

Smart-binder 'PLUS HS'

Product Guide

Revision 43 (April 2026)

Smart-binder System for saddle-bound books

Smart-binder references in this document
also apply to the Smart Label-binder



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Product specifications and / or appearance are subject to change without notice.

Preface

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1 Smart-binder Introduction Summary

IBIS's '**Smart-binder**' system processes digitally printed sheets into either stitched or glue-bound booklets, or books:



The **Smart-binder** is an evolution of IBIS's first in-line connected 'DST2' digital saddle-stitcher, which was released to the market at Drupa 2000. The Smart-binder replaced the DST2 at Drupa 2004 with many enhancements over its predecessor including **easier operation** and a unique, patented **glue-binding option**. In 2012 the second generation Smart-binder '**PLUS HS**' was launched with a **66% increase in performance** over earlier models and new electrical controls and drives. The Smart-binder system leads the way as the system of choice for feed from a web cutter (in-line or near-line) or off-line from a high-pile sheet feeder.

The Smart-binder model SB-2 produces conventional wire-stitched booklets up to 10mm in thickness. The model SB-3 offers wire stitching and IBIS's unique, patented sheet-gluing process called **Individual Sheet Gluing (ISG)**: both on the same machine. Perfect bound books may also be produced from book blocks (piles of glued signatures) delivered by the SB-3 connected to the in-line BSS-10 signature stacker.

The latest 2025 version Smart-binders provide a further increase in running speed which means they can be fed from a web-cutter at web velocities up to **130 m/min, or 180 m/min** if the optional buckle-folder is used. Booklets are delivered at speeds up to **7,000 bph** or 14,000 bph in 2-up mode. All Smart-binder systems are capable of running '**24 / 7**' and producing over 1 million booklets/month.

When making ISG cold-glued booklets then a line of cold glue dots is applied precisely on the fold line of each sheet and the sheets are then collected and pressed together, before being 3-knife trimmed. ISG cold glue binding provides many benefits over conventional wire stitching. The cost of the cold glue is similar to wire staples, but ISG cold glued booklets offer better **lay-flat, improved recycling, better page pull strength** and the ability to **vary book thickness on-the-run** from minimum to maximum without needing to make stitch-head adjustments.

Sheet sequence within each booklet is controlled by reading a bar code (or 2D code) on each sheet and any incorrectly assembled booklets are automatically rejected, ensuring **100% correct booklet integrity**.

The extended model Smart-binder SB-XW offers an increased booklet spine length of 457mm and an increased booklet width of 273mm. It can produce **A5 portrait (or 8.5 x 5.5") books in 2-up mode** using the optional trimmer centre-knife.

A large range of Smart-binder add-on modules are available including (for 2025) an in-line **laser-tabber** for ECL label booklets and a suite of in-line equipment to provide **wrapped and labelled booklet piles** for secure exam booklet production

2 IBIS Product Range Summary

1/ Saddle-binding (wire-stitching or saddle cold-glue binding)

	Model	Max Input Speed	Max Output speed	Binding method (s)	Max book thickness	Cover or insert sheet feeding	Key Features
Saddle-stitching only	Smart-binder <i>SB-2</i> 'PLUS HS'	Up to 400 sheets/min (off-line) Up to 130meters/min web speed Up to 180meters/min web speed (with extra buckle-folder)	7,000 booklets/hour (1-up) 14,000 booklets/hour (2-up using optional trimmer center-knife).	<u>Saddle stitching</u> Wire stitching only	10 mm (0.39")	Low pile feeder (reload on the run). More than one feeder may be supplied (cover feeder and insert feeder or two cover feeders)	• Very heavy-duty and high performance. • Individual Sheet and booklet tracking for personalised output • On the run variation in book thickness • Suitable for long production runs/24/7 operation. • Maximum flexibility. • Adaptable for special applications. • Simple and easy-to-use.
Saddle-stitching + saddle gluing (ISG)	Smart-binder <i>SB-3</i> 'PLUS HS' & Smart Label-binder (<i>SLB</i>)		Note: If the trimmer is modified to produce 82.5mm min booklet width, then the max speed reduces by 30%	<u>Saddle-binding</u> Wire-stitching and ISG cold glue binding		Covers use same folder as sheets.	<i>Additional features:</i> Includes IBIS's patented cold-glue binding process (ISG) <u>in addition to</u> conventional saddle-stitching).

Note 1: A lower performance, lower cost Smart-binder model 'SB-1' is available for use in-line with cut sheet printers (max input sheet rate: A3=100 sheets/min A4 = 200 sheets/min).

Note 2: Smart-binder model 'SB-X' increases maximum untrimmed booklet spine length to 457mm (18") to allow 2-up 5 ½ x 8 ½" (or A5) portrait booklet production.

Note 3: Smart-binder **model 'SB-W'** increases the maximum untrimmed booklet width to 273mm (10 ¾").

3 Glossary of terms used in this Product Guide

Bar-code: A series of small black lines printed close together and used to communicate coded numerical data. Bar-codes read by the Smart-binder system enable it to identify sheets and/or signatures and also carry out automated functions under bar-code control.

Bed knife: The lower knife blade which does not move during the shear cutting process.

Buckle fold: When a sheet is folded by stopping the leading edge of the sheet so that the center part of the sheet passes through a pair of pressure rollers. The resulting fold is perpendicular to the direction of sheet travel through the folder.

Buffer: a device which can accept sheets at one speed, store them and deliver them at a different speed.

Bump turn: The act of changing the direction of a sheet by stopping it and then moving it in a direction which is 90-degrees to its original direction.

CF Printing: Printing on a 'Continuous Forms' web (as opposed to cut-sheet printing)

Clincher: A device which bends a wire stitch (staple) closed, after it has been pushed through several sheets. Clinching is required to complete the stitching process.

Cold glue: PVA (poly vinyl acetate) glue which contains a high proportion of water and becomes hard when this water is lost (evaporates).

Continuous forms (CF): a method of printing using a paper web fed from a roll

Cover: The outside sheet of a book

Creasing: The act of pressing something with a V-edge against a sheet of paper, to assist subsequent sheet folding.

Creep: This describes the way that images move gradually further away from the front edge of a finished (trimmed) book, the further the sheet is from the center sheet. This is due to the need for the outer sheets on a saddle-bound book to 'wrap around' the inner sheets.

CSP: IBIS Customer support package.

Datamatrix: A 2-D code (normally a square box with dots inside it) used to print on sheets to provide data about that sheet and the booklet to which the sheet will be added.

Digital printing: A printing process in which each printed image can be computer controlled using 'digital signals' to be different to the next printed image.

DFA/DFD: Communication protocols used to allow finishing devices to communicate with cut-sheet digital printers (Canon and Xerox).

EVA glue: normal 'hot melt' glue used to make perfect bound books (see also 'PUR')

Finishing: The conversion of sheets into booklets or books.

Foot: The bottom edge of a finished book or booklet (perpendicular to the spine)

Fore-edge (front edge): The edge of a book which is opposite to the bound edge

Gsm: Grams per square metre (paper stock weight)

Head: The top edge of a finished book or booklet (perpendicular to the spine)

Hole drilling: The act of making a small hole in a sheet through using a rotary drill

Hole punching: The process of making a small hole in a sheet or a booklet by using a circular 'punch' (through pressure only, no rotation).

Hot Melt glue: EVA glue which becomes liquid when heated and hardens when cooled (see also 'PUR').

ID number: personalised book identity number (a unique number for each different book).

Impositioning: The arrangement of printed pages on both sides of a sheet or a web to give a desired end result of correct page sequence after the sheets are bound together.

Ink Jet printing: A method of printing by applying dots of liquid ink to paper

In-line finishing: A book or booklet finishing machine which is directly connected to a digital printer.

Insert sheets: Sheets which are fed from a different source to the other sheets in a book and inserted in between these other sheets.

Inserting: Either the addition of an additional sheet inside a book, or the placement of a finished book inside an envelope

Integrity: Refers to the page sequence inside a finishing book being correct (the 'integrity' of the book relates to it having the correct print content and page sequence, which may be unique to that book)

IJ Printing: Digitally controlled Ink-jet printing

ISG: 'Individual sheet gluing' . This is an IBIS-patented process of applying cold glue dots to the inside of the sheet fold and is unique to the IBIS Smart-binder.

Knife fold: When a sheet is folded by a blade pushing the center of the sheet between a pair of pressure rollers.

Landscape format: A book bind orientation in which the bound edge is along the shorter dimension of the page (the American word for this is "oblong").

Loop stitching: A wire staple which has a loop in it allowing a booklet to be placed into a 'ring binder'

Near Line: When a book finishing machine is not directly connected to a digital printer but is close to a printer (usually a finishing system fed from a pre-printed roll using a roll unwinder).

Oblong (US): A book bind orientation in which the bound edge is along the shorter dimension of the page (see also 'Landscape').

Omega Stitching: See 'loop stitching'.

Off-line: When a book finishing machine is not directly connected to a digital printer.

Page: One printed image (each page in a finished book has a different page number)

Perfect Binding: The process of collecting several sheets or signatures (sigs) together side by side, clamping these sheets/sigs together, applying hot-glue to the edges of the sheets/sigs and then pressing a cover sheet over the top of the hot glue to bind the sheets and cover together. The resulting book spine has 90-degree 'square' edges (sometimes called 'square backed').

Perforations (Perfs): A row of small holes in a sheet which allow a sheet to be manually torn easily along the line of perforation holes.

Plough fold (U.S: *Plow fold*): A fold which is parallel to the direction of movement of the sheet and in which the sheet direction is not changed during the fold process.

Portrait format: A book bind orientation in which the bound edge is along the longer dimension of the page (the opposite of 'Landscape' or 'Oblong').

pp: Pages (as in '8pp' means a sheet with 8 pages printed on it).

Printed Sheet: One single unfolded sheet of paper, comprising several pages printed on each side.

PUR: Polyurethane Reactive glue which is liquid when hot and reacts with the water in the air to solidify as it cools after being applied to the book spine (an alternative to EVA 'hot melt' glue)

Rotator: a device which 'rotates' sheets by 90-degrees

Saddle-stitching: The process of collecting folded sheets astride an inverted 'V' shaped saddle and then stitching these sheets together while the apex of the saddle ensures all sheets are correctly registered. The resulting book spine has a V shape.

Saddle-binding: The process of collecting folded sheets astride an inverted 'V' shaped saddle and then binding these sheets together using either wire staples or ISG cold glue, while the apex of the saddle ensures all sheets are correctly registered. The resulting book spine has a V shape.

Scoring: The act of rolling a V-edged wheel against a sheet of paper, to assist subsequent sheet folding.

Self-cover booklet: a booklet in which the outside sheet is processed identically to the other sheets within the booklet

Sheet: An unfolded sheet of paper, normally containing printed images (pages) on both sides

Shear knife: A dual opposing knife system whereby one knife blade moves past the other knife blade.

Shrink Wrapping: Passing a polythene-wrapped booklet, or pile of booklets, through a heat tunnel to cause the wrapping material to shrink onto the contents

Side edges: The two edges of a book which are perpendicular to the bound edge

Side Glue: The thin line of glue that is applied to each side of the book spine, so that the cover glues to the side of the book and not just to the spine.

Signature (sig): A printed sheet which has been folded once or several times. When using the Smart-binder SB-4 then a signature may also apply to several sheets which have been folded onto a saddle and glued together (typically 16 – 28 pages in a signature).

SM(P): Scheduled machine Maintenance (Program): Machine maintenance, which is scheduled in advance, paid for in advance and occurs at pre-decided dates.

Spine: The bound edge of a finished booklet or book.

Spine squaring: When the V spine of a saddle-stitched booklet is compressed to have square edges (to look more like a perfect bound book)

Spool: A coiled reel of wire using to feed wire stitching heads

Square back: This description applies the spine of a perfect bound book. See also 'spine squaring' above

Stacking: the act of placing consecutive sheets or booklets on top of each other

Staple: See 'Stitch'.

Static charge: This refers to the static electrical charge which may be found on the surface of a non-conductive material (such as a sheet of paper). 'Anti-static' systems may be used to apply an equal and opposite static charge to the paper to neutralise the static charge.

Stitch (or 'Staple'): A small length of metal wire which passes through several sheets and is then bent back on itself ("clinched") to attach these sheets together.

Stitching head: A device which pulls continuous wire from a spool, cuts a small length of this wire, bends this small length into an inverted U shape and presses this U-shaped piece of wire through a number of sheets (after which the ends of the wire are bent again by clinchers to bind the sheets together)

Tabbing: This word may be used to describe either small piece of material with an adhesive backing which is applied to a booklet (or sheet), or it may describe an extended portion of a label-booklet (normally on the front cover) used to help attach the booklet to a box or container.

Three-knife trim: A knife trim (cut) operation in which a small amount is trimmed off all three (non-bound) edges of a book

Thread sewing: The use of 'thread' to attach signatures together, prior to further binding processes (normally associated with 'hard cover' or 'case' binding).

Toner: plastic 'dust' heated onto the paper by 'toner printers'

Trolley: A devices with wheels capable of storing a pile of sheets and moving these easily around the factory

TUSDC: The TUSDC-100 two-up Sheet Direction changer enables A5 (or 5½ x 8½") booklets to be produced from a 450mm (or 17½ - 18") wide web using 4-page sheets

Web printing: Printing on a continuous 'web' of paper coming from a paper roll.

Wrapping: enclosing a booklet or a pile of booklets in paper or polythene

4 Smart-binder Saddle-stitcher regulatory certifications

4.1 Compliance with Safety Regulations:

IBIS Integrated Bindery Systems Ltd, 9 The Gateway Center, Coronation Road, Cressex Business Park, High Wycombe, Bucks, HP12 3SU, UK hereby state that the machine listed below:

Product: Smart-binder

Model: SB1, SB2, SB3

Complies with the following:

4.2 Legislation

The Supply of Machinery (Safety) UK Regulations 2008 as amended 2011 (2004/108/EC).

The Electrical Equipment Directive (2006/95/EC)

The Electromagnetic Compatibility UK Regulations 2006. (2004/108/EC).

4.3 Standards

EN60204-1:2006, A1 2009

EN61000-6-4:2007, A1 2011

EN61000-6-2:2005

FCC Part 15 Subpart B Class A (USA) C108.8 Class A (Canada).

5 Summary of Smart-binder user-features and benefits



1) A True 24/7 Production System

With over 220 **systems installed world-wide**, the Smart-binder is a true 7/24 reliable, heavy-duty production system and the most commonly used finishing system for use with high-speed digital web printers. Many SB systems run continuously in 3-shift operation over many years and produce millions of booklets every month. No other digital saddle-stitcher has a comparable record of accomplishment.

2) Integrated Sheet and Book Tracking

The Smart-binder was designed from its inception to incorporate sophisticated **data tracking** for personalized booklets. The Smart-binder's integrated system of sensors and software permits 100% accurate tracking of each sheet and booklet (competitive systems use 3rd-party tracking systems). Incomplete booklets are automatically rejected. Separately fed covers may be checked to ensure matching with inside sheets.

A detailed log file is created as the machine runs from which individual booklet data can be extracted. This is critical in production environments where each document must be tracked and accounted for.

The Smart-Data Analysis system presents all machine operating data and production information.

3) Second-to-none Book Finish Quality

The Smart-binder processes and **folds each sheet individually** (instead of in batches as with competitive systems) which ensures optimum possible book fold quality and lay-flat even when making books up to 10mm (3/8") thick. The Smart-binder trimmer **cuts all three edges** for an optimum finish and a unique, patented device minimizes book corner tearing when trimming maximum thickness.

Sensors are used to check that wire staples and/or cold glue have been correctly applied to each booklet.

4) Bind-on-demand for personalization or short job runs

Because the Smart-binder was designed to finishing digitally printed sheets, it incorporates the unique ability to **vary book thickness on-the -run** without any adjustment needed. The trimmer uses gravity-registration to allow it to process books with a constantly changing thickness. In combination with integrated sheet and book tracking this makes the Smart-binder a true bind-on-demand system.

5) Different Configurations and Finishing Methods:

The Smart-binder offers the greatest variety of possible **system configurations providing** saddle-stitched booklets, cold-glued booklets (with optional spine-squaring), combined cold and hot glue-perfect-bound books, ECL (extended content label) booklets with optional laser tabbing. Every Smart-binder system may be configured to operate either in-line with the printer, near line from a roll unwinder/sheeter or off-line from a sheet pile feeder. It is also possible to configure an

SB system to operate both in-line and off-line with quick changeover between the two operating modes.

6) High Production Speeds:

The Smart-binder cycles at up to **7,000 cycles/hour**. It can accept sheets at rates up to **400 sheets/min** and can run with web cutters at web speeds of **130 meters/min (426 ft/min)** or **180 meters/min (595 ft/min)** with an additional buckle folder.

7) Unique, 'ISG' cold-glue binding:

The Smart-binder model SB-3 includes IBIS unique **ISG cold glue binding option** (which applies a line of cold glue dots to the fold on each sheet). Saddle-bound booklets produced with ISG cold glue, instead of wire staples, have higher page-pull strength, better fold quality (lay-flat) and are easier to recycle compared with equivalent wire-stitched booklets. The ISG glue consumable cost is similar to wire staples. Quick changeover is available between stitching and gluing. The ISG cold-glue nozzle is reliable and easy to use: no operator adjustment needed. Glue is applied to the surface of the sheet, not the edge. An optical sensor detects immediately if there is 'missing glue'.

The SB-3 can create ISG cold-glue bound 'signatures' for feed into the clamp(s) of a perfect binder. The resulting book resembles a thread-sewn book but is made using a combination of ISG cold glue and hot-melt glue. Advantages of this unique binding process include:

- Easier and more reliable to feed pre-glued signatures into the binder clamp instead of a pile of individual loose sheets.
- Hot-melt glue is applied to the outside fold of the ISG-glued 'signatures', not the individual sheet edges (removes the need for sensitive operator adjustments and removes the risk of individual sheets coming loose due to poor binding).
- No spine preparation, milling or roughing needed and therefore no noise or dust created.

8) Cover-To-Text Matching:

The Smart-binder's integrated software provides the option for personalized cover to-book text matching, using barcode scanners mounted on the cover feeder and sheet infeed register table.

9) 2-up A5 portrait (or 5.5 x 8.5" portrait)

The 'stretched' model Smart-binder SB-XW can produce 2-up **A5 portrait booklets** at up to 10,000 booklets/hour.

10) Customization:

The Smart-binder can be customized for a large **variety of applications**. We have connected with envelope inserters, stackers, folders, in-line booklet drills, knife folders, amongst many other options. Additional modules can be added directly to the Smart-binder, including sheet pile feeders, cover and insert feeders, in-line cover gate-folding, pile loading trolleys, trimmer center-knife, card and reply envelope tipping, dynamic sheet perforation (see below), hole punching and much more.

IBIS specialize in creating **customized systems** to meet each individual customer's needs. This may require adapting and interfacing modules from other vendors and/or designing unique equipment solutions. IBIS has many hundreds of man-years experience in putting together 'tailored' finishing systems.

11) Ease of use and maintenance:

The machine is **easy to operate**, has good access and visibility of the paper path, and is easy and economical to maintain.

6 Different model Smart-binders (& Smart Label-binder)

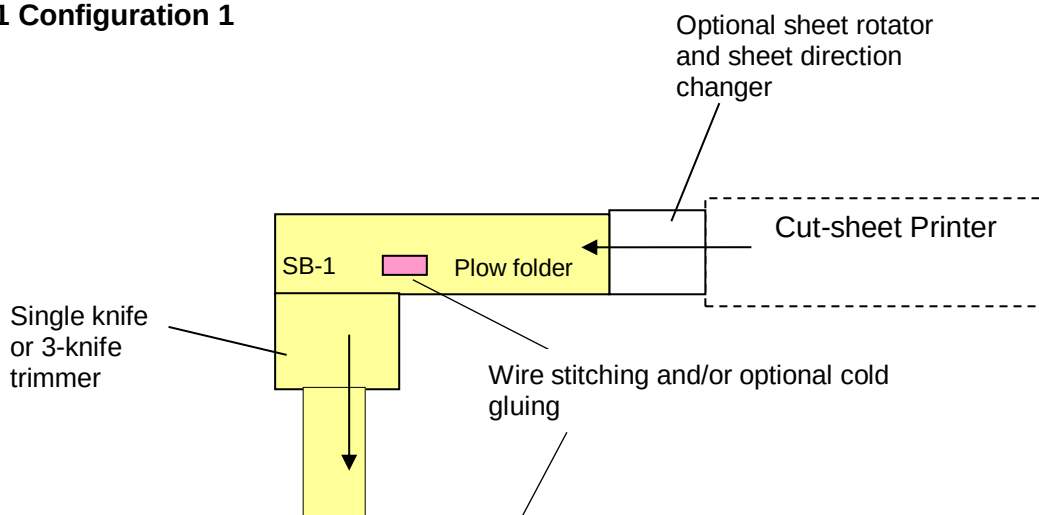
Using the “fold-bind-trim” process, the Smart-binder (SB) produces either wire-stitched (saddle-stitched) booklets or cold-glued booklets up to a maximum of 10mm (3/8”) thick. The optional addition of a ‘perfect binder’ (hot glue binding) allows glued books to be produced up to a maximum of 70mm (2 3/4”) thick.

The Smart-binder may be fed either from a high-speed digital web printer, or a pre-printed paper reel, or a high-speed sheet feeder (or a combination of these options). Printed sheets must enter the SB in correct sequence (i.e. sheets must be digitally printed or offset-litho printed and then pre-collated).

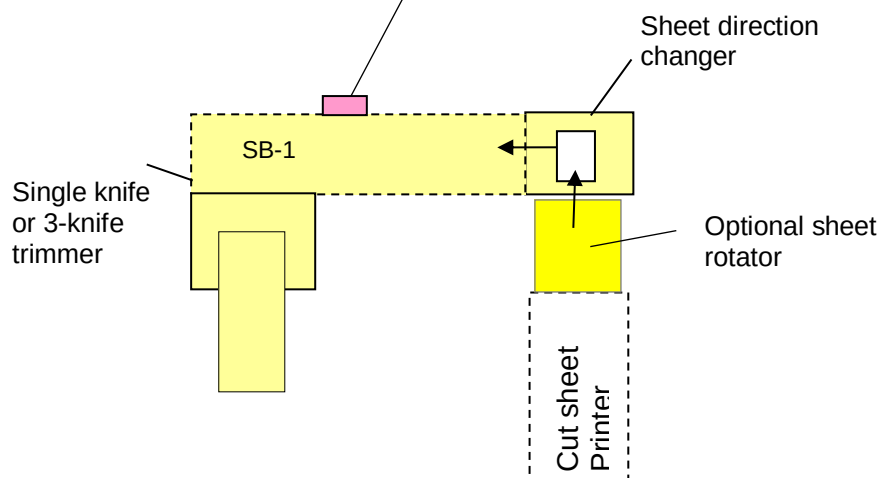
Various model Smart-binders are available (each upgradeable from the preceding model):

6.1 Smart-binder SB-1 (low-speed applications only in-line with cut-sheet digital printers)

SB-1 Configuration 1



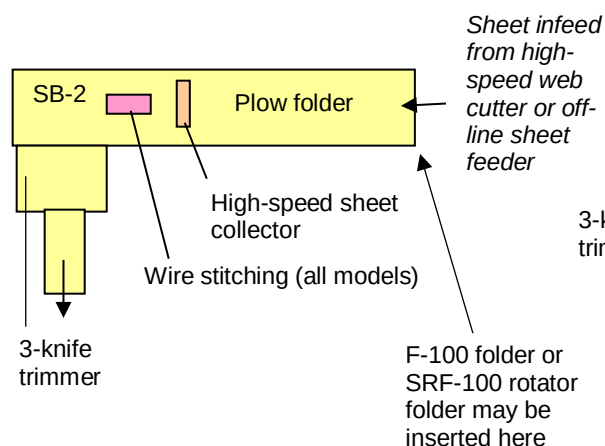
SB-1 Configuration 2



6.2 Smart-binder SB-2, SB-3 (and stretched model SB-XW) for high-speed applications

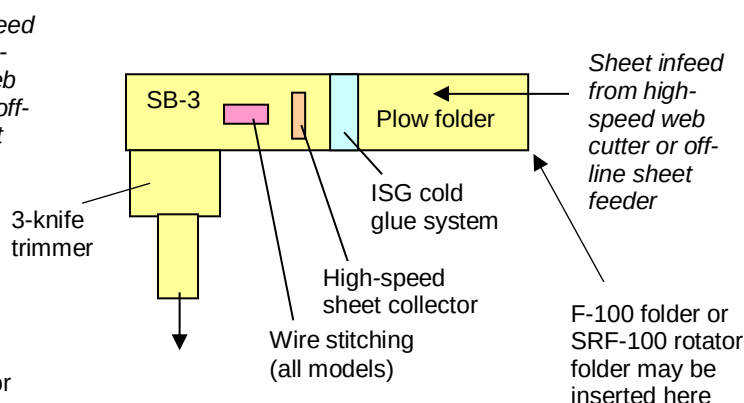
Smart-binder SB-2

Saddle-stitched booklets only.



Smart-binder SB-3

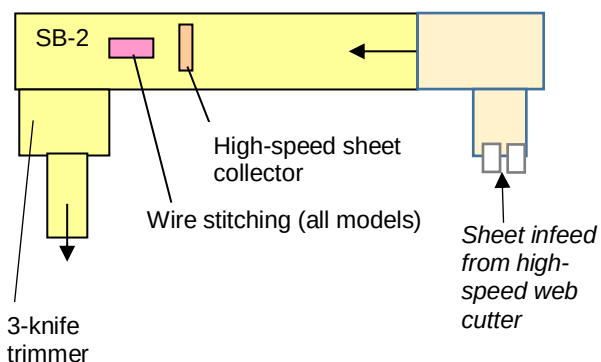
Saddle-stitched and ISG cold-glued booklets.



Smart-binder SB-2

(with sheet direction change TUSDC)

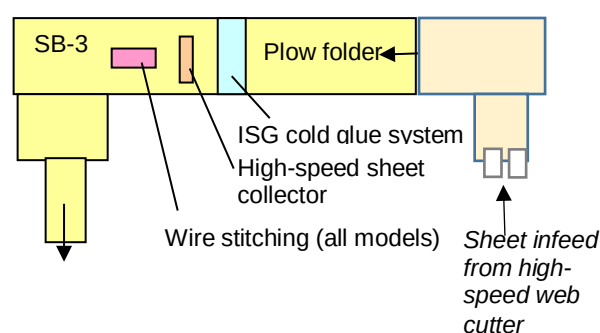
Saddle-stitched booklets only.



Smart-binder SB-3

(with sheet direction change TUSDC)

Saddle-stitched and ISG cold-glued booklets.



The Smart-binder models SB-2XW and SB-3XW are 'stretched' machines, identical to the standard SB-2 or SB-3, but capable of producing larger format booklets

6.3 Smart Label-binder for ECL booklet production

The Smart Label-binder (SLB) is a special variant of the standard Smart-binder. With high-quality cold-glue spine binding it has been optimized for the production of 'Extended Content Labels' (ECLs) when used together with an in-line laser-tabbing machine. It offers integrity, speed, and quality with maximum efficiency and reliability. The SLB can run paper weights as light as 37gsm without requiring the folder F-100.



The IBIS Smart Label-binder (SLB) provides unmatched flexibility and performance for ECL production, ensuring that every booklet is produced at the highest quality – first time, every time.

Feeding options

- Off-line feed from a high-pile sheet-feeder at feed rates up to 6 sheets per second
- Near-line feed from a roll-unwinder and web-cutter at web speeds up to 180 meters/min
- In-line feed from a digital web-printer and web-cutter, or a digital cut-sheet printer
- Combination of feed from a web-cutter or feed from a sheet pile, with quick changeover between each mode.



Smart Label-binder fed from a sheet feeder



Smart Label-binder fed near-line from a web-cutter

Key benefits

- Eliminates the multiple manual operations normally associated with conventional ECL production
- Label booklets containing a variable number of pages: up to 200, or more
- Patented ISG cold-glue binding: Stronger, flatter booklets that integrate seamlessly into packaging
- High-speed production: Up to 7,000 cycles per hour (42,000 ECL booklets/hour if running 6-up)
- 100% production integrity: Sheet-level tracking and error rejection to eliminate waste
- Flexible configurations: Inline, near-line, or off-line to suit existing print workflows
- In-line laser cutting of the outside cover for extended tabs needed for Pharma ECLs

Applications

- Pharmaceutical and healthcare
- Agrochemical
- Industrial products
- Consumer goods packaging

ISG glue binding with missing glue detection

Patented ISG cold-glue binding ideal for ECLs where wire stitching isn't suitable. Optical sensor monitors glue application. Automatic System stop if any glue drop is missing.

Integrity, Tracking and Reporting

Every sheet is code-read and tracked throughout production. Automatic rejection of incomplete or incorrect booklets. Individual booklet status data for full audit and quality control. Ensures 100% booklet integrity.

Maximum flexibility

The modular design of the SLB allows you to tailor the system to your exact requirements. Options such as automated cover feeders, autoloaders, dynamic perforation, and integrated data management tools make the SLB the most versatile ECL booklet solution on the market.

Light weight paper

Most ECL label booklets must be produced using very lightweight paper stock in order to contain as much printed data as possible with the minimum number of pages. The SLB can handle paper stocks as light as 37gsm (reduced feed speed) or 45 gsm (full speed).

Multi-up production

The SLB produces booklets with spine lengths up to 320mm. Typically this means that multiple small format ECLs are produced in one booklet and these are separated at a later stage in the process. This multi-up process combined with quick job changeovers results in exceptionally high production efficiencies.

Laser cutting for extended tabs

New for 2025, the additional Laser-Tabber model LT-101 brings a new level of efficiency to Pharma ECL production. Designed to work in-line with the IBIS SLB, the LT-101 provides a clean, efficient and flexible tabbing solution:

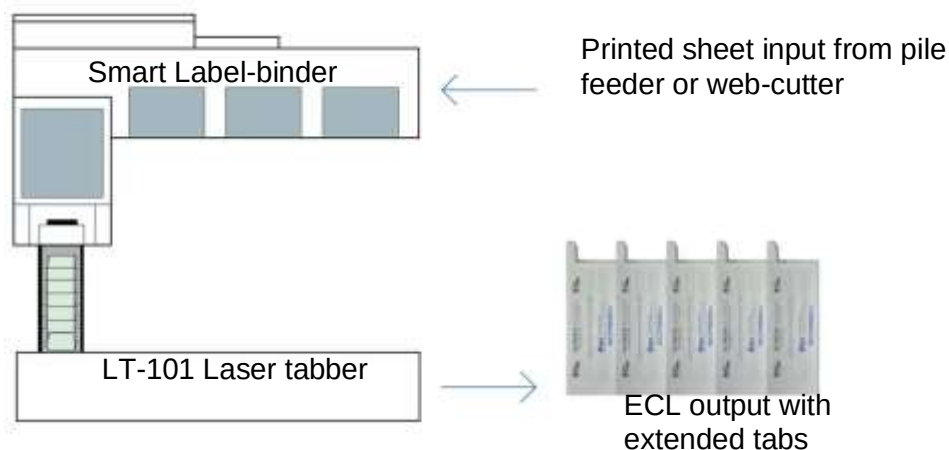
- Precise laser cutting of the outside sheet for consistent, high quality extended tabs
- 'Shear knife' cutting to reduce the width of all other sheets
- Increased production speed, quick job changeover time and reduced waste
- Seamless in-line integration with the Smart Label-binder

SLB with Laser-Tabber LT-101 (floor plan)

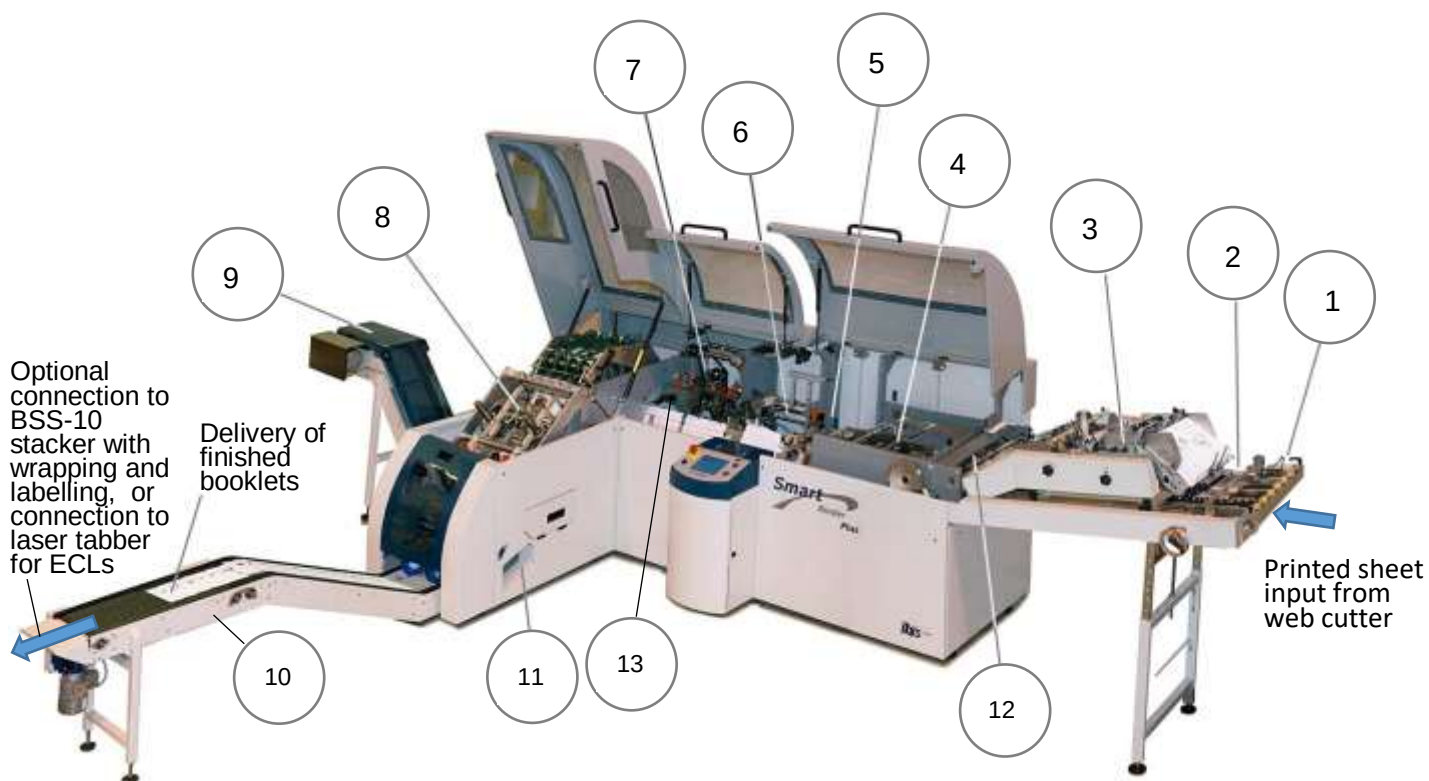
The ultimate solution for Pharma ECL production

The IBIS Smart Label-binder with optional in-line LT-101 Laser Tabber helps you achieve faster, high-quality, and more reliable ECL production – whether you're scaling up or optimizing your current processes.

The Laser-Tabber automatically opens up the front cover, laser-cuts the front edge of the cover to create the required extended 'tabs' and cuts all the other pages to a shorter width so that only the 'tabs' remain extending on the front edge of the booklet

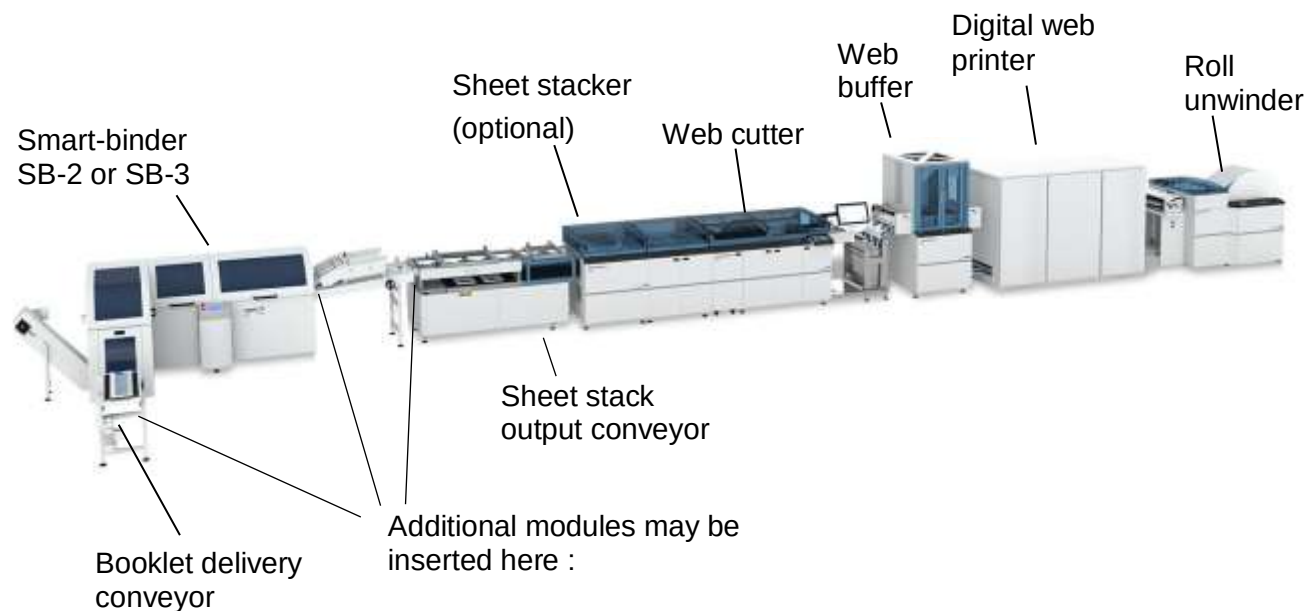


7 Basic Smart-binder modules

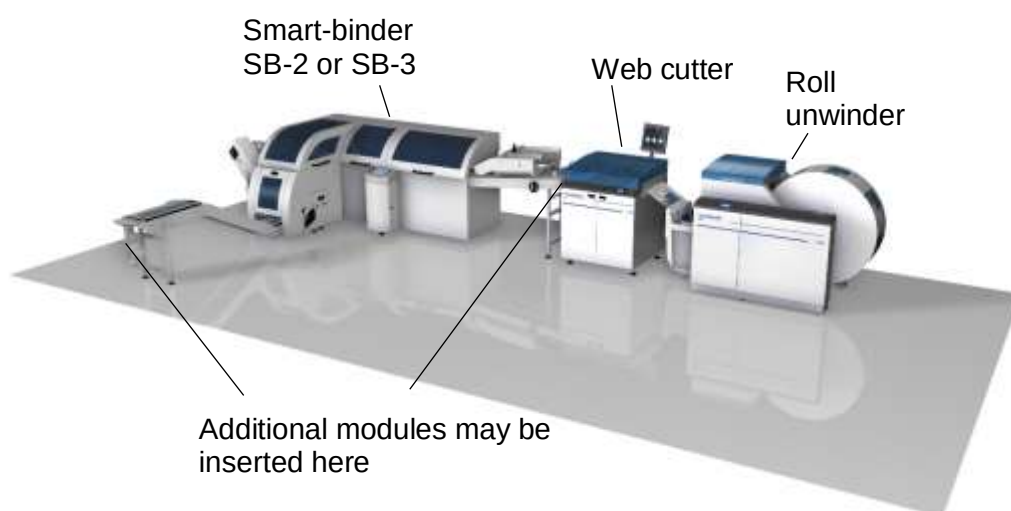


1. Sheet code reader
2. Infeed sheet alignment conveyor
3. [CIF-102](#) cover feeder and [CAL-101](#) cover auto-loader (optional)
4. Sheet and cover folder system
5. [ISG-100](#) cold glue system (SB-3 only)
6. Sheet and cover collector system
7. Stitcher module with two wire stitching heads, clinchers and wire spools.
8. Trimmer (3-knife)
9. [TWC-100](#) trimmer waste removal conveyor (optional)
10. Booklet delivery conveyor
11. Automatic book reject bin
12. ASS-100 anti-static system
13. Missing wire-stitch detection system

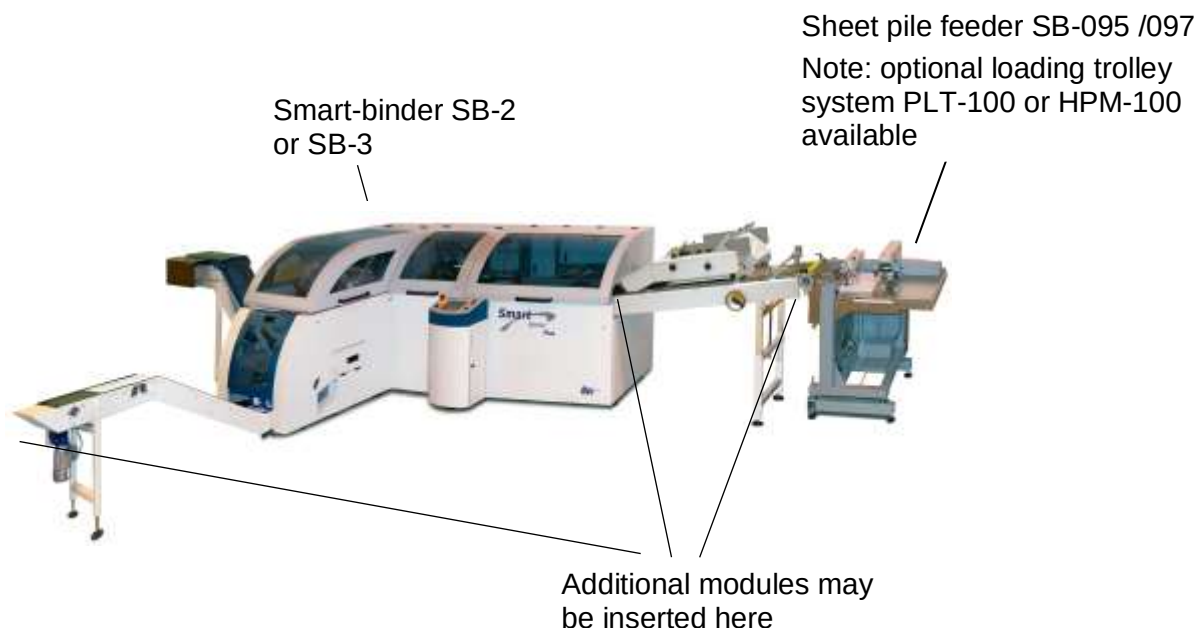
7.1 Smart-binder SB-2, or SB-3 in-line with a digital web printer



7.2 Smart-binder SB-2 or SB-3 near-line with a web cutter and roll-unwinder



7.3 Smart-binder SB-2 or SB-3 off-line fed from a high-speed high-pile sheet feeder

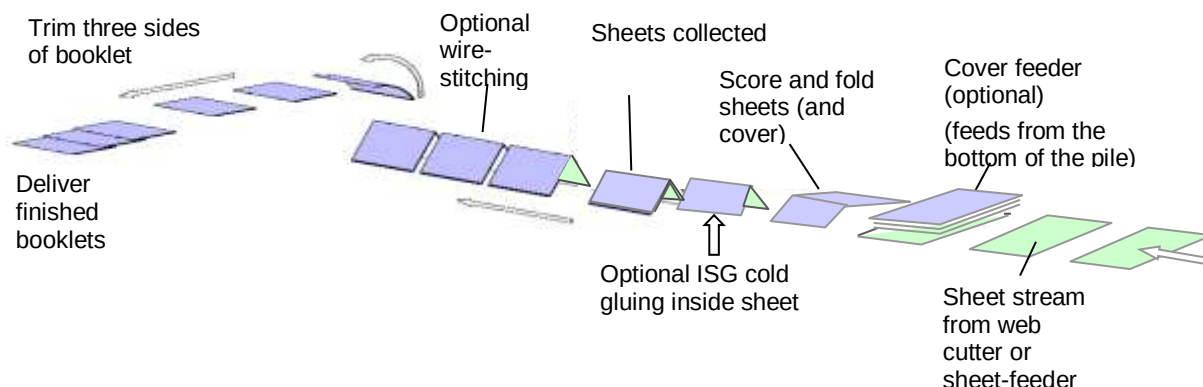


8 Smart-binder binding processes and sheet flow

8.1 Producing saddle-bound booklets up to 10mm (3/8") thick

8.1.1 Sheet flow

The Smart-binder can be installed directly in line with a web cutter (and CF web printer) running at web speeds up to 130meters/min (426 feet/min). By adding an extra in-line buckle folder (F-100, F-101 or F-200) this web speed may be increased to 180-200 meters/min (595 - 656 feet/min). Alternatively, the Smart-binder may be fed off-line from a sheet pile feeder at rates up to around 400 sheets per minute.



Note: View animated sheet flows on the IBIS website here:

[Smart-binder animated sheet flow \(wire stitching\)](#)

[Smart-binder animated sheet flow \(ISG cold glue binding\)](#)

8.1.2 Accurate high-quality folding.

Each sheet inside the book is folded individually and collected with the book cover to produce wire-stapled or cold-glued booklets. Individual sheet folding results in a flatter book compared with folding multiple sheets together in sets.

8.1.3 Wire stitched booklets

After the sheets and cover are collected together, they pass into the stitching module. Wire stitches are formed from continuous wire spool using stitching 'heads.' Up to six stitching heads can be used to give up to six stitches per book. Loop stitches may be applied (instead of normal 'flat' stitches) to produce booklets to fit into standard ring binders.

After stitching the books are three-knife trimmed to finished size. Individual sheet folding, stitching on the saddle, and three-side trimming produces the highest possible quality stitched booklets.

An optional additional post-trimmer 'spine squaring' system (SM-100 or ARSD-E) is available if required to compress the V-shape spine into 'squarer' shape.

8.1.4 ISG cold-glued booklets – SB-3 and SLB only

The unique IBIS-patented ISG (Individual Sheet Gluing) system applies a carefully controlled line of cold glue 'dots' accurately on the inside fold line of each sheet, and the outside cover, before the sheets are collected, pressed together and three-side trimmed. See Appendix 1 for further details.



