent sign are removed. Additionally, a start and an end line can be configured:

```
%  
:0329  
(CNC SE 001457 / INDEX AB)  
...  
M30  
:0349  
M10  
M150  
...  
M99  
%
```

2.5.2 Parameter for Database: ORDERTYPE DB

2.5.2.1 DNCDOWNLOADTYPE

Only the specified element type can be called up via request program.

Example: DNCDOWNLOADTYPE = NCP,NCW

2.5.2.2 DNCUPLOADTYPE

The NC program is stored in the FDM with this element type.

Example: DNCUPLOADTYPE = NCP

2.5.2.3 DNCDOWNLOADART

Only specified element types can be requested via request program.

Example: DNCDOWNLOADART = NOR,PRO

2.5.2.4 DNCUPLOADART

This type is used in case of an upload.

Example: DNCUPLOADART = OPT

2.5.2.5 NCPAKETFILTER

Additional conditions in the SQL statement when searching packet ID. Valid besides the DncStat parameters PAKETCOLAPL and PAKETCOLAPLGRP.

Variables, which can be used: APL, APLGRP, QUALIFIER.

Examples

1. Fixed machine type in column NC_PAKET.USER1

NCPAKETFILTER = „USER1='0198'“

2. Machine type is written in the workplace master data in column APL_EBENE0.USER3

NCPAKETFILTER = USER1 = (select user3 from {QUALIFIER}APL_EBENE0 where apl='{APL}'")

2.5.2.6 UPLOADPAKETSEARCH

If no packet can be assigned during retransfers, this packet is used.

Example: UPLOADPAKETSEARCH= "SE_050100"

2.5.2.7 SEARCHELEMENT

When retransferring, the program number is extracted from the NC program. This program number is used for the search for the correct element in the packet. The program number is used as variable {PROGNR} in the SQL statement.

Examples:

SEARCHELEMENT = "ORGFILE LIKE '%{PROGNR}'"

SEARCHELEMENT = "ORGFILE = 'o{PROGNR}'"

2.5.3 Parameter for File Structure: ORDERTYPE DIRECTORY

2.5.3.1 DOWNLOADDIR

Directory, in which FDM files are located. Alternatives can be specified, separated by a comma.

Example: DOWNLOADDIR = \\server\fdm-daten,c:\notfall-fdm-daten

2.5.3.2 DOWNLOADFILES

File extensions for NC programs.

Example: DOWNLOADFILES = "* .nwd, * .ncp, * .mpf, * .spf"

2.5.3.3 UPLOADDIR

Directory for retransfer. Alternatives can be specified, separated by a comma.

Example: UPLOADDIR = = \\server\fdm-daten\opt\machine

2.5.3.4 UPLOADFILENAME

When retransferring, the file name can be created via a template.

Sigils between two curly brackets { } are interpreted as variables.

As variables are available:

PROGNR: program number from request program

PAKET_NAME: packet name from request program

FILENAME: original file name

FILEEXT: original file name extension

Column from NC_ELEMENT: Example: ORGFILE, ORGEXT

Example: UPLOADFILENAME = "o{PROGNR}.ncw"

The program number 1234 results in a file name o1234.ncw.

