# FORCE MES FLEX - Document Control

## Version 5.12

*Product Description*

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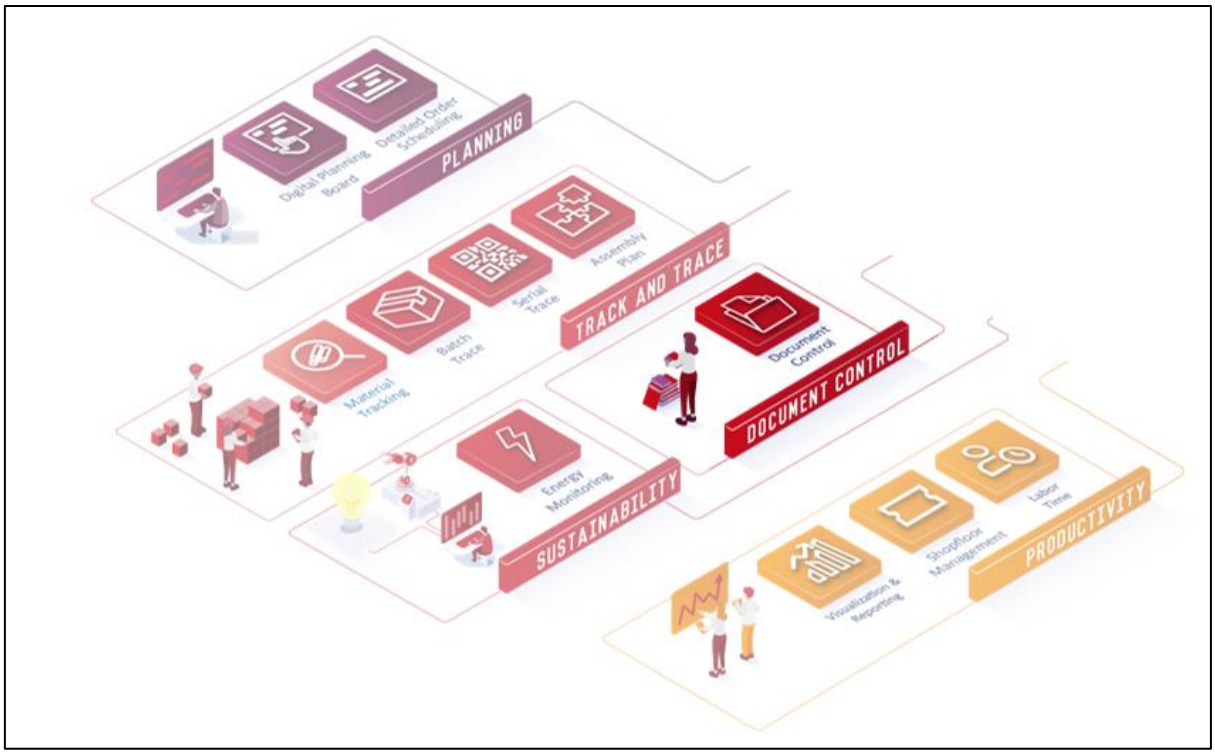
# Overview*

The **Document Control** app offers a highly configurable production data management. Its main benefit is making documents and data required for production directly available to the workers on the shopfloor.
The range of functions of the Document Control app includes two features:

- Basic package: **Digital Folder**
- Add-on: **File transfer (DNC, parameters)**

The **Digital Folder** offers a production data management (PDM) system that enables you to configure all production-relevant information (e.g. drawings, tool data or NC programs) in the Workbench and make it available in the Shopfloor Terminal.
The File transfer add-on lets you automatically transfer or receive NC programs to or from a machine.




* For better readability, we generally use the generic masculine in the text. These formulations, however, are equally inclusive of all genders and address all equally.