ISG cold-glue nozzle

8.1.4.1 Advantages of the ISG process over conventional wire stitching:

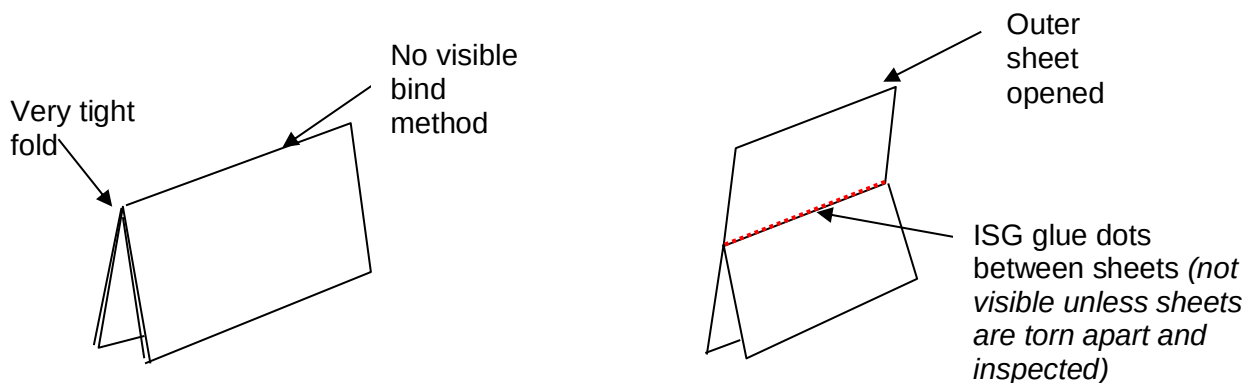
- Higher page-pull strength on the outer and inner sheets
- Tighter fold, particularly on thicker books. This is because wire stitching tends to 'open up' the book fold. A tight fold is particularly important when inserting documents into envelopes
- Cold-glued books can be recycled more easily than books containing wire staples.
- Glue binding avoids any child safety issues relating to the edges of wire staples.
- Glued books can sometimes be mailed directly, unlike wire-stapled books.
- The ISG gluing process requires no adjustment when the book format or thickness changes.
- The ISG glue application nozzle system has a much lower maintenance cost compared with wire stitch heads which comprise hundreds of small components.

Note that bond strength when using ISG gluing is linked to the paper porosity and integrity of the paper surface. Higher strength results from more absorbent papers. Certain inks/toners may weaken the bond strength if applied to the same area as the ISG glue (the sheet fold).

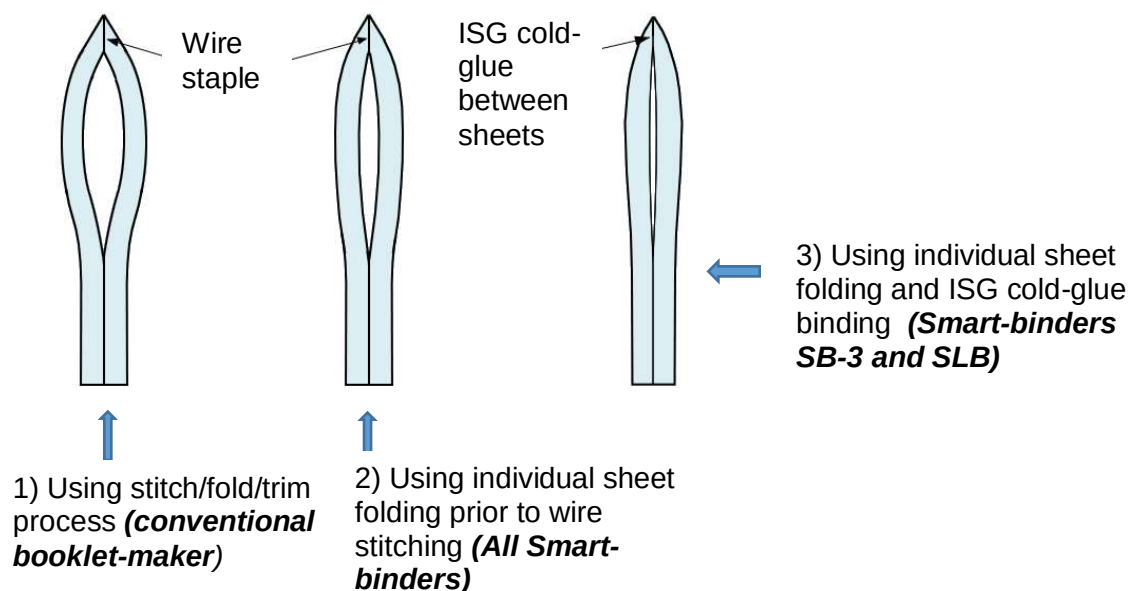
Note: a continuous glue dot optical-detection system stops the Smart-binder immediately if glue stops being applied to the sheets. This prevents the production of any un-bound booklets.

8.1.4.2 ISG- Glued booklets

See Appendix 1



Thick-book cross-section comparisons: Wire-stitching vs. ISG cold-gluing



8.1.4.3 Quality comparison between wire stitching and ISG cold-gluing

This booklet was made on the SB-3 using ISG cold-glued (showing improved lay-flat)



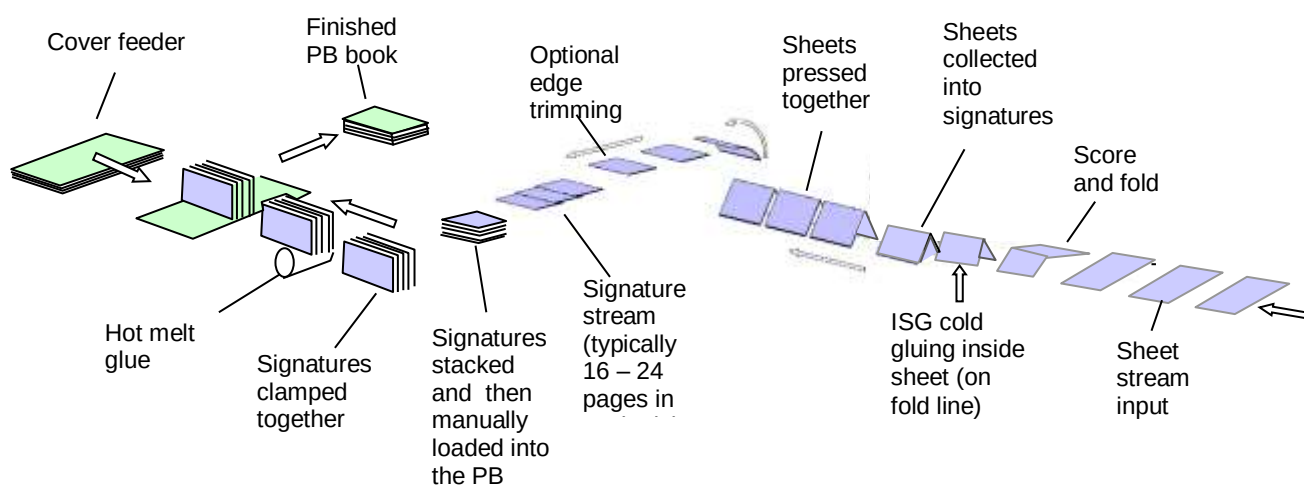
This identical booklet was made on the SB-3 using conventional wire-stitching

8.1.4.4 Consumable cost comparison between wire stitching and ISG cold-gluing

See 'Consumables' section

Note: In general, ISG cold glue is a similar consumable cost to wire staples when making thin to medium thickness booklets.

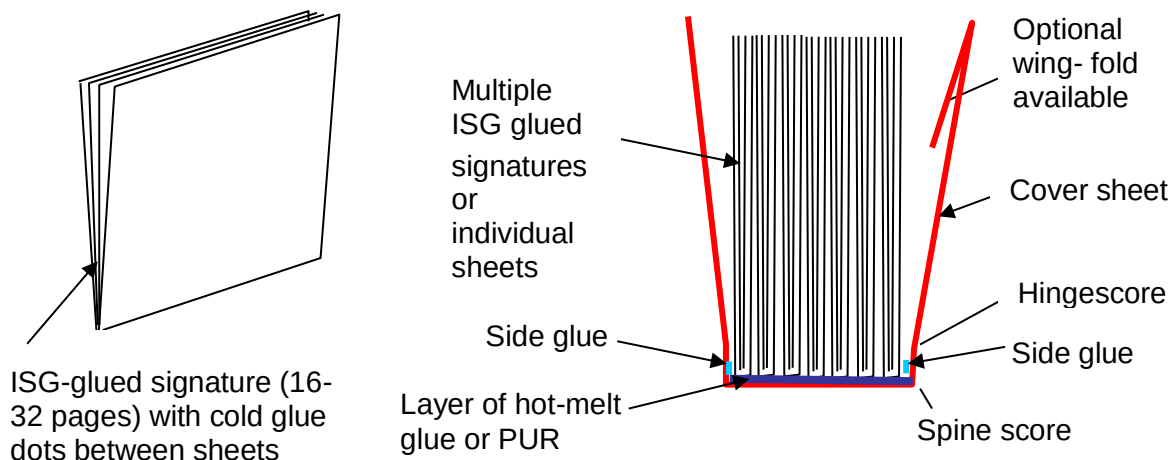
8.2 Producing perfect bound books 5-60 mm thick (1/8-2 3/8").



The Smart-binder produces 'perfect bound' books from SG glued sections ('signatures') containing typically between 16 and 24 pages which are delivered by the SB-3. These tightly-folded and cold-glued signatures are then stacked into book blocks and manually loaded into the clamp(s) of the off-line perfect binder where a layer of hot-melt glue (or PUR) is applied to the outside of the signature folds and a scored book cover is pressed tightly around the spine. The perfect-binder adjusts itself automatically to suit incoming book thickness to make the system truly bind-on-demand.

Different model perfect binders are available depending on cycling speed needed and other requirements (such as end sheet feeding, back-lining or gauzing, PUR gluing etc).

The perfect binder (PB) uses two glue applicator rollers and a reverse spinner roller to accurately control the EVA 'hot-melt' glue layer. Alternatively, PUR gluing (Polyurethane reactive glue) is available in place of EVA hot melt. Side rollers (or nozzles) are also fitted to apply glue to each side of the book, close to the book-spine. When using ISG cold glued signatures then spine preparation (cutting, milling, or roughing) is not necessary so there is no noise or dust produced. Since the glue does not need to adhere to the fibres on the edge of each sheet (only to the signature folds) the process does not require sensitive operator settings and is not susceptible to paper condition.



The PB cover feeder applies multiple score lines to each cover to assist it to bend around the book and to open easily (including optional 'gate-fold' or 'wing-fold' creasing). The resulting square-back books resemble those produced by conventional high-quality burst-bound or thread-sewn binding processes. The number of redundant (blank) pages in the book is minimised by automatically varying the number of pages in each signature using the printed bar codes.

Book blocks are fed manually into the binder clamp(s) or may be loaded into a book block feeder with multiple 'pockets'.

8.2.1 Optional book trimmer

A book trimmer may be used after the perfect binder, either in-line or off-line, to trim books to finished size.

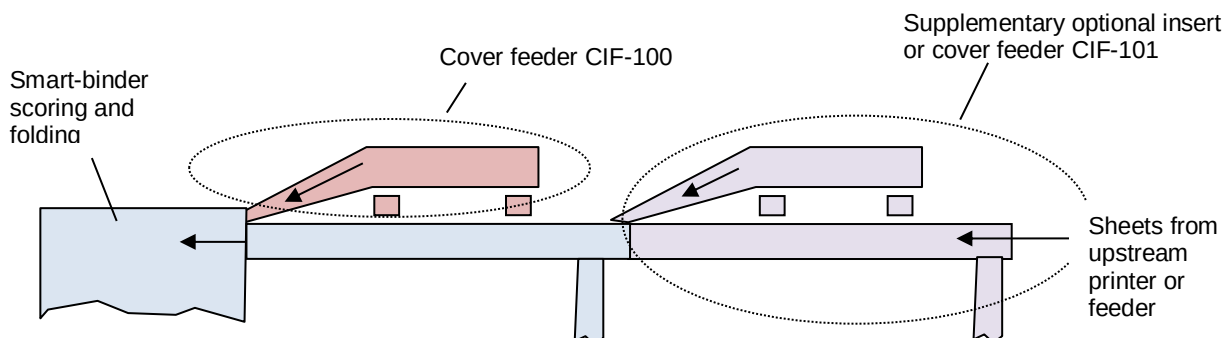
9 Smart-binder Options

9.1 Cover and Insert-Sheet feeding

Separately-printed cover or insert sheets may be added to the digitally-printed sheets coming from the printer or pile feeder.

The standard cover feeder allows for one cover or insert sheet. It is recommended that cover feeder is fitted with the optional Cover Autoloader CAL-101 which increases the maximum cover pile height from 20mm to 200mm (3/4" to 7 7/8") in order to decrease the frequency of reloading the feeder. Use of the CAL-101 also increase cover feed reliability by keeping the pile height constant on top of the vacuum feed drum.

Other options include an additional feeder (CIF-101) for extra insert sheets or covers.



The CIF-101 is used in conjunction with the normal cover feeder CIF-102. Both are identical feeders, but the assembly CIF-101 includes a second sheet transport conveyor below. CIF-100 cover feeder assembly does not include a sheet conveyor below because this sheet conveyor is part of the standard base-model Smart-binder.

An optional cover code reader (bar code reader BCR-105 or 2D code reader DCR-101, (see appendix 18) is available to check matching of cover to content sheets for personalised book production. See appendices 2, 3, and 20 for more detailed information on cover and insert feeding.



Note: When ISG glue binding (instead of wire stitching), then sufficient space must be made in between the last sheet of one book and the first of the next book, into which the cover sheet can be fed. This space is not needed when wire-stitching because the cover can then be fed on top of the last sheet in each booklet.

9.2 Optional trimmer center-knife

The Smart-binder trimmer includes three cutting knives as standard (face knife, head knife and foot knife). There is also an option for a lower cost single face-knife trimmer.

An additional center-knife CKN is available for 2-up production. See Appendix 17.

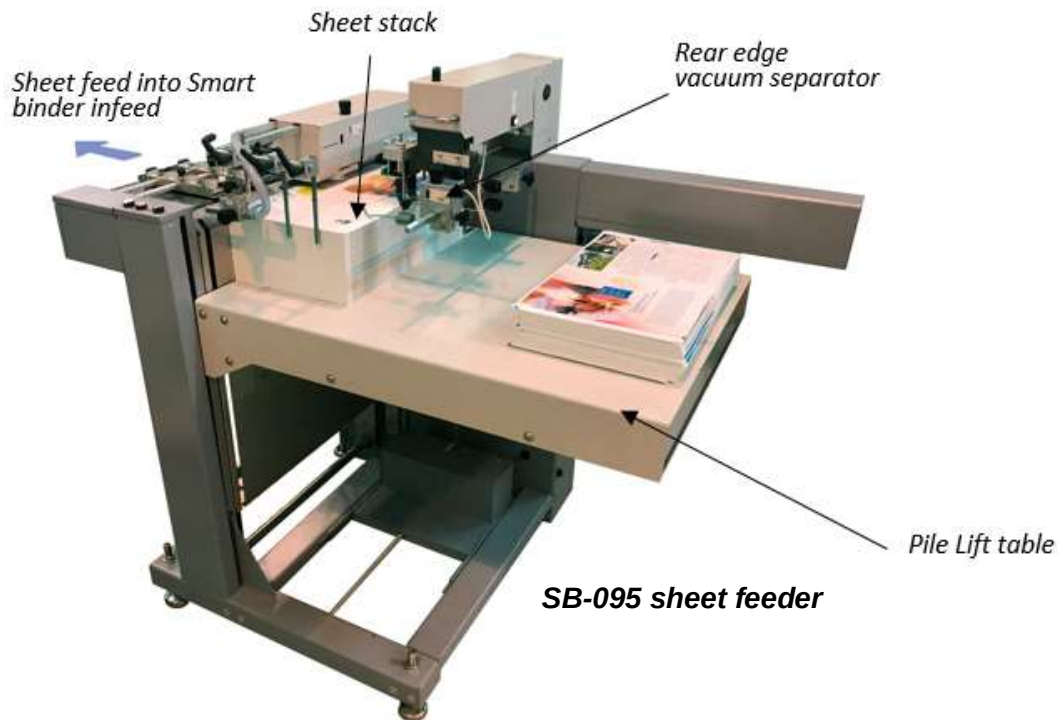
9.3 Trim waste removal

Cut-off waste from the SB-2 or SB-3 trimmer may be removed by the optional TWC-100 or TWC-101 waste removal conveyors. See Appendix 4. These collect the waste trim-off paper strips for both the front knife and the side knives (and optional center-knife) and delivers these wastepaper strips out of the side of the machine into a collection bin.

Alternatively (and preferably) , a collection chute TCC-100 with a circular outlet may be fitted to connect to a customer's pneumatic (vacuum) waste extraction system. See Appendix 30.

9.3.1 High Pile sheet feeder for off-line operation

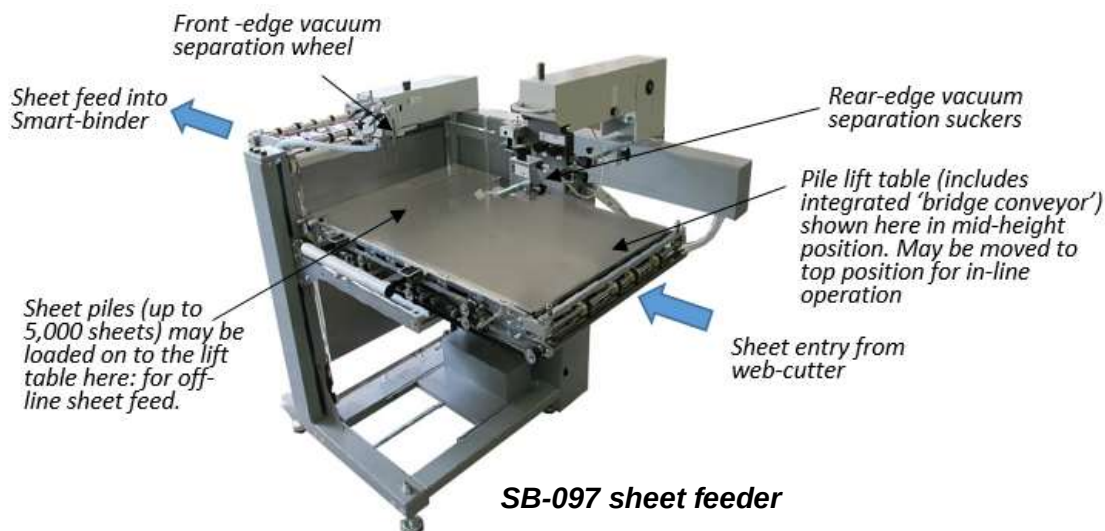
The direct-connected pile feeder, option SB-095, (see appendix 5) is available to allow dedicated off-line operation and the optional loading trolley systems PLT-100 (see Appendix 6) or HPL-100 (see Appendix 8) are available to assist pile loading.



An additional pile feeder on the side SB-096 (see appendix 27) may also be used in combination with SB-095.

9.3.2 High Pile sheet feeder for use in-line with a web cutter

If requiring to feed the Smart-binder from a sheet pile or from a web cutter, with quick changeover between the two modes of operation, then the SB-097 feeder is available. See Appendix 7.



9.4 Additional Sheet Buckle-Folding

An additional sheet 'buckle-folder' (models F-100, F-101, F-200) may be used directly before the Smart-binder infeed. See Appendix 13, and 32. The F-100, F-101 and F-200 folders may be used to fold each sheet in half to help run very lightweight paper stocks, or to increase the web speed when feeding from a web cutter. These folders may also be used to enable small book formats to be made from large sheets by applying an additional fold.



The SRF-100 rotator/folder positioned before the infeed conveyor consists of the F-100 folder and the SR-100 90-degree sheet rotator. The rotator/folder enables small format books to be produced from a 'wide web' and avoids having to change to a 'narrow' paper web.

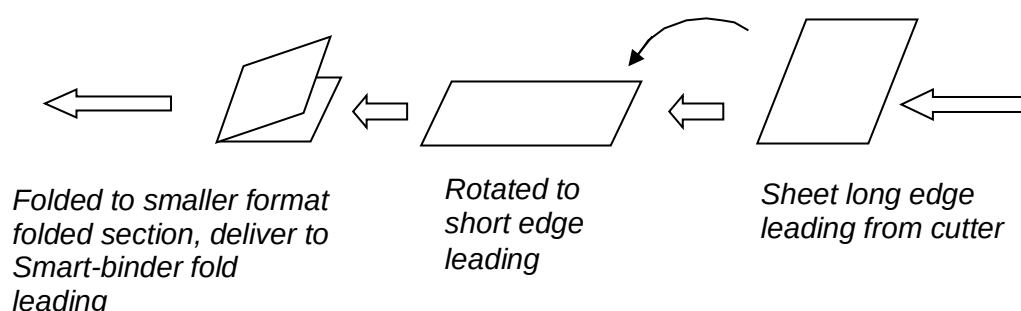
For example: to produce A5 (or 5 1/2" x 8 1/2") booklets, print oversize A3 sheets (or 12 x 18"). These sheets will be delivered from the web cutter long-edge leading. The SRF-100 then rotates each sheet by 90-degrees to short-edge leading. Each sheet is then folded in half to give an oversize A4 (9 x 12") section with the folded edge leading. These folded sections are then fed into the Smart-binder and processed normally.

Since sheets are folded into sections before entering the Smart-binder, and books can only be made from whole sections, it is only possible to make books with pages in multiples of 8-pages.

Folded sections are more bulky than flat sheets, so this technique reduces the maximum number of pages in the book.

The maximum printer web speed when using the SRF-100 is approximately 100m/min (328 ft/min) and the maximum printer web width is approximately 457mm (18").

Sheet flow through "Rotator/Folder"



Both the rotating and folding processes may be deactivated when it is required to pass sheets through the RF100 without rotating or folding.

The SRF-100 folder may be fitted with optional anti-static bars to reduce the static charge on the sheets delivered to the Smart-binder.

When using ISG gluing together with pre-folded sheets, then a second cold-gluing nozzle must also be installed in the folder (to place a line of glue inside the folded sheet). Use option FGS-100/FGS-101.

It is not recommended to use the RF100 rotate function if the sheet weight is less than 60 gsm, or if the sheet input rate is higher than approximately 250 sheets/min.

The F-101 is a heavier duty folder capable of faster speeds. The F-200 folder is a 'special' selective folder capable of varying on-the-run between one fold and two folds (mixing 8pp and 12pp signatures within each booklet). See Appendix 32. This folder should be selected (in combination with a dynamically-selective web cutter) when wishing to run the Smart-binder at speeds over 130 m/min (430 ft./min) web and requiring the number of pages in the book to vary in 4-page increments, not 8 pages.

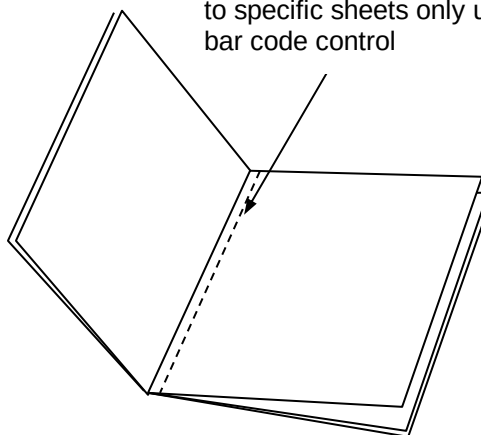
9.5 DMP-100 Sheet dynamic micro-perforation option

Option DMP-100 provides an extra module integrated into the Smart-binder, in-between the infeed side-register conveyor. Sheets passing through this perforator module may be perforated so that any one sheet can be easily torn out of the book later.

DMP-100 perforator module fitted before SB folder.



Line of perforation 'slots' allows sheet to be easily torn-out. Applied selectively to specific sheets only under bar code control



The addition of this module increases the machine length by 325mm (12 ¾").

The DMP-100 requires an external high pressure air supply.

Perforations may be automatically applied to the left of the center fold, the right of the center fold, or on both sides, selectively on each sheet under bar code control (requires extra bar code digit for perforation control).

The DMP-100 contains as standard two independent perf heads.

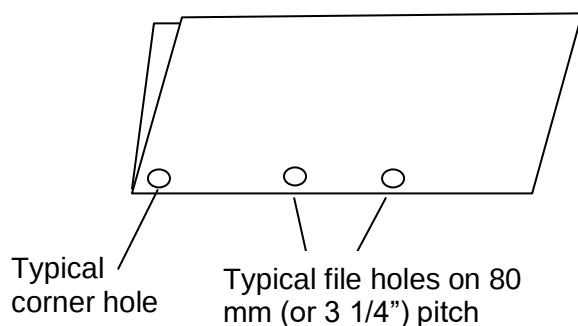
The DMP-101 option is provided with four independent perf heads.

The rotary perforation knives may be supplied to give normal perforation or micro perforation.

Refer to IBIS for further details, if needed.

9.6 Hole punching or drilling (Options CHP-101, HPM-100, and HDM-100)

As an alternative to loop-stitches, punched or drilled holes may be added to the book spine using the CHP-101. See Appendix 24.



A corner hole may be punched using the CHP-101 punch module which is installed inside the Smart-binder trimmer. The CHP-101H punches a hole in the head side of the booklet. The CHP-101F punches a hole in the foot side of the booklet. The CHP-101HF punches a hole in the head and/or the foot side of the booklet.



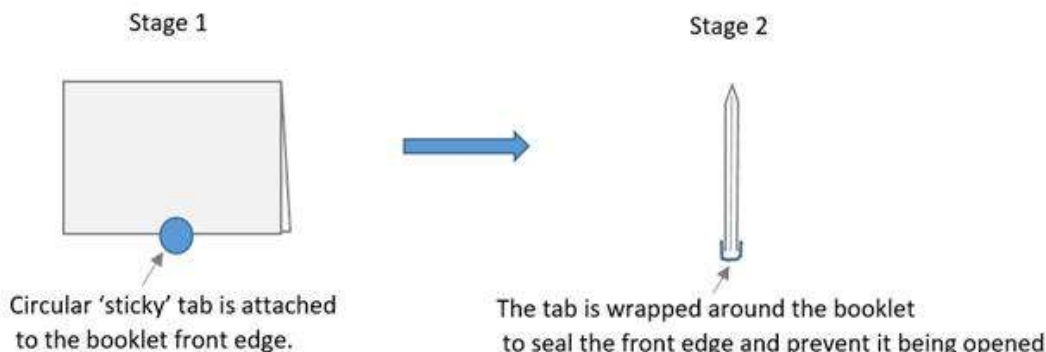
Corner hole punch and die assembly

Additional side jogger assembly (pneumatic operated)

Two or three file holes may be made using a hole-punch module (HPM-100 or HPM-101) for books up to 4mm (5/32") (3/8") thick, or hole-drilling module (HDM-101) for books up to 50mm (2") thick. The HPM-100 and HDM-100 modules operate either in-line with the Smart-binder delivery conveyor, or off-line. Contact IBIS for more details.

9.7 Booklet edge-tabbing

Each booklet may have a paper or plastic tab applied to head, foot or face edge using the in-line BTM-730 tabbing module (appendix 36). The tab is adhesive-backed to stick to the booklet. The tab is then wrapped around the open edge to prevent the booklet being opened without tearing/splitting the tab. The tab may be perforated to assist easy opening, but this perforation may not be needed if the tab is made from a paper material.



The above diagram shows a tab applied to the booklet fore-edge which requires booklet direction change. If tabs are applied to the head and foot then no booklet direction change is needed.

9.8 Sheet inserting

Each booklet may have a separate ('matching') sheet inserted into it, normally under the top cover, using the ISF-100 insert sheet feeding system. The booklet direction is changed to 'spine to the side' the top cover is opened and a sheet is inserted into the booklet from the side from the ISF-100 feed hopper. Bar code readers ensure that the correct sheet is inserted into each booklet.

Note: A Data Sheet appendix will be added soon.



9.9 Booklet Ink-Jet printing

Each booklet produced by the Smart-binder may be personalised by ink-jet printing on the outside using the IJPH-100 module.

Note: A Data Sheet appendix will be added soon.



9.10 Booklet stacking BSS-10

The BSS-10 stacker, see appendix 9, allows non-stop Smart-binder operation without the need for the operator to continually have to remove books from the delivery conveyor. Books pass through the standard delivery conveyor into the BSS-10 stacker where they collect into horizontal piles up to 235mm (9.25") or optionally up to 330mm (13"). The number of books in each pile is selectable by the machine operator. A turntable in the stacker enables books within each pile to be stacked in batches with spines in each batch in the opposite direction to the spines in the next batch. This ensures pile stability by avoiding all the spines being on the same side.

Booklet piles are delivered onto a free running roller table where they accumulate until removed by the operator. In-line (or off-line) pile 'strapping' PS-100 is also available: See appendix 31.



The BSS-10 booklet stacker:
for in-line connection to the Smart-binder delivery conveyor

The BSS-10 stacker may be fitted with option 'SBCR' which provides a bar code reader and additional controller for 'intelligent' stacking. This may be used, for example, to process signatures into 'book blocks' for feed into a perfect binder. (It may also be used to create piles with specific booklets and determine if any booklets are missing from each pile.

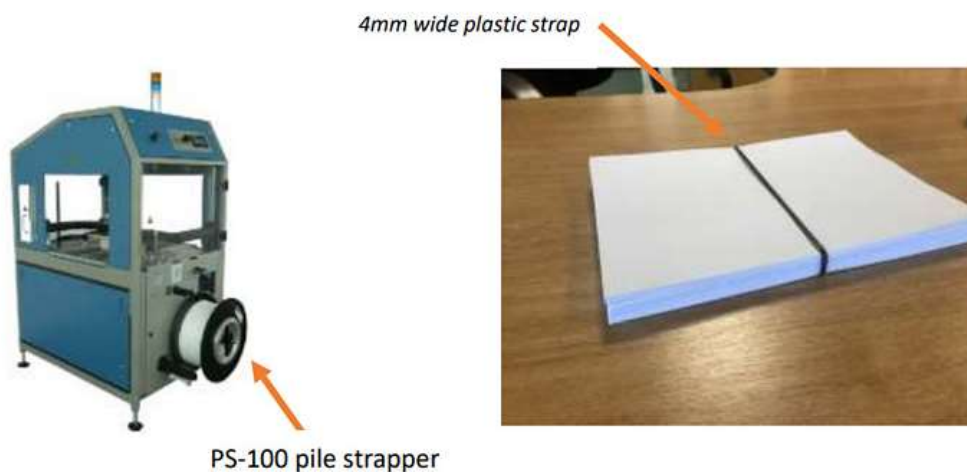
An automatic bad-pile rejection facility is available.

The BSS-10 may be connected to an inline pile 'strapper' (see 9.8 below) or pile 'bander' and a pile wrapping system and pile labelling system.

The BSS-10 may be fitted with a 2-up kit which allows 2 streams of booklets to be stacked side by side.

9.11 Pile strapping

Finished booklet piles delivered by the BSS-10 stacker may have a plastic strap applied around them using the in-line connected PS-100 strapper module. See Appendix 31 for details



9.12 Pile banding

Finished booklet piles delivered by the BSS-10 stacker may have a paper or plastic (film) band applied around them using the in-line connected PBM-100 banding module.

Note: A Data Sheet appendix will be added when available.



9.13 Polythene-film pile wrapping/bagging

Banded piles of finished booklets may also be wrapped in a polythene film bag using the in-line connected flow wrapper module PFW-100 or PFW-101.

Note: A Data Sheet appendix will be added when available.



9.14 Pile labelling

Booklet piles which have been wrapped (bagged) may have a label inkjet printed with data about the booklets in each particular pack using the IJL-100 ink jet labeller. This data is obtained by reading a bar code (or 2D code) on the top booklet of each pile.



9.15 Booklet 'Spine squaring' module Options SM-101 and ARSD

The optional SM-101 or ARSD 'spine squarer' may be attached to the end of the Smart-binder book delivery conveyor to press the book spine into a 'square' shape.



Note: because of individual sheet folding, books produced by the Smart-binder do lie very flat (particularly if ISG cold-glued) even without 'spine squaring'. There may not therefore be any significant improvement in booklet flatness after spine-squaring.

The SM-101 unit (see Appendix 22) gives an acceptable result only when making thinner saddle-stitched books (up to about maximum 3-4 mm thick). Its maximum cycling speed is 1,700 books/hour (28 books/min) so it may reduce maximum SB operating speed if making very thin books. The SM-101 delivers 'squared-spine' books either into a small capacity stack on top of the SM-101, or (optionally, with modification) into a separate in-line stacker such as the BSS-10.

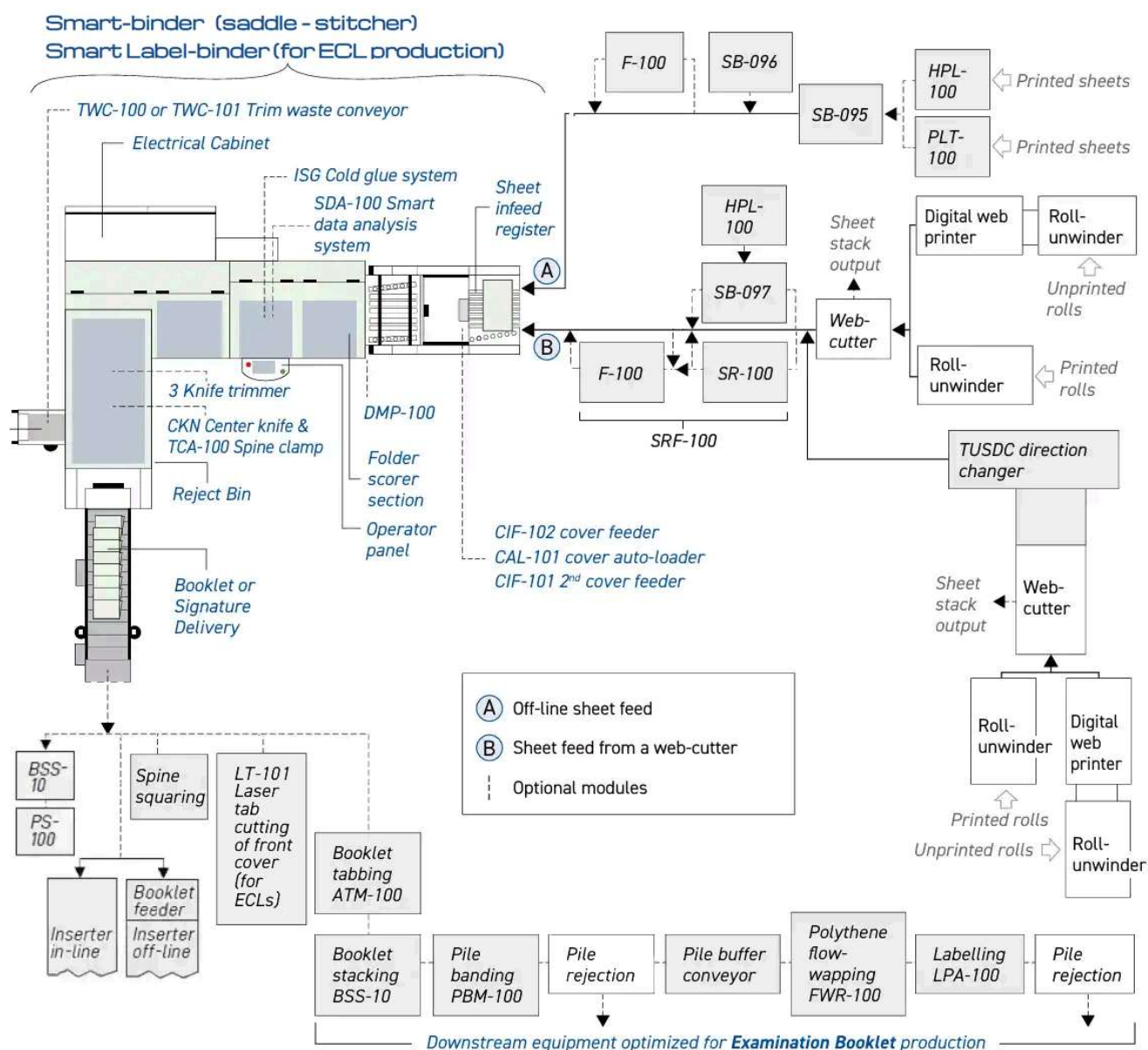
The ARSD-S-100 (see Appendix 23) is a heavy-duty and faster version of the SM-101. The ARSD can square booklets up to 10 mm (0.4") thick.



9.16 Laser 'tabber' module LT-101 (for ECL booklet extended tabs)

The laser tabber LT-101 receives glue-bound booklets directly from the IBIS Smart-binder, opens the top cover, laser cuts tabs into this top cover and cuts all other sheets to a narrower width so tabs protrude from the front edge of the booklet. This is often required when producing Pharma ECLs (Extended Content Labels). Refer to IBIS for full details. Appendix 10.

9.17 Summary of Smart-binder configurations and optional equipment



Key to Optional Ancilliary Modules

BSS-10	Booklet stacker (BSS-10)	SB-095	Sheet pile feeder
DMP-100	Dynamic perforator	SB-096	2 nd Sheet pile feeder (use with SB-095)
F-100	Buckle folder	SB-097	Sheet pile feeder, allows sheets to pass over the top (in-line use)
HPL-100	Pile loading trolley	SR-100	Sheet rotator
PLT-100	Pile loading trolley (for use with SB-095 only)	SRF-100	Sheet rotator/buckle folder
PS-100	Pile strapper	TUSDC	Sheet separator and sheet direction change modules

Full list of Options

Options that may be added within the Smart-binder

Part no.	Description	Function	Appendix number
ISG-100	ISG cold glue binding system (integral part of the SB-3)	Provides cold-glue binding as an alternative to wire stitching. This fitted to the SB-3 but not to the SB-2 (note: requires high pressure air supply to the glue reservoir).	See Appendix 1
CIF-102	Cover or insert sheet feeder (high-speed version)	Used to feed a separately-printed cover sheet onto the outside of the book or an insert sheet inside the book	See Appendix 2
CIF-101	Additional cover or Insert sheet feeder	Additional insert or sheet feeder (includes extra sheet conveyor below)	See Appendix 20
CAL-101	Cover Autoloader for use with CIF-102 or CIF-101	Increases maximum cover pile height from 20 to 200mm (3/4" to 7 7/8")	See Appendix 3
DMP-100	Dynamic Micro-perforator system with <u>2</u> perf heads	Can add multiple perforations to selected sheets parallel to the spine (under bar code control) so these sheets can be torn out of the finished book	See Appendix 11
DMP-101	Dynamic Micro-perforator system with <u>4</u> perf heads	Can add multiple perforations to selected sheets parallel to the spine (under bar code control) so these sheets can be torn out of the finished book.	See Appendix 11
HPM-100	Hole punch module	Independent, self-driven module may be installed at the end of the Smart-binder delivery to add punched holes to the finished book. Different modules are available to suit performance requirements <i>Max book thickness: 4 mm (1/8")</i>	Refer to IBIS for further details
CHP-101	Corner Hole punch device	May be installed inside the Smart-binder trimmer to add a punched hole in the corner of each booklet <i>Max book thickness: 3-4 mm (1/8")</i>	See Appendix 24
BCR-105	BS3 Bar-code reader for the cover/insert feeder CIF-102 or CIF-101	May be used to match bar codes on covers with bar codes on sheets	See Appendix 18

DCR-101	2DDatamatrix reader for the cover/insert feeder CIF-102 or CIF-101	May be used to match bar codes on covers with bar codes on sheets	See Appendix 18
FGS-100	Folder glue system	Used to apply a line of ISG cold-glue inside the F-100 or F-101 folders.	See Appendix 13
TFR-100	Voltage transformer for main power supply	For use when the factory supply voltage is outside the 380V–415V range (e.g., for installations outside Europe)	Refer to IBIS for further details
SST-101	Standard Hohner 43/6S stitch head, with clincher, centring device wire guides and 2.5 Kg wire spool holder	To supplement the two stitch heads normally supplied with each Smart-binder (for jobs requiring 3 or 4 stitches). <i>The 43/6S may be used for books up to 7mm (9/32") thickness</i>	See Appendix 33
SST-100	Standard Hohner 43/6S stitch head and clincher, <u>without</u> centring device, wire guide or wire spool holder	For use as a <u>spare</u> stitch head. (recommended to be ordered with each new machine) <i>The 43/6S may be used for books up to 7mm (9/32") thickness</i>	See Appendix 33
SST-105	Standard Hohner 52/8 stitch head, with clincher, centring device wire guides and 2.5 Kg (5 ½ lbs.) wire spool holder	To supplement the two stitch heads normally supplied with each Smart-binder (for jobs requiring 3 or 4 stitches) <i>The 52/8 may be used for books up to 10mm (3/8") thickness</i>	See Appendix 34
SST-106	Standard Hohner 52/8 stitch head and clincher, <u>without</u> centring device, wire guide or wire spool holder	For use as a <u>spare</u> stitch head. (recommended to be ordered with each new machine) <i>The 52/8 may be used for books up to 10mm (3/8") thickness</i>	See Appendix 34
LST-100	Loop (Omega) stitch head	May be used to replace <u>standard</u> stitch heads to produce loop stitches	Refer to IBIS for further details
LSM-100	Loop (Omega) stitch drive modification	Stitcher drive upgrade needed when using loop stitch heads	Refer to IBIS for further details
SDI-100	Stitcher drive automatic inhibit system	May be used to automatically inhibit stitching (for example if producing single 4-page folded sheets).	See Appendix 21
HKS-100	Two 100Kg wire spool holders and spools (floor mounted)	May be used instead of normal 2.5Kg (5.5lbs.) wire spools. Recommended for long run applications and to reduce wire pull force needed.	See Appendix 12
WST-100	Handling trolley for 100 Kg wire spools (includes hydraulic lifting jack)	Used in conjunction with HKS-100 (above)	See Appendix 12

CKN-100	Trimmer center knife assembly with ¼" wide trim-out knife	Use to make small format booklets: 2-up production. Maximum book thickness approximately 3mm (1/8")	See Appendix 17
CKN-101	Trimmer center knife assembly with 3/8" wide trim-out knife	Use to make small format booklets: 2-up production. Maximum book thickness approximately 4 -5mm (3/16")	See Appendix 17
CKN-102	Trimmer center knife assembly with single bladed knife (no trim-out)	Use to make small format booklets: 2-up production. Maximum book thickness approximately 6-7mm (1/4")	See Appendix 17
TWC-100	Trimmer waste removal conveyor	Used to remove trimmed-off paper if no pneumatic waste extraction system is available.	See Appendix 4
TWC-101	Trimmer waste removal conveyor (High level delivery for large 'wheelie' bin collection)	Used to remove trimmed-off paper if no pneumatic waste extraction system is available.	See Appendix 4
PLT-100	Pile loading trolley	Used together with Sheet feeders SB-095 or SB-096 to reduce sheet reload time from about 3 minutes to about 35 secs.	See Appendix 6
HPL-100	Hovmand pile loading system	Used together with Sheet feeders SB-095, SB-096, or SB-097 to reduce sheet reload time from about 3 minutes to about 35 secs.	See Appendix 8
B0000586 (TCA-100)	Trimmer clamp assembly for thick books	May be used to reduce spine 'corner-tearing' when making thick books.	See Appendix 19
TWB-100	Trimmer waste collection bin	Use to collect trim-off paper from waste removal conveyor TWC-100.	Refer to IBIS for details
TCC-100	Trimmer waste collector with circular outlet	Use instead of TWC-100 to connect trimmer to customer-supplied vacuum paper waste extraction system.	See Appendix 30
NSP-100	Non-standard paint color	Choose if the machine color needs to be different from the standard IBIS 'ivory white' and grey color scheme (extra cost).	Refer to IBIS for details

Optional modules that may be added before or after the Smart-binder (in-line connected)

SB-095	Sheet pile feeder for connection directly to the sheet infeed conveyor.	For dedicated off-line operation from a pile of digital-printed sheets.	See Appendix 5
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	Includes air pump and interface parts.		
SB-096	Sheet pile feeder mounted <u>on the side</u> (with roller table to change sheet direction) Includes air pump and interface parts.	To allow an off-line Smart-binder (with direct-connected sheet pile feeder SB-095) to also feed from an additional sheet pile feeder on the side.	See Appendix 27
SB-097	Sheet pile feeder mounted <u>in-line</u> (with bridge conveyor to transport sheets over feeder when running in-line) Includes air pump and interface parts.	To allow a Smart-binder fed from a web cutter to also be fed from an in-line sheet pile feeder (<i>combined in-line and off-line operation</i>).	See Appendix 7
F-100 or F-101 or F-200	Cross-Folder (buckle fold)	The F-100 or F-101 may be used directly before the Smart-binder infeed register conveyor to allow web speeds in excess of 130meters/min using 8-page sheets, or to run paper stock weights below 60 gsm. The F-200 is a more expensive 'selective' folder which can vary on the run between producing 8 and 12-page signatures.	See Appendix 13
SRF-100	Rotator/folder	The SRF-100 may be used directly before the Smart-binder infeed register conveyor to rotate and fold sheets (<i>for production of small format books from large 8-page sheets</i>).	See Appendix 14
MS-45	Knife folder	May be used directly at the end of the trimmer delivery conveyor (in-line) to put one extra 'knife-fold' in the finished document.	See Appendix 28
RRT-100	Roller table	May be used to change sheet direction	Refer to IBIS for further details
RRT-101	Roller table	May be used to change sheet direction by 90-degrees. Includes an input bridge conveyor with separate drive	Refer to IBIS for further details
RRT-105	Roller table		Refer to IBIS for further details
HDM-101	Hole drilling module	May be installed at the end of the Smart-binder delivery to add drilled holes to the finished book. <i>Max book thickness: 50mm (2")</i>	Refer to IBIS for further details

BSS-10	Booklet or signature stacker module	May be installed at the end of the Smart-binder delivery to create completed book stacks (piles). May be fitted with optional Intelligent stacking controls (see below) to deliver (for example) stacks of signatures for feed into the perfect binder.	See Appendix 9
SBCR-100	Intelligent stacking options for BSS-10 stacker	Includes bar code reader and separate controller	See Appendix 9
BSS-30	Palamides stacker, non compensating	Alpha 500 stacker. Maximum stack height 120mm (4 ¾"). Optional gluing between sigs to create book blocks for perfect binding.	See Appendix 29
PB-1-clamp binder	Single clamp off-line perfect binder with cover feeder	Use to make perfect-bound books (<i>single shift work</i>).	Refer to IBIS for further details
PB-multi-clamp binder	Off-line Perfect binder with multiple clamps (for higher speed) and cover feeder	Use to make perfect-bound books (<i>multi-shift work</i>).	Refer to IBIS for further details
Book trimmer	3-side trimmer for perfect bound books	Use for final trim of perfect bound books (<i>may be used off-line or in-line with the binder</i>)	Refer to IBIS for further details
SM-101	Spine squaring module	May be fitted directly to the end of the Smart-binder delivery conveyor, to press the spine into a 'square' shape. Only for books up to about 6.5mm (1/4") thick. Maximum speed 1700 books/hr.	See Appendix 22
ARSD	Spine squaring module	May be fitted directly to end of Smart-binder delivery conveyor to press the spine into a 'square' shape.	See Appendix 23
DES-100	Document edge sealer	May be fitted directly to end of Smart-binder delivery to glue the edges of the over-size cover together. Used to secure 'sensitive/confidential' documents such as exam papers.	Refer to IBIS for further details
BDC-100	90-degree bend conveyor	Puts book delivery conveyor at 90 degrees to reduce overall machine width	Refer to IBIS for details
PS-100	In-line pile strapper	Used to apply a plastic strap around each booklet or signature pile. Normally used in combination with stacker BSS-10 book stacker	See Appendix 31

BTM-730	Tabbing Module	Applies an adhesive tab (or tabs) to close the booklet edge for increased security	See Appendix 36
ISF-100	Sheet inserter	Allows a separately-printed sheet to be inserted into the booklet	Note: A Data Sheet appendix will be added soon.
IJPH-100	Ink-Jet print heads	Offers ink jet printing on the outside of each booklet for 'personalisation'	Note: A Data Sheet appendix will be added soon.
PBM-100	Pile bander	Applies a wide paper or plastic (film) band around each booklet pile.	Note: A Data Sheet appendix will be added soon.
PFW-100	Flow Wrapper	Encloses each booklet pile in a sealed polythene film bag	Note: A Data Sheet appendix will be added soon.
IJL-100	Label Applicator	Ink jet prints a label and attaches it to each finished pile of booklets	Note: A Data Sheet appendix will be added soon.
LT-100	Laser-Tabber to produce extended tabs for ECL label booklets (Pharma Extended Content Label booklets)	Receives ECL label booklets from the Smart-binder (in-line connected), opens the top cover, laser cuts tabs into the top cover and cuts all other sheets to a narrower width so tabs protrude from the front edge of the booklet.	Note: A Data Sheet appendix will be added soon.

