



Operating Instructions Manual



1 Preamble

1.1 Scope

This original operating instruction is valid for the following Rhin-O-Tuff® Tornado Autopunch EX™ (TAP EX).

1.2 Revision History

Version	Date	Name	Description
00	2017-04-21	G. Braun	Initial Draft Revision
01	2017-04-27	G. Braun	Pictures added
02	2017-06-26	G. Braun	Pictures updated, Comments from Amy McManus implemented
03	2017-07-20	G. Braun	Information added
04	2017-07-24	G. Braun	Corrections
05	2017-11-21	G. Braun	Pictures updated
06	2018-01-21	G. Braun	Pictures / GUI updated
07	2018-01-31	G. Braun	Formatting/ SW Disclaimer added
08	2018-02-05	G. Braun	GUI updates / information added
09	2018-02-06	G. Braun	Updates from S.D.
10	2018-02-07	G. Braun	FW loading removed

1.3 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 General Information

2.1 About this Manual

This document is intended to describe the basic TAP EX structure, function and performance of the system and the fundamental function of operating. Its main purpose is to provide a guideline on how to operate the TAP EX and describe the prevention of unsafe situations for personnel working with the equipment caused by incorrect operation or mishandling.

2.2 Targeted Audience

This manual is specifically written for administrator and operator personnel of the TAP EX. The TAP EX must only be operated by properly trained personnel who are thoroughly familiar with all the operating, safety and maintenance procedures of the system. Before you attempt to use the TAP EX, fully read and understand the manual and the safety procedures. Any service procedures may only be done by specially trained and authorized personnel.

2.3 Using the Manual

Keep a copy of this manual close to the TAP EX at all times in an accessible location. Read this manual with care and follow all instructions and safety procedures described in this document. In case of loss, contact Rhin-O-Tuff for a replacement user manual at

<http://www.rhin-o-tuff.com/p/64/tornado-autopunch-ex>

2.4 Model Designation

Rhin-O-Tuff® Tornado Autopunch EX™, Product Code XXXXXXXX

2.5 Manufacturer Data

Performance Design LLC

2350 East Braniff

Boise, Idaho 87316

Tel.: +1-800-390-5782

Web: www.rhin-o-tuff.com

E-mail: pdiassistance@pdibind.com

2.6 Technical Support Inquiries

For service inquiries click here:

<http://www.rhin-o-tuff.com/tech-support.php>

3 Declaration of Conformity

3.1 Declaration of Conformity (In accord. with ISO/ICE 17050-1)

No. 01

Performance Design LLC
2350 East Braniff
Boise, Idaho 87316

Rhin-O-Tuff® Tornado Autopunch EX™ (TAP EX)

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

3.1.1 Safety

- Machinery directive 2006/42/EC
- UL60950-1 1st edition
- IEC/EN 60950-1 2nd edition
- EN ISO 12100:2010
- EC 60204-1 (Fifth edition) + A1:2008; EN 60204-1:2006 + A1:2009
- EN ISO 13849-1:2008; EN ISO 13849-2:2012
- EN 1010-1

3.1.2 EMC

- FCC Class A Digital device pursuant to Part 12
- Canadian ICES-003

3.2 Emissions of Acoustic Noise

The TAP EX has been tested for acoustic emissions under the guidelines as required in EN 1010-1:2011. The resulting emissions were at 81.5 dB(A). Since the noise level is between 80 dB(A) and 85 dB(A) hearing protection is not mandatory but must be provided (by the end-user) for use by the operator. The TAP EX has no specific vibrations or resonances that could be damaging for the user's health. There are no pneumatic or hydraulic compressors used in the product.

4 General Product Description

4.1 General Functions, Area of Application and Intended Use

The Tornado Autopunch EX (TAP EX) is a stand-alone automatic punching system designed to, interpose front and back covers, index tabs or inserts, punch desired hole-pattern for selected binding style and deliver offset book stacks via an exit tray ready for binding. The system combines feeding, interposing, punching, collation and stacking technologies to produce a book ready for binding. The TAP EX will maintain proper order / pagination of sheets at each functional component (feeder; interposer bins; paper path through punch, output tray and stacker) and deliver a complete book set with original pagination.

The Tornado Autopunch EX system configuration includes:

- **System Configuration: 1 high capacity feeder + 2 interposers**

The TAP EX utilizes a user interface for job set-up, definition, job monitoring and changeovers. The system's reliability and robustness allows the operator to set-up the job, press a button and walk away to return to punched/collated books ready to be bound.

The TAP EX system is designed to utilize an operational interface with a touch screen GUI with an intuitive operational method. Once the system is loaded, programmed and running, it requires no manual intervention by the operator. The operator is free to undertake other tasks (e.g. binding of the pre-punched books) while the TAP EX automatically creates the required book sets.

4.2 Appropriate Use of the TAP EX

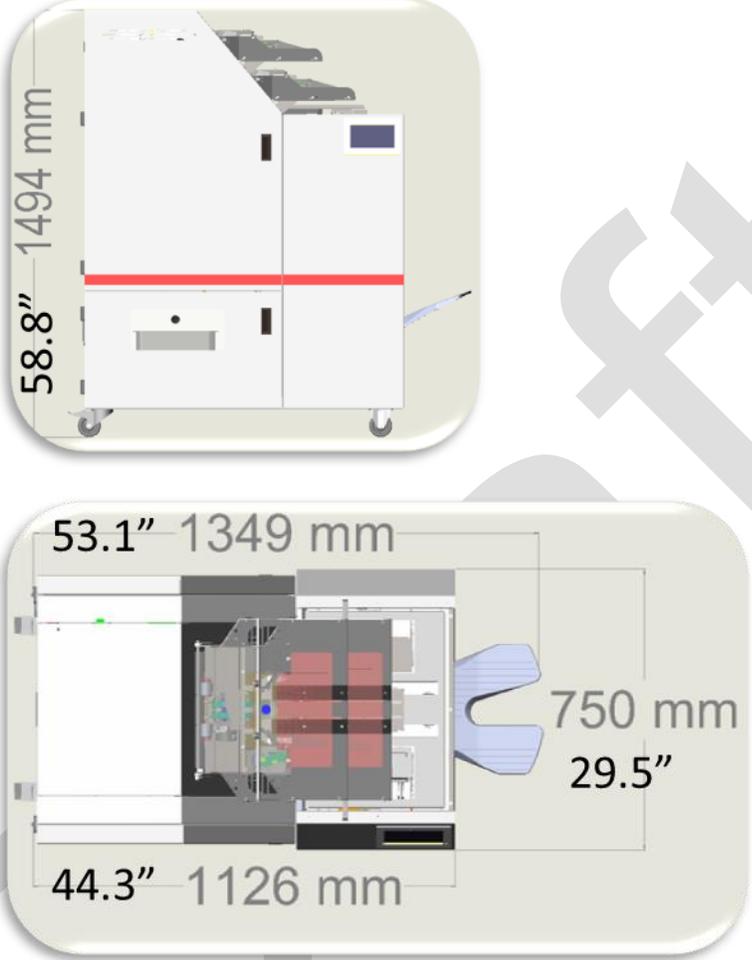
The TAP EX serves exclusively to feed pre-defined media (See Recommended Media Chart), collate and transfer them into the punch unit and punch the media. Afterwards, the punched media will transfer onto the output stacker for operator collection and binding.

4.3 Electrical Requirements

The TAP EX has the following power data:

Input voltage	110 Volts – depending on market 240 Volts – depending on market
Frequency	50-60 Hz
Power input	800 W
Current consumption	Max. 8.5A (basis 110 Volts)
System voltage	24 Volts

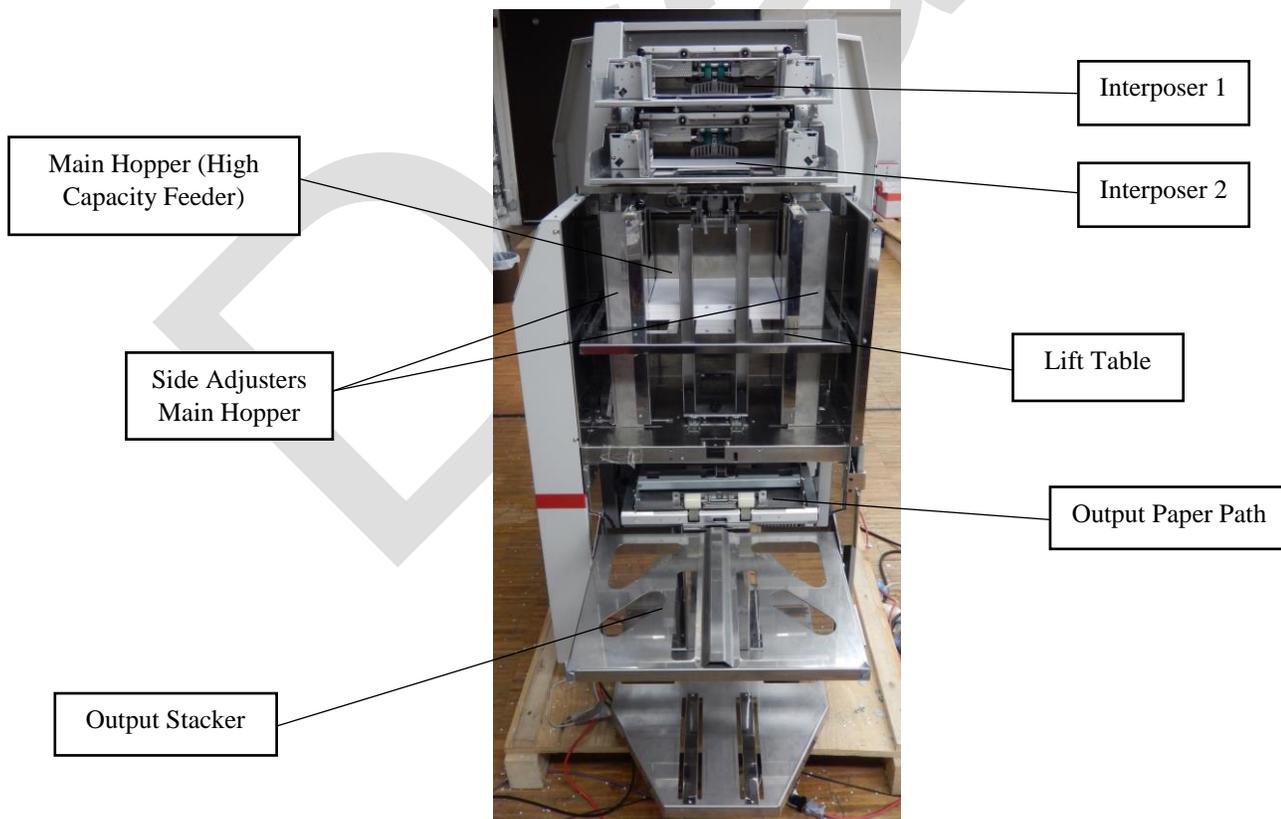
4.4 TAP EX Dimensions and Weight

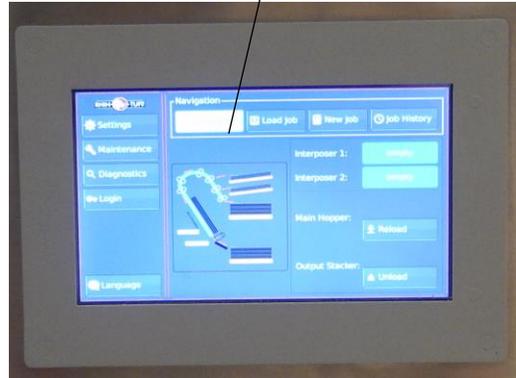
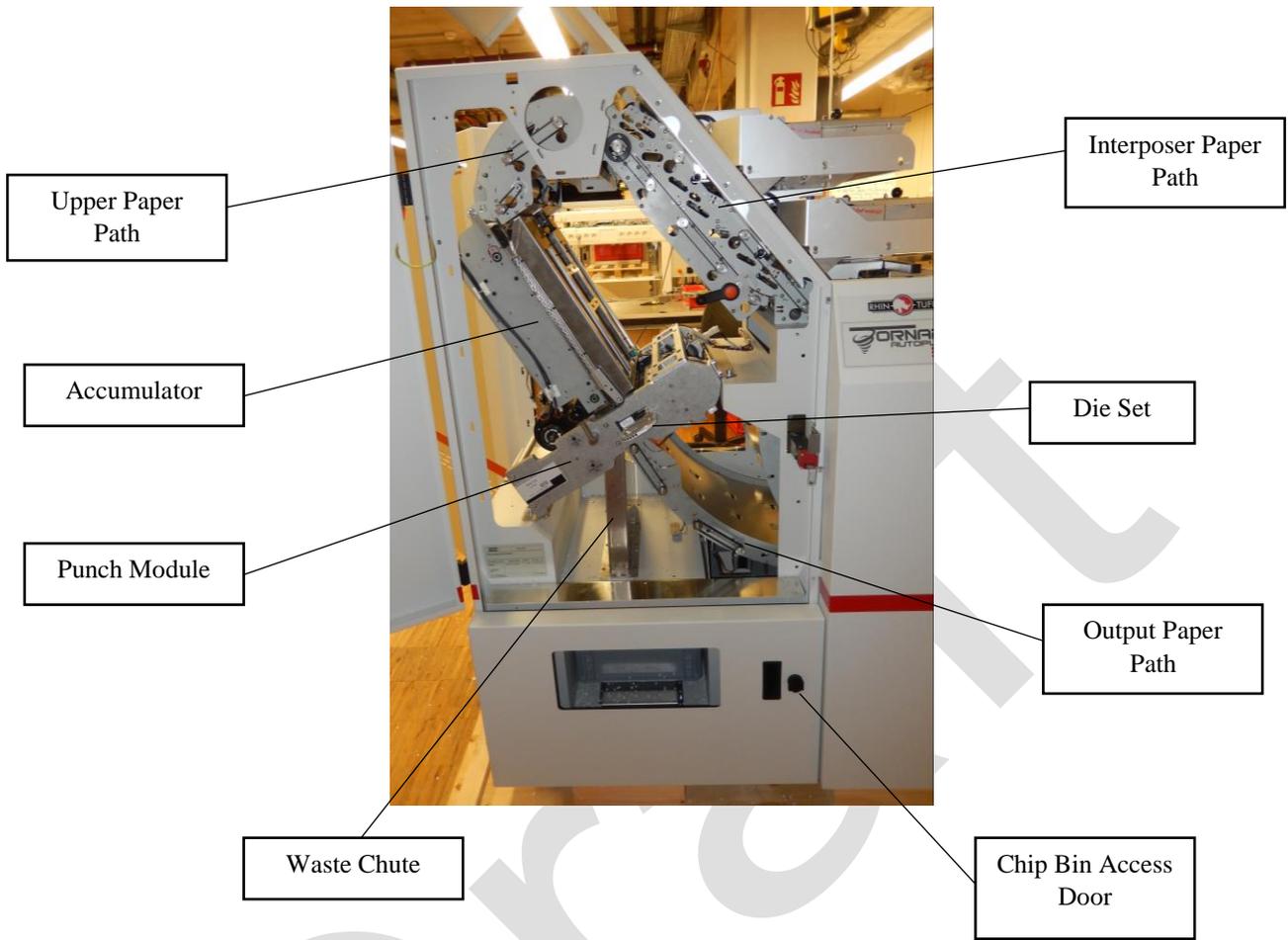
Parameter	TAP EX Dimensions / Figures
Weight	Approx. 770 lbs. (350 kg)
Main dimensions	 <p>The image contains two technical drawings of the TAP EX machine. The top drawing is a front view showing a height dimension of 58.8" (1494 mm). The bottom drawing is a top-down view showing a width of 53.1" (1349 mm) and a depth of 44.3" (1126 mm). A specific component on the right side of the top view is dimensioned as 750 mm (29.5").</p>

4.5 Hardware Component Overview

The TAP EX has the following main hardware components:

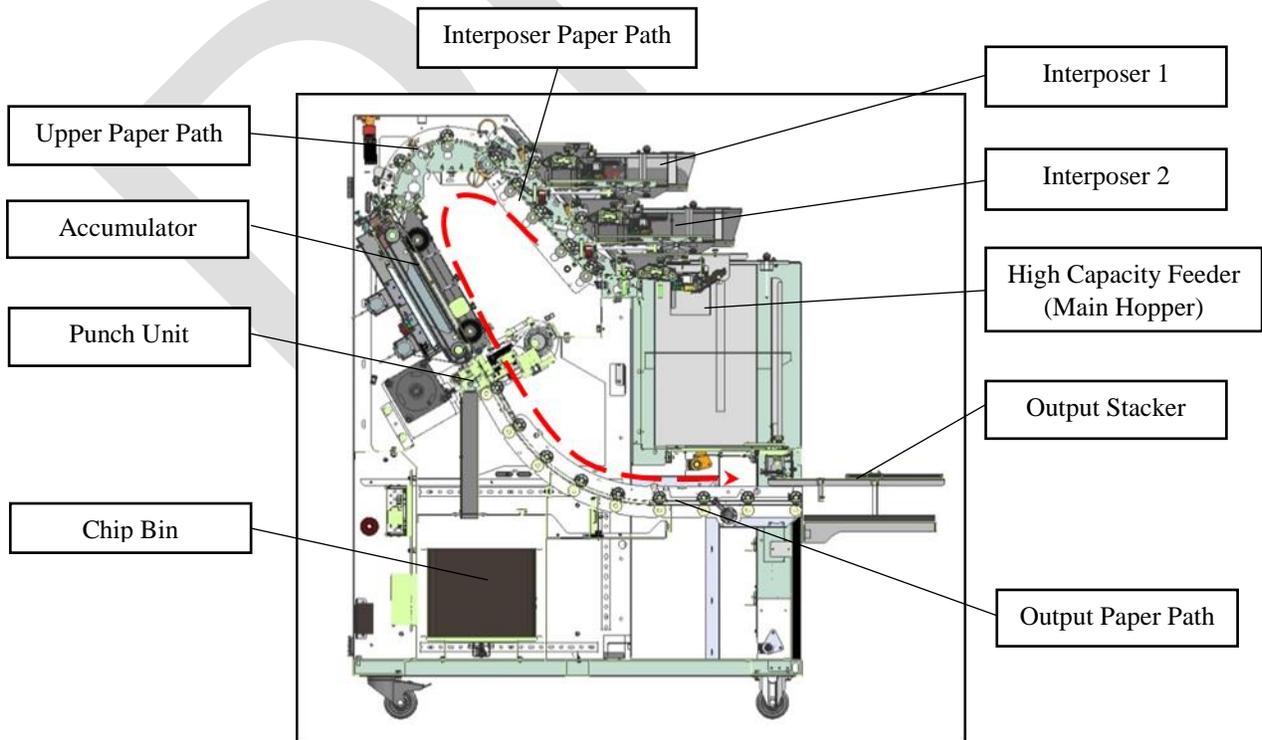
Pos.	Element	Function/Specification
1	High Capacity Feeder (Main Hopper)	Feeding of media into paper path. Max stack height 9.85" (250 mm)
2	Lift Table	Lifting the media stack
3	Side Adjusters	Fixes the side of the media stack and hold it in position
4	Interposers 1 / Interposer 2	Feeding of media into paper path. Max stack height 0.59" (15 mm)
5	7" Touchscreen Display with Graphical User Interface (GUI)	Operator interface. Controlling the TAP EX
6	Output Stacker	Collating and stacking of media. Max stack height 10.04" (255 mm)
7	Chip Bin	Collects the punched chads







4.6 Media Flow



4.7 Media Types and Weights

The TAP EX is able to handle the following homogeneous media types and weights:

Media Type	Description	Min Weight	Max Weight	Most Common
Overall Media Range	See category description below	60 gsm	312 gsm	
Uncoated Paper - Bond	Various brands of standard copy and bond paper, including recycled and virgin papers	16 lb./ 60 gsm	87 lb./ 312 gsm	20 – 32 lb. (75 – 120 gsm)
Uncoated Offset/Text	Uncoated specialty papers used in offset or book printing. Text papers are available in a variety of colors and textures.	40lb./ 60 gsm	220 lb./ 312 gsm	50 – 80 lb. (75 – 120 gsm)
Coated Paper	Paper that has a specialty coating (gloss or matte). Examples include inkjet, laser or UV coated papers.	47 lb./ 70 gsm	220 lb./ 312 gsm	70 – 100 lb. (105 – 120 gsm)
Covers – Paper	Document covers whose base material is paper. Paper can be smooth or textured (e.g. Grain or Linen or other embossed patterns)	22 lb./ 60 gsm	120 lb./ 312 gsm	65 – 100 lb. (177 – 271 gsm)
Covers – Plastic** (Acetate/PVC/Poly/LP)	Document covers whose base material is a type of plastic (e.g. Acetate, Polyvinyl chloride, Polypropylene or linear Polyethylene. Covers may have a clear, tinted or matte appearance.	4 mil/ 94 gsm	10 mil/ 235 gsm	5 – 10 mil (118 – 235 gsm)
Covers – Vinyl	Document covers whose base material is paper with a coating. Coatings may be Vinyl in nature giving the cover a Leatherette or Regency type feel.	3 pt./ 60 gsm	15 pt./ 312 gsm	5 – 15 pt. (90 – 312 gsm)
Index Tabs – Uncoated & Mylar-coated	Tab sheets – Index Paper or any of the above listed media types. Tabs are plain uncoated or coated in Mylar. Pre-printed and Docutech Style tabs are both compatible with the TAP EX.	33 lb./ 60 gsm	180 lb./ 312 gsm	65 – 110 lb. (116 – 200 gsm)

- ****Within the weight restrictions defined above, the TAP EX is able to handle mixed media combinations of ALL media types with the exception of the Covers – Plastic. Plastic media of any type (Acetate, PVC, Polyethylene or Linear Polyethylene) must be run using one of the two Interposer Bins on the TAP EX. Plastic media cannot be run mixed with other media from the high-capacity main bin feeder.**

4.8 Media Formats

The TAP EX can handle the following media sizes in the high capacity feeder:

Media Formats	Min US/INTL	Max US/INTL
Punched Edge	8.27" / 210mm	12" / 305mm
Unpunched Edge	5.5" / 139.7mm	12.5" / 317.5mm
Index Tabs	Base sheet for index tab + the tab extension cannot exceed the Max	

REFERENCE CHART: MOST COMMON DOCUMENT SIZES

The most common document sizes (US/INTL) that can be run on the TAP EX are listed in the Reference chart below. LEF stands for Long Edge Feed. SEF stands for Short Edge Feed. This reference for our purposes also indicates the Binding Edge (BE) which is also the Punched Edge.