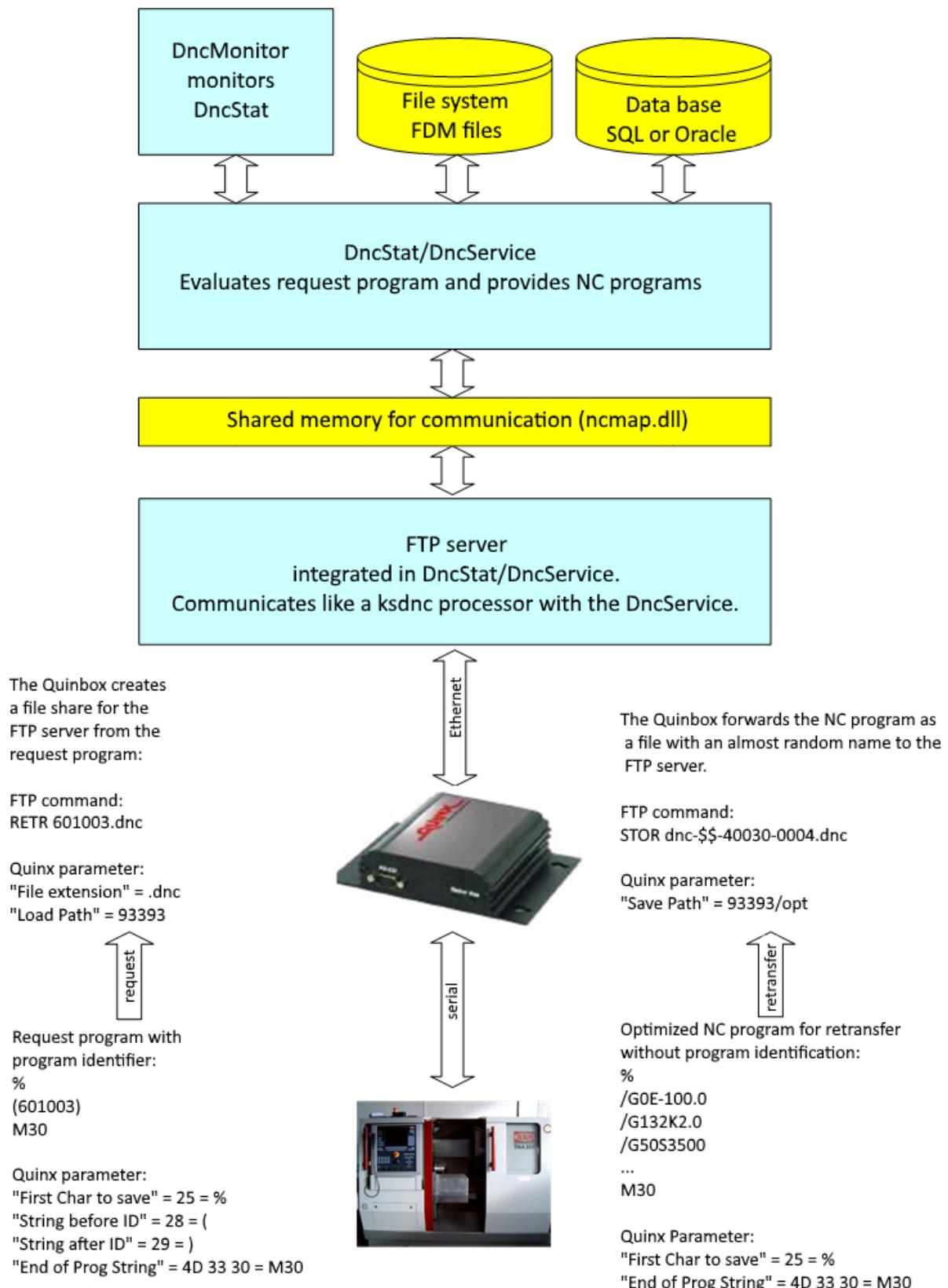
2.6 Program Transfer via ksDnc

The actual transfer of NC programs is executed via the application ksDnc.exe with according nc*.dll.

The configuration parameters are also stored in the machine paragraph.

There are different adjustment options per nc*.dll .

2.7 DNC with Quinx Box



2.7.1 Configuration Quinx Box

Identify the IP-address.

```
C:\programme\Nmap>nmap.exe -v -sP 10.48.112.0/24
Starting Nmap 4.60 ( http://insecure.org ) at 2008-06-25 14:59 West European day-
light saving time
Initiating ARP Ping Scan at 14:59
Scanning 59 hosts [1 port/host]
Completed ARP Ping Scan at 14:59, 0.69s elapsed (59 total hosts)
Initiating parallel DNS resolution of 59 hosts. at 14:59
Completed parallel DNS resolution of 59 hosts. at 14:59, 4.00s elapsed
...
Host 10.48.112.204 appears to be up.
MAC Address: 00:08:E1:00:23:5C (Barix AG)
```

The MAC address area of the Quinx box is assigned to the Barix AG.