Optional spare parts and post installation support

SPK-100	Essential Smart-binder spare parts kit	Includes all parts that <u>must</u> be held close to the machine to support normal operation. <i>Refer to IBIS for spare parts relating to optional modules.</i>	Refer to IBIS for details
SPK-101	Basic Smart-binder Spare Parts Kit	Includes all parts recommended to be held close to the machine. <i>Refer to IBIS for spare parts relating to optional modules.</i>	Refer to IBIS for details
SPK-102	Extended Smart-binder spare parts kit	Includes all parts recommended to be held by distributors in each country when the installed base exceeds 3 units. <i>Refer to IBIS for spare parts relating to optional modules</i>	Refer to IBIS for details
SKK-100	Spare set of trimmer front and side knives (upper and lower)	It is recommended to hold two spare sets of knives for each machine (<i>one ready to fit and one being reground</i>).	Refer to IBIS for details

SCK-101	Spare set of trimmer center-knives (1/4" trim out)	It is recommended to hold two spare sets of knives for each machine (<i>one ready to fit and one being reground</i>)	Refer to IBIS for details
SMK-100	Scheduled maintenance kit	All parts that are required to be changed at regular intervals (every 3000 running hours)	Refer to IBIS for details
SMP-100	Scheduled Maintenance Programme SMP	Chose this option for all scheduled maintenance (PM) to be carried out by IBIS.	Refer to IBIS for details
CSP-100	Customer support program CSP	Chose this option for enhanced support program from IBIS.	Refer to IBIS for details

10 Using the Smart-binder

10.1 Book and sheet integrity checking

All Smart-binders have a code reader fitted (bar-code reader or 2D Datamatrix code reader) which reads a code printed on each incoming sheet. If there are no codes printed on the sheets then the Smart-binder can be set to produce booklets with a fixed 'selectable' number of sheets, based on a simple count, but it is then very difficult for the operator to ensure that sheets are in the correct position in each booklet and there is a high risk that bad booklets will be delivered.

Assuming sheets are coded then the Smart-binder tracks each sheet and each saddle-bound booklet (or signature) using the information from the barcode to ensure that only books/signatures with the correct pages in the correct sequence are delivered as "good" onto the delivery conveyor. Any "bad" books are automatically rejected into the reject bin below the trimmer. If each booklet contains a unique ID number in the bar code, then the Smart-binder machine controller (PC) retains production data on each individual booklet that may be accessed by the user. Booklets which fail to be delivered onto the Smart-binder delivery may require to be reprinted and this re-print signal can be provided by the Smart-binder controller. The optional SDA-100 Smart-Data Analysis system (fitted as standard with all new in-line version Smart-binders) assists the creation of reprint signals for rejected/missing booklets (see 10.2).

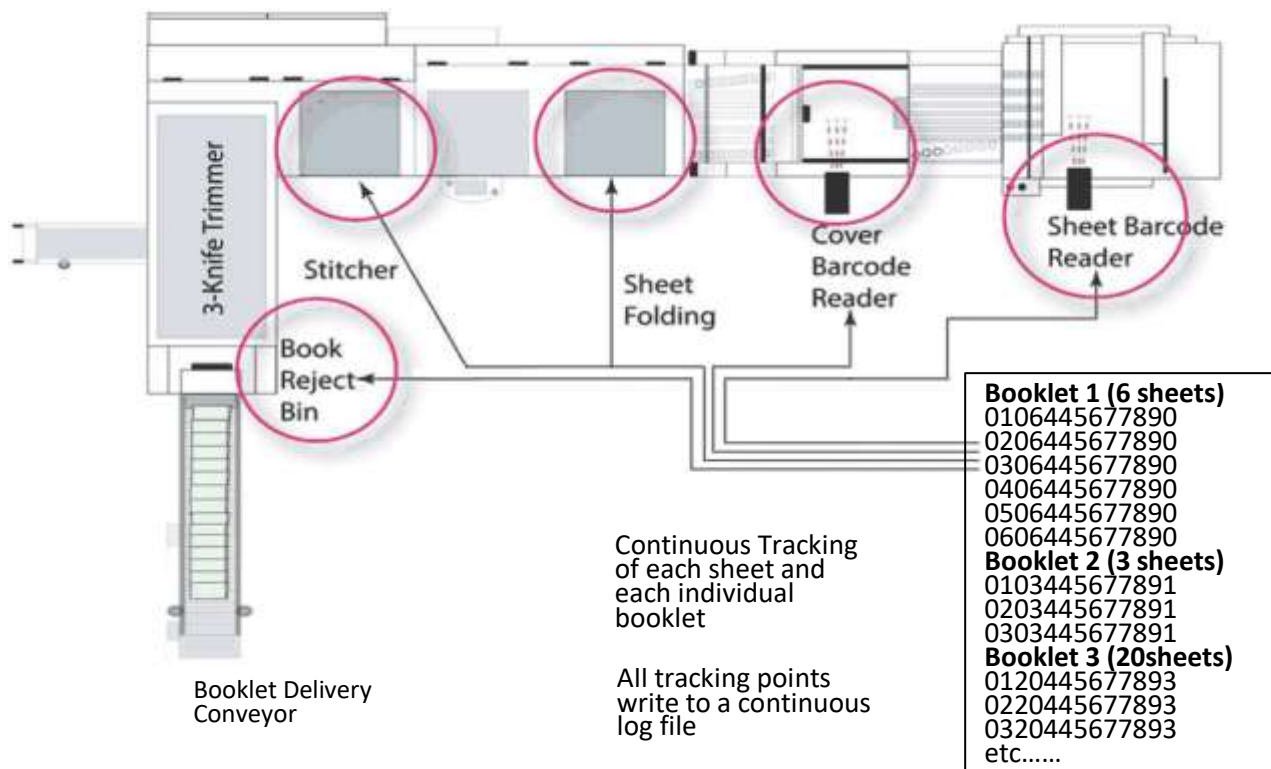
The Smart-binder can read all common barcode or 2D code symbologies, depending on the reader that is selected. The code can be trimmed off from the finished booklet by the Smart-binder three-knife trimmer if the code is not to remain visible on the finished booklet or signature.

Additionally, the Smart-binder can match separately-printed personalized covers with the booklet text. In this case a reader in the cover feeder will compare the ID number printed on each cover with the ID number on the inside text sheets. The Smart-binder can be set to either stop when a mismatch or other fault is detected, or to reject the faulty booklet by placing it into a reject bin.

If a unique booklet ID is added to the code printed on each sheet, then the Smart-binder will automatically check that all sheets in each booklet contain the same 'ID'

number to ensure that sheets from one booklet cannot be mixed with sheets from another booklet.

Off-line version Smart-binder: Integrity checking



Booklet data obtained from the code printed on each sheet is written to an internal continuous 'log file' in the Smart-binder's PC. This log file can be accessed to review the status of each booklet, and to create a reprint file, and is an "auditable" file. Smart-binders are used extensively in critical booklet applications such as examination booklets, HIPPA-compliant health care policy booklets, and even surgical instrument instruction booklets which are opened in the operating room.

10.1.1 Other automated features driven by data within the printed code on each sheet:

Selecting the binding method

The code printed on each sheet may contain a digit to enable automatic switching between ISG cold glue binding and wire stitching. In this way any booklet in a job may be either stitched or glued. Alternatively, glue may be automatically inhibited on any sheet so that these sheets can be loose inside a book, or one part of the booklet may be loose compared with the other part.

Selective perforation for sheets "tear-out"

If using the optional DMP dynamic perforation system then the the code printed on each sheet may contain a digit to automatically control the perforation of each sheet, offering up to 4 different dynamically-controlled perf lines.

Selecting 'stitch' or 'no-stitch'

If using the option SDI-100 wire stitch inhibit device (see Appendix 21, then the code printed on each sheet may contain a digit to activate this stop-stitch functionality

10.2 SDA-100 Smart-Data Analysis

The SDA-100 system analyses and presents Smart-binder production data on a separate pc screen. It may also be used to assist in the creation of reprint signals for rejected/missing booklets. The SDA-100 is an integral part of the Smart-binder system when running in-line with a digital web printer but is optional when running near-line or off-line. See Appendix 25 for further details.

10.3 Producing personalised (varying thickness) saddle-bound booklets with matching covers

The Smart-binder system allows for the number of pages in each book to be continually varied (from book to book) without stopping the line, resulting in personalised 'book of one' production. This function relies on the use of barcodes printed on each sheet (or from DFA/DFD control interface if running in-line with cut-sheet printers). The Smart-binder can process ISG cold-glued saddle-bound booklets which vary continually between minimum and maximum thickness without stopping. Wire-stitched books, however, require a small stitch head adjustment if changing book thickness by more than about 3mm (1/8").

Note that if some booklets contain fewer than 4 sheets, and these are mixed with thicker booklets, then this will reduce the maximum sheet infeed rate. Refer to IBIS for more details about this speed limitation.

Personalised book production may also require a matching cover to be fed from the optional CIF-102 cover feeder. In this case an extra cover code reader (option BCR-105 or DCR-101) is available to ensure that the bar-coded book ID number on the cover matches the ID number on the inside sheets (and stops the machine if not matching).

Note: the feeding of a 'matching' cover may be avoided by feeding covers with a die-cut window, to allow external visibility of personalised data printed on the first sheet inside the booklet.

When producing personalised books in off-line mode (using the sheet pile feeder SB-095, see Appendix 5) then the sheet bar code reader may be positioned to read the top sheet in the pile. If applying a personalized cover, then the optional code reader in the cover feeder reads a code printed on the outside of the cover after the bottom cover in the pile has pre-fed a short distance. If the coded ID numbers on the sheets and cover do not match, then the machine will stop immediately before the first sheet of a book feeds from the pile feeder. This makes it easier for the operator to seek and correct the cause of non-matching sheets and cover, without having to remove sheets or covers from the machine and replace them in their respective feeders.

10.4 Producing personalized (varying thickness) perfect-bound books with matching covers.

A perfect binder may be used (off-line) and fed with 'signatures' (ISG glued or 'loose') produced by the Smart-binder. When stacked into loose books ready for hot glue binding then these signature stacks are called 'book-blocks'. Depending on the perfect binder used, the binding can adjust itself automatically to differing incoming book block thicknesses. An optional code reading system is available (refer to IBIS for details) to ensure the applied cover sheet matches the inside book block, if required.

The Smart-binder can automatically vary the number of sheets in each signature and the number of signatures in each book block if wishing to vary the number of pages in each book block (on-the-run variation).

10.5 Producing saddle-bound booklets with a large number of pages (max booklet thickness).

The Smart-binder can produce booklets up to 10mm (0.4") thick. This maximum reduces to about 8mm (0.31") if feeding pre-folded sheets into the Smart-binder because of the extra bulk of the head-folds entering the trimmer.

Note: the Smart-binder head trimmer knife removes the folded edges.

The quality of very thick booklets is much improved when using ISG cold-glue binding compared with wire stapled, because the ISG process improves booklet 'lay flat':

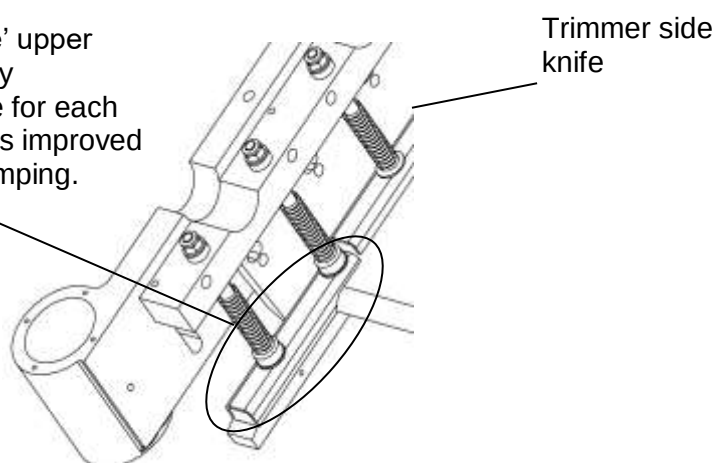


ISG glue-bound booklet

Wire-stitched booklet

All saddle-stitcher trimmers tend to create a small tear on the corner of the book spine. This is caused by the side-knife since the V shaped spine cannot normally be securely clamped. A special trimmer clamp system is available on the Smart-binder which can reduce or eliminate this tearing (refer to option B0000586 (TCA-100), Appendix 19). This special clamp system is made to suit the width of the book being trimmed. The clamp must be changed if the book width is changed, and the book widths must therefore be stated when ordering this option.

Special 'double' upper clamp assembly B0000586 (one for each side knife) gives improved book spine clamping.



10.6 Using lightweight paper stocks

The Smart-binder is best suited to sheet stock weights in the range 60 to 110 gsm (41 to 74 lb offset). Providing that the paper grain direction is parallel to the spine fold and the paper is a good quality stock, then 45 gsm (27lb offset) is the normal minimum for 4-page sheets that enter the Smart-binder, without any pre-fold.

Stock weights as low as 40 gsm (27lb offset, 11lb bond) may be used. In this case it is recommended to pre-fold each sheet using the optional F-100, F-101 or F-200 (see Appendix 13). When running very lightweight stock then the grain direction should be parallel to the spine, the paper must be of good quality and there must not be excessive static electrical charge on the paper. If pre-folding each sheet then each sheet will contain 8 pages instead of 4 pages. However if the selective folder F-200 is used, then sheets may contain 8 or 12 pages (mixed) will allows booklets to be produced in 4-page intervals even when pre-folding.

Selection of the IBIS optional anti-static system (Option ASS-100) and enhanced infeed register table (standard supply for all Smart-binders built after 2010 from serial number #52 onwards) is advisable when using lightweight sheets. Refer to IBIS before attempting to run paper weights less than 60 gsm (41lb offset).

When making thick saddle-bound booklets in the 5-10mm (3/16-3/8") range from lightweight paper then a separately-fed heavier-weight cover sheet is recommended to maintain a good quality finished book.

10.7 Using wire stitching

10.7.1 Standard 'flat' stitching

The standard Hohner 43/6S or 52/8S wire stitch heads produce a flat stitch, using round section wire (0.4 – 0.6mm diameter).

The 43/6S has a maximum stitch thickness of 6mm (maximum book thickness 7-8mm (9/32-5/16")). The crown length is 12mm. See Appendix 33

The 52/8S has a maximum stitch thickness of 8mm (maximum book thickness 10mm (3/8")). The crown length is 14mm. See Appendix 34



Normal flat stitch

10.7.2 Producing books with 'loop' stitches (Option LST-100)



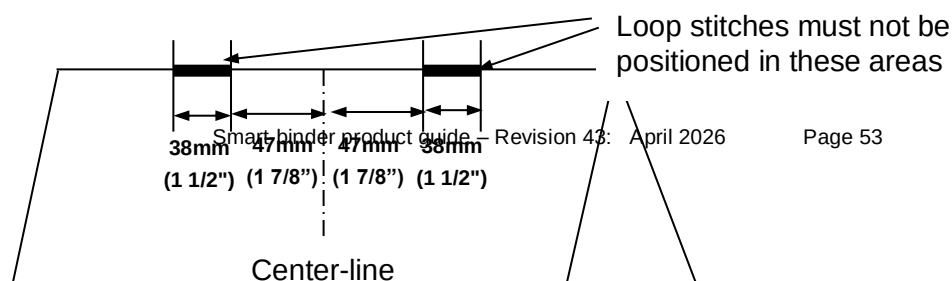
Loop stitch

Loop (or 'Omega') stitches may sometimes be required in place of normal stitches to allow booklets to be placed into ring binders (as an alternative to hole punching). Loop-stitch heads may be selected from the standard Smart-binder options list. Note that the maximum stitch thickness when running loop stitch heads is 4mm (1/8-5/32") (maximum finished book thickness is 6 mm).

The use of loop-stitch heads requires a modification LSM-100 to the Smart-binder stitch-head drive.

10.7.3 Limitations on positions for loop stitches

Loop stitches cannot be placed in the areas shown below as they would interfere with the trimmer backstops. This does not prevent loop stitches being placed in the standard positions to suit either European or USA ring binders.



10.7.4 Stitcher drive upgrade option LSM-100

An upgrade to the Smart-binder stitcher drive is needed if using loop (omega) stitch heads due to the higher operating force required.

10.7.5 Using the stitcher drive inhibit option SDI-100

If option SDI-100 is selected, then the stitcher drive may be automatically inhibited. This function may be required if producing 4-page booklets (single folded sheets with no stitches), or to assist book run-out at the end of a job. See Appendix 21.

10.7.6 Missing stitch detection MSD-100

Missing stitch detection. All Smart-binders manufactured from summer 2022 onwards include as standard an Automatic Wire stitch (staple) detection system. This will reject any booklets which are missing a staple. Multiple consecutive rejects will cause an automatic machine stop to allow the Operator to rectify the problem. See Appendix 35 for details.

10.7.7 Using 100Kg (220 lbs.) Wire spools

The standard Smart-binder is supplied with two 2.5Kg (5.5lbs.) wire spools mounted on the back of the stitcher.

A recommended option is to replace these with 100Kg (220 lbs) wire spools which are floor mounted behind the stitcher. The advantage of these large spools is that spools will last a very long time before needing replacement and the wire pull force is reduced (which assists stitch head operation). See Appendix 12.

10.7.8 Using the ISG cold-glue binding system

ISG cold glue binding offers many advantage compared with wire stitching when making self-cover booklets using non-coated (absorbent) paper stocks (See Appendix 1 for details) . The glue bond is reduced if using coated stocks. If feeding a separately-printed cover from the cover feeder and using ISG cold glue binding then there must be a gap after the last sheet of each booklet into which the cover can be fed. Creating this gap may reduce slightly the machine speed, particularly if making very thin booklets, and if feeding from a web cutter, then the cutter must be programmed to create the gap automatically. If using a Tecna TC-7000 or C7 web cutter then the Smart-binder can control the cutter to automatically create the required gaps in the sheet stream.

If using ISG binding then the automatic glue detection system ensures that no booklets are produced without glue binding.

Only the IBIS-recommended glue of the correct viscosity should be used. This glue is applied from a reservoir behind the Smart-binder which is pressurized with high pressure air and delivers the glue through a pipe to the applicator nozzle mounted in the Smart-binder folder.

Glue is applied in the form of dots to each sheet exactly on the fold line. Dot spacing and dot duration may be varied from the Smart-binder touch screen. The standard nozzle size is 0.4mm, but this may be replaced with other nozzles if significantly more or less glue is required. Using the touch screen, the glue system can be programmed to automatically apply more glue to the outside cover compared with the inside sheets, if required to increase the cover bond strength.

The consumable cost of cold glue is similar to the cost of stitching wire. See Appendix 1
The glue application on each sheet may be controlled automatically by a digit in the bar code printed on each sheet.

10.8 Feeding Covers and/or insert sheets

10.8.1 Covers or insert sheets fed from cover feeder (Option CIF -102)

See Appendices 3 and 16 for information on optional Cover 'Autoloader' and 'Cover Matching'.

When making saddle-bound books, covers or insert sheets must be the same length as the sheets on to which they are fed (same spine length). Covers or inserts that are longer or shorter than the sheets will cause some loss of print registration between sheets. The cover or insert-sheet width does not have to be the same as the content sheet width because covers are independently side-registered before entering the folder.

If feeding covers or inserts from the cover feeder and making ISG cold glued books then there must be sufficient space between the last sheet of one book and the first sheet of the next book into which to feed the cover or insert sheet. If running in-line with a high-speed digitally-printed web, then this may mean that the web cutter must be programmed to pause momentarily to create this gap. If feeding from a pile feeder, then the gap in sheet feeding will be created automatically by the Smart-binder feeder control system.

10.8.2 Two cover feeders (using optional extra feeder CIF-101)

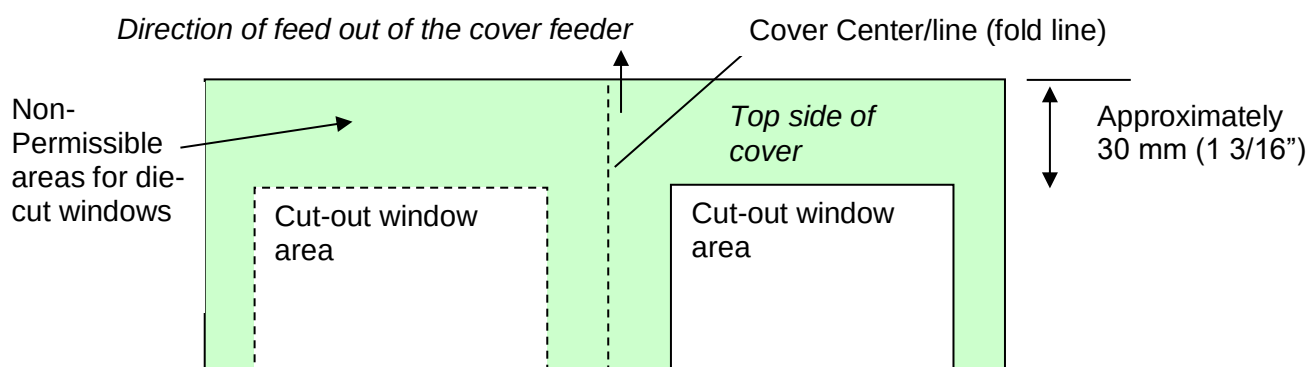
The additional CIF-101 feeders may be supplied so that one cover (or insert) 'A' can be fed from the CIF-102 and another cover (or insert) 'B' from CIF-101. See Appendix 20. An extra digit in the sheet bar codes will then determine whether CIF-101 is activated or CIF-102 is activated (or both). This dual feeding may be used to allow covers to be changed frequently without stopping the system, or to allow an insert sheet to be fed into each book in addition to a cover sheet.

Note: if an insert sheet is fed from additional feeder CIF-101, or is required to be fed into the center position within a book from either CIF-101 or CIF-102, then it must be fed into a sheet gap, not on top of another sheet

The CIF-101 is only needed if it is required to feed two sheets into each booklet. If only one sheet is needed (for example one cover sheet, or one insert sheet), then only the Cover/insert feeder CIF-102 is required.

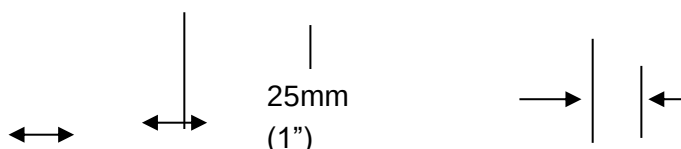
10.8.3 Feeding Covers with cut-out windows

Covers with die-cut windows may be fed from the CIF-101 or 102 cover feeders depending on the type of cover, and type of cut out. The window should be at least 30mm (1 5/32") wide (measured in the direction of cover flow out of the feeder). There are areas on the cover where it is not possible to position a cut-out window (see below):



Note: avoid this area if possible because windows on the underside of the book can cause difficulties in the trimmer.

Permissible area for die-cut windows



If feeding covers with windows, then a special design 'guide' must be fitted inside the window hole.

Cut out windows

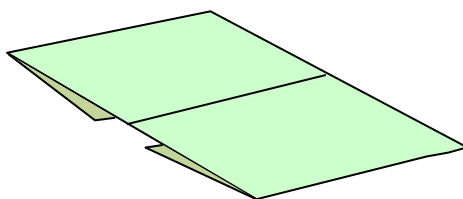
Custom design guide to assist feeding of covers with windows

Pile of covers in the cover feeder

This guide will be provided by IBIS and made to fit exactly the size of the cut-out window hole.

10.8.4 Covers with Gate-Folds (winged covers)

Covers with gate-folds have an extra folded 'flap' on one or both sides which make them difficult, or in some cases impossible, to feed. These types of covers may contain 6 or 8 printed pages.



Check with IBIS first if wishing to run gate-fold covers.

10.8.5 Covers with 'tear-off' perforations

Some covers with 'tear-off perforations' may be run depending on the type and position of the perforations.

Check with IBIS first if you wish to run perforated covers

Note that an optional 'dynamic' micro-perforation system DMP-100 (see Appendix 11) is available for installation just before the Smart-binder folder. This may be used to automatically perforate covers (and/or content sheets) if not already pre-perforated.

10.8.6 Cover Code Reader (option BCR-105 or DCR-101)

To check that the correct cover (or insert sheet) is being fed onto each book, the optional code reading system (BCR-105 bar code reader or DCR-101 2D code reader) must be used (see Appendix 18). This compares bar coded ID numbers printed on each cover (or insert) with the code printed on the inside sheets and stops the system (or alerts the operator) if they do not match.

10.8.7 Feeding covers or inserts mixed with content sheets from the off-line pile feeder (instead of feeding from the cover feeder)

Covers or inserts may be mixed with the content sheets to create one pile (sheets and covers mixed together). This pile may be fed from sheet feeders SB-095, SB-096, SB-097. In this case we recommend that the ratio between cover/insert stock weight and sheet stock weight is no more than about 2.5 :1.

10.9 BSS-10 booklet or signature stacking

Booklets or signatures produced by the Smart-binder may be stacked into horizontal piles up to 235mm (9.25") high , or 330mm (13" high) as a special option, using the BSS-10 stacker (see appendix 9). The number of books in each pile is selectable by the machine operator. A turntable in the stacker enables books within each pile to be stacked in batches with spines in each batch in the opposite direction to the spines in the next batch. This ensures pile stability by avoiding all the spines being on the same side.

Book piles are delivered onto a free running roller table where they accumulate until removed by the operator. An in-line (or off-line) pile 'strapper' PS-100 (see appendix 31) or Pile Bander PBM-100 is also available .

The BSS-10 stacker may be fitted with Option SBCR which provides a bar code reader and additional controller for 'intelligent' stacking. This may be used, for example, to process signatures into 'book blocks' for manual feed into a perfect binder.

10.10 BSS-20 and BSS-30 booklet or signature stacking

The BSS-30 'Alpha' stacker may be selected if book blocks need to be produced for perfect binding. This stacker has the option to apply glue between adjacent sigs to ensure the book blocks stays in register when being transported to the binder clamps. It also includes the option for automatic reject of any 'bad' book block stack.

10.11 Booklet Spine squaring

The Optional SM-101 or ARSD spine squarers (see appendices 20 and 21) may be attached to the end of the Smart-binder book delivery conveyor to press the normal booklet 'V' shaped spine into a 'square' shape:



Note: because of individual sheet folding, books produced by the Smart-binder do already lie very flat (particularly if ISG cold-glued) and there may not therefore be any significant improvement in flatness after spine-squaring. In fact, spine squaring does not give a good result on ISG glue bound booklets because the glue makes the spine more difficult to deform into a square shape. It is recommended therefore that spine-squaring is only used when making wire-stitched booklets.

The Spine Squarer may restrict the Smart-binder running speed and maximum booklet thickness if used in-line.

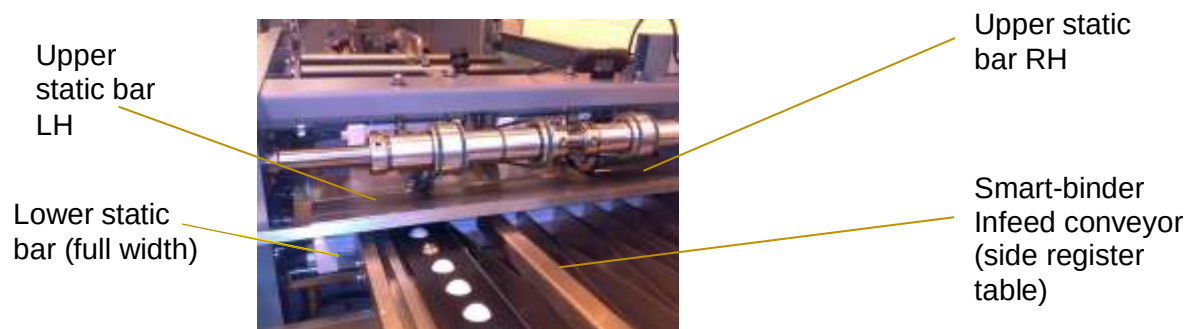
10.12 Using Pile Loading systems

The pile-loading systems PLT-100 or HPL-100 may be used to reduce the time needed to load the off-line version Smart-binder (SB-095 feeder), or the SB-097 feeder used as part of a near-line or in-line system. See Appendices 6 and 8 for details.

Pile reload times may be reduced from about 4 minutes to about 35 secs, resulting in approximately 10% improvement in system output.

10.13 Dealing with 'Static' electrical charge on the sheets

The ability to fold and collect sheets reliably at high speed is very dependent on the amount of static charge on the sheets, particularly when running with lightweight papers stocks or coated stocks which attract static. The Smart-binder has anti-static systems fitted just prior to the scoring module (see below) and above the sheet collector. However, it is important that anti-static devices are also fitted in all upstream equipment to minimize static charge on the sheets entering the Smart-binder.



Additional anti-static reduction systems may be available for installation in the sheet collector area if needed. Refer to IBIS if required.

10.14 Smart-binder Production Speeds

10.14.1 Sheet infeed rates

10.14.1.1 Production in-line with a Digital printer or 'near-line' from a pre-printed roll

When running in-line with a digital web printer (or pre-printed roll), the sheet arrival rate depends on web velocity and sheet cut-off dimension. The Smart-binder 'PLUS HS' model allows for operation

in-line with printers or near line from an unwinder/cutter at up to around 130 meters/min (426 feet/min) web speed.

If higher speeds are needed then each 'sheet' may be 'pre-folded' using an in-line cross-folder (F-100, F-101, F-200, SRF-100: see Appendices 13 and 14). In this case each sheet must contain 8 pages (or 12 pages if double-folded) instead of 4 pages and a web speed of 180meters/min (590 ft/min), or faster, is possible. Our experience to date (as of July 2025) is with webs operating at up to 150meters/min (500 feet/min).

Note: Production speeds when making very thin booklets: When producing 8-page booklets (excluding separately-fed cover), the maximum sheet infeed rate is reduced to about 232 x 4-page sheets/minute (or 116 x 8-page pre-folded sheets/min if using the optional cross-folder), in order not to exceed the maximum Smart-binder PLUS HS speed of 116 booklets/min (7,000 books/hour).

10.14.2 Booklet Production Rates: A4 saddle-bound books (no separately-fed cover)

10.14.2.1 Performance calculation when running from a web cutter

When running from a web cutter and producing booklets 1-up, then the booklet production rate can be calculated as follows:

$$\text{Booklets/minute} = \frac{\text{Web speed in meters/min}}{\text{Sheet length (in meters) x number of sheets in booklet}}$$

For example: If a 450mm web is running at 100 m/min and the sheets are cut to 450 x 307mm then 6-sheet booklets (24 printed pages) will be produced at a rate of:

$$\frac{100}{0.307 \times 6} = 54.3 \text{ booklets/min}$$

This calculation applies unless this would result in a speed in excess of 116 booklets/min. (7,000 bks/hr), in which case the web speed must be reduced to avoid exceeding this maximum Smart-binder cycling speed.

10.14.2.2 Performance calculation when running off-line from a sheet feeder

When running from a sheet pile feeder and producing booklets 1-up, then the booklet production rate can be calculated as follows:

$$\text{Booklets/minute} = \frac{\text{Sheet feeder rate (sheets/min)}}{\text{number of sheets in booklet}}$$

For example: If a the sheet feeder is set to feed sheets at 400 sheets/min. then 6-sheet booklets (24 printed pages) will be produced at a rate of:

$$\frac{400}{6} = 66.7 \text{ booklets/min}$$

This calculation applies unless this would result in a speed in excess of 116 booklets/min. (7,000 bks/hr), in which case the web speed must be reduced to avoid exceeding this maximum Smart-binder cycling speed.

10.14.2.3 Notes on booklet production rates

- The preceding calculation is for one-up production. Two-up production (running with center knife) will double the book output rate.
- Page throughputs may be increased if using a cross-folder directly prior to the Smart-binder (providing the maximum machine cycling speed of 116 cycles /min is not exceeded). In this case each sheet entering the Smart-binder infeed will contain 8-pages instead of 4-pages and production speeds. If 8-page increments are not acceptable then the selective folder F-200 is available to deliver a mixture of 8 and 12-page signatures and thereby retain 4-page increments.
- When running with very lightweight or 'difficult' paper (for example: paper weights less than 60 gsm), then web speeds may have to be reduced, or the in-line F-100 (or F-101 or F-200) folder may be used to avoid a web speed reduction.
- The maximum book output rate of 116 books/min cannot be exceeded (or 232 books/min if running 2-up with trimmer center-knife).
- On a CF web system, time is needed to change paper rolls periodically, and there may be system stops caused by the upstream printer and/or web cutter. When running off-line, then time is needed to load stacks of paper on the pile feeder. When book size changes, time is needed to adjust the Smart-binder (and often the upstream equipment as well). These stops must be considered when estimating production capacity. Refer to IBIS for estimated Smart-binder operating efficiencies.
- System make-ready time for a change in booklet format size varies depends on circumstances and operator experience, but as a guide:
 - The Smart-binder make-ready time for booklet format change is about 5 minutes if stitch head positions do not need to be moved, or 10 minutes if they do need to be moved.
 - Pile feeder loading (off-line operation only) – about 3 -5 minutes depending on pile height, or 35 secs if using PLT-100 or HPL-100 pile loading systems. Loading may be required every 5,000-8,000 sheets depending on sheet thickness
 - After changing to a different booklet format size then some additional time may be required for further small adjustments to achieve the require booklet finish quality.
- When using ISG gluing and feeding a separately-printed cover sheet, then the output rate may have to be reduced to allow sufficient space to feed a cover between the last sheet of one booklet and the first sheet of the next booklets.
- The optional SM-101 spine squaring module reduces the maximum output rate, if used in-line with the Smart-binder (see Appendix 22).
- The modification to reduce the minimum trimmed booklet size from 119mm to 82.5mm reduces the maximum trimmer cycling speed from 7,000cph to about 5,000 cph.

11 Booklet finished format sizes

11.1.1 Standard Smart-binder booklet sizes

Typical booklets that can be produced on the **standard Smart-binder SB-2 and SB-3** include the following sizes:

Size	Metric dimensions (mm) (Spine length x width)	Inch Dimensions (Spine length x width)
A4 (1 up)	297 x 210	
A5 Portrait (1 up)	210 x 148	
A5 landscape (2-up only)	148 x 210	
A6 landscape (2-up only)	105 x 148*	
CD booklet (2-up only)	120 x 120	
US Letter size (1-up)		8 1/2 x 11
US Digest size (1-up)		5 1/2 x 8 1/2
US Digest Oblong (2-up only)		8 1/2 x 5.5
US Oblong (1/4 letter) (2-up only)		5 1/2 x 4 1/4

Notes:

2-up production required optional trimmer center-knife and requires 2 additional wire stitch head, unless ISG cold glue binding is used (recommended).

Booklet sizes not listed above may also be produced: Refer to Smart-binder specifications.

Booklets with finished spine lengths in between 150 and 200mm (5 7/8 and 7 7/8") must be produced 2-up using the stretched model SB-XW (see 11.1.2 below).

11.1.2 Producing booklets outside the normal format size range

The Smart-binder may be manufactured with the modification package 'BFM-100'. This increases the maximum incoming sheet width from 470 to 545mm and the maximum finished booklet, with from 230 to 273mm (less from knife trim off). It also reduces the minimum incoming sheet width from 250mm to 150mm and the minimum trimmed booklet width from 119mm to 82.5mm. This latter modification reduces the maximum trimmer cycling speed from 7,000 cph to about 5,000 cph due to the change from cam-driven to pneumatic-driven trimmer backstop actuation.

The Smart-binder models SB-2X or SB-3X are an extended version of the normal SB-2 or SB3 which increases the maximum booklet spine length from 320mm to 457mm (less head/foot trim off).

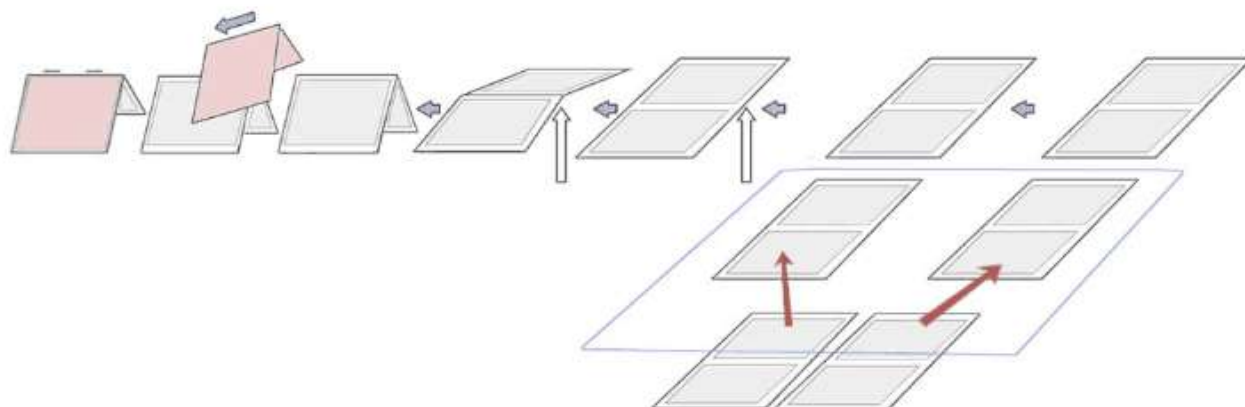
This allows production of booklets longer than the normal Smart-binder maximum, or it can be used to produce A5 (or 5 1/2 x 8 1/2") portrait format booklets 2-up (using the optional trimmer center-knife):

Size	Metric dimensions (mm) (Spine length x width)	Inch Dimensions (Spine length x width)
SB-XW maximum size	457 x 273 (less trim-off)	18 x 10.75 (less trim off)

11.1.3 Producing small format booklets using TUSDC-100 sheet direction-change module

By slitting the web down the middle, producing two sheets side-by-side, and then changing the direction of both sheets by 90-degrees before they enter the Smart-binder, it is possible to produce

smaller format booklets (such as A5 or 5 ½ x 8 ½”) in 4-page increments starting from a wide web (for example 450mm or 18”).



The disadvantage of this configuration is that all sheets must be direction-changed so it does not allow the production of larger format booklets such as A4 or 8 1/2 x 11”) . See Appendix 26

11.1.4 Producing small format booklets using the SRF-100 rotator/folder

By rotating each sheet by 90-degrees and buckle-folding each sheet in half before it enters the Smart-binder, it is possible to produce smaller format booklets (such as A5 or 5 ½ x 8 ½”) from a wide web (such as 450mm or 18”) in 8-page increments.



The advantage of this method is that the rotate and fold processes can be easily deactivated to allow large sheets to flow into the Smart-binder without rotation or folding; hence both small and large format booklets can be produced. The disadvantage of this method is that the small format booklets (produced from a wide web) must contain increments of 8-pages and the additional bulk of the head-folds prior to trimming reduces the maximum number of pages in the finished booklet. See Appendix 14.

12 Smart-binder System Specifications

Maximum input web speed when fed from a web cutter

<u>Without</u> additional buckle folder	<u>With</u> additional F-100/F101/F-200 buckle folder
130 meters/min (426 ft/min). Note: booklets are made from an integral number of 4-page sheets Note: exact maximum web speed is determined by paper weight, paper stock quality and other external factors	150-180 meters/min (492-585 ft/min) Note: booklets are made from an integral number of 8-page sheets when using the F-100 or F-101 buckle folder Booklets are made from a mixture of 8-page and 12 page sheets when using the F-200 selective buckle folder in order to allow 4-page increments

Maximum input speed when fed from a sheet pile feeder

<u>Without</u> extra option F-100/F101 buckle folder	<u>With</u> extra option F-100/F201 buckle folder feeding 8-page sheets
Approximately 400 4-page sheets/min (1600 pages/min)	Approximately 300 x 8-page sheets/min (2400 pages/min)

Note: The actual maximum in live production depends on many factors such as sheet format size, paper weight (gsm), paper curl, paper static charge, sheet alignment in the stack and operator skill level.

Maximum booklet production output rate

Saddle-bound booklets
Maximum output rate (one-up) : 7,000 booklets /hour Maximum output rate (two-up using center-knife): 14,000 booklets /hour Note: the special extended model SB-X has a reduced maximum cycling rate of 5,500 cph (11,000 bks/hr in 2-up mode) Note: The modification package BFM-100 reduces the maximum cycling speed from 7,000 cph to about 5,000 cph).

Smart-binder SB. Input sheet sizes:

Sheet Input Size	Width (leading edge)	Length (in direction of travel)
Maximum	470mm (18.5")	320mm (12.6)
Minimum	250mm (9.84")	210mm (8")

Note: The size of sheets being fed into the Smart-binder should not vary by more than 0.5mm (0.020") during running. The fold line must not be more than 232mm (9 1/8") or less than 105mm (4") from either side edge.

Smart-binder SB with BFM-100 format size modification. Input sheet sizes:

Sheet Input Size	Width (leading edge)	Length (in direction of travel)
Maximum	546mm (21.5")	320mm (12 ⁹ / ₁₆ ")
Minimum	150mm (5.9")	210mm (8")

Note: use of the cover feeder CIF-102 may restrict the sizes stated above

Smart-binder SB-X 'extended model' allows for increased spine length.

Sheet Input Size	Width (leading edge)	Length (in direction of travel)
Maximum	470mm (18.5") or 546mm (21.5") with BFM-100 modification	457mm (18")

Note: The size of sheets being fed into the Smart-binder should not vary by more than 0.5mm (0.020") during running. The fold line must not be more than 273mm or less than 105mm from either side edge

Cover Sizes

Cover input size	Width (leading edge)	Length (in direction of travel)
Maximum	500mm (19.7¼") 472mm (with cover autoloader fitted)	320mm (12 ⁹ / ₁₆ ")
Minimum	300mm (11.8") with CAL-101 cover autoloader fitted. 250mm (9 7/8") without autoloader fitted and with small modification applied	210mm (8")

Note: The cover must be the same length as the sheet to ensure that it is consistently registered along the spine. Cover size should not vary by more than 0.5mm whilst running. The cover fold line must not be more than 232mm (9 1/8") or less than 105mm (4") from either side edge.

Standard Smart-binder finished booklet sizes (after 3-side trimming)

Description	Spine length	Booklet width (spine to face-edge dimension)
Maximum	320mm (12 5/8") without head/foot trim (side knives removed) 312mm after min head/foot trim (newer model SBs) 306mm with min head and foot trim (older model SBs)	225mm (8.86") or 268mm (10.55") with BFM-100 modification Note: The above assumes min 5mm front edge trim off
Minimum	** 200mm (7.9")	* 119mm (4.68") or 82.5mm (3.25") with BFM-100 trimmer modification

***Maximum when using 6.35mm (1/4") center trim-out knife	157mm (6 3/16") each booklet (thin booklets only)	225mm (8.86")
Minimum when using 6.35mm (1/4") center trim-out knife	102mm (4") each booklet	119mm (4.68")

** Booklet spine lengths between 157 and 200mm must be produced 2-up using the SB-X

*** Maximum booklet thickness is reduced when center-trimming.

Smart-binder SB-X 'Extended model': finished spine length (after 3-side trimming)

Description	Spine length (X stretch)
Maximum	457mm (18") less trim off
Minimum	200mm (7 7/8")
Maximum when using 6.35mm (1/4") center trim-out knife	225mm (8.9") each booklet less head and foot trim
Minimum when using 6.35mm (1/4") center trim-out knife	102mm (4") each booklet

Trim-off size

	Maximum	Minimum
Front knife and side knife trim-off	<i>Before April 07:</i> 20mm (3/4") on all three side <i>From April 07:</i> Front knife 27mm (1 1/16) Side knife 20mm (3/4")	3mm, or 0mm *

*Note: A trim-off between 0 and 1mm is not possible. A trim-off between 1 and 3mm (1/8") is not recommended.