Document Size/Orientation	US Length (BE) X Width	International Length (BE) x Width
Half letter (LEF)	8.5" x 5.5"	216mm x 140mm
Half letter (SEF)	5.5" x 8.5"	140mm x 216mm
Letter (LEF)	11" x 8.5"	279mm x 216mm
Letter (SEF)	8.5" x 11"	216mm x 279mm
A4 (LEF)	11.7" x 8.3"	297mm x 210mm
A4 (SEF)	8.3" x 11.7"	210mm x 297mm
A5 (LEF)	8.3" x 5.8"	210mm x 148mm
Calendar	12" x 12"	305mm x 305mm

All sheet sizes contained in any given document configuration or book must be the same size or flush-cut with one other. For index tabs the same rule applies for the base sheet minus the tab extension.

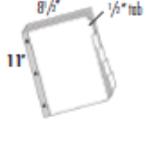
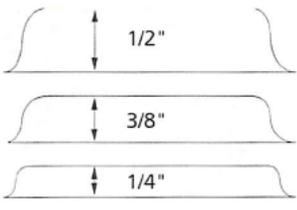
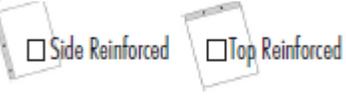
OVERSIZED COVERS

Oversized covers (e.g. 11" x 9") may be run if the "oversize" is on the unpunched edge of the sheet and does not exceed the max sheet size of 12.5" (305mm). Oversized covers in both the punched and unpunched sides (e. g. 11 ¼" x 8 ¾") may not be run on the TAP EX.

PRE-PUNCHED MEDIA (Body Sheets, Covers, Covers with Windows, Index Tabs)

Pre-punched paper and covers: The TAP EX is not designed to run any type of pre-punched media type including paper, covers or index tabs.

INDEX TABS: ADDITIONAL SPECIFICATIONS

<p>Sheet/Tab Orientation</p>	<p>Side Tab is the standard sheet/tab orientation</p> <p>Other options include: Hang Bottom Tab Hang Side Tab</p> <p>The TAP EX can run side tab and hang bottom tab only. No Hang side tabs can be run.</p>	 <p>YES Side Tab</p>	 <p>YES Hang Bottom Tab</p>	 <p>No Hang Side Tab</p>
<p>Min Tab Shoulder Distance</p> <p>Standard tab shoulder is 1/4"(6mm),</p>	<p>Min Tab Shoulder Distance is 3/16" (5mm).</p> <p>The TAP EX can only run index tabs with a shoulder cut-out. Step Tabs (no shoulder) cannot be run.</p>	 <p>YES Min 3/16" (5mm) Shoulder</p>	 <p>NO – Step Tabs or tabs with no shoulder</p>	
<p>Tab Cut</p>	<p>Up to 1/10th Cut</p>			
<p>Tab Extension Width</p> <p>Standard is 1/2" tab extension (this is the machine default setting)</p>	<p>1/4"(6mm), 3/8" (9.5mm), 1/2"(12.7mm), 5/8" (15.8mm)</p> <p>Un-punched Sheet not to exceed 12.5" with tab extension</p>			
<p>Mylar Coated Tabs and Mylar Side/Top sheet reinforcement</p>	<p>Mylar Tabs and sheets with Mylar reinforcement can be run if the Mylar tab/strip is <0.003" thick</p>			
<p># of Tabs run in a Single Book</p>	<p>Up to and including 25 tabs</p>			
<p>Non-Standard Tab Cuts</p>	<p>Custom indexes can be manufactured with custom tab cuts/shapes. They can be run on the TAP EX as long as they have a min tab shoulder of 3/16" (5mm). See example in picture of half-moon tab cut/shape.</p>			

4.9 System Throughput

Nominal system throughput of punched and collated booklets with maximum 10 sheets and without interposing other media:

Sheets Per Hour	Media Format US Length (BE) X Width	Media Type/Weight
10,800	A4	Uncoated Paper – Copy Paper 80lb./75 gsm
8,000	12" x 12.5	Uncoated Paper – Copy Paper 80lb./75 gsm
6,000	11" x 8.5" with .5" tab extension	Index Stock 110lb./200 gsm
6,000	A4	Coated Paper 65lb./100 gsm
5,000	A4	Cover – Paper 110lb./300 gsm

- 6,000 sheets/hour of A3 (120 gsm) ‘copy paper’ (HP Office standard)

4.10 Packaging

4.10.1 TAP EX Packing Dimensions and Weight

Parameter	Packaging dimensions
Width	49.5" (1260 mm)
Depth	65" (1650 mm)
Height	35.5" (900 mm)
Weight	770 lbs. (350 kg)

4.10.2 TAP EX Packing Box

The packaging box has an integrated ramp for ease of unloading. One of the walls transforms into a ramp so the unit can roll out of the box without lifting.



5 Conditions and Limits for Operation and Storage

5.1 Storage and Transport Environment

Storage and Transport environment conditions for the TAP EX are:

- Temperature: 0°C to 40°C (32°F to 104°F)
- Relative humidity: 5% to 95%

CAUTION! In case the storage and transport conditions may fall below or exceed the described conditions, the performance of the TAP EX may not function correctly until operating conditions are re-established.

5.2 Operating Environment

The TAP EX may not be operated below or above the following conditions:

- Temperature: 15°C to 35°C (59°F to 95°F)
- Relative humidity: 20% to 75%
- The TAP EX needs to be operated in a dust and airborne contaminant-free environment.
- The potential for oil/ liquid contamination and/or oil/mist during service or other manual work at the machine needs to be prevented completely; otherwise the TAP EX may not function properly anymore.

CAUTION! In case the operating conditions may fall below or exceed the described conditions, the performance of the TAP EX will be significantly reduced or it will not function correctly until operating conditions are re-established.

6 General Safety Information

6.1 Inappropriate Use of the TAP EX

CAUTION! Inappropriate use of the TAP EX can cause serious physical injury and damage to the TAP EX

- Inappropriate use is any use which differs from or exceeds the appropriate use of the TAP EX
- It is inappropriate to operate the TAP EX if it is **NOT** in perfect working condition
- Any modification to the TAP EX is inappropriate
- Bypassing any of the safety elements of the feeder is inappropriate
- **CAUTION!** Do not load any substrates that are contaminated with metal dust
- **CAUTION!** Do not load any substrates that are wet with any fluids
- **CAUTION!** Do not load any articles that are thicker than 2 mm
- **CAUTION!** Do not load any substrates that exhibit high static electricity

Any of these inappropriate usage cases may cause a risk of damage or a personal injury risk.

6.2 Safety Instructions for Safe Operation

- This manual is to be kept close to the TAP EX
- The TAP EX must only be operated by staff that is able to meet certain physical and qualification requirements
- Before the TAP EX 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 appropriate training
- Make sure that during any unit operation, you are not interfering with any moving part of the TAP EX
- Operating personnel must always tie up their hair if it is long and must not wear loose clothing or jewelry, including rings
- Make sure that there are no persons or objects in the working range of the TAP EX before you start any operations
- Keep the working and safety areas around the TAP EX free from paper dust, paper, water, grease, solvents, tools and any other operating supplies
- Always comply with all accident prevention regulations and safety instructions on the TAP EX and in the manual
- The TAP EX safety features must function properly during operation. Do not bypass, remove, or disconnect any safety feature
- In case of accidents, please follow the internal reporting requirements and comply with any defined emergency procedures
- If you observe any safety-related changes to the TAP EX or if it operates incorrectly, immediately switch off the TAP EX and secure it so that it cannot be switched on again accidentally
- Make sure that no other personnel are in the working range of the TAP EX while opening or closing covers and doors

- Make sure that your hands are not harmed during the locking/unlocking of covers
- Never replace parts or components with the main voltage switched on
- No covers must be removed
- Any technical modification to the TAP EX may only be made with the explicit approval of the manufacturer
- The environmental temperature must not be higher than 35° Celsius (95° Fahrenheit)
- Comply with all instructions and regulations concerning fire and explosion protection
- In the event of fire, only use CO2 as an extinguishing agent
- Inform your supervisor if the TAP EX does not seem to work properly or you feel that you need further training

DANGER! Only specially trained personnel are allowed to replace components of the TAP EX for service

6.3 Safety Symbols

The following symbols appear on warning labels on the TAP EX:

	<p>Use fork lift with 1.0 ton capacity and fork extenders from this side only. DANGER! Make sure the minimum load capacity of the fork lift has 1.0 tons when handling TAP EX packaging boxes.</p>
	<p>Center of gravity DANGER! Location of the center on the TAP EX packaging box. Make sure the fork lift or pallet jack is used at the foreseen positions of the packaging box only.</p>
	<p>Electrical Hazard DANGER Electrical Hazards! Contact may cause electrical shock or burn. Turn off power before servicing. Only authorized personnel may open the electrical cabinet panels.</p>
	<p>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 feeder components.</p>
	<p>Mechanical Hazard DANGER! Crushing of toes/foot.</p>
	<p>CAUTION! Safety symbols and notices on the feeder may not be removed and covered and must remain readable.</p>

6.4 Placement of Warning Labels

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

6.5 Electrical Safety

The TAP EX must be properly connected to the main power supply. Make sure all connectors are engaged correctly.

DANGER! Do not operate the TAP EX 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 procedure, you must electrically turn off the TAP EX.

6.6 Safety Switches (Doors)

The TAP EX has a number of safety door switches which stop immediately TAP EX operations and turn off electrical power to system devices when these switches are actuated.

DANGER! Do not disconnect or override any of these safety devices

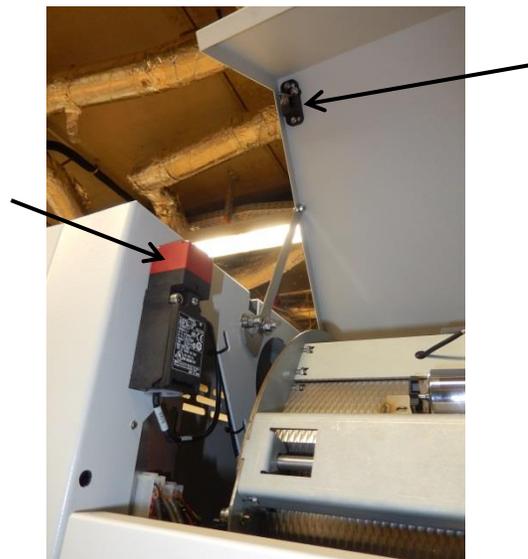
The following components are connected to a safety door switch:

1. Upper Paper Path Access Door
2. Operator Access Door

Safety switch operator access door



Safety switch upper paper path access door



6.7 Protection Switches

The TAP EX has a number of protection switches. The functionality of these switches is to prevent the machine from starting in the event that the module is not in the correct state.

The following components are connected to a protection switch:

- Feed head of the high capacity feeder
- Locking lever upper paper path
- Locking lever interposer paper path
- Flap accumulator
- Locking lever die module
- Locking lever output paper path
- Chip bin

6.8 Main Supply Switch (Main Voltage)

The main supply switch of the TAP EX is located at the back side of the electric cabinet. Turn off the power by pressing the main supply switch.



7 Preparation of the Product for the Use

7.1 Safety Precautions before Installing

ATTENTION! Ensure personal safety equipment is in place prior to installation

7.2 Unpacking, Safe Disposal of Packaging Materials

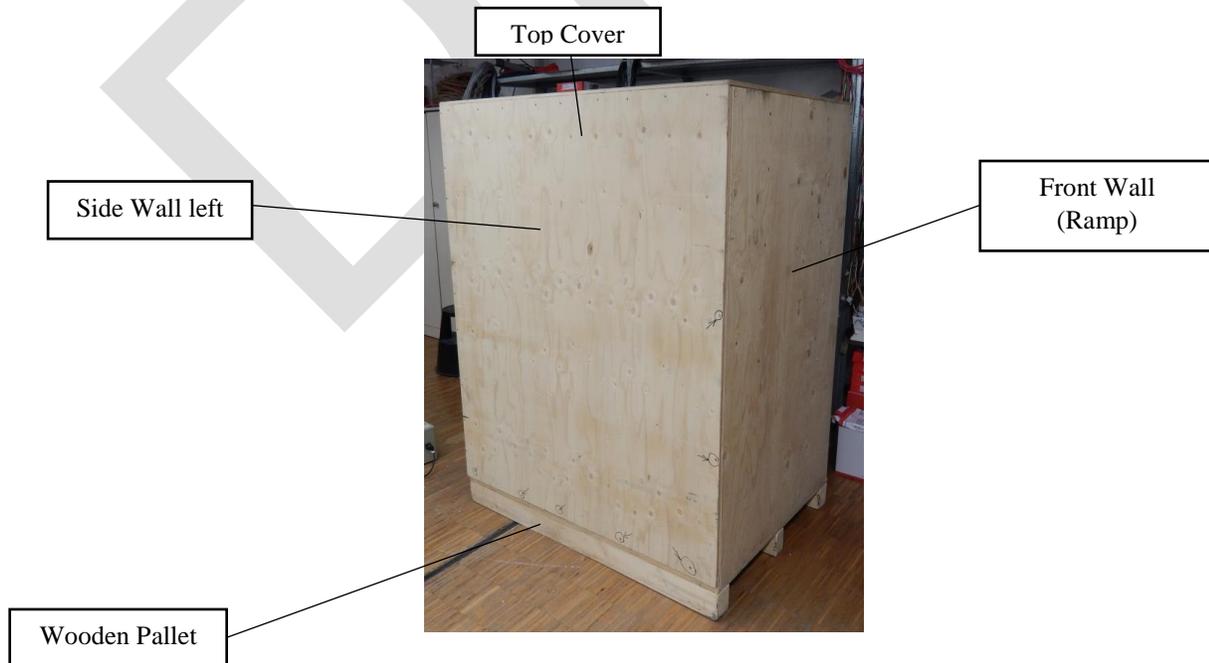
The instructions for unpacking and installation of the TAP EX are located in a plastic bag attached to one of the side walls of the wooden box.

7.2.1 Packaging Structure

The packaging of the TAP EX consists of several main elements:

- TAP EX pallet
 - Wooden pallet
 - Wooden fixation brackets (2)
- Wooden box
 - 2x2 side walls
 - Top cover
- TAP EX metal fixation brackets (4x)
- TAP EX fixation bolts (4x)
- TAP EX fixation nuts (4x)
- Transparent wrap foil

The front wall will be used as ramp for unloading the machine from the pallet.



7.2.2 Lifting the TAP EX Packaging Box

When using a hand pallet truck, enter the pallet from the front as shown in the picture below. Make sure the entire box rests firm and safely on the forks.



WARNING! When entering the hand pallet truck, make sure the forks support the entire pallet. If adjustable the position of the forks has to be as wide as possible. Make sure that there are no personnel in the working range during the handling of the TAP EX box.

7.2.3 Tools Needed

To remove the side walls and remove the TAP EX from the pallet you need following tools: Cordless screwdriver, TORX bit T20, T25, Allen key 3 mm and 4 mm, wrench 17 mm (5/8 alternatively).



7.2.4 Remove wooden Walls from the TAP EX

NOTE: Only the circled screws need to be removed. Rear wall, top cover and the 2 side walls can be removed in one piece.



- 1) Remove the circled screws (8) from the left side wall using TORX 20
- 2) Remove the circled screws (8) from the right side wall using TORX 20
- 3) Remove the circled top screws (2) from the front wall using TORX 20
- 4) Remove the front wall. It will be later used as ramp.



- 5) Remove circled the screws (3) from the rear wall (bottom) using TORX 20

6) Push the remainder of the box backwards off the pallet until the TAP EX stands freely



7) Remove the plastic wrapping

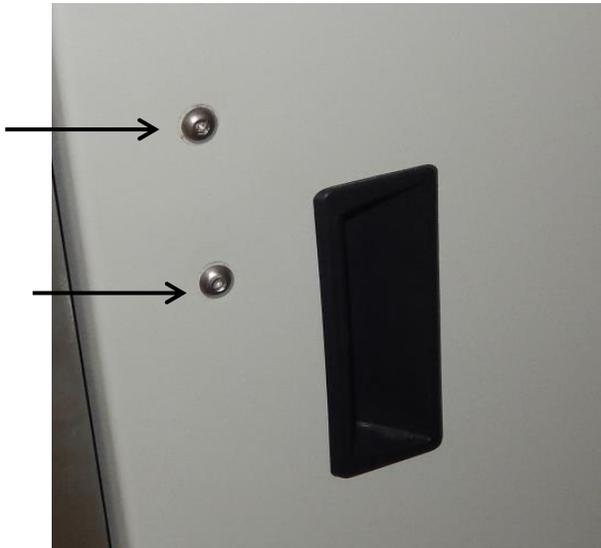


ATTENTION! Make sure that the packaging is disposed in accordance with local environmental regulations and standards.

8) Now the transport (steel) brackets can be removed:

9) Open the operator door (left) to access the left rear bracket

10) Open the service door to access the right rear bracket. The door is locked with 2 screws. Use Allen key 3mm.



11) Unscrew the nuts of the 4 brackets using wrench 17mm



12) Remove the 4 steel brackets and the 4 bolts



13) Fasten the sheet metal piece inside the electrical cabinet with a bolt using Allen key 4mm.



14) Lock the service door with the screws you have previously removed.

7.2.5 Unloading the TAP EX from the Pallet

1) Remove the 2 wooden support blocks (left and right) underneath the TAP EX by using a wooden beam as a lever as shown below.



Support block left

2) Once all transport blocks are removed the TAP EX stands on its casters on the pallet

3) Fit the unloading ramp to the pallet as shown in the photographs, ensuring that it is aligned to the pallet and there are no gaps between the pallet and the ramp.



4) With the aid of a 2nd person gently roll the TAP EX down the ramp (Make sure that the brakes of the casters are released)

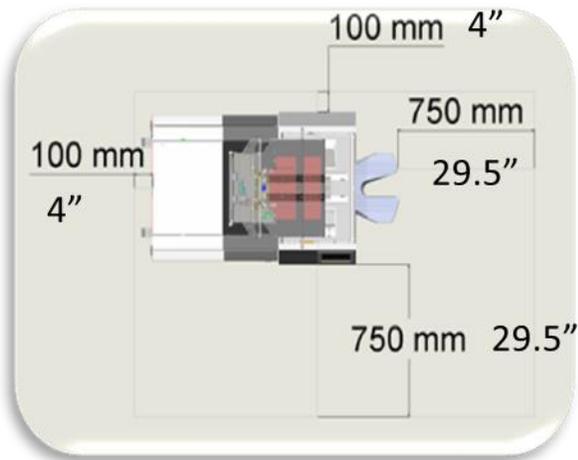
WARNING! Stay clear from the moving direction of the TAP EX

5) Once on ground the casters can be locked

8 Mechanical Installation

8.1 TAP EX Space Requirements

Pictured below is the general guideline for the recommended free space around the TAP EX.

