User Guide
Machine Operation

VX 370 Feeder - Canon

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1 Revision History

Version	Date	Name	Description
01	2016-04-29	Marc Steinhilber	Initial revision
02	2016-09-01	Marc Steinhilber	Update on best practice on media settings
03	2017-01-30	Frank Oehrle	Update on drawings
04	2017-02-07	Frank Oehrle	Side blower settings added
05	2017-03-20	Marc Steinhilber	Updated based on machine redesign
06	2017-04-25	Guenter Braun	Formatting and photos
07	2017-05-27	Marc Steinhilber	Updated GUI description
08	2017-05-30	Guenter Braun	Corrections
09	2017-06-28	Guenter Braun	Updates based on customer feedback
10	2017-07-20	Frank Oehrle	Update based on further design improvements
11	2017-07-21	Guenter Braun	Photos updated
12	2017-07-27	Guenter Braun	Corrections, photos updated
13	2017-08-21	Guenter Braun	Information added
14	2017-08-29	Guenter Braun	Release
15	2017-10-18	Guenter Braun	Details added
16	2017-11-07	Guenter Braun	Pictures updated

Abbreviations

GUI	Graphical User Interface
HMI	Human Machine Interface
M2M	Machine to Machine
OCP	Operator Control Panel
PLC	Programmable Logic Controller

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2 Scope of Content

2.1 About this Manual

This document describes the basic machine structure and the fundamental functions of operation. Its main purpose is to explain all functions as well as the prevention of dangerous situations for personnel working at the unit caused by inappropriate operation or handling.

2.2 Note

Read this manual before operating the feeder. The manual must be fully read and understood by all persons working with the feeder. Any service procedures may only be done by specially trained and authorized personnel. This is supported by a separate manual.

2.3 Targeted Audience

This manual is specifically written for operator personnel and service engineers of the VX 370 Feeder. Both operators and service engineers must receive adequate training in order to be aware of the functions, guidelines and safety procedures of the machine.

2.4 Scope

This manual is valid for the following feeder types:

‘VX 370 Feeder - Canon’

The ‘VX 370 Feeder - Canon’ may be referred to as ‘feeder’ in this manual.

3 Declaration of Conformity

3.1 Declaration of Conformity (in Accordance with ISO/ICE 17050-1)

No. 01

BDT Print Media GmbH
Saline 29
78628 Rottweil
Germany

'VX 370 Feeder Standard'

The object of the declaration above is in conformity with the requirements of the following National and International Standards.

3.1.1 Safety

- US: UL 60950-1, 2nd edition
- CAN/CSA-C22.2 No. 60950-1-07, 2nd edition
- Europe: EN 60950-1:2006+A11:2009+A1:2010+A12:2011+A2:2013
- EC Machinery Directive: 2006/42/EC
- CE Mark: A Declaration of Conformity (DoC) shall be provided
- Acoustic Noise Test acc. To ISO/IEC 17025

3.1.2 EMI / EMC

- FCC Class A EMC Directive 2014/30/EU
- EN 55022:2010 and CISPR 22 (Class B emissions EU and International markets)
- FCC 47 CFR part 15 Class B emissions and ICES-003 (US and Canada)
- EN 61000-3-2:2014+A1/2014+A2/2014 (Harmonics Current Emissions if under 16 amps per phase)
- EN 61000-3-3:2013 (Flicker if under 16 amps per phase)
- EN 55024:2010 (ITE Immunity)

3.1.3 HSE

RoHS and WEEE compliant

- IEC 60204
- ISO 13849-1

3.2 Emission of Acoustic Noise

The VX feeder has been tested for acoustic emissions under the guidelines as required in EN 1010-1:2011. The resulting emissions are 75 dBA max (depending on Tornado / side blower speed), which is safe for the user. Since the noise level is under the threshold level of 80 dB (A) no hearing protection is required. The VX feeder has no specific vibrations or resonances that could be damaging for the user's health.

4 Electrical Requirements

The VX 370 Feeder standard has a single phase connector.

Input voltage:	90 – 260 V AC
Frequency:	47 / 63Hz
Input current:	max. 14 A (AC) / 110V - max. 6.5 A (AC) / 240V
Back up fuse:	16A

Note: The VX 370 is not equipped with an overcurrent protection. Please make sure, that the electrical installation in the building is protected against overcurrent.

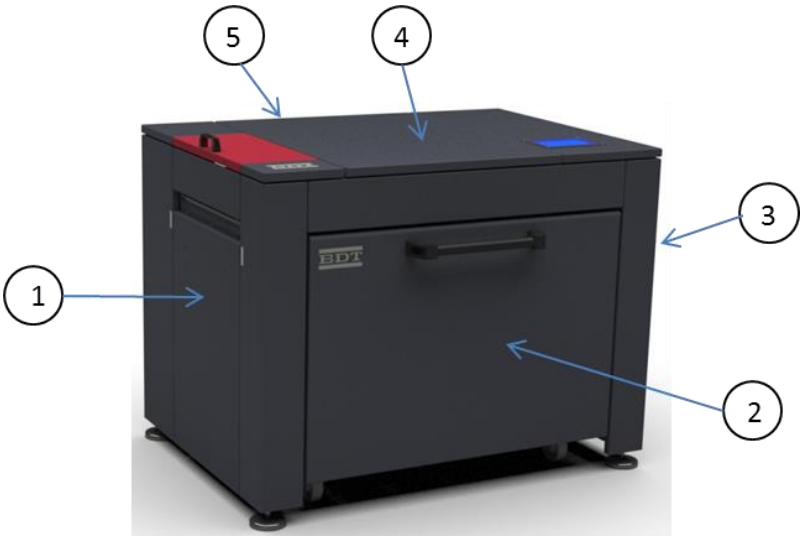
5 Product Overview

5.1 Feeder Side & Axle Definition

Below the definition of the feeder's sides and axles are described:

Pos	Side description
1	Interface side
2	Operator side
3	Back side
4	Top side
5	Rear side

Table 1: Feeder – Side & Axle Definition



Picture 1: Feeder - Side & Axle Definition

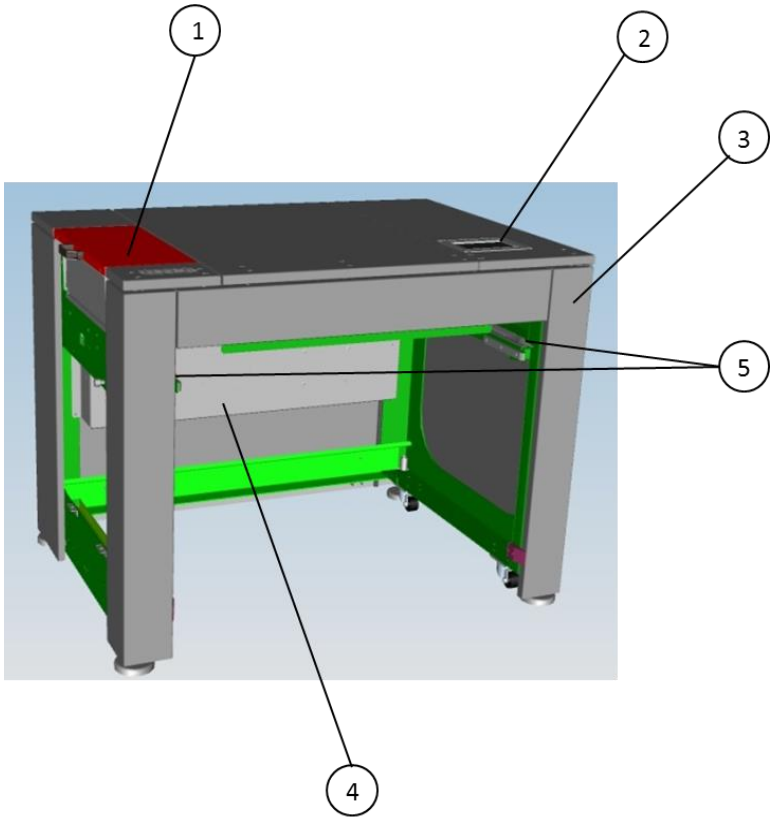
5.2 Hardware Component Overview

Below the main hardware components of the feeder are described:

5.2.1 Feeder - Frame

Pos	Element	Function
1	Feed module	Feed head top cover that accommodates the Tornado modules and the media guide including optical sensors
2	Operator Control Panel	OCP - User interface for controlling the feeder
3	Frame housing	Sheet metal frame housing for stabilization of frame in order to accommodate the cart and the respective movement and forces
4	Electronic cabinet	Contains the majority of electronics to support the function of the feeder
5	Fixations poles	Poles that fixate the assistance side rollers of the cart to hold position of the cart in the frame

Table 2: Feeder Frame – Main Hardware Components

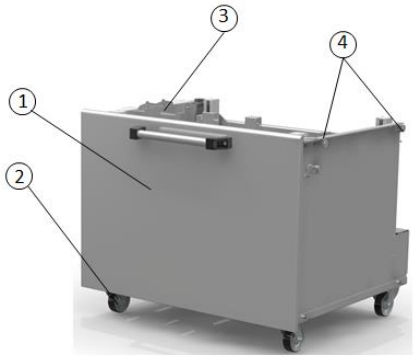


Picture 2: Feeder Frame - Main Hardware Components

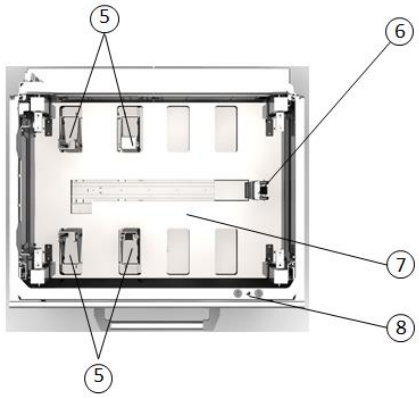
5.2.2 Feeder - Cart

Pos	Element	Function
1	Cart front cover	Front cover includes the handle for moving the cart and covers the operator side of the machine as the cart is attached to the frame
2	Cart rollers	Industrial rollers for easy moving of the cart when it is undocked from the frame
3	Feed wall	Specially shaped feed wall that support to smooth the transition of the media into the eject module and prevents jam errors
4	Fixation side rollers	Fix the cart position when moved into the frame
5	Width adjusters	Fix the sides of media stacks and hold position
6	Length adjuster	Fixes the trailing edge of the media stack and holds position
7	Lift plate	Lift plate for lifting of media stacks to the top of stack position
8	Control buttons	Control buttons for offline levelling system of the lift table

Table 3: Feeder Cart – Main Hardware Components



Picture 3: Feeder Cart – Main Hardware Components 1/2



Picture 4: Feeder Cart – Main Hardware Components (top view) 2/2

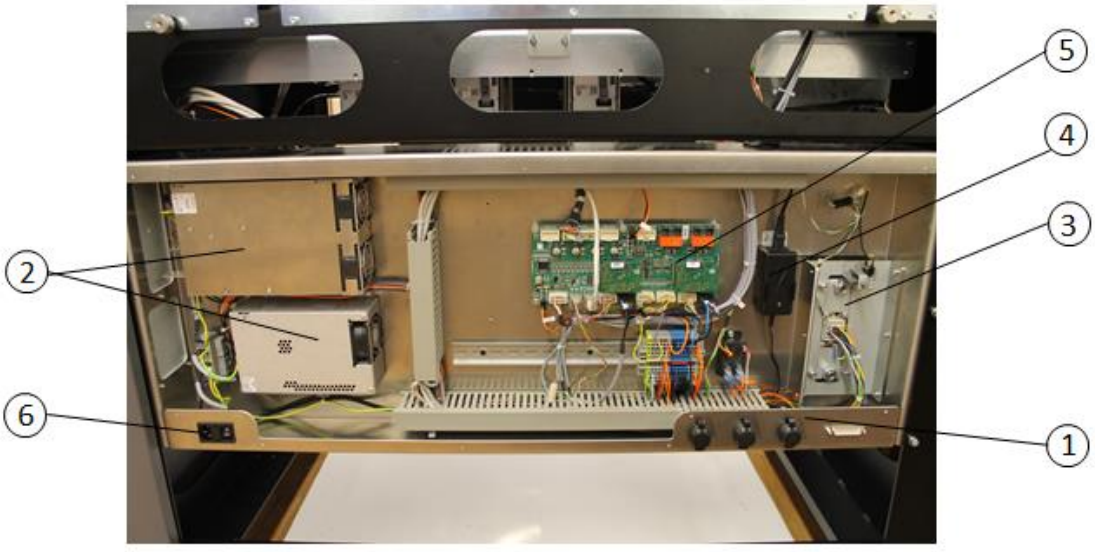
5.3 Electronic Component Overview

Below the main electronic components of the feeder are described. The electronic cabinet is at the rear side of each the frame and the cart.

5.3.1 Feeder - Frame

Pos	Element	Function
1	Interface section	Includes the M2M interface via TCP/IP (RJ45) & Digital I/O (Sub-D 25pins). Further the service interface and alignment CAN interface (both RJ45) are located there. See labelling on the machine.
2	Power supply (2x)	Supplies power to the whole machine (frame & cart)
3	Floating connector bush	Accommodates the plug of the floating connector of the cart
4	Battery charger	Charging device for the two batteries in the cart for the offline levelling system
5	I/O control board	Input / output control board that controls all signal functions that are exchanged in the feeder internally
6	Power section	Contains the switch to turn the feeder on and off

Table 4: Feeder Frame – Main Electronic Components 1/2

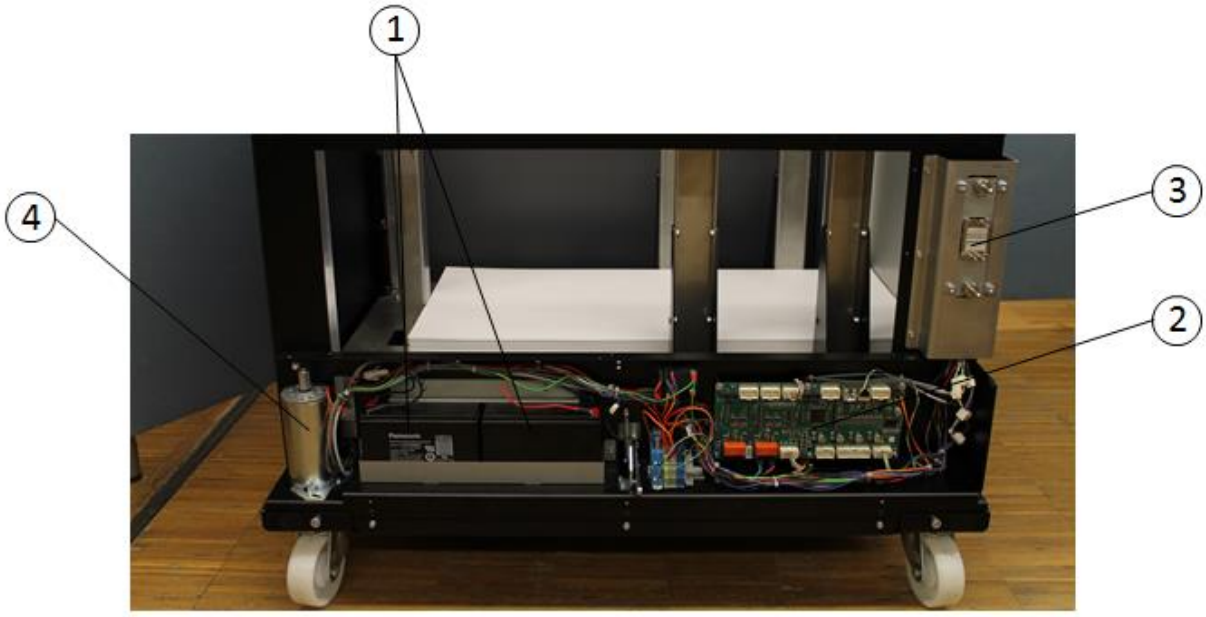


Picture 5: Feeder Frame – Main Electronic Components 2/2

5.3.2 Feeder – Cart

Pos	Element	Function
1	Batteries (2x)	Batteries for the offline levelling of the cart when it is undocked from the frame. Expected trickle design life: 10 – 12 years at 20°C.
2	I/O DCMC motor controller board	Controlling of the lift motor
3	Floating connector plug	Plug of the floating connector that is accommodated by the floating connector bush of the cart
4	Lift motor	Lift motor that drives the lift table of the cart

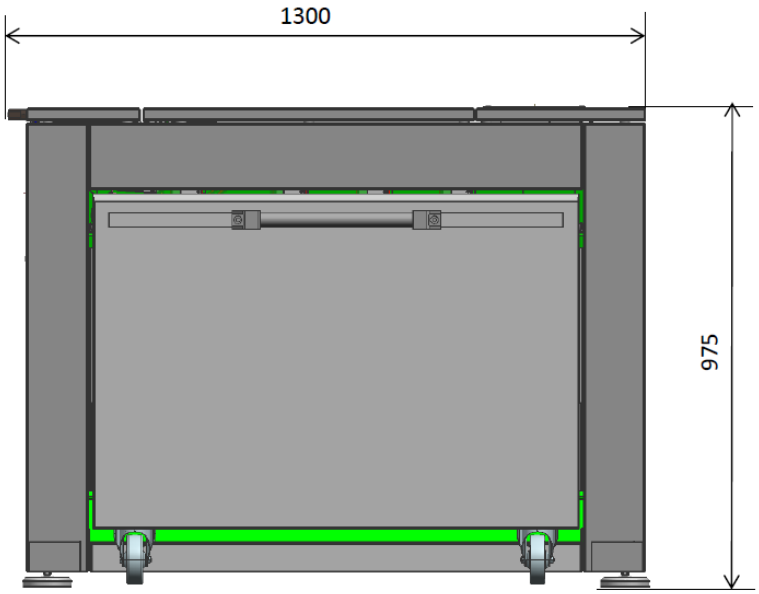
Table 5: Feeder Cart - Main Electronic Components



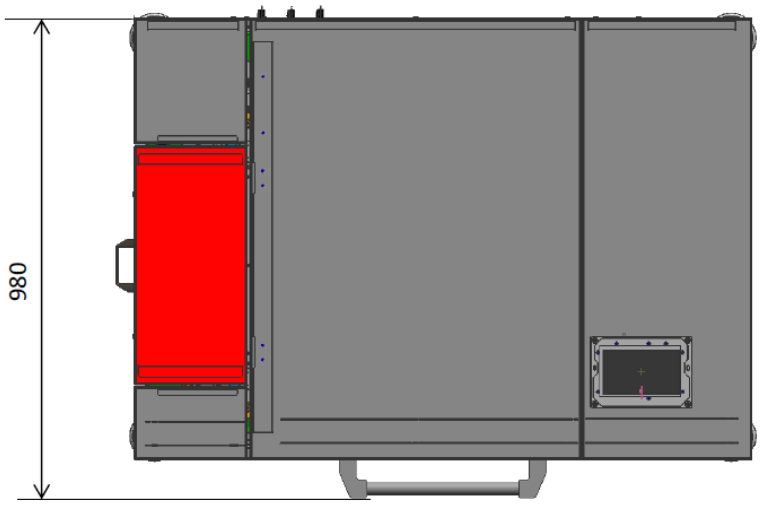
Picture 6: Feeder Cart - Main Electronic Components