Optional Center Trim-out dimension

Center knife trim out	6.35mm or 9.52mm (1/4" or 3/8") or 0mm (other dimensions by special quote).	0mm
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Book Thickness

	Maximum	Minimum
Without center-knife installed and no F-100/F-101/F-200 folder used	10mm (3/8")	1 folded sheet =Approximately 0.2 mm (.008")

With center-knife installed	6-7mm with no trim-out (center split only) 3mm ($\frac{1}{8}$ ") for 6.35mm ($\frac{1}{4}$ ") center trim 4.5mm ($\frac{3}{16}$ ") for 9.525mm ($\frac{3}{8}$ ") center-trim	1 folded sheet =Approximately 0.2 mm (.008")
If using the F-100, F-101 or F-200 buckle folder to pre-fold each sheet	Approx 8mm (0.31")	1 double folded sheet =Approximately 0.4 mm (.016")

Paper Stock Weight range

Description	Paper stock weight	Cover stock weight
Maximum	160 gsm / 108lb offset / 43lb bond	300 gsm / 200lb offset / 80lb bond **
Minimum (without F-100 pre-folder)	50 gsm / 34lb offset/ 13lb bond*, providing grain is parallel to spine.	70 gsm / 47lb offset / 19lb bond
Minimum (with F-100, F-101 or F-200 pre-folder)	40 gsm / 27lb offset/ 11lbs bond* providing grain is parallel to spine	

* Note: The minimum paper weights quoted above assume that the paper grain direction is parallel to the finished book spine. If the grain direction is perpendicular to the book spine (i.e. perpendicular to the direction of sheets entering the Smart-binder), then the minimum paper stack weights may be slightly increased. Weights below 60 gsm may require the running speed to be reduced. Weights below 60 -70 gsm are not possible when sheet rotating (see Appendix 14 and 15) or using the TUSDC direction-change modules (see Appendix 26).

** Note: refer to IBIS if wanting to run covers heavier than 250 gsm or lighter than 100gsm to confirm suitability.

Wire-stitch specifications

Description	Maximum	Minimum
Wire Stitches using 43/6-S head	Maximum stitch thickness: 6mm (0.2") Maximum booklet thickness: 7-8mm (0.27 - 0.31") Up to 4 stitches per booklet. (refer to IBIS if 6 stitches are required) 12mm flat stitch, 0.4mm to 0.6mm (0.016 to 0.024") diameter round wire. Optional 12mm loop stitch	Minimum stitch spacing (43/6 head) = 43mm (1.89") center-line to center-line. Note: minimum spacing is when making a 2-sheet booklet and increases with book thickness.
Wire Stitches using 52/8-S head	Maximum stitch thickness: 8mm (0.31") Maximum booklet thickness: 10mm (0.4")	Minimum stitch spacing (52/8 head) = 52mm (2.05") center-line to center-line.

	Up to 4 stitches per booklet. (refer to IBIS if 6 stitches are required) 14mm flat stitch, 0.4mm to 0.6mm (0.016 to 0.024”) diameter round wire. Optional 14mm loop stitch	Note: minimum spacing is when making a 2-sheet booklet and increases with book thickness.
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Glue specification (for saddle-gluing: SB-3 only)

Description	Glue type	Application
ISG cold glue	Pafra PVA cold glue AQUAPAL 9278 (sold also by Robatech as R-5183L50)	Glue dots along the inside of each sheet fold. Size and spacing of dots is variable from the SB operator I/F

12.1 Rotator/folder SRF-100 Specifications

Performance:

Speed: Approximately 300 sheets/min

Note: speed must be adjusted to provide sufficient gap between sheets for turning

Sheet sizes

Max. sheet size: width 463.5mm x length 317.5mm (18 $\frac{1}{4}$ " x 12 $\frac{1}{2}$ ")

Min. sheet size: width 297mm x length 210mm (11" x 8 $\frac{1}{2}$ ")

Maximum Fold lengths:

Fold plate I: 465 mm (18 $\frac{15}{16}$ ")

Fold plate II to IV: 385 mm (15 $\frac{5}{32}$ ")

Minimum Fold lengths:

Fold plate I to IV: 35 mm (1 $\frac{3}{8}$ ")

Number of fold plates: 4

Infeed and delivery heights.

Infeed Height: 1060mm (41 $\frac{3}{4}$ ") plus or minus 50mm (2") (adjustable)

Delivery Height: 80 –100mm (3 $\frac{1}{8}$ – 3 $\frac{15}{16}$ ") lower than the infeed height

Paper weights:

From 80 gsm to 130 gsm when sheet rotating. *Note: 70 gsm subject to testing.*

Agency approvals:

CE Conformity

GS - Mark

12.2 BSS-10 Stacker specifications

See Appendix 9

12.3 Spine squarer specifications

SM-101: See Appendix 22.

Important note: The maximum output rate from the SM-101 is 28 books/min and maximum book thickness (for high quality 'squaring') is about 3-4mm.

ARSD: See Appendix 23. Offers higher speed and/or thicker booklets

13 Configuration options for Smart-binders SB-1, SB-2 and SB-3

13.1 Common Configurations for fed from a web cutter

Key

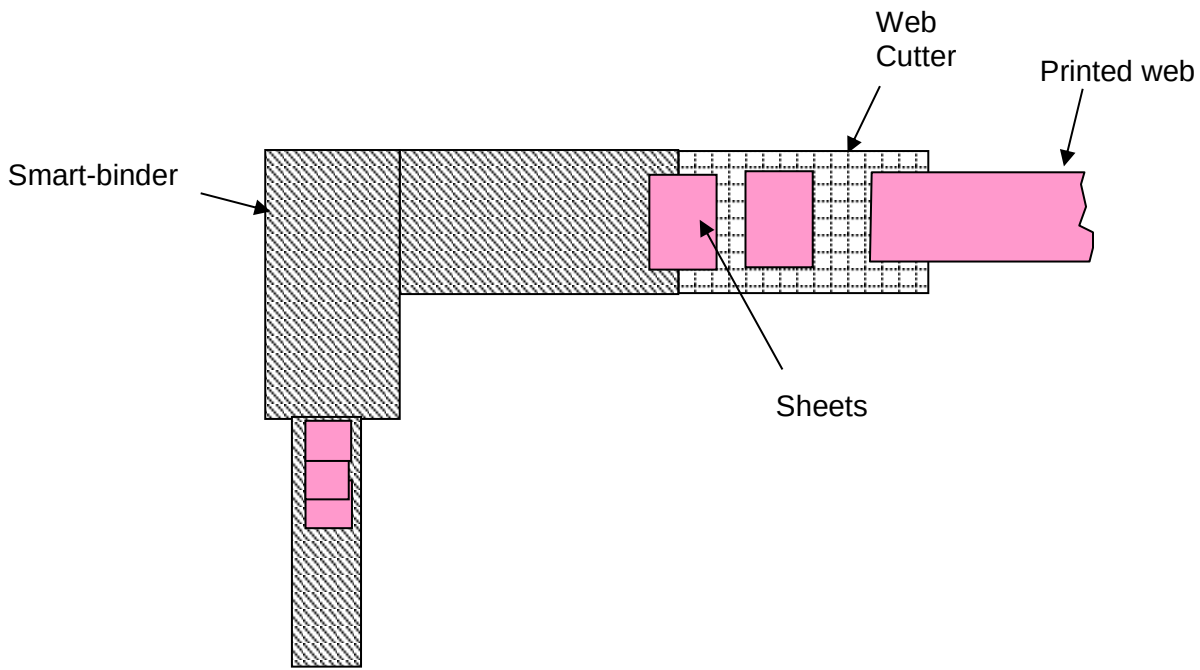
Standard Smart-binder

Smart-binder optional equipment

Equipment supplied by other manufacturers

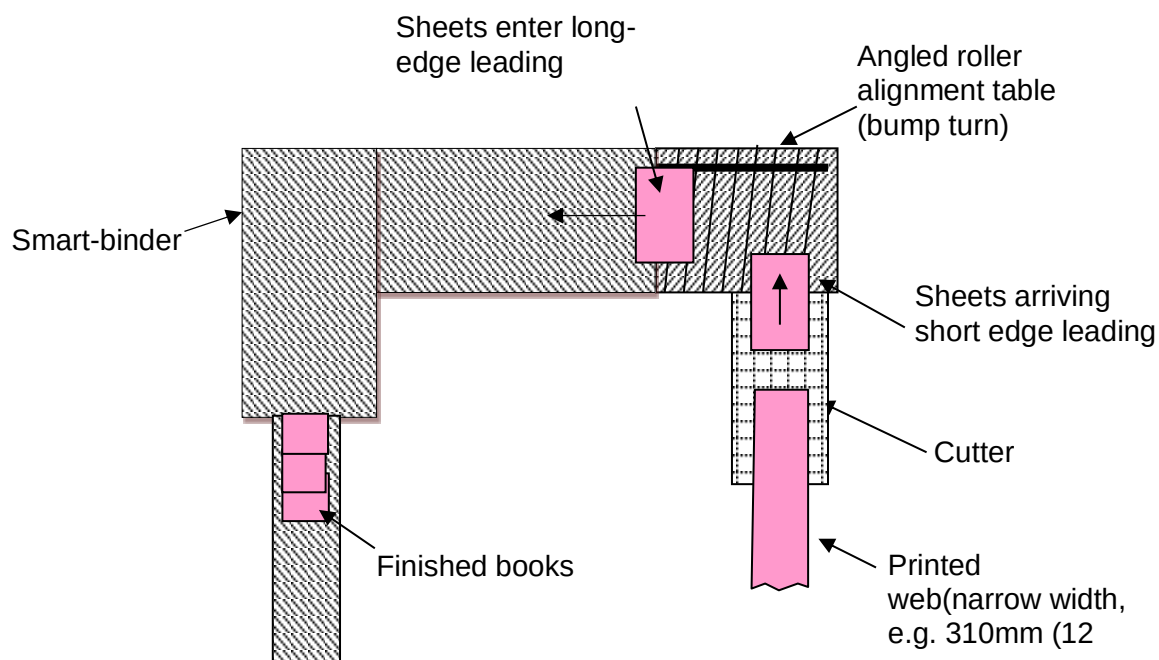
Sheets and Books

13.1.1 Normal configuration – feed directly from a web cutter



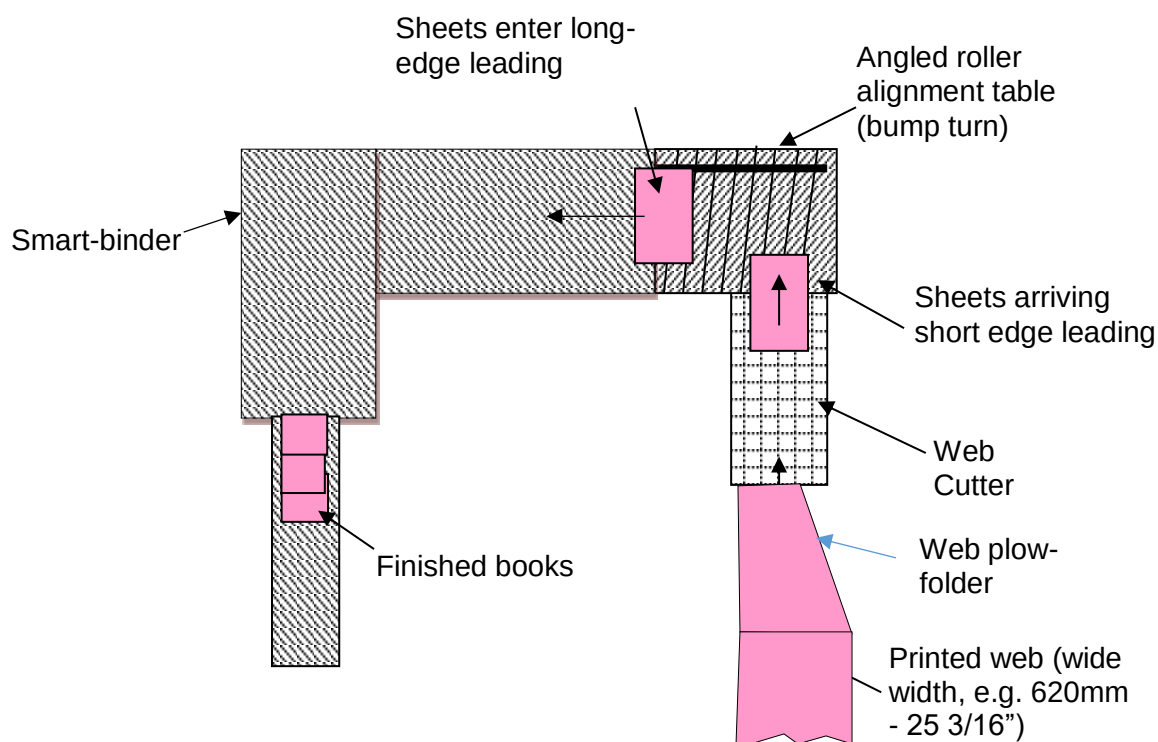
Advantages	Disadvantages
Simplest configuration will give the best system running efficiency (maximum up-time)	Small format books (e.g. A5) have to be made from a narrow web, which reduces the printer's efficiency.
	Narrow web-width printers can only make small format books.

13.1.2 Feed from a web cutter on the side - narrow web



Advantages	Disadvantages
Can make large (A4 & US letter) books in-line from a 'narrow' (e.g. 320mm (12 5/8") wide) web	Cannot make smaller (A5/Digest) sizes inline (except landscape/oblong sizes using trimmer centre-knife) .
A 320mm (12 5/8") web may be created but slitting a 640mm (25 3/16") wide web in half	Stocks lighter than 70 gsm may not reliably bump turn and any stock must be tested to verify that it can be handled in this way.
	The need to bump turn each sheet reduces the maximum web speed.

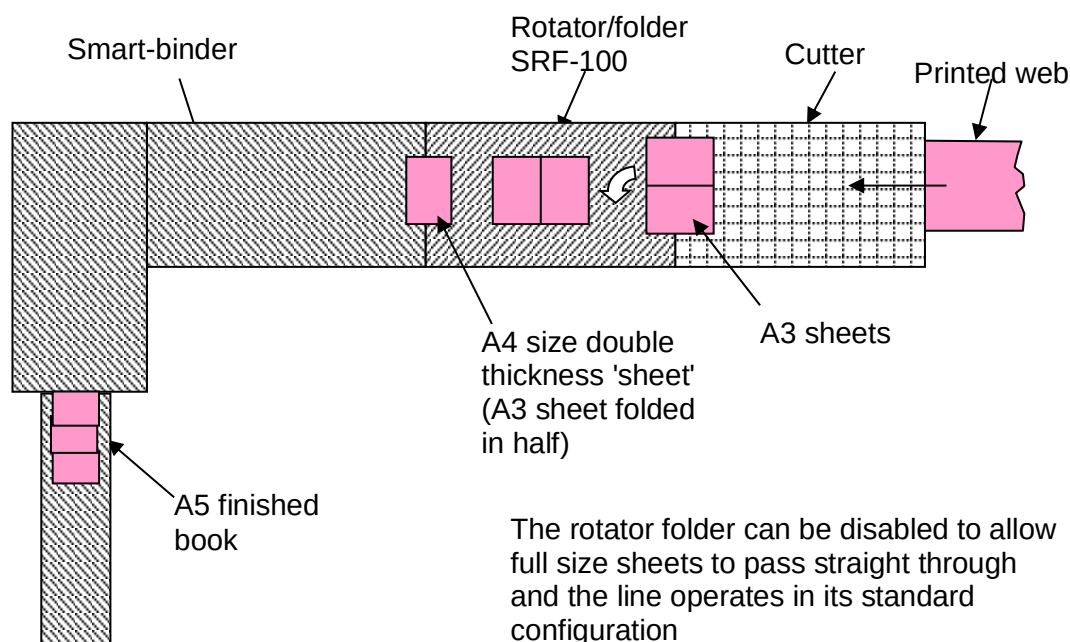
13.1.3 Feed from a web cutter on the side – wide web plow-folded in half



Advantages	Disadvantages
Can make A4 & US letter booklets using 620mm (25 3/16") wide web.	Cannot make smaller (A5/Digest) sizes inline (except landscape/oblong sizes using trimmer center-knife) .
The folded sheets are easier to bump turn than non-folded sheets	The need to bump turn each sheet may reduce the maximum printer web speed.

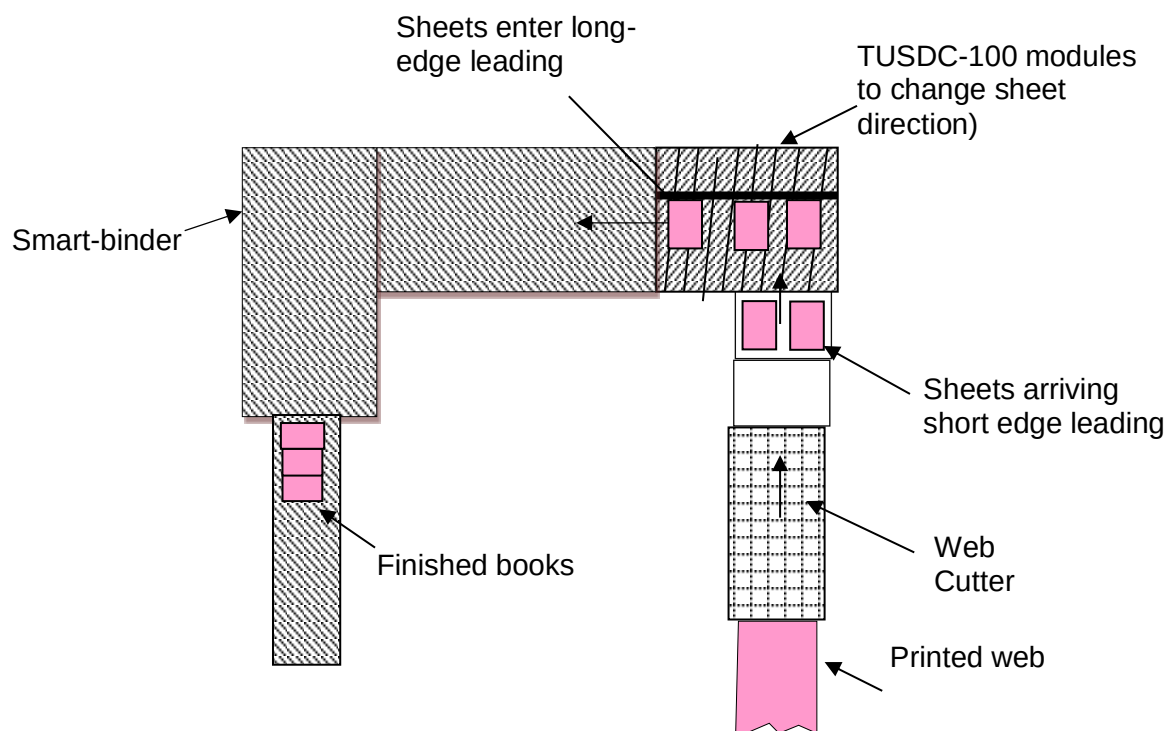
13.1.4 Feed from a web cutter via rotator/ folder to make small size books.

Example below shows A5 booklet production from a 450mm (17 11/16") wide web



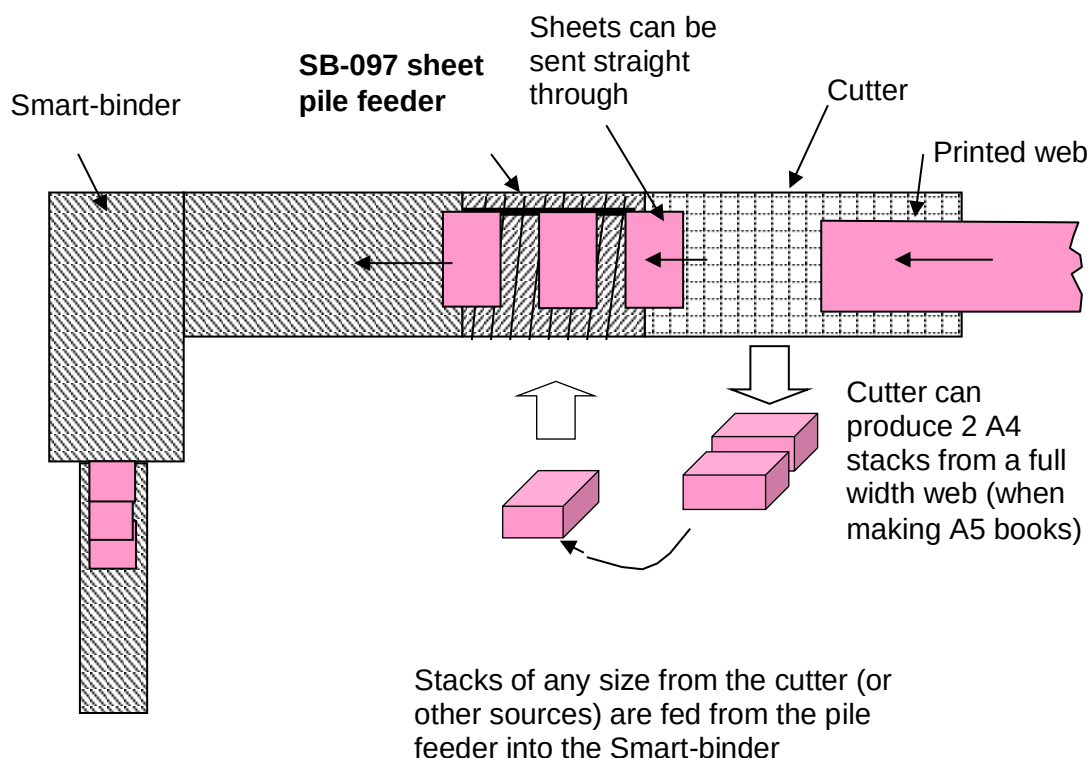
Advantages	Disadvantages
Can produce small size books (A5 / Digest) from same 'wide' web as larger books (A4 / Letter). This utilises the full print width and giving quicker changeovers between A4 and A5 by avoiding a web change.	Extra elements complicate the system and increase its cost.
	A5 Books must be made in increments of 8pp.
	The maximum thickness of the book made from folded sections is restricted because the folded edge tends to be thicker. The exact restriction depends on the behaviour of the stock in use.
	Additional anti-static measures may be needed.
	RF100 needs its own (additional) ISG glue system if wishing to make ISG glued books
	Sheets lighter than 60 gsm may not rotate reliably in the SRF-100
	The SRF-100 may not be used to rotate sheets at web speeds higher than about 90-100meters/min .

13.1.5 Feed from web cutter on the side, web slit in half with change of sheet direction (Uses TUSDC-100 module. See datasheet Appendix 26)



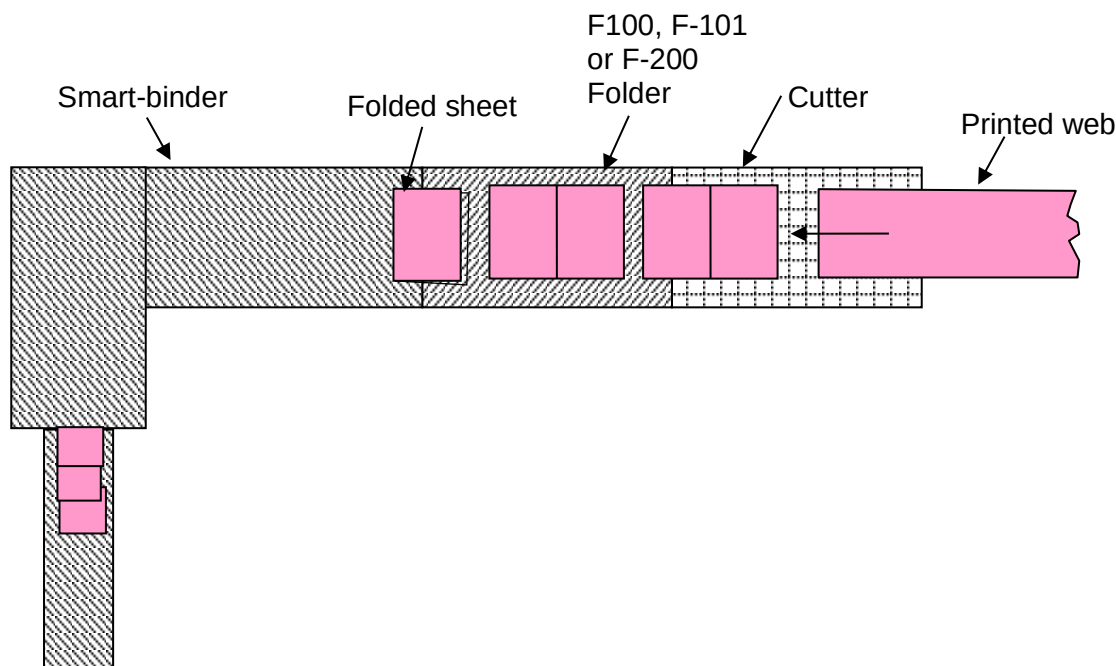
Advantages	Disadvantages
Can make A5 or 5 ½ x 8 ½" booklets from a 450mm or 18" wide web .	Cannot produce larger (A4 or 8 ½ x 11") booklets
Page numbers can be varied in 4-page increments	The need to bump turn sheets reduces the maximum web speed to about 60 m/min .
Sheets do not require pre-folding which make ISG gluing easier and allows maximum thickness booklets to be produced	

13.1.6 In-line / off-line configuration (using optional SB-097 feeder)



Advantages	Disadvantages
Can choose between feeding from piles of sheets or directly from a web cutter. Allows sheets to be fed which have come from more than one printer or from other sources.	Increases the length of the line slightly
Combines the benefits of in-line production for A4/letter sizes with the ability to switch rapidly to smaller sizes by stacking down and re-feeding.	Increases system cost
Avoids need for SRF-100 rotator/folder or TUSDC modules to produce small-format size booklets (e.g. A5). Allows books to be made in 4pp increments.	

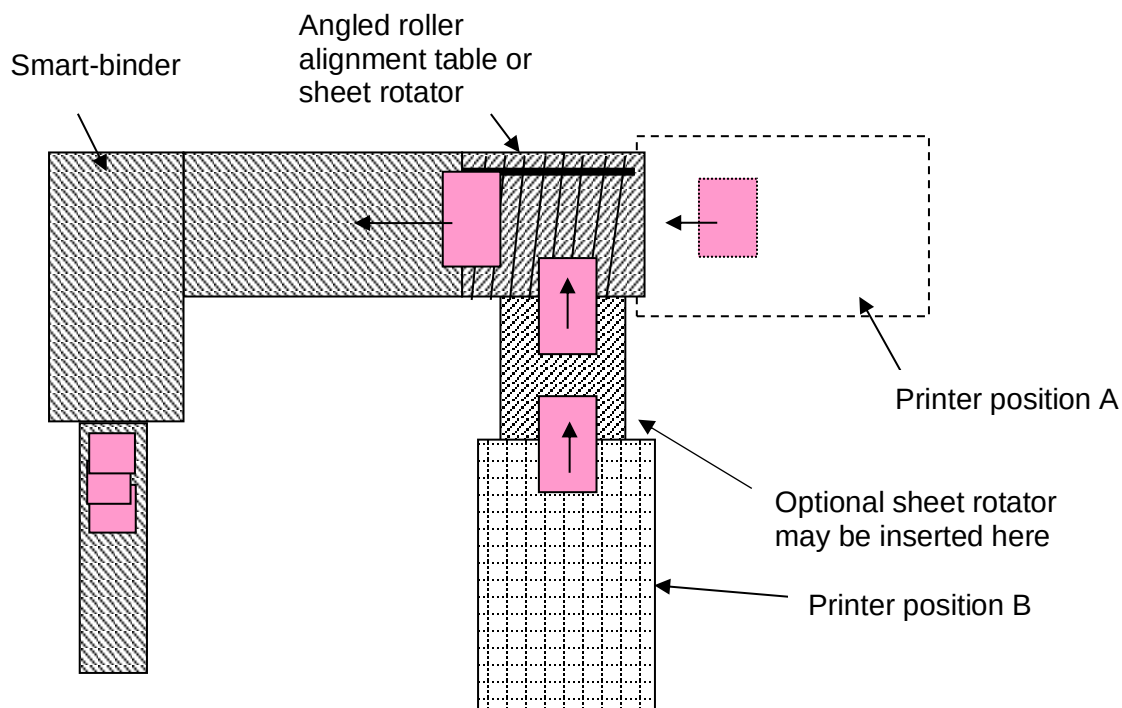
13.1.7 In-line with extra F-100 folder to allow higher web speeds or lighter paper stock



Advantages	Disadvantages
Assists use of lightweight (< 60 gsm) stocks, <u>and</u> Increases maximum web speed to approximately 180 meters/minute	Increased cost and complexity of the line
	Can only make books in 8pp increments when folding (unless the 'selective' F-200 folder is used in which case 4pp increments are possible).
	The fold restricts the maximum thickness of the finished book. *
	Additional anti-static measures may be needed.
	The folder must have its own additional ISG glue system if making books with ISG cold-glue.

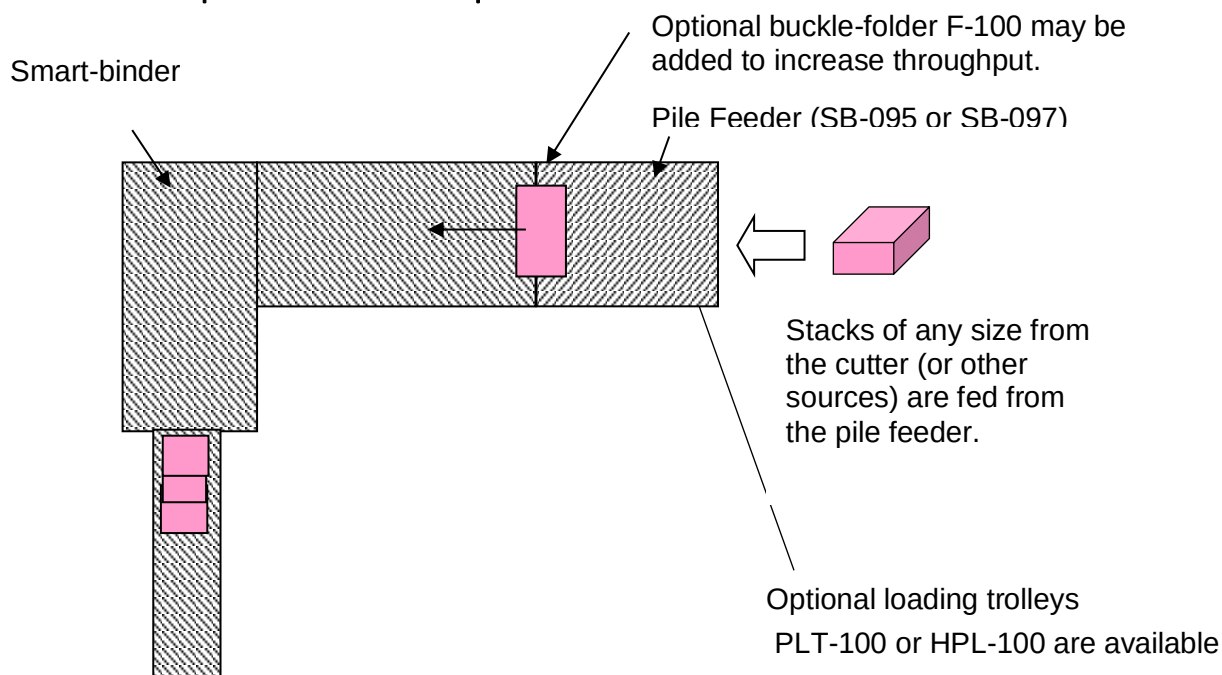
* Note: Maximum number of pages in the book may be restricted because the maximum specified thickness of 10mm (3/8")) must be applied to the thickness of all the sheets together, measured at the thickest point: i.e., at the edge folds.

13.1.8 In-line with a cut-sheet printer



Advantages	Disadvantages
In-line operation eliminates manual sheet handling.	Some booklet formats require sheet direction change and/or rotation
DFA/DFD link available with printer.	

13.2 Off-line operation from a pile feeder



Advantages	Disadvantages
Quick and simple size changes	Increases the amount of manual handling of the sheets.
Flexibility of feeding from piles of sheets, which can come from more than one printer or from other sources.	The piles must be turned over if the print order must be maintained during binding, however, in many cases the workflow can be planned to avoid this. If piles are turned over then a different impositioning scheme is needed.
Can run independently of the print line so improving overall output	Additional cost (for the feeder)
Can make small size books in 4pp increments	
Can easily pause sheet feed to allow center inserting etc.	
Allows small format booklets to be produced without needing to change to narrow web or use optional in-line SRF-100 rotator/folder.	
Optional loading trolley PLT-100 available to speed up reloading of feeder	

13.3 Selecting whether to use the Smart-binder in-line, near-line, or off-line

13.3.1 Running the Smart-binder 'in-line' with a digital printer:

- Avoids manual handling of the sheets between the stacker and the Smart-binder.
- Minimises hardware cost (no re-winder, unwinder, stacker or sheet feeder needed).
- Minimises equipment floor-space requirement.
- Avoids the extra complexity, maintenance, make-ready time and system 'stop' time associated with rewinding the web or sheeting/stacking immediately after printing
- Avoids extra costs, complexity, maintenance, make-ready time and system 'stop' time associated with re-feeding sheets into the Smart-binder from the off-line pile feeder (needed for off-line operation).
- Delivers the first finished booklets within seconds of printing, compared with 'near line' production where a lot of time is lost rewinding the roll and then moving the roll to the finishing system, and 'off-line' production where some time is lost in stacking sheets and loading them into the sheet feeder.
- Maximizes sheet page sequence integrity (no intermediate sheet manual handling).
- Can make system start-up more difficult because all elements of the system have to start together without problem.
- More difficult to change book format sizes compared with off-line operation.

13.3.2 Running the Smart-binder 'near-line' from a pre-printed roll unwinder and cutter

- Avoids any potential system problems associated with sheeting the web immediately after printing (rewinding is more reliable than sheeting). Web rewinding allows maximum printer speed and efficiency (e.g., compared with sheeting/stacking after printing).
- Near line finishing introduces a time delay between printing and finishing, due to the need to produce a printed roll before it can be moved to the finishing system
- Rewinding onto a roll decreases the risk of losing sheet page sequence integrity compared with producing cut-sheet piles). However book sequence is reversed because the first page on the roll is the last page to come off the roll when finishing.
- Extra time and operator input is needed to remove printed rolls from the unwinder, move these rolls to the finishing system and load these printed rolls onto the unwinder of the 'near-line' finishing system.
- It is more difficult to monitor and control print quality when the printed web goes straight onto a roll, compared with producing sheets immediately after printing.
- It is more difficult to change book format sizes compared with off-line operation.

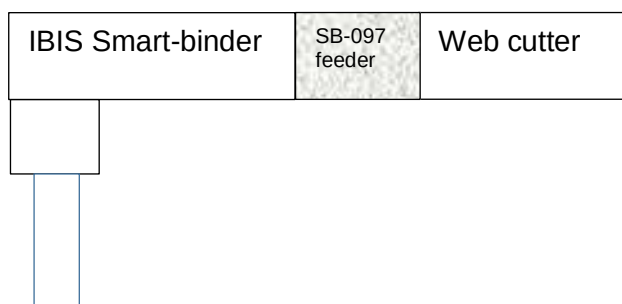
13.3.3 Running the Smart-binder 'off-line' from a high-pile sheet feeder:

- If making frequent large changes in format sizes (e.g.: A4 – A5), then it may be easier/cheaper to run off-line from a sheet pile feeder. In-line or near-line production of small format books either requires the web width to be reduced (with associated loss of printer efficiency), or the use of an additional in-line folder with sheet rotator (option SRF-100). If running small book sizes off-line from sheets printed on a CF printer, then the printer web cutter can be set to produce stacks of smaller sized sheets (i.e.: using slit/merge facility) which may be loaded directly into the off-line Smart-binder sheet pile-feeder.

- An off-line Smart-binder can feed sheets faster than the speed at which sheets are printed on some printers (e.g. cut-sheet printers or many color printers). This means that one off-line Smart-binder can sometimes be used to finish the sheets produced by more than one printer.
- Running off-line gives the sheets time to cool and lose their static charge. This may sometimes improve sheet-collecting performance in the SB compared with in-line production.
- When producing small format sized books off-line, the need for folding (prior to the Smart-binder) can be avoided. Folding can sometimes limit the maximum book thickness due to the bulk of the extra head folds.
- When running off-line, then downtime in one part of the system (roll change, format change, etc.) does not affect the rest of the system.
- Off-line operation allows the Smart-binder to be used to stitch one job while the printer prints a different job that may not need stitching.
- Any extra gaps can be more easily created after the last sheet of each book if needed to feed covers from the cover feeder when using ISG cold-glue.
- Book sequence is changed because the drop stackers used web cutters mean that the last sheet to be cut from the web is on top of the sheet pile. This sheet therefore becomes the first sheet to enter the Smart-binder after the pile is loaded into the sheet feeder (because the feeder feeds from the top of the pile). Maintaining book sequence can sometimes be important when printing personalised output. The last book to be printed in each pile becomes the first book to be finished, unless the pile is turned over before loading into the Smart-binder pile feeder.
- Off-line operation requires an additional sheet stacker as part of the web cutter and sheet feeder as part of the Smart-binder (additional modules) . Also additional manual handling is needed to move sheet piles between stacker and SB feeder. Note: the optional pile handling trolley system PLT-100 or HPM-100 is available to reduce reload time.
- The sheet stacking operation (part of the web cutter) and the high pile feeder (part of the Smart-binder) increase the overall risk of system stops and down-time.
- The manual handling of sheets increases the risk of losing page sequence integrity (however the use of bar codes on each sheet will detect this and automatically reject an incorrectly assembled booklets: only good booklets will be delivered by the SB).

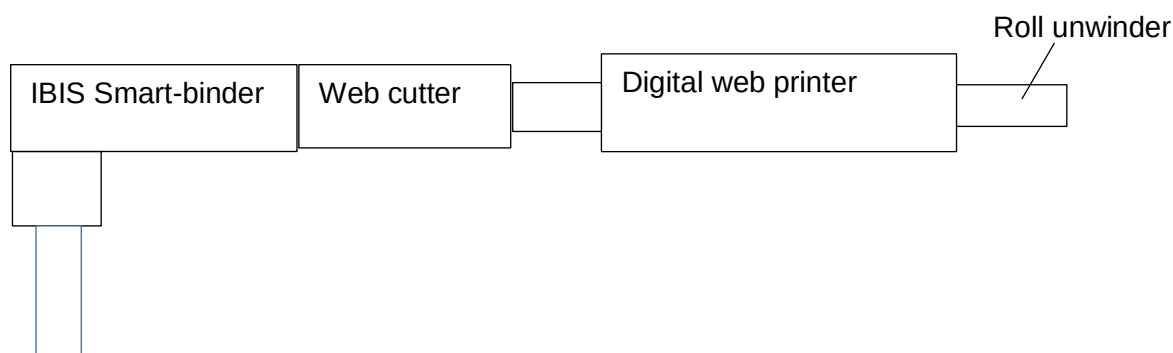
13.3.4 In-line/ off-line configuration (Option SB-097)

- It is possible to configure the Smart-binder to be in-line with a digital printer, but also to have a sheet pile feeder, located in between the printer and the Smart-binder (option SB-097). This option is selected by many customers to enable jobs to be either run in-line or off-line, with quick changeover between the two modes. See appendix 7



13.3.5 Choosing between an in-line, near-line or off-line Smart-binder system

Finishing in-line with a digital web printer



Advantages:

- Booklets are produced within seconds after printing: no delays.
- Reduced number of operators needed: no intermediate paper handling required.
- Printed sheets are immediately converted into finished booklets which increases security and reduces risk of any data breach. This is particularly important for high security printing such as examination papers
- No additional roll re-winders or un-winders or sheet feeders are needed, so in-line is the lowest cost (hardware) solution

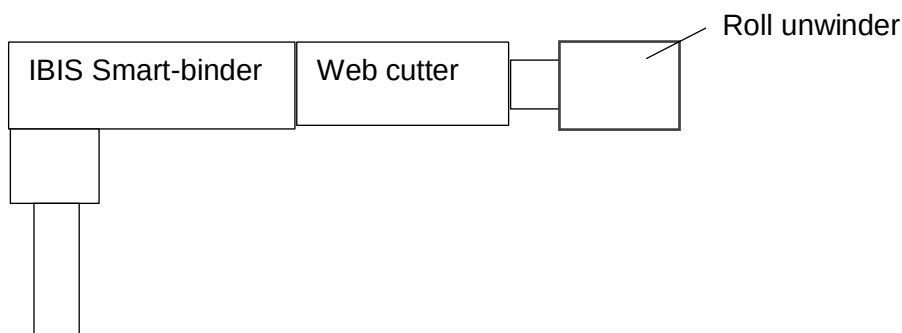
Disadvantages:

- Printer speed may have to be reduced when making very thin booklets (e.g: 8pp or 12pp)
- Finishing directly from a web does not suit production of smaller format booklets since this requires web width to be reduced or, complex additional in line folding and/or sheet rotation.
- Printer efficiency will be slightly reduced because printer must stop if the finishing system stops.
- Some printers can take a few minutes to restart after a stop which reduces the finishing system efficiency

Summary:

In-line finishing is best suited to high security print applications where the booklet format size does not change and booklets must be produced immediately after printing

Finishing near-line from a roll un-winder and web cutter.



Advantages:

- The printer is free to run at full speed with maximum printing efficiency when printing roll to roll.
- The roll un-winder can be set at the optimum speed to suit the finishing system

- The system can be restarted quickly after a stop
- The finishing system can handle the output (rolls) from multiple printers
- Compared with off-line finishing (3/), it is easier to manually move a printer roll every few hours compared with frequently moving small piles of sheets.

Disadvantages:

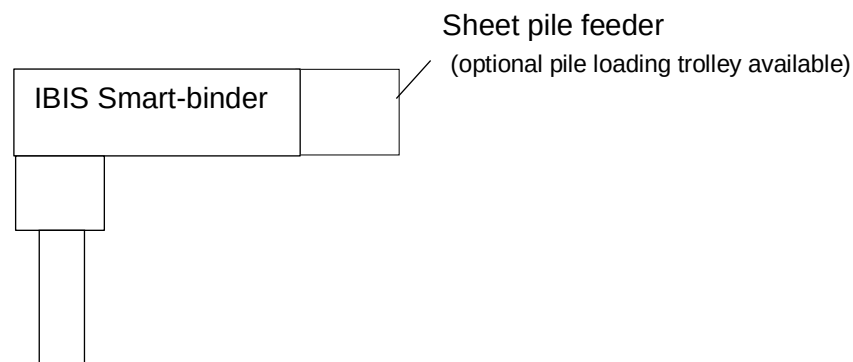
- It can take about 2 hours for the printer to produce a printed roll which delays the production of finished booklets
- An additional roll re-winder and un-winder are needed (extra cost compared with in-line finishing)
- Paper rolls have to be manually moved from the printer and loaded onto the finishing system roll un-winder.
- Finishing directly from a web does not suit production of smaller format booklets since this requires web width to be reduced or, complex additional in line folding and/or sheet rotation.

Summary:

Near-line finishing is best suited to applications requiring maximum possible system operating efficiency, and where there is little or no variation in booklet format size.

Note: In-line or near-line Smart-binders may be fitted with the optional SB-097 sheet pile feeder to offer also the benefits of feeding off-line, if needed.

Finishing off-line from sheet pile feeder



Advantages:

- Sheets may be easily cut to a smaller format size to allow production of smaller format booklets. Off-line operation is therefore recommended if a large range of different booklet formats are needed.
- The printer is free to run at full speed with increased printing efficiency.
- The sheet feed rate can be varied automatically to suit the number of pages in each booklet.
- Cover matching is easier when running off-line because the codes on the sheet and the corresponding cover for each book can be checked before the sheet is fed. Also it is easier to recover after a system stop.
- The system can be restarted quickly after a stop.

Disadvantages:

- The print line has to include a sheet stacker and the finishing line has to include a sheet feeder (additional cost compared with in-line finishing)
- The Smart-binder must be stopped to reload the sheet feeder which reduces production time and required additional manual paper handling.

- The sheet feeder can occasionally mis-feed which reduces the efficiency of the finishing operation.
- The sheet feeder requires additional operator skill and training.
- The reliability of sheet feeding will be reduced if the paper is light-weight or curled or contain too much static charge.
- A booklet may be rejected at the interface between one pile and the next, unless piles are turned over before loading into the sheet feeder.

Summary:

Off-line finishing is best suited to production of a range of different format sized booklets and/or if booklets are personalised with matching covers.

14 Selecting upstream modules as part of an in-line or near-line system

When the Smart-binder is running in-line with web printers or near-line from pre-printed roll.

14.1 Web-cutters

A number of different web-cutters are available on the market and these all reliably produce good quality cut-sheets from printed web at high speed. The web- cutter may also include an optional sheet stacker with sheet by-pass conveyor to feed the Smart-binder.

14.1.1 Cut-sheet length

The web-cutter must give accurate sheet cut length, even when the system is accelerating or decelerating on system start-up or stop. Any inaccuracy in cut sheet length will be apparent in the finished book when checking the distance of the print to the trimmed edge. If the sheet is more than about 1mm too long then it may jam in the Smart-binder collector.

The web –cutter should include an automatic sheet reject gate. This will reject any incorrect length sheets and will reject a certain number of sheets every time the system starts up to avoid curled sheets. Either incorrect length sheets or curled sheets can cause a sheet jam if allowed to enter the Smart-binder . Sheet curl after the web stops and restarts results from the paper web going around tensioner rollers in the cutter or festoon web buffer. The web tension should be automatically released when the web cutter stops to reduce curl (see also paragraph below on sheet rejection) .

During system start-up and stopping, the time between each sheet and the next being delivered to the Smart-binder must not fall below about 220 milliseconds, otherwise a sheet jam in the Smart-binder collector may result.