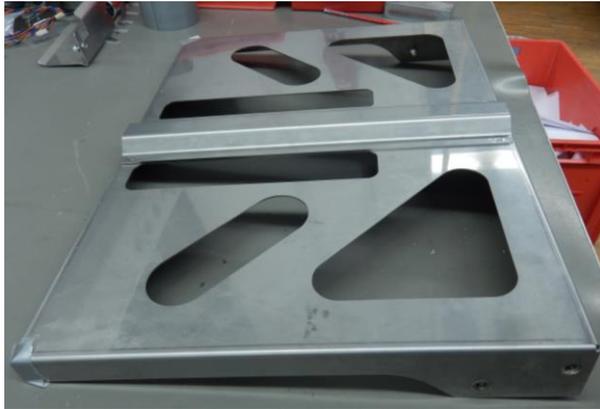
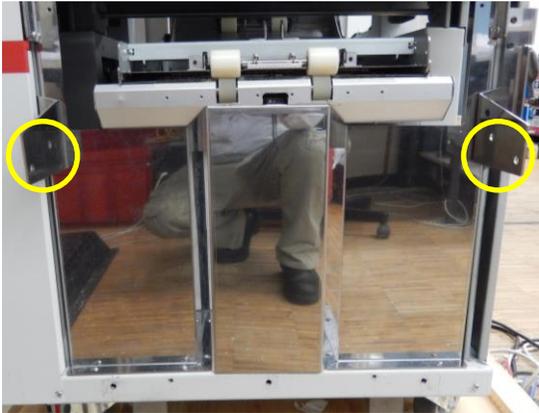


8.2 Assembly of the Output Stacker

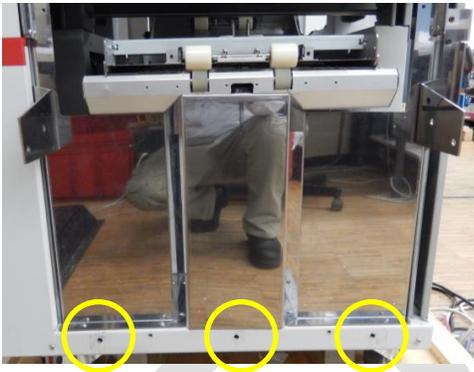
Once the TAP Ex is at its final location, the output stacker needs to be assembled.



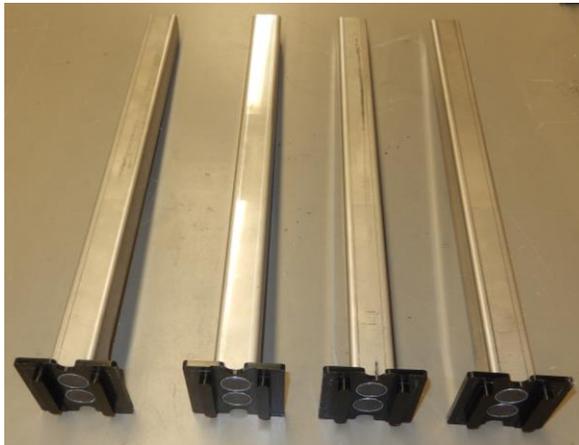
1) Attach the lift plate of the stacker to the brackets of the TAP EX with the 4 screws using Allen key 5 (Two at each side)



2) Attach the base plate of the stacker at the bottom of the TAP EX with the 3 screws using Allen key 5



3) Install the paper guides as depicted in the picture below. They are held in place by magnets at the bottom of the guides.



8.3 Electrical Connection

The TAP EX has the following external electrical connection:

1. Main switch and an a power cord to mains supply



8.4 Connecting the TAP EX to Electrical Power

DANGER! Before connecting the TAP EX to an appropriate electrical outlet, make sure the TAP EX is switched off.
Connect the power cable to a grounded electrical outlet with an adequate current rating.

8.5 Moving and Securely Positioning

The TAP EX is equipped with two foot operated locking casters located on the back of the machine.

- To move the TAP EX, unlock both front casters
- To operate the TAP EX, securely lock both front casters at all times

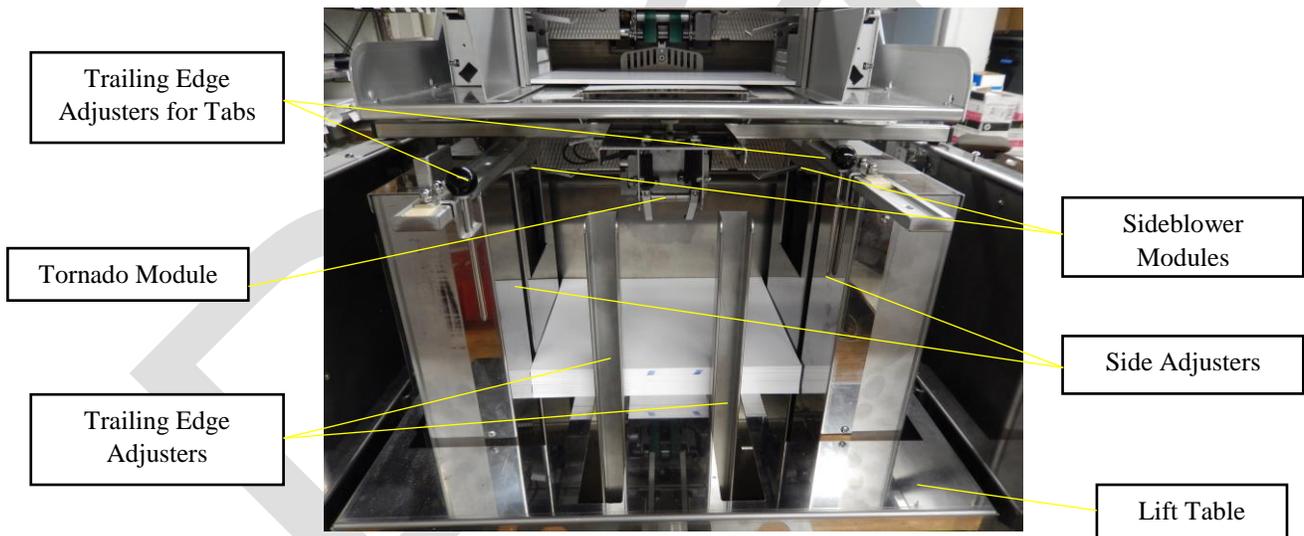
9 Functional Principles

9.1 High Capacity Feeder (Main Hopper)

- The high capacity feeder is located at the front of the TAP EX
- The feeder is able to handle all types and sizes of media as described in section media types

The High Capacity Feeder includes the following components:

Element	Function
Lift Table	Lifting media stacks
Side Adjusters	Fixes the side of the media stack and hold it in position
Trailing Edge Adjuster	Fixes the trailing edge of the media stack and hold it in position
Sideblower Modules	Separate top sheets by an air cushion
Tornado Module	Transports media into paper path



9.1.1 Sideblower Modules

- The sideblower modules are located on both sides of the side adjusters
- 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 by using the BDT patented sideblower modules. The sideblowers will simultaneously aerate the top sheet along with the following sheets and will minimize any adhesion or static forces working between the individual sheets.

9.1.2 Tornado Modules

- The Tornado modules are located at the upper area of the high capacity feeder.
- The media is located on the lift table of the feeder. The top sheets will be separated and lifted by the Tornado modules and transferred into the nip rollers of the feed module. The nip rollers move the media into the paper path.

9.2 Interposers

There are 2 Interposer modules which are located above the high capacity feeder. Each interposer is able to handle the types and sizes of media described in chapter 4.7 (Media Types).

9.2.1 Sideblower Modules

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

9.2.2 Tornado Module

- The Tornado module is located at the upper area of the interposer
- The media is located on the base plate of the interposer. The top media will be separated and lifted by the Tornado module and transferred into the nip rollers of the feed module. The nip rollers move the media into the paper path.

9.3 Upper Paper Path

- The upper paper path module is located between the high capacity feeder and accumulator
- It can be accessed via the upper access door
- The upper paper path module transports the media from the high capacity feeder in correct sequence, speed and gap required into the accumulator

9.4 Accumulator

- The accumulator is located at the rear of the TAP EX between the upper paper path and punch module
- It can be accessed via the operator access door
- The accumulator collects and aligns (side and length offset) the defined paper lifts prior to punching
- The accumulator includes also a tapping function to align the lift
- The accumulated stack is then conveyed into the punch throat so that the punched edge of the sheet is tight against the fixed stop gate in the punch module

9.5 Punch and Die Mechanism

- The punch module is located at the rear of the TAP EX between the accumulator and output paper path
- It can be accessed via the operator access door
- The punch mechanism executes the punch of the media (stacks)
- Numerous die sets with standard sizes and patterns are available

9.6 Output Paper Path

- The output paper path is located between the punch module and the output stacker
- The output paper path module transports the punched media from the punch module into the output stacker

9.7 Output Stacker

- The output stacker is located at the front of the TAP EX, under the high capacity feeder
- The output stacker collates and stacks the punched sections until individual books are completed
- With the offset function (when selected; see section 11.3) the stack on the tray will be stacked with an offset pattern. This is an aid for separating and identifying the individual books.

9.8 Chip Bin

- The chip bin is located under the punch module
- It can be accessed via the chip bin door
- The chip bin collects the punched paper chips (chads)

10 Installing and Setup

10.1 Turn-on Procedure

The main switch is located at the rear side of the electrical cabinet cover.



- Press the main switch to the 'ON' position
- Wait for the start-up of the GUI
- This procedure may take up to 60 sec.

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

10.2 Initial Start-up

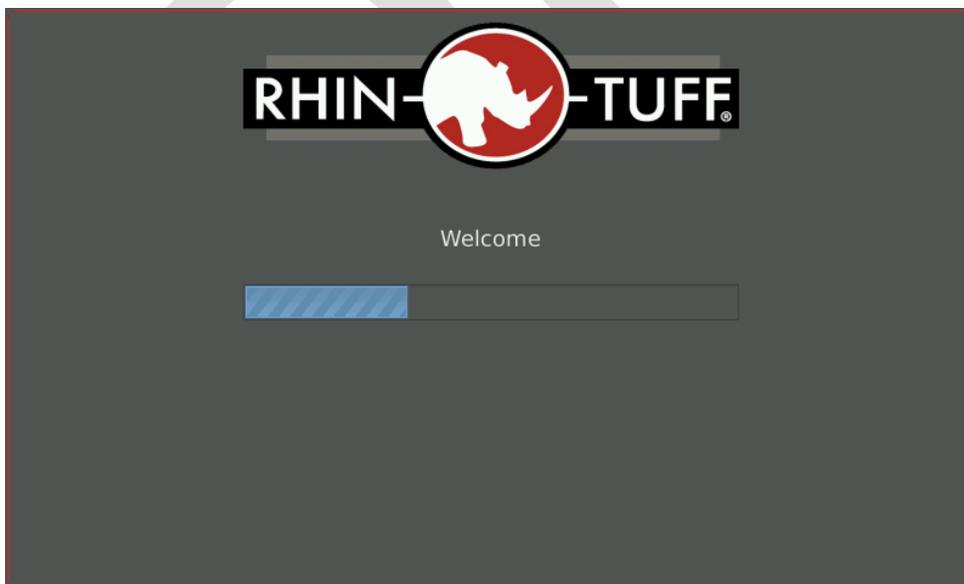
During the initial start-up sequence there will be two screens shown.

NOTE: It must be noted that during all start-ups these two screens will also be seen.

1st screen



2nd screen



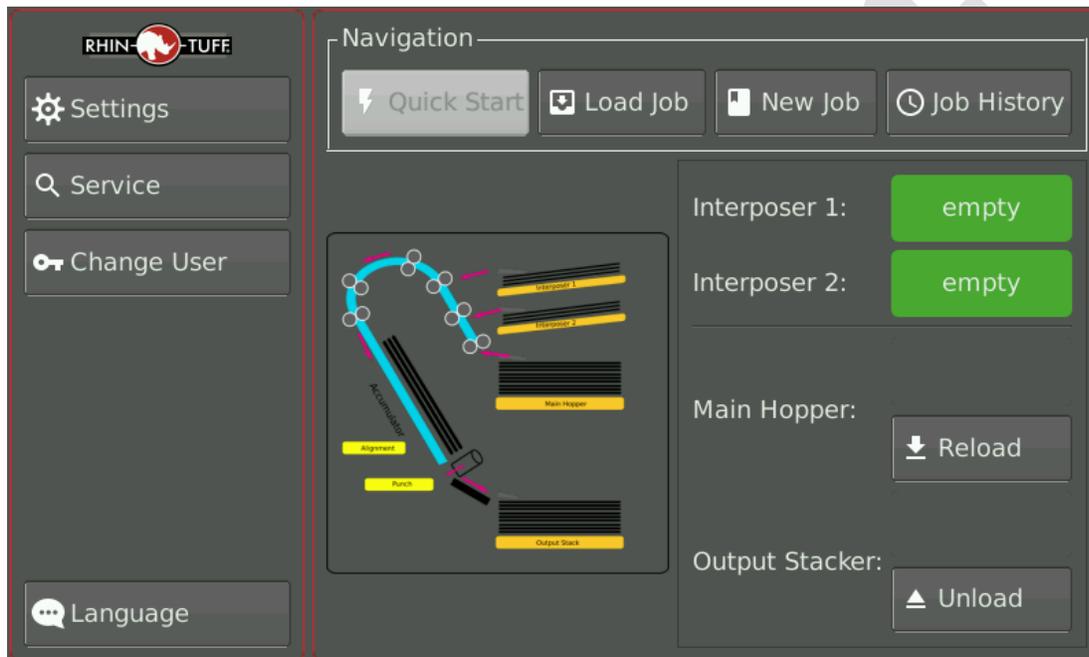
10.3 Initial Set-up Activities

Once the initial start-up process has been completed and the machine is initialized, the home screen, as below, will be seen.

NOTE: It must be noted that during all start-ups this screen will indicate the completion of the start-up process and that the machine is ready for operation.

At this stage, the machine is ready for either further settings or programming a job.

The Home Screen



It can be seen that certain elements, for example 'Quick Start', are greyed out. This is a general principle to indicate that, at the current point in time, the greyed out element will not have any operational functionality.

This will change according to the machine condition when in operation or at a required point in the operational/programming sequence.

10.4 User Management

On this screen you can login as service / admin to use diagnostic functions and change settings.



The GUI of the TAP EX has two different user access levels with different rights:

Service / Administrator

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

Operator

- Run, set and clear all job parameters
- Save parameter pre-setting
- Reboot system by control

10.5 Settings and Basic Parameters

ATTENTION! The following sequences are generally only required for the initial installation of the machine. However, they can be accessed and changed at any time or when the need arises, for example in the case of the need to change the machine from metric to imperial units or the machine's language as needed. For some of the settings you will need to login as admin / service.

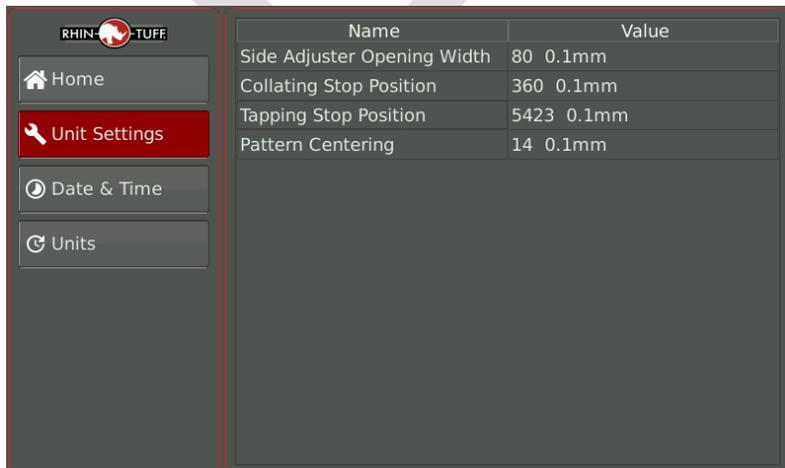
10.5.1 Language Selection

From the home screen, the respective languages can be selected. Select the required language and press the change language button.



10.5.2 Unit Settings

From the home screen the icon 'Settings' can be selected. The machine will immediately go to the screen as displayed below. On this screen machine settings can be set and fine-tuned.

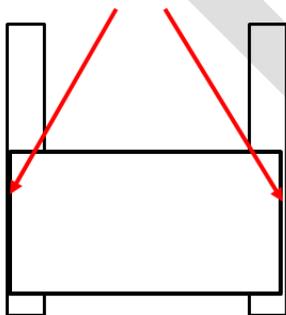


10.5.2.1 Side Adjuster Opening Width

Here the opening width of the side adjuster can be set.



Paper must be centered between side adjusters.



10.5.2.2 Collating Stop Position

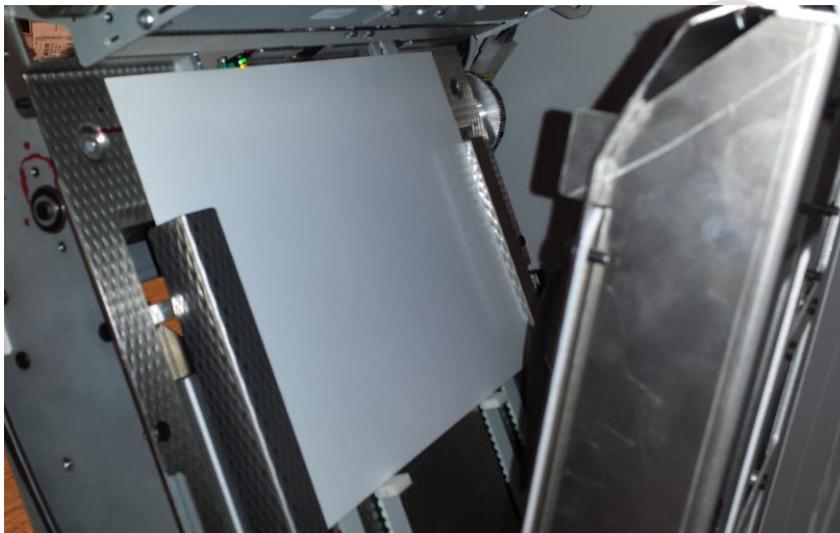
Here the collating stop position can be set



The screenshot shows the RHIN-TUFF control interface. On the left is a navigation menu with options: Home, Unit Settings (highlighted in red), Date & Time, and Units. The main area displays a table of settings:

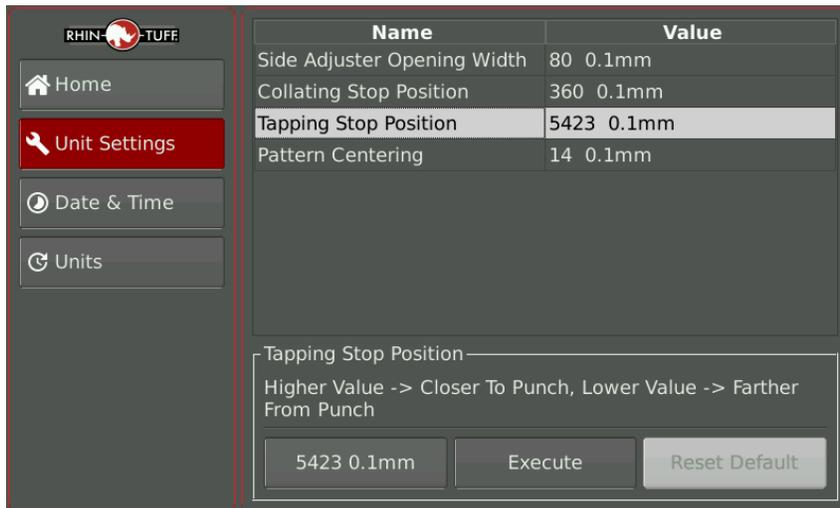
Name	Value
Side Adjuster Opening Width	80 0.1mm
Collating Stop Position	360 0.1mm
Tapping Stop Position	5423 0.1mm
Pattern Centering	14 0.1mm

Below the table, there is a section for the 'Collating Stop Position' with the instruction: 'Higher Value -> Closer To Punch, Lower Value -> Farther From Punch'. At the bottom of this section are three buttons: '360 0.1mm', 'Execute', and 'Reset Default'.