5.4 Machine Dimensions

5.4.1 Feeder – Frame

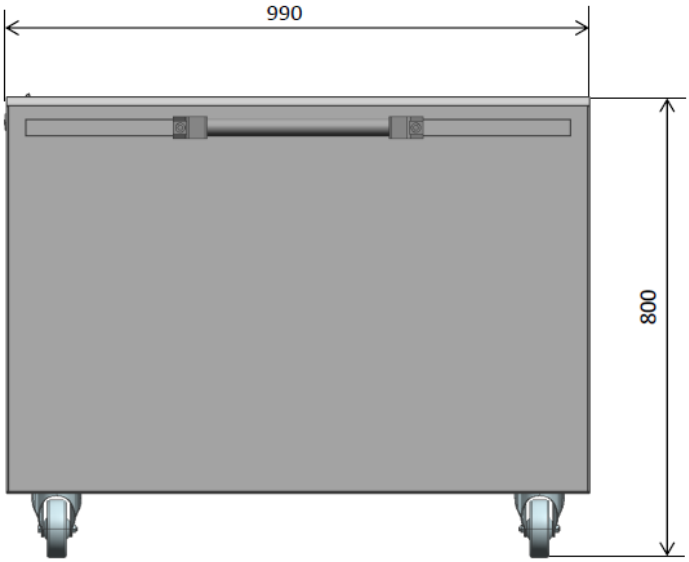


Picture 7: Feeder Frame - Dimensions (front view)

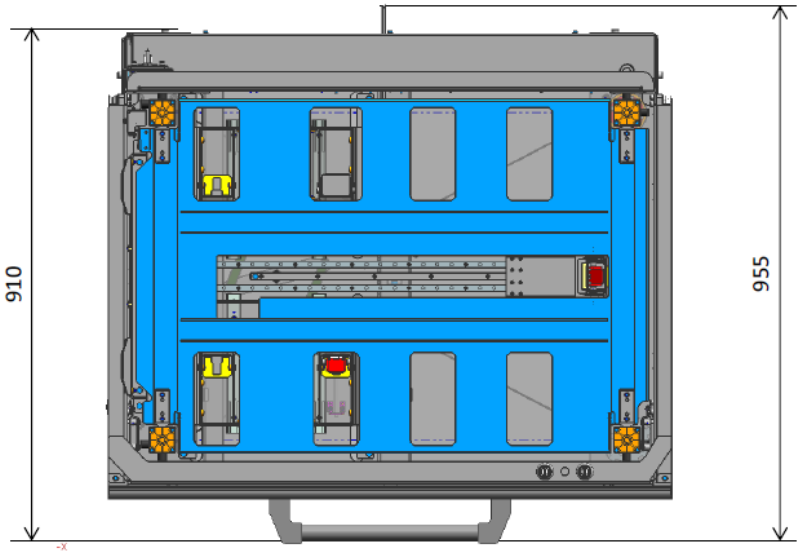


Picture 8: Feeder Frame - Dimensions (top view)

5.4.2 Feeder – Cart



Picture 9: Feeder Cart - Dimensions (front view)



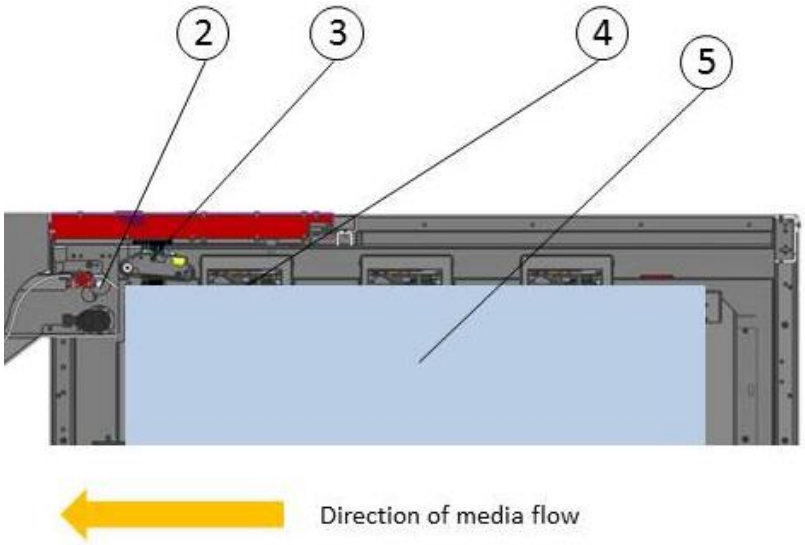
Picture 10: Feeder Cart - Dimensions (top view)

5.5 Media Flow

The media is located on the lift table. The top sheet will be separated by the sideblower modules, lifted by the Tornado module and transferred into the nip rollers of the eject module. The nip rollers move the media into the respective module located downstream. The lift table will level itself depending on the top-of-stack sensor signal.

Pos	Element / Functions
2	Nip rollers in the eject path transporting media out of the feedhead
3	Lifting media by Tornado modules at leading edge and transport it in horizontal direction
4	Width adjusters for fixing the media position on the lift table
5	Lift table transporting the media stack in vertical direction

Table 6: Feeder Main Functional Elements



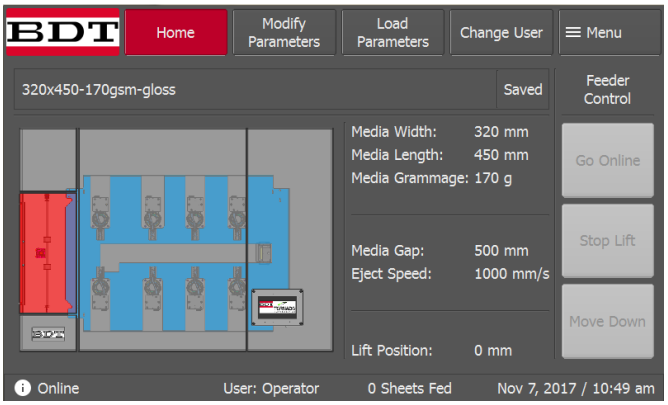
Picture 11: Feeder Media Path (section view)

5.6 Feeder Control Elements

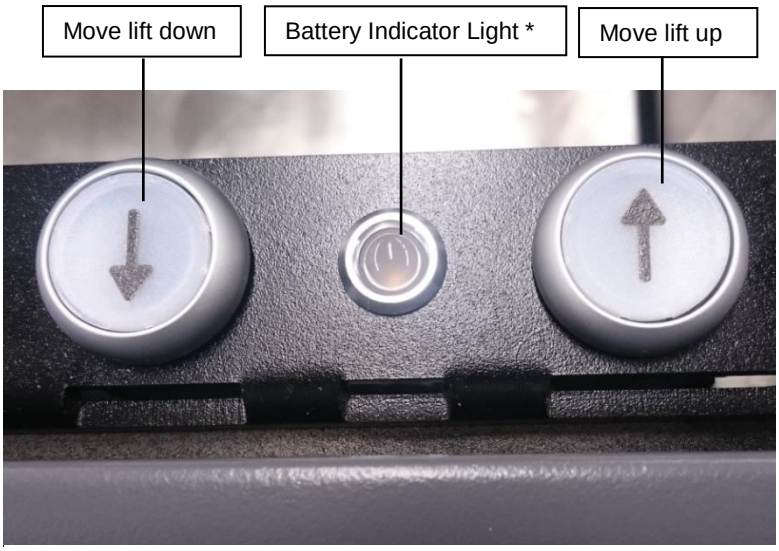
The feeder is controlled by an operator control panel (OCP) which is at the top of the frame. To control the lift table of the cart there are 2 buttons at the top of the cart.

5.7 Display and Control

Picture 12: Touch Screen Display



Picture 13: Main Menu



Picture 14: Cart Controls

*The light between the up- and down buttons will be green in case the batteries are fully charged. As the capacity of the batteries get weaker, the light will switch to yellow, orange and red (in case the batteries are empty). The batteries will recharge automatically as the cart is docked into the frame.

6 Safety & Interface

The safety information and procedures described in this chapter apply to operators and other personnel working on or near the feeder. The safety procedures cover the device and the area immediately surrounding it.

Use the following Guidelines

The feeder must only be operated by properly trained personnel who are thoroughly familiar with all the operating, safety and maintenance procedures of the device. Before you attempt to use the feeder, read and understand this manual and the safety procedures.

Appropriate Use of the Feeder

The feeder serves exclusively to feed flat flexible media and transfer them into the following printing press or post-processing equipment.

Inappropriate Use of the Feeder

CAUTION!
Inappropriate use of the feeder can cause serious physical injury and damage to the feeder.

1. Inappropriate use is any use which differs from or exceeds the appropriate use of the feeder.
2. It is inappropriate to operate the feeder if it is not in perfect working condition.
3. Any modification to the feeder and its modules is inappropriate.
4. Bypassing any of the safety elements of the feeder is inappropriate.

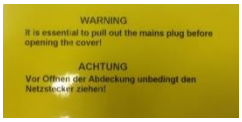
6.1 General Safety Instructions

1. Before the feeder or any of its components are taken into operation, it must be ensured that the relevant personnel have read and fully understood this manual and received an appropriate training.
2. This manual is to be kept close to the feeder.
3. The feeder must only be operated by any personnel who are able to meet certain physical and intellectual requirements.
4. Any technical modification to the feeder may only be made with the explicit approval of the manufacturer.
5. Always comply with all accident prevention regulations and safety instructions on the feeder and those described in the manual.
6. In case of accidents, please follow the internally defined and communicated reporting requirements and comply with any emergency procedures.
7. Immediately switch off the feeder and secure it so that it cannot be switched on again accidentally if you observe any safety-related changes to it or if it behaves incorrectly.
8. Keep the working and safety areas around the feeder free from paper dust, paper, water, grease, solvents, tools and any other operating supplies.

9. Before you start any repair or maintenance work in any of the areas containing electrical components, completely unplug the feeder from the power outlets.
10. Comply with all instructions and regulations concerning fire and explosion protection.
11. In the event of fire, only use CO2 as an extinguishing agent.
12. Make sure that there are no persons or objects in the working range of the feeder before you start any operations.
13. The safety features of the feeder must function properly during operation. Do not bypass, remove, or disconnect any safety element. Check the safety equipment integrity at least once per working shift.

6.2 Safety Symbols

Some of the following symbols appear as warning labels on the feeder.



Electrical Warning
DANGER – Electrical Hazard
The power cord needs to be unplugged prior to any removal of any cover.

Electrical Hazard
DANGER - Electrical Hazards
Contact may cause electrical shock or burn. Turn off power before servicing.
Only authorized personnel may open the electrical components areas.

Mechanical Hazard
DANGER - Hand Pinching. Can trap hands, fingers, clothing, and cause serious injury. Stay well clear. Make sure you mind your hands prior to any operation of the devices or its components.

Placement of Warning Labels

Warning labels are placed in various locations on the feeder. Some of the warning labels may be behind covers and on parts that may be accessible only to authorized service personnel.

6.3 Electrical Safety

The feeder must be properly connected to the main power supply and, if applicable, to any host system. Make sure all connectors are engaged correctly and if there are metal brackets used to connect to the host, make sure all screws are fastened properly during installation of the devices.

DANGER! **Do not operate the feeder if it is not properly connected to the main power supply. Perform a weekly check on all cabling and connectors. If a cable has to be disconnected or reconnected during a maintenance or service procedure, you must switch the feeder off.**

6.4 Interlock Switches

The feeder has two interlock switches:

1. A key switch is located in the feeder frame close to the feed module.
2. A key switch (functionality incorporated in the floating connector pin) is located on the rear side of the cart and the inner side of the rear side of the frame.

ATTENTION! **When interlock switches are not activated / closed, the operation of the feeder will stop, and all moving parts will be stopped immediately by disconnecting them from power.**

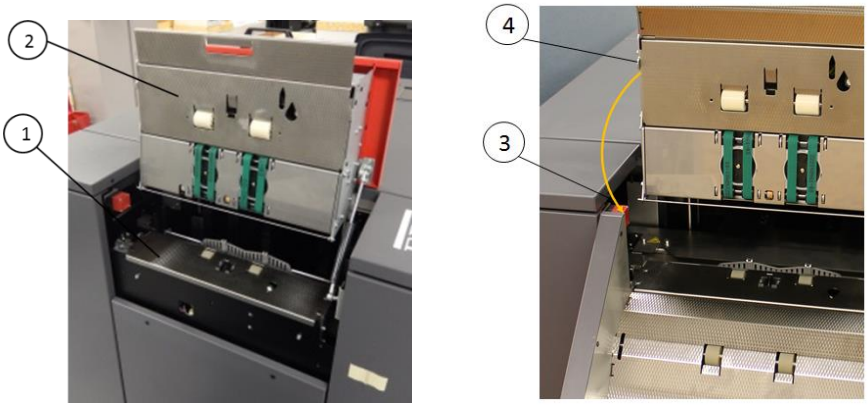
DANGER! **Do not disconnect or override the interlock switches**

6.4.1 Feeder Interlock Switch - Fead Head

The following components are connected to the first interlock switch:

Pos	Element / Functions
1	Feeder frame (includes interlock switch bush)
2	Feed module (includes interlock switch connector)
3	Interlock switch bush on feeder frame
4	Interlock switch connector on feed module

Table 7: Components connected to Safety Switch #1



Picture 15: Feeder Interlock Switch Position

Operation

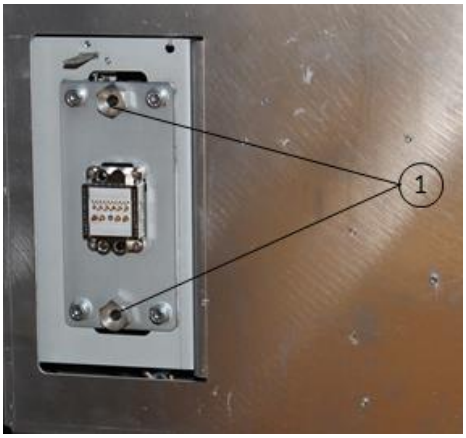
- When the cover of the feed module is closed, the electrical power will be activated
- As soon as the cover of the feed module is open, electrical power will be deactivated
- The OCP will remain powered on

6.4.2 Feeder Interlock Switch - Floating Connector

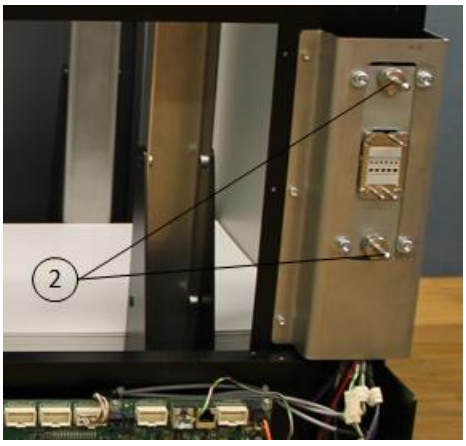
The following components are connected to the second interlock switch:

Pos	Element / Functions
1	Feeder frame floating connector part (includes interlock switch bush)
2	Feeder cart floating connector part (includes interlock switch pins)

Table 8: Components connected to Safety Switch #2



Picture 16: Feeder Frame – Floating Connector



Picture 17: Feeder Cart – Floating Connector

Operation

- ➔ When the cart is moved into the frame, the pins of the floating connector of the cart will connect to the plug of the floating connector of the frame and the signal is activated.
- ➔ As soon as the cart is undocked from the frame, electrical power will be deactivated.
- ➔ The OCP will remain powered on.

6.5 Special Safety Instructions

1. Never replace parts or components with the main power supply switched on.
2. Do not remove any of the safety precautions or safety elements.
3. Operating personnel must always tie up their hair if it is long and must not wear loose clothing or jewelry, including rings.
4. The feeder cannot be modified without authorization of the manufacturer.
5. Make sure that during any unit operation, anyone is interfering with any moving part of the feeder.

Covers and Doors Handling:

6. Make sure that your hands are not harmed during the locking and unlocking of covers.
7. Make sure that no other personnel are in the working range of the feeder while opening or closing covers and doors.
8. Inform your supervisor, if the feeder does not seem to work properly or you feel that you need further training.

6.6 Service Safety Procedures

DANGER! **Only specially trained personnel are allowed to replace components of the feeder for service**

1. When replacing components off the feeder, make sure they are securely supported by personnel before loosening screws in order to avoid unexpected movement or dropping of the components.
2. Entire sub modules and components might be heavy and it needs to be considered if a second person must be available in order to replace them.
3. Make sure the feeder is powered-off during any service procedure.
4. When working inside the feeder frame under the side blowers watch out for the paper side guides. They are pointy and can hurt your head.

6.7 Main Power Supply Switch

The main power supply switch of the feeder is located at the rear side of the frame. Turn on/off the power by turning on/off the main supply switch.

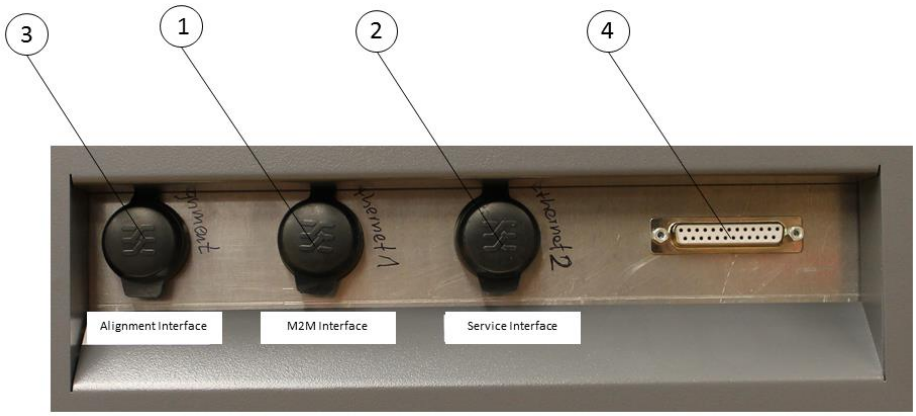
Picture 18: Feeder- Main Power Supply Switch

6.8 External Interface Connectors

The feeder has three external interface connectors (RJ 45) and one Sub-D 25 pin connector. All connectors are located at the rear side of the frame.

Pos	Element
1	M2M interface – RJ45 connector
2	Service interface – RJ45 connector
3	Alignment interface – RJ45 connector
4	Digital input/output interface – Sub-D connector (25 pins)

Table 9: Feeder - External Interface Connectors



Picture 19: Feeder - External Interface Connectors

7 Operation Instructions

This chapter describes the fundamental functions such as loading media, clearing paper jams at different areas and controlling the devices from the operator touch panel.

7.1 Feeder Installation

Unpacking and installation see separate instructions.

7.1.1 Turn-on/Turn-off Procedure

- Attach the power cables on the feeder to the chosen power source
- Turn the feeder on by pushing the main power switch button from status '0' to status '1'. Wait for start up of the PLC. This procedure may take up to 60 sec and is finished as soon as the home screen on the OCP appears.
- Turn the feeder off by pushing the main power switch from status '1' to status '0'.

Picture 20: Feeder - Main Power Switch

ATTENTION! Power-off time has to be min. 15 sec in order to ensure a controlled shut down of the PLC.

7.1.2 Turn-On / Turn-Off Procedure with Registration Unit attached to the Feeder

(This is only applicable, if the VX Feeder is equipped with the VX Registration Unit. – Not all configurations require this feature).