The configuration is done per telnet at port 9999.

```
C:\>telnet 10.48.112.204 9999
*** QUINX DNC-In-The-Box FTP ***
Serial Number      MAC address 0008E100235C
Software version 05.4b1 (050906)

Press Enter to go into Setup Mode

V(iew Settings) R(eset to Factory) S(avve and exit) Q(uit without saving)
G(eneral) F(TP Settings) D(NC Settings) I(nput Settings) L(icence) ?

----- General Settings -----
Hardware..... Ethernet TPI
Local IP-Addr..... --- not set ---
Gateway..... --- not set ---
Netmask..... 255.255.255.255
Password..... none
Wireless networkname...
Infrastructure-Mode.... no
WEP-Mode..... 0
WEP-Key..... none
First DNS IP-Addr..... --- not set ---
Second DNS IP-Addr..... --- not set ---
Config IP-Addr..... --- not set ---
I/F Mode.....Port0..... 4C
Baudrate.....Port0..... 9600
Flow Control.Port0..... 02
I/F Mode.....Port1..... 4C
Baudrate.Div.Port1..... 0
Baudrate.....Port1..... 9600
Flow Control.Port1..... 00
Function Serial Pin2... Rx (In)
Function Serial Pin3... Tx (Out)
Function Serial Pin4... open
Function Serial Pin5... open
Function Serial Pin6... open
Function Serial Pin8... open
Function Serial Pin20.. open
Function Serial Pin9/22 open

----- FTP Client Settings -----
FTP Server IP-Addr..... 010.048.112.059
FTP Server Port..... 21
```

```

FTP User Name..... dnc
FTP Password..... dnc
FTP Account..... dnc
Load Path..... mnrl
Load Path alternative..
Save Path..... mnrl/opt
Duplicate Path.....
File extension..... .ncp

----- DNC Driver Settings -----
Add Remove ID..... 0
First Char to save.... 25
Last Char to save..... 00
End of Line String..... 0D 0A
Load Header String.....
Load Trailer String.... 00
Subst Match String.....
Subst Replace String...
String before ID..... 28
String after ID..... 29
End of Prog String..... 4D 33 30
End of Prog Range..... 30
Barcode Prefix.....
Load Ready Delay..... 0
Load Ready Char..... 11
Save Timeout..... 30
Load Timeout..... 120
Load Disconnect..... 02
Tx Retries..... 0

```

Important parameters:

First Char to save	Sign for program start, 25 = %
String before ID	28 = (
String after ID	29 =)
End of Prog String	4D 33 30 = "M30"
Load Ready Char	11 = Ctrl-Q (start sign of control for reception of specific program)
Save Timeout	30 = write file after 30 s of inactivity

2.7.2 Request with Quinx

The worker creates a request program at the machine and sends it.

The Quinx box recognizes the program identifier between the brackets (configurable).

Thereupon the Quinx box sends a command to the FTP server to request the file.

The machine name and the packet name are identified with the help of the file name in the RETR command.

Now the regular request program processing is carried out. The requested NC program is created and is retransferred from the FTP server back to the Quinx and is deleted subsequently.

The parameter SENDMULTIFILESASONE has to be set to Y, if multiple NC programs have to be transferred at once.

2.7.3 Retransfer with Quinx

A NC program without program identifier is received by Quinx. After a timeout Quinx tries to store this NC program under an almost random file name on the FTP server (STOR command). The DNC server imports this optimized NC program into the archive.

2.8 Evaluation of NC Programs with Regex

Regular expressions (regex in short) are used to extract program number as well as packet name.