10.5.2.3 Tapping Stop Position

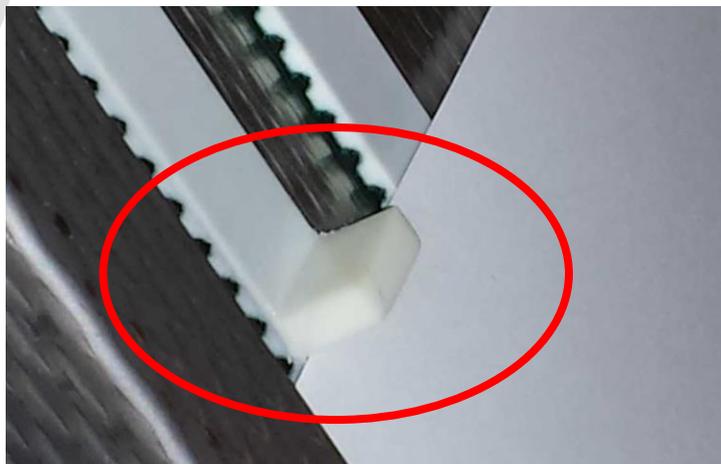
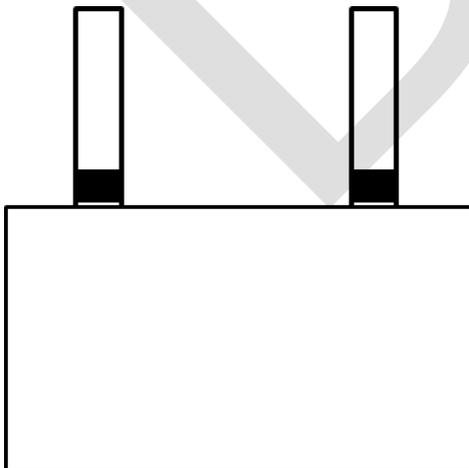
Here the tapping stop position can be set.



The screenshot shows the RHIN-TUFF control interface. On the left is a navigation menu with options: Home, Unit Settings (highlighted in red), Date & Time, and Units. The main area displays a table of settings:

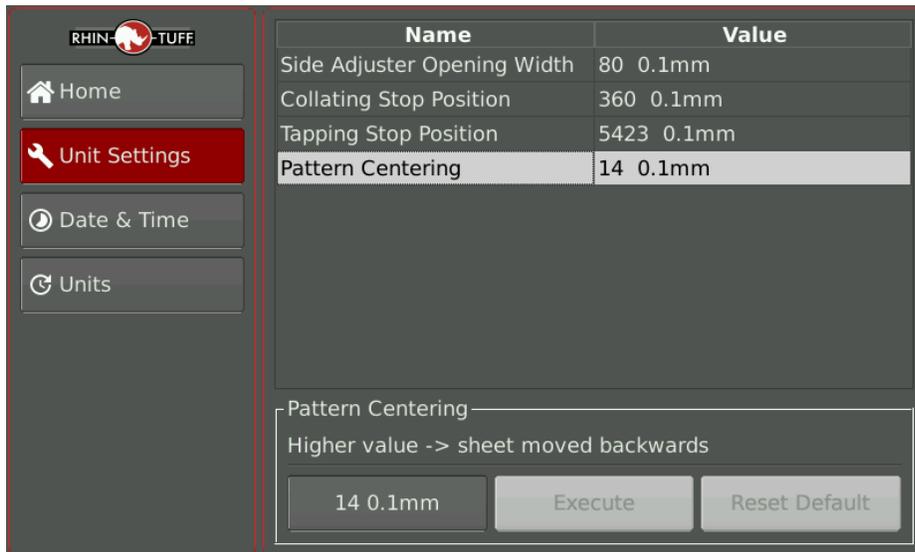
Name	Value
Side Adjuster Opening Width	80 0.1mm
Collating Stop Position	360 0.1mm
Tapping Stop Position	5423 0.1mm
Pattern Centering	14 0.1mm

Below the table, there is a section for the Tapping Stop Position with the instruction: "Higher Value -> Closer To Punch, Lower Value -> Farther From Punch". At the bottom, there are three buttons: "5423 0.1mm", "Execute", and "Reset Default".



10.5.2.4 Pattern Centering

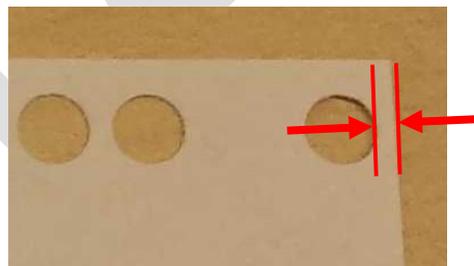
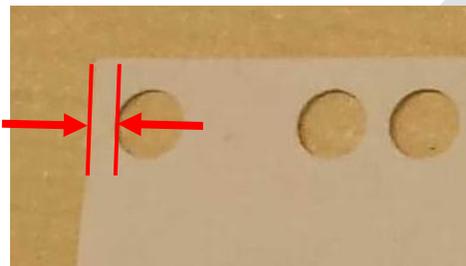
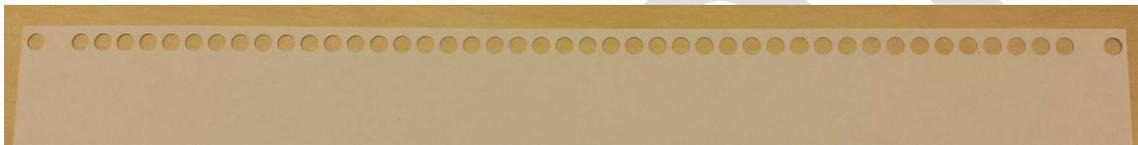
Here the pattern of the punched holes can be centered.



The screenshot shows the RHIN-TUFF control panel interface. On the left is a navigation menu with options: Home, Unit Settings (highlighted in red), Date & Time, and Units. The main display area shows a table of settings:

Name	Value
Side Adjuster Opening Width	80 0.1mm
Collating Stop Position	360 0.1mm
Tapping Stop Position	5423 0.1mm
Pattern Centering	14 0.1mm

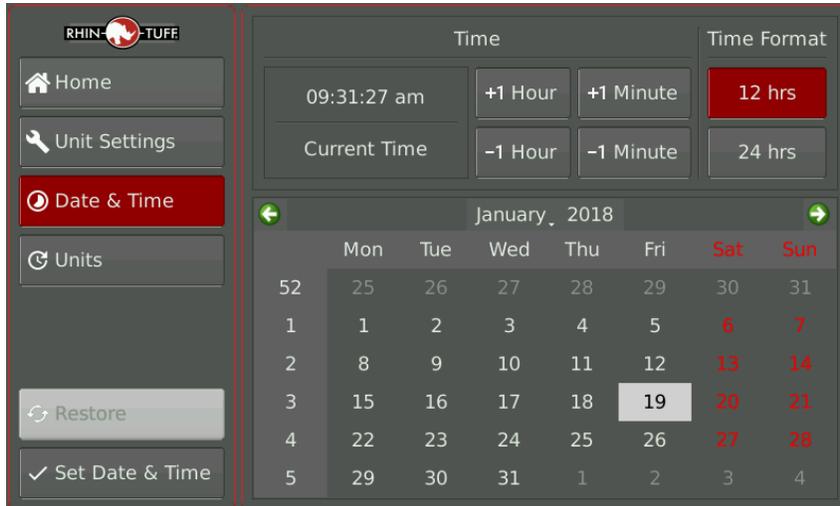
Below the table, there is a section for 'Pattern Centering' with the text 'Higher value -> sheet moved backwards'. At the bottom of this section are three buttons: '14 0.1mm', 'Execute', and 'Reset Default'.



10.5.3 Date and Time

From the home screen the icon 'Settings' can be selected.

The machine will immediately go to the 'Time and Date' screen as displayed below.



The date needs to be set in relation to the local time zones for both summer and winter times. In the event of a problem with the machine it is important that the time and surrounding conditions are documented as this will aid the service technician in determining the cause to the issue.

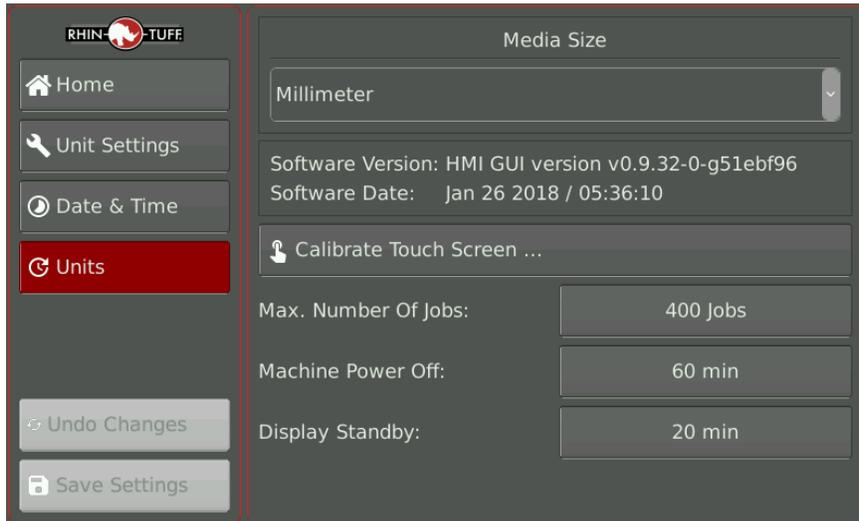
For reference all machine will be sent out with the time set at GMT in relation to the season.

ATTENTION! The 'Execute' button will remain grey until a selection or input is made. Once setting is completed and the execute button is selected, the process can proceed to the next screen.

10.5.4 Units

By pressing the 'Units' tab at the top of the screen, the selection of either metric or imperial units can be made and saved. The units of the media weight can also be selected (GSM or lbs.).

Also on this screen miscellaneous other settings can be set. They are described below.



10.5.4.1 Max. Number of Jobs

Here the maximum amount of jobs can be set which can be saved.

10.5.4.2 Machine Power Off

Here the time can be set when the machine is turned off

10.5.4.3 Display Standby

Here the time can be set when the displays goes to sleep.

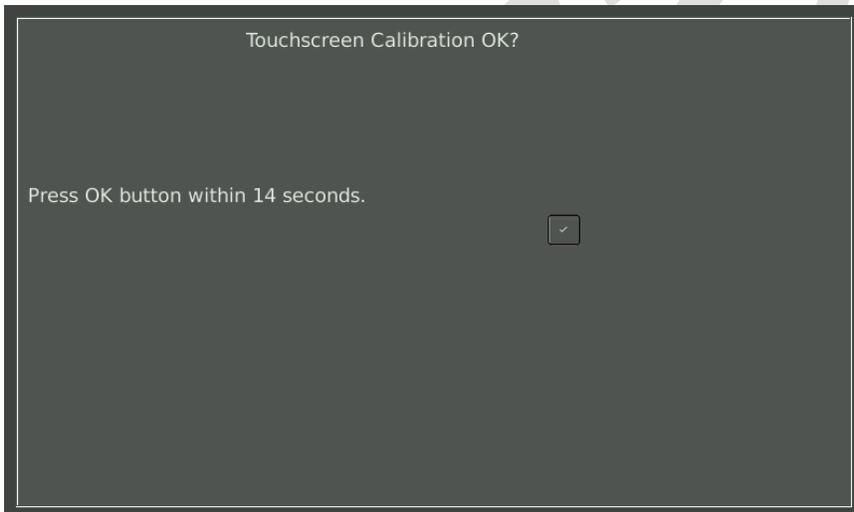
10.5.4.4 Calibration of the Touch Screen

If necessary here the user can calibrate the touch screen.

There 5 crosshairs, appearing in sequence, which need to be touched one after the other.



When completed press the "OK" button.



Afterwards the application is restarted.

10.6 Custom Settings



10.6.1 Lift Size

Here the amount of sheets per lift can be adjusted. It is recommended to reduce the lift size with thicker media.

10.6.2 Machine Speed

Here the machine speed can be adjusted. It is recommended to reduce the machine speed with difficult media.

10.6.3 Accumulator Fan Speed

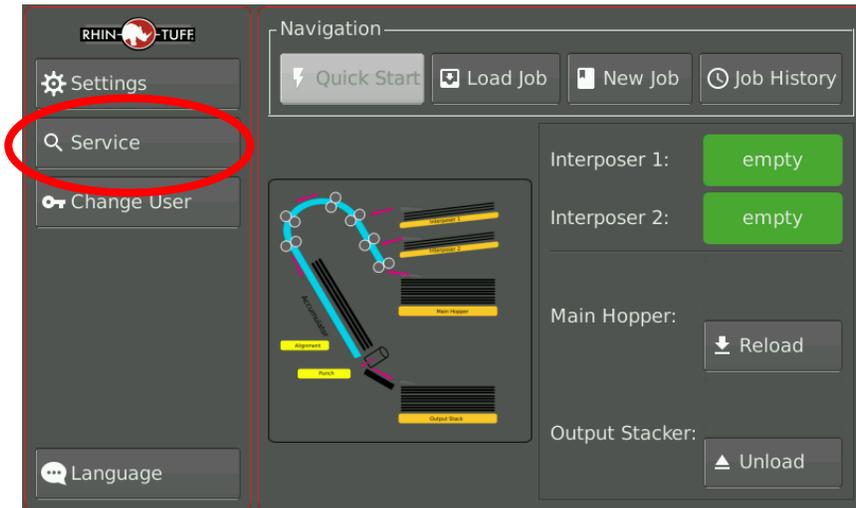
Here the accumulator fan speed can be adjusted. It is recommended to adjust the fan speed when having trouble with jams in the accumulator.

10.6.4 Tapping

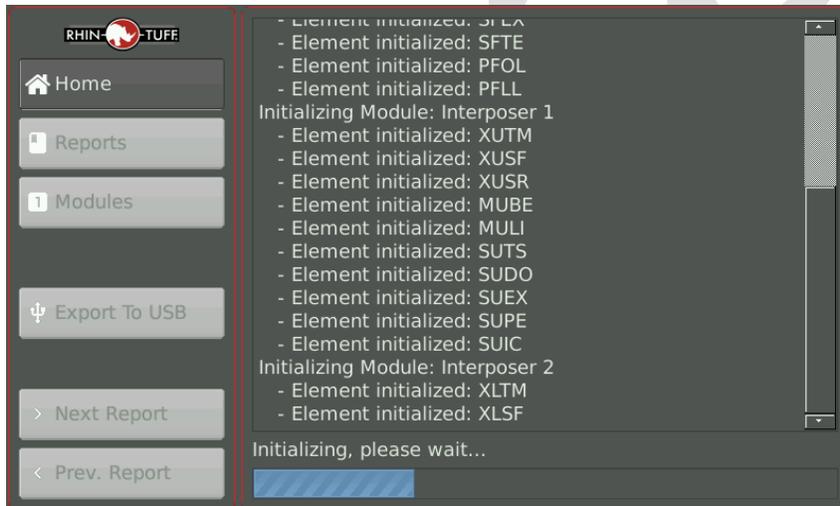
Here the amount of taps can be selected.

10.7 Diagnostics

The GUI of the TAP EX includes a diagnostics screen which helps with the troubleshooting of the machine. Within this screens the sensors and motors of each module can be tested individually and reports can be viewed. Also error reports can be exported to a USB drive. To use the diagnostic features you must be logged in in as service.



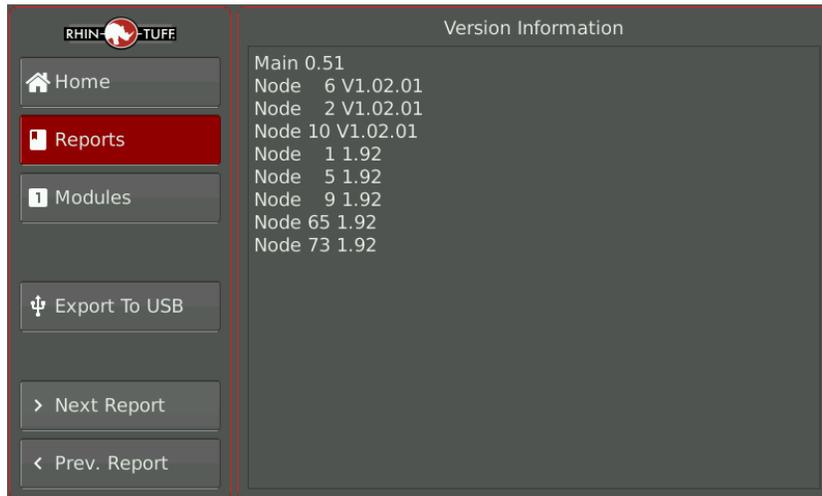
Initializing of modules and sensor will run before you can start.



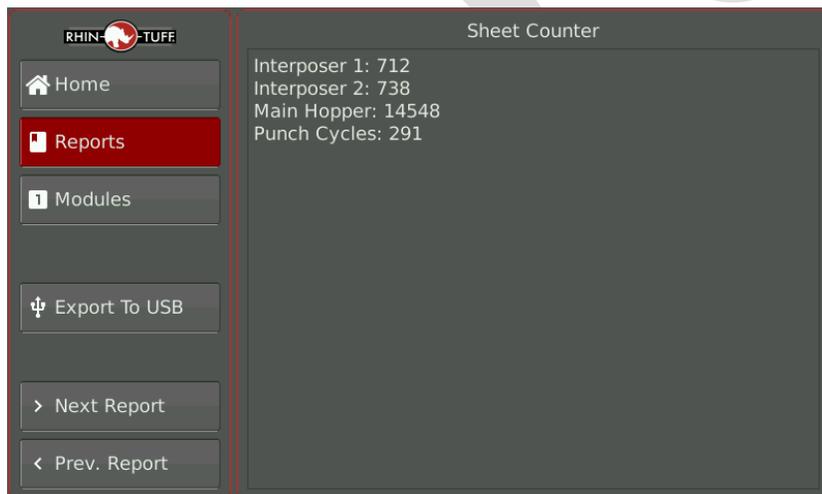
10.7.1 Reports

With the buttons 'Next Report' and 'Previous Report' you can navigate through the reports.

10.7.1.1 Version Information



10.7.1.2 Sheet Counter



10.7.2 Modules

With the buttons 'Next Module' and 'Previous Module' you can navigate through the modules.