# Basic package: Digital Folder

The **Digital Folder** is your production data management tool from FORCAM. With this tool, you can manage your production-relevant documents digitally and in a targeted manner, thus promoting paperless production in your company.
Document types that are typically managed via the PDM:

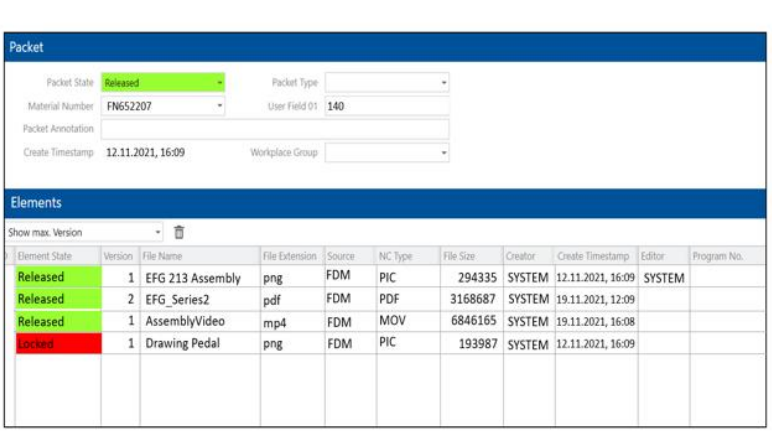
- Work and inspection instructions
- Datasheets
- Setup plans
- Preset data
- Setup sheets
- Clamping diagrams
- Tool data
- Safety instructions
- Drawings or graphics

**Production Data Management (PDM)**

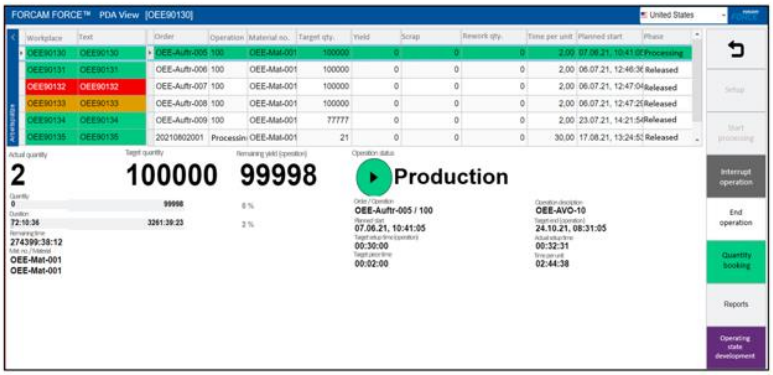
The PDM manages and controls all files relevant to production. In the PDM environment, these are called elements. Any file can be selected and uploaded as an element. Examples of file types: TXT, RTF, DOC, DOCX, ODT, PDF, BMP, JPEG, PNG, AVI, MP4 etc.
Elements are then assembled into packages (so-called digital production folders) for individual workplaces. The data is always up to date because it comes from the production database. They are maintained in the database, and can be searched for or sent to workplaces/machines.
All changes to the data are automatically logged, greatly reducing the possibility of errors. The time it takes to find the right production data is also significantly reduced compared to a paper environment.

Document Control offers the following basic functionalities:

- Management of production folders (packages), documents or data (elements) as well as respective versions
- Creating, changing and deleting production folders as well as documents or data
- Running external programs