The Registration unit is powered by the feeder. No external power connection is needed.
If you are using a Registration unit (RU) with the feeder following procedure applies:

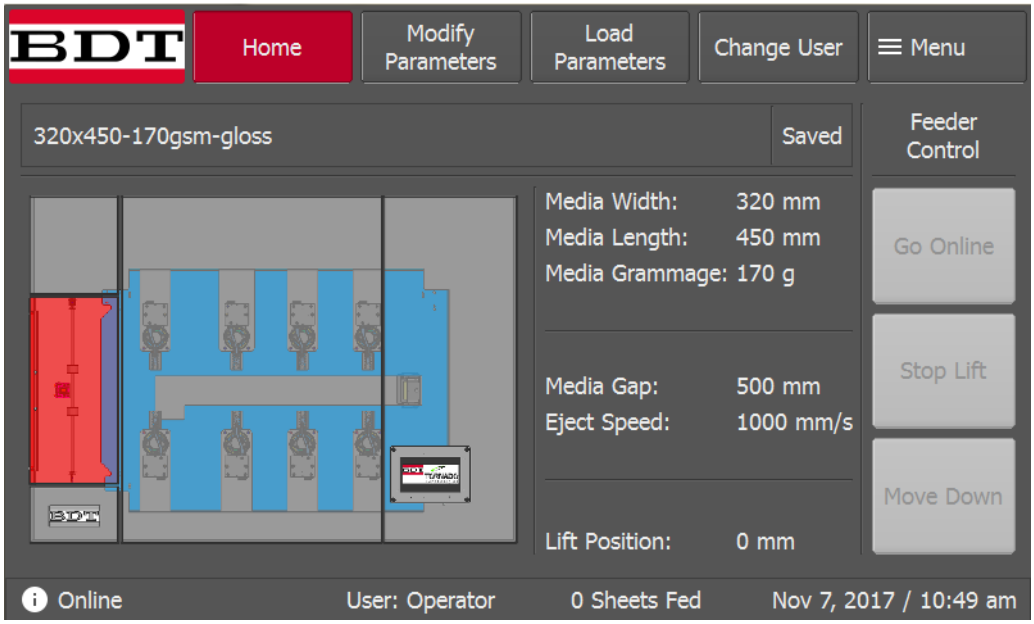
- Attach the power cord to feeder and connect to the power outlet
- Connect the power cord between feeder and RU
- Connect the interface cable (RJ45) between feeder and RU
- Connect the grounding wire between feeder and RU
- Switch on the main power switch on the RU

ATTENTION! The power switch on the RU needs to stay in the ON position all the time.

- Switch on the main power switch on the feeder

7.1.3 Feeder Operator Control Panel Sections / Control Indicators

The feeder is controlled by an operator control panel (OCP). The feeder is fully controlled via the OCP unless the feeder control is integrated in another system via the interface options.

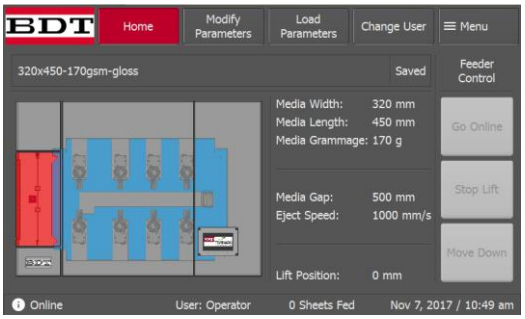


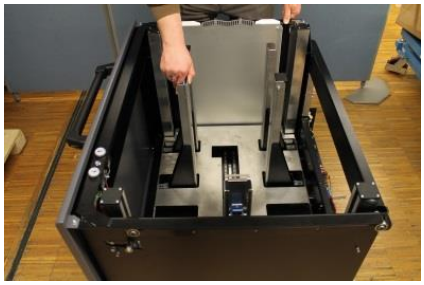
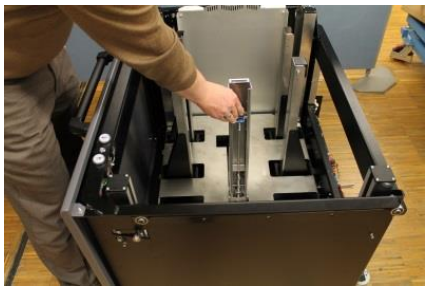
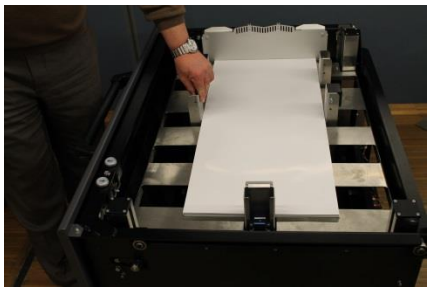
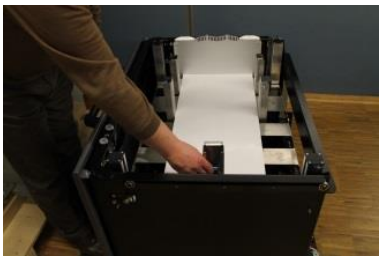
Picture 21: Feeder Operator Control Panel Sections

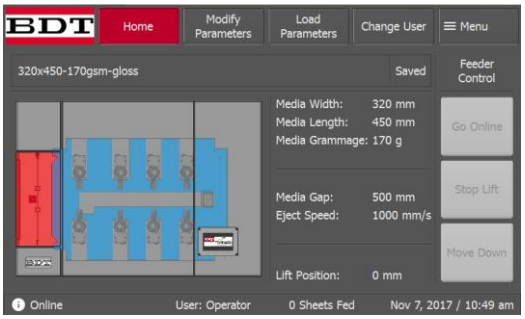
7.2 Feeder – Machine Setup

7.2.1 Loading Media

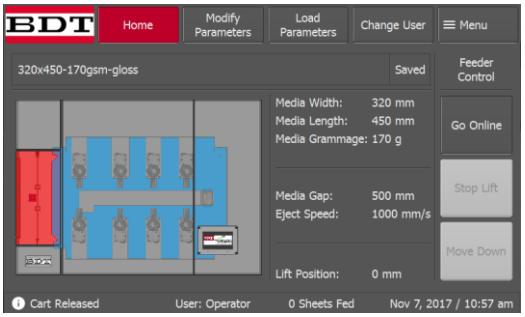
The following descprition shows the general steps to mechanically arrange the feeder in order to be able to feed media. The feeder should not be operated without having set the correct parameter settings via the OCP.

1	Switch the feeder on and make sure that the cart is docked into the frame.	
2	Make sure that the home screen is shown on the OCP after booting up the feeder. No error messages should be present. **ATTENTION!** The top cover of the feed module should be closed. Press the 'Move Down' button and the lift table will move down to the lowest position and the mechanical connection between frame and cart will be released.	
3	After the lift table is in the lowest position the cart status indication on the OCP will change from 'locked' to 'released'. If the OCP shows the status 'released', the mechanical connection between frame and cart is released.	
4	If the cart is 'released', pull out the cart by its handle. **ATTENTION!** Please make sure that the cart is pulled out without being skewed. The outer parts of the cart may collide with inner parts of the frame.	
5	By pushing the 'Up' and 'Down' buttons at the top side of the cart (as indicated in the picture) the lift table will move up and down. Adjust the lift table height as it is convenient to start the loading of the media. **ATTENTION!** The light between the 'Up' and 'Down' buttons will be green in case the batteries are fully loaded. As the capacity of the batteries gets weaker, the light will switch to yellow, orange and red (in case the batteries are empty). The batteries will recharge automatically as the cart is docked into the frame.	

6	Open the width adjusters by pushing the green lever on one of the side adjusters closest to the ‘up’- and ‘down’ buttons by simultaneously pushing the left and right side adjusters to the maximum extend.	
7	Open the length adjuster by pushing the green lever and move the length adjuster to its widest position.	
8	Load the media onto the lift table as centric and precisely jogged as possible. **ATTENTION! Be sure to not insert any media format or type which is not specified in the Technical Data Sheet.**	
9	Close the width adjusters as described above in order to find the right centric position of the stack in cross direction.	
10	Close the length adjuster as described above in order to find the right centric position of the stack in transport direction.	

11	**ATTENTION!** When loading media, take care not to damage the corners and edges of the media. **ATTENTION!** Make sure that the media is not uptight between the width adjusters and the length adjuster. **ATTENTION!** When loading media, do not load higher than specified (500 mm). The pile must not be higher than the sheet metal lip on the length adjuster. **ATTENTION!** If the complete media stack will be loaded in several lifts, make sure to close the side and trailing edge adjuster(s) with every lift in order to get a precise stacking for the complete stack.	
12	After loading the media stack, move the cart again in the frame until it is completely docked and the cart status information of the OCP changes back to 'locked'. **ATTENTION!** It is helpful to concentrate on one side of the frame and cart and have a close look that the fixation assistance rollers on the cart slides smoothly on the frame's fixation pole. The shape of the parts compensates max. 5 mm of side offset. **ATTENTION!** Make sure that the cart is pushed into the frame as slowly as possible in order to avoid a movement of the frame in case the cart is hitting the feet of the frame.	
13	As soon as the cart is docked to the frame and the OCP cart status information shows 'locked', the lift table will level itself and move the lift table into the Top-of-Stack position. The system is ready for feeding.	

7.2.2 Unloading Media

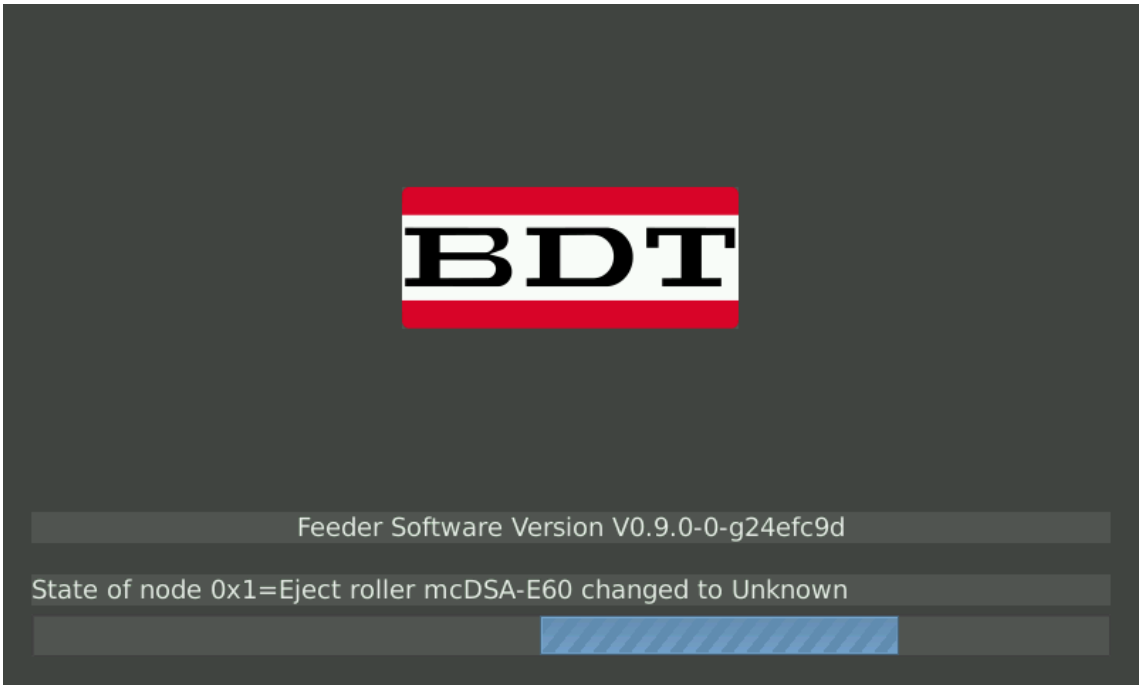
1	Make sure that the feeder is switched on and that the cart is docked in the frame.	
2	Make sure that the home screen is shown on the OCP after booting up the feeder. No error messages should be present. **ATTENTION!** The top cover of the feed module should be closed. Press the 'Move Down' button and the lift table will move down to the lowest position and the mechanical connection between frame and cart will be released.	
3	After the lift table is in the lowest position the cart status indication on the OCP will change from 'locked' to 'released'. In case the OCP shows the status 'released' the mechanical connection between frame and cart is released.	
4	In case the cart is 'released', pull out the cart by its handle. **ATTENTION!** Please make sure that the cart is pulled out without being skewed. The outer parts of the cart may collide with inner parts of the frame.	
5	By pushing the 'Up' and 'Down' buttons at the top side of the cart (as indicated in the picture) the lift table will move up and down. Adjust the lift table height as it is convenient to start the unloading of the media. **ATTENTION!** The light between the 'Up'- and 'Down' buttons will be green in case the batteries are fully loaded. As the capacity of the batteries gets weaker, the light will switch to yellow, orange and red (in case the batteries are empty). The batteries will recharge automatically as the cart is docked in the frame.	
6	Follow the instructions described in chapter 7.2.1 starting from #6 and unload the media accordingly.	

8 Software Navigation VX 370 Feeder Standard

This chapter describes the software navigation of the ‘VX 370 Feeder Standard’.

8.1 Overview: Boot-up Screen

After pushing the main power switch, the ‘Boot-up’ screen’’ will appear. Afterwards the ‘Home’ screen appears which is shown in chapter 8.2.



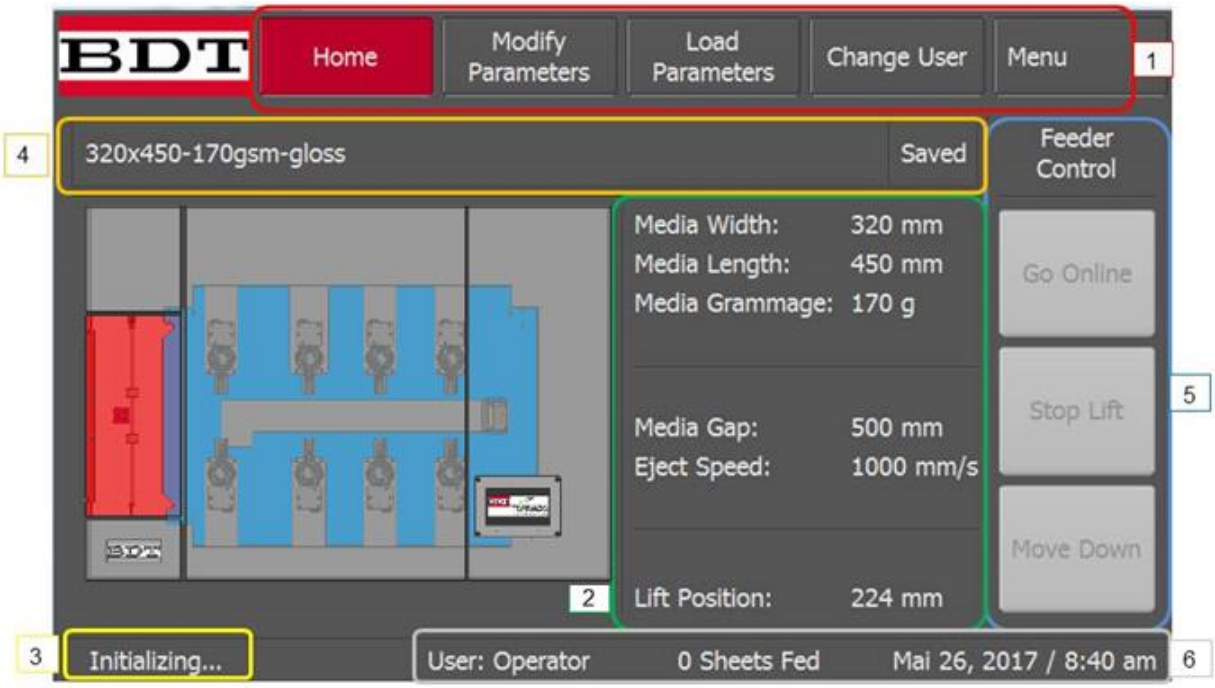
Picture 22: OCP – Boot-up Screen

8.2 Parameter Settings

In this chapter the software and parameter setting functionality is described by explanation of all available screens that are available in the OCP.

8.2.1 Home Screen

The home screen consists of the following information and control sections:



Picture 23: OCP - Feeder Home Screen

1. Navigation Section

Contains five buttons that help to choose a saved job, modify a saved job, create a new job, go in diagnostics mode or go in menu

2. Job Information Section

It shows the basic information and relevant parameters set in the current job.

3. Feeder Status Information

This section shows the status of the feeder and the cart. The following status conditions are available:

- **'Initializing'**
  - ➔ System initializes.
- **'Docking active'**
  - ➔ Cart is attached to the frame and mechanically locked with it. Cart cannot be undocked.
- **'Cart released'**
  - ➔ Cart is attached to the frame but not mechanically locked with it. Cart can be undocked because the lift table of the cart is in the lowest position.

- **'Cart undocked'**
  - ➔ Cart is not attached to the frame. Cart is undocked.
  - ➔ As the cart is properly docked into the frame, the lift table will automatically reference itself and the lift table moves into the top-of-stack position.
- **'Offline'**
  - ➔ Feeder is not ready to feed.
- **'Online'**
  - ➔ Feeder is in Top-of-Stack position and ready to be set in standby.
- **'Error'**
  - ➔ Error occurred. Feeding will be stopped and standby will be inactive.
- **'Ready'**
  - ➔ Standby, Tornados and sideblowers active. Ready to feed sheet.

4. Job Name Section

The name of the current job is shown. If a new job is programmed <unnamed> is present on the OCP.

5. Feeder Control Section

Contains three buttons that help to operate the lift table in the cart and bring the feeder in 'Online' status that is precondition for starting the feed process. The buttons can only be selected when the cart is successfully docked into the frame.

- **'Go Online'**
  - ➔ Lift table will move upwards in the Top-of-Stack position and the feeder status will change to 'Online'.
- **'Stop lift'**
  - ➔ Lift table movement will be stopped and remain in last position.
- **'Move down'**
  - ➔ Lift table will move downwards in the lowest position and the cart will be 'released'. Cart can be undocked from the frame afterwards.

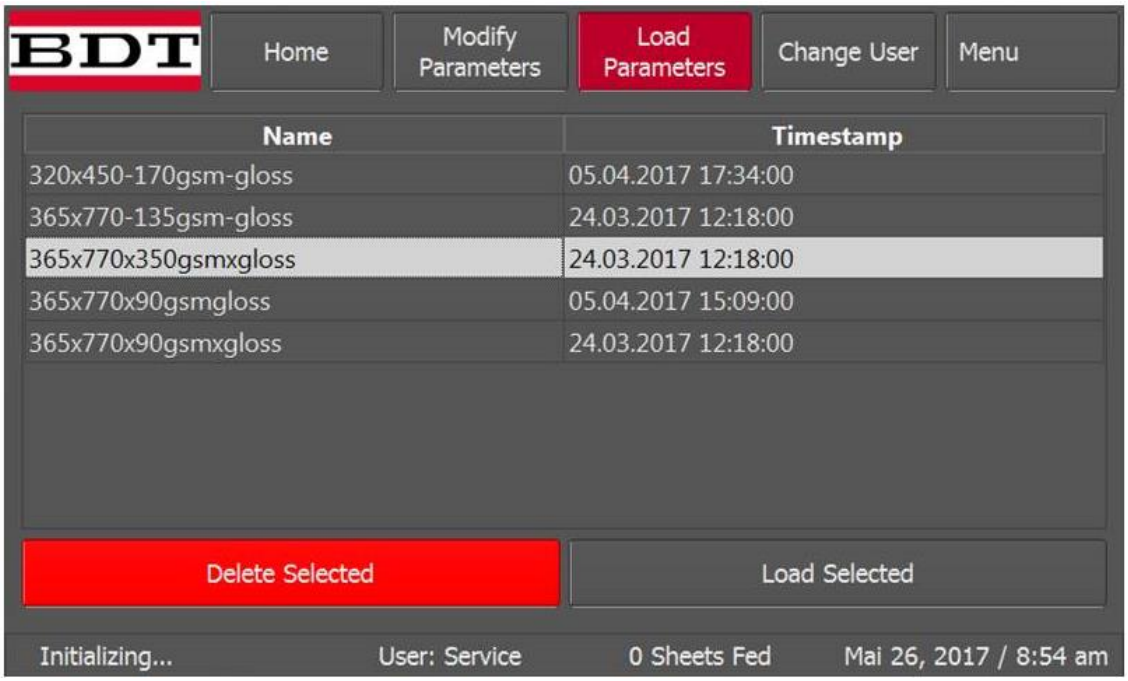
6. General Information

Contains three types of information:

- **'User'**
  - ➔ Displays which user level is currently logged-in
- **'Sheets fed'**
  - ➔ Displays the number of sheets fed since the feeder has been powered-on for the last time
- **'Date'**
  - ➔ Displays current date and time

8.2.2 Load Parameters

By pressing the button ‘Load Parameters’ in the navigation section, the following screen will appear.