10.7.2.1 Module Main Feeder

Module: Main Feeder

Tornado XFTM	Sideblower Front XFSF	Sideblower Rear XFSR	Motor Tornado Belt MFBE	Motor Lift MFLI
On	Top Of Stack SFTS	Off	Tornado DI_CNT_0	
On	Lift Home SFDO	Off	Sideblower Front DI_CNT_1	
Off	Paper Exit Sensor SFEX	On	Sideblower Rear DI_CNT_2	
On	Tray Empty Sensor SFTE			
Off	Lift Protection Switch	On	Lift Enc A EFLP	
Off	Lift Overload PFOL	Off	Lift Enc B EFLP	
Off	Lift Protection Switch Lower Limit PFL			

10.7.2.2 Module Interposer 1

Module: Interposer 1

Tornado XUTM	Sideblower Front XUSF	Sideblower Rear XUSR	Motor Tornado Belt MUBE	Motor Lift MULI
On	Top Of Stack SUTS	Off	Tornado DI_CNT_0	
On	Lift PLate Home SUDO	On	Sideblower Front DI_CNT_1	
Off	Paper Exit Sensor SUJEX	Off	Sideblower Rear DI_CNT_2	
Off	Paper End Sensor SUPE			
On	Connected Sensor SUIC			

10.7.2.3 Module Interposer 2

Module: Interposer 2

Tornado XLTM	Sideblower Front XLSF	Sideblower Rear XISR	Motor Tornado Belt MLBE	Motor Lift MLLI
On	Top Of Stack SLTS	On	Tornado DI_CNT_0	
On	Lift PLate Home SLDO	On	Sideblower Front DI_CNT_1	
Off	Paper Exit Sensor SLEX	On	Sideblower Rear DI_CNT_2	
Off	Paper End Sensor SLPE			
On	Connected Sensor SLIC			

10.7.2.4 Module Input Path

Module: Input Path

Motor Input Path MIPT			
On	Multipick Sensor No Sheet	Off	Top Cover Interposer 1 Locked SIUL
Off	Multipick Sensor One Sheet	Off	Top Cover Interposer 2 Locked SILL
Off	Multipick Sensor Multi Sheets	On	Top Cover Feeder Locked SIFL
On	Left Input Path Locked SICL	On	Right Input Path Locked SICR

10.7.2.5 Module Accumulator

Module: Accumulator

Motor Collator MABC	Motor Tapper MABT	Media Width Front MAWF	Media Width Rear MAWR	Blower MAAB
Off	Accu Entry SAEN	Off	Width Adjuster Rear Home SAWR	
Off	Accu Exit SAEX	Off	Width Adjuster Front Home SAWF	
		On	Accu Closed/Locked SACL	

10.7.2.6 Module Punch

Module: Punch

Punch Motor MPPU	Punch Gate MPGT	Punch Controller Relay XXPD
Off	Off	On
Punch Home SPHO	Punch Gate Down SPGD	Die Locked SPDL
Off	On	On
		Punch Controller Relay SXPDL
		On

10.7.2.7 Module Exit Path

Module: Exit Path

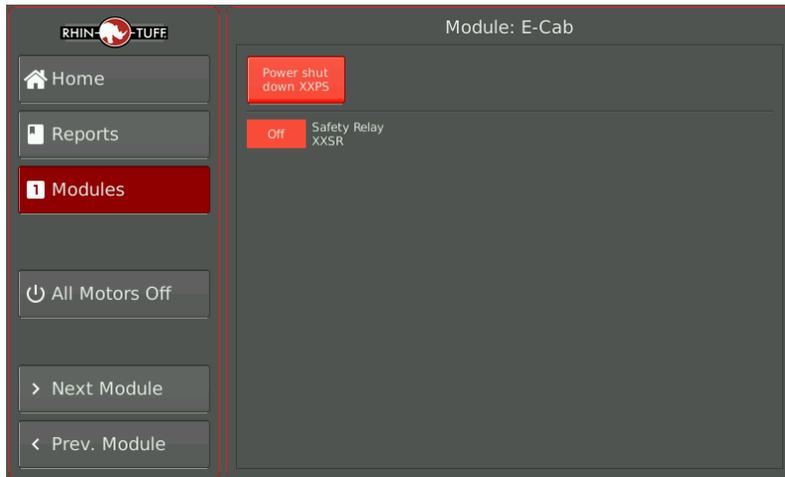
Motor Exit Path MOTR	Motor Exit Offset MOOF
Off	Off
Exit Path Entry SOEN	Exit Left Closed SOLL
Off	Off
Exit Path Exit SOEX	Exit Mid Closed SOML
On	On
Stacker Top Of Stack SOTO	Exit Right Closed SORL
Off	
Exit Offset Home SOOH	

10.7.2.8 Module Stacker

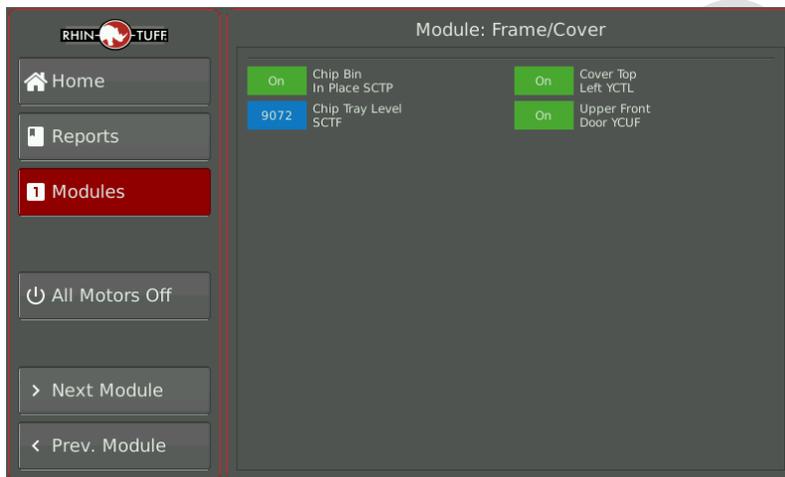
Module: Output Stacker

Motor Lift MSLI
On
Lift Home SSDO
On
Lift Overload PSOL
Off
Lift Protection Low PSDO
Off
Lift Enc A ESLP
On
Lift Enc B ESLP
On

10.7.2.9 Module E-Cabinet



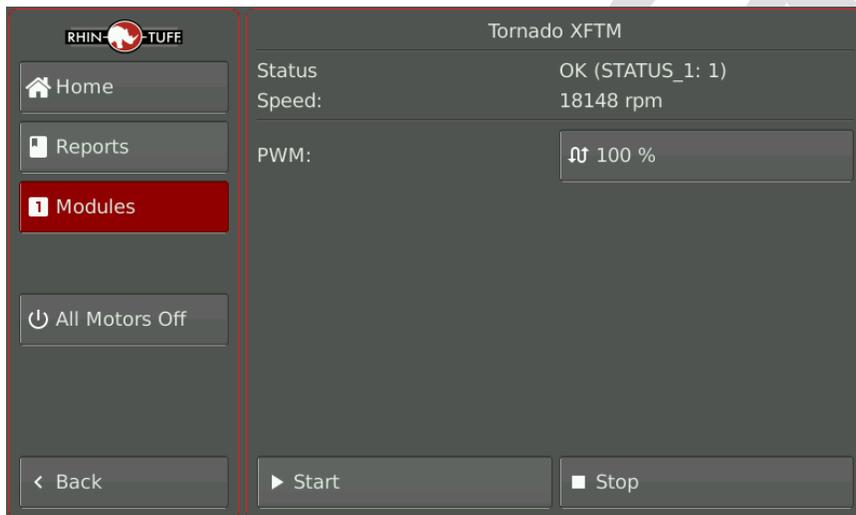
10.7.2.10 Module Frame/Cover



10.7.3 Testing of Tornado and Sideblower Modules

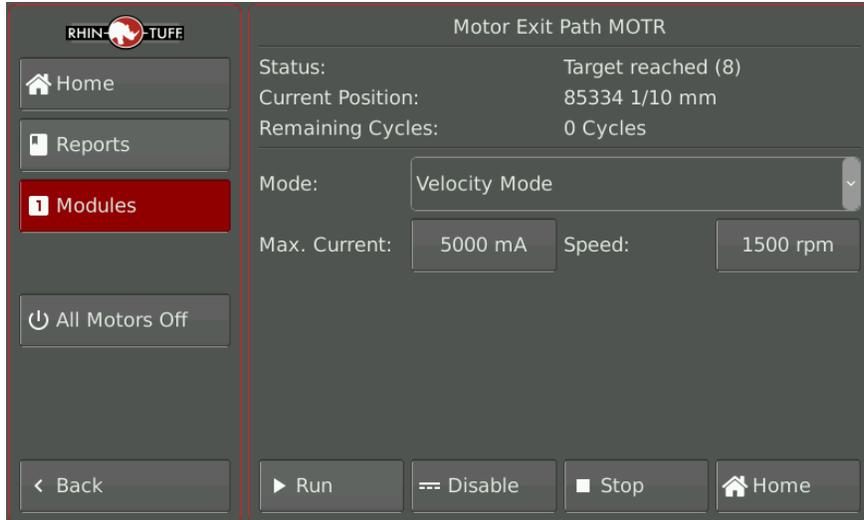
Within the respective Module tap on the Tornado or sideblower you want to test.

Type any number between 10 and 100 and press start. This number is the speed in % at which the Tornado / sideblower runs. To stop, press the stop button.



10.7.4 Testing a Motor

Within the respective module tap on the motor you want to test. Select the mode, type in the speed and press start. To stop, press the stop button.



10.7.5 All Motors Off

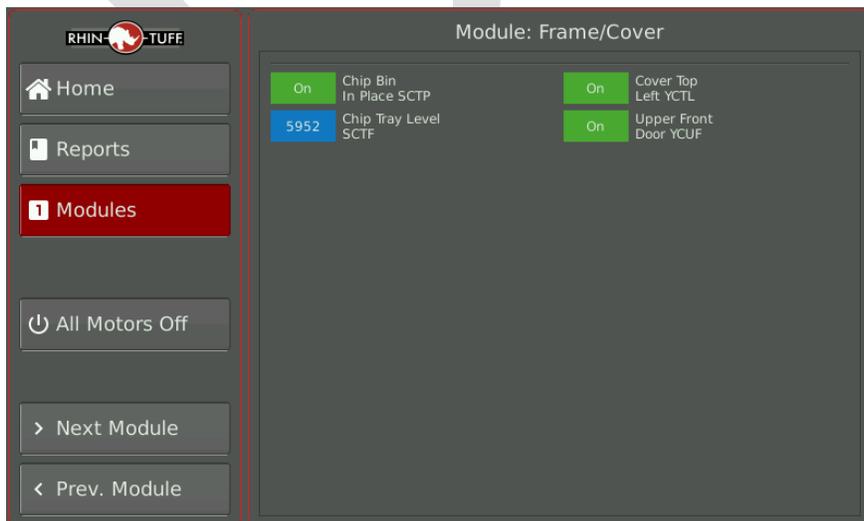
With a tap on the button 'All Motors Off' all motors can be switched off simultaneously.

10.7.6 Testing a Sensor or Safety Switch

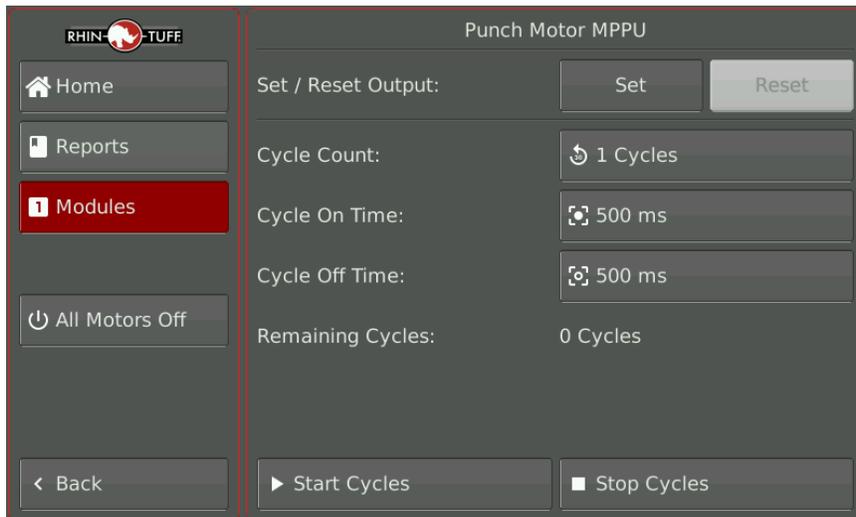
Within the respective Module check the status of the sensor or safety switch.

Green = On

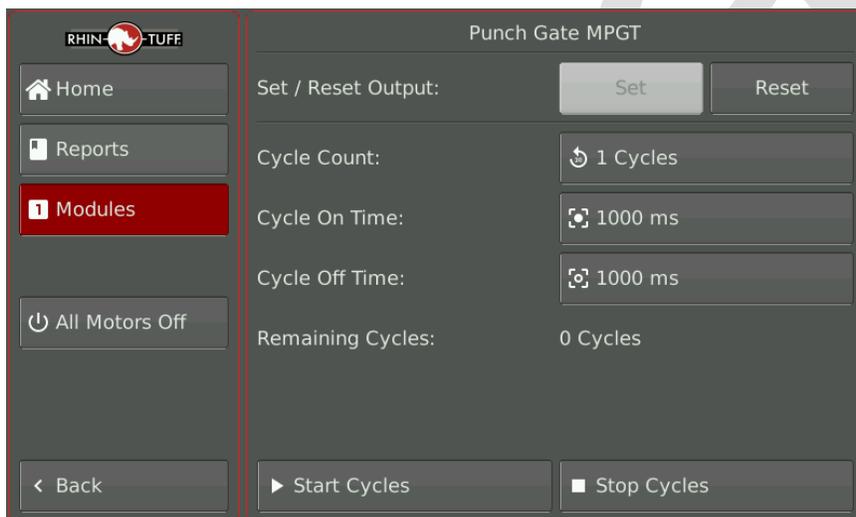
Red = Off



10.7.7 Testing the Punch Motor



10.7.8 Test of the Punch Gate



11 Programming for a Job

11.1 Requirements for Programming a Job

In order to program a job within the GUI, a number of key points need to be known:

- Quantity of books to be produced
- Format of book e.g. A4, letter, custom, etc.
- Design of the book
 - Front cover
 - Content
 - Tabs
 - Covers
 - Custom size material
- Location of tabs and covers within the book
- The type and basis weight of the substrate

ATTENTION! For any product, the covers and content must be the same size (with the exception of pre-determined tabs)

The following modes of operation are available for use by the operator:

- Set-up of material
- Creation of a job
- Dry running (job verification) without punching the product
- Single job running with a punch cycle
- Automatic job running to completion or empty stack with sound signal
- Collate and stacking only, without punching
- Stacking with and without an offset
- Mixed media mode
- Pause mode for re-filling and or product checking during the run
- Cycle stop to interrupt the process and the next possible stop in the process
- Maintenance and die conditions/cycle status
- Auto stop and alarm mode on detection for example mis-feed, empty stack, full stack, machine error, die set issues

11.2 Programming a Job

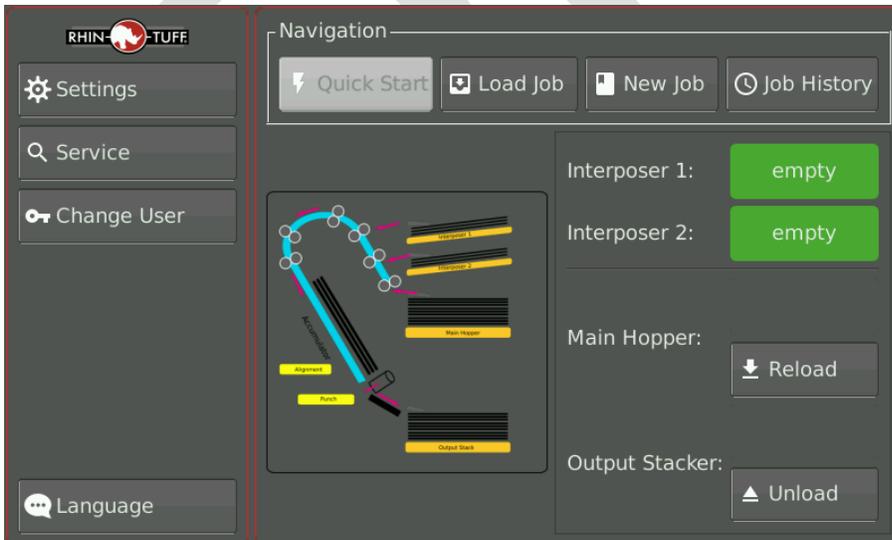
Once the initial installation and commissioning has been carried out in accordance with section 10, the machine is now ready for operation.

As an example the following job is to be produced:



ATTENTION! Machine is in the ready state and the home screen displayed

11.2.1 'New Job' Screen

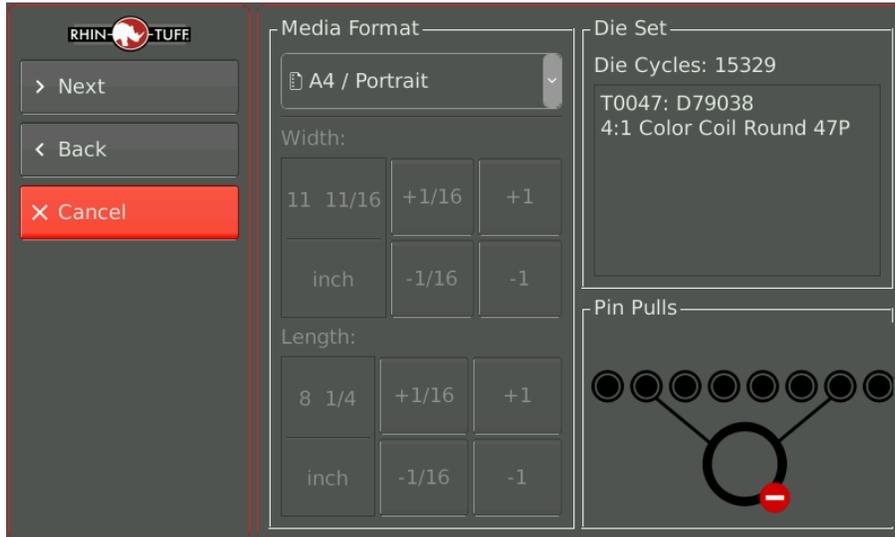


From the home screen, a job can be programmed, firstly by selecting the 'New Job' button.

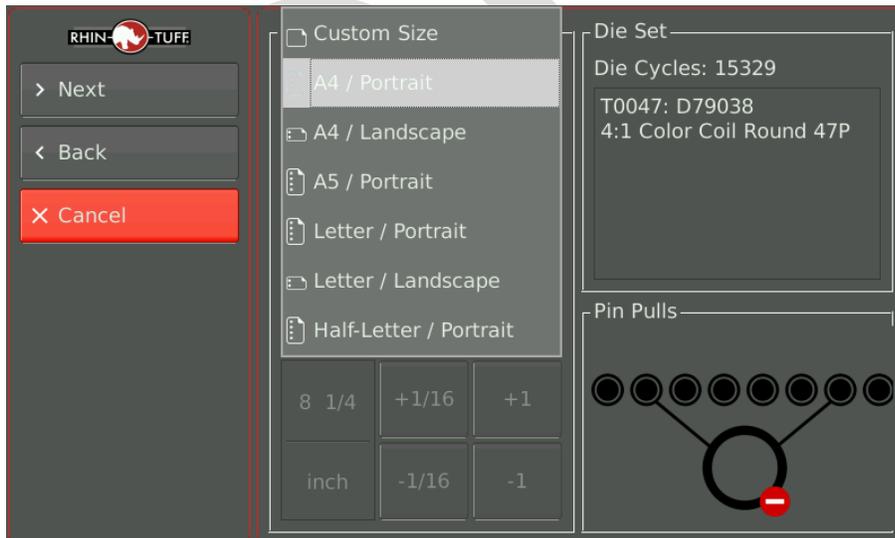
The user will be guided through several screens where the characteristics of the book can be selected.

11.2.2 Step 1 – Format Selection

On this screen, the media format is preselected as a result of the settings of the machine. In this case, as the machine is set to metric units, the media format will automatically be A4.



Available selection of alternative sizes and orientation of substrates are shown in the dropdown menu.



To progress to the next screen the 'Next' button needs to be pressed.

11.2.3 Step 2 – Book Structure

On this screen different media of the book can be selected and set.

ATTENTION! It can be seen in the loaded screen that the ‘Next’ button is grey and therefore the machine will not progress further until the required entries are made.

The screenshot shows the RHIN-TUFF software interface for configuring book structure. It features four main sections: Front Cover, Back Cover, Body / Pages, and Index Tabs. Each section has a 'Yes' button (grey) and a 'No' button (red). The 'No' buttons are currently selected. Below each 'No' button is a dropdown menu showing 'light' and a checkbox for 'Precollated /w Body'. The 'Next' button is grey, 'Back' is dark grey, and 'Cancel' is red. A 'Custom Size' button is at the bottom left.

By pressing the respective ‘On’ buttons, in this case for front covers, content, rear covers, following fields become active:

‘Substrate Type’ field, here one can select the tape of substrate

‘Substrate Weight’ field, here one can select the basis weight of the substrate

The screenshot shows the RHIN-TUFF software interface for configuring book structure. The 'Yes' button for the Front Cover is now green, and the dropdown menu is open, showing options: Uncoated Paper, Uncoated Offset, Covers Paper, Coated Paper, Covers Paper, Covers Plastic, and Covers Vinyl. The 'No' button is red. The 'Next' button is grey, 'Back' is dark grey, and 'Cancel' is red. A 'Custom Size' button is at the bottom left.

The screenshot shows the RHIN-TUFF software interface with the following selections:

- Front Cover:** Yes (green), Uncoated Paper, light
- Back Cover:** No (red), Uncoated Paper, light
- Body / Pages:** Yes (green), Uncoated Paper, light
- Index Tabs:** No (red), Uncoated Paper, light

Available selection of substrate types and weights:

For the selection of the respective substrate weight category, the following rule shall apply: Light, Medium, and Heavy.

- **LIGHT:** Materials with a basis weight of up to 80gsm
- **MEDIUM:** Materials with a basis weight from 81gsm up to 150gsm
- **HEAVY:** Materials with a basis weight from 151gsm up to 312gsm

The screenshot shows the RHIN-TUFF software interface with the following selections:

- Front Cover:** Yes (green), Uncoated Paper, light
- Back Cover:** Yes (green), Covers Paper, medium
- Body / Pages:** Yes (green), Uncoated Paper, light
- Index Tabs:** No (red), Uncoated Paper, light

The respective front cover, content and back cover, material and basis weights have been selected.