Production Data Management

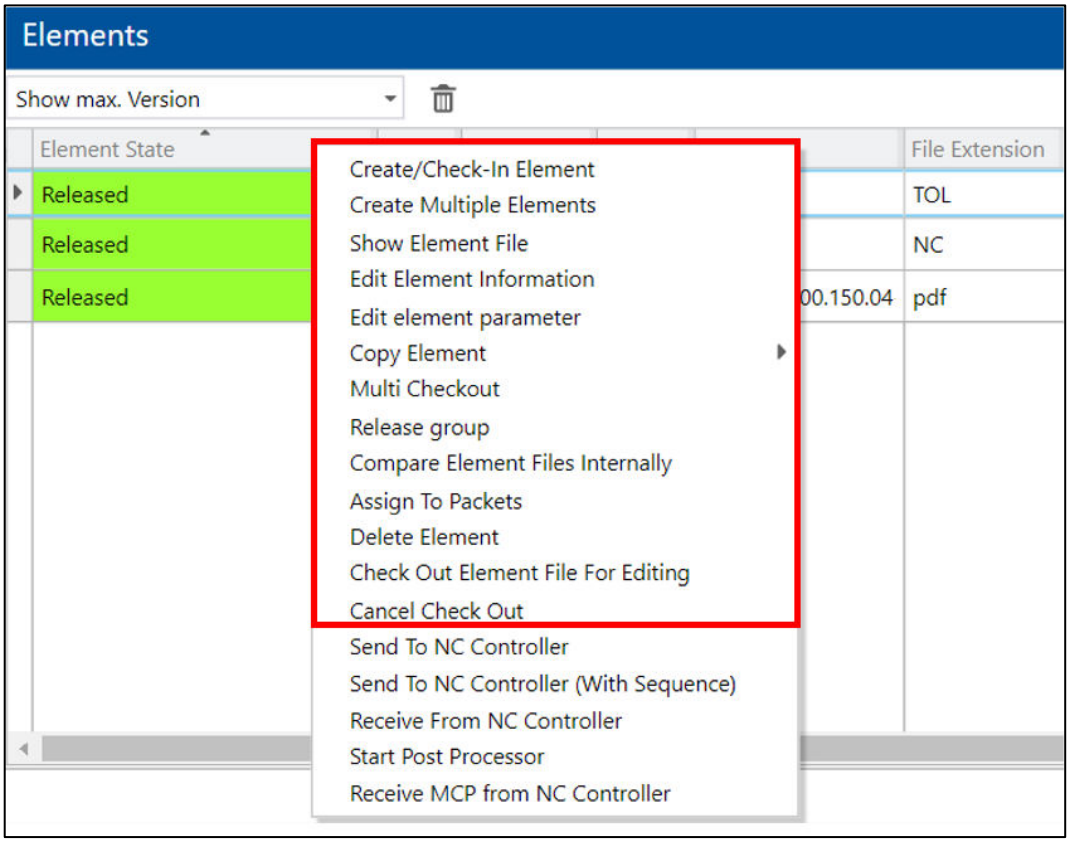



Shopfloor Terminal

Documents

### Elements

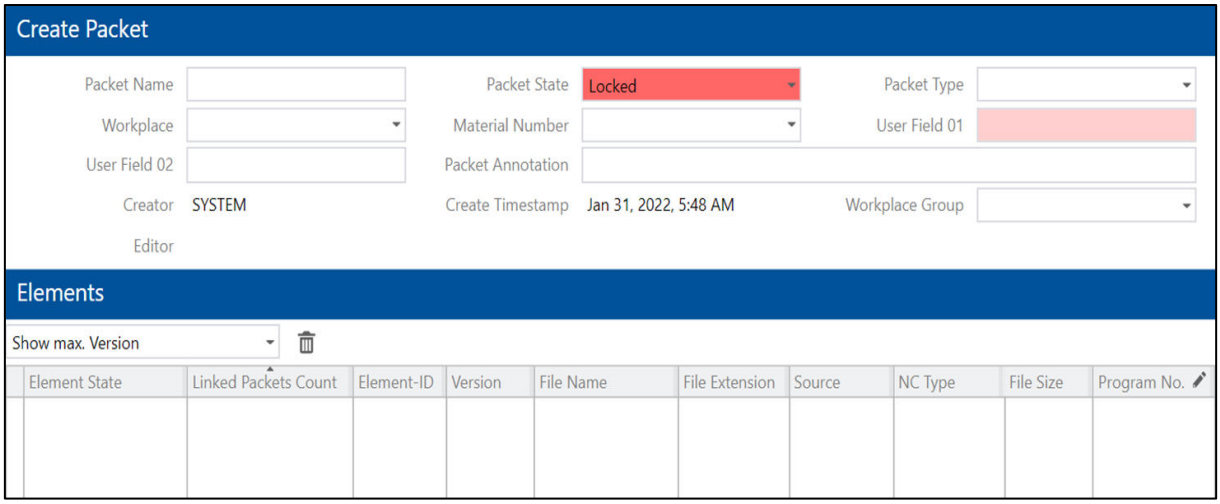
An individual element in the app corresponds to a document or dataset. These can be, for example, work instructions, tool data or production sketches. In a traditional paper environment, such documents are typically placed in a production folder and handed to the worker at the machine. Elements are components of packages. Any number of elements can be created for each package. Elements can be created in the PDM, assigned to packages, searched for, compared with each other or deleted. Simple management ensures that always the latest, approved elements are available at the machine.