Examples from the Heidenhain NC program:

```
BEGIN PGM SE_191815 AA MM
; LOADINGDEVICE PART 01 / 1.OP
; DRAWING SE_162564
...
```

To be extracted are:

Program number	SE_191815_AA
With regex;	<code>^.*([A-Z_0-9]+).*\$</code>
Packet name:	SE_162564
With regex:	<code>^\x3B.*([A-Z_0-9]+).*\$</code>
	<code>"0,^\x3B.*([A-Z_0-9]{9}).*\$"</code>

Since the semicolon stands for a comment in the configuration file, this has to be configured in the regex per ASCII sign \x3B.

```
%  
:123453_AB  
(CNC SE_002462 / INDEX AD)  
(CLAMPING SCREW M6*18)  
(STAR SV32-2) (50117765)  
...
```

Program number:	<code>^:(.[A-Z_0-9]+).*\$</code>
Packet name:	<code>^\\((\\d{6})).*\\$</code>

The term 002462 was extracted, but SE_002462 is needed as packet name.
 It is possible to search per LIKE 'S__002462' per SQL. Underscore counts as any sign.
 Now the term 002462 only has to be extended to S__002462.

This is done with the following configuration:

REQUESTFILEPAKETNAME= "0,S__ ^\\((\\d{6})).*\$"	
0 means	Search in all lines until regex is found
S__	add S__ to the beginning
<code>^\\((\\d{6})).*\$</code>	Regex to extract the 6-digit number in the packet name

3 Configuration - **DNCP.CFG**

Besides the necessary interface parameters for module FACT DNC-transmission (ksdnc.exe) it is possible to configure further machine specific setting data for it like trailer, transmission end, program start etc. in paragraph **DNCTYP** in configuration file **DNCP.CFG**. This way similar control types can be grouped.

3.1 NC Archive/DNC-Client with Machine Connection

```

;----- Machine parameter for CONTROL STANDARD
PARAGRAPH = STANDARD ; control name
; Parameter for DNC-Upload (CNC => MT)
DNCUSTART = ; Identifier string for transmission start e.g. %
DNCUENDE = ; max. 3 identifier strings for transmission end e.g.
M30,M17
DNCUCRLF = #13#10 ; String for LF: #13#10 = CRLF
DNCUSSYM = ; Sign for program start e.g. #002 = STX
DNCUESYM = ; Sign for program end e.g. #003 = ETX
DNCUECLR = ; Sign for program end not to be written (Yes/No)
DNCUPTMOUT= 20 ; Timeout for transmission pause status (default 500
equates to 5 sec)
DNCUETMOUT= 1 ; 0: if end transmission pause manually, otherwise
timeout for transmission pause end
DNCUEOK = ; End string an NC after program end, if ok.
DNCUEERR = ; End string an NC after program end, if error
DNCUPRGID = ; max. 3 signs for program line display, separated by
comma
DNCUXON = ; Send initialization for CNC e.g. #017 = XON
DNCURTRIM = N ; Trim line on the right, i.e. remove conclusive in-
visible signs
DNCUSAVERCTRLCHARS = N ; Save control character (ASCII<32) (N=default|Y) (on-
ly with ncwut.dll and ncnport.dll)
DNCUCODETABLE = "\d000:<NUL>" ; Code table for DNC upload. Format
; "String1:String2" in which String1 is replaced by
; String2. Example: "<NUL>:\d000", "\d034:\d000"
; Parameter for DNC-Download (MT => CNC)
DNCDSTART = ; Identifier string for transmission start e.g. %
DNCDENDE = ; max. 3 strings for transmission end e.g. M30
DNCDESYM = ; Sign for program end e.g. #003 = ETX
DNCDECLR = ; Sign for program end not to control(Yes/No)
DNCDPRGID = ; max. 3 signs for program line display, separated by
comma
DNCDCRLF = #13#10 ; String at the end of a line e.g. #13#10 = CR-LF
DNC DINI = ; Prefix needed by control before transmission
DNCDEXI = ; Trailer needed by control after transmission
DNCDXON = ; Send initialization for MT e.g. #017 = XON
DNCDCPAUSE = ; Pause string, to be able to switch to 2nd control
DNCDCPSYM = ; Pause sign, to be able to switch to 2nd control
DNCDCPCLR = ; Pause string or sign, resp. not transmitted (Yes/No)
DNCDCPMANU = ; If pause string, sign manual transmission start
DNCDCPEXI = ; Trailer before pause
DNCDCDELAY= 0 ; Only nctrs60.dll: n Delay in microseconds before
sending of each sign (Default:0=deactivated)
DNCDCODETABLE = "<NUL>:\d000" ; Code table for DNC Download. Format
; "String1:String2" in which String1 is replaced by
; String2. Example: "<NUL>:\d000", "\d034:\d000"
PARAGRAPH =