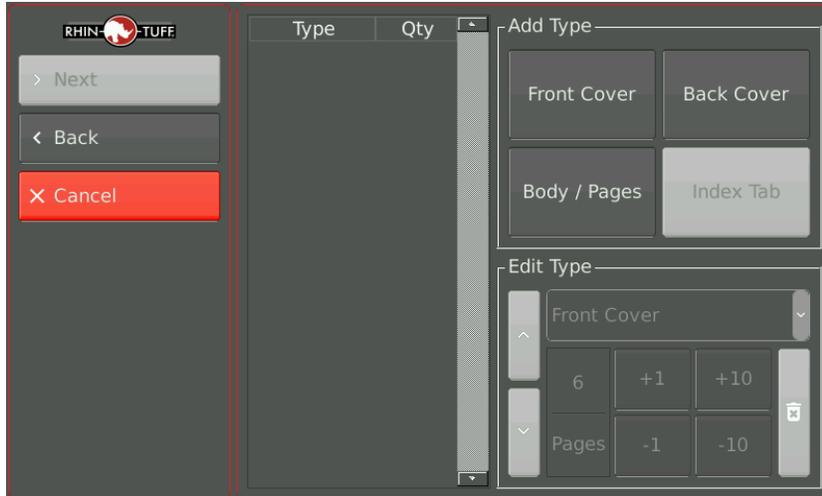
To progress to the next screen the 'Next' button needs to be pressed.

ATTENTION! Once a single entry has been made into one of the required fields, the next button will permit advancement to the next stage; however the operator needs to check that all sections are correctly chosen.

11.2.4 Step 3 - Building the Book

On this screen the structure of the book can be selected.

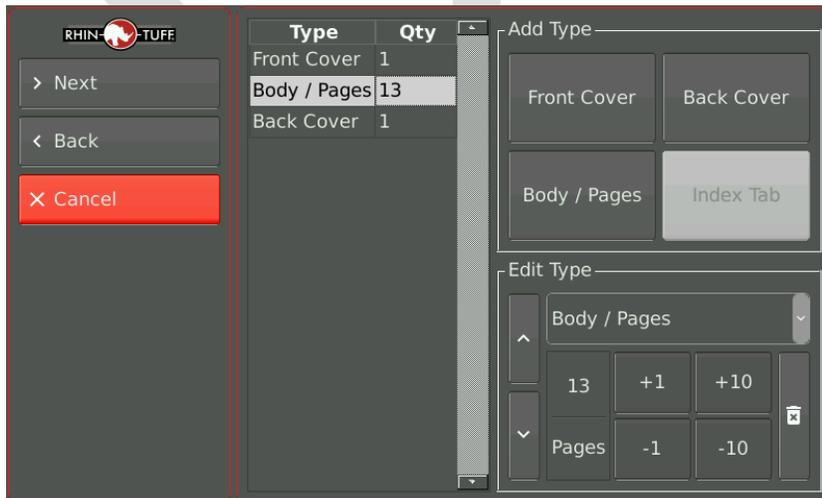
The screen below is shown:



By pressing the required elements of the book, in this case front cover, back cover and body / pages, the form of the book is established.

ATTENTION! The order of the book as represented by line numbers 1, 2, and 3 represents the final form of the book that will come out of the output stacker. Only the types that are previously selected are available in this screen, for example the 'Index Tab' button is grey as this is not required in this job.

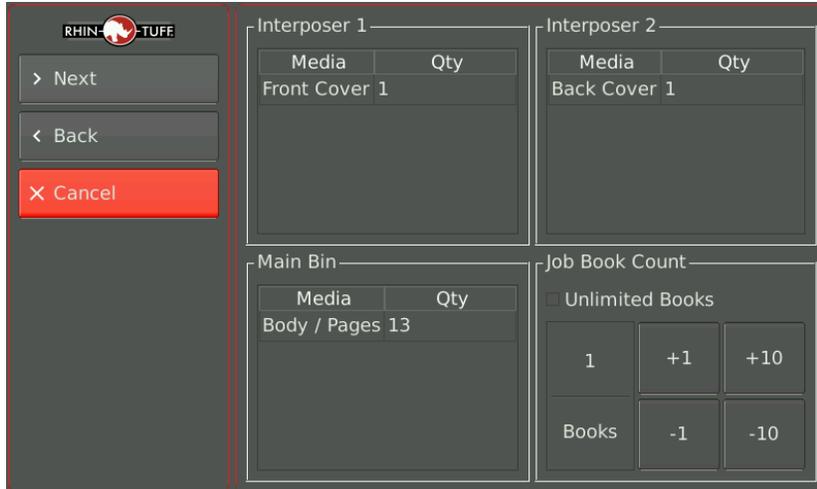
ATTENTION! In order to change the number of pages in this case to 13, it is necessary to press the area as shown by the circle and highlighted area and then by using a combination of the +1, -1 or +10 -10 keys create the required number as in this case 13



To progress to the next screen, the 'Next' button needs to be pressed.

11.2.5 Step 4 - Loading the Machine

ATTENTION! Included here are only the required programming steps. For detailed information in loading material into the machine refer to chapter 12.



The principle function of the screen shown above is to show where the covers and body are to be loaded in the machine, so as to ensure the correctly constructed book is delivered to the output stacker in the correct order.

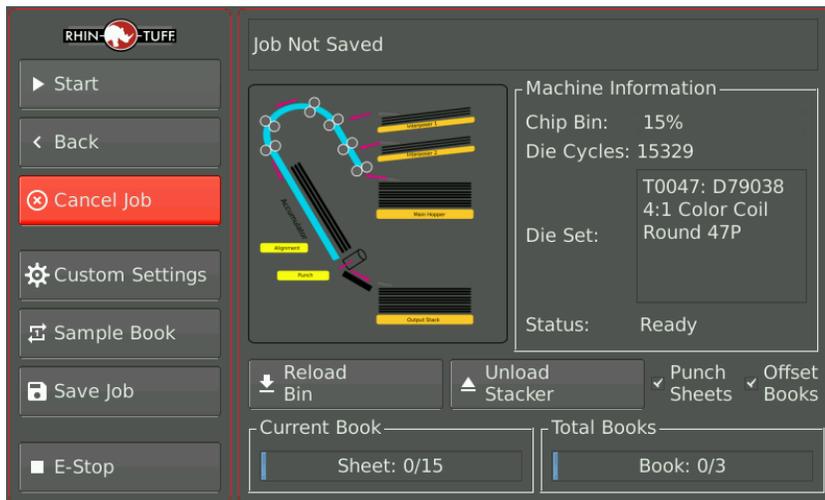
For example, here the front cover must be loaded into the interposer number 1.

Here you can also select the amount of books you want to run. The adjustment of the required number of books is done by using a combination of the +1, -1, +10, -10 buttons.

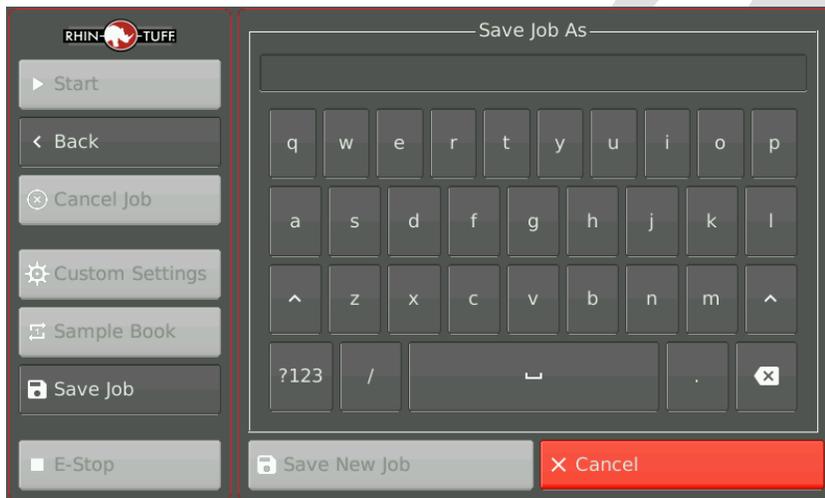
Optional you can select the function of running an unlimited number of books.

11.2.6 Step 5 – Saving the Job

Tap on 'Save Job'



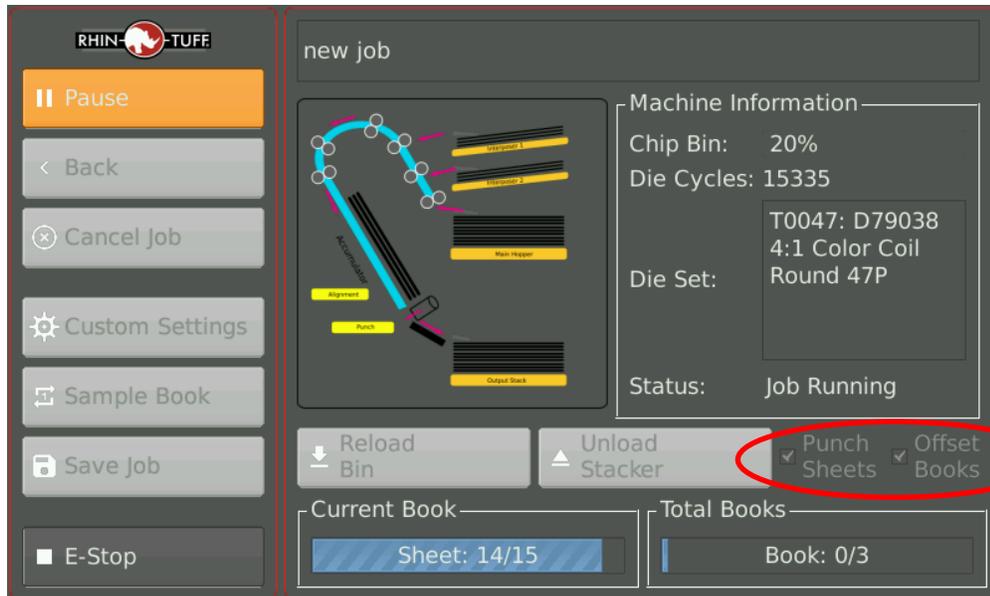
Type in the name of the new job and press 'Save New Job'.



On a yearly basis the saved jobs should be cleaned and redundant jobs deleted

11.3 Test Run of a Job (Sample Book)

Within this screen you have several options (shown below in the area identified by the circle) to choose from.



Here you have the option to select different functions:

Select or de-select the punching function. When checked as above the product will be punched. This function is useful when the job needs to be pre-collated and then fed a second time (and punched) through the machine with the additional required elements.

Select or de-select the 'Offset Books' functionality. As above the stack will be offset. This function serves as a method for the easier separation of the individual books.

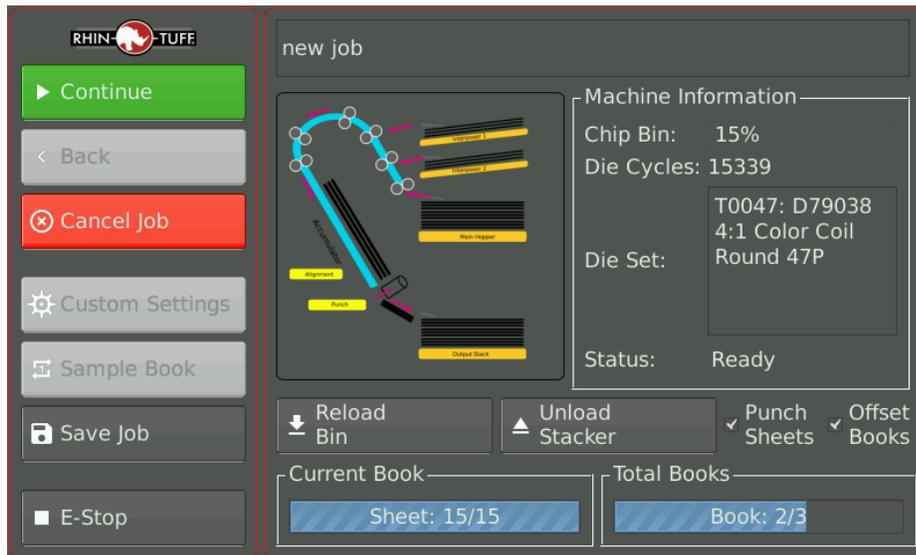
Test button to run a single book (with or without punching, depending on the requirements)

When the start button is pressed the machine will automatically produce the number of jobs as desired, in this case 3 that will be punched and offset stacked in the stacker.

At this time the job can be saved as required. Should one not save the job, an additional reminder question will be shown after pressing either the 'Start' or 'Test' button.

ATTENTION! It must be noted that in the event a job is not saved and either the power is switched off or another job loaded or programmed the current unsaved job will be lost and in the event that one needs to repeat the job it will require to be completely re-programmed.

11.4 Interruption of a Job



11.4.1 E-Stop

ATTENTION! In the event that there is the need to stop the machine when in operation, there is an 'E Stop' function on the GUI. Activating this function will stop the machine immediately with the consequence that there may be paper trapped within the paper path and/or other areas of the machine. Prior to restarting the machine, careful attention needs to be exercised. Thoroughly check all areas of the machine.

11.4.2 Activating the Safety Switches

ATTENTION! It must be noted that when either the operator door or the access door to the upper paper path are opened the machine will also stop. This removes all power to any driven element and it will re-start once the error message is acknowledged. A thorough check of the paper paths needs to be done and clearing of any paper is required prior to restarting the machine.

11.4.3 Activating the Pause Button

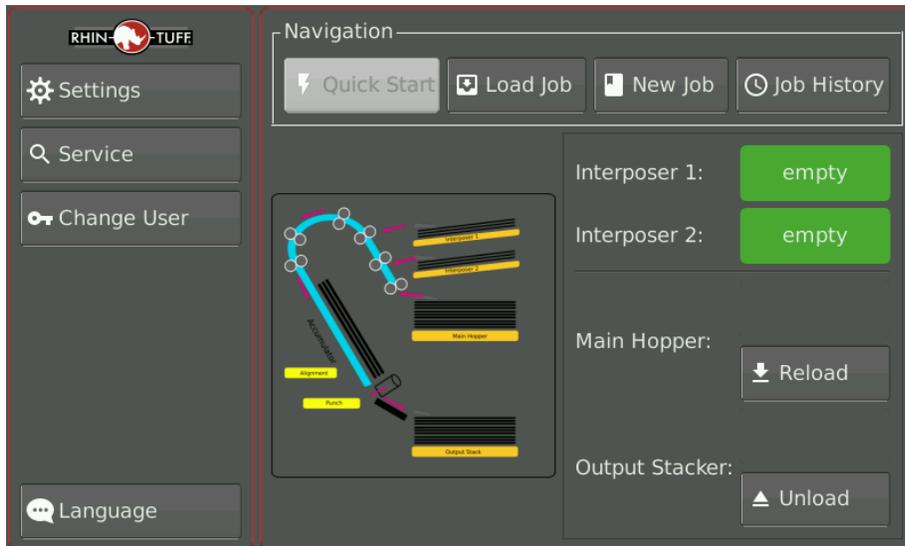
Should there be a need to stop the process at some time during running the job the 'Pause' button function can be used.

By pressing the 'Pause' button, the machine will stop automatically at the end of the current book.

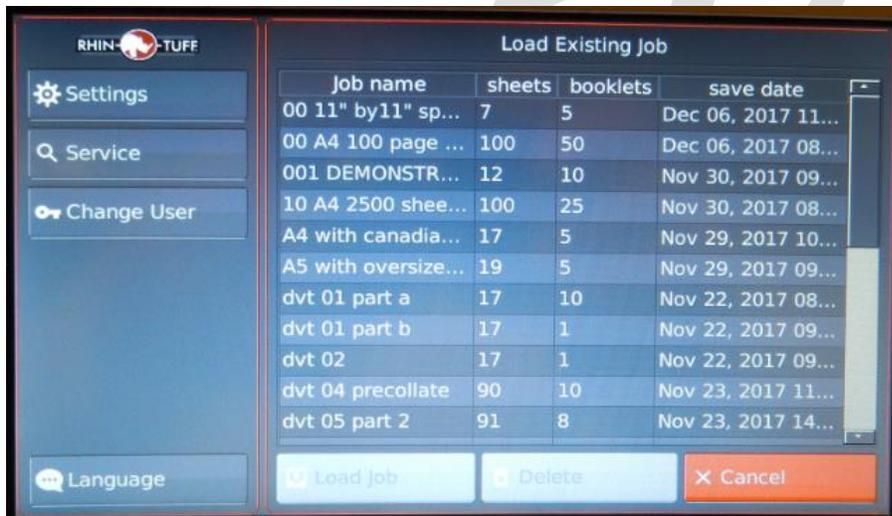
The job can be resumed at any time by pressing the 'Continue' button.

11.5 Loading of a Job

On the home screen press 'Load Job'



The list of all saved jobs will be shown. Select job and press 'Load Job'.



12 Loading Material into the Machine

The following description shows the general steps required to load either the bin of the high capacity feeder or the interposers.

ATTENTION! In the operation of loading the machine, the lift table can move electronically, however this can only be started by the activation of a button on the GUI touch panel.

Caution needs to be exercised when the lift table is in motion.
The machine is not designed to be loaded when in operation.

12.1 High Capacity Feeder (Main Hopper)

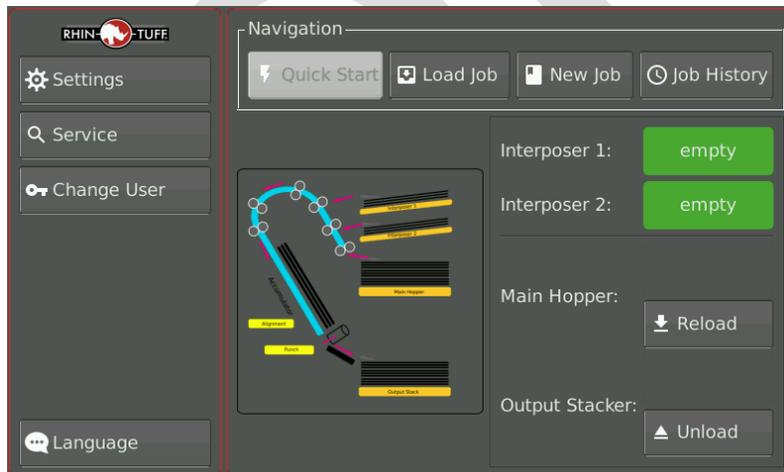
12.1.1 Stack Height

The high capacity feeder has an effective stack height of 9.85” (250mm) supported by a software controlled automated lift table.

ATTENTION! Make sure not to load any media format or type which is not included in the chapter ‘Technical Data’

12.1.2 Loading of the High Capacity Feeder

From the home screen press the ‘Reload’ button. The lift table will then automatically stop on reaching the lowest position. Should the need arise to stop the lift table, the (now) blue button can be pressed and all movement will cease.



ATTENTION! It is not necessary that the lift table is lowered to the lower position; it can be stopped at any height. For convenience purposes and ease of loading, it is normally lowered to the lowest position.

12.1.3 Step 1 - Positioning of the Lift Table

The main hopper is shown here with the lift table in the lowest (loading) position and the end stop in the normal installed position.

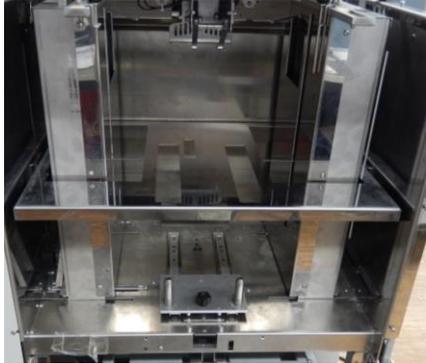
The end stop can be gently pulled towards one self until it stops on the end of its travel.



12.1.4 Step 2 - Positioning of End Stop and Side Adjuster

To make loading product easier and faster, the end stop can be positioned as shown in the photo below.

This is simply achieved by pulling the end stop in an upwards direction.



To make the side adjusters, the lever as shown needs to be pulled in a left direction, and at the same time, both side adjuster arms will move equally in an outwards direction.