### User options related to elements

## Packets

In a paper environment, packets correspond to classic manufacturing folders. They contain all the documents, information and resources that workers on the shopfloor need to complete their production orders safely and with the best possible quality.
Each packet consists of a header with defined parameters and any number of associated elements. The system comes with a default packet header with the fields Workplace (or Workplace group) and Material. However, these parameters can be modified and extended if required.
The packets can be created, displayed, edited, copied, linked to elements or deleted by authorized editors. They can, however, also be part of an internal release process and thus be released or locked, for example.




**Input mask for creating a new packet**

### Links

One of the advantages of the Digital Folder is that each individual element in its latest version can be linked to a variety of packages. For example, a safety instruction that is part of the production folders for the machinery of two plants does not have to be copied several times and inserted into each individual production folder. No one needs to replace it when it has been changed. Since each element is from just one source in the database, its latest version is available in all packages at the same time after changes are made at the global level.

### Uniqueness and data consistency

There are two ways to search for packets - complete search or packet tree search.
The packet key is defined by linking different parameters. All the fields available for the packet header can be used for this purpose. The combination of these key fields makes each packet uniquely identifiable, which is a prerequisite for data consistency. Default key fields:

- Workplace (or workplace group)
- Material
- Operation

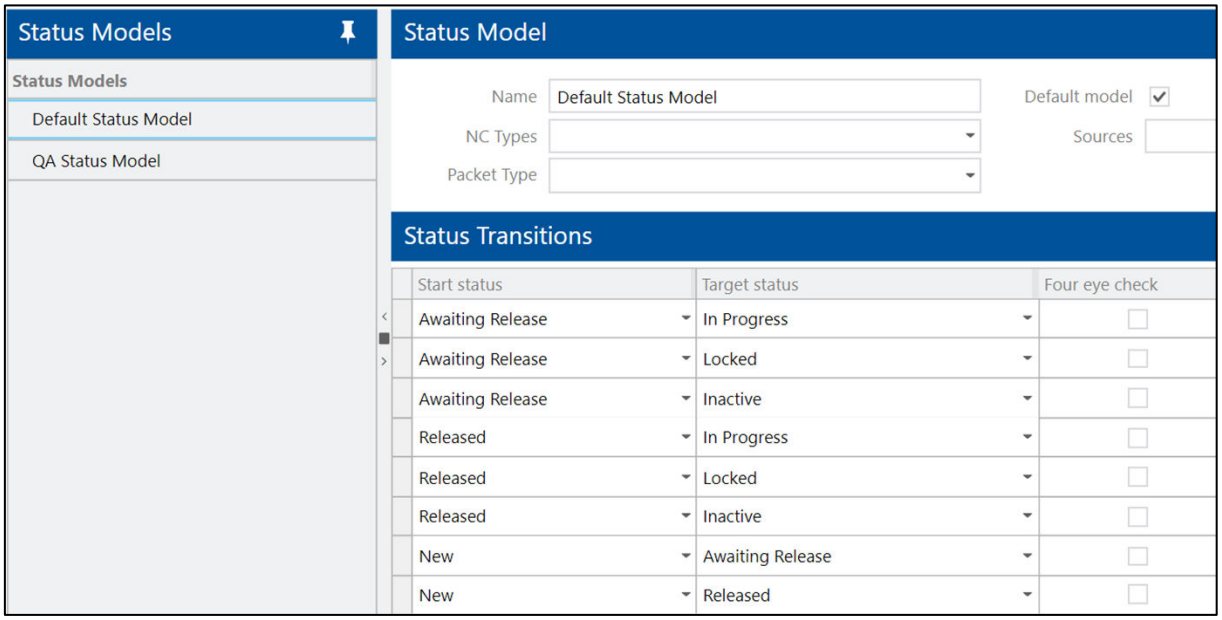
**Packet link**

| Packet Field | Key domain | Key identifier | Editor | Changed |
|---|---|---|---|---|
| Packet key 1 | Operation | Order | SYSTEM | 16.01.2017 14:10 |
| Packet key 2 | Workplace | Machine name | SYSTEM | 16.01.2017 14:10 |
| | | | | |