Whilst running, any more than 1% variation in the distance between the trailing edge of one sheet and the trailing edge of the next sheet (as they are delivered to the Smart-binder) may cause synchronisation problems in the Smart-binder, particularly when producing very thin books (e.g.: 8 and 12 pages). Gradual, smooth changes in distance between one sheet and the next (i.e.: cutter speed) do not generally cause problems, provided the change between each sheet and the next is within 1%.

Special note: If choosing to use the 'selective' folder option F-200 (in order to run at high web speeds but make books with 4-page increments) then the web cutter must be able to read a code

printed on the web and automatically vary sheet cut length on the run (to produce a mixture of 8-page sheets or 12-page sheets).

14.1.2 Cut-sheet stack delivery (stacker)

If the web printer is to be also used for producing piles of loose cut sheets (in addition to passing sheets into the Smart-binder), then the web cutter must be fitted with a sheet stacker. In this case the a bypass 'transfer conveyor' is needed so that sheets can pass over the sheet stacker, without slipping or twisting, to enter the Smart-binder.

14.1.3 Sheet reject

The web cutter should be fitted with an automatic sheet reject which is programmed to reject the first sheets after each system start-up. These first sheets are often curled because they have been stationary and wrapped around rollers in the cutter/buffer etc. Rejecting these curled sheets on start-up reduces the risk of these sheets causing a paper jam in the Smart-binder. Some printers produce unprinted paper on start-up (and on stopping) and it is desirable to reject any unprinted sheets in the web cutter instead of passing these on to the Smart-binder.

14.1.4 Web buffers

A web accumulator (buffer) is used between the printers and the cutter (in-line system) to allow the printers to continue running while a stack is being ejected from the stacker. In this case, the cutter will be set to run faster when there is more than a certain amount of paper web in the buffer. The maximum speed of the cutter must be limited to avoid exceeding the maximum input speed of the Smart-binder. When feeding the Smart-binder, the buffer should have the minimum amount of paper in it and the cutter speed will match the printer web speed. Stopping the line with paper web accumulated in the buffer introduces curl into the paper which can give problems with sheet handling in the stacker and Smart-binder. If the buffer stops with paper web in it then the tension should be automatically released to reduce paper 'curl'.

14.1.5 Anti-static equipment for web cutters

Web cutters may need to be fitted with anti-static equipment to reduce static charge on the sheets delivered to the Smart-binder. This is particularly important when running with lightweight paper.

14.1.6 Different types of Web Cutters

The following web cutters are recommended and approved for use with the Smart-binder: Hunkeler, Tecna, Kern, EMT, Iram, Spedo and MBO.

14.2 Web Moisturiser

A web moisturiser (such as the Weko RFDi) may be needed when running a Smart-binder in-line with a high-speed toner-based web printer at high-speed. This is because the printer heats and dries the paper web during the printing process.

The moisturiser is essential to put water back into the paper and thereby avoid static charge build-up which can cause problems in the finishing equipment

The web moisturiser is not normally used when running in-line with ink-jet printers because the paper is not heated as it is with toner printers.

15 Print impositioning schemes for Smart-binder booklet making

15.1 Example impositions

Key to impositioning schemes



Side trim, removed by side knives, recommended range 3 to 15mm



Front trim, removed first, recommended range 3 to 20mm. Note that more must be trimmed from thicker books to allow for the distance that the outer sheets must wrap around the spine of the book which causes the inner sheets to protrude further.



Center trim, removed second if this option is used. The center knife removes 0mm, 6.35mm ($\frac{1}{4}$ ") or 9.525mm ($\frac{3}{8}$ ") but may limit the book thickness.



Fold line, produced either by buckle folding in an inline folder, or by the Smart-binder. The fold made by the Smart-binder is always the spine of the finished book



Stitch, always shown as they appear on the outside of the sheet when it is in the Smart-binder.



Register, the top left corner of the page in the finished book with the spine on the side (rather than on top - notebook style).

N

Number of sheets in book, the total number of sheets used to make the book, used in the page position calculation.

M

Sheet number, the position of this sheet in the book (sheet 1 arrives at the Smart-binder first), used in the page position calculation

In the tables below, printer 1 refers to the printer on which the lower side of the sheet is printed and printer 2 refers to the printer on which the upper side of the sheet, including barcode, is printed.

The diagrams are pictorially correct looking down from above onto the sheet as it enters the Smart-binder.

The barcode must always on the top face of the sheet as it enters the Smart-binder.

15.2 A4 or 8 ½ x 11” finished format size

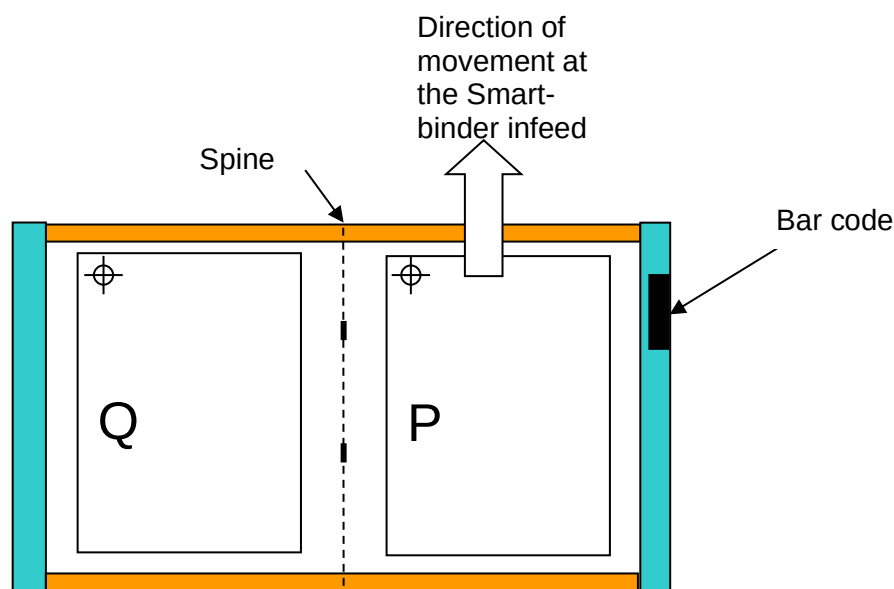
	A4 size (297 x 210mm)	Letter size (11 x 8½”)
Web Width	430 – 460mm	17 ½ - 18 ¼”
Sheet cut length	305 – 320mm	11 ½” -12 ½”

A5 Portrait or Digest (8½ x 5½”) without pre- folding

(From narrow web or pile feeder, without using folder before Smart-binder infeed.)

	A5 size (Portrait) 210 x 148mm	½ Letter size 8 ½ x 5 ½”
Web Width	310 – 340mm	11 ½ - 12 ½”
Sheet cut length	220 – 250mm	9 – 10”

Page impositioning for A4 / 8 ½ x 11” from wide web, or A5 / 5 ½ x 8 ½” portrait from ‘narrow’ web:



Page number	Printer 1	Printer 2
P	$2*(n+m)-1$	$2*(n-m)+1$
Q	$2*(n-m)+2$	$2*(n+m)$

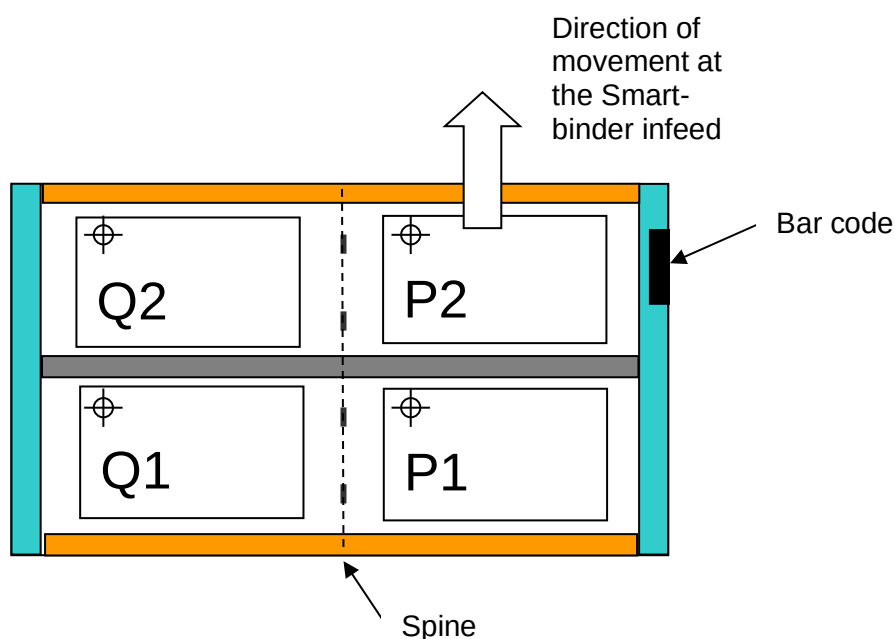
Note: It is assumed that Printer #1 prints on the under-side of the sheet and printer #2 prints on the upper side of the sheet

15.3 A5 landscape (or 8 ½ x 5 ½" oblong) finished size

	A5 size (Landscape) 148 x 210 mm	½ letter size (oblong) 5 ½ x 8 ½"
Web Width	430 – 460mm	17 ½ - 18 ¼"
Sheet cut length	310 – 320mm	11" –12 ½"

15.4 CD booklets (120mm square) from narrow web or pile feeder

	CD (120 x 120mm)
Web Width	250 - 280mm
Sheet cut length	250 - 280mm



Page number	Printer 1	Printer 2
P	$2*(n+m)-1$	$2*(n-m)+1$
Q	$2*(n-m)+2$	$2*(n+m)$

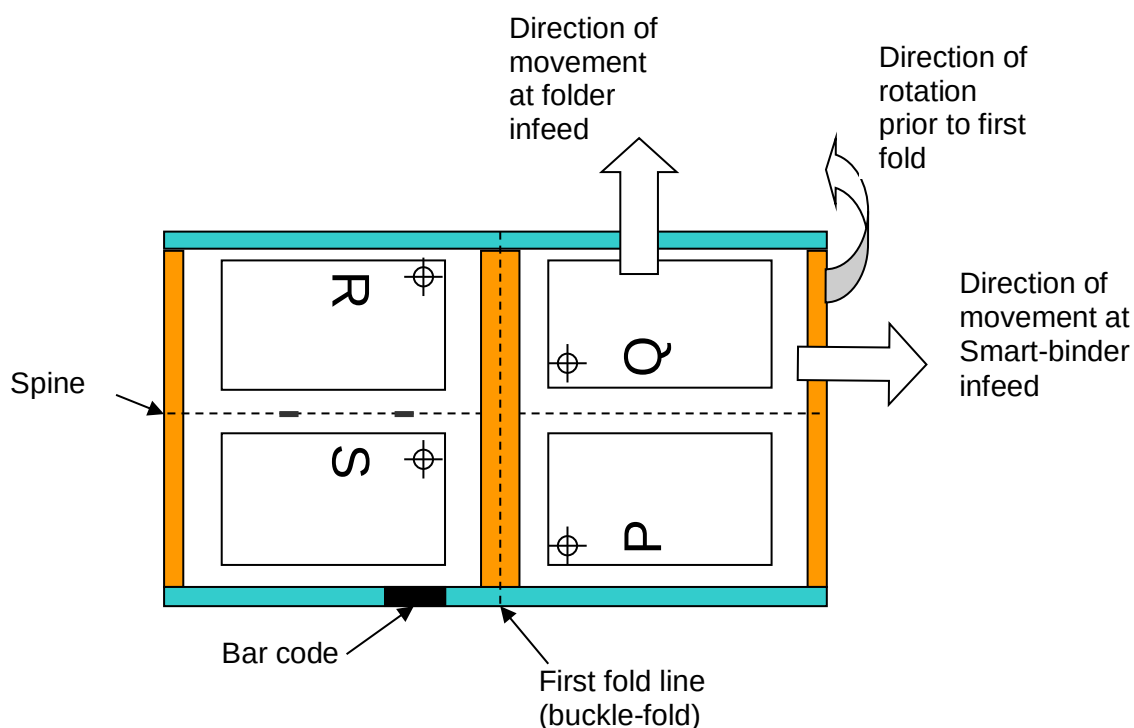
Note: Book 1 (P1 & Q1) is nearest the operator on the delivery conveyor.

Note: It is assumed that Printer #1 prints on the under-side of the sheet and printer #2 prints on the upper side of the sheet

15.5 A5 Portrait (or 8 ½ x 5 ½") finished size using SRF-100

To produce smaller sizes books from a full width web using the SRF-100 in-line rotator folder. This scheme applies when the leading section of the sheet is folded down in the folder.

	A5 size (Portrait) 210 x 148mm	½ letter size 8 ½ x 5 ½"
Web Width	430 – 460mm	17 ½ - 18 ¼"
Sheet cut length	305 – 320mm	11 ½" – 12 ½"

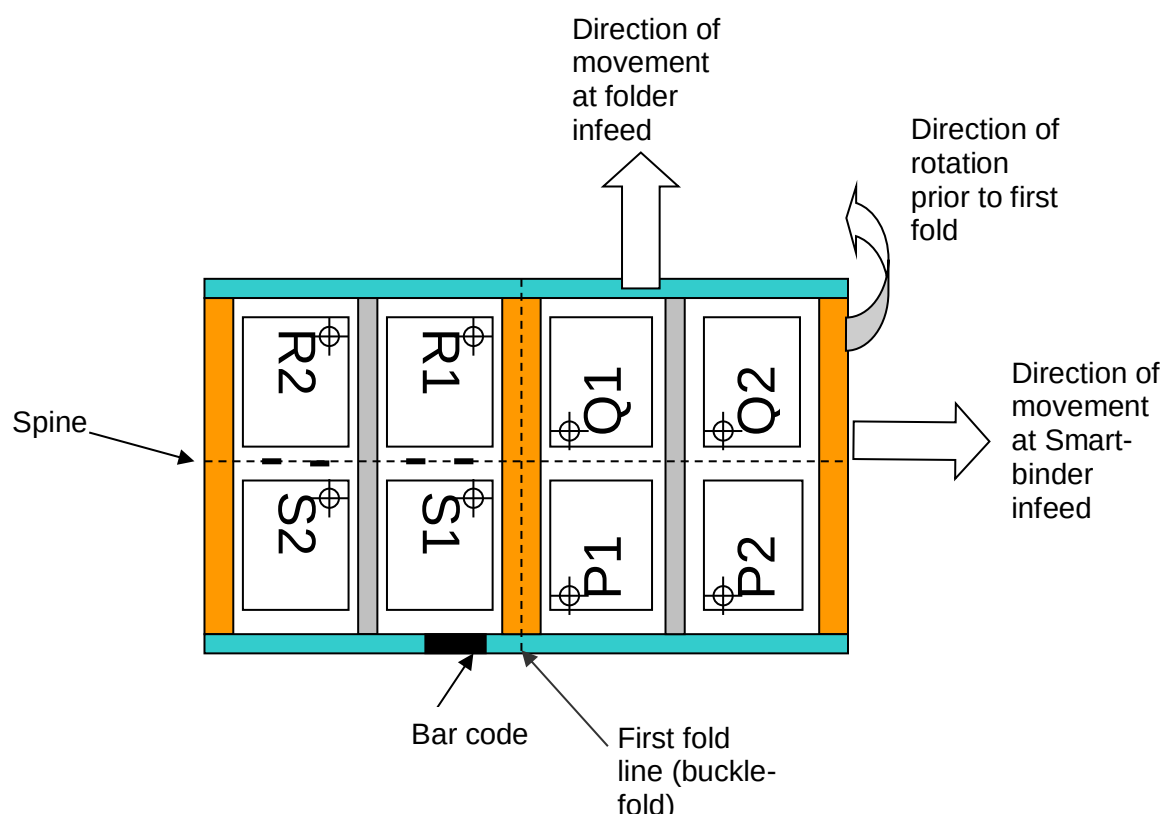


Page Number	Printer 1	Printer 2
P	$4*(n-m)+2$	$4*(n-m)+4$
Q	$4*(n+m)-1$	$4*(n+m)-3$
R	$4*(n+m)-2$	$4*(n+m)$
S	$4*(n-m)+3$	$4*(n-m)+1$

Note: It is assumed that Printer #1 prints on the under-side of the sheet and printer #2 prints on the upper side of the sheet

15.6 A6 Landscape (or 4 ¼" x 5 ½" oblong) finished size

	A6 size (Landscape) 105 x 148mm	1/4 letter size (oblong) 4 ¼" x 5 ½"
Web Width	442 – 464mm	18 – 18 ¼"
Sheet cut length	305 – 320mm	11 ½" – 12 ½"



Page	Printer 1	Printer 2
P	$4*(n-m)+2$	$4*(n-m)+4$
Q	$4*(n+m)-1$	$4*(n+m)-3$
R	$4*(n+m)-2$	$4*(n+m)$
S	$4*(n-m)+3$	$4*(n-m)+1$

Note: Book 1 (P1, Q1, R1 & S1) is nearest the operator on the delivery conveyor.

Note: It is assumed that Printer #1 prints on the under-side of the sheet and printer #2 prints on the upper side of the sheet

16 Guide to Printing for Smart-binder booklet production

16.1 Sheet sequence

The first sheet to enter the Smart-binder needs to be the center sheet of the booklet. The center two pages on this sheet should be facing downwards

1. Sheet sequence for in-line operation (*Smart-binder fed directly from a printer and web cutter*):

The first sheet to be printed should be the center sheet of the booklet

2. Sheet sequence for near-line operation (*roll to roll printing: Smart-binder fed from a pre-printed roll*):

If printing roll-to-roll then the first sheet to be printed will be the last sheet to come off the roll when used to feed the IBIS Smart-binder. This means that the first sheet to be printed should be the outside (cover) sheet of the booklet.

3. Sheet sequence of off-line operation (*feeding the Smart-binder from a sheet pile feeder*) :

The sheet feeder feeds off the top of the pile, so the top sheet must be the center sheet of the booklet.

16.2 Sheet quality

Bar codes must be printed with high enough print quality to enable them to be read by the Smart-binder code reader at high sheet velocity.

Sheets to be fed into the Smart-binder must not contain high levels of static charge, must be flat (not curled) and must not be physically damaged in any way.

Paper stock weights should normally be 60 gsm or higher, although paper weights as light as 40 gsm may be used, subject to testing. Paper weights below 50 gsm may require use of the optional additional in-line buckle-folder F-100, F-101 or F-200). Very lightweight sheets should be fed into the Smart-binder with the paper grain parallel to the direction of sheet movement to help to avoid sheet collapsing when they are stopped in the sheet collector.

Sheets that are heavily coated (glossy stock) may result in a reduced strength bond if using ISG cold glue binding. In this cases tests and recommended to determine bond strength.

Sheets that are printed to stack, for subsequent feeding into the Smart-binder using the optional sheet pile feeder (SB-095, SB-096 or SB-097) must all be the same format size and must be accurately registered to the rear edge of the pile to allow reliable feeding.

16.3 Codes to be printed on each sheet

Note: For more details about code printing see Appendix 18.

Every sheet requires a bar code (or 2DDatamatrix code) printed on it which contains at least 8 digits. Digits in positions 1 and 2 must show the number of the sheet in the booklet (first sheet 01, second sheet 02 etc.). Digits in positions 3 and 4 must show the total number of sheets in the booklet (02 for a 2-sheet booklet and 03 for a 3 sheet booklet). Digits in positions 5-8 should all be zeros assuming that no further data needs to be contained in the code. That means if making a 3-sheet booklet then the 3 sheets should have the following codes on them:

01030000

02030000

03030000.

Additional Digits may be also be used to automatically control certain special Smart-binder functions if needed. Digits may be added to show a job number or booklet ID number if needed. Refer to the IBIS Bar Code Guide on the IBIS website [HERE](#) for further details.

If feeding a personalized cover from the cover feeder CIF-102 then the cover also needs a code printed on it which must contain the same ID number as printed on the inside sheets. The code on the cover should be 0000 plus the booklet ID number. The Smart-binder will then stop automatically if the cover ID number does not match the sheet ID number.

16.4 Different types of Bar Codes

The following bar codes may be used:

ITF – Industrial 2of5, numeric characters only (0-9), digits are encoded in pairs so there must be an even number of them.

CODE39 – alphanumeric characters, however, it takes up more space because it encodes more characters.

CODE128 – has numeric only & alphanumeric forms, the reader automatically detects the correct type, the numeric form is compact like ITF.

Quiet zones:

Linear bar codes require space before and after the code to allow the reader to discriminate it from other printed marks or linear codes. There should be 5mm of clear paper at either end.



Note: Human readable numbers are not necessary for Smart-binder operation

16.4.1 Bar code size:

The minimum code width when using the MS3 reader is 4 mm. However, wider codes can always be read more reliably so we recommend that codes are as wide as possible.

16.4.2 Using ITF codes:

When using a font based code we recommend that the font is at least 26pt (which produces a code approximately 29mm (1 1/8") for an 8 digit code).

Do not include check digits in the code, ITF code generators add a padding digit because an ITF code must have an even number of digits. Typically they place this at the start of the code which prevents the sheet number & number of sheets fields from being decoded.

The MS3 Laser reader will read codes of up to about 16 characters at web speeds up to 150m/min.

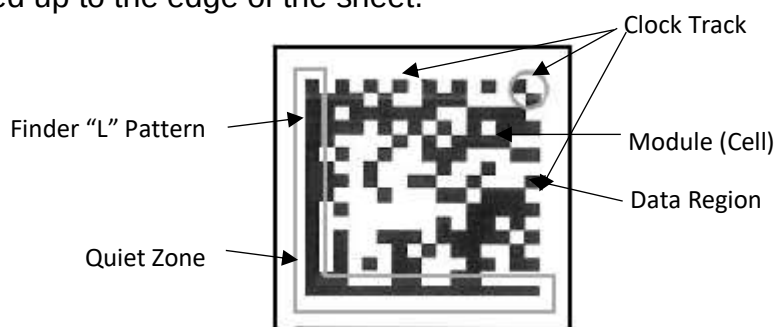
16.4.3 Different types of 2D codes

Datamatrix – 2D code is a compact way of encoding alphanumeric data, can contain hundreds of characters (whereas it is usually not possible to read linear codes containing more than 16 characters on moving sheets).

QR – similar to Datamatrix, commonly used in Japan as it can encode Kanji/Kana character sets. Widely used these days to encode URL's that you can scan with your phone.

Quiet Zone requirement

2D codes require a quiet zone of at least 1 cell width **all round** which is why they cannot be printed up to the edge of the sheet.



2D code size

For web speeds up to 150m/min the minimum cell size for use with the Smart-binder 2D reader (Microscan Mini Hawk) is 0.4mm (0.015"). Larger cells can help to make reading more reliable.

16.4.4 Capacity of Datamatrix ECC200 codes

Size (cells)	Size (mm) for 0.4mm square cell	Numeric characters only	Alphanumeric characters
10x10	4	6	3
12x12	4.8	10	6
14x14	5.6	16	10
16x16	6.4	24	16
18x18	7.2	36	25
20x20	8	44	31
22x22	8.8	60	43

Larger capacity codes (using more cells) are available but they have to be more than 10mm (3/8") square to meet the minimum cell size needed to read the moving code.

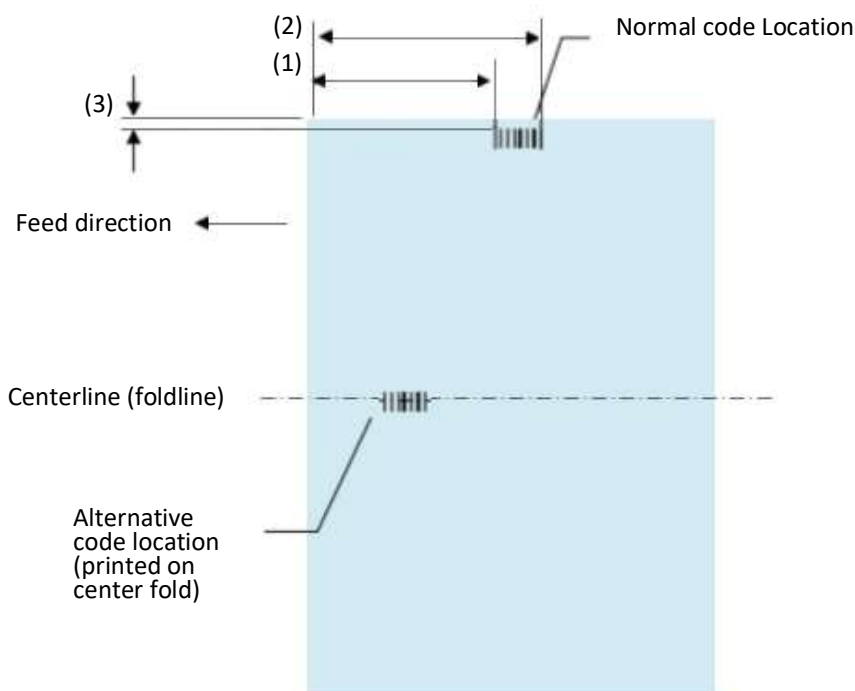
DataMatrix codes can be rectangular (eg 8x32) which can be useful if trim-off is limited.

QR codes are approximately 15% larger than Datamatrix codes of the same capacity, for example a 21x21 QR code holds 41 numeric or 25 alpha numeric characters (similar to an 18x18 Datamatrix) with the lowest level of error correction. They take slightly longer to decode but that does not affect their use with Smart-binder as the readers decode much faster than sheets can be fed. QR codes must be at least 21 modules square (so their minimum size is about 8mm (0.3") square.

16.5 Code positions

16.5.1 Code position when feeding a Smart-binder directly from a web cutter (or from a sheet feeder with the code reader positioned on the Smart-binder infeed)

The bar code (or 2D Datamatrix code) on each sheet needs to start at least 6.7" from the leading edge of the sheet. This bar code should be very close to the right edge of the sheet and facing upwards as the sheet feeds into the Smart-binder.

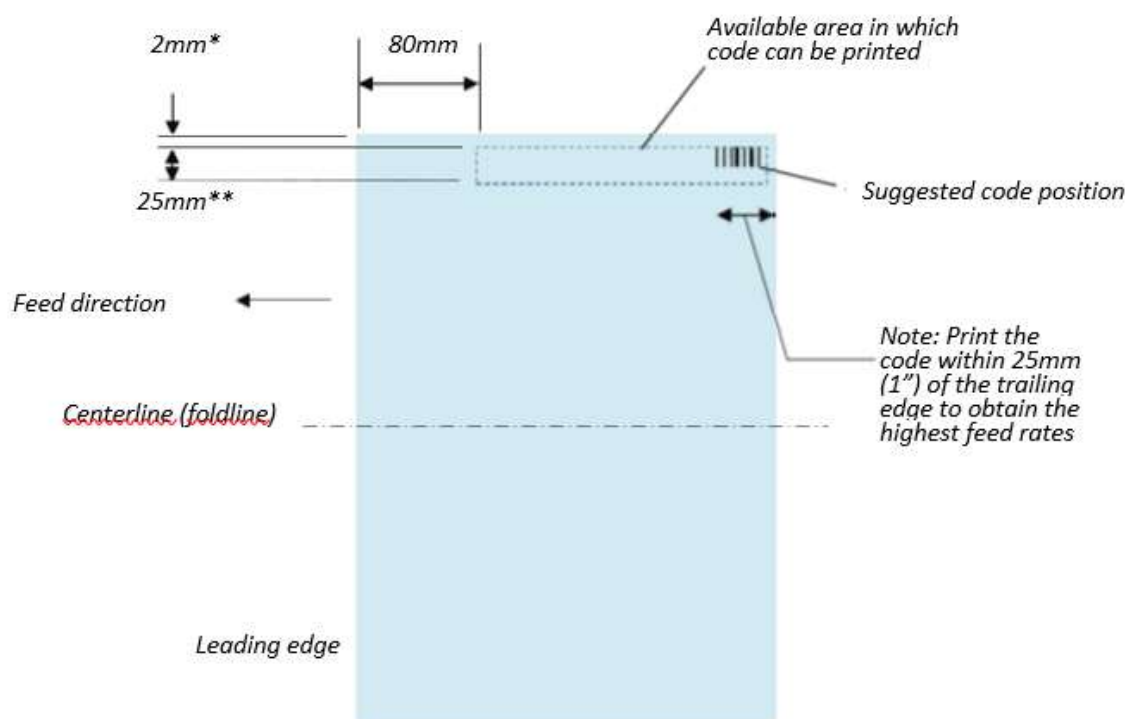


Dimension		Linear code	2D code
(1)	Minimum distance from leading edge of sheet	170mm (6.7")	170mm (6.7")
(2)	Maximum distance from leading edge of sheet	Up to trailing edge of sheet	240mm (9.4")
(3)	Minimum distance from edge of sheet	Can be printed to edge of sheet	Quiet zone defined for code (see 4.2)
Minimum width		Depends on which reader is used	

1652 Code position when running off-line from a sheet pile feeder (SB-095 or SB097)

With a code-reader mounted in the feeder.

Each sheet needs to have a bar code printed on it which is positioned at least 80mm from the leading edge of the sheet. This bar code should be 2mm from the right edge of the sheet and facing upwards as the sheet feeds into the Smart-binder.



Notes

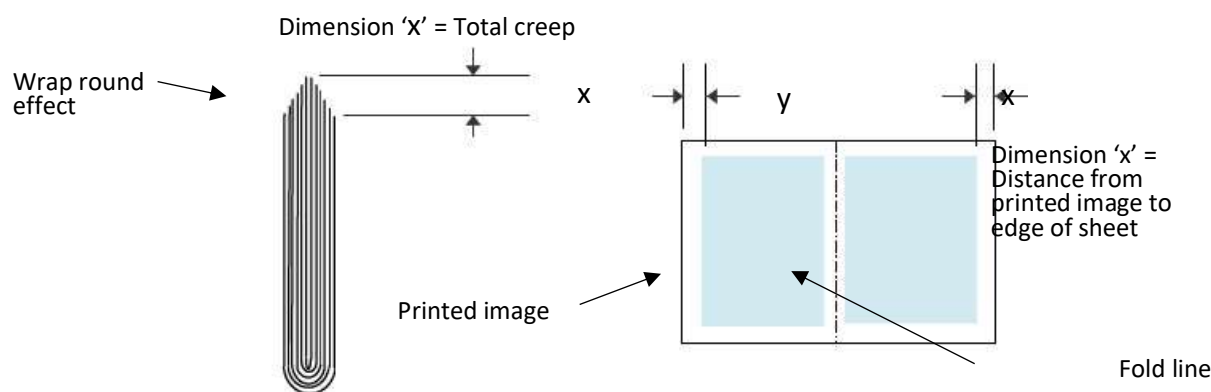
Minimum code width depends on the reader used.

* Codes must be printed a small distance away from the edge of the sheet. This is because the sheet moves slightly as it is picked up by the separator and this can expose the code on the sheet below, hence preventing the reader from decoding the code on the top sheet.

** The code must be positioned no more than about 25mm from the edge of the sheet. This is because there are parts of the feeder which prevent the code reader from being moved to these positions. Normally the code is printed close to the edge of the sheet so that it is removed by then Smart-binder front knife cut and not therefore visible in the finished booklet.

16.6 Image creep

When producing saddle-stitched or thin ISG-glued books, the thickness of the spine causes the outer sheets to appear shorter than the inner sheets when looking at the front edge of the untrimmed book. This is called the 'wrap round' effect. The Smart-binder trims this edge to create a square edge to the book, but, unless this effect is taken into account when imposing the pages of the book, the print on the inner pages will not line up with that on the outer pages. The effect of this is referred to as image 'creep'.



When imposing the printed image on each sheet, dimension 'y' must increase by the amount 'x' from the outer sheet to the innermost sheet. If there are 32 sheets in the book then 'y' increases by 'x'/32 from one sheet to the next sheet.

The relationship between the total creep dimension 'x' and the total number of sheets and pages in the book for different paper weights is shown in the table below. For book thicknesses not shown, interpolate values from the table, e.g. for a 9-sheet (36 page) book, use the value for 'x' half way between those for 6 and 12 sheets. For thinner books than those shown, it is not usually necessary to compensate for image creep.

If a separate cover is used, its page layout should be arranged to align with the outer sheet.

Paper Stock Weight													
Gsm		60		70		80		90		100		110	
Lb. bond		16		19		21		24		27		29	
Lb. offset		41		47		54		61		67		74	
Sheets in book	Pages in book	Approximate total creep dimension 'x'											
		mm	inch	Mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
6	24	1.2	0.05	1.4	0.06	1.6	0.06	1.8	0.07	2.0	0.08	2.2	0.09
12	48	2.3	0.09	2.7	0.11	3.1	0.12	3.5	0.14	3.9	0.15	4.3	0.17
18	72	3.5	0.14	4.1	0.16	4.7	0.19	5.3	0.21	5.9	0.23	6.5	0.25
24	96	4.7	0.19	5.5	0.22	6.3	0.25	7.1	0.28	7.9	0.31	8.7	0.34
30	120	5.9	0.23	6.9	0.27	7.9	0.31	8.9	0.35	9.9	0.39	10.9	0.43
36	144	7.1	0.28	8.2	0.32	9.4	0.37	10.6	0.42	11.8	0.46	NA	NA
42	168	8.3	0.32	9.6	0.38	11.0	0.43	NA	NA	NA	NA	NA	NA
48	192	9.5	0.37	11.0	0.43	NA	NA	NA	NA	NA	NA	NA	NA

NA = Not available (this is outside the Smart-binder SB-1, SB-2, SB-3 thickness specification)

17 Operating the Smart-binder

17.1 Booklet thickness changes

Changes in book thickness (number of pages) are normally made automatically up to about 3mm variation, under bar code control, without stopping the machine.

No change or adjustment is needed to the ISG gluing system when the number of pages changes, even if changing from minimum to maximum.

However, for large changes in book thickness when wire stitching (changes more than about 3mm (1/8")), it is recommended to adjust stitch wire length and 'leg balance'. This requires the Smart-binder to be stopped and adjustments to be made to the stitching heads. These adjustments take only a few seconds for each stitch head.

17.2 Booklet format size changes

Small format size changes may be made without changing the position of the stitching heads. In this case the machine changeover may be made in about 5 minutes, plus additional time to fine-tune for required booklet quality.

For larger format changes, if the stitch positions need to be moved, then changeover time will increase from 5 minutes to about 10 minutes. plus additional time to fine-tune for required booklet quality.

The optional center knife, used for 2-up book production, takes about 5 -10 minutes to install (assuming lower center-knives are left in position), but may be removed in a shorter time

Changeover time for upstream equipment must also be taken into account when estimating total changeover time for a complete print-line with in-line finishing.

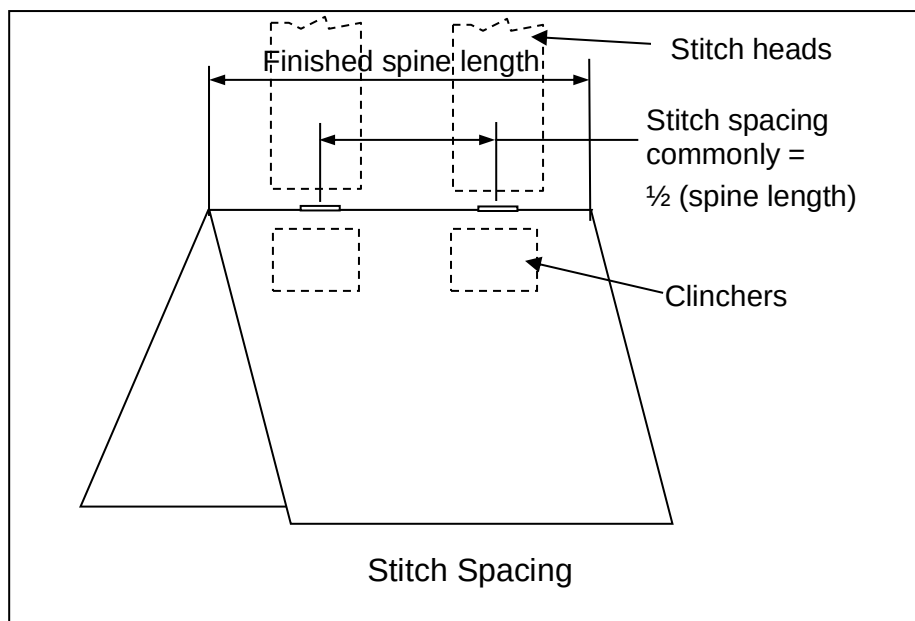
17.3 Trimmer make-ready sequence

It is recommended that the machine operator follows the following set-up procedure when changing the Smart-binder trimmer for a different booklet format size (note: see the Smart-binder Operator manual for the make-ready sequence relating to the infeed, folder, collector and stitcher) :

- 1- Jog the trimmer until the back-stops are fully up and the clamps have lifted off the bed knives (upper knives are in the up position).
- 2- Take an untrimmed booklet, mark where it needs to be trimmed (face, head and foot trim) and place it centrally with the spine against the first set of trimmer backstops in the front trim position.
- 3- Adjust the backstops using the +/- buttons in the touch-screen trimmer make-ready section until the front trim mark on the booklet aligns with the edge of the bed knife.
- 4- Adjust the hold-down brushes (or spring-steel guides) so that they just have light contact with the top of the booklet.

- 5- Adjust the position of the spring-steel front-stop fingers so that the front edge of the booklet is just in contact with these two fingers (no pressure on the springs unless the booklet contains more than 4-5 sheets).
- 6- Check what the required trimmed booklet spine length is in mm (1" = 25.4mm). Adjust the position of the side-knives to the desired spine length cut by loosening the orange 'Kipp' handles, turning the hand wheel until the indicator shows the spine length and retightening the handles.
- 7- Check the gap between the side jogger adjustment screws and the side 'A' frames. Do not continue to step 8 if the side knives have been adjusted out too far such that either side jogger adjustment screw is touching the frame.
- 8- Jog the SB until the first knife has cut the booklet front-edge. Then continue jogging until the booklet stops against back-stop fingers in the side-knife trim position.
- 9- Adjust the hold down brushes /guides so that they are just above the top of the booklet.
- 10- Close all the guards, press the 'jogger-adjusting icon' in touch-screen trimmer make-ready section and press the green 'run' button. The trimmer then moves and stop at the correct position for the joggers to be adjusted (note: if the side jogger cam follower is not at the bottom of the cam detent then the calibration setting must be slightly adjusted : see Trimmer Service Settings).
- 11- Adjust the LH and RH joggers so that they are contacting the head and the foot of the booklet and the booklet side-trim marks align with the side trim bed knives.
- 12- Run the machine and fine adjust if needed to obtain required trim quality.

17.4 Wire Stitch Spacing



17.4.1 “Normal” stitch spacing for most common book sizes

Book size	spine length x width (mm)	Spine length x width (inches)	Stitch spacing (mm)	stitch spacing (inches)
A4	297 x 210	11.69 x 8.27	148	5.83
A5	210 x 148	8.27 x 5.83	105	4.13
Letter	279 x 216	11 x 8.5	140	5.5
Digest	216 x 140	8.5 x 5.5	108	4.25

17.4.2 Limitations on stitch spacing

- Minimum stitching head spacing: 52/8 head = 52mm. 43/6 head = 43mm for thin books without centring device fitted.

Note: The ‘centering device’ is a spring-loaded inverted ‘V’ clamp used to centralise the book on the saddle.

- Minimum clincher spacing = 55mm 2.17” (with lower anvils fitted between clinchers)

(Running without centering devices risks that the stitches may not be exactly on the book spine fold, and is generally not acceptable. Running without lower anvils between clinchers may allow stitches to miss the spine by a small amount – and may not be acceptable.)

17.4.2.1 Notes on stitch spacing

- Generally users will want stitches at “normal” stitch spacing (see table above) or slightly greater spacing. It is not usually desirable to have stitches closer together than the “normal” distance.
- It is not usual for users to insist on precise stitch spacing – except where loop stitches are used.

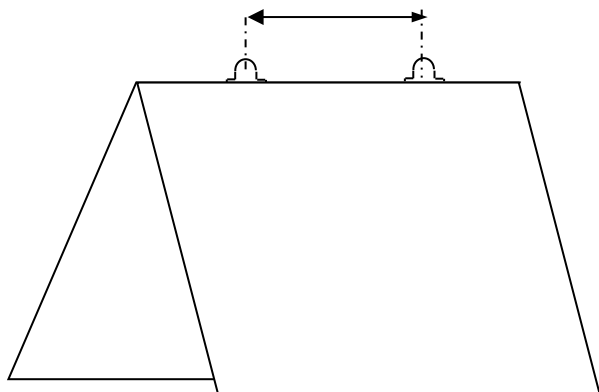
- Stitches are usually arranged symmetrically (distance from end of spine to stitch is same at both ends of spine).

17.4.2.2 Possible methods of dealing with stitch position for different book sizes

For a user who wants to run 2 different sizes, say A4 and A5 or letter and digest, there are several ways of dealing with stitch position and the changeover between sizes:

- Always adjust stitch heads and clinchers to be at exactly the “normal” position (using current standard parts). This takes up to 5 minutes, but will give best results with no compromises on quality.
- Leave the stitch heads and clinchers in one position for both sizes, say 148mm spacing for A4 and A5, this will give stitches that look of a long way apart for A5. A better compromise may be about 135mm, which will look better on the small books, but will not look too bad on the larger books. With this method, there is no changeover time for moving stitch heads and clinchers for different sizes.

Stitch Spacing when Loop Stitching (Option LST-100)



- A4 books, 2 loop stitches 80mm (3.15") apart.
- A4 books, 4 loop stitches 80mm (3.15") apart.
- A4 books, 2 loop stitches 80mm (3.15") apart and 2 standard stitches 240mm (9.45") apart.
- A5 books, 2 loop stitches 80mm (3.15") apart
- Letter size books, 3 loop stitches 4.25" apart

Other loop stitch spacings are used, but this list covers all those most commonly encountered.

Loop stitches are practically always arranged symmetrically on the spine (distance from end of spine to nearest stitch is the same at both ends).

Stitch heads and clinchers must be set to exact spacings for loop stitches (to match standard ring binders).

Whenever loop stitch spacing needs to change it is necessary to set the heads and clinchers exactly, which can take about 5 minutes.

Note that all common Metric/European loop stitch spacings can be made with stitch heads and clinchers in fixed positions.

Changeover from loop stitch to standard stitch

Stitching heads need to be removed from the machine and either swapped for alternative heads or a conversion kit installed. It should only take a few minutes per head to convert from standard to loop stitches or vice versa.

17.5 Using the Cover/Insert Feeder option CIF-102

The Cover Feeder for saddle-bound books can be loaded with up to approximately 20mm pile height or about 200mm pile height if using the optional additional CAL-101 cover Autoloader. The cover pile can be replenished without needing to stop the machine.

Covers should be flat and should be stored covered or wrapped in the same environment as the Smart-binder (temperature and humidity). Covers with damaged or curled edges, or covers which are 'curled' will not feed reliably.

The cover feeder may also be used to feed 'insert' sheets. An insert in the center of the book requires a gap in the sheet feed after the last sheet of each book into which to feed the insert sheet.

The maximum cover feed rate is 116 covers/min, depending on stock etc.

If feeding a cover/insert sheet and ISG cold-gluing, then the cover/insert sheet must be fed into a gap between sheets (not on top of another sheet) to receive a line of cold glue. This gap is not necessary if wire-stitching.

If ISG cold-gluing a cover or insert which is coated (non absorbent) on the inside then the operator can select to apply a continuous glue line (instead of a row of glue 'dots') on the cover/insert sheet only, to increase cover adhesion strength.

17.6 Working with printed paper rolls, or printed stacks of sheets

Printed paper rolls (reels) and sheet piles should be stored carefully, in the environment in which they will be used and sealed in plastic film prior to use, to ensure that they are in optimum condition for use. The outside part of any new reel should be discarded before use to avoid damaged or dirty paper going through the line.

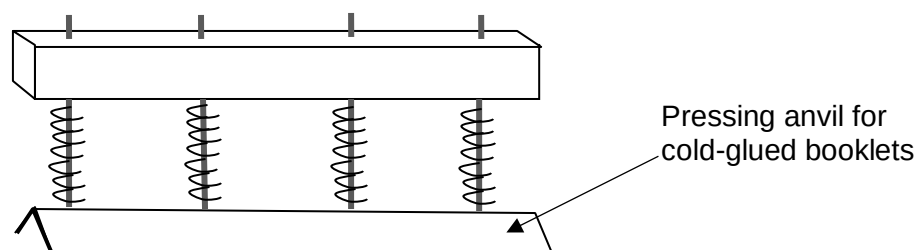
Printed sheet stacks (for off-line operation) should be flat, and should be stored in the environment in which they will be used. Damage to stack edges and curl will reduce reliability of the Smart-binder pile feeder.

Print toner should be properly fused to all digitally printed sheets. If not, it will transfer from the paper onto parts of the Smart-binder and cause book marking. If toner does transfer to Smart-binder guides or belts, clean them using a cloth soaked in alcohol, or soap and water.

Paper stocks lighter than about 50 gsm require use of the optional F-100 folder connected to the SB infeed, and the optional ASS-100 anti-static system.

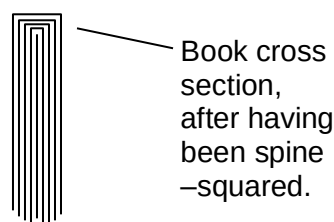
17.6.1 Changing between wire stitching and ISG cold-gluing

A changeover from wire stitching to ISG cold gluing can be done on-the-run (if stitching heads are to be left in position). However, for optimum quality the stitching heads may be removed to enable the ISG press-down 'anvil' to be fitted in their place, which requires a few minutes changeover time. The ISG gluing nozzle can be activated from the operator 'touch-screen'.



17.6.2 Using the optional 'Spine-squaring' unit SM-101 or ARSD

The spine squaring unit receives finished booklets and presses their spines into a square shape (see Appendices 20 and 21).



However, the effectiveness of this squaring process diminishes as the booklet thickness increases. The Spine-squarer may be connected in-line to the end of the Smart-binder delivery conveyor. The SM-101 is 660mm long and 710mm wide and requires a single phase power input (3 Amps at 240 Volts: other voltages available as required) .The maximum cycle rate of the SM-101 is 28 books/min. The ARSD-S-100 should be used if faster cycling speeds are required.