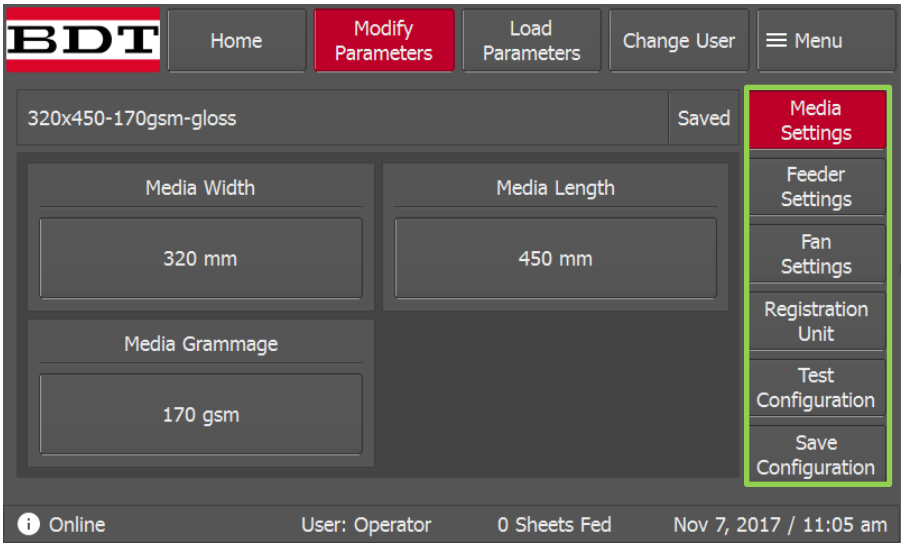


Picture 24: OCP – Load Parameters Overview

- ➔ This screen shows all saved jobs. Information includes also the save date.
- ➔ Every job shown can be selected by highlighting the job and then pressing ‘Load Selected’. Afterwards the OCP will show the home screen with the information of the selected job.
- ➔ Some jobs may not be selected or changed due to restrictions based on the rights of the activated user level.
- ➔ To delete a job, highlight the job and press ‘Delete Selected’

8.2.3 Modify Parameters

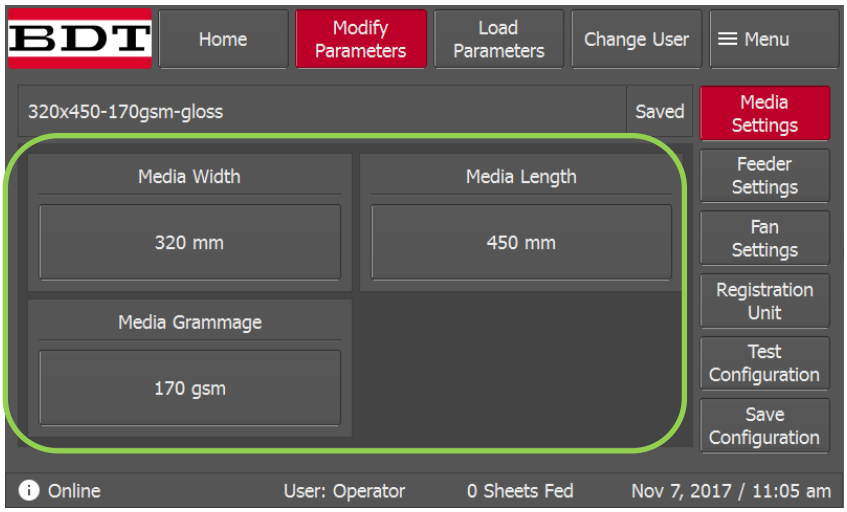
By pressing the button ‘Modify Parameters’ in the navigation section, the following screen will appear.



Picture 25: OCP – Modify Parameters Overview

The screen shows on the right side five buttons for selection. Each of the buttons contains information that is necessary to either configure and/or save a new job or to modify an existing and selected job. Below the content behind these five buttons is explained.

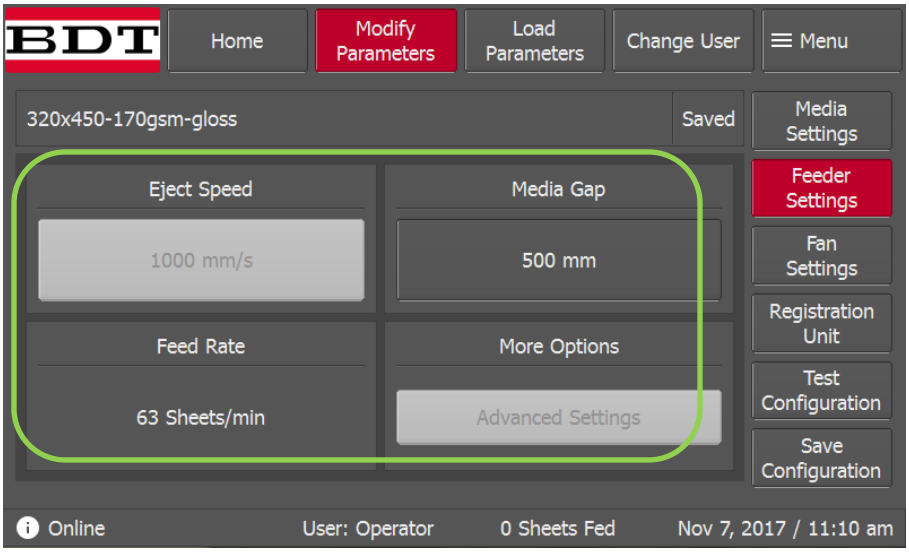
8.2.3.1 Media Settings



Picture 26: OCP - Media Settings Overview

- ➔ Media width can be selected in steps of one millimeter.
- ➔ Media length can be selected in steps of one millimeter.
- ➔ Media grammage can be selected in steps of 1 gram.

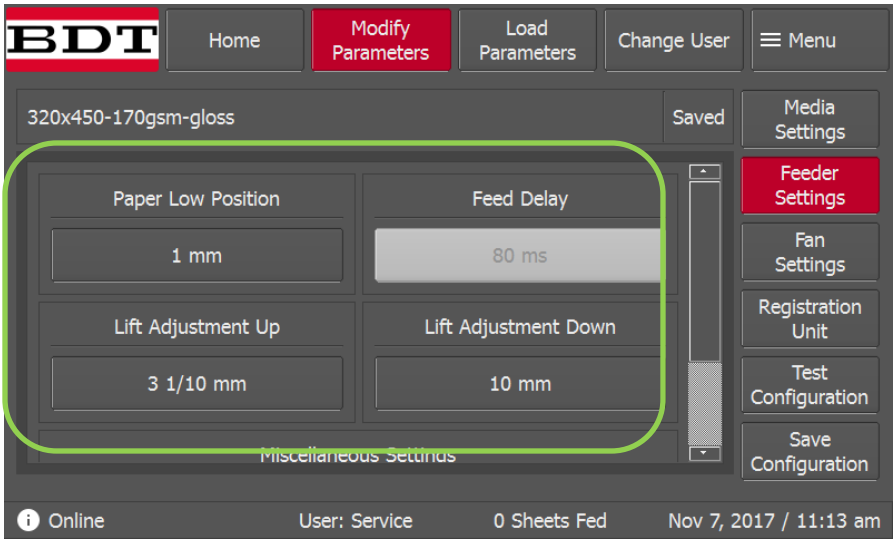
8.2.3.2 Feeder Settings



Picture 27: OCP - Feeder Settings Overview 1/3

- ➔ Feed rate shows the calculated value in sheets/min.
- ➔ Media gap describes the gap between the trailing edge of one media and the leading edge of the next media. Can be selected in steps of one millimeter.
- ➔ Eject speed is inactive. This value is greyed-out and cannot be modified

'Advanced Settings', is only available in service mode.
By clicking on 'Advanced Settings' the following screens will appear:



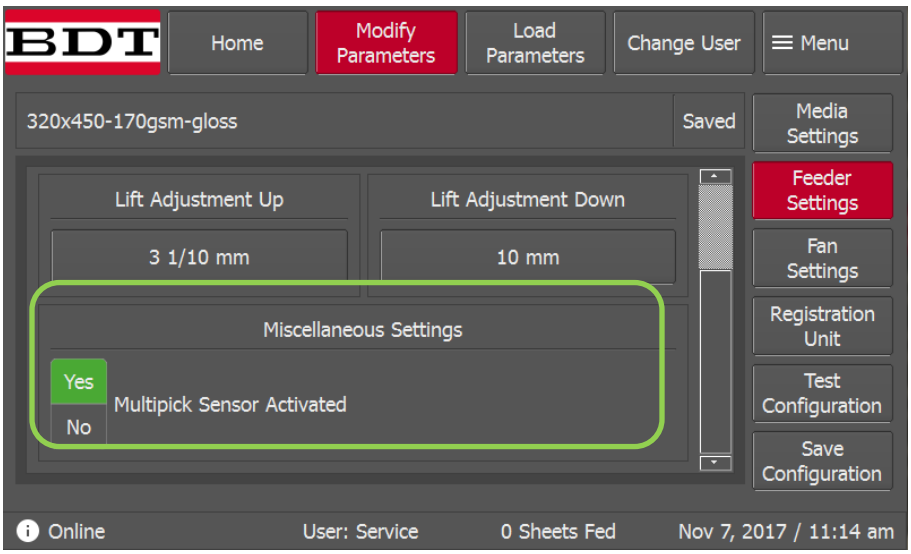
Picture 28: OCP - Feeder Settings Overview 2/3

➔ ‘Paper Low Position’ can be defined in steps of one millimeter. The set value shows the minimum height of the stack before the paper low signal will be activated and shown on the OCP.

➔ ‘Lift Adjustment Up’ describes the frequency of the adjusting the lift table position during feed operation. Maximum value is 10 mm.

➔ ‘Lift Adjustment Down’ describes the amount of lift movement in down direction during initial aeration of the stack. The recommended value is between 10-15mm. The maximum value is 90 mm.

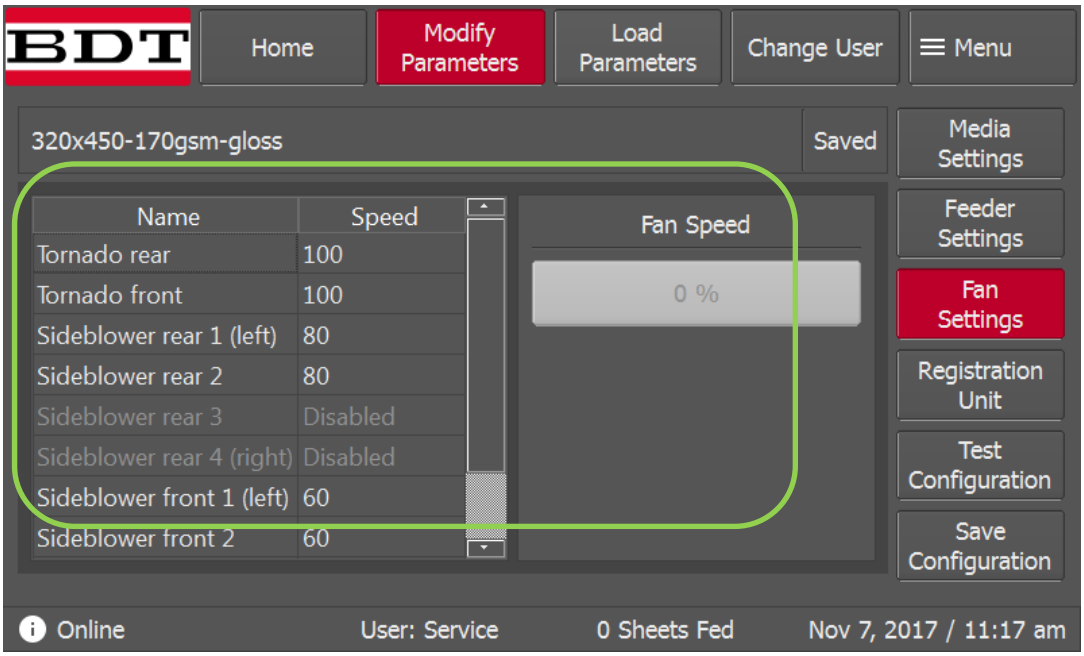
➔ ‘Feed Delay’ is inactive. This value is greyed-out and cannot be modified



Picture 29: OCP - Feeder Settings Overview 3/3

➔ Under ‘Miscellaneous Settings’ the multipick sensor can be activated or disabled, by clicking on the checkbox on the left side and select either ‘Yes’ or ‘No’.

8.2.3.3 Fan (Tornado & Sideblower) Settings



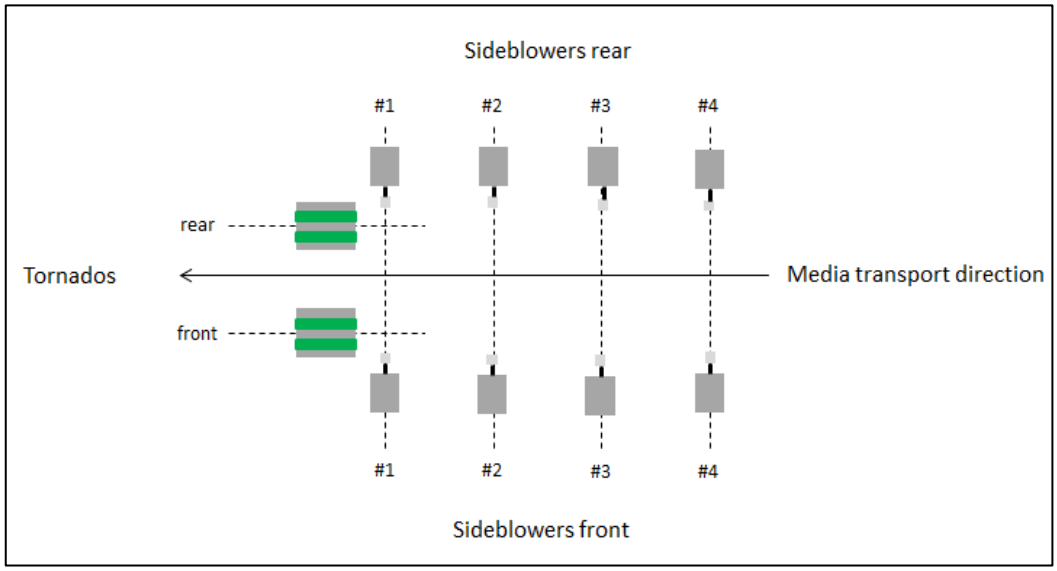
Picture 30: OCP - Fan Settings Overview

➔ The Tornado impeller speed can be individually selected in a range of 0% - 100% by clicking on the defined Tornado in the name section and define the desired value in the fan speed section.

➔ The side blower impeller speed can be individually selected in a range of 0% - 100% by clicking on the defined sideblower in the name section and define the desired value in the fan speed section.

➔ Generally: By selecting more than only on Tornado or sideblower value, the selected fields will appear in grey color and all of these grey values will be changed together as the fan speed is adjusted.

➔ The feeder control will calculate how many sideblowers are needed for the feed operation in regards to the defined media length. In case some sideblowers are not needed, the area of the speed value will show the word ‘Disabled’



Picture 31: Tornado / Sideblower Definition

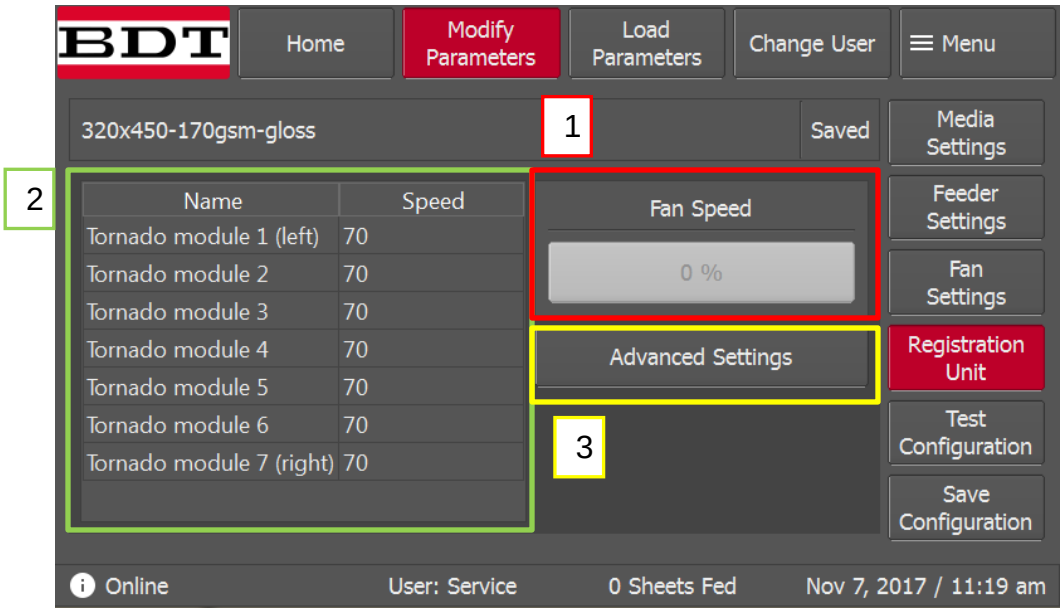
8.2.3.4 Registration Unit

NOTE: This is only applicable, if the VX Feeder is equipped with the VX Registration Unit. Not all configurations require this feature.

The RU comes with seven Tornado modules. The impellers create suction, which hold the media down and the Tornado transport belts move the media in transport direction.

Picture 32: Registration Unit

The Registration unit does not come with a control panel. All functions are set via the screen of the VX 370 Feeder.
To set the suction force (called ‘Fan Speed’) of the Tornados, please use this screen:



Picture 33: Registration Unit Settings 1/2

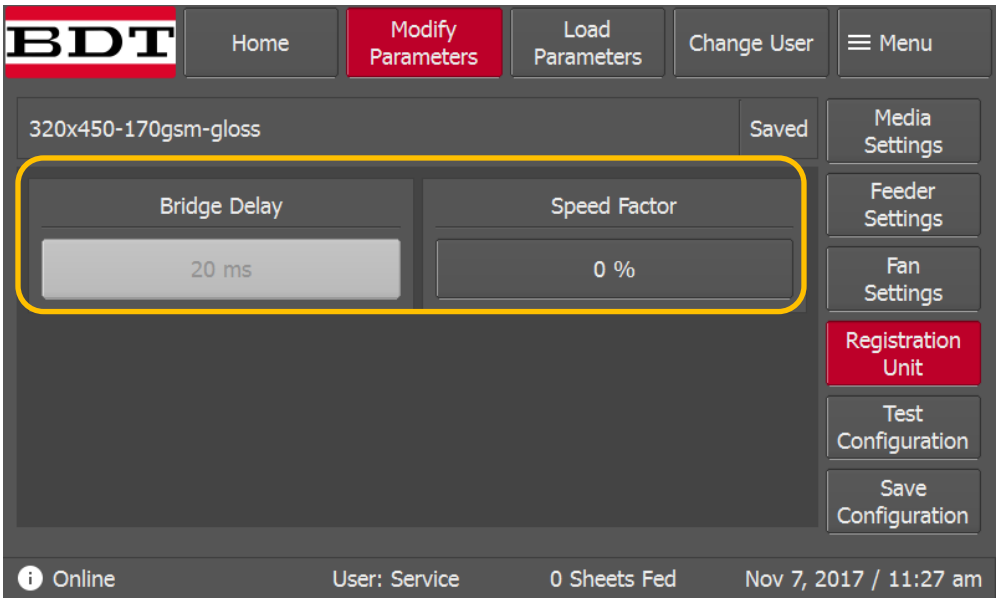
1 First tap on the Tornado module you want to change the setting for.