**Example of a packet link**

### Flexible status model

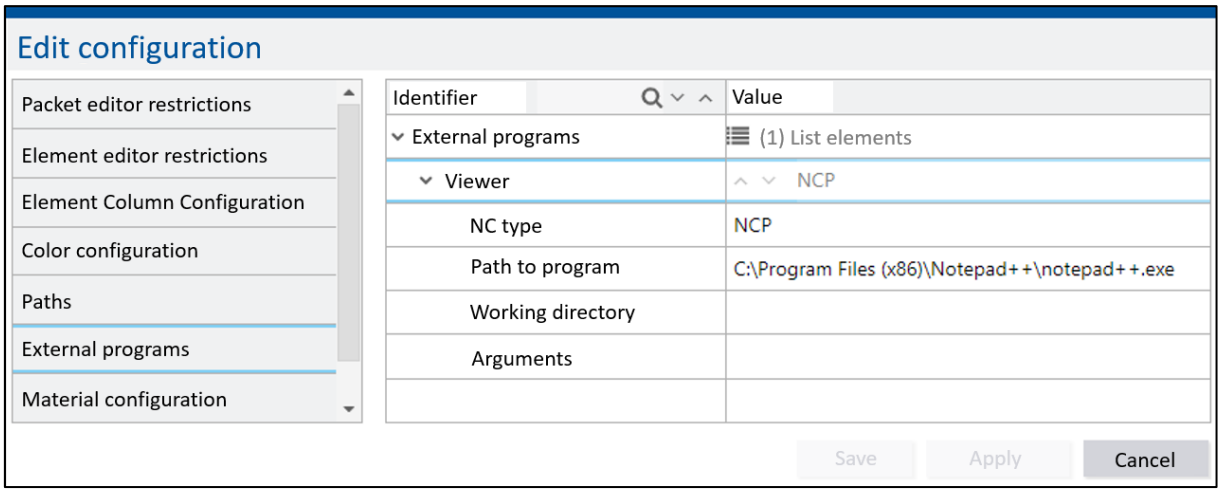
The PDM offers a customizable release routine for the various statuses that files and documents can have (e.g. new, in progress, released, locked, etc.).
When changing to another status, meta information is added to the elements so that it is always possible to trace which file was transferred to another status, when and by whom.
You can model the prerequisites for status changes and specify any transaction information for them.
You can also assign a four-eyes principle. The rights and roles for this are defined in the user administration.




**Different status models for different production departments or manufacturing plants**

### External programs and URLs

External viewers and programs can be used if they are physically installed on a client PC running FORCAM FORCE IIOT. For instance, for image files, a program of choice can be selected to display graphics. The programs approved for this purpose are defined in the configuration.




### Configuration for using an external program

### Delta-Export

Delta-Export can be used to save data on external systems, for example (backup). When the configuration is complete, they are exported there for the first time, then incrementally each time a packet is changed. All the necessary settings are stored in configuration pages. This way, in the event of a server failure, work can continue offline and manually using an external data source.

### WIT Import

WIT Import is used to import packets or elements from external sources. WIT files also contain information on data usage. This additional information makes sure that the data is interpreted, newly created, existing data is deleted or changed.