17.7 Maintaining the Smart-binder

17.7.1 Spare Parts

17.7.1.1 Stitching Heads

The Smart-binder is supplied with two Hohner stitching heads (43/6S) which pull 0.4 – 0.6mm round-section wire from wire spools mounted on the back of the machine. These heads include special wire clinchers that are manufactured uniquely for use on the IBIS Smart-binder. *Note: do not attempt to use standard Hohner clinchers because they will not fit on the Smart-binder.*

Damaged stitching heads may be returned to your local Hohner representative for repair, or returned to IBIS.

To minimise machine downtime in the event of a damaged stitching head, it is recommended that customers hold at least one spare head. A stitching head can be changed in minutes by the operator, and repaired or cleaned when off the machine.

Loop stitch heads (Option LST-100) may be used but require a special stitcher drive modification (refer to IBIS for quotation)

17.7.1.2 Spares Kits

Spare parts kits are available in either Basic or Extended forms:

Basic Spare Parts Kits (normally recommended to be purchased with each new Smart-binder)
--

Smart-binder Basic spare parts kit

Additional Basic Spare Parts for Smart-binder optional modules
--

Extended Spare Parts Kits

Smart-binder Extended Spare Parts kit

Additional Extended Spare Parts for Smart-binder optional modules

The 'Essential' spare parts kits contain components that are likely to be needed during normal operation. The 'Basic' spare parts kit contains additional components that might be damaged in the event of a severe jam or parts to repair other general machine malfunctions. It is recommended that this kit is held at sites where time -critical jobs are being run.

An 'Extended' spare parts kit contains components that can fail but are not commonly required. This kit is primarily intended for re-sellers who are offering a maintenance service, but may also be justified to be held at any site with several Smart-binders.

17.7.2 Scheduled Maintenance SMP and Customer Support CSP

Scheduled maintenance kits are also available. These contain parts that are needed to carry out the scheduled maintenance programme for the Smart-binder. There is a kit for each service interval (every 3,000 operating hours, or every 12 months).

It is recommended that all Smart-binder scheduled maintenance is carried out by IBIS according to the IBIS Scheduled Maintenance Programme (SMP). Refer to IBIS for full details.

Following installation of a new Smart-binder system it is recommended to select the IBIS CSP (Customer Support Program) which includes Preventative Maintenance (PM) and the following additional support services:

IBIS CSP program

- One week on-site support by an IBIS technician during the first week of live production.
- No charge supply of all replacement parts required during normal machine operation, excluding consumables such as trimmer knives and stitching wire. Priority given to urgent spares orders for quickest possible delivery.
- One follow-up visit by an IBIS Technician to take place between 5 and 7 months after installation to ensure the machine is operating correctly, is correctly adjusted and to provide 'refresher' training.
- One visit by an IBIS Technician between to take place around 11 and 12 months after machine installation to complete scheduled preventative-maintenance (PM).
- All required preventative-maintenance (PM) parts.
- Access to IBIS technical support telephone hot-line, including out-of-hours support.
- Priority given to IBIS technician on-site reactive support when needed, and special reduced price per visit.
- Performance related software and hardware upgrades.

17.7.3 Smart-binder 'Consumables'

17.7.3.1 Stitching Wire (consumable)

Two 2.5K (5.5lbs.) (5 lb) spools of wire are supplied with each Smart-binder, enough for 43,000 to 60,000 stitches from each head (depending on book thickness – thin books need slightly less wire per book than thick books). This is sufficient for normal system commissioning after initial new machine installation.

Other sizes of wire spool (up to 100Kg/220lbs) are available; refer to IBIS for more information.

A suitable wire vendor should be found to provide good quality round cross section wire between 0.4 and 0.6mm in diameter (or wire may be purchased from IBIS).

17.7.3.2 Glue (consumable)

17.7.3.2.1 ISG cold glue

Smart-binders fitted with the ISG glue system (see Appendix 1) are supplied with 5 litres of cold glue, which is sufficient for the normal machine commissioning period. The normal recommended glue is Pafra PVA cold glue AQUAPAL 9278 (sold also by Robatech as R-5183L50), but

alternative glues may sometimes be used for difficult applications, such as with the use of coated paper stocks. **It is essential that only glues approved by IBIS with the correct viscosity are used to avoid glue application problems.**

The Smart-binder uses approximately one litre of ISG cold-glue for every 78,000 sheets (312,000 pages) when applying 'dots' of glue at normal spacing. When calculating glue usage per booklet note that:

- The center sheet in each booklet automatically receives no glue .
- Normal uncoated absorbent paper stocks require only 'dots' of glue spaced about 4 - 8 mm apart. However it is possible to select to apply more glue (such as a continuous line of glue) to the outside cover compared to the insider sheets, which may increase glue consumption. Additional glue may be required for example if using a coated cover.

17.7.3.2.2 Cost Comparison: wire stitching vs ISG cold gluing

Wire stitching

The cost of wire to produce 1000 wire-stitched booklets is about GBP £0.74 (GB Pounds.. 2020 price) if purchased from IBIS. This cost may be lower if buying from a local supplier. The cost does not vary much between a thin and a thick booklet.

ISG cold gluing

The cost of ISG cold-glue binding depends on the number of sheets in the booklet. The cost of Eukalin cold-glue (specification R5183-L50) needed to produce 1000 A4 booklets is as follows (assuming glue purchased from the glue manufacturer):

Number of sheets in booklet	Number of pages in booklet	Cost of ISG for 1000 A4 books (GB Pounds: 2020 pricing)
4	16	£0.08
10	40	£0.26
30	120	£0.82

Note 1: In summary ISG glue is a lower cost compared with wire staples when making A4 booklets containing up to about 100 pages in thickness or A5 booklets up to about 140 pages (assuming glue purchased directly from the glue manufacturer)

Note 2: If the booklets are A5 size then the cost of glue shown above is reduced by 30%

Note 3: The ISG cold glue system is easier and less expensive to maintain than the wire stitching system. Also, ISG glued booklets are stronger and lay flatter than wire stapled booklets

17.7.3.3 Trimmer knives (as used for saddle-bound booklet production)

Knives require sharpening at intervals depending on machine usage and type of booklets being produced (these intervals are normally at least some weeks and often many months). Sharpening is best carried out by a local specialist. For budgeting purposes, assume knives are reground quarterly and replaced with new annually.

Knives must only be changed or adjusted by a trained technician. IBIS provides this training as part of the 5-day Smart-binder service engineer maintenance training course.

Knives are used in pairs consisting of an upper shear knife and a lower bed knife (pairs are not matched: any new or reground upper shear knife may be used with any new or reground bed knife). If one of the pair is changed, the other should also be changed, otherwise premature wear of the new knife will occur.

The same knives are used in the three main knife positions: a complete set of main knives is made up of 3 pairs of shear and bed knives.

The center-knife assembly CKN-100 or 101 consists of a special shear knife, with two cutting edges, and a pair of bed knives (see Appendix 17). Alternatively option CKN-102 has a singled bladed upper knife and only one lower knife. As with other knives, these should be treated as a set, and all be changed together.

We recommend that at least two sets of knives are purchased in addition to the set supplied with the machine. This allows for one set to be in use on the machine, one set to be away for regrinding and one set ready to install in case the knives in use are damaged.

One spare set of knives is included in the basic spares kits; additional sets can be purchased from IBIS:

Option number	Trimmer knife blade sets
SKK-100	Trimmer knives: face head and foot (3 upper and 3 lower).
SCK-100	1/4" Center knives (1 upper and 2 lower)
SCK-101	3/8" Center knives (1 upper and 2 lower)
SCK-102	Single bladed Center-knife (1 upper and 1 lower)

17.8 Smart-binder log-files, diagnostics and connection to external MIS systems

17.8.1 Log files

These can be found in the Smart-binder PC controller D: drive. A new file is created every time the Smart-binder operating software starts and is called 'LogNNNN.txt' where NNNN is a sequential number. Files are limited to about 1Mbyte and a new file started when this limit is reached. Logfiles are deleted automatically when they are 100 days old.

17.8.2 Connecting the Smart-binder to a network (external MIS system)

Connect to the network port (Smart-binder supports 10/100) on the PC card (upper left of the control panel at back of machine). The log files are on the Hard disk drive (if fitted) drive letter D: (or if you do not have a Hard disk drive they will be in c:\temp). Share the folder (C:\temp or D:) to be able to see it over the network. The Smart-binder runs on a stripped-down version of windowsXP so you do not have the full range of menus, however, you can create a share on a folder by right-clicking the appropriate folder with a mouse.

The optional Smart-Data analysis system SDA-100 assists connection to an external network.

See IBIS document **Smartbinder_Diagnostics** for further information.

18 Planning a Smart-binder installation (SB-1, 2 and 3)

When planning installation and commissioning, allow 2 days to install the Smart-binder and approximately 8 days for system commissioning and operator training, prior to the start of live production (this time may be reduced if installing an off-line Smart-binder fed from sheet feeder) . Allow some extra days for commissioning systems which include optional modules such as F-100, SRF-100, SB-097, BSS-10, LT-101. For exam paper production lines with full in-line stacking wrapping and labelling systems allow up to two additional weeks before starting live production.

18.1 Installation schedule (SB-1, 2 and 3)

Day	Activity
1	Unpacking, checking shipment and moving into position
2	Assembling Smart-binder, connecting power
3-6	Commissioning: requires printed work and covers available from day 3.
7-10	Operator training
11-12	Pre-production tests

Note: In particular connection of power (day 2), the availability of printed work (day 3) and the availability of trainees (days 7-10) are critical to meeting this schedule.

18.2 Preparing the site

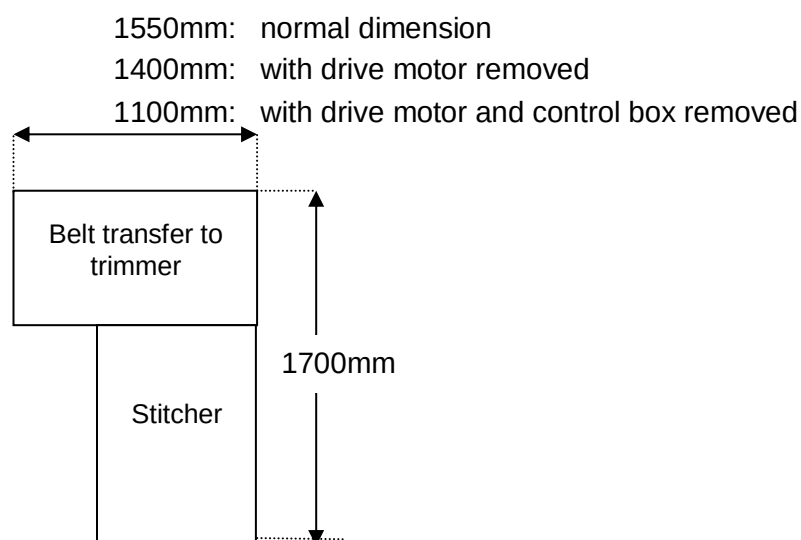
Refer to the Smart-binder Installation Questionnaire for full list of all site preparation issues.

Installation questionnaire

The IBIS installation questionnaire is included with all IBIS 'Order Confirmations' (issued to the buyer on receipt of all new SB machine Orders)

Access:

Ensure that there is sufficient space to manoeuvre the largest Smart-binder module into the final position (see below for dimensions of largest module). This is particularly important where this unit must pass through doorways.



Floor:

The machine should be sited on a substantial floor, which is level over the total area of the machine to within 10mm (3/8"). The layout drawings shown on the next pages show floor loads applied by the

Smart-binder. The floor must be able to withstand at least these loads without damage or movement.

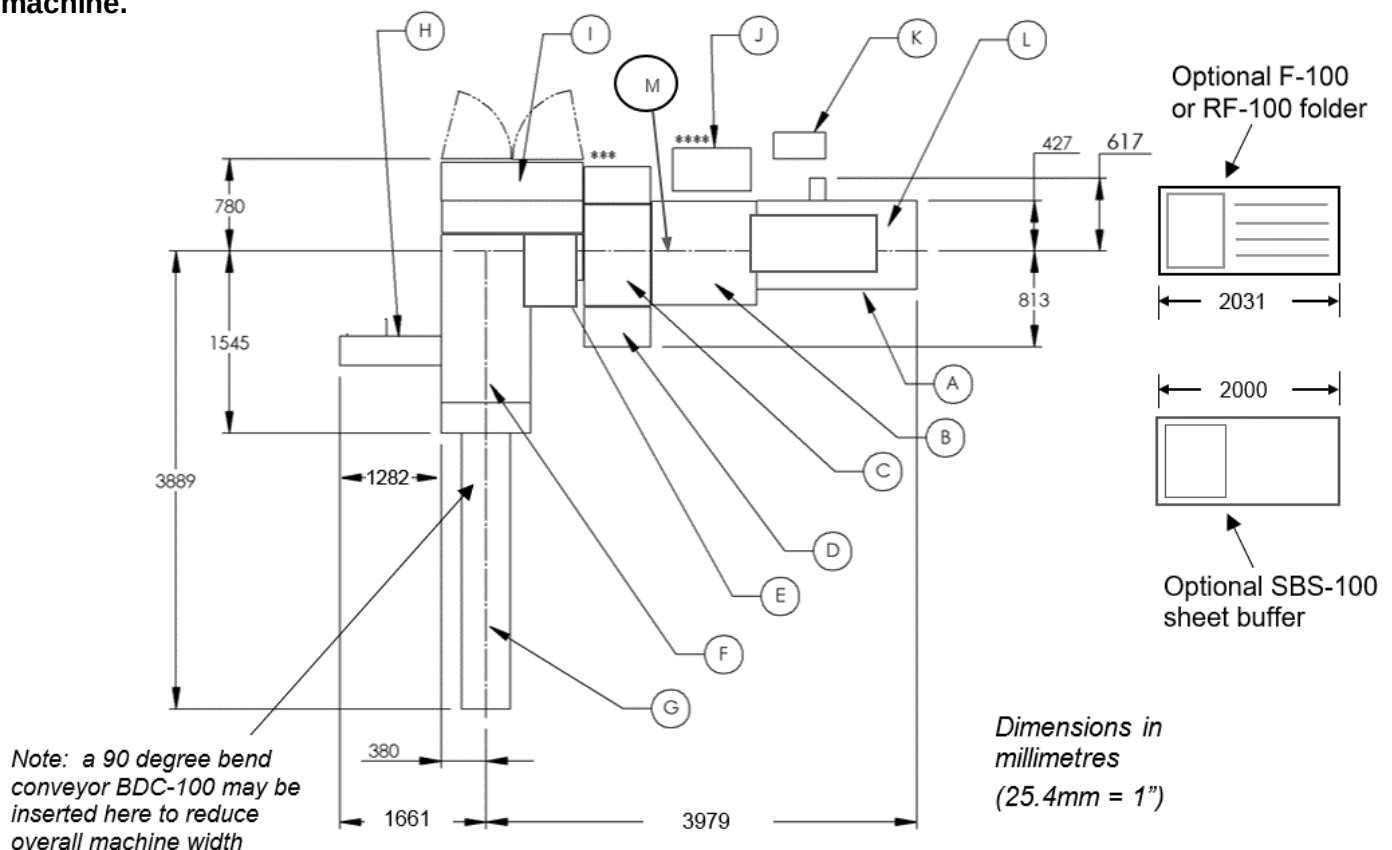
Space around the machine: Allow adequate space for:

- All the machine guards to be fully removed.
- Electrical box doors to be fully opened (mounted on the back of the machine, behind the stitcher)
- Operators to move freely in the working area between the delivery conveyor, cover feeder and pile feeder if one is installed.
- Access to all sides of the machine for maintenance. Particularly, at the end of the Stitcher module to allow the saddle skirts to be removed.
- The trimmer waste collection bin, if the TWC-100 or TWC-101 removal conveyor is used (see Appendix 4).
- Trimmer waste conveyor removal: allow about 1 meter space to pull the conveyor out from the trimmer.
- Floor standing Wire Spools (for example the optional 100kg wire spools which mount on the floor behind the Stitcher). Note: the standard 2.5K (5.5lbs.) spools mount on the machine and do not take up any floor space.
- The vacuum pump(s), transformer and interface unit for pile feeders.

The following layouts show space requirements for different variants of the Smart-binder.

18.2.1 Layout of basic Smart-binder SB-2 or -3

Plan of in-line version Smart-binder SB-2 and SB-3 – showing machine size and parts of machine.



SB-1, SB-2 and SB-3 Smart-binder elements			
A	Infeed conveyor	H	Trimmer waste conveyor (optional)
B	Scoring and folding	I	Electrical enclosure
C	Collator	J	Transformer (optional) <i>(optional.. needed only for input voltages outside the 380 – 415v range)</i>
D	Operator interface	K	Vacuum pump
E	Stitcher	L	Cover feeder (optional)
F	Trimmer	M	ISG Gluing (SB-3 only) +++
G	Delivery conveyor		

Machine height: 1350mm (53") with guards closed.

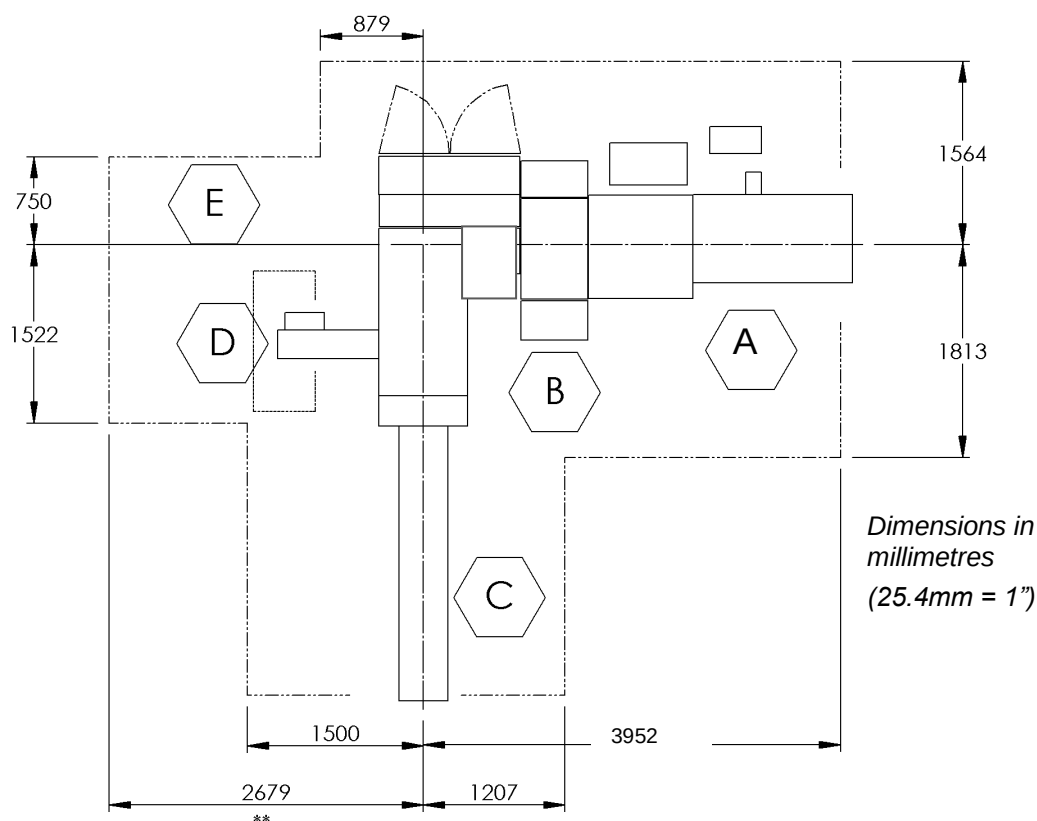
Ceiling height required to allow guards to open: 2500mm (98.5") over trimmer and 2000mm (79") over rest of machine.

*** Electrical supply position. 3 metre cable and plug supplied, so customer's power socket must be within 3meters of this point.

**** Electrical supply position when transformer is supplied (supplies both main Smart-binder and pile feeder). Customer provides wiring to terminals in transformer housing.

+++ ISG glue option requires a high pressure air supply.

Plan of in-line Smart-binder showing clearance needed around machine.



The area within the chain dotted line must be clear of fixed obstructions to allow operator and service access to the machine.

A - Cover Loading Position

B - Control Panel

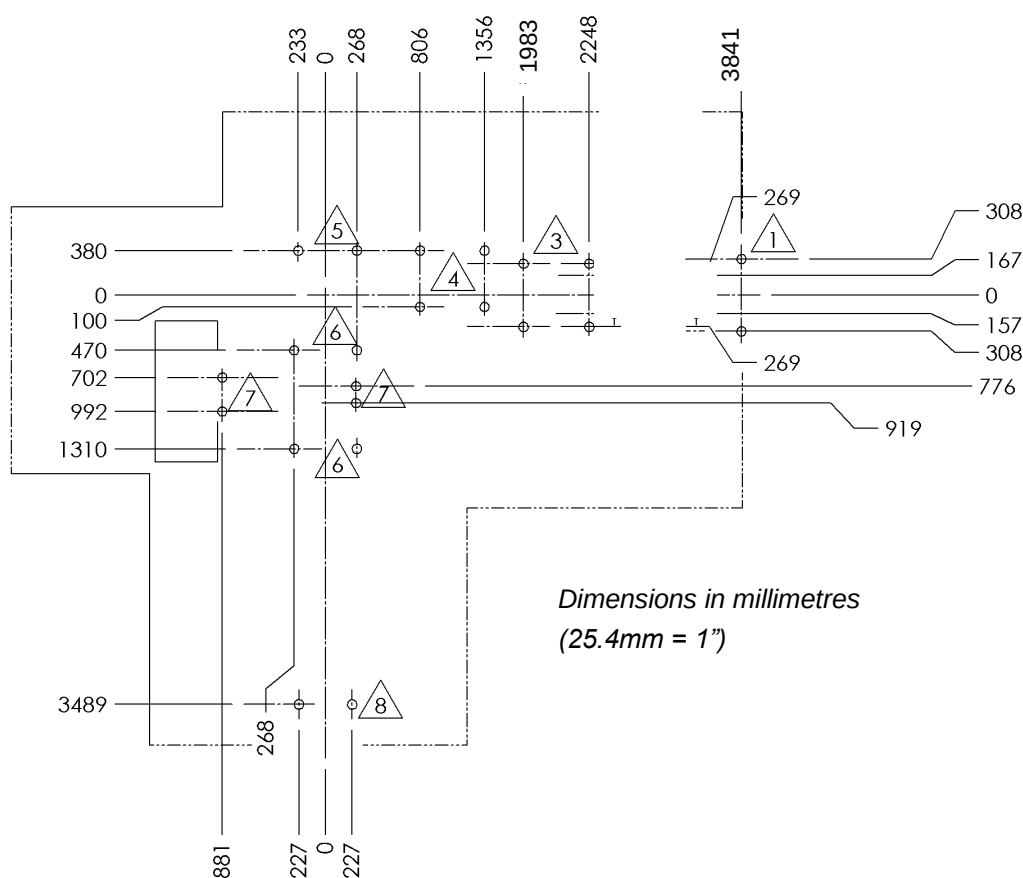
C - Position for Removal of Finished Books from Delivery Conveyor

D - Location of Waste Bin when used with standard trimmer waste removal conveyor

E - Space for Removal of Saddle Skirts (Service and Maintenance)

** This dimension is needed to allow space to remove saddle skirts and space to remove the trimmer waste conveyor.

Plan showing floor loadings of all feet of installed Smart-binder.



Feet	Quantity	Maximum static load per foot	
1	2	40 kg	88 lb
3	4	140 kg	308 lb
4	4	500 kg	1100 lb
5	4	500 kg	1100 lb
6	2	500 kg	1100 lb
7	4	20 kg	44 lb
8	2	30 kg	66 lb

Feet are typically 70 mm (2.75") diameter. Actual loads on each foot are usually much lower, but floor must be able to withstand the loads in this chart.

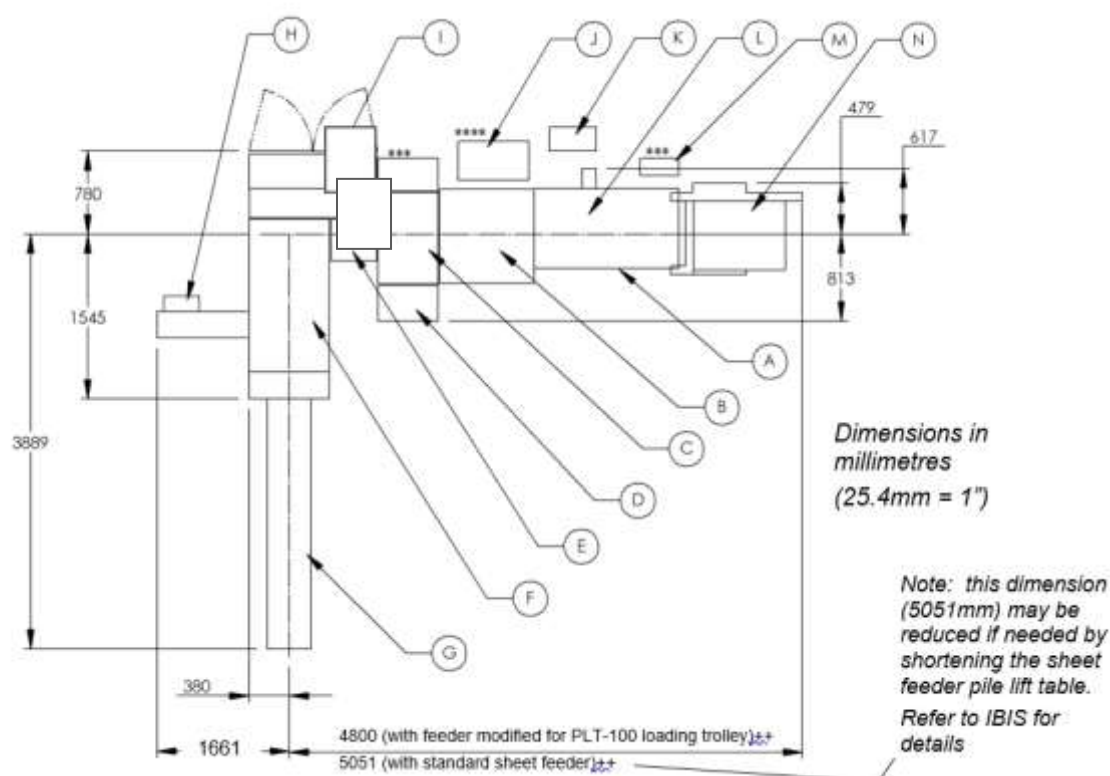
Total machine weight 1900 kg (4200 lb).

Maximum dynamic loads during operation +/- 40 kg (+/- 88 lb) over feet number 6 (Trimmer).

During installation machine is moved on wheels, which can apply more concentrated loads than those listed here. This is not usually a problem but can make machine alignment and movement on soft floor surfaces difficult.

18.2.2 Layout of Off-line version Smart-binder SB-2 or 3

Plan of off-line Smart-binder SB- 2 or 3 – showing machine size and parts of machine.



Smart-binder elements			
A	Infeed conveyor	H	Optional trimmer waste conveyor
B	Scoring and folding	I	Electrical enclosure
C	Collator	J	Transformer <i>(optional.. needed only for input voltages outside the 380 – 415v range)</i>
D	Operator interface	K	Vacuum pump
E	Stitcher	L	Cover feeder
F	Trimmer	M	Pile Feeder Interface Box
G	Delivery conveyor	N	Pile Feeder

Machine height: - 1350mm (53") with guards closed.

Ceiling height required to allow guards to open: 2500mm (98.5") over trimmer and 2000mm (79") over rest of machine.

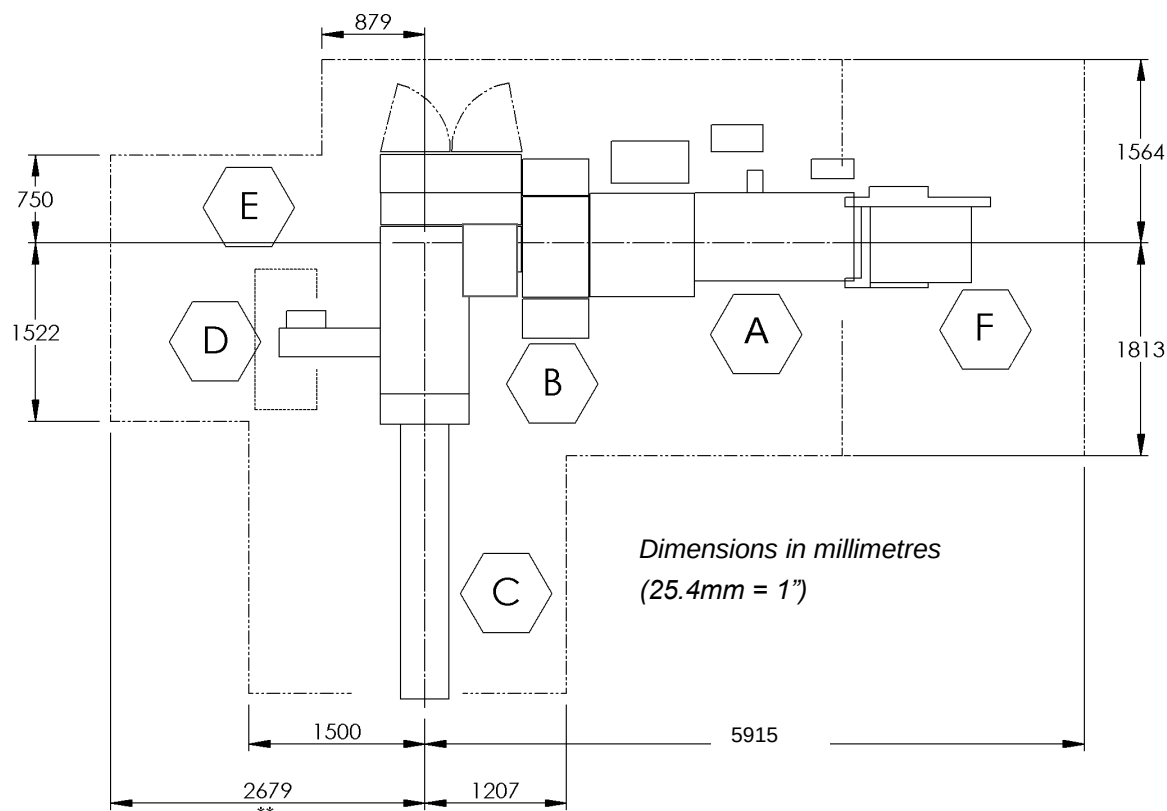
*** Electrical supply positions (one for main Smart-binder, one for pile feeder). 3 metre cables and plugs supplied so customer's power sockets must be within 3meters of these points.

**** Electrical supply position when transformer is supplied (supplies both main Smart-binder and pile feeder). Customer provides wiring to terminals in transformer housing.

++ These dimensions increases by 330mm when the DMP-100 perforator is fitted (Appendix 11).

+++ ISG glue option requires a high pressure air supply.

Plan of off-line Smart-binder SB-2 or SB-3, showing clearance needed around machine.



The area within the chain dotted line must be clear of fixed obstructions to allow operator and service access to the machine.

A - Cover loading position

B - Control panel

C - Position for removal of finished books from delivery conveyor

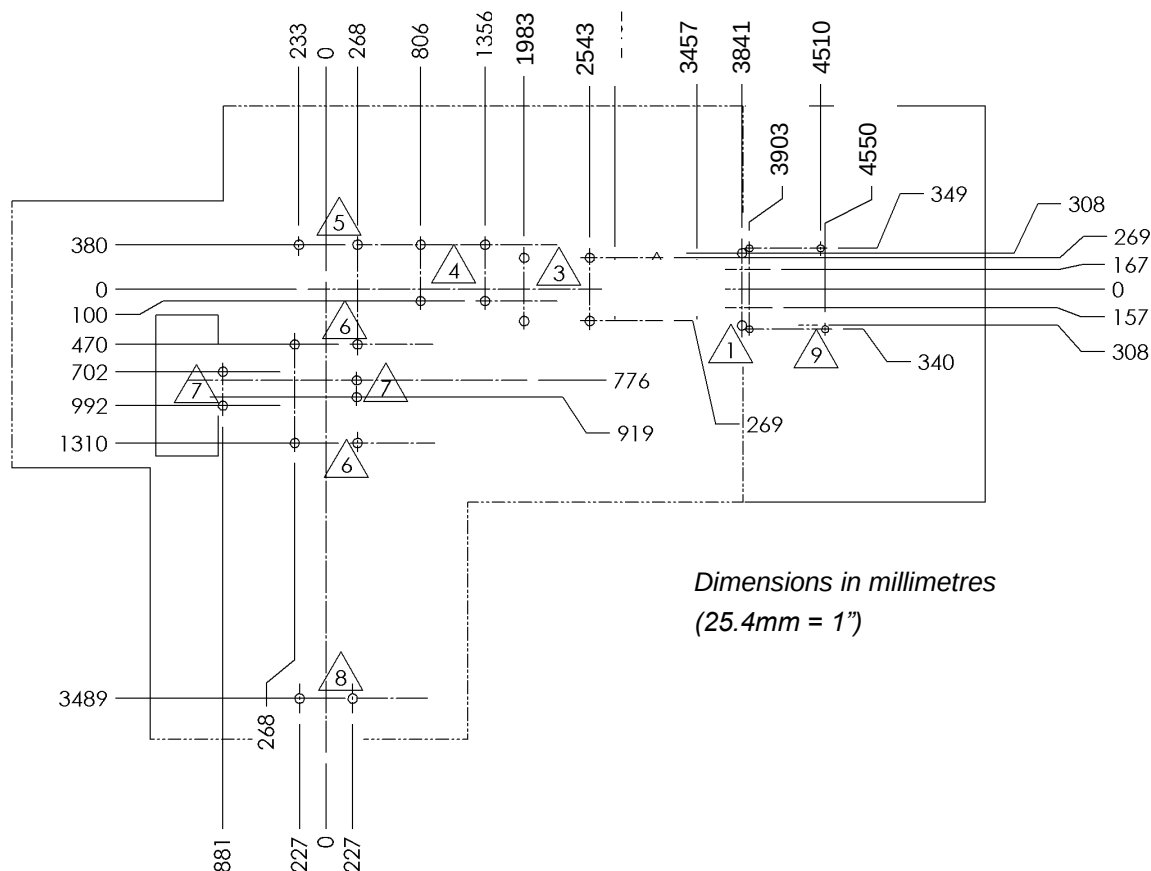
D - Location of waste bin when used with standard trimmer waste removal conveyor

E - Space for removal of saddle skirts (service and maintenance)

F - Sheet feeder loading area

** This dimension is needed to allow space to remove saddle skirts and space to remove the trimmer waste conveyor.

Plan showing floor loadings of all feet of installed off-line Smart-binder.



Feet	Quantity	Maximum static load per foot	
1	2	40 kg	88 lb
3	4	140 kg	308 lb
4	4	500 kg	1100 lb
5	4	500 kg	1100 lb
6	2	500 kg	1100 lb
7	4	20 kg	44 lb
8	2	30 kg	66 lb
9	4	100 kg	220 lb

Feet are typically 70 mm (2.75") diameter. Actual loads on each foot are usually much lower, but floor must be able to withstand the loads in this chart.

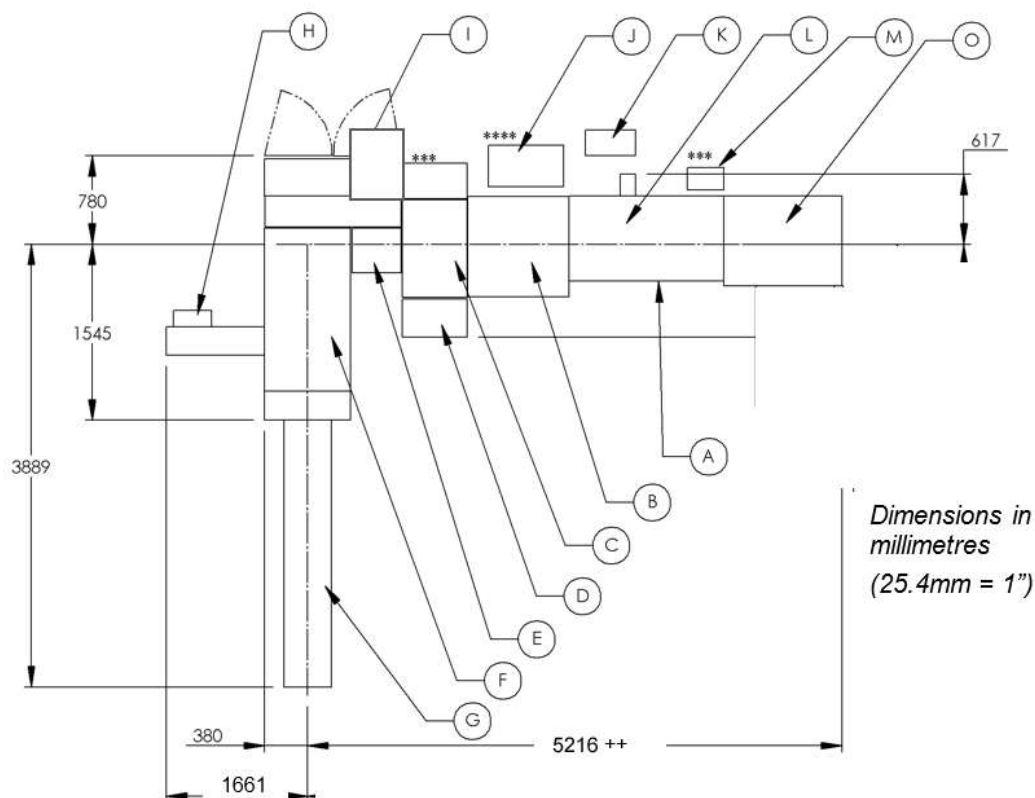
Total machine weight 2100 kg (4600 lb).

Maximum dynamic loads during operation +/- 40 kg (+/- 88 lb) over feet number 6.

During installation machine is moved on wheels, which can apply more concentrated loads than those listed here. This is not usually a problem but can make machine alignment and movement on soft floor surfaces difficult.

18.2.3 Layout of in-line Smart-binder SB-2 or 3 with optional SB-097 sheet pile feeder

See Appendix 7



Smart-binder elements			
A	Infeed conveyor	H	Trim waste conveyor (optional)
B	Scoring and folding	I	Electrical enclosure
C	Collator	J	Transformer (optional) <i>(optional.. needed only for input voltages outside the 380 – 415v range)</i>
D	Operator interface	K	Vacuum pump
E	Stitcher	L	Cover feeder
F	3-knife trimmer	M	Pile Feeder Interface Box
G	Delivery conveyor	O	Sheet pile feeder (SB-097)

Machine height: 1350mm (53") with guards closed.

Ceiling height required to allow guards to open: 2500mm (98.5") over trimmer and 2000mm (79") over rest of machine.

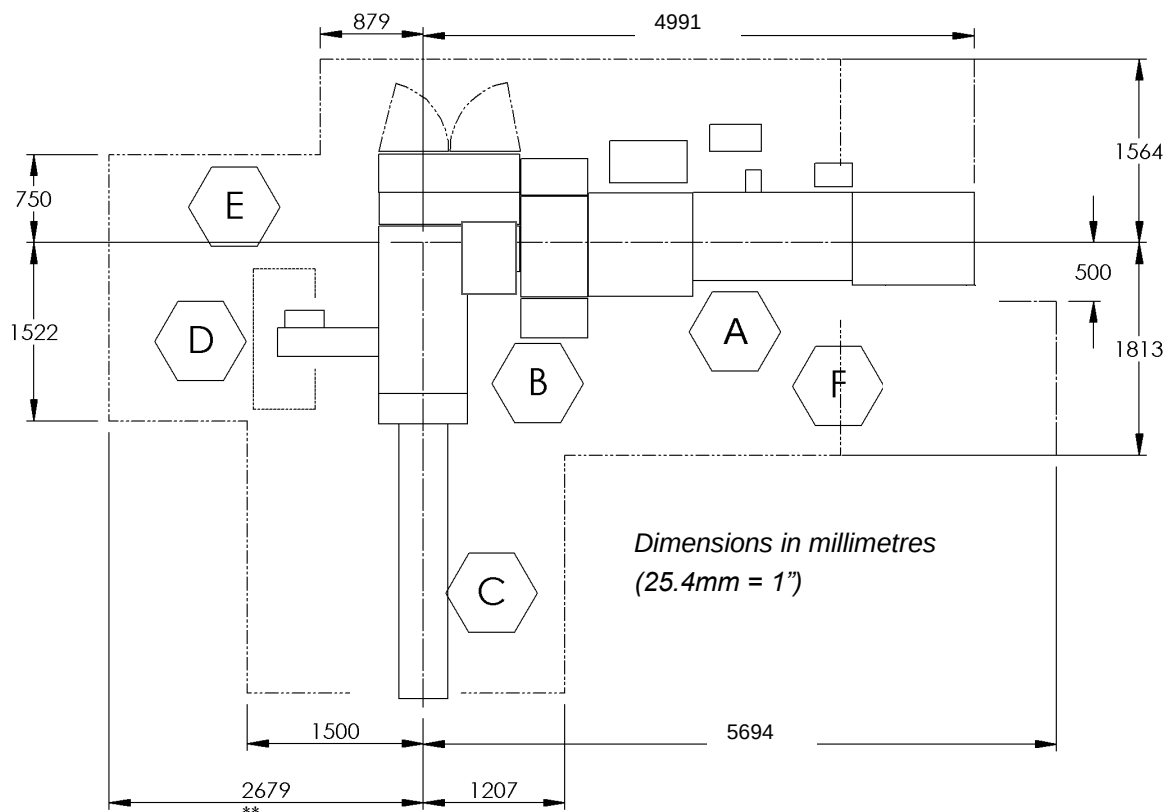
*** Electrical supply positions (one for the Smart-binder, one for pile feeder). 3 metre cables and plugs supplied so customer's power sockets must be within 3meters of these points.

**** Electrical supply position when transformer is supplied (supplies both main Smart-binder and pile feeder). Customer provides wiring to terminals in transformer housing.

++ This dimension increases by 330mm when the DMP-100 perforator is fitted (see Appendix 11).

+++ ISG glue option requires a high pressure air supply.

Plan of Smart-binder in-line/off-line (with SB-097) showing clearance needed around machine.

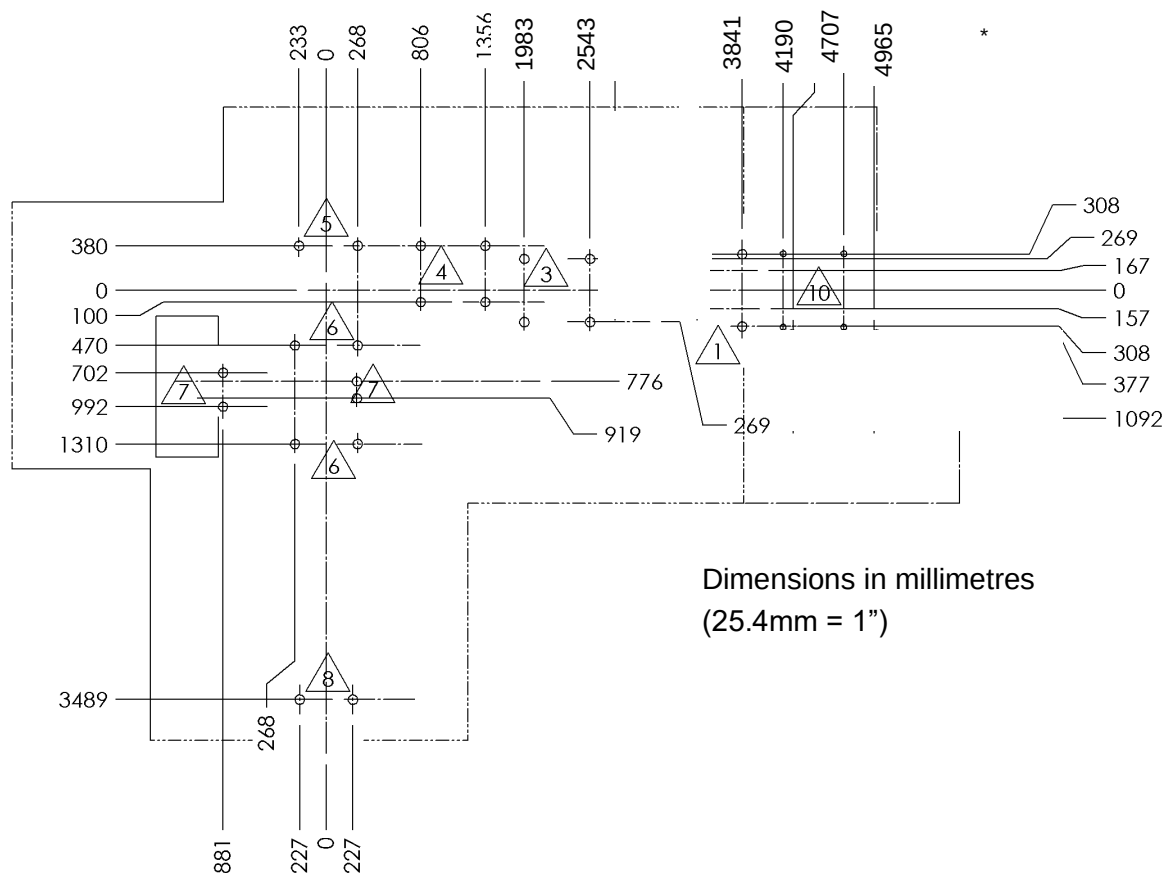


The area within the chain dotted line must be clear of fixed obstructions to allow operator and service access to the machine.

- A - Cover loading position
- B - Control panel
- C - Position for removal of finished books from delivery conveyor
- D - Location of waste bin when used with optional trimmer waste removal conveyor
- E - Space for removal of saddle skirts (service and maintenance)
- F - Sheet feeder loading area

** This dimension is needed to allow space to remove saddle skirts and space to remove the trimmer waste conveyor.

Plan showing floor loadings of all feet of installed Smart-binder in-line/off-line (with SB-097).