2 Then set the value by typing in the field called ‘Fan Speed’.
Use the recommended settings described later in this chapter.

3 Ignore the field called ‘Advanced Settings’, which allows access to the configuration. This field **o**nly works in service mode.

Advanced Settings of the RU (only in Service Mode)

Under ‘Advanced Settings’ following screen will be displayed:

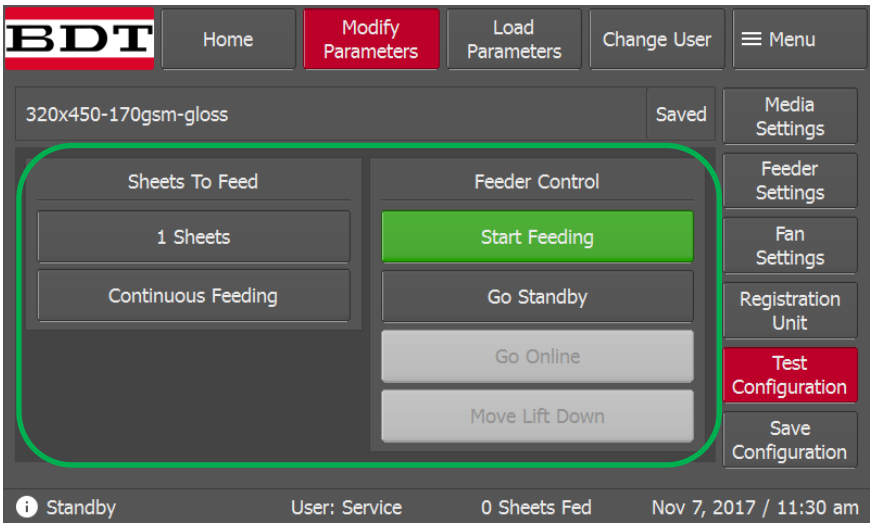


Picture 34: Registration Unit Settings 2/2

Speed Factor is for fine tuning / correction of the RU transport speed. Only to be changed by service/admin personnel.

Bridge Delay is inactive. This value is greyed-out and cannot be modified.

8.2.3.5 Test Configuration



Picture 35: OCP - Test Configuration Overview

➔ Define the desired number of sheets to be fed in steps of one sheet

➔ Select 'Continuous Feeding' for infinite feeding operation

➔ In the 'Feeder Control' section the feeder operation can be triggered:

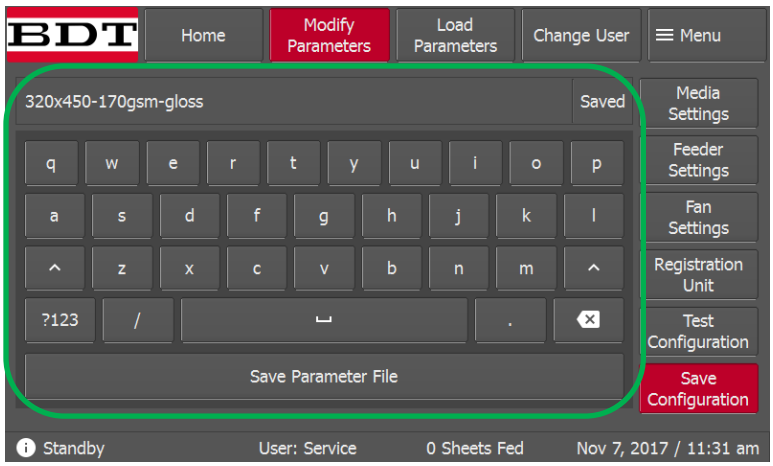
➔ Press 'Go Online' and the feeder will bring the lift table in a position of being ready to start the feed process. If this button is highlighted, it is activated.

➔ Press 'Go Standby' and the feeder will activate the Tornados and sideblowers as well as the motors for feed operation.
- During the time when the feeder goes to standby, this field will flash in yellow
- When the feeder is in standby this field will be highlighted in yellow
- When the feeder is in standby, the information in this field will change to 'Leave Standby'

➔ Press 'Start Feeding' as soon as this field is not greyed-out anymore and the feeder will start feeding.
- While the feeder is feeding, this field will be highlighted in green
- When the feeder feeds, the information in this field will change to 'Stop Feeding'

➔ Press 'Move Lift Down' then the feeder will stop feeding immediately.
- The lift table will move down to the lowest position
- Standby signal will be inactive

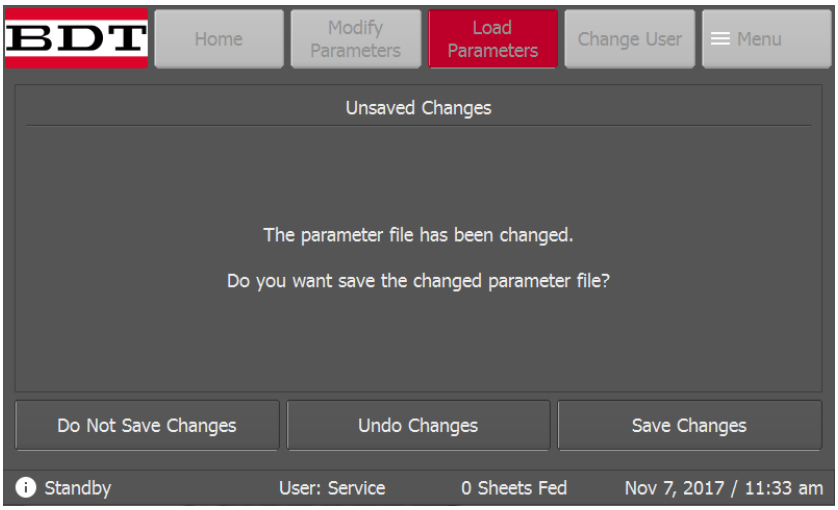
8.2.3.6 Save Configuration



Picture 36: OCP - Save Configuration Overview 1/2

- ➔ Type in the desired name of the job via the digital keyboard.
- ➔ After completion tap on the button ‘Save Parameter File’.

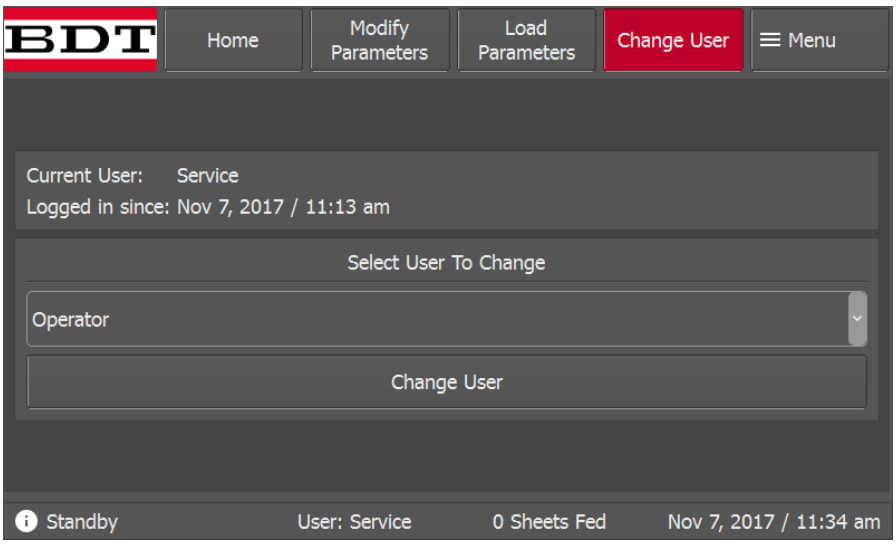
In case the button ‘Save Parameter File’ is not pressed but any other button in the navigation screen, the following screen will appear:



Picture 37: OCP - Save Configuration Overview 2/2

- ➔ By pressing ‘Do Not Save Changes’, the determined values of the current job will not be saved
- ➔ By pressing ‘Undo Changes’, the determined values of the current job will be erased
- ➔ By pressing ‘Save Changes’ the determined values of the current job will be saved

8.2.4 Change User



Picture 38: OCP - Change of User Settings

There are 2 levels of privileges: Service and operator.
To use the service features you need to login first.

Each access level has the following privileges:

Operator

- Run all pre-saved job files
- Save parameter pre-settings
- View all diagnostic parameters

Service

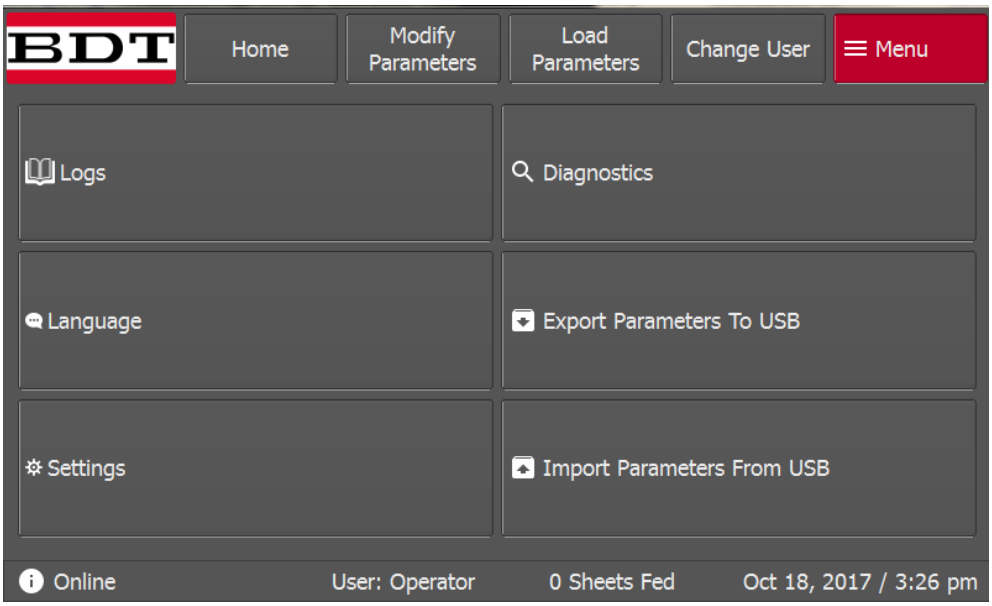
- Run, set and clear all job parameters
- Save parameter pre-settings
- Manage operator access and accounts
- Reboot system by control
- Upgrade system with new firmware
- Run all diagnostic parameters
- Run all configuration parameters

The current user level as well as the information since when this user level is logged-in will be displayed.

‘Operator’ is always the standard user level after boot-up of the feeder.

To change the user level, select the desired user level in the drop-down menu and press the ‘Change User’ button. A keyboard will appear that requires the user to type in the password for the selected user level. Type in the password and confirm.

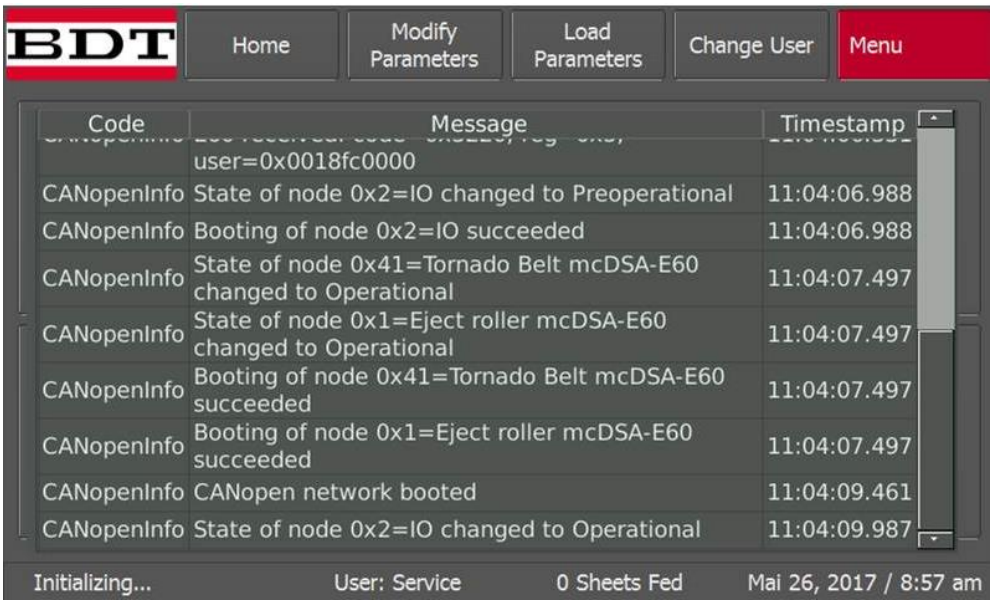
8.2.5 Menu



Picture 39: OCP - Menu Overview

8.2.5.1 Logs

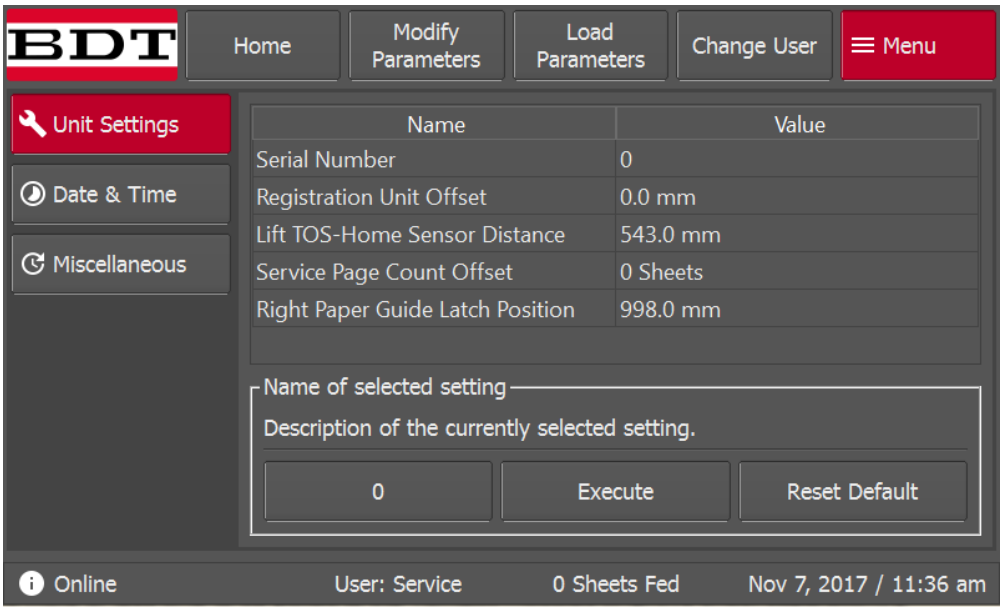
Select ‘Logs’ in order to get the latest error log information.



Picture 40: OCP - Log Screen Overview

8.2.5.2 Settings

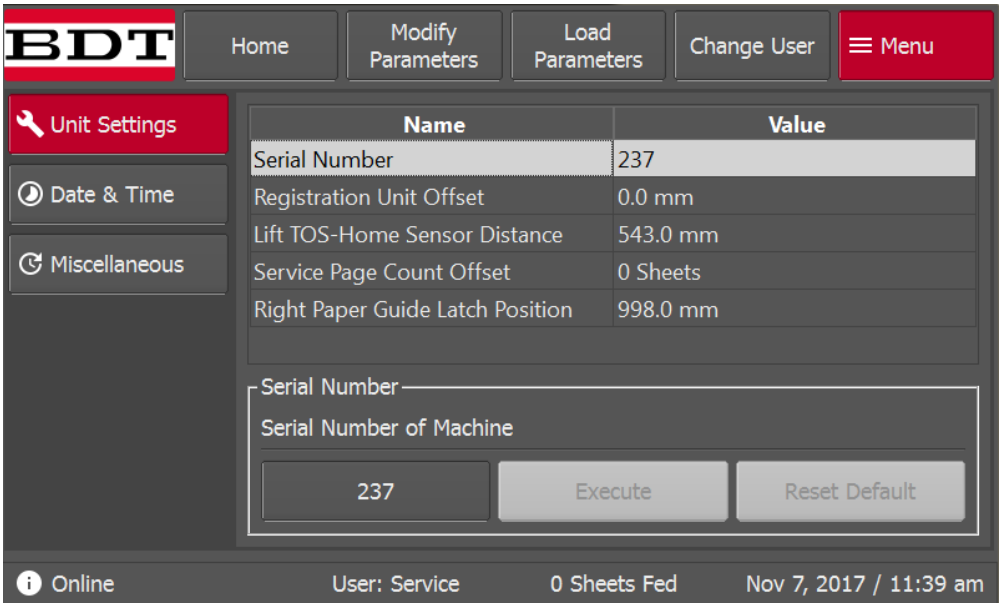
Under settings the follow screen is displayed:



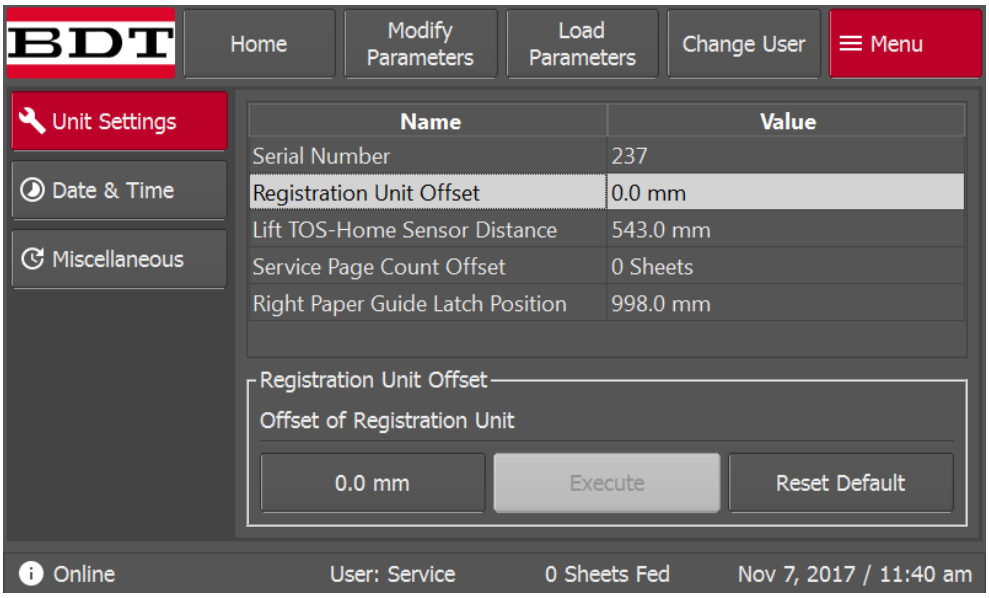
8.2.5.2.1 Unit Settings

Tap on ‘Unit Settings’.