### Log data

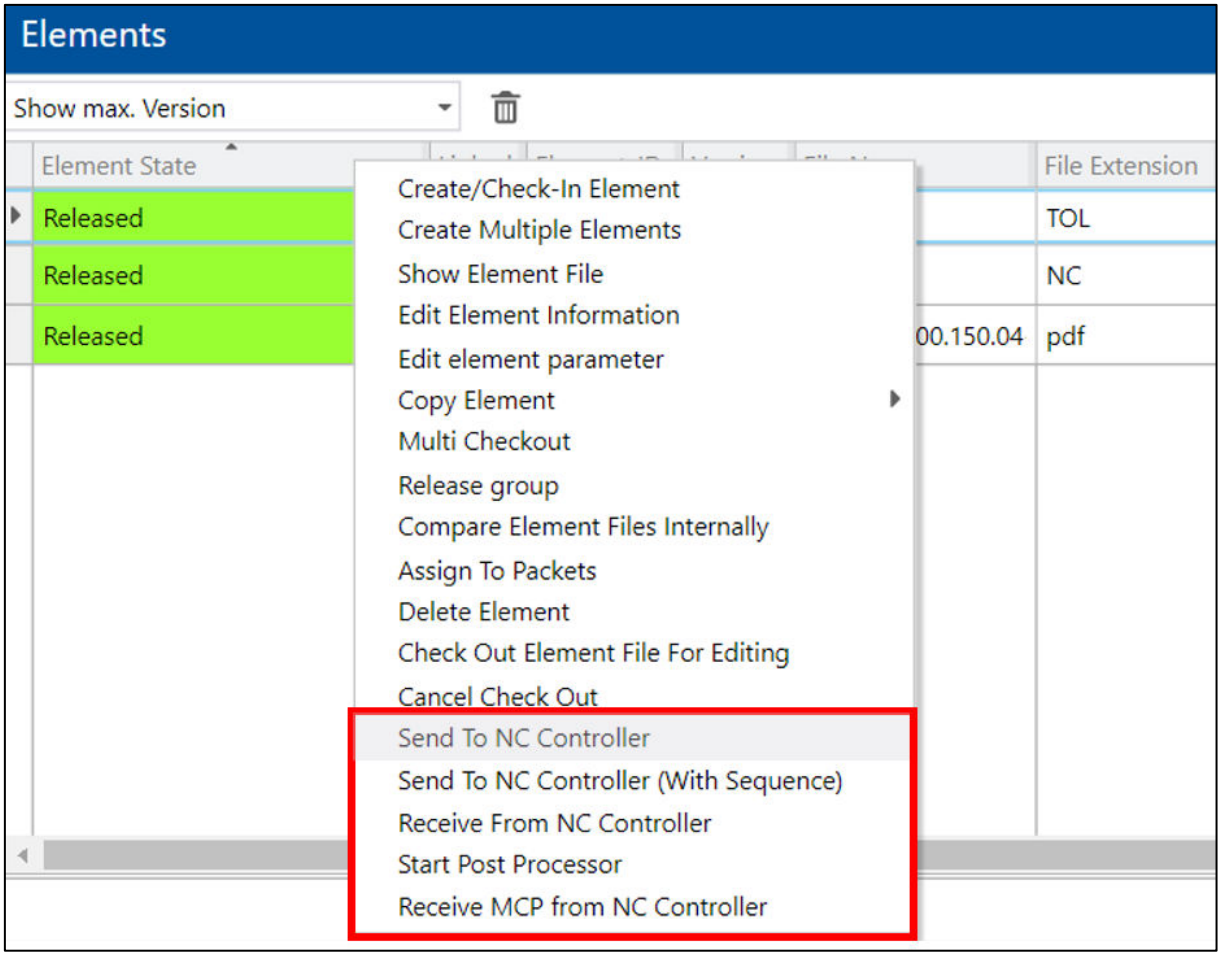
The production data management automatically creates logs of user interactions which are stored in the database. Important information about history and user interaction is logged and remains traceable. For example, this means that the user, the time when processing took place, or the text of the logged activity can be viewed at any time. The rights for this can be assigned via corresponding roles.

## Scope of functions

- General:
  - Creation of digital production folders with different elements in any desired file formats (e.g. TXT, RTF, DOC, DOCX, ODT, PDF, BMP, JPEG, PNG, AVI, MP4 etc.)
  - Customizable packets and elements
  - Management of packets, elements as well as document versions
  - Definition of custom statuses and possible status transitions
  - Query of any information at specific status transitions
  - Logs/protocols of detailed information
  - Linking of documents
- Connectivity:
  - Connection of third-party systems (e.g. Product Lifecycle Management Systems, PLM) via the open API interface; the connection options can be requested from FORCAM
  - Running external programs/viewers
- Workbench:
  - Manage elements and packets (create, delete etc.)
  - Flexible packet mapping
  - Search for elements and packets
  - Configurable packet header
  - Versioning of elements and packets for better tracking and quality assurance
  - Delta-Export (external backup)
  - General WIT settings as well as WIT import configuration regarding the interpreting the contents of the control file during WIT imports
- Shopfloor Terminal:
  - Display files in external viewers (e.g., datasheets, instructions, drawings, clamping diagrams etc.)