```

3.2 Configuration Parameter

The configuration variables for DNCDLL NCTRS60.DLL are listed in the following:

3.2.1 For Upload (PC Is Sending, Control Is Receiving)

Parameter	Description	Example
PARAGRAPH	Control type, equates to the DNCTYP from paragraph machine name	C200
DNCUSTART	String for program start when transmitting NC -> PC (upload). Entry format: [<sign>] whereupon <sign> equals ASCII sign or #number with number between 0 and 255	%
DNCUENDE	Up to 3 strings for transmission end if transmission NC -> PC. Entry format: [<sign>...[,<sign>...[,<sign>...]]] whereupon <sign> equals ASCII sign or #number with number between 0 and 255	M03
DNCUCRLF	String for line separator when transmitting NC->PC. Entry format: [<sign>]. whereupon <sign> equals ASCII-sign or #number with number between 0 and 255	#13#10
DNCUTRANS	Specification of signs to be converted. Entry format: [<sign alt><sign new>]. Whereupon <sign alt> or <sign new>, respectively equals ASCII sign or #number with number between 0 and 255	§@,:#064
DNCUSSYM	Sign for program start when transmitting NC -> PC (upload). Entry format: #number with number between 0 and 255 or one of the defined strings STX, ETX, ENQ, ACK, LF, FF, CR, XON, DC2, XOFF, DC4, %	STX
DNCUESYM	Sign for program end when transmitting NC -> PC (upload). Entry format: see DNCUSSYM	#003
DNCUECLR	Sign for program end not to be written (Yes/No)	NO
DNCUPRGID	Sign for program line display	%
DNCUXON	XON sign is sent to NC as transmission initialization NC -> PC (upload). Entry format see DNCUSSYM	XON
DNCUPTMOUT	Timeout for transmission pause status	
DNCUETMOUT	0: transmission end manual, otherwise timeout for transmissions end	
DNCUEOK	End string to NC after program end, if ok	
DNCUEERR	End string to NC after program end, if error	
DNCUTRIM	Trim line on the right, i.e. remove conclusive invisible signs (N=default Y)	N
DNCUSAVECTRLCHARS	Save control character (ASCII<32) (N=default Y) (only with ncwut.dll and ncnport.dll)	N
DNCUCODETABLE	Replace string, see 3.3 Code Conversion Table	"\d000:<NUL>"

3.2.2 For Download (Control Is Sending, PC Is Receiving)

Parameter	Description	Example
DNCSTART	String for program start when transmitting PC -> NC (download). Entry format: see DNCUSTART	%
DNCDENDE	Up to 3 strings for transmission end when transmitting PC -> NC (download). Entry format: [<sign>...[,<sign>...[,<sign>...]]] whereupon <sign> equals ASCII sign or #number with number between 0 and 255	M02,M30
DNCDESYM	Sign for program end when transmitting PC -> NC (download). Entry format: see DNCUSSYM	#003
DNCDECLR	Do not send sign for program end to control (Yes/No)	
DNCDPRGID	Sign for program line display	%
DNDCRLF	End of sentence when transmitting PC -> NC (download). Entry format: <sign>. whereupon <sign> equals ASCII sign or #number, with number between 0 and 255	#013#013#010
DNCDTRANS	Specification of signs to be converted. Entry format: see DNCUTRANS	\$_@,#064
DNCINI	Prefix to NC before program start. Entry format: <sign>. whereupon <sign> equals ASCII sign or #number or <sign> equals ASCII sign and [number] or <sign> equals #number and [number], with number between 0 and 255 and number between 1 and 9999	#0[20]#13#10
DNCDEXI	Trailer to NC after reading in end. Entry format: see DNCDINI	#013#010#0[20]
DNCDXON	To initiate transmission PC -> NC it is waited for XON sign of the NC. Entry format see DNCUSSYM	#017
DNCDPAUSE	Pause string, to enable switching to 2 nd control	
DNCDPSYM	Pause sign, to enable switching to 2 nd control	
DNCDPCLR	Do not transmit pause string or sign, respectively (Yes/No)	
DNCDPMANU	Manual transmission start when pause string or sign, respectively (Yes/No)	
DNCDPEXI	Trailer before pause	
DNCDCDELAY	Delay in microseconds before sending of each sign (default:0=deactivated)	0
DNCDCODETABLE	Replace string, see 3.3 Code Conversion Table	"<NUL>:\d000"
PARAGRAPH	Paragraph end	