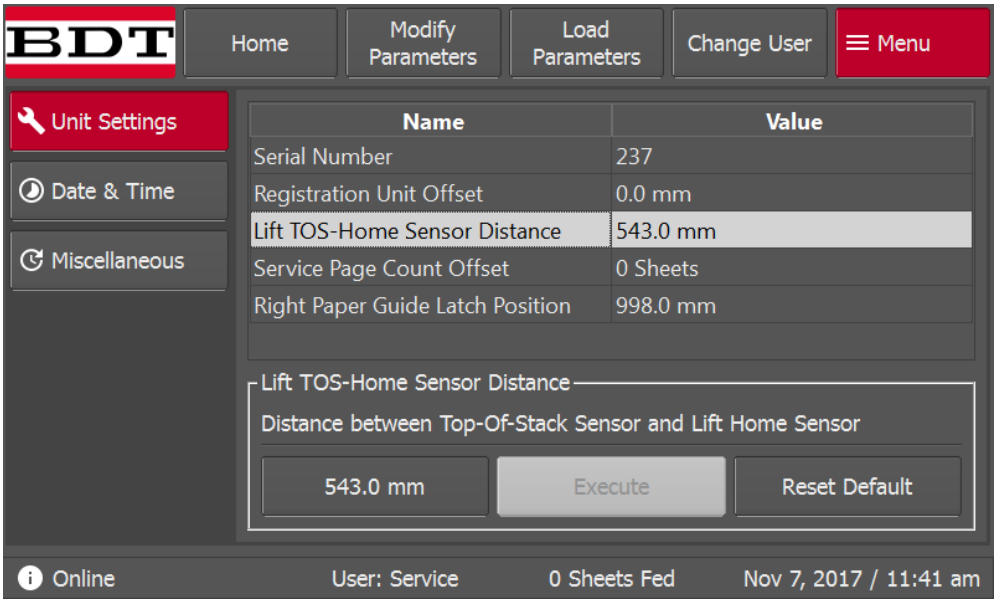
Here the user needs to type in the serial number (last 3 digits) of the feeder.



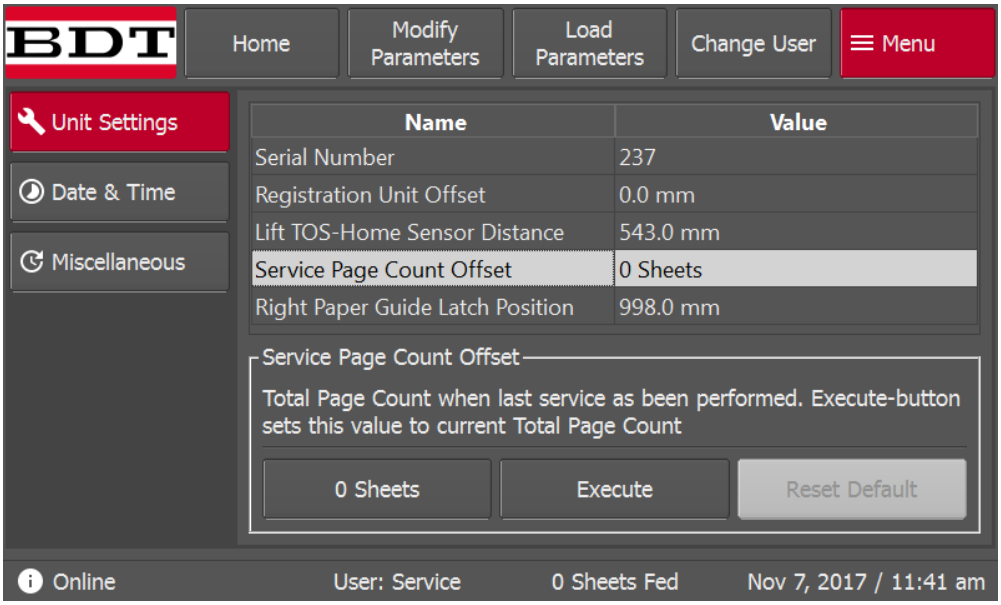
Here the user can select an offset of the alignment fence of the RU.



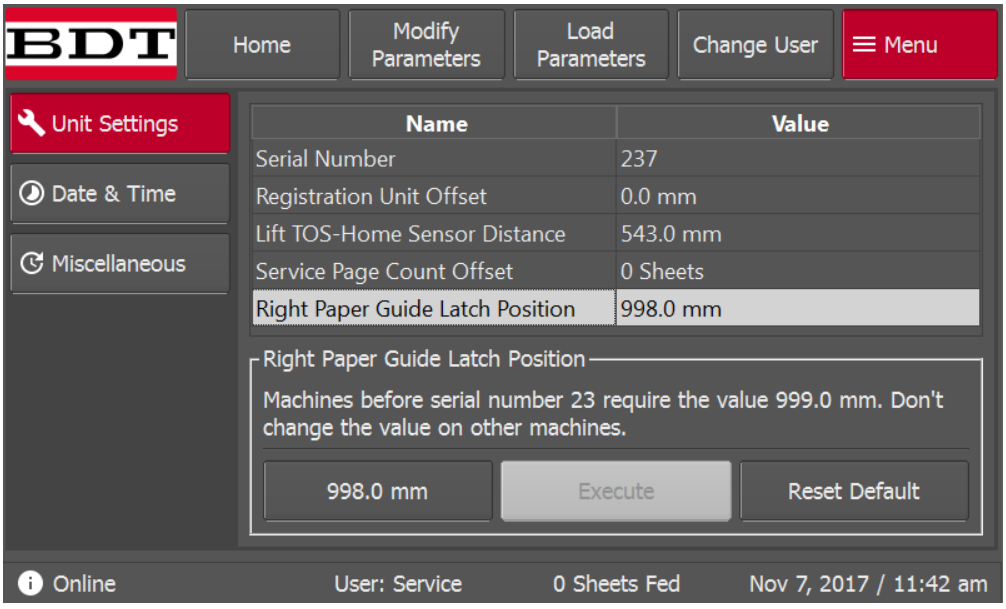
Here the user can adjust the distance between top of stack and lift table reference sensor. This allows the media to have more or less time to be pulled to the Tornado modules (improve sheet separation).



Here the service page count can be set.

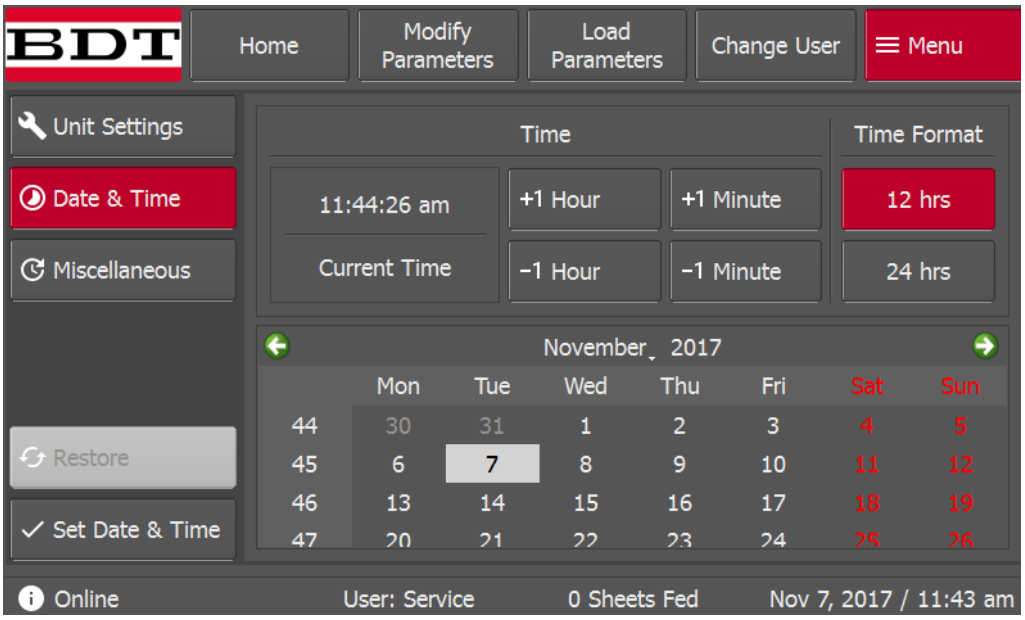


This setting only needs to be set for feeders with serial number 023 and lower.



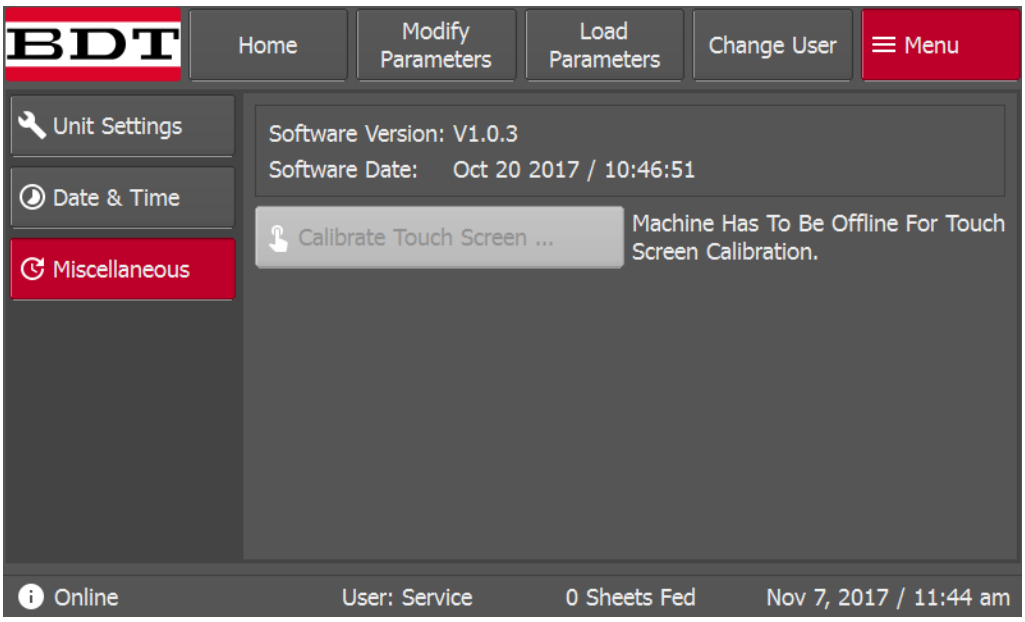
8.2.5.3 Date and Time

Select ‘Date & Time’ to change the date/time.



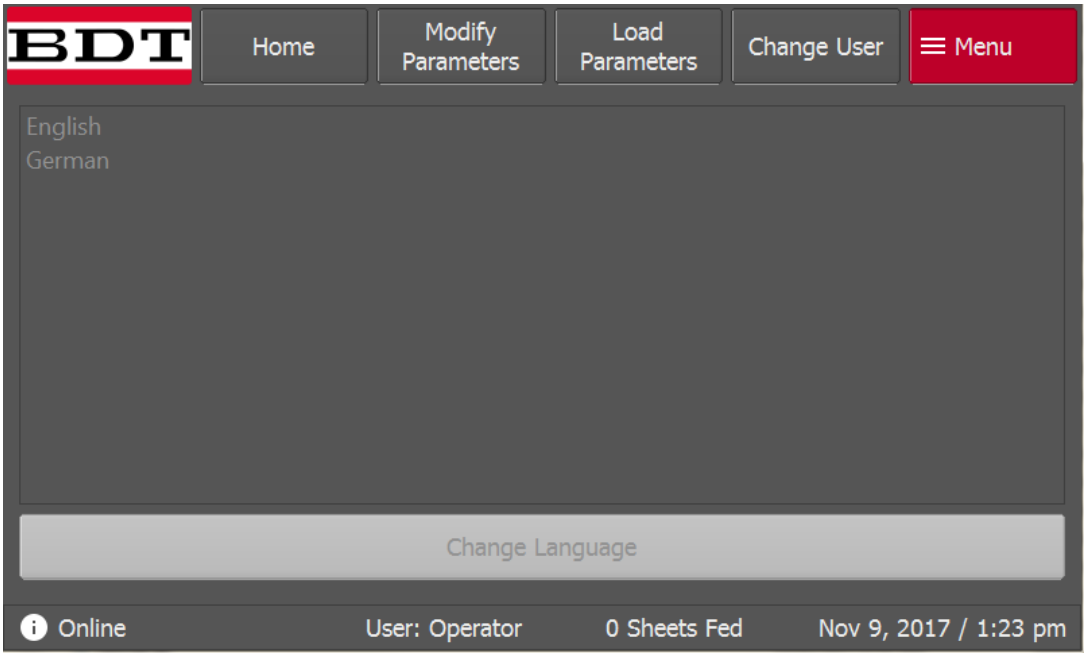
8.2.5.4 Miscellaneous

Here the touch screen can be calibrated.



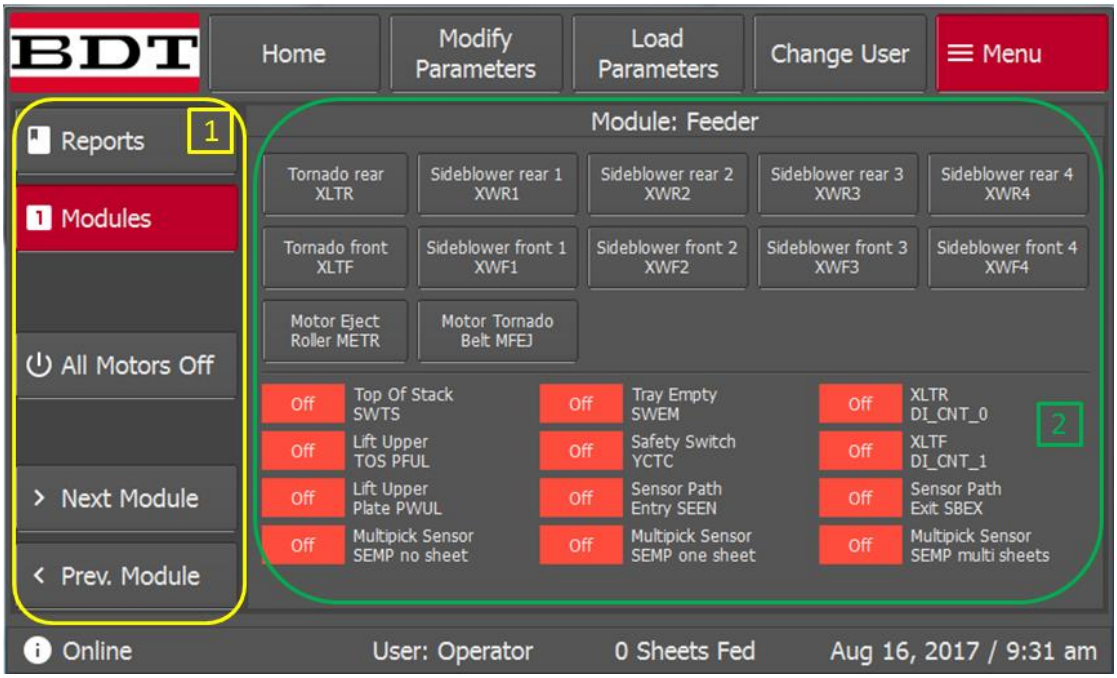
8.2.6 Language

Tap on ‘Language’ to select the language.



8.2.7 Diagnostics

8.2.7.1 Modules



Picture 41: OCP - Diagnostics Screen Overview

➔ **[1]Selection bar section:**

Here the user can open the module overview which enables the user to check signal and actors within the feeder and the Registration Unit.

Further forward and backward arrows are available for changing the module (see [2])

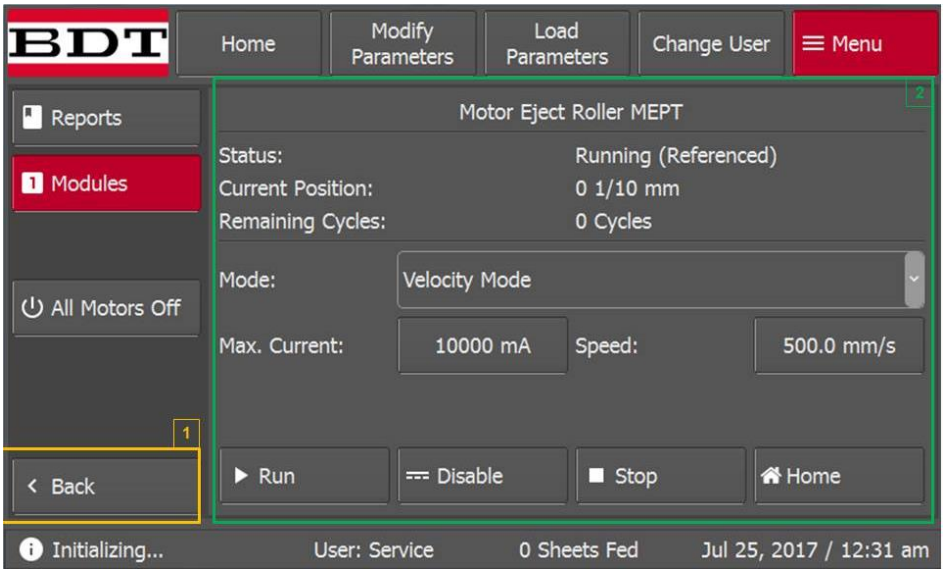
➔ **[2] Module section:**

Contains the following module pages:

- Feeder
- Additional sensors
- Paper guide adjuster
- DIO Host Interface
- Button Interface
- Registration Unit

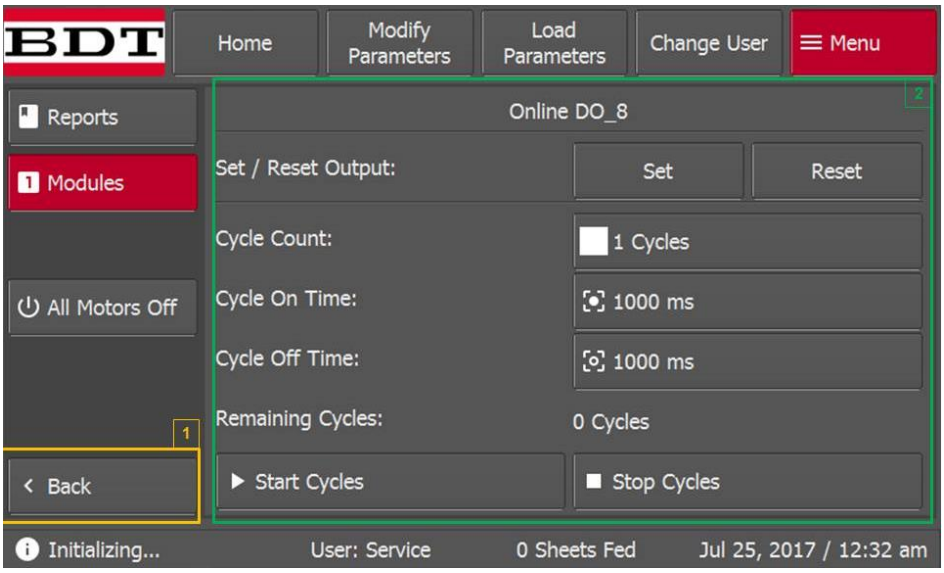
➔ Any sensor that is active will be displayed in green color. Any sensor that is inactive will be displayed in orange/red color

➔ By selecting any actor, the following screen will appear and the user will be able to perform a test activation of the chosen actor. Only in service mode.



Picture 42: OCP - Diagnostics Actor Activation

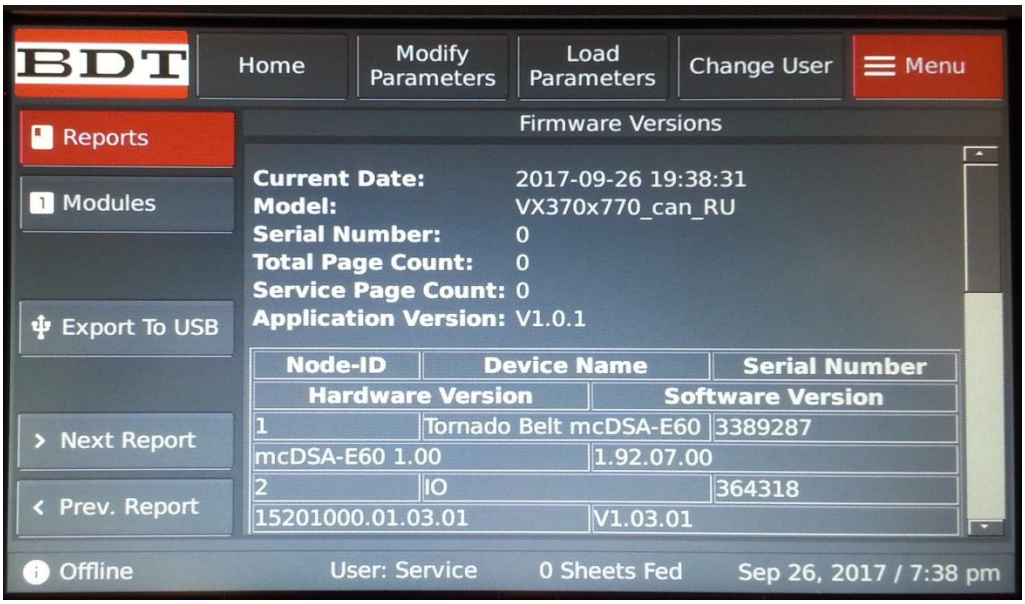
➔ By selecting any signal line, the following screen will appear and the user will be able to perform a test activation of the chosen actor. Only in service mode.