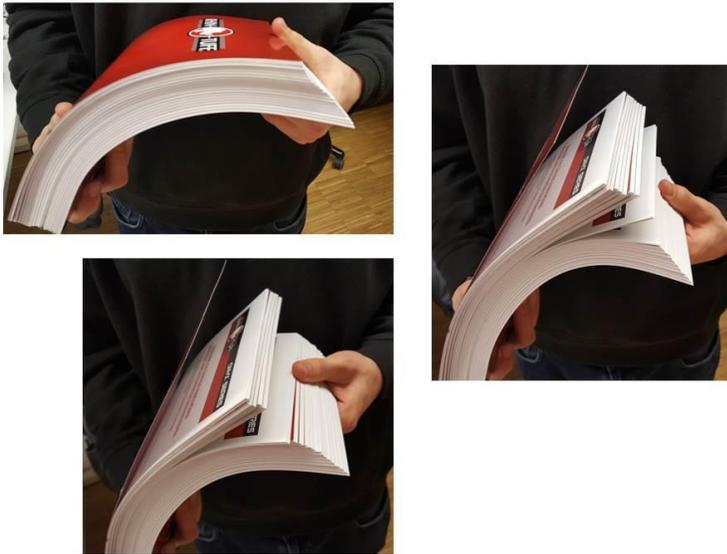


12.1.5 Step 3 - Loading of Media

ATTENTION! When loading media, ensure that the corners and edges of the media are not damaged.

To make loading easier, the side adjusters have to be opened to the widest position. Loading the product is best achieved with stack heights of approximately 50 mm to 70 mm (2" – 2 ¾"). Before loading the product, it is necessary to fan the product. This can be achieved by holding the product securely in one hand and gently flicking through the free end. This will ensure that the sheets are free and ensuring trouble free feeding.

Prepare the product for loading: Fanning as shown below, prior to loading into the machine.



The product is loaded into the machine with the orientation as shown.



12.1.6 Step 4 - Aligning and Setting the Side and End Adjusters

In general, the complete stack is loaded into the machine by gently moving the side adjusters towards each other and using a rocking motion to align the stack, proving to be sufficient to enable trouble-free feeding.

It must be noted that there needs to be approximately a 1mm gap on each side of the book.



ATTENTION! The side adjusters are designed so that only the lever needs to be operated in order to move the side adjusters in an outward direction. To move them in an inward motion in order to ‘adjust’ on to a book, you only need to gently move the adjusters as needed. Once adjusted, the side adjuster will hold the set position throughout the entire job run or until the lever is once again operated.



ATTENTION! Be aware that the media is not too tight in the hopper and there must be a gap between the media side adjusters and the leading edge adjuster. Make sure that there is a space of 1-2 mm (3/64” – 5/64”) between media and the lateral limits. Otherwise the optimal feed performance cannot be guaranteed.

12.2 Interposers

12.2.1 Stack Height

Each interposer has an effective stack height of 15 mm (0.59”).

ATTENTION! Make sure not to load any media format or type which is not included in the chapter ‘Technical Data’. There are no controls or actions required from the GUI for the process of loading or unloading of the interposer units.

12.2.2 Step 1 - Preparing the Interposers

ATTENTION! Make sure not to insert any media format or type which is not included in the chapter ‘Technical Data’.

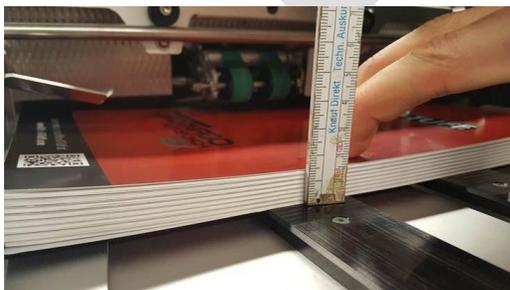
The side adjuster lever (circled) can be moved toward the center of the machine and then the side adjusters gently moved in an outward direction to their widest position.



12.2.3 Step 2 - Loading the Interposers

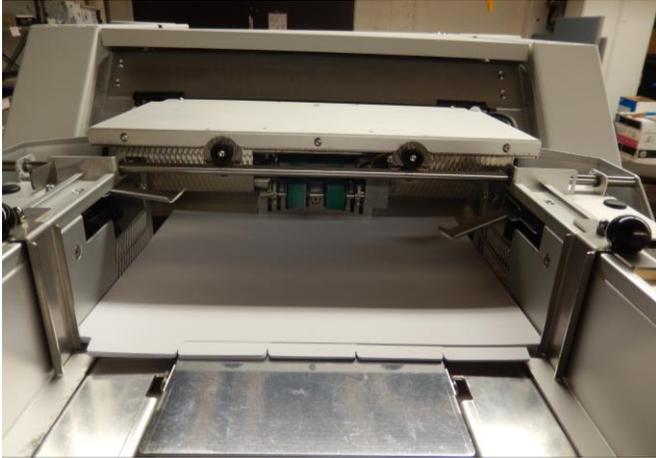
ATTENTION! When loading media, ensure the corners and edges of the media are not damaged. To make loading easier, the side adjusters have to be opened to the widest position.

Fanning of the product as described previously in the high capacity feeder loading section is recommended to ensure optimum performance.



The interposers are designed to feed a maximum stack height of 15 mm (0.59”) irrespective of the material.

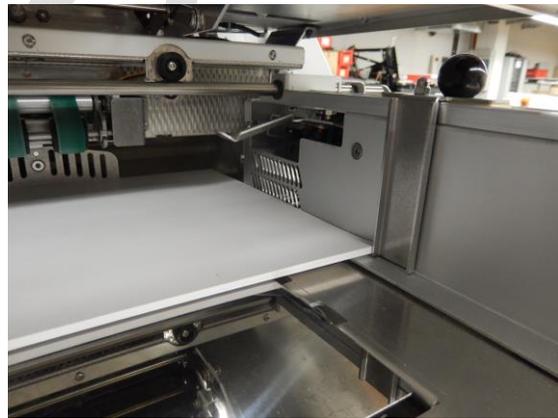
12.2.4 Step 3 - Adjusting the Interposers



Gently moving the side adjusters towards each other and using a rocking motion to align the stack will be sufficient to enable trouble-free feeding.

It must be noted that there needs to be about a 1mm (3/64") gap on each side of the book.

Slide the rear adjuster towards the trailing edge of the stack, leaving a gap of about 1mm (3/64")



13 Running a Job

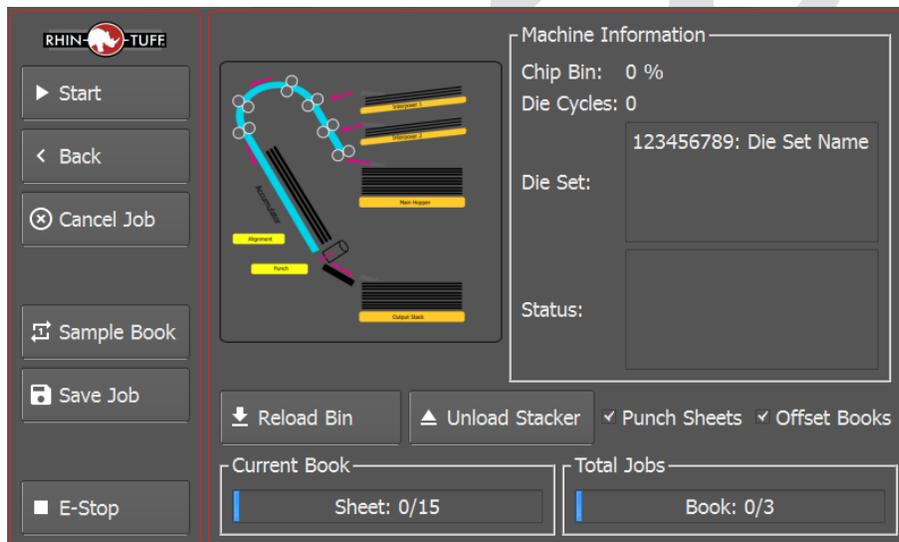
13.1 Running in Fully Automatic Mode

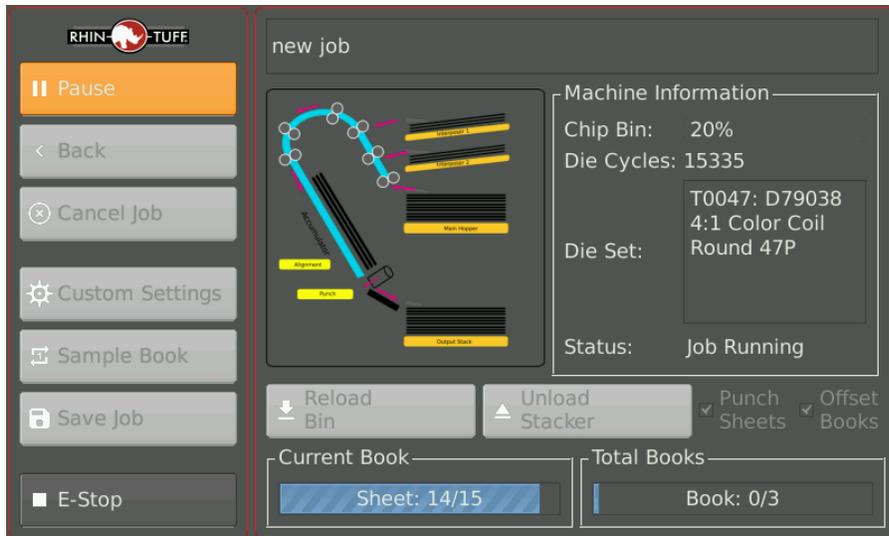
ATTENTION! In the event that there is the need to stop the machine when in operation, there is an ‘E Stop’ function on the GUI touch. Activating this function will stop the machine immediately with the consequence that there may be paper trapped within the paper path and/or other areas of the machine. Prior to re-starting the machine, careful attention needs to be exercised and thorough checking of all areas of the machine needs to be performed. It must be noted that when either the operator door or the access hatch to the upper paper path are opened, the machine will also stop. This removes all power to any driven element and it will re-start once the error message is acknowledged. A thorough check of the paper paths needs to be done and clearing of any paper is required prior to restarting the machine.

NOTE: The process described herein is of a general nature and is not intended to reflect all operating cases.

From section 11.3 the job can now be run in fully automatic mode.

By pressing the ‘Start’ button the machine will process the number of books as entered in the ‘# of Books’ field, in this case 3.

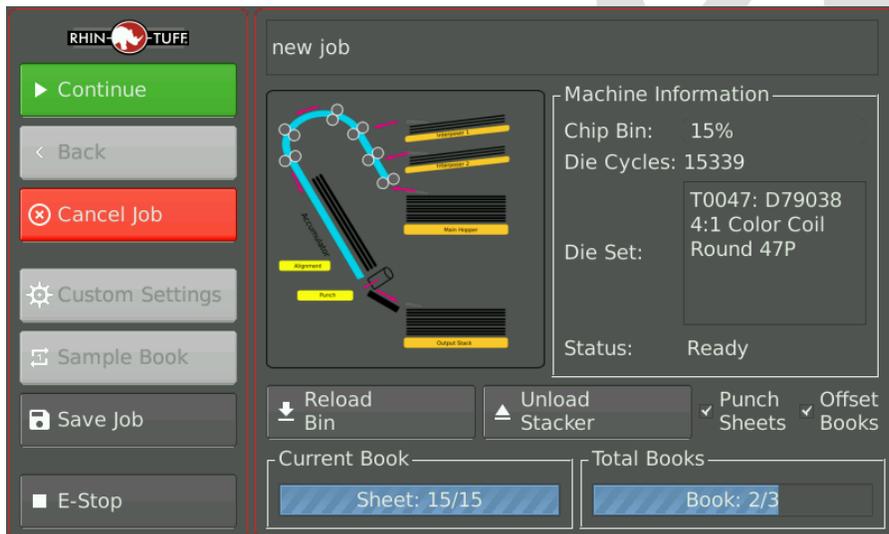




Should there be a need to stop the process at some time during the running the job, the 'Pause' button function can be used.

By pressing the 'Pause' button, the machine will stop automatically at the end of the current book.

The screen as shown below is as a result of the 'Pause' button being activated.



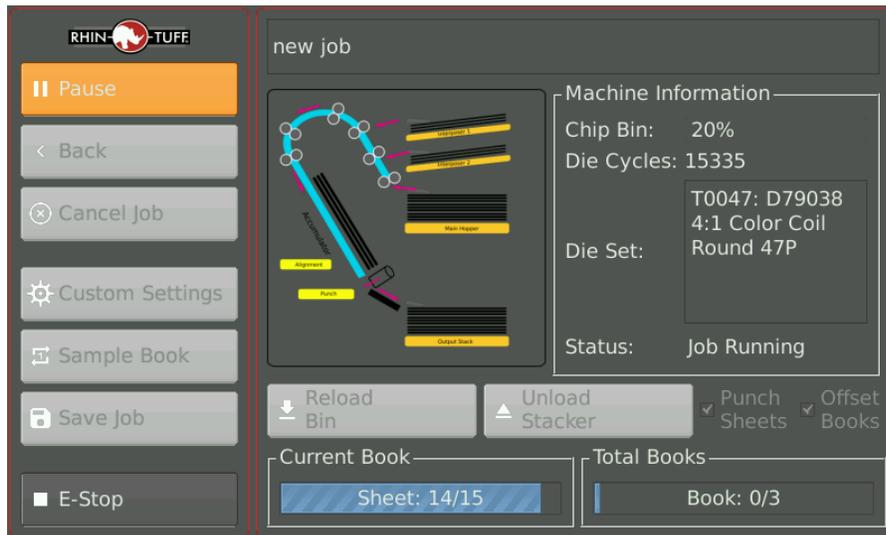
To restart the machine, the 'Continue' button needs to be pressed and the machine will continue operation until the job is completed or the paper feeding hoppers require to be refilled.

ATTENTION! In the event that any of the paper feeding elements are empty prior to completing the job, the machine will automatically stop and an error message detailing the action required will be displayed.

When the machine is stationary, the respective feeding element can be refilled.

NOTE: The machine will not restart until after the 'Done' button is pressed.

14 Unloading Media



14.1 Remove Media from the Output Stacker

The output stacker has an effective stack height from 10.04” (255mm)

- The output stacker will collate and stack the punched sections until the individual books are completed
- There is a side-offset functionality from booklet to booklet. The cycle will repeat until the completion of the required number of books is completed independent from the number of lifts.
- Remove the completed book stacks if the operation is completed
- To remove the completed book stacks in operation press the ‘Pause’ icon in order to stop the TAP EX. After removing, then press the ‘Continue’ icon and the process continues.

14.2 Unloading Media from High Capacity Feeder

- Press the ‘Reload bin’ button and the lift plate will move down to the end position
- Open the media side adjusters by pushing the metal bracket on the top of the left media side adjuster and simultaneous push the left and the right media side adjusters to the maximum
- Move the trailing edge adjuster to the maximum position or remove them completely as described in chapter ‘Loading’.
- Pull and move them to the maximum
- Unload the media off the lift plate
- Otherwise follow the instructions as described in ‘Loading Media’

ATTENTION! When unloading the media, ensure the corners and edges are not damaged

15 Chip Waste Control

A level indicator located on the GUI visualized the filling level of the chip bin. For visual inspection of the filling level, there is a window at the access door of the chip bin. The 'Bin Full' notification triggers an alarm on the GUI.

- Open the chip bin access door to remove the waste container for clearance

ATTENTION! Do not remove the chip bin whilst the machine is in operation.
The machine functionality will stop immediately.

- Insert the waste container
- Close the access door
- Acknowledge the error message at the GUI

ATTENTION! Make sure that chip waste is disposed of in an environmentally-friendly manner



Bin Sensor

16 Changing the Die Set

- Open the operator access door
- Unlock the die set by moving the lever to the unlock position
- Pull the die set out

ATTENTION! The die set is heavy. Hold it securely while changing.

- Insert the new or modified die set
- Move the lever to the lock position. Make sure that it is locked properly.
- Close the operator access door



17 Identification and Recovery from Error Situations

In the event of an error, the TAP EX will go into fault mode with an audible tone alarm and a description of the error/problem on the GUI.

The operator must acknowledge and follow the required sequence of operations and restart the TAP EX directly from the GUI screen to continue the job from the previous complete cycle.

17.1 Error Types

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

17.1.1 Feed Error

Abnormal related to paper feeding or paper transport (e.g. sheet stuck in sensor, multipick, etc.).

17.1.2 System Error

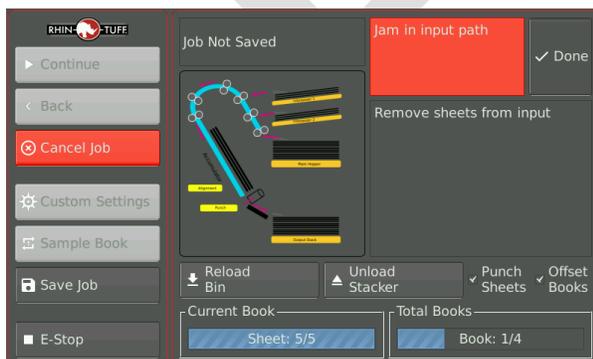
Abnormal related to TAP EX components (e.g. motor or sensor defect, communication to components not working, etc.).

17.1.3 Safety Error

Activating of safety door switches or protections switches described in the chapter 'General Safety Information'. Abnormal in safety-related electrical components/ circuitry detected (e.g. safety switch defect /not correctly activated, safety related wiring broken).

17.2 Error Messages

In case of an error, an error message will be displayed on the GUI. In addition a dot is flashing on the location where the error (jam) is located.



17.3 GUI Error list

Below list shows all errors which can occur and instructions to fix it.

Error message	Recovery Message
Main hopper empty	Add paper
Interposer 1 empty	Add paper
Interposer 2 empty	Add paper
No feed in main hopper	Check main hopper
No feed in interposer 1	Check interposer 1
No feed in interposer 2	Check interposer 2
Output stacker full	Remove sheets
Jam in output stacker	Check output stacker
Interposer opened	Close it
Accumulator is open	Close accumulator
Access 2 is open	Close it
Access 1 is open	Close it
Die set isn't locked	Close lever
Access 5 is open	Close it
Access 6 is open	Close it
Access 4 is open	Close it
Interposer 1 isn't locked	Lock interposer 1
Interposer 2 isn't locked	Lock interposer 2
Main hopper isn't locked	Lock main hopper
Chip bin isn't in place	Insert chip bin
Upper paper path access door isn't closed	Close it
Operator access door isn't closed	Close it
Main hopper overloaded	Remove some sheets
Output stacker overloaded	Remove sheets
Die set missing	Install it
Chip bin full	Empty it
Sheet at main hopper exit	Remove it
Sheet at interposer 1 exit	Remove it
Sheet at interposer 2 exit	Remove it
Sheet in upper paper path	Remove it
Sheet at punch assembly	Remove it
Sheet at access 4	Remove it
Sheet at access 6	Remove it
Sheet stuck in output stacker	Remove sheets from output stacker
Jam at main hopper	Remove sheet
Multipick main hopper	Remove sheets from upper paper path and reload in main hopper
Multipick interposer 1	Remove sheets from upper paper path and reload in interposer 1
Multipick interposer 2	Remove sheets from upper paper path and reload in interposer 2
Punch gate open	
Jam in upper paper path	Remove sheets from upper paper path
Side adjuster jam	Remove sheets from accumulator
Jam before punch assembly	Remove sheets before punch assembly
Punch assembly error	Remove sheets below punch assembly
Punch gate isn't open	Remove sheets at punch assembly
Sheet stuck in output paper path	Remove sheets from output paper path
Sheet stuck at punch assembly	Remove sheets at punch assembly
Punch assembly board power missing	Call service technician
Remove sheets from interposer 1	
Remove sheets from interposer 2	
Remove sheets from main hopper	
Remove sheets from output stacker	
Have all unprocessed sheets been removed?	
Startup failureDefective node:	Call service technician