3.3 Code Conversion Table

Herewith it is possible, to convert strings before and after a transmission. One individual configuration per DNC type can be stored.

The allocation machine to DNC type is done with parameter DNCTYP. The parameters are entered in file dncp.cfg.

```
; New parameter code conversion table: DNCDCODETABLE for download, DNCUCODETABLE
for upload
; Multiple parameters can be configured either separated by comma or in multiple
lines.
;     Backslash for special character
; \xnn  hexadecimal numbers. Example: \x20 for 20h = 32d
; \dnmm decimal numbers. Example: \d032 for 32d, \d065 for 'A'
; \\ for a backslash '\', or \d092
DNCDCODETABLE = ; code table for DNC Download. Format
"String1:String2" whereupon String1 is replaced by String2. Example: "<NUL>:\d000",
"\d034:\d000"
DNCUCODETABLE = ; Code table for DNC Upload. Format "String1:String2"
whereupon String1 is replaced by String2. Example: "\d000:<NUL>"
```

If control characters (ASCII < 32) shall be converted during upload, the DNC parameter DNCUSAVEC-TRLCHARS has to be set to Y.

3.3.1 Example:

Configuration:

```
; Download
DNCDCODETABLE = "\d034:\d000" ; \d034 is a quotation mark (")
DNCDCODETABLE = "<SOH>:\d001"
DNCDCODETABLE = "<STX>:\d002"
DNCDCODETABLE = "<ETX>:\d003"
DNCDCODETABLE = "<EOT>:\d004"
DNCDCODETABLE = "<ENQ>:\d005"
DNCDCODETABLE = "<ACK>:\d006"
DNCDCODETABLE = "<ESC>:\d027"
; Upload
DNCUCODETABLE = "\d000:<NUL>"
DNCUCODETABLE = "\d001:<SOH>"
DNCUCODETABLE = "\d002:<STX>"
DNCUCODETABLE = "\d003:<ETX>"
DNCUCODETABLE = "\d004:<EOT>"
DNCUCODETABLE = "\d005:<ENQ>"
DNCUCODETABLE = "\d006:<ACK>"
DNCUCODETABLE = "\d027:<ESC>"
```

NC program before transmission:

```
%MM
N030024
N1(OUTLET VALVE DISK C11.11457-0463 )
N5X2.6Y134.
N10Z18.3
N15G1X10.6Y109.5Z19.2F600.
N20X15.1Y100.
N25G0Z50.
<EOT>
*****
```