Feet	Quantity	Maximum static load per foot	
1	2	40 kg	88 lb
2	4	100 kg	220 lb
3	4	140 kg	308 lb
4	4	500 kg	1100 lb
5	4	500 kg	1100 lb
6	2	500 kg	1100 lb
7	4	20 kg	44 lb
8	2	30 kg	66 lb
9	4	100 kg	220 lb
10	4	25 kg	55 lb

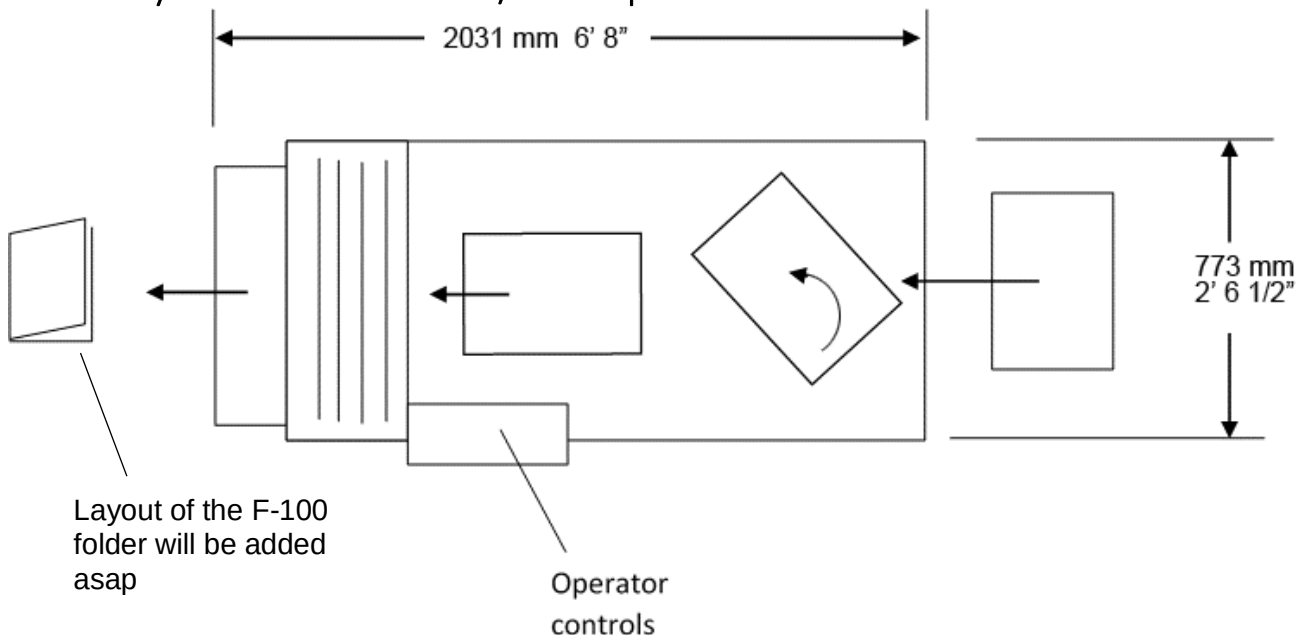
Feet are typically 70 mm (2.75") diameter. Actual loads on each foot are usually much lower, but floor must be able to withstand the loads in this chart.

Total machine weight 2100 kg (4600 lb).

Maximum dynamic loads during operation +/- 40 kg (+/- 88 lb) over feet number 6.

During installation machine is moved on wheels, which can apply more concentrated loads than those listed here. This is not usually a problem but can make machine alignment and movement on soft floor surfaces difficult.

18.2.5 Layout of SRF-100 rotator/folder option

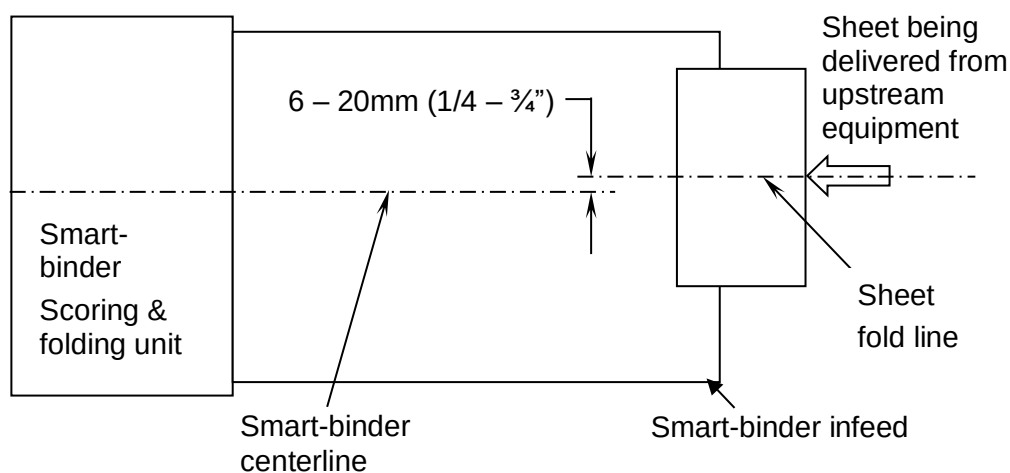


Note: Check with IBIS on availability of the SRF-100 before ordering.

Note: Refer to IBIS for layout dimensions of other optional modules

18.3 Connection to upstream/downstream equipment

Sheets must be delivered into the Smart-binder infeed from the upstream equipment correctly oriented (usually long edge leading) and with the sheet fold line (normally the center of the sheet) offset from the Smart-binder center-line as shown below.



Note: if changing web width when using Smart-binder fed from a web-cutter then the new web must be centralized in the web-cutter.

The Smart-binder infeed accepts sheets delivered from the upstream equipment (or the pile feeder in the off-line configuration) at the following heights.

The height of the Smart-binder delivery conveyor at the take-off end is 730mm. A special modified delivery conveyor may be provided if books need to exit at a different height for interface to downstream equipment such as a book stacker or inserter (refer to IBIS for details).

18.4 Smart-binder Factory Services

Electrical power , compressed air and environmental control, waste removal

18.4.1 Electrical power requirements

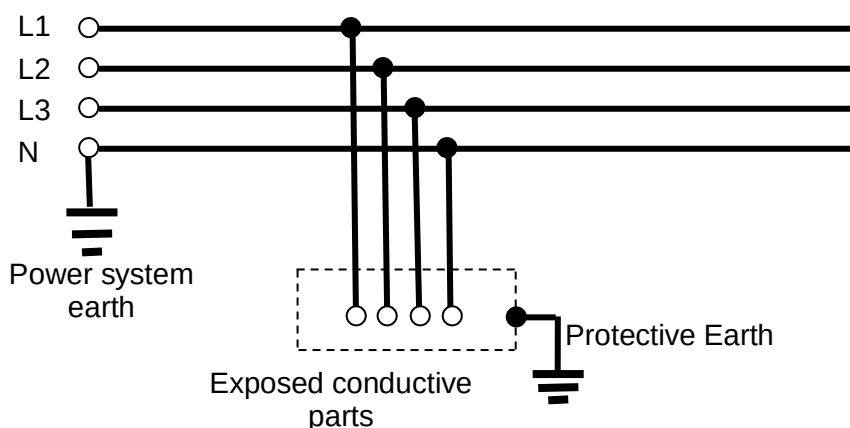
Equipment	Model	Phases	Rated Voltage (V)	Rated Current (A)	Recommended Supply ⁽¹⁾ (A)	Operation from 208/220V supply ⁽²⁾
Smart-binder	SB2,SB3	3+N	400	16	(US)15/(EU)16	TFR-100 ⁽³⁾
Sheet Pile Feeder	SB-095	3	400	5	(US)15/(EU)16	TFR-100 ⁽³⁾
Sheet Pile Feeder	SB-097	3+N	400	6	(US)15/(EU)16	TFR-100 ⁽³⁾
Sheet Rotator & Folder	SRF-100	3	400	3	16	Specify voltage with order
		3	208	6	15	
Sheet Folder	F-100	3	400	3	16	Specify voltage with order
		3	208	6	15	
Sheet Folder	F-101	3+N	220/400	3	(US)15/(EU)16	-
Booklet Stacker	BSS-10	2	208-440	6-3	(US)15/(EC)16	-
Spine Squarer	SM-100	1	208-254	3	(US)15/(UK)13/(EC)16	-
Spine Squarer	ARSD	TBA	TBA	TBA	TBA	TBA
Insert Feeder	CIF-101	3+N	400	6	16	TFR-100 ⁽³⁾
Laser Tabber	LT-101	TBA	TBA	TBA	TBA	TBA

Consult IBIS if input voltage is not in the ranges listed above.

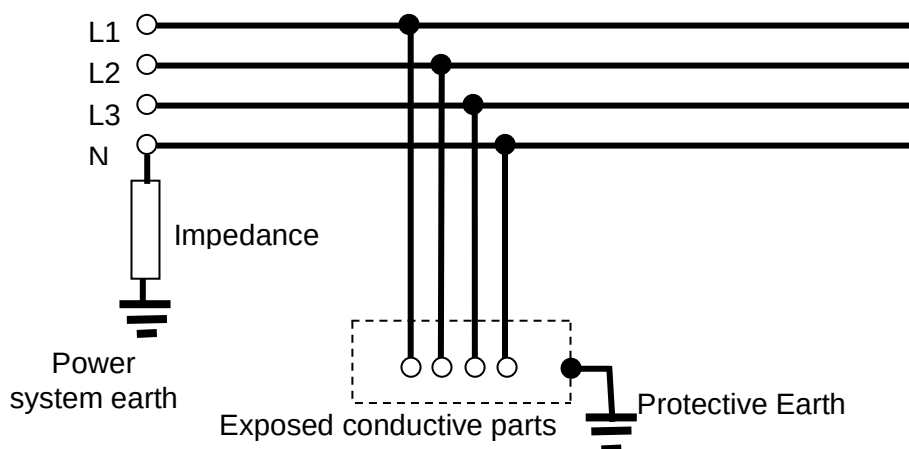
- (1) Circuit breakers should be Type C (according to EN60947), or equivalent. Residual current devices (RCD) and Ground Fault Interrupters (GFI) must not be fitted to the power supply as leakage currents from the Smart-binder could cause nuisance trips. Power networks with significant impedance between neutral & ground (known as IT networks) should not be used to supply any equipment as this can lead to damage in the inbuilt EMC filters.
- (2) Equipment marked “–” can operate from a range of supplies, or has inbuilt transformers that can be configured on installation.
- (3) The TFR-100 transformer can supply the Smart-binder plus one of SB-097, SB-095, CIF-101. If the factory supply voltage is 208V then it requires a 30A supply to be wired to the unit and is equipped with 2 sockets to which the Smart-binder etc can be connected.

18.4.2 Power Distribution Networks (according to EN60950)

1. **TN POWER SYSTEM:** A power distribution system having one point directly earthed, the exposed conductive parts of the installation being directly connected to that point by protective earth conductors. Three types of TN POWER SYSTEM are recognized according to the arrangement of neutral and protective earth conductors, as follows:
 - i. TN-S system: having separate neutral and protective earth conductors throughout the system;
 - ii. TN-C-S system: in which neutral and protective functions are combined in a single conductor as part of the system;
 - iii. TN-C system: in which neutral and protective functions are combined in a single conductor throughout the system;
2. **TT POWER SYSTEM:** A power distribution system having one point directly earthed, the exposed conductive parts of the installation being connected to earth electrodes electrically independent of the earth electrodes of the power system.



3. IT POWER SYSTEM: A power distribution system having no direct connection to earth the exposed conductive parts of the installation being earthed.



18.4.3 Compressed air supply requirements

Equipment	Model	Pressure		Consumption		Maximum Flow	
		Mpa	PSI	litre/min	CFM	litre/min	CFM
Smart-binder	SB1,SB2,SB3	0.62	90	3.5	0.1		
Stacker	BSS-10 ⁽²⁾	0.55	80	45	1.6	76	2.7

- ⁽¹⁾ The BSS-10 stacker requires large but intermittent air-flow. Supply pipework must accommodate the maximum flow.

18.4.4 Factory Air conditioning

The Smart-binder environment should be controlled to reduce variability in the behaviour of the paper. This should result in more consistent, reliable operation.

Maintain relative humidity within the range **40-60%** and temperature between **18 and 25°C (64 and 77°F)**.

Heat output when running

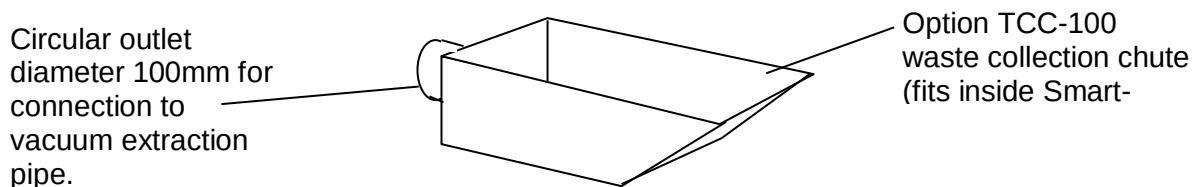
Equipment	Model	Running Heat Output	
		(kW)	(BTU/hr)
Smart-binder	SB2,SB3	6.7	22860
Pile Feeder	SB095	2.5	8530
Pile Feeder	SB097	3	10236

Rotator Folder	SRF-100	0.5	1706
		0.5	1706
Folder	F-100	0.5	1706
		0.5	1706
Folder	F-101	0.75	2559
Stacker	BSS-10	1.5	5118
Spine Squarer	SM-101	0.55	1877
Insert Feeder	CIF-101	4	13648

Standby heat output from each unit is generally less than 250W.

18.4.5 Trimmer waste (trim-off) removal systems

If the installation site has a pneumatic (vacuum) paper extraction system then it is recommended that this is used to remove waste paper from the Smart-binder trimmer, instead of the waste conveyor TWC-100 or TWC-101. The optional Smart-binder trimmer waste collection chute TCC-100 (part B0001944: see Appendix 30) may be supplied to connect to the external extraction pipe.



Consult IBIS for routing and dimensions of ducts.

Alternatively, the optional Trimmer Waste removal conveyor (Option TWC-100 or TWC-101) can be used to conveyor trimmed paper trim-off to a collecting bin (Option TWB-100).

Waste collection bin option TWB-100 (normally customer – supplied)



TWC-100
Optional
waste
removal
conveyor

18.5 Installation, Commissioning and Training

18.5.1 Unloading

- All machines will be delivered on wooden pallets, and either covered or wooden-crated, depending on whether the machine is transported by sea/air or by only by road . See below for dimensions and weights of these crates.
- A Fork Lift Truck, capable of lifting 2.5 Tons (2500kg/5500lb) is required for lifting the largest module of the Smart-binder off the base of the crate and into position. Its forks must be at least 1.5m (59") long (requires fork extensions).
- Each module has castor wheels for easy positioning and screw pads for final location.
- See next page for the dimensions of the largest unit. Ensure that doors, etc. are large enough for this module.

18.5.2 Machine module weights and sizes (crated)

Approximate weights and sizes

The basic in-line Smart-binder SB2 and SB-3 is delivered in 4 separate wooden crates (Note: if exact weights and dimensions are needed then information should be obtained from IBIS at the time the machine is shipped):

Crate	Size (L x W x H)		Weight	
	Cm	Inches	Kg	lb
1	206 x 196 x 156	81 x 78 x 61	1150	2530
2	256 x 206 x 147	101 x 81 x 58	638	1403
3	156 x 106 x 150	61 x 42 x 59	350	770
4	156 x 101 x 150	61 x 40 x 59	500	1100

The pile feeders SB-095 or SB-097 are delivered in a separate crate

Crate	Size (L x W x H)		Weight	
	Cm	Inches	Kg	lb
5	180 x 96 x 156	71 x 38 x 61	355	781

Refer to IBIS for weights and dimensions of other optional modules

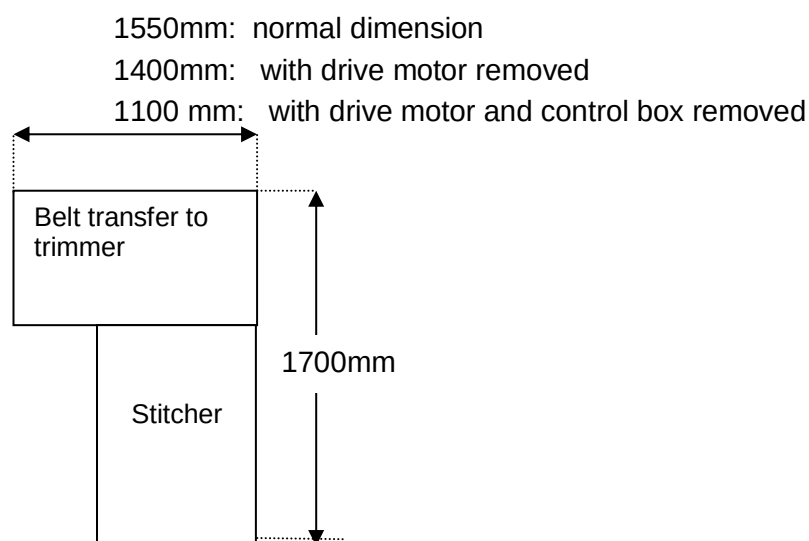
18.5.3 Smart-binder Module Weights and Sizes (uncrated)

Approximate weights and sizes

Module	Size (L x W x H)		Weight	
	Cm	Inches	Kg	Lb
Infeed Conveyor	150 x 100 x 50	59 x 40 x 20	80	176
Scoring / Folding Module	105 x 120 x 130	42 x 48 x 52	275	605
Stitcher / collector Module	192 x 179 x 132	75 x 71 x 52	900	1980
Trimmer Module	108 x 80 x 97	43 x 32 x 39	400	880
Delivery conveyor	260 x 53 x 70	103 x 21 x 28	70	154
SCF -100	94 x 105 x 127	37 x 41 x 50	320 est	704 est
Pile feeder (SB-095) for dedicated off-line feeding	80 x 90 x 115	32 x 36 x 46	268	590
Cover feeder air pump	55 x 33 x 29	22 x 13 x 12	35	77
TWC-101 waste removal conveyor	154 x 50 x 103	61 x 20 x 41	50	110
Accessories	30 x 30 x 20	12 x 12 x 8	10	22

18.5.4 Size of largest SB 2 or 3 module (stitcher module)

Excluding packaging



Note: all new installation sites should be checked to ensure that there is room to move this largest module into position

18.5.5 The Operator Training Course

Machine operators with previous experience of saddle-stitchers will learn to operate the new Smart-binder system more quickly than operators without this experience. Knowledge of operating wire stitching heads, trimming knives and all issues relating to saddle stitch book quality will be of particular value in operating the Smart-binder.

The training program is divided into four sessions. Each session lasts approximately four hours. It is recommended that the course be spread over a 3 or 4 day period

A.	Introduction	Session
A.1.	Introduction to IBIS and the Smart-binder system.	
A.2.	Distribution of Smart-binder Operator manuals.	
A.3.	Introduction to Safety issues in general.	

B.	The SMART-BINDER system	
B.1.	Identification of all elements of the Smart-binder system.	
B.2.	Glossary of terms used in operating the machine.	
B.3.	Overview of general operation of the Smart-binder system.	
B.4.	Review of Safety Issues related to actual machine operation.	
B.5.	How to start/stop the system.	
B.6.	Running demonstration of the Smart-binder in operation.	
B.7.	Review important factors relating to the presentation of sheets from the upstream equipment.	

C.	Make-ready adjustments	
C.1.	Adjusting the infeed and collator for different sheet sizes.	
C.2.	Adjusting the push out conveyor.	
C.3.	Review safety issues relating to stitcher and trimmer operation.	
C.4.	Adjusting stitching head and clincher positions.	
C.5.	Adjusting backstops and front stops for different book sizes.	
C.6.	Adjusting side knives for different book sizes.	
C.7.	Adjusting trimmer side joggers for different amounts of trim off.	
C.8.	Review operation of delivery conveyor (book shingling and batch marking).	
C.9.	Carry out make ready adjustments on cover feeder (sheet size and thickness).	
C.10.	Loading and Saving Smart-binder setup.	
C.11.	Review complete make-ready flow chart.	

D.	Stitching head operation and adjustment	
D.1.	Review Hohner stitching head operator manual.	
D.2.	Complete stitching head training (view Hohner video if available, how to change wire spools, clear jams, adjust wire length and balance leg lengths, change clincher points, etc.).	
D.3.	Run the Smart-binder with paper and produce stitched and trimmed books.	

E.	Center-knife installation, setting and operation (if supplied)	
E.1.	Review safety issues relating to trimmer operation and knife handling.	
E.2.	Fit 4th/5th knife assembly and set to produce good quality trim.	
E.3.	Run the Smart-binder with paper and produce 2-up stitched and trimmed books.	

F.	Operator maintenance	
F.1.	Review safety issues relating to trimmer operation.	
F.2.	Carry out knife adjustment to produce good quality trim.	
F.3.	Lubrication (stitching heads and trimmer).	
F.4.	Belt cleaning.	
F.5.	Polycord belt changing and joining	
F.6.	Cleaning sensors.	

G.	Fault Finding and resolution	
G.1.	Review possible book quality problems, causes and rectification.	
G.2.	Review possible paper jam conditions, causes, and prevention and jam clearance.	
G.3.	Review fault messages on touch screen.	

H.	Review of Smart-binder System operation	
H.1.	Review all machine adjustments needed to control finished book quality.	
H.2.	Run the complete system with a range of different book thicknesses and sizes.	
H.3.	Demonstrate that commercially acceptable book quality can be achieved.	
H.4.	Demonstrate that the operator trainees have been adequately trained and are capable of operating the Smart-binder system in a live production situation (run a typical job, at an adequate quality and efficiency).	
H.5.	Issue training certificates to operator trainees.	

18.5.6 The Smart-binder Maintenance training course

Service-Engineer Training (5 Days) for Smart-binder SB-1, SB-2 or SB-3

Documentation available during training course:

Smart-binder Operator Manual, Smart-binder Service Manual, Smart-binder Parts Manual, Smart-binder Installation Guide, Stitching head manual, Pile feeder operator manual and parts manual and roller table operator manual and parts manual (needed for off-line and on-line/off-line variant only), Smart-binder Documentation CD (includes electronic versions of all the above documents).

Note: the following training syllabus is an approximate guide only. The training subjects may be covered in a different sequence to that shown below.

DAY 1

A. Introduction.	
A 1.	Introduction to IBIS and the Smart-binder system.
A 2.	Introduction to Smart-binder manuals and Documentation CD.
B. The Smart-binder system.	
B 1.	Identification of all elements of the Smart-binder system.
B 2.	Glossary of terms used in operating the machine.
B 3.	Overview of general operation of the Smart-binder system.
B 4.	Safety issues relating to operating and servicing of the Smart-binder System.
B 5.	How to start/stop the system.
B 6.	Running demonstration of the Smart-binder in operation.
B 7.	Review important factors relating to the presentation of sheets from the upstream equipment.
C. Infeed Table.	
C 1.	Adjusting the Infeed for different sheet sizes. Calibrating the Dial.
C 2.	Adjusting the Infeed for straight accurate folding.
C 3.	Ball placement and effects.
C 4.	Belt replacement.
C 5.	Discuss folding position (center fold / off center fold) relating to paper size and barcode.

DAY 2

D. Sheet Folding and Scoring.	
D 1.	Setting and adjusting the Nip Rollers.
D 2.	Setting and adjusting the Scoring Rollers.
D 3.	Setting and adjusting the Folding Lane Belts.
D 4.	Polycord Belt welding and replacement.
D 5.	Setting and adjusting the Folding Nip Rollers.
D 6.	Setting the Entry Guides and guide wire replacement.
D 7.	Demonstrate correctly folded and scored sheets.
E. Collator	

E 4.	Collator Backstop operation, setting and Dial calibration.
F.	Pusher / Shuttle
F 1.	Introduction to Pusher and Shuttle operation.
F 2.	Shuttle timing and Gripper timing (Timing belt replacement).
F 3.	Pusher automatic and manual adjustment.
F 4.	Saddle removal.
F 5.	Pusher belt replacement.
F 6.	Pusher Torque Limiter operation and drive belt replacement.
F 7.	Saddle End Stop setting and adjustment (If fitted).

DAY 3

G.	Stitching head operation and adjustment.
G 1.	Introduction to Hohner Stitching Head.
G 2.	Setting and adjusting Stitch positions and Lower Guides.
G 3.	Setting and adjusting Stitch pressure and V Clamps.
G 4.	Setting, adjusting and servicing Clinchers.
G 5.	Stitcher Head timing and Clincher timing. (Belt replacement).
G 6.	Complete Stitching Head training (view Hohner video if available), how to change wire spools, clear jams, adjust wire length and balance leg lengths.
G 7.	Fault diagnosis relating to Stitch quality. (Hohner manual)
G 8.	Run the Smart-binder with paper to produce correctly Stitched books.
H.	Trimmer and Trimmer Transfer
H 1.	Introduction to Trimmer Transfer and Trimmer.
H 2.	Review safety issues relating to Stitcher and Trimmer operation.
H 3.	Belt replacement on Trimmer Transfer.
H 4.	Setting and adjusting the Upper Transfer Assembly.
H 5.	Adjusting Front Knife and Side Knife Backstops to give 'square' books.
H 6.	Adjusting Backstops and Front-stops for different book sizes.
H 7.	Adjusting Side Knives for different book sizes.
H 8.	Adjusting Trimmer Side Joggers.
H 9.	Setting and adjusting the Book Guides.
H 10.	Setting and adjusting the Transfer Nip Rollers.
H 11.	Transfer Nip Roller drive belt replacement.
H 12.	Backstop Drive Belt replacement.
H 13.	Setting and adjusting the Reject Gate.
H 14.	Setting and adjusting the Trimmer Con-Rods.
H 15.	Setting and adjusting the Front knife.
H 16.	Setting and adjusting the Side Knives.
H 17.	Run the Smart-binder with paper to produce correctly trimmed books.
I.	Center knife (4th/5th knife) installation, setting and operation (if supplied)
I 1.	Review safety issues relating to 4 th /5 th Knife and Knife handling.
I 2.	Fitting and setting the 4th/5th Knife assembly.
I 3.	Run the Smart-binder with paper and produce 2-up stitched and trimmed books.

Day 4

J.	Outfeed Conveyor.
J 1.	Introduction to Outfeed Conveyor.
J 2.	Batch counting.
J 3.	Book separation.
J 4.	Belt replacement.
K.	Cover Feeder.
K 1.	Introduction to the Cover Feeder.
K 3.	Adjusting the Infeed for different cover sizes. Calibrating the Dial.
K 4.	Setting the Pile Guides
K 5.	Replacing the Cover feeder belts.
K 6.	Run the Smart-binder with paper to produce correctly trimmed books with Covers.
L.	Touch Screen.
L 1.	Operator Functions and settings.
L 2.	Service Functions and settings.
L 3.	Log Files.
L 4.	PC and PMAC Software Updates.
M.	Fault Finding and resolution.
M 1.	Review possible book quality problems, causes and rectification.
M 2.	Review possible paper jam conditions, causes, prevention and jam clearance.
M 3.	Practical Fault Diagnosis including fault insertion tests.
M 4.	Review of Make-ready Charts and carry out sheet length change.
M 5.	Review of Make-ready Charts and carry out Web size change.
N.	Electrical overview
N 1.	Function and setting of all sensors.
N 2.	Review all electrical systems.
N 2.	Review all electrical drawings.

Day 5

O.	Parts replacements, Maintenance & spares kits
O 1.	Review contents and use of standard Smart-binder accessories kit.
O 2.	Review basic spares kit
O 3.	Review extended spares kit
O 4.	Review use of parts manual
O 5.	Carry out routine maintenance procedures.

P.	ISG Gluing System
P 1.	Overview of Gluing system.
P 2.	Operation of Gluing system, sensor and settings
P 3.	Carry out routine maintenance procedures

For off-line Smart-binder only.

Q	Off-line Pile Feeder.
Q 1.	Introduction to the pile feeder and offline operation.
Q 2.	Adjusting the feeder for different sheet sizes.

Q 3.	Setting the Pile Guides and Pile Height Sensor and air and vacuum.
Q 4.	Maintenance of sheet feeder.
Q 5.	Run the Smart-binder with paper to produce correctly trimmed books.

19 Frequently asked questions

19.1 In-line or off-line operation?

Does IBIS recommend operation in-line with the digital printer, or off-line from a pile feeder or near-line from a roll unwinder and web-cutter?

Answer: There are many factors to consider when making this decision. However, as a general rule operation in-line with the printer/web cutter or the web unwinder/cutter is recommended if the booklet format size changes infrequently. Off-line operation from a pile feeder is recommended if a range of different book format sizes is needed.

See section 12.3 of this Guide

19.2 In-line and off-line operation?

Can a Smart-binder system be configured to run in-line with a digital printer, but also have the capability of being fed from sheets coming from other printers?

Answer: Yes. This is done by selecting the feeder option SB-097 which provides the ability to feed the machine from a sheet pile feeder while retaining the ability to alternatively run in-line from the web cutter. See Appendix 7

19.3 Maximum and minimum book thicknesses

What are the maximum and minimum book thicknesses that the Smart-binder can produce?

Answer: The Smart-binder saddle-binder is limited to 10 mm (0.4") maximum book thickness. Books thicker than this may be produced using a separate hot-glue 'Perfect Binder', from signatures produced by the Smart-binder and stacked by the BSS-10 into book-blocks

The minimum booklet thickness is one folded sheet (4 pages), but producing very thin booklets may require the maximum sheet input rate to be reduced to avoid exceeding the maximum Smart-binder output rate of 116 cycles/min. Good quality paper stock, min 80 gsm (with grain parallel to spine), must be used if running single folded sheets (4 pages) through the Smart-binder to produce a document containing only 4 pages.

The use of options such as Loop stitching (LST-100), Folder (F-100 or SRF-100), Center-knife option (CKN-100 or 101) and/or the Spine squaring option (SM-100) will reduce maximum book thickness.

19.4 Maximum Operating Speeds and Efficiencies

What system operating speed and efficiency can be expected?

Answer: The maximum input web speed (in-line or near-line operation) is around 130 meters/min without an extra buckle folder (4-page increments) This can be increased to around 150 meters/min with the extra F-100 or 180 m/min with the extra F-101 buckle folder (8-page increments). The F-200 selective folder is available to enable high web speeds while retaining 4 page increments.

The maximum speed when running off-line (from a sheet pile feeder) is around 400 sheets/min (a sheet normally contains 4 –pages, but may alternatively contain 8 or 12 pages if the extra F-100/F101 folder is selected.).

The maximum Smart-binder cycling speed for saddle-stitching is 7,000 cycles/hour or 14,000 books/hour (2-up), or 5,500 cycles/hr if using the SB-X or if the narrow booklet modification is fitted.

The actual booklet output rate is the sheet input rate divided by the number of sheets in the book (excluding a separately-fed cover sheet), providing this does not exceed 7000 cycles/hour (or 5,500 cycles/hr if using the SB-X or if the narrow booklet modification is fitted).

The system efficiency depends on the complexity of the system (how many different elements are in use). For the Smart-binder itself (in-line or near-line), we suggest to plan on an operating efficiency of about 90%, unless it is being used to produce an unusual or difficult job which may reduce this running efficiency. Efficiencies in excess of 90% are achievable with some in-line Smart-binders running straightforward near-line applications. Efficiencies slightly lower than 90% might be expected for an off-line Smart-binder due to the time needed to reload the feeder (unless loading trolleys are used to reduce this reload time).

19.5 Perfect-Bound books

Can the Smart-binder produce perfect-bound books (using hot glue) and what advantages does the Smart-binder have over other systems when making these types of books?

Answer: The SB-3 can create ISG cold-glued 'signatures' containing typically 16- 28 pages (variable) and collect these signatures together into 'book blocks' using the BSS-10 stacker.

These book blocks may be fed into the clamp(s) of a separate perfect-binder. Hot-glue (EVA or PUR) is applied to the book spine in the perfect binder and the cover is attached, resulting in very strong books. If the sheets in each signature are glued together on the spine using ISG cold-glue, then the spines do not need to be cut off in the binder clamp. This avoids dust/noise being created and makes the process more operator-friendly. The ISG cold glue may in some cases be better than hot-glue for use with hot, dry digitally-printer papers, but may not provide such good adhesion as hot-glue when using heavily coated papers.

19.6 Producing small format books in-line with a web printer

How can smaller book format sizes be best produced when running in-line with a digital web printer or from a pre-printed roll?

Answer: Small book formats can be easily produced in-line with a digital web printer by using a web which is double the book width (plus a little extra to allow for trim-off). However this web width may be much narrower than the printer maximum. It is more efficient for the printer to run a 'wide' web. In this case IBIS offer a number of different solutions to produce small format booklets from a wide web : see Appendices 14 and 24.

19.7 Light-weight paper stock.

What is the lightest weight paper stock that the Smart-binder can handle?

Answer: Paper stocks as light as 37 gsm are possible, but sheets lighter than 45 gsm must normally be buckle-folded before entering the Smart-binder using the optional in-line F-100/F-101/F-200 folder , or run at much reduced speed. Maximum sheet input speeds may have to be reduced if running paper stocks less than 60 gsm .

19.8 Personalized books

Can the Smart-binder produce personalized saddle-bound books with a constantly changing number of pages (without stopping for adjustment)?

Answer: Yes. The Smart-binder saddle-binder was designed to continually vary book thickness on-the-run and track each page using bar codes to ensure page sequence security. Each book can

contain a different number of pages in between 8 and 200 (if using IBIS's unique ISG cold glue binding system) or within a range of about plus/minus 3mm (1/8") (if using wire stitching).

19.9 Personalised covers (or covers with cut-out windows).

Can the Smart-binder saddle-stitcher handle personalized book covers?

Answer:. The Smart-binder cover feeder can be fitted with an optional Bar code reader (or 2D code reader) to ensure that each personalized cover sheet contains the same unique book ID number as the content sheets coming from the digital printer. See Appendix 18. If there is a cover mismatch then the Smart-binder will automatically stop and the touch screen will inform the operator of the reason for this stop.

After such a stop the operator must manually recover the correct cover sequence which will cause extra machine down-time. It is sometimes preferred therefore to feed covers with cut-out windows which allow the personalized name and address to show through the window from the digital print on the first inside page. This 'personalizes' the booklet from the outside without requiring a personalized cover sheet.

Optional Cover-matching control systems are also available for the perfect binders.

19.10 ISG cold glue.

What are the benefits and/or risks of using IBIS's unique ISG cold- glue system instead of wire staples to make saddle-bound booklets?

Multi-part answer:

- 1/ Cold gluing results in a much high page pull strength, particularly on the outside and middle sheets. (However, note that ISG glue strength may be reduced if using coated and non-absorbent papers).
- 2/ Cold glued books lie much flatter than wire-stitched books because wire-stitching crushes and opens up the book spine, and because the moisture in the cold glue weakens the glue fibres resulting in a much tighter 'set to the fold sheet folds. Flat-lying books are extremely important if envelope-inserting these booklets after binding.
- 3/ Cold gluing is easier to use than wire-stitching because no adjustments are needed when changing book size or thickness.
- 4/ Cold glued books are easier to recycle compared with wire-stitched books
- 5/ Cold glued books look better and contain no risk of damage to a child's fingers (as can exist with wire staples).
- 6/ An optical sensor constantly monitors the glue application and stops the machine immediately if the glue is not being applied to the book
- 7/ The cold glue system requires less maintenance than stitching heads
- 8/ Booklets bound with ISG cold glue show evidence of any pages which have been removed by the end-user (if the paper stock is uncoated and absorbent). This can be important when producing insurance documents.

Note: For these reasons many Smart-binder users **prefer to use ISG cold glue** instead of wire-staples. However, two disadvantages of ISG cold glue are that the bond strength is reduced if used heavily coated paper stocks, and also the booklets may not lay-open so readily (the lay flat is better than wire-stitching but the lay-open is not as good as stitching.)

19.11 Cost of cold glue

How does the cost of cold glue compare with the cost of wire staples?

Answer: The consumable cost of cold glue is generally similar to the cost of wire stitching (cold gluing is slightly cheaper when making thin booklets and slightly more expensive when making very thick booklets)

19.12 Multiple covers and insert-sheets.

Can the Smart-binder saddle-stitcher change covers automatically on-the run and/or feed insert sheets inside the book?

Answer: The Smart-binder saddle-stitcher may be fitted with two cover/insert feeders, the CIF-102 and CIF-101 see Appendix 20. Feeder #2 may be loaded with the next cover while the current cover is feeding from feeder #1.

Alternatively, the additional cover feeder may be used to feed a pre-printed insert sheet at any position inside the book.

Note: if the insert must be in the center of the book (or if it is fed from feeder CIF-101) then there must be a gap large enough between sheets coming from the printer into which to feed the insert.

Note: any inserted sheets will be bound into the book. If a loose insert is required then this must be inserted into the book using a separate post-trimmer inserter machine.

19.13 Frequency of reloading the cover feeder pile

How frequently must the cover pile be replenished?

Answer: This depends on whether the optional CAL-101 'Cover Autoloader' is fitted or not. Without the Autoloader (see Appendix 3) the maximum pile height is about 20mm, but this increases to about 200mm if the Autoloader is used, thereby greatly increasing the time between reloads. The actual time between reloads depends on the running speed and the average number of pages in the booklets. The thinner the booklet the faster the covers must be fed and the feeder must then be reloaded more frequently.

19.14 Ease and frequency of reloading the sheet pile feeder

How much time is needed to reload the SB-095 or SB-097 sheet pile feeders and how frequently must they be reloaded?

Answer: These feeders can accept up to about 5000-7,000 sheets (depending on the paper weight/thickness). The time between reloads depends on how fast the machine is running and the average number of pages in the booklets. Note: the Smart-binder must be stopped to reload the sheet pile feeder. The reload time depends on whether the optional loading trolley system (PLT-100 or HPL-100: see Appendices 6 and 8) is used or not: allow for a few minutes to reload without the trolley system, or about 35 secs with the trolley system (if trolley is already loaded in advance).

19.15 Perforated sheets.

Can the Smart-binder saddle-stitcher produce books with tear-out pages?

Answer: Yes. The optional DMP-100 Dynamic micro-perforator system (see Appendix 11) may be integrated just before the Smart-binder folder. This allows any sheet to receive a perforation (perf) line at any position parallel to the sheet flow direction. A bar-code digit on each sheet controls whether that sheet is to receive a perf line or not. Each perf wheel is individually controlled so a sheet may receive a perf line on one side, but not the other side, or both sides together.

The DMP-101 system offers 4 perf heads instead of 2.

19.16 Hole punching and drilling

Can the Smart-binder produce books with holes?

Answer: Yes. Both hole drilling and (lower cost) hole punching modules are available to be connected on-line with the Smart-binder delivery. A corner hole punch (CHP-101) is also available to be installed inside the standard SB trimmer. CHP-101H punches a head hole, CHP-101F punches a foot hole and CHP-101HF punches a head and/or a foot hole.

See Appendix 24 for further information.

19.17 Loop Stitching

Can the Smart-binder produce books with loop stitches to fit into ring binders?

Answer: Yes. The standard wire stitched heads may be exchanged for loop-stitch heads. In this case the stitcher drive upgrade LSM-100 must also be selected because loop heads require additional drive force.

19.18 Book Stacking and strapping

Can the Smart-binder be fitted with an automatic booklet stacker and strapper?

Answer: Yes. A variety of stacking, wrapping and/or strapping/banding modules are available for direct connection to the Smart-binder delivery (see Appendices 9 and 29).

19.19 Spine squaring

Can the Smart-binder produce saddle-bound books with spines that have been pressed into a 'square' shape?

Answer: IBIS offer two different types of spine squarer (the SM-101 or the heavier duty ARSD) that can press book spines into a square shape and can be fitted directly to the Smart-binder delivery conveyor (see Appendices 20 and 21)

19.20 Two-up production

Can saddle-bound booklets be made 'two-up' by using a trimmer center-knife and what are the restrictions when using the center knife?

Answer: Yes. The Smart-binder has an optional center-knife system (0mm or 6.3mm or 9.5mm width) which results in two booklets being delivered side-by-side. The minimum book spine length when using the 9.5mm trimmer center knife is 95mm. The maximum book thickness when using the 6.3 or 9.5mm trimmer center knife is about 3-4mm (5/32") but this can be increased if using the single-bladed center-knife CKN-102. If using the trimmer center knife when wire-stitching, then two extra stitch heads are normally required (See Appendix 17)

19.21 Minimum book format size.

What is the minimum book spine length and minimum book width?

Answer: For normal one-up production the minimum spine length is 200mm. When using the optional center-knife CKN-101 for 2-up production (see above), then the minimum spine length is 95mm. Note: The stretched model SB-X must be used if spine lengths are in between 150 and 200mm.

The minimum book width is normally 119mm, but a special modification is available to reduce this dimension to 82.5mm if required. Modifications are available to allow the minimum finished booklet width to be reduced to 75mm if needed.

19.22 Maximum booklet format size

What is the maximum booklet spine length and width?

Answer: The standard Smart-binder can produce a maximum finished book size of 320mm (spine) x 230mm less trim off..

The stretched model Smart-binder model SB-X (with special modifications to increase max booklet width) can produce a maximum booklet size of 457mm (spine length) x 273mm (width), less trim off.

19.23 How can the Smart-binder best produce A5 or 5 ½ x 8 ½" booklets ?

What are the different ways in which the Smart-binder can produce A5 or 5½ x 8½" booklets?

Answer: The standard Smart-binder can produce A5 or 5 ½ x 8 ½ in landscape format 2-up using the optional trimmer center-knife. The extended model Smart-binder SB-X can produce A5 or 5 ½ x 8 ½ portrait booklets 2-up using the optional trimmer center-knife.

The standard Smart-binder can produce A5 or 5 ½ x 8 ½ in portrait format directly from a narrow web (320mm or 12" width) but it is inefficient for most web printers to print on a narrow web.

The standard Smart-binder can produce A5 or 5 ½ x 8 ½ in portrait format directly from a wide web (450mm or 18") by using either the SRF-100 rotator/folder (see Appendix 14) or the TUSDC-100 modules (see Appendix 26.)

19.24 Trimmer waste removal.

What are the options for removing trimmer waste?

Answer: The normal waste removal system is a simple inclined conveyor which delivers the trim-off paper strips into a customer-supplied collection bin. Two different conveyor systems are available, for delivery into either a small bin (TWC-100) or a large bin (TWC-101).

If the customer has a factory vacuum waste extract system, then it is preferred to connect the Smart-binder to this instead of using the normal waste conveyor. In this case a waste collection 'chute' is available with a circular outlet for piping connection to customer's extract system.

19.25 Electrical power supply voltage.

What supply voltage is needed for the Smart-binder?

Answer: The Smart-binder operates off a voltage of 400V (plus/minus 5%). Any 3 phase voltage supply may be used, but voltages outside the 380 – 420 Volt range require the optional voltage transformer TFR-100 to be selected.

19.26 Spine corner tearing on thick books.

How can the normal tearing of the spine corners be avoided when trimming very thick books?

Answer: The Smart-binder can be fitted with an optional book clamp system (Option TCA-100, see Appendix 19) that reduces or eliminates spine corner tearing. This assembly is customized to suit a particular book width, so the book width must be specified when ordering this option.

19.27 In-line connection to cut-sheet printers.

Can the Smart-binder be used in-line with cut-sheet printers, not just web printers?

Answer: Yes. A reduced-speed Smart-binder 'SB-1' is intended for use with slower speed printers, such as cut-sheet printers. A sheet rotator and/or sheet direction changer may be needed in between the printer and the Smart-binder. Note: Cut-sheet printers normally deliver large sheets short-edge leading and small sheets long-edge leading. The Smart-binder must receive sheets long-edge leading (for normal portrait format booklet production).

19.28 Factory climate control

How important is climate control when producing books or booklets?

Answer: The condition of the paper is a critical factor in determining how well a high-speed book-binding system will perform. Factory air conditioning is particularly important when external temperature and humidity is outside the normal range. Hot and dry paper will attract much higher levels of static charge which the environment must be carefully managed. We recommend to maintain relative humidity within the range 40-60% and temperature between 18 and 25°C (64 and 77°F).

19.29 Missing stitch detection

Does the Smart-binder detect if a wire staple is missing?

Answer: All Smart-binders manufactured from summer 2013 onwards include a missing stitch detection system MSD-100 (See Appendix 35).

19.30 Producing Extended Content Label booklets

Can the Smart-binder produce ECLs?

Answer: The special Smart Label-binder is available to produce glue bound ECLs from lightweight paper stock. More information will be added here soon.

If the ECL booklet requires an extended tab then the additional LT-101 laser-tabber is available to cut these tabs into the outside cover and reduce the width of all other sheets. (Appendix 36)

19.31 Wrapping and Labelling for Examination booklet security

Can the Smart-binder be fitted with additional in-line modules for exam booklet security

Answer: Additional modules are available as follows: booklet tabbing to seal the open edges, booklet IJ printing for personalization, booklet inserting to add an answer-sheet, booklet wrapping, booklet stacking, pile banding, pile buffering, pile wrapping, pile weighing and pile labelling.

Note: Data Sheet appendices for these additional modules will be added when available

20 IBIS Scheduled Preventative Maintenance (PM)

IBIS offers a Scheduled Maintenance Program for all IBIS products. This is based upon scheduled visits by IBIS to the end-customer site.

Why use us to help look after your IBIS equipment?

Our aim is that your IBIS system will always provide the best possible performance and finished book quality. During each scheduled visit we will firstly replace all parts which are recommended to be changed at specified intervals as part of Preventative Maintenance (PM). Doing this prevents unscheduled machine down-time at a later date. At the same time our experienced IBIS technicians will check the machine over generally to see whether any other parts need replacing or adjusting.

During each visit we will inform you about the latest performance upgrades, discuss with the machine operators any specific issues they have and provide advice and assistance in these areas.

The PM package includes all scheduled visits, software upgrades and all PM parts.

Scope of the IBIS PM program

During each visit the IBIS technician will:

- Replace all parts which should be changed at regular time intervals (Smart-binder preventative maintenance).
- Check over the machine generally, ensure everything is correctly set up and adjusted and identify whether any other parts need replacement.
- Install any software upgrades to keep the Smart-binder up-to-date and discuss the availability of possible hardware upgrades.
- Ensure that the machine is performing correctly and meeting the customer's requirements.
- Provide additional help that may be required by the machine operators.
- Discuss any additional requirements that the customer may have.