17.4 Clearing Paper Jams

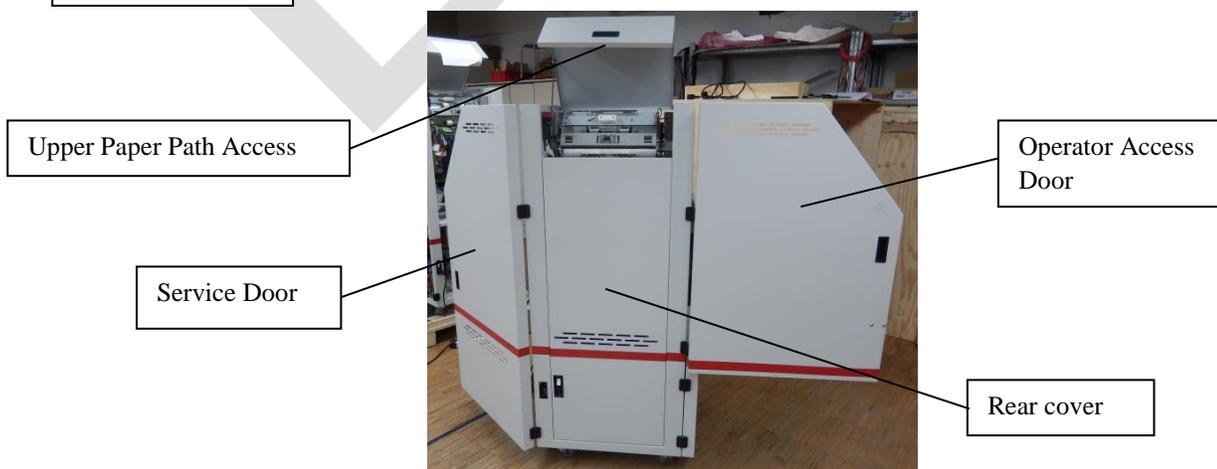
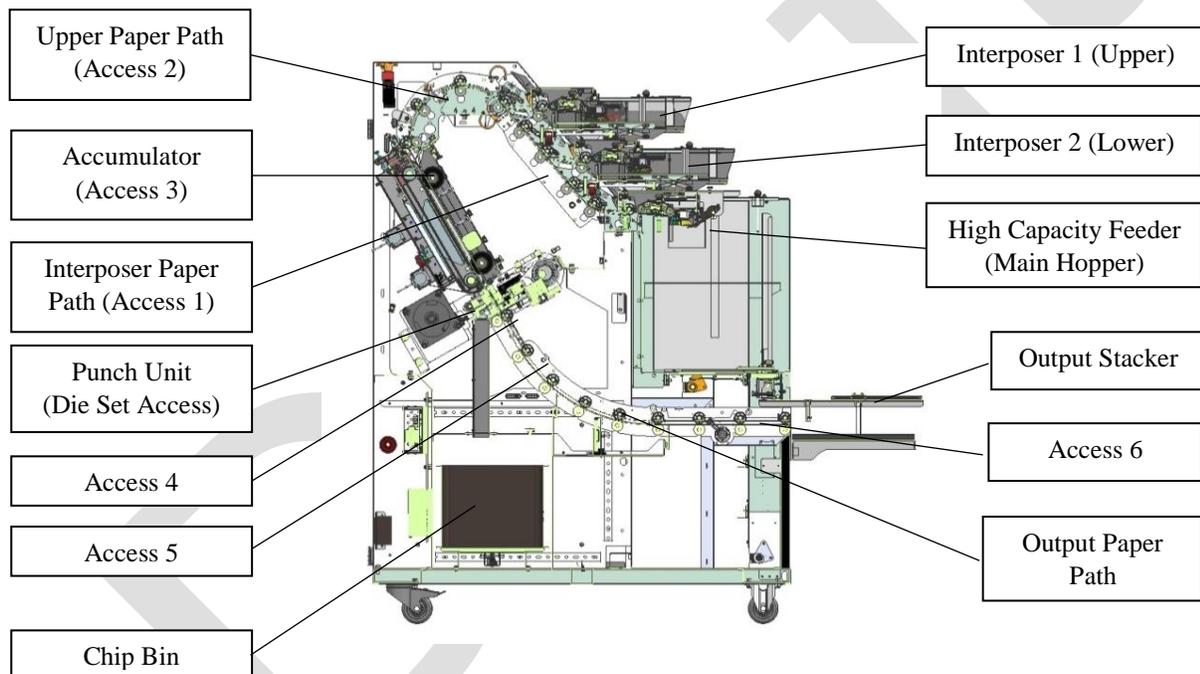
In case of a paper jam, the TAP EX goes into fault mode with an audible tone alarm and a description of the error / problem on the GUI.

The operator must acknowledge and follow the required sequence of operations and restart the TAP EX directly from the GUI screen, to continue the job from the previous complete cycle.

ATTENTION! In the event of a paper jam, all the pages (covers and content) for the book running at the time of a jam must be removed from the machine.

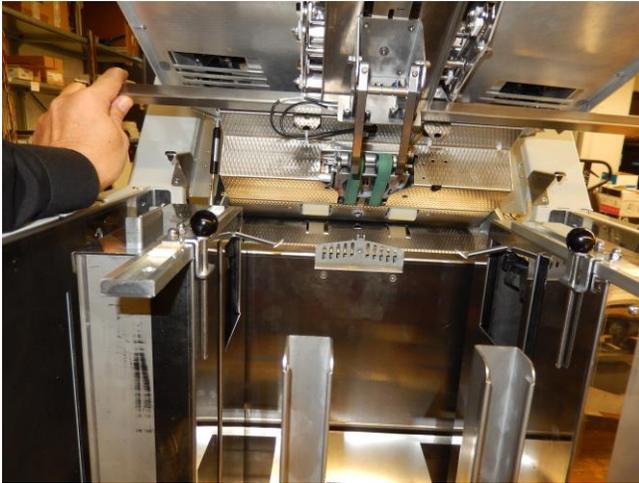
For example:

- Partly completed book from output stacker
- Unloaded pages from either high capacity feeder or interposers
- Pages jammed within the machine's paper transport paths
- Where possible, all the pages can be recycled (when not excessively damaged) at the end of the job



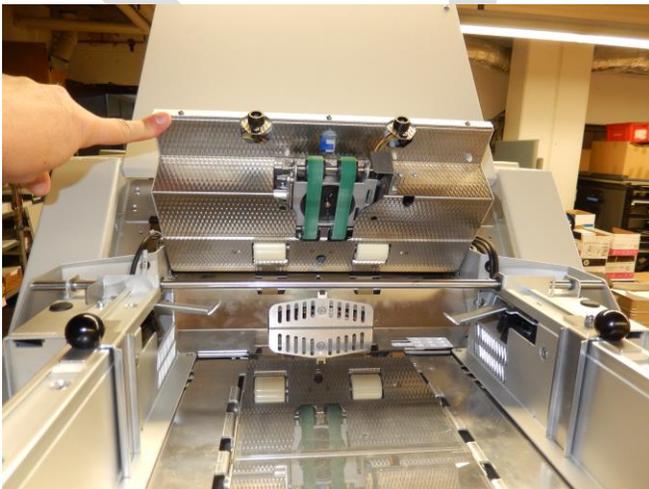
17.4.1 Paper Jam at the High Capacity Feeder Module

- Open the media guide
- Make sure that the media is properly secured
- Clear the paper jam
- Make sure that the feeder area is free from paper residue
- Close the media guide
- Acknowledge the error message at the GUI



17.4.2 Paper Jam at the Interposer Modules

- In accordance to the error code at the GUI, open the upper or lower interposer
- Clear the paper jam
- Make sure that the area is free from paper residue
- Close the interposer
- Acknowledge the error message at the GUI



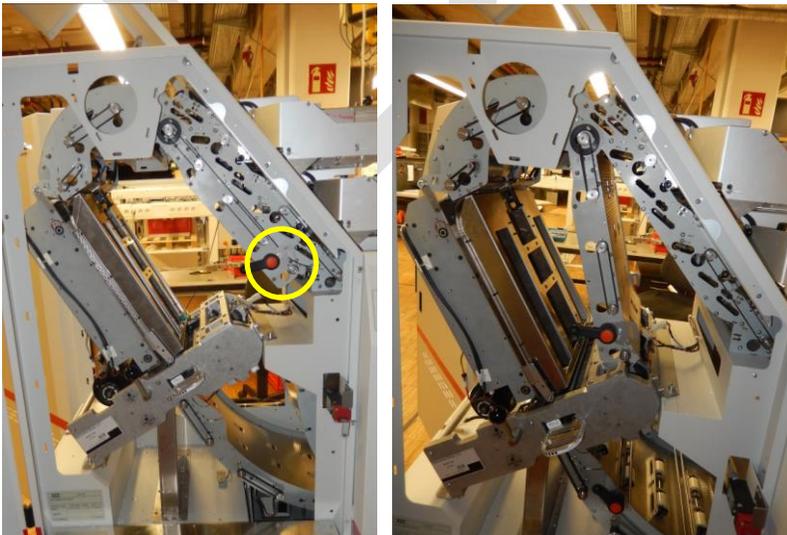
17.4.3 Paper Jam at the Upper Paper Path Module

- Open the upper access door
- Use the locking lever to open the flap of the upper paper path (Access 2)
- Clear the paper jam
- Make sure that the paper path is free from paper residue
- Close the upper paper path and lock it with the lever
- Acknowledge the error message at the GUI



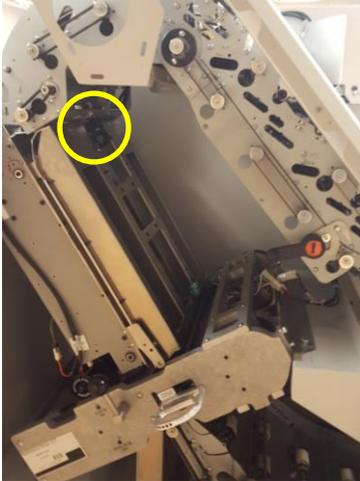
17.4.4 Interposer Paper Path

- Open the operator access door
- Use the locking lever to open the bottom of the paper path (Access 1)
- Clear the paper jam
- Make sure that the paper path is free from paper residue
- Close the paper path and lock it with the lever
- Close the operator access door
- Acknowledge the error message at the GUI



17.4.5 Paper Jam at the Accumulator Module

- Open the operator access door
- Use the locking lever to open the flap of the accumulator (Access 3)
- Clear the paper jam
- Make sure that the accumulator is free from paper residue.
- Close the flap and lock it with the lever
- Close the operator access door
- Acknowledge the error message at the GUI



17.4.6 Paper Jam at the Punch Module

- Open the operator access door
- Use the locking lever to open the flap of the accumulator (Access 3)
- Clear the paper jam
- Make sure that the accumulator and punch is free from paper residue
- If the punch mechanism is jammed, the die set can be removed as described in chapter 16
- Close flap and lock it with the lever
- Close the operator access door
- Acknowledge the error message at the GUI



17.4.7 Paper Jam at the Output Paper Path (Access 5)

- Open the operator access door
- Use the locking lever to open the paper path
- Clear the paper jam
- Make sure that the paper path is free from paper residue
- Close paper path and lock it with the lever
- Close the operator access door
- Acknowledge the error message at the GUI



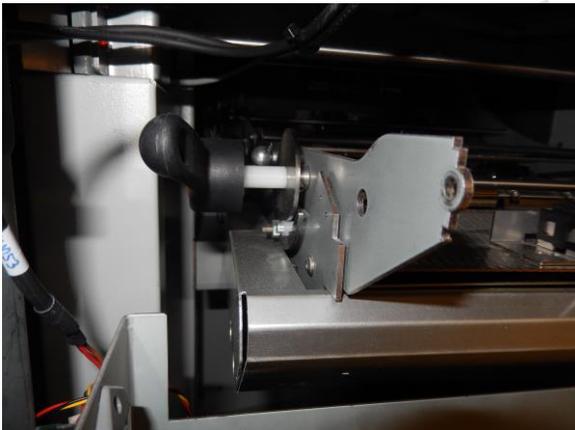
17.4.8 Paper Jam at the Output Paper Path (Access 4)

- Open the operator access door
- Use the locking lever to open the paper path (Access 5)
- Tilt the flap by pulling the half circled shaped handle upwards (Access 4)
- Clear the paper jam
- Make sure that the paper path is free from paper residue
- Close paper path and lock it with the lever (Access 5)
- Close the operator access door
- Acknowledge the error message at the GUI



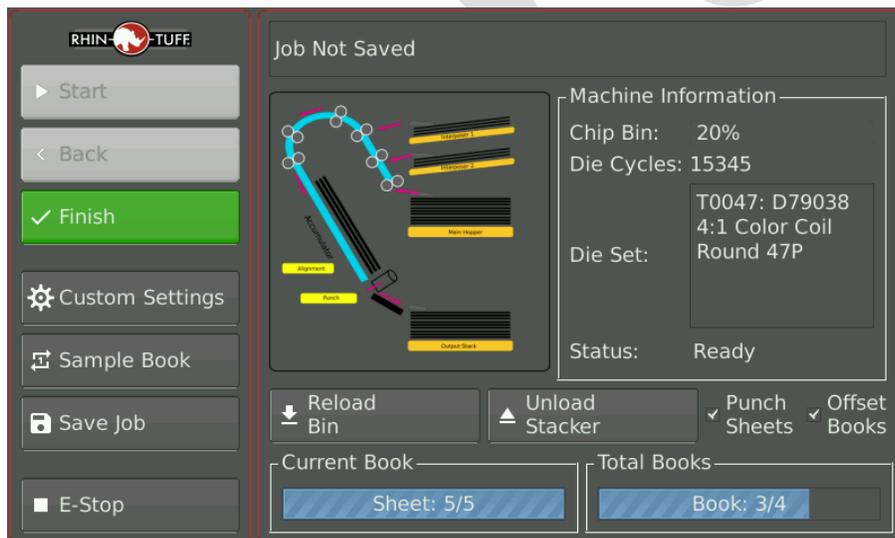
17.4.9 Paper Jam at the Output Paper Path (Access 6)

- Use the locking lever to open the paper path (Access 6)
- Clear the paper jam
- Make sure that the paper path is free from paper residue
- Close paper path and lock it with the lever
- Acknowledge the error message at the GUI



17.5 Recommencing the Job

- Remove all remnants of the incomplete book from many of the feeding elements, main hopper, and either of the interposers dependent on whether they are being used
- The machine will not start unless the 'Finish' button is pressed
- All safety doors and feed path elements must also be closed
- The 'Continue' button will change status to a green color and can then be pressed and the machine will start accordingly



18 Maintenance and Cleaning

Maintenance Task	Daily	Weekly	Monthly	Yearly	Remarks
Inspection of the touch panel	X				Visual inspection, make sure the panel is not damaged
Inspection and cleaning of die set and punch assembly	X				Visual inspection (pull out die set). If required vacuum or blow out dust from die set and punch module
Inspection of the safety switches		X			Visual inspection of safety switches
Cleaning of the output paper path		X			Vacuum or blow out dust from output paper path
Cleaning the optical paper path sensors		X			Use a soft and clean cloth, air jet or vacuum cleaner to remove dust or paper particles
Inspection of sideblower modules		X			Visual inspection of impellers, use a soft clean cloth to remove any dust (do not use air to blow out dust)
Inspection of Tornado modules			X		Visual inspection of <ul style="list-style-type: none"> ▪ Tornado belts ▪ Timing belt ▪ Blow out any dust
Cleaning paper path surfaces			X		Use a soft and clean cloth. Can be moistened with water /or soapy solution, or Isopropyl alcohol if there are markings from contamination
Replacing Tornado transport belts					See chapter spare part replacement in service manual Maintenance cycle depends on fed media types and application.

18.1 Sideblower Modules

After one year of a 24/7/365 duty cycle, we recommend replacing the whole unit. There are no replaceable parts in the sideblower module.

18.2 Daily Maintenance

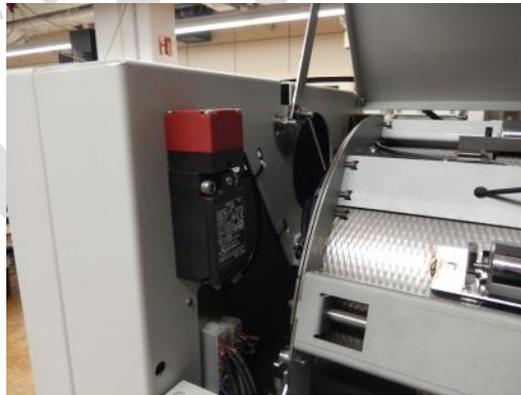
18.2.1 Inspection of the Touch Panel

The TAP EX touch panel must be visually inspected. Make sure there are no mechanical damages visible to this element.



18.2.2 Inspection of the Safety Switches

The safety switches must be visually inspected. Make sure there are no mechanical damages visible on these elements.



18.2.3 Cleaning Paper Path and Sensors

Open relevant covers and use a soft cloth or a vacuum cleaner in order to clean the sensors and/or the paper path surfaces from paper dust. The procedure is relevant for all optical sensors in any location within the TAP EX.

DANGER! Do not insert or allow any reflective objects to be inserted in the paper path or lift table. Do not attempt to clean the respective devices or look into laser beam.

Do not remove covers or bypass safety devices of the TAP EX.

18.2.4 Cleaning Punch Assembly and Die Set

Open the operator door. Use a clean and soft cloth or a vacuum cleaner in order to remove paper dust from affected areas.

ATTENTION! Do not use any liquids containing solvents



18.3 Weekly Maintenance

18.3.1 Cleaning Paper Path Surfaces and Eject Rollers

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 substrate coatings can be cleaned using a clean cloth with water/soapy solution or with Isopropyl alcohol.

ATTENTION! Do not use any liquids containing solvents

- Paper Path Interposer 1
- Paper Path Interposer 2
- Paper Path High Capacity Feeder
- Upper Paper Path
- Paper Path Accumulator
- Output Paper Path

18.3.2 Inspection of the Sideblower Modules

It is recommended for administrator / qualified users to check visually the following:

- Check that the respective airflow adjustment rings are set to the correct positions
- Check that the top of stack sensor levers are not damaged and are moving freely
- Check if the module has been contaminated by dust or dirt particles

Optionally, this visual check can be also included in a planned service maintenance cycle.

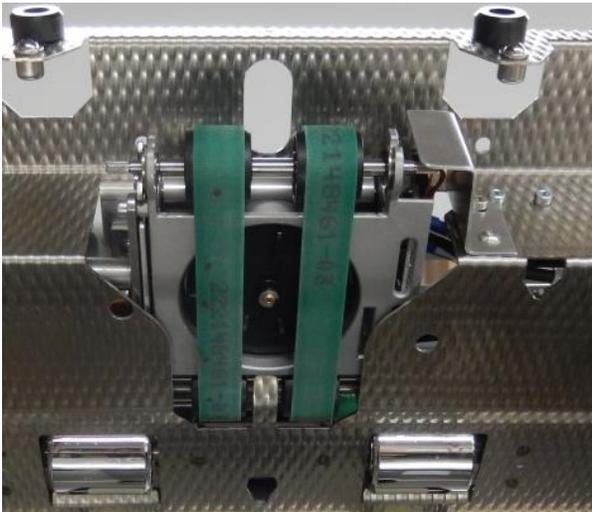


18.4 Monthly Maintenance

18.4.1 Inspection of the Tornado Modules

Make a visual inspection of the Tornado transport belts and the timing belts. Make sure they are:

- Correctly placed and not partially or completely slipped off their drive wheels
- Not worn out or dusty
- Not damaged



18.4.1.1 Cleaning Tornado Belts

Clean the Tornado belts with a clean dry cloth. Dirt and contamination can be removed by moistening the cloth with distilled water or a soapy solution. The belts can be rotated by hand slowly to clean the whole belt surface. Be sure all elements are fully dry before powering up the unit. Avoid excessive moisture; only use enough to perform the required cleaning operation.

18.5 Yearly Maintenance

See side blower module chapter 18.1

19 Spare Parts List

See spare part list (separate document)

20 Decommissioning and Recycling Procedures

DANGER! Only specially trained personnel are allowed to decommission the product

- When disassembling heavy components of the TAP EX, make sure they are securely supported by personnel before loosening screws in order to avoid unexpected movement or dropping of the components. Handle heavy modules by at least 2 persons.

WARNING! Make sure the TAP EX is completely detached from the main power supply before undertaking any decommissioning activity

- For proper treatment, recovery, and recycling of old products please take them to the applicable collection points in accordance with your local and national legislation. In the European region the Directive 2002/96/EC and 2006/66/EC apply. For more information about collection and recycling of old products, please contact your local municipality, local authorities, your waste disposal service or the point of sale where you purchased the items. Penalties may be applicable for incorrect disposal of this waste, in accordance with national legislation and disposal standards.
- When replacing heavy TAP EX components, make sure they are securely supported by personnel before loosening screws in order to avoid unexpected movement or dropping of the components.
- Entire sub modules and components are heavy and at least two persons must be available in order to replace them.
These are:
 - Lift table of the high capacity feeder
 - Upper paper path
 - Accumulator module (heavy)
 - Punch and die module (heavy)
 - Output paper path
- Make sure the TAP EX is powered-off during any service procedure

21 Annex

21.1 Software License

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Qt Toolkit 4.8

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