# Add-on: File transfer (DNC, parameters)

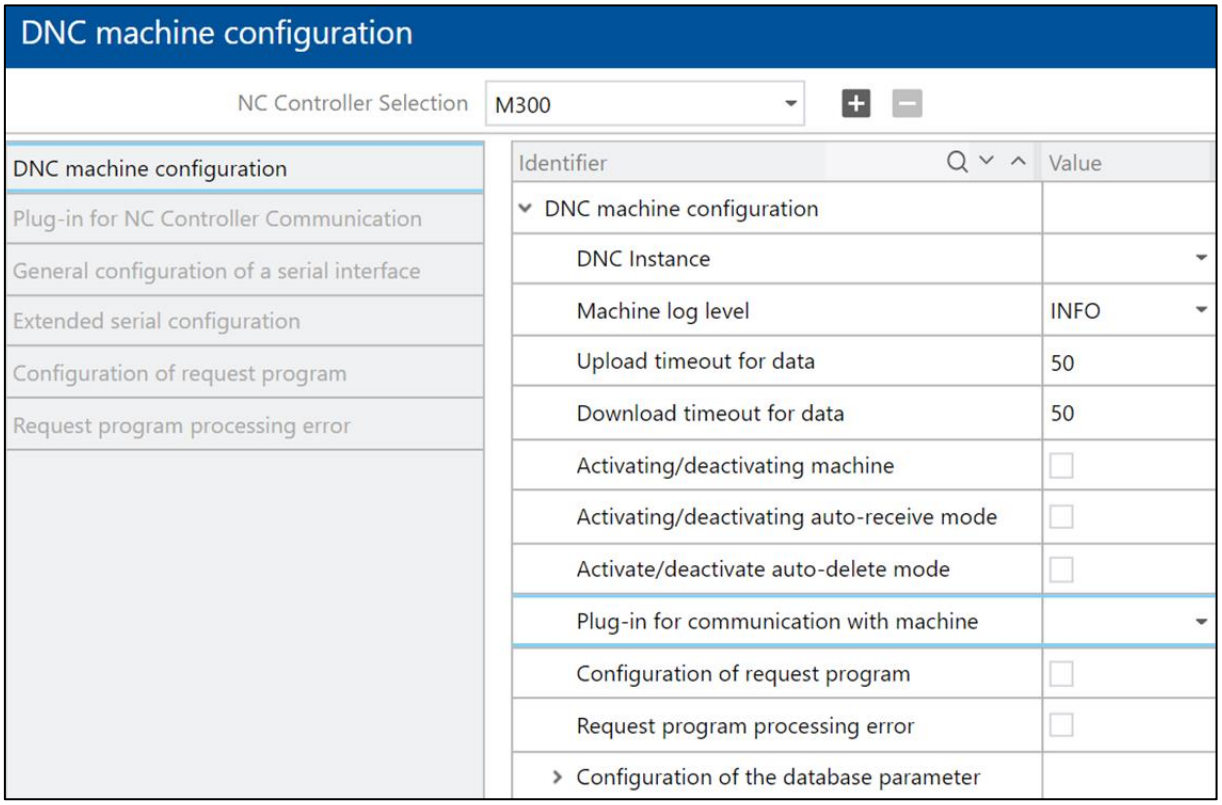
The **File transfer** add-on enables the automated transfer of NC control programs to machines This data can be sent to a machine at the push of a button. Conversely, they can also be received from the machine side after having been optimized by the worker during production, for example.
For this purpose, the NC programs are managed in a central database. Traceability is ensured because every program transfer to and from the machine and every change is logged.