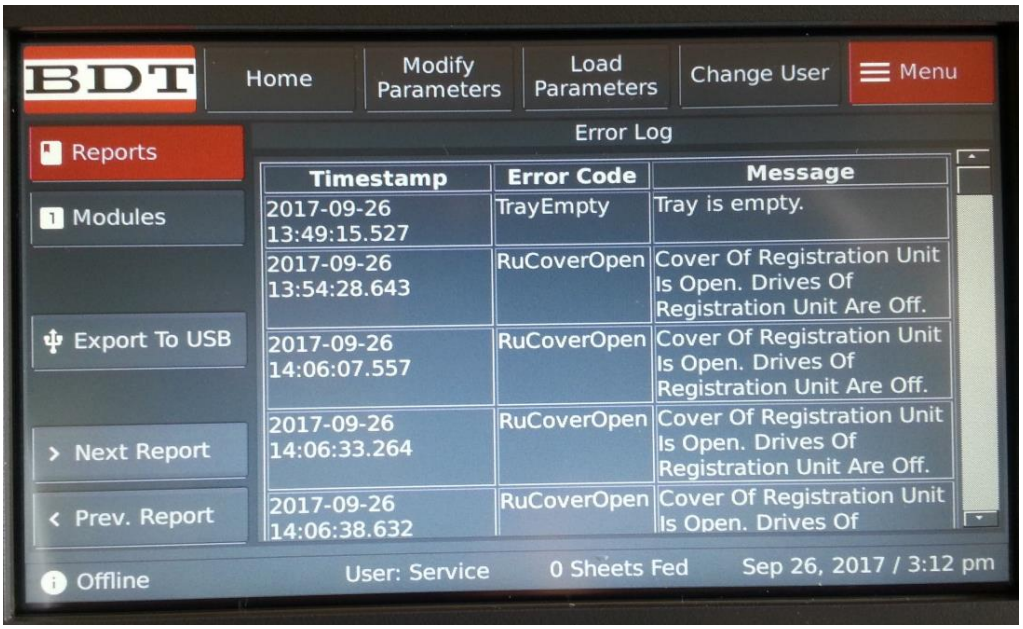


Picture 43: OCP - Diagnostics Signal Status Check

8.2.7.2 Reports

Select ‘Reports’ to get information on FW versions and error messages history.





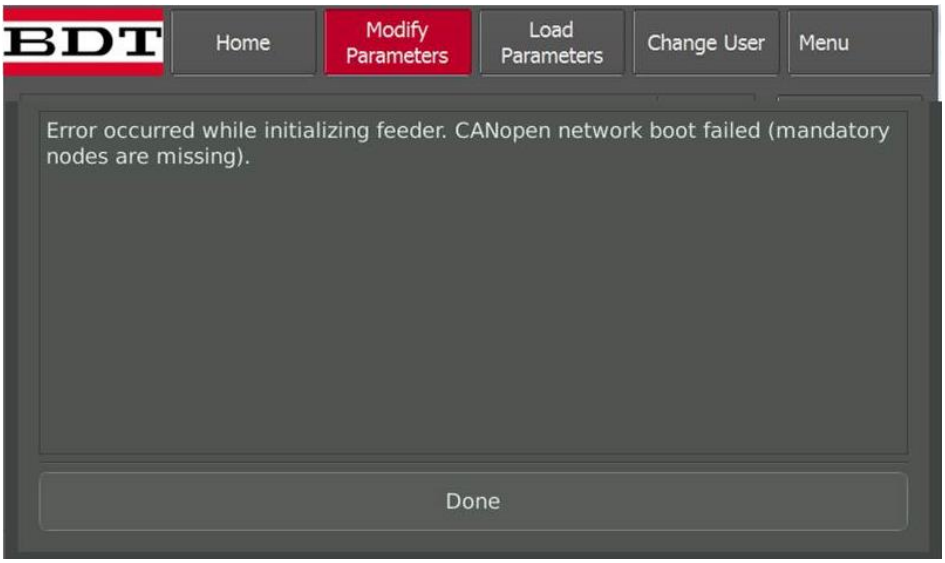
8.3 Abnormal Conditions

8.3.1 Error Types

The feeder contains a software module for abnormal conditions detection and handling. This module distinguishes between three abnormal condition categories:

- **Feed Error** (e.g. sheet stuck in sensor, media too late, etc.)
- **System Error** (e.g. motor or sensor defect, communication to components not working, etc.)
- **Safety Error** (e.g. safety switch defect / not correctly activated, safety related wiring broken)

As soon as an error occurs, the presence of it is indicated at the OCP by the following information:



Picture 44: OCP - Error Message

➔ As soon as an error occurs the home screen will change and only the error message is displayed.

➔ In order to clear the error, make sure that the error (e.g. jam is cleared) and the ‘Done’ button is pressed. Afterwards the home screen will be shown again.

ATTENTION! **To remove any jammed media, it is recommended to always eject the media in transport direction.**

8.3.2 Error List

Abnormals related to feed errors, system errors or safety errors are:

- Tray is empty.
- Jam in paper path detected. Sensor <SENSOR> is active. <SENSOR> can be one of the following: SEEN, SBEX, SDEN, STEX, SDMI, SDLE
- Feed timeout. Sheet did not reach paper path entry sensor. 1 second timeout
- Jam in paper path detected. Sheet didn't arrive at exit sensor. Dynamic timeout according to sensor distance plus 200 mm margin.
- Jam in paper path detected. Sheet didn't arrive at sensor <SENSOR>. Dynamic timeout according to sensor distance plus 200 mm margin. <SENSOR> can be one of the following: SEEN, SBEX, SDEN, STEX
- Jam in paper path detected. Sheet didn't leave exit sensor. 3 seconds timeout
- Jam in paper path detected. Sheet didn't leave sensor <SENSOR>. Dynamic timeout according to media length plus 200 mm margin. <SENSOR> can be one of the following: SEEN, SBEX, SDEN, STEX
- Sheet arrived too late at paper path exit sensor.
- Door is open. Drives are off.
- Multiple sheets detected.
- Lift reached upper limit switch <SENSOR>. <SENSOR> can be one of the following: TPF800: PFUL, PGUL, PLUS, PLUP
- Lift reached lower limit switch.
- Error occurred while initializing feeder. CANopen network boot failed (mandatory nodes are missing).
- Homing Of Registration Unit Offset Motor Failed.
- Stack Edge Sensor <SENSOR> Is Active. Guide Adjuster Cannot Be Moved. Moving Lift Upwards Is Inhibited. Please Move Lift Down And/Or Remove Paper. <SENSOR> can be one of the following: SGWR, SGWF, SGLS
- Rear Stack Edge Not Found. Moving Lift Upwards Is Inhibited. Please Move Lift Down And Check That Stack Is Aligned Properly.
- Front Stack Edge Not Found. Moving Lift Upwards Is Inhibited. Please Move Lift Down And Check That Stack Is Aligned Properly.
- Right Stack Edge Not Found. Moving Lift Upwards Is Inhibited. Please Move Lift Down And Check That Stack Is Aligned Properly.
- Rear Stack Edge Sensor SGWR Is Not Active As Expected. Moving Lift Upwards Is Inhibited. Please Check That Stack Is Aligned Properly And Media Size Is Entered Correctly
- Front Stack Edge Sensor SGWF Is Not Active As Expected. Moving Lift Upwards Is Inhibited. Please Check That Stack Is Aligned Properly And Media Size Is Entered Correctly
- Right Stack Edge Sensor %1 Is Not Active As Expected. Moving Lift Upwards Is Inhibited. Please Check That Stack Is Aligned Properly And Media Size Is Entered Correctly
- Homing Of Rear Width Adjuster Motor Failed.
- Homing Of Front Width Adjuster Motor Failed.
- Homing Of Length Adjuster Motor Failed.

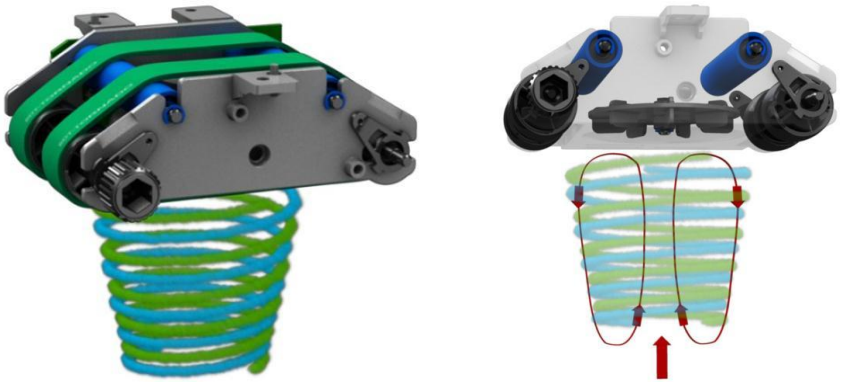
9 Best Practice on Feeding Media

9.1 Functional Principle

9.1.1 Tornado

BDT's Tornado technology uses the principle of the natural Tornado or whirlwind to create a local low pressure zone which can be used in various media handling applications.

BDT's patented Tornado technology is based on the method of causing a small volume of air to rotate locally at very high speeds (over 10000 rpm) within a captive cylindrical volume. A compact, high-speed motor drives a specially shaped 'impeller' within an enclosed cavity. This impeller causes the surrounding air to spin in a column. The spinning column of air generates a low pressure central zone which is used to attract media from a distance.



Picture 45: Tornado Functional Principle

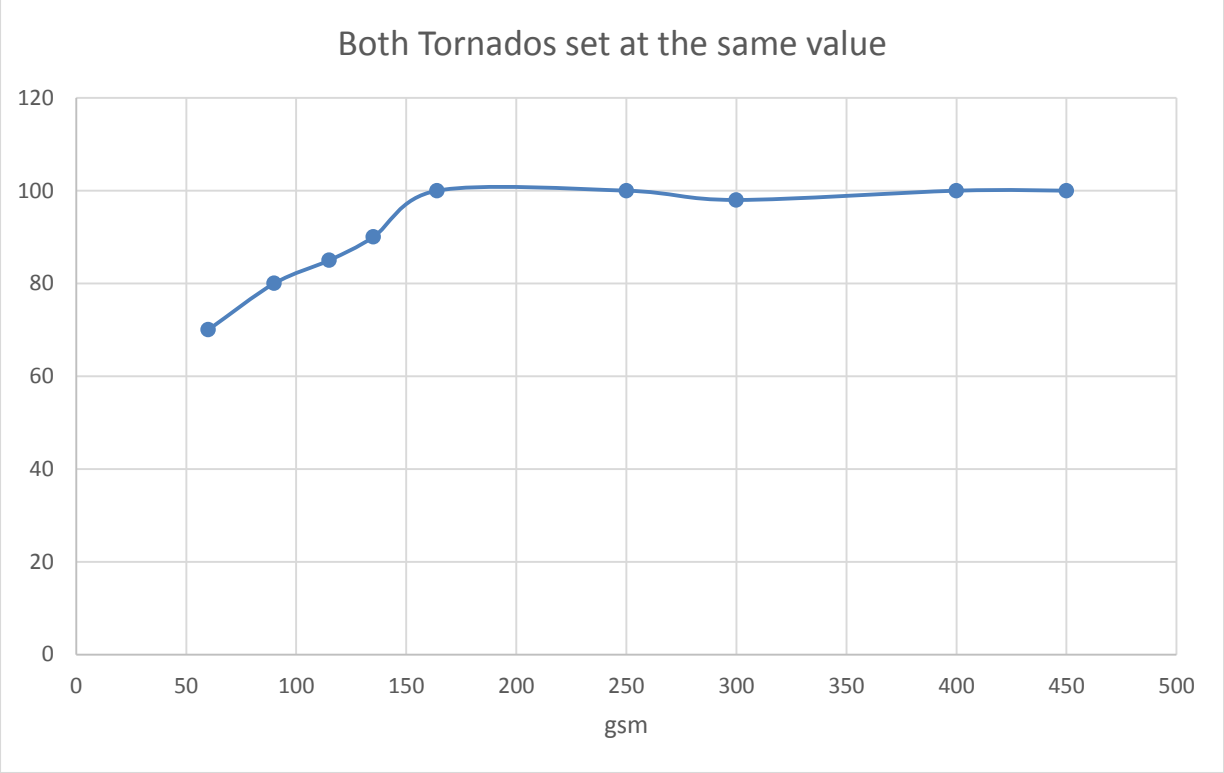
9.1.2 Side Blower

Before the individual sheets can be 'collected' by the Tornado modules, the top sheet needs to be fully separated from the next sheets by an air cushion. This is created using the BDT patented sideblower modules. The sideblower will simultaneously aerate the top sheet and the following sheets and will minimize any adhesion or static forces working between the sheets.

The sideblower module contains:

- A specially shaped impeller driven at a very high speed creating a shaped airstream blowing into the top edge of the media stack
- A motor which drives this impeller vertically up and down using integrated electronics with embedded software control
- A paper lever for controlling the top sheet and provide closed-loop control of the lift motor via optical sensors, and to 'damp' or calm the stack, especially with very light-weight papers which could otherwise float away

9.2 Guideline – Tornado Settings

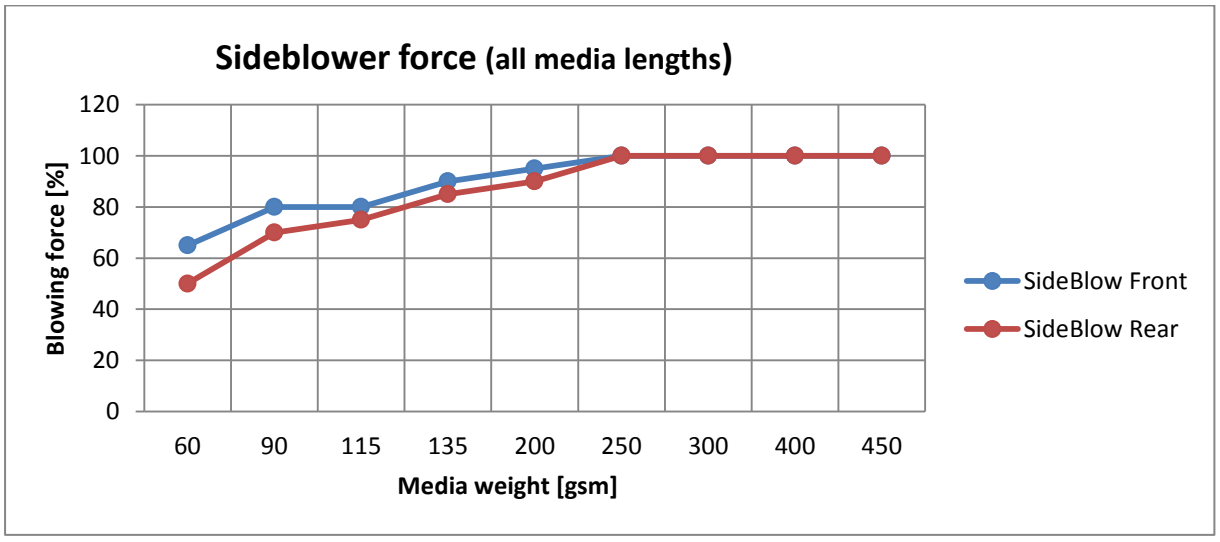


Picture 46: Recommended Tornado % against Media Weight

- Keep the values for both Tornado modules the same
- For higher paper weights the Tornado settings reach a constant 100% as shown
- The curve shows a force increasing gradually from ˜70% at 75gsm
- ***Note:*** *Please consult VX 370 Feeder Standard Technical Data Sheet for specified min. weights and thicknesses for different formats. Media outside these values can be run subject to application testing. The illustrated curve is a guideline for starting off with settings does not represent a performance window.*
- If a very flimsy media has excessive deformation between the Tornado modules then possible to run lower in % to prevent wrinkling
- Depending on the application it is possible to increase the Tornado force to 100% earlier than is shown here, if required

9.3 Guideline – Sideblower Settings

- Generally it is recommended as a starting point to have the same sideblower settings for each of the two sideblowers in every row
- The 2nd, the 3rd and the 4th row of the sideblowers are not activated as the media length does not require it
- Generally it is recommended to increase the sideblower force slightly as the gap between the media is little (< 75mm)
- Generally it is recommended to increase the sideblower force slightly as the eject speed is increased (> 1.500 mm/sec)
- For media lighter than 80 gsm the sideblower force should never be above 80 gsm
- Settings 'Sideblow front' (1st side blower row) and 'Sideblow rear' (2nd, 3rd and 4th side blower row) are 'asymmetrical' for media weight below 250 gsm to improve cross-track and skew performance of the feeder delivering sheets to the host
- Up to approx. 250 gsm the 'Sideblow rear' blowing force will approach the value of the 'Sideblow front'
- Above 250 gsm the 'Sideblow front' and the 'Sideblow rear' values should be the same
- Generally it is recommended to increase the sideblower force slightly as the eject speed is high (> 1.500 mm/sec)



Picture 47: Sideblower Force Chart

9.4 Strategy of Asymmetric Settings for Improved Skew and Offset Performance

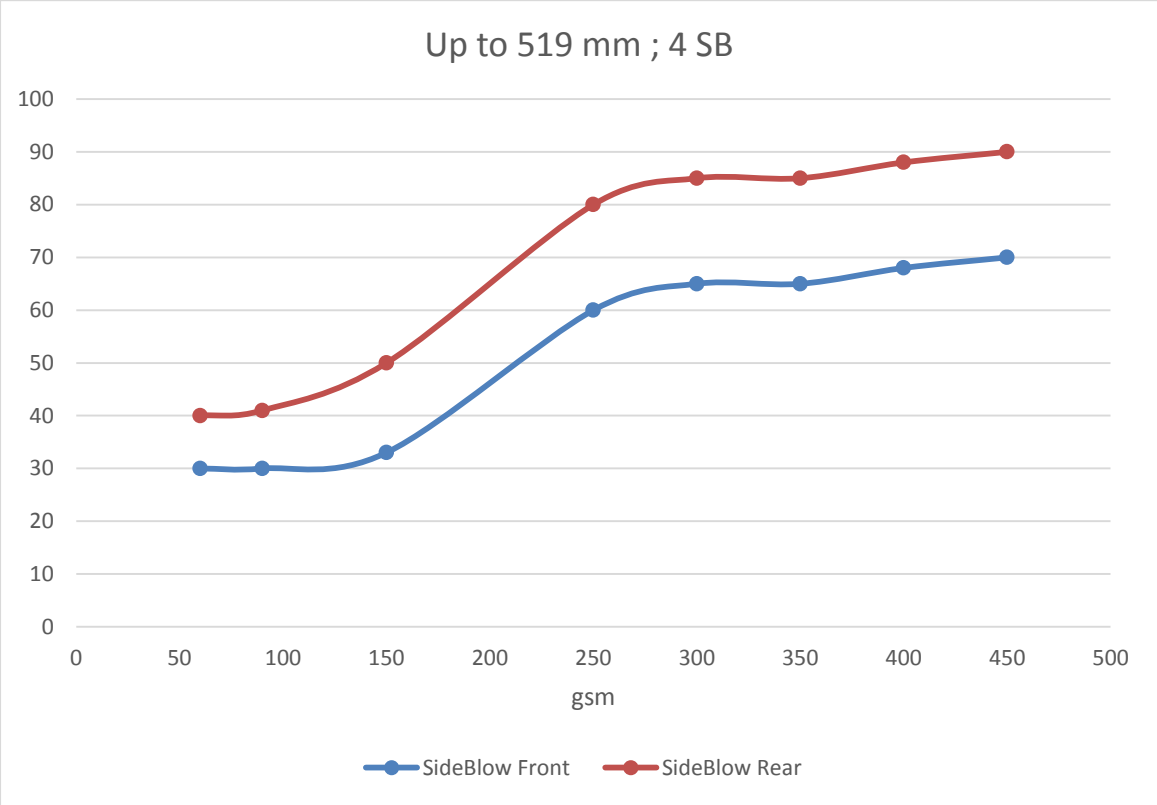
In the following graphs show that one of the rows of sideblowers is ‘biased’ to have a higher % setting than the other one. This is shown in the different colors blue and red you can see in the graphs. The purpose of setting the rear side by x% higher than the front side is to use the directional air stream of the sideblower to actively push each floating sheet towards the front set of vertical guides on the housing of each sideblower.