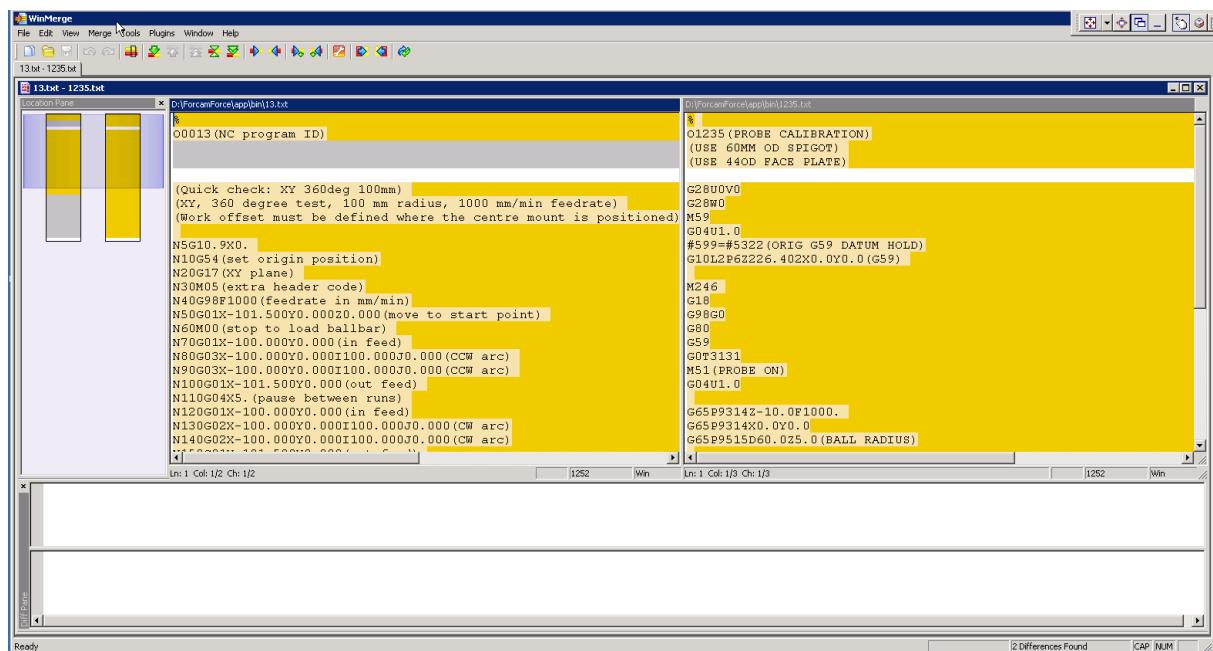
NC program for transmission after converting with DNCDCODETABLE parameters.

Changed signs are yellow.

ASCII codes are shown in square brackets.

```
%MM
N030024
N1 (OUTLET VALVE DISK C11.11457-0463 )
N5X2.6Y134.
N10Z18.3
N15G1X10.6Y109.5Z19.2F600.
N20X15.1Y100.
N25G0Z50.
[004]
[000] [000] [000] [000] [000] [000] [000] [000]
```

Comparison with WinMerge:



NC program after retransfer.

The DNCUCODETABLE parameters "\d000:<NUL>" and "\d004:<EOT>" act.

```
%MM
N030024
N1 (OUTLET VALVE DISK C11.11457-0463 )
N5X2.6Y134.
N10Z18.3
N15G1X10.6Y109.5Z19.2F600.
N20X15.1Y100.
N25G0Z50.
<EOT>
<NUL><NUL><NUL><NUL><NUL><NUL><NUL><NUL><NUL><NUL>
```

4 Revision Sheet

Date	Page(s)	Description	Author
25.09.08	15	Neuer Parameter DNCREPLYFILE	MV
25.09.08		DncMonitor, Neuer Parameter MONITORPASSWORD	MV
21.10.08	17-18	Dnc mit Quinx	MV
01.12.08	14-16	request program mit programname	MV
02.12.08	16	NCPAKETFILTER	MV
23.01.09		NCSENDPLAUSISTATEMENT ersetzt NCPAKETFILTER and PAKETCOLAPL and PAKETCOLAPLGRP	MV
23.01.09		DNC mit Quinx and integriertem FTP-Server	MV
16.02.09	14	Kap. 2.3.20 OPTIONALUPLOADFILE	MV
16.02.09		Konfiguration Quinx Box per telnet	MV
16.07.09		UPLOADFILENAME	MV
16.07.09		NC-programme auswerten mit Regex	MV
03.08.09	27	Codewandeltabelle	MV
12.08.09	24	DNCP: DNCUSAVECTORLCHARS	MV
02.10.09	17	DNCUPLOADTYPE: Beschreibung korrigiert	MV
11.12.09		USEMNRDEFAULTCONFIG	MV
11.12.09		SENDMULTIFILESASONE	MV
08.02.10	14	ORDERFILEMINSIZE	MV