**User options related to NC controls**

### FFDNC

The FFDNC enables bidirectional communication with machines for transferring production-relevant documents. Based on the main configuration in the Workbench, and depending on the machine, a suitable communication method can be used.
The transfer of documents to and from the machine to the system can be triggered via the Workbench as well as via the Shopfloor Terminal. By transferring the documents back, any optimizations made to the documents by the worker can be tracked via the version management of the production data management module (PDM module).



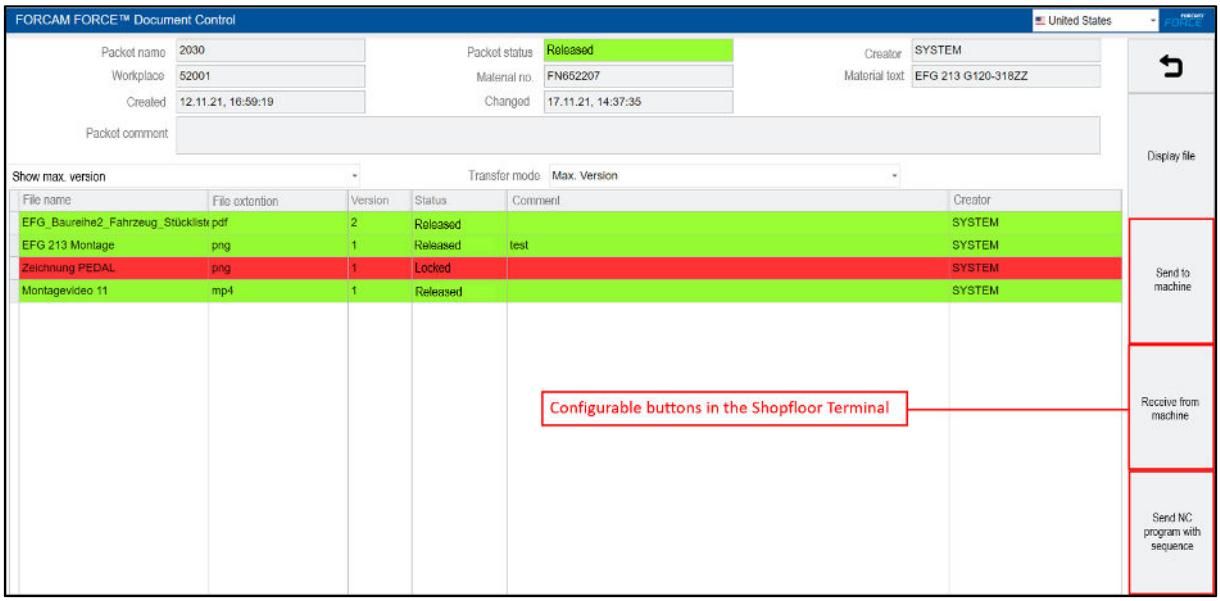

**Input mask for the DNC machine configuration**

### NC types for machine control

Besides the functionality of the NC types relevant for the PDM module, these can also be used for restricting transferable documents based on the NC types. This prevents documents with the incorrect file extension from being transmitted to a machine, which could cause problems at the machine.

### Document Control in the Shopfloor Terminal

Workers can transmit or receive NC files from a machine in the Shopfloor Terminal. The necessary buttons in the Shopfloor Terminal can be easily created and configured according to individual needs.




**Document Control in the Shopfloor Terminal with buttons for transferring DNC files**

### DNC Logs

The PDM logs section also contains an NC control log. This is a log of all DNC file transfers from/to NC controls within a specified time period. The information subsequently exported: NC control, transmission time, file details and possible error description.

## Scope of functions

- General:
  - Creation of digital production folders with NC programs and files in any desired file formats (e.g. TXT, NC, NCP, OPT etc.)
- Workbench:
  - Monitoring of the FFDNC application
  - Display of the DNC logs
- Shopfloor Terminal:
  - Displaying NC files in an external viewer
  - Send or receive files to or from machine
- Many popular plugins * for Document Control:
  - Serial interfaces ComPortServer, MOXA with MOXA Box
  - File transfer with FTP protocol, FileHandler with SMBv1 protocol and all SMB protocols via FileHandlerServer
  - FANUC
  - Mazak communication server
  - RPC Sinumerik
  - Heidenhain

* A list of all available plugins can be requested from FORCAM.