This achieves 3 effects:

- The side edges of the sheets are aligned to the front edge during feeding improving the cross-track tolerances going downstream
- Especially for longer sheets this side alignment improves the skew along the front edge
- The difference in air flow from front to rear ‘calms’ down the levers of the sideblowers, leading to a more uniform air cushion, and better control of the aeration process

Note: **The settings for the rear side can also be lower than the front side. This pushes the sheets to the rear. You can decide by your application which way round the skew and offset correction should be.**

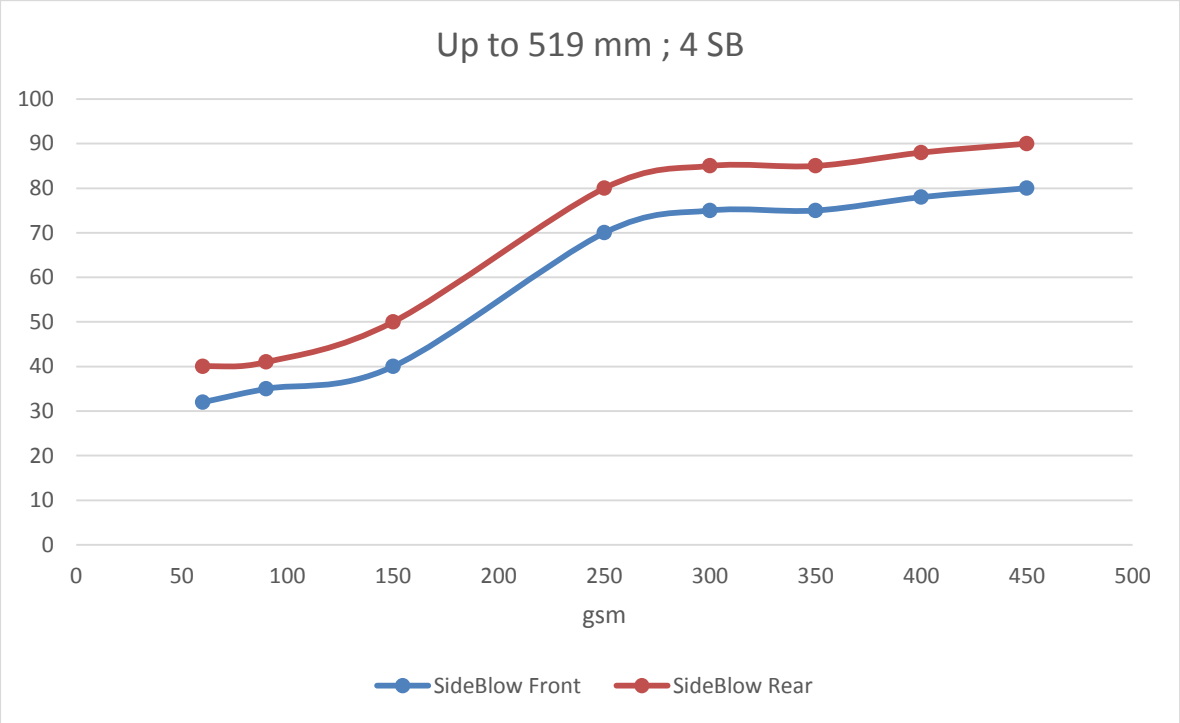
9.5 Guideline – SB Settings / Width <350mm / Length 210mm – 519mm



Picture 48: Recommended Sideblower Settings % against Media Weight (1/4)

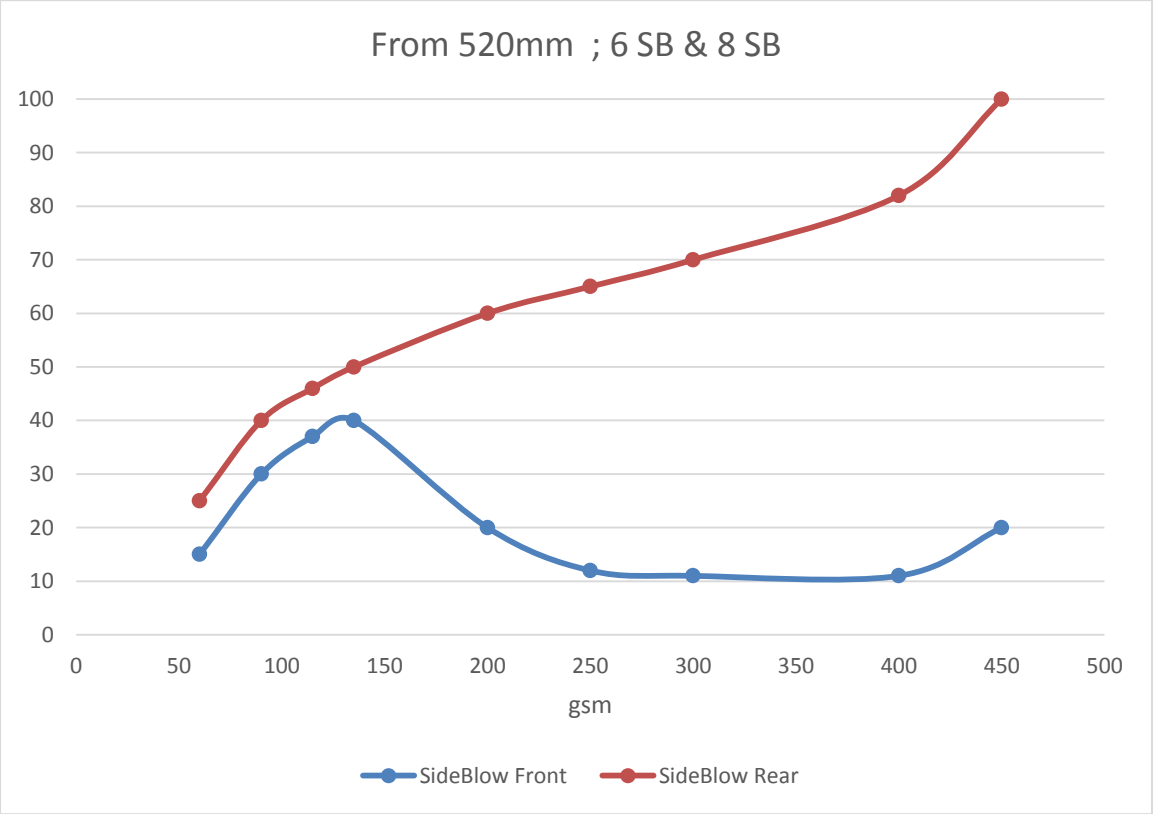
- Settings front and rear sideblowers are ‘asymmetrical’ to improve cross-track and skew performance of the feeder delivering sheets to the host
- Generally it is recommended as a starting point to have the same sideblower settings for each of the front and the rear groups respectively
- The values between the front and rear sideblowers have an offset varying between 10% and 20% as shown here
- The purpose of this offset is to improve the skew and offset performance of the feeder, giving tighter cross-track and skew tolerances at the host
- Up to a media length of 519 mm, 4 sideblowers are engaged whose impellers turn in the same direction
- For 4 sideblowers, the settings show a distribution as shown, the 2 curves moving generally parallel to one another, with a slight increase in the % offset for heavier stock

9.6 Guideline – SB Settings / Width >350mm / Length 210mm – 519mm



Picture 49: Recommended Sideblower Settings % against Media Weight (2/4)

9.7 Guideline – SB Settings / Width <350mm / Length 520mm – 762mm



Picture 50: Recommended Sideblower Settings % against Media weight (3/4)

- Again settings are ‘asymmetrical’, here the front sideblower row always lower than the rear row
- Up to ~130gsm the recommended setting curves run generally parallel
- Above this value, the offset between the % values of the rows of sideblowers front/rear increases significantly
- This offset is used to calm down the stack, and optimize the stack geometry. For media above 520 mm, sideblowers (6 or 8) have impellers which are turning in different directions. In this case too much air coming in from all sides can cause strong undulations of the stack, leading to an agitated vertical ‘wobble’ of the sideblowers. This is particularly the case for stiffer & heavier media. By keeping the front sideblowers low (~10%) and increasing the rear sideblower % force, sufficient air can be applied to support heavy media, while keeping the cushion ‘calm’.
- For very thick/heavy media, e.g. 450gsm the sideblowers front settings are increased on both rows as shown

9.8 Guideline – SB Settings / Width >350mm / Length 520mm – 762mm

Picture 51: Recommended Sideblower Settings % against Media Weight (4/4)

- Again settings are 'asymmetrical', here the front sideblower row always lower than the rear row – this gives the best skew/offset performance
- Up to ~250gsm the recommended setting curves run generally parallel. For lighter glossy coated art media 90-135gsm the values of the sideblowers may need to be increased due to the risk of adhesion/sticking between the sheets, and also sometimes an uneven air cushion can be seen with flimsy media.
- The asymmetrical settings are also used to optimize the stack geometry. For media above 520mm, sideblowers (6 or 8) have impellers which are turning in different directions. In this case too much air coming in from all sides can cause strong undulations of the stack, leading to an agitated vertical 'wobble' of the sideblowers. This is particularly the case for stiffer & heavier media. By keeping the front sideblowers lower and increasing the rear side blower % force, sufficient air can be applied to support heavy media, while keeping the cushion 'calm'.
- For very thick/heavy media, e.g. 450gsm the sideblower front settings are increased on both rows as shown.
- ***NOTE HEAVY RIGID MEDIA**: Media that is in the media specification of 450gsm, but is thicker than the current media spec, i.e. 600 microns may need as much air as possible from the sideblowers. In this case the settings can be made symmetric, i.e. 100% for front and back. For rigid media types there should be a clear air cushion between the top and second sheet in the stack, and the sideblower levers should not wobble too much.*

9.9 Getting Started – General Points to look out for

- Check that your paper or media stack is not trapped – the top sheet needs to be free to float and you need some play between paper guides at side and rear of the stack.
- **NOTE:** If sheets in the stack are sticking or snagging mechanically (perforations, glue, labels etc.) or a very high adhesion has been caused by incorrect shipment or storage of the media, or under extreme climatic conditions, it is necessary to fan out the stack before running. Generally the sideblower works very well preventing the development of static/adhesion effects from the media itself during feeding. However mechanical sticking or snagging can only be effectively broken by fanning.
- Set the Tornados / sideblowers to the recommended setting as described above, or to a setting for a similar type of media (Stored Media Settings).
- Ideally the whole top sheet is floating on an equal height cushion, with no significant low points or high points, and the sideblowers all reach a ‘steady state’ in vertical position, with only small steady travel of ~1-2 mm, not strongly jumping up and down.
- It should be possible to move the top sheet by hand on top of the air cushion and it should be fairly loose.
- Light media (60gsm – 110gsm): Is the stack fully aerated or are there low points where the sheets stick together? If the cushion is not uniform, the sideblower settings can be increased or adapted locally.
- For pre-printed light glossy media, increased air values are beneficial
- If the stack geometry, aeration & sideblowers look ok, save the settings

9.10 Multipicks

If you get multipicks first thing to try is to increase the % of the front sideblowers.

10 Maintenance - Feeder

The table below shows the areas of maintenance and the suggested frequency of performing the maintenance activities.

ATTENTION! It is necessary to power-off the feeder prior to the maintenance operation (except for the movement test of the lift table).

Maintenance Task	Maintenance Frequency					
	daily	weekly	monthly	quarterly	yearly	Media cycles
Inspection of the user panel elements	x					
Inspection of lift mechanism & spindles	x					
Cleaning optical paper path sensors		x				
Inspection of side blower modules		x				
Inspection of Tornado modules			x			
Cleaning Tornado belts			x			
Cleaning paper path surfaces			x			
Greasing lift spindles				x		

Table 10: Maintenance Overview

10.1 Inspection of User Panel Elements

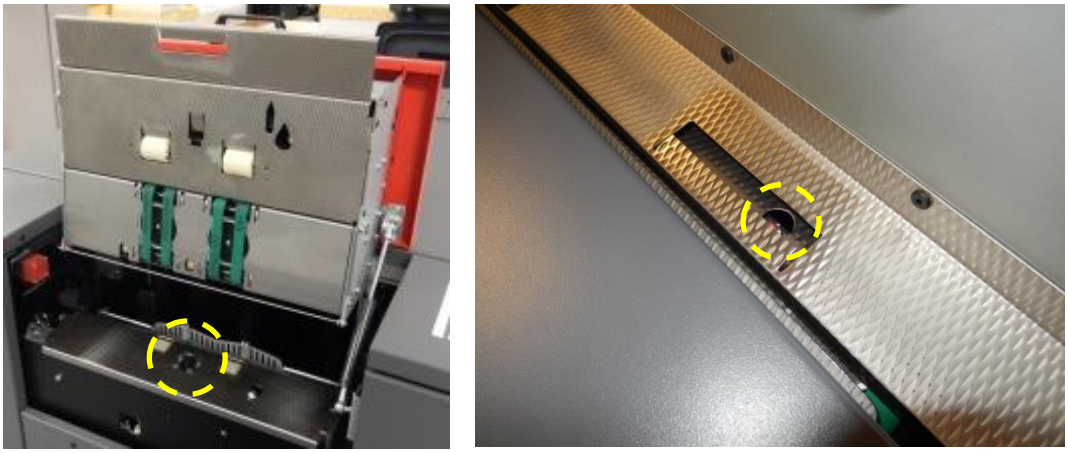
The touch panel and the control buttons must be visually inspected. Make sure there are no mechanical damages visible to these elements and the surface is free of grease and physical substances.

10.2 Inspection of the Lift Mechanism

The spindle and the nut of the feeder lift table mechanism must be visually inspected on all four sides of the cart. Remove any physical parts possibly interfering with the function of the spindle. Move the lift table to the lowest and to the highest position and make sure there is no abnormal behavior.

10.3 Cleaning the Optical Sensors of the Paper Path

There is only one optical sensor within the feeder frame. It is located in the lower part of the exit path. If the feedhead is opened, access to this sensor is available.
If using the feeder with a Registration unit there is a 2nd sensor in the Registration unit (see picture below on the right)



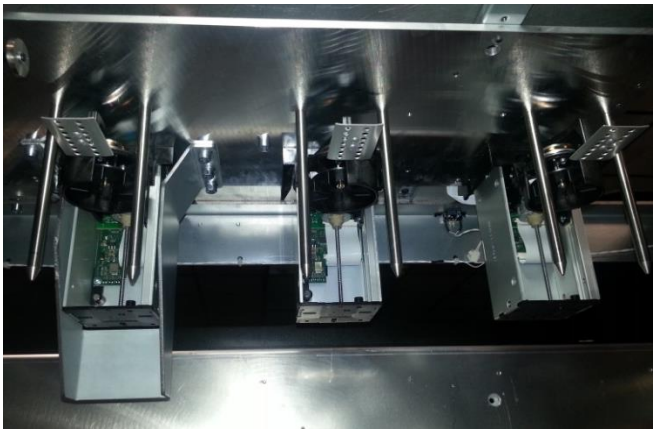
Optical Sensors in Feeder and Registration Unit

ATTENTION! When closing the feedhead module, hold it by the handle until it has reached its lowest position. Otherwise it could drop down.

Visually check the surfaces of the sensors. In case there is any contamination by any substance, use a soft and clean cloth or vacuum cleaner (without touching the sensor) to remove paper dust particles.

10.4 Inspection of Sideblower Modules

Check if the modules have been contaminated by dust or dirt particles. If so, blow the dust or air particles out of the modules.

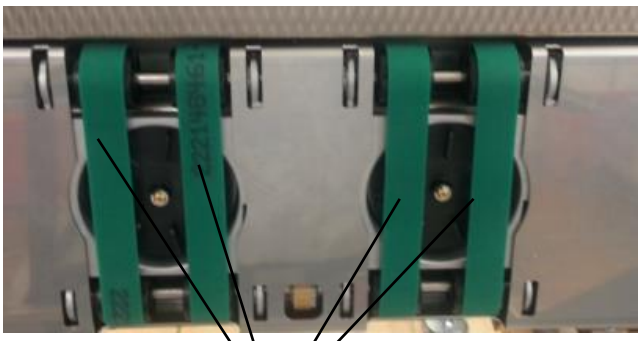


Picture 52: Sideblower Modules

10.5 Inspection of Tornado Module and Belts

There are two Tornado modules in the feeder included. If the feedhead is opened, access to these modules is available.

Picture 53: Tornado Modules In-Feed Module



Picture 54: Tornado Belts

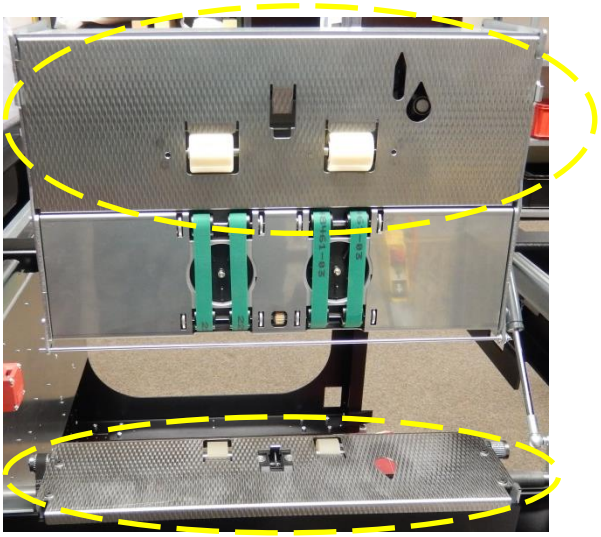
The Tornado module belts need to be visually inspected. Make sure the belts are:

1. Correctly placed and not or partially not slipped off their drive wheels
2. Not worn out or dusty
3. Not damaged

Further check if the impellers are spinning as expected without and resistance. In case there is any resistance caused by dirt or dust particles, blow the module out.

10.6 Cleaning Paper Path Surfaces

It is recommended to clean the paper path surfaces. Use a clean and soft cloth or a vacuum cleaner in order to remove paper dust from affected areas. Contamination by dirt or media coatings can be cleaned using a clean cloth with water/soapy solution or with Isopropyl alcohol – Do not use any liquids containing solvents.



Picture 55: Paper Dust Area

10.7 Greasing the Lift Spindles

The lift table spindles needs to be greased regularly. Use any industrial proven grease which does not damage stainless steel or brass materials. Add grease to lift spindle by using a brush.

Picture 56: Lift Spindle