20.1 Frequency of PM visits

PM should be carried out annually

20.2 Duration of visits

The normal PM visit duration is 2 -3 days

20.3 PM Price

Refer to IBIS for price quotation

20.4 Scheduling of PM visits

Visit dates must be agreed between IBIS and the customer at least one month in advance. If this visit date is changed by the customer within one month of the scheduled visit date then we will attempt to accommodate this change, where possible. However, any extra costs relating to re-scheduling may be charged to the customer.

20.5 Replacement parts

Components will be changed as part of IBIS's published preventative maintenance schedule. The maintenance parts list may be modified by IBIS based on additional field feedback in future. The parts required for each PM visit (for pre-planned replacement) will be sent by IBIS, at IBIS's expense, to be on the customer's site before the arrival of the IBIS technician (or parts will be hand carried by the IBIS technician).

20.6 Conversion charts for stock weights

BOND lb/500 sheets 17" X 22"	BOOK OR OFFSET lb/500 sheets 25" X 38"	COVER lb/500 sheets 20" X 26"	METRIC Grams/metre ² (gsm)
11	27	15	40
12	30	17	45
13	34	18	50
16	41	22	60
19	47	26	70
21	54	30	80
24	61	33	90
27	68	37	100
35	88	48	130
43	108	59	160

Stock weight as a function of the number of pages in the finished book

Stock Weight			Approximate number of pages	
Gsm	Pounds Offset	Pounds Bond	7mm thick book	10mm thick book
60	40.6	16	172	232
70	47.3	18.6	148	200
80	54.0	21.3	128	176
90	61.0	24.0	116	156

Number of pages excludes separate covers.

High volume (low density) paper stock will give a thicker book.

20.7 Tools and Special Equipment Required for Service and Maintenance

Routine Service and Maintenance Operations:

Allen Keys - 1.5, 2, 2.5, 3, 4, 5, 6, 8, 10mm (3/8") ball ended

Combination (ring and open ended) spanners - 6, 7, 8, 10, 13, 16, 17, 19, 24 A/F hexagon

Adjustable spanner, about 200mm, 8" long

Plastic faced hammer

Side cutters (small, flush cutting)

Screwdrivers

- Very small flat bladed (about 2mm, $\frac{5}{64}$ " tip)

- Small flat bladed (about 3mm (1/8"), $\frac{1}{8}$ " tip, parallel shank)

- Medium flat bladed (about 5mm, $\frac{3}{16}$ " tip)

- Very large flat bladed (about 12mm, $\frac{1}{2}$ " tip)

- Small Philips (number 1)

- Medium Philips (number 2)

Craft knife and blades

Fine nose pliers

Normal pliers (medium)

Circlip pliers (inside and outside)

Steel rule (300mm/12")

Tape measure (3m, 10')

Torch

Inspection mirror

Emery paper (medium, fine and very fine)

Fine files (square, flat, round and half round, about 200mm, 8" long)

Electrical Fault Finding and Repairs:

Multi-meter

Wire strippers

Small soldering iron and solder

Software or Control System Problems:

PC keyboard and mouse (with USB or PS2 type connectors)

USB memory key (64MB or larger)

The following equipment is only needed for certain rare fault conditions: It is not needed for routine maintenance or rectifying any common faults.

Laptop PC with CD drive, serial port and network adapter

USB 2 Cable, Standard USB A to USB B connectors.

Special cable to connect PC serial port to Siemens servo drives (plus Siemens servo drive software which is supplied with machine)

Crossover network cable to connect laptop to PC (RJ45 connectors, cat. 5 UTP cable)

20.8 Smart-binder (SB) Application Questionnaire for Digital Print Applications.

The following questionnaire may be used to help determine suitability and specification of Smart-binder for a digital print finishing application requiring stitched or glued booklets

Note: refer to IBIS for separate questionnaire if perfect-bound books are needed

Questions		Answers
How would you prefer the saddle-stitcher to be fed:	a) In-line: with a digital printer and web-cutter <i>(if so what type of printer and what type of web-cutter and roll-unwinder - and what is the maximum web speed?)</i>	
	b) Near line: from a roll-unwinder and web-cutter? <i>(if so what type of web-cutter and roll-unwinder - and what is the maximum web speed)</i>	
	c) Near-line or Off-line: from a roll unwinder and web-cutter, and also with the sheet pile feeder SB-097 <i>(if so what type of web-cutter and roll-unwindr and what is the maximum web speed (for nearline) and maximum sheet feed rate (for off-line)</i>	
	d) Off-line: from a sheet pile feeder (dedicated off-line operation (info SB-095))	
Cold glue binding	Is ISG cold glue binding required (ie SB-3 model) in addition to conventional wire stitching? (info ISG-100)	
Booklet size and type Booklet type	What finished booklet sizes are required. Are they in 'portrait' or 'landscape' format. What is the size of the printed sheets that will enter the saddle-stitcher (x mm x y mm)?	
	What type of booklets need to be produced?. Please provide as much information as possible	
Speed	If sheets are to enter the saddle-stitcher directly from the web-cutter, what will be the maximum paper web speed?	
Frequency of format size change	How often will the format size change (times per day)?	
Booklet thickness	What will be the maximum, minimum and average number of pages in the finished booklets?	
Number of pages variation	Will the number of pages continually vary between one booklet size and the next?	
Web width	If sheets are to enter the saddle-stitcher directly from the web-cutter what will be width of the paper width?	
Paper weight	What will be maximum and minimum paper stock weights to be used?	
Printed codes	Will sheets have a standard bar-code or 2DDatamatrix codes printed on them (needed for saddle-stitcher control)?	

Cover feeder	Is the optional cover feeder required to feed a separate cover onto the outside of each booklet? (info CIF-102)	
	Is the optional cover code reader needed to 'match' the cover to the inside sheets (personalised booklet production).	
	What will be the maximum and minimum cover stock weights to be fed? Will covers ever have cut-out windows? Will covers ever have 'gate folds' or 'flaps'?	
Productivity	How many booklets need to be produced in a given time period?	
Waste removal conveyor	Is a factory vacuum paper waste extraction system available to remove waste paper from the trimmer?	
Other options required	What other options are required? All IBIS saddle-stitching options are listed on our webpage: IBIS optional modules	
Custom requirements	Do you have any other special application requirements (customized machine modifications)?	

Appendix 1: Optional ISG 100 cold gluing

The Smart-binder may be supplied as model SB-3 which also includes **IBIS's unique ISG cold glue binding system**.

This system produces a “stitchless” book which has better lay-flat qualities than a wire-stitched booklet, as illustrated in the photo below. The lay-flat difference is less pronounced when making thin booklets.

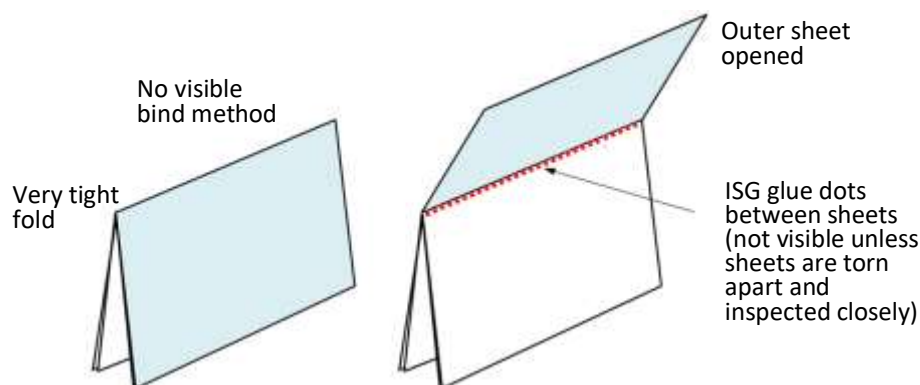


Booklets with ISG cold glue (left) and conventional stitching (right)



ISG cold glue application nozzle on the Smart-binder

The ISG cold-glue ‘nozzle’ applies a row of cold-glue ‘dots’ (or a continuous glue line) to the inside of each folded sheet as it passes through the Smart-binder folder. Sheets are then collected on top of each other (on the saddle) and pressed together tightly when they reach the stitching station (the stitching heads are inhibited when cold gluing, or replaced with a pressing ‘anvil’).



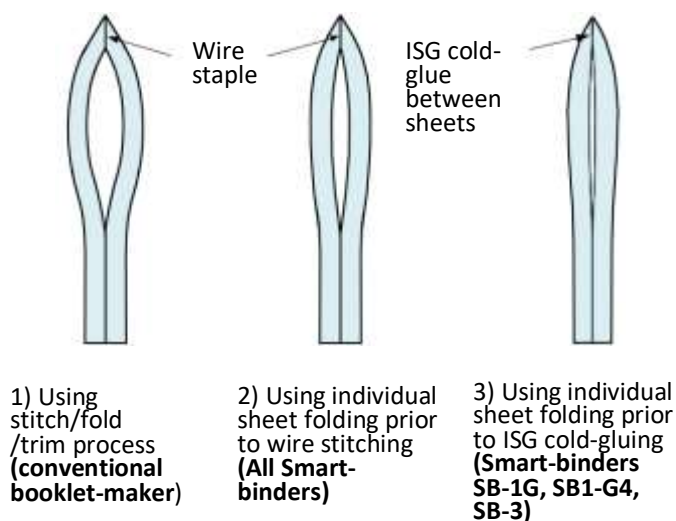
The many advantages of ISG cold-gluing over conventional wire-stitching include:-

- ISG glue gives **higher page pull strength** on the outer and inner sheets
- Note that the paper bond strength when using ISG gluing is linked to the integrity of the paper surface. Higher strength results from more absorbent papers. Certain toners may weaken the bond strength if applied to the same area as the ISG glue (the sheet fold).
- **ISG gluing results in a tighter fold**, particularly on thicker books. This is because wire stapling tends to 'open up' the book and the moisture in the cold glue softens the paper fibers and helps give a tighter 'set' to the fold..
- The ISG gluing process allows the **number of pages in the book to be changed** between minimum and maximum on-the-run without any adjustment (wire stitching requires stitch head pressure adjustments)
- ISG gluing allows the **book format size to be changed** without adjustment (wire stitch heads may have to be moved to a different position when changing book lengths).
- The ISG cold-glue is a **"maintenance-free"** system which is easy to operate than wire stitch heads.
- Cold-glued books can be **recycled** more easily than books containing wire staples.
- Glue binding avoids any **child safety** (finger damage) issues relating to the edges of wire staples.
- Glued books can sometimes be **mailed directly**, unlike wire-stapled books.
- ISG cold glue costs approximately the same in **consumable material costs** (on a 'per book' basis) as wire stitches (and much less than hot-melt EVA adhesives used for conventional 'perfect-binding').

ISG Cold-Glue Application
Nozzle on the Smart-binder

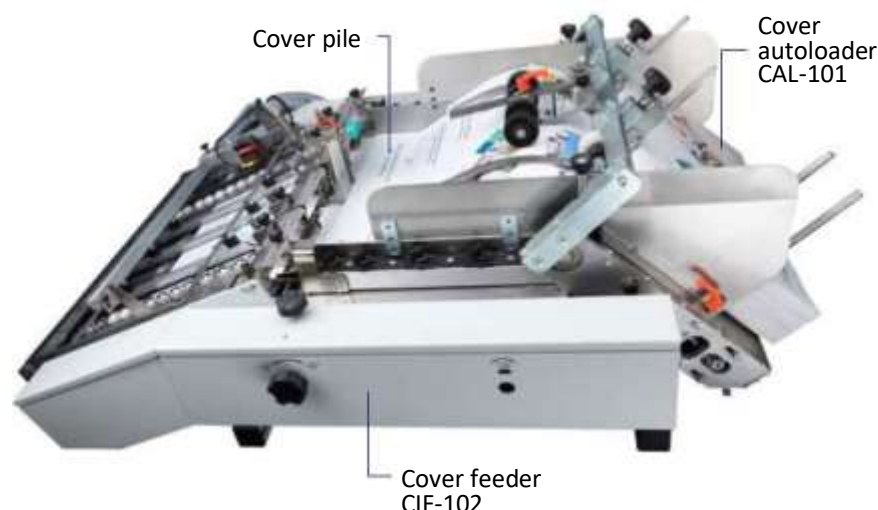


**Thick-book cross-section comparisons:
Wire-stitching vs. ISG cold-gluing**



Appendix 2: Optional Cover feeder CIF-102

The **CIF-102 Cover/Insert Feeder** is designed to feed separately printed booklet covers or 'insert sheets' as part of a booklet assembled by the IBIS Smart-binder. The CIF-102 is mounted on slide rails over the Smart-binder infeed register table, and will feed a cover/insert at the appropriate place in the sheet stream passing below.



The CIF-102 feeds sheets from the bottom of the pile using a rotating vacuum wheel. Air-blow nozzles mounted at the sides and rear of the feeder help separate sheets from each other in the pile. Covers/inserts may be **reloaded on-the-run** without stopping the Smart-binder.

The maximum pile height in the CIF-102 feeder is about 20 mm. This may be increased to about 200mm with the addition of the **optional Autoloader CAL-101**.

Cover sheet size

Cover sizes without optional Cover Autoloader CAL-101	Maximum: 320mm length x 500mm width Minimum: 210mm length x 250-300mm width (*Note: a small modification is required to the CIF-102 cover feeder to reduce min cover width from 300mm to 250mm)
Cover size WITH optional Autoloader CAL-101	Maximum: 320mm length x 472mm width Minimum: 210mm length x 300mm width (*Note: 300mm is the minimum cover width with the Autoloader fitted)

Covers (or inserts) are **independently side-registered** so that their width does not have to be the same as the width of the digitally-printed 'content' sheets. However the covers (or inserts) must be the same length as the sheets on to which they are fed (same spine length). Covers or inserts that are longer or shorter than the other sheets in the book will cause some loss of print registration between sheets.

If running covers with **cut-out windows**, then IBIS can supply an extra part (made to suit the dimension of the window) to assist feed and prevent the windows in the cover being fed catching on the window of the cover above.

After side register, then covers (or inserts) enter the Smart-binder scoring and folding module. **Scoring pressure** may be adjusted to minimize color-toner cracking. However, the optimum way to eliminate cracking is to **pre-crease** the covers.

A **bar-code reader** is available for the cover/insert feeder if feeding **personalized** covers or insert sheets. The cover/insert feeder will then compare the unique ID number in the cover/insert barcode to the ID number in the barcode on the incoming sheets. The Smart-binder can be programmed to either stop on a mismatch, or reject the booklet (without stopping) via the trimmer reject gate. The standard bar code reader is option BCR-105. Choose the 2D Datamatrix reader DCR-101 if the 2D codes are to be used. See appendix 16.

The cover and insert feeder CIF-102 is capable of feeding sheets in the range **70 – 230 gsm** (47 – 154 lbs offset or 19-61 lbs bond). Covers outside this weight range should be tested before use to check feeding performance.

If feeding covers or inserts from the CIF-102 feeder and making **ISG cold-glued books**, then there must be sufficient space between the last sheet of one book and the first sheet of the next book into which to feed the cover or insert sheet. If running in-line with a high-speed digitally-printed web, then this may mean that the web cutter must be programmed to pause momentarily, in order to create this gap. If feeding from a pile feeder, then the gap in sheet feeding can be created automatically by the Smart-binder feeder control system. This gap is also required if feeding an insert sheet into the center of a booklet (center-spread).

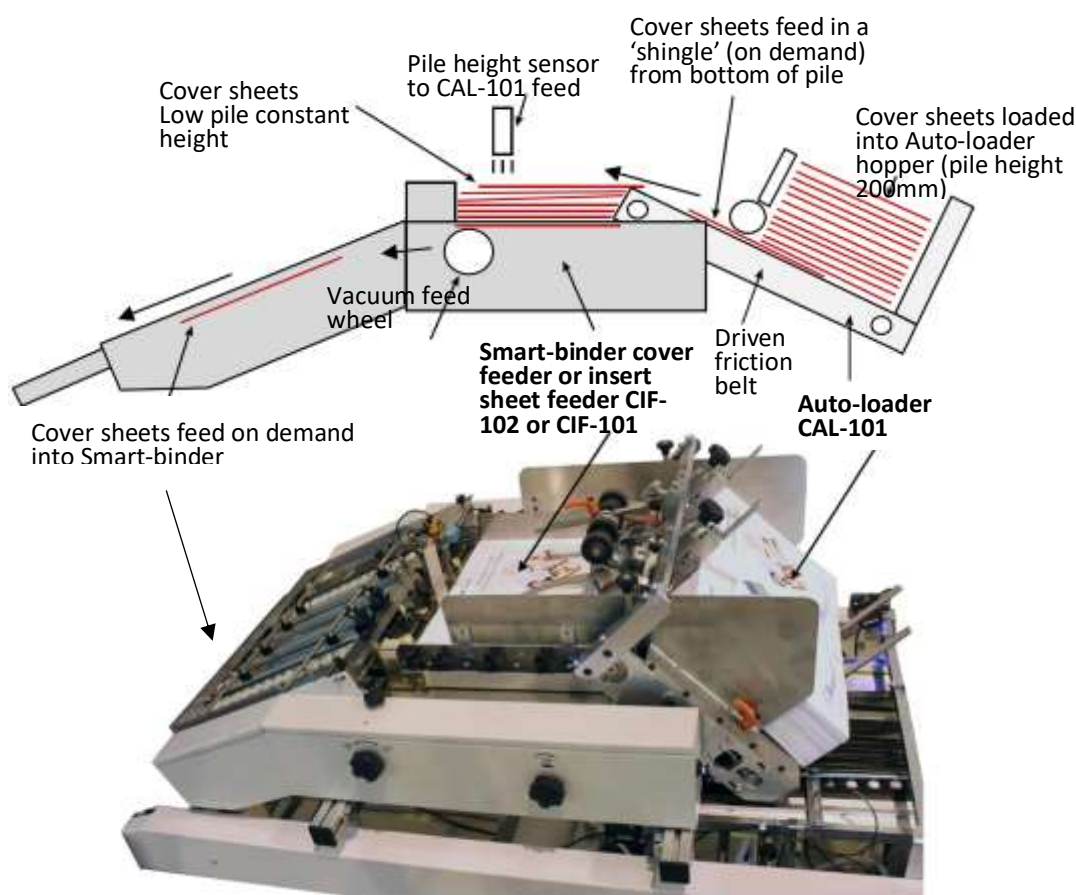
A **dual cover feeder system** may be fitted (one behind the other: CIF-102 + CIF 101) if wishing to feed both an insert sheet in addition to a cover sheet, or if wishing to split cover feed between two feeders.

Covers with **tear-off perforations** may be run depending on the type and position of the perforations. Check with IBIS first if wishing to feed perforated covers. Note that an optional 'dynamic' micro-perforation system (option DMP-100) is available for installation just before the Smart-binder folder. This may be used to automatically perforate covers (and/or all other sheets within the booklet) if not already pre-perforated.

Covers with **'gate' folds** (or 'wing' folds) have an extra folded „flap“ on one or both sides which make them difficult, or in some cases impossible, to feed. These types of covers may contain 6 or even 8 printed pages.

Appendix 3: Optional Cover Auto-loader CAL-101

The optional **CAL-101 Cover/Insert 'Auto-loader'** increases the number of covers or inserts that may be loaded into the Smart-binder Cover Feeder from **20mm to 200mm pile height**. This greatly **extends the time between reloads and also improves the feed reliability**:



The operator may load a large quantity of covers (up to 200mm pile height) into the CAL-101 Auto-loader. The covers feed out automatically from the bottom of the Auto-loader in a 'shingled' stream.

Minimum and maximum cover size when cover feeder is fitted with the auto-loader

Length: Min 210mm, Max 320mm
Width: Min 300mm, Max 472mm

The pile height sensor automatically advances the CAL-101 Auto-loader friction belt when more sheets are needed in the feed hopper. The pile height in the feed hopper remains at a constant low level, which improves feed reliability by avoiding excess pressure on the bottom cover when a new stack of covers is loaded.

Note: The Auto-loader may not be able to feed insets or covers with cut-out 'windows' (sheets with windows should be loaded directly into the cover/insert feeder).

Appendix 4: Optional trimmer waste removal conveyor TWC-100/101

The preferred way to remove trimmed off paper strips from the Smart-binder is to connect to the customer's **centralized vacuum waste extraction system** (for which IBIS can provide a connection chute option TCC-100 with a circular outlet). However if this is not available then the optional **TWC-100 or TWC-101 waste removal conveyor** must be selected.

TWC-100 waste removal conveyor ('low level' for delivery into a small collection bin)



The waste conveyor delivers the paper strips at a height of 940mm (37") into a collection bin which is normally customer-supplied. The recommended dimensions of this collection bin are approximately: L: 1000mm (39") W: 750mm (29.5") H 600mm (23.5").

It is also possible to connect the TWC-100 waste conveyor to a vacuum extraction system via an ECB-100 connection box. If the vacuum extraction fails the hinged plate on the underside of the box can be lowered to allow the paper strips to drop into a bin below. The TCC-100 vacuum trim waste connector doesn't have this 'extraction-failure' safeguard as it connects directly to the trimmer.



Vacuum extraction system via ECB-100 connection box, with lower bin

The TWC-101 (as shown below) is a larger '2-part' removal conveyor which delivers trimmer waste up to a high elevation into an 'industrial' larger (deeper) waste collection bin with wheels (such as the Continental 1100 with 1100 liters capacity).

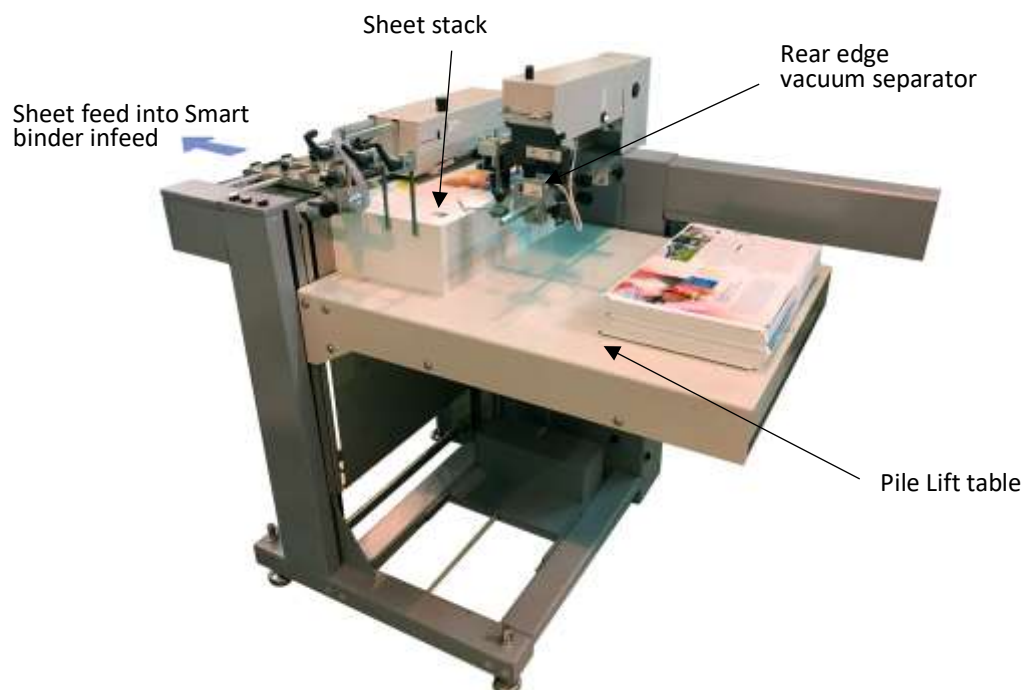


Waste removal conveyor TWC-101

This collection bin is to be supplied by the customer and located next to the Smart-binder delivery conveyor. The maximum height of this collection bin ('wheelie-bin') is 1400 mm. It requires emptying less frequently than the TWC-100 bin. The use of the TWC-101 slightly reduces the overall machine length compared with use of the TWC-100, because the collection bin is located next to the book delivery conveyor.

Appendix 5: Sheet Pile Feeder SB-095

The direct-connected pile feeder SB-095 is an integral part of every off-line version Smart-binder.



The feeder may be loaded with piles of pre-collated sheets and optional loading trolley options PLT-100 and HPL-100 are available to assist loading the maximum pile height is approximately 550mm (21.65") but actual pile heights depend on a number of factors including the amount of toner used (the top sheet must remain relatively flat).

The feeder must be stopped to reload the pile. Allow about 5 mins to reload without using the optional loading trolley, or approximately ½ min if using the loading trolley PLT-100. Each sheet requires a code printed on the edge.

Sheet feed rates up to approximately 400 sheets/min may be achieved. However high sheet feed rates are dependent on:

- The top of each feeder pile must be flat and level (no excessive toner, ink or NCR build-up on any part of the sheet)

Note: This may reduce the maximum pile height in the feeder as smaller piles may have to be used to keep the top flat

- The sheets in each pile feeder must all be the same size and to ensure reliable feed the trailing edge of the sheets in the pile must be registered together within 0.5mm variation
- The sheets and covers must be free of static charge (steps must be taken to reduce static charge applied in the upstream printing equipment)
- The sheets must not have been processed in a way that causes them to stick together
- The machine operator must have paper handling experience and must have received training from IBIS in the operation of the sheet feeder

Sheet stock weights in the pile may vary by up to a factor of about 'two'. This means for example that the pile may contain 160 gsm covers mixed in with 80 gsm 'content' sheets. Greater stock weight variations may be possible but require testing to establish feed reliability.

Appendix 6: Optional Pile Loading Trolley PLT-100

The **pile loading trolley PLT-100** for Smart-binder pile feeders (SB-095 or SB-096) provides a fast and simple way to load large piles of sheets into the off-line Smart-binder sheet-feeder. Note: The PLT-100 cannot be used with the pile feeder SB-097.

The PLT-100 trolley system reduces the pile reload time from about 2 minutes to about 35 secs and thereby increases the overall Smart-binder running efficiency by about 10%.

Smart-binder sheet pile feeder (modified to accept loading trolley)

Pile feeder includes rubber guide wheels which guide the trolley accurately into position and a quick 'latching' system to hold it securely



Loading trolley PLT-100 with a pile of printed sheets. The trolley includes adjustable side guides for pile stability while being moved.

Wheels for easy trolley movement

Trolley used to transport sheets to the pile feeder



Trolley handle is easily removed after location in the pile feeder

Trolley now becomes the sheet 'pile lift table' and rises automatically as sheets are fed from the top of the pile.



Trolley engaged with sheet feeder

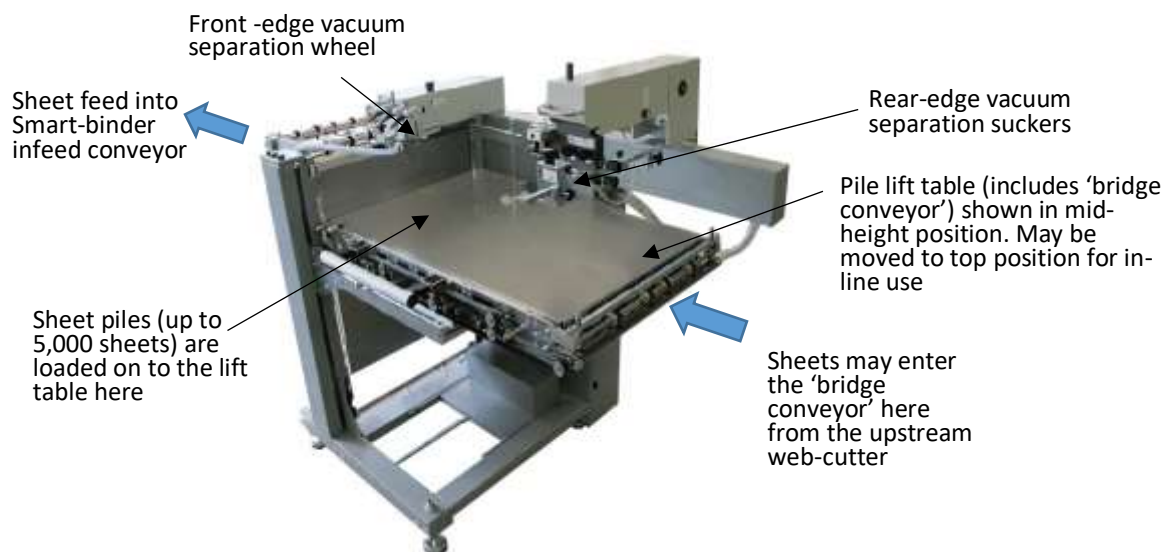
It is recommended that at least **two loading trolleys** are used per Smart-binder. Trolley #2 can be loaded with the next pile of printed sheets, while Trolley #1 is engaged with the feeder and feeding sheets into the Smart-binder.

If Trolley #2 is already loaded with the next sheet pile this reduces the Smart-binder reload time to about 35 seconds.

Retro-fit of the pile loading trolleys in the field is difficult, requiring modifications to the pile feeder. Please refer to IBIS.

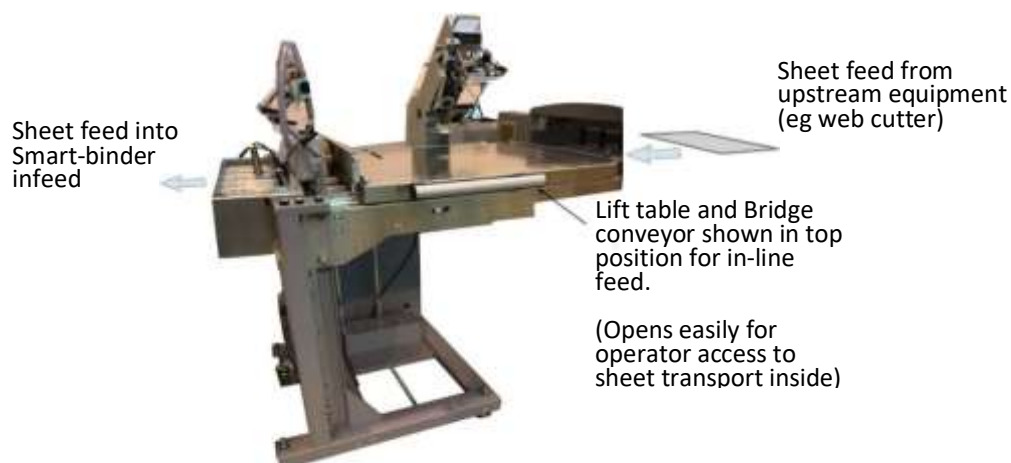
Appendix 7: Optional sheet pile feeder SB-097

The in-line **Sheet Feeder (option SB-097)** allows a Smart-binder which is fed from a web-cutter to also be fed off-line from piles of cut-sheets which are loaded in the feeder.



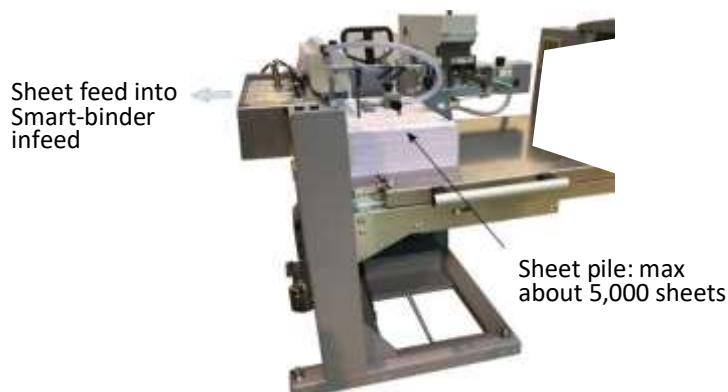
In-line operating mode

To run in-line, the 'Lift Table and Bridge conveyor' is raised to its highest position, as shown below. The bridge conveyor, which is integral with the lift table, then transports sheets from the upstream web-cutter through the sheet feeder to the Smart-binder infeed.



ff-line sheet feed mode

When running 'off-line' the 'lift table and bridge conveyor' is lowered and bar-coded sheets are loaded onto the bridge conveyor, as shown below. The feeder then feeds sheets one by one off the top of the pile into the Smart-binder at rates up to 400 sheets/min.



Notes

The changeover between in-line and off-line operation is less than one minute. The feeder must be stopped for about two minutes to reload the pile.

Each printed sheet must have a bar code, or Datamatrix code, printed on it to allow the Smart-binder to control booklet integrity.

The length of the SB-097 feeder is 1230mm (48 7/16").

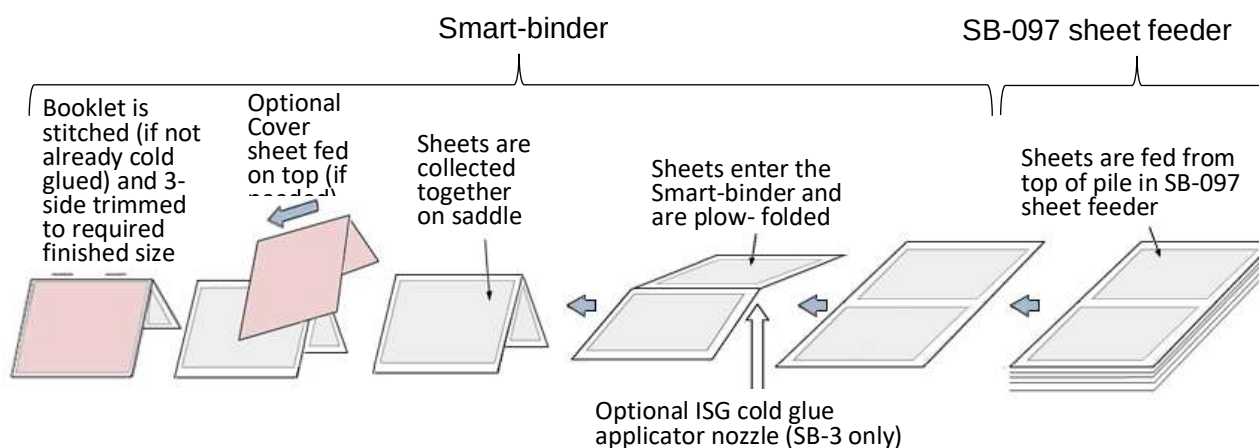
The feeder requires a 10A 3-phase power supply

The height of the bridge conveyor can be varied between 925mm (36 7/16") and 1100mm (43 5/16"), by raising or lowering the complete feeder.

SB-097 maximum and minimum sheet sizes

Sheet length	Maximum 760 mm (29.9")	Minimum 192 mm (7.5")
Sheet width	Maximum 520 mm (20.5")	Minimum 100 mm (3.9")

Sheet Flow Diagram for off-line operation

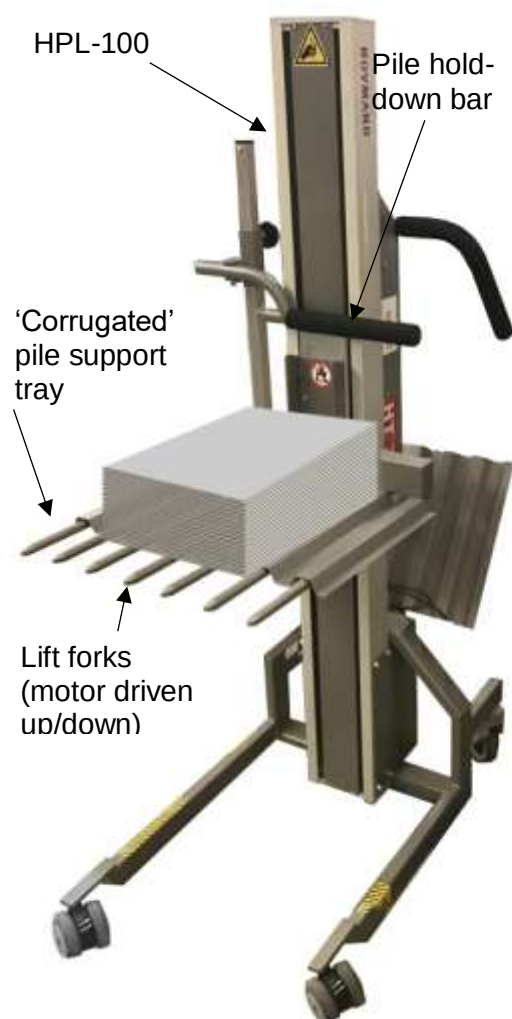


View a short video of the SB-097 feeder [HERE](#).

Appendix 8: Sheet pile handling system HPL-100

The Hovmand pile handler HPL-100 is a lifting trolley system which can pick up a large sheet pile (up to 380mm pile height), move it to the IBIS Smart-binder and place the pile on the lift table of the sheet feeder SB-095, SB-096 or SB-097. This reduces the Smart-binder stop-time by reducing the pile reload time.

The HPL-100 is an alternative to the PLT-100 loading trolley system (which cannot be used with the SB-097)



The HPL-100 is mounted on wheels so it can be easily moved around the factory. An integral battery-powered electric motor is used to raise and lower the forks.

A separate 'pile-support tray' allows the forks to be lowered and withdrawn when the pile is placed on the feeder lift table.

Sequence of operation:

1. Sheets are built up into a pile (up to 380mm height) on the 'pile support tray'. Note: an optional stacking table ST-100 may be supplied to assist creation of this pile.
2. The HPL-100 forks engage with the support tray and lift the pile. The 'hold -own' bar may be used to prevent the pile being disturbed while being moved
3. The pile is transported to the Smart-binder sheet feeder and placed on the feeder lift table. The HPL-100 is then removed and the pile is slid into the feed position
4. When all the sheets have been fed into the Smart-binder the support tray is removed and the HPL-100 loads the next pile

Note: multiple support trays may be provided

View a video of the Hovmand Pile Handler loading a sheet pile into the feeder [HERE](#).

Appendix 9: Optional automatic book stacker BSS-10

The BSS-10 book stacker allows non-stop Smart-binder operation without the need for the operator to continually have to remove books from the delivery conveyor.



[View BSS-10 video](#)

Books pass through the standard Smart-binder delivery conveyor into the BSS-10 stacker where they collect into horizontal piles up to 235mm (9.25") height (or special option up to 330mm (13") height). The number of books in each pile is selectable by the machine operator. A turntable in the stacker enables books within each pile to be stacked in batches with spines in each batch in the opposite direction to the spines in the next batch. This ensures pile stability by avoiding all the spines being on the same side.

Book piles are delivered onto a free running roller table where they accumulate until removed by the operator. In-line (or off-line) pile 'banding' is also available.

BSS-10 stacker description of operation

Individual booklets from the IBIS Smart-binder delivery conveyor are conveyed 'spine leading' by a positive-control belt system up an inclined infeed. The booklets collect on top of each other in the upper 'bin' up to a quantity selected during the set up (or automatically controlled by the bar code). When this upper stack is complete then it is released to fall down into the lower bin which is on a turntable. Booklets then continue stacking in the upper bin.

If stack 'compensation' is required (to increase stack stability) then the turntable rotates 180 degrees between each drop from the upper bin. When the total stack height is reached in the lower bin then the stack is ejected onto a free running delivery roller table.

'Intelligent stacking' option SBCR-100

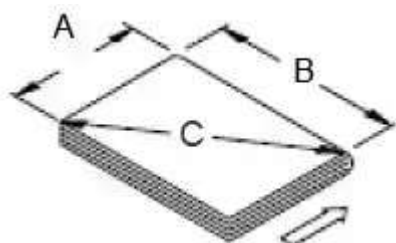
An optional bar code reader may be supplied to read a bar code on each booklet. An additional control system may then be programmed to use the bar code data to create stacks which contain specific booklets or signatures. This may be used for example to create stacks of signatures (book blocks) for subsequent perfect binding, or to create stacks of booklets in specific 'sets'.

Note: if automatic pile reject is needed, or gluing of signatures together within each stack, then select the more expensive Palamides stacker option BSS-20 or [BSS-30](#).

Other options

Include: table-up option, stack compression, motorized basket adjustment, servo-pusher

BSS-10 stacker - Key specifications

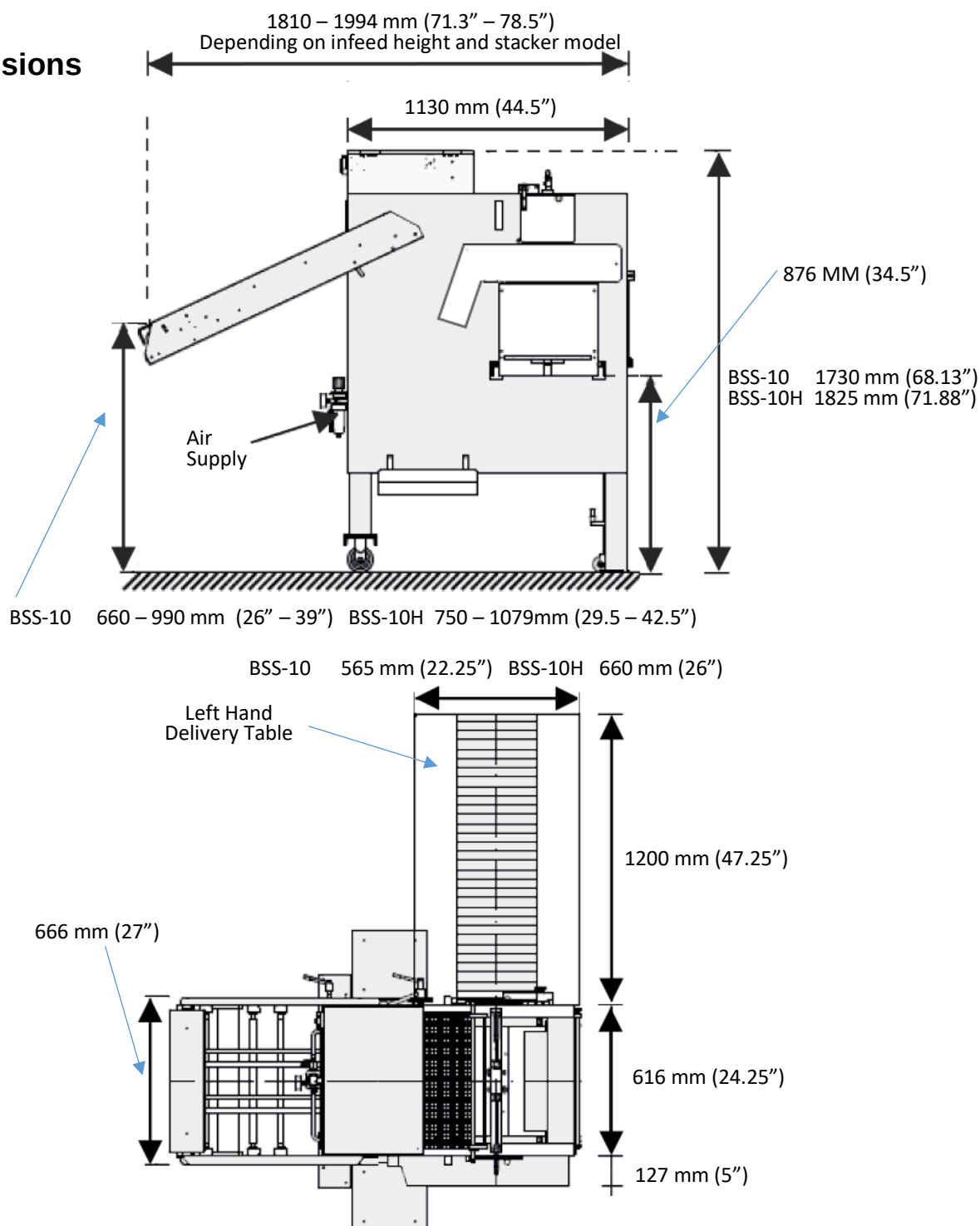


Booklet size – Dimension A	Min: 102mm (4"), Max: 320mm (12.63")
Booklet size – Dimension B	Min: 152mm (6"), Max: 4700mm (18.5")
Booklet size – Dimension C	Min: limited by A & B, Max: 520mm (20.5")

Booklet thickness	Min: 1mm (0.04"), Max: 32mm (1.25")
Max stack height – BSS-10	235mm (9.25")
Max stack height – BSS-10H	330mm (13")
Infeed height range standard BSS-10	660mm (26") to 990mm (39")
Infeed height range BSS-10H	750mm (29.5") to 1079mm (42.5")
Upper bin max height	127mm (5")
Delivery table height	876mm (34.5")
Other dimensions	See section below

Booklet orientation (for best stacking)	Spine-leading
Max speed	12,00 booklets/hr (limited by Smart-binder to 7,000 booklets/hr in 1-up mode)
Air required	85 liters/min at 5.5bar (3 cfm at 80 psi)
Input voltage	400 V, 3-phase
Noise level	Max 85 db(A)

Other Dimensions



Appendix 10: Laser Tabber LT-101

For Pharma Extended Content Label booklets (ECLs).

Details of the LT-101 laser-cutting tabbing module will be added here when available.

Appendix 11: Optional dynamic micro perforator DMP-100

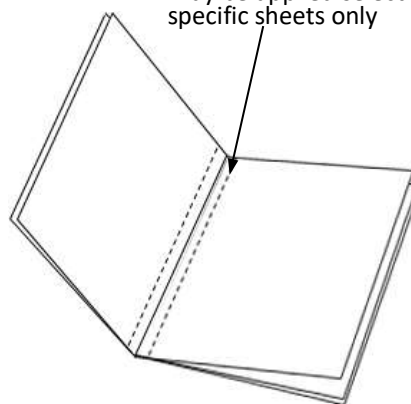
The Smart-binder DMP-100 (or DMP-101) dynamic perforator can perforate any sheet at any place based upon a barcode input. All perforations run parallel to the folded sheet edge (booklet spine).

The DMP-100 comes with 2 perforation rotary knives and the DMP-101 has 4 perforation rotary knives. Each rotary knife is activated by a single extra digit in the standard IBIS sheet barcode, so that each side of the sheet can be perforated (or not) on command. A variety of different perforation rotary knives are available ranging from micro-perf, up to a very coarse perf. The DMP makes it easy to incorporate selective “pull-out” sheets into the finished booklet.



DMP Dynamic Perforation Unit mounted between the infeed conveyor and the scoring module

Line of perforations allow any sheet to be easily torn-out. May be applied selectively to specific sheets only



DMP-100 Rotary perforator knife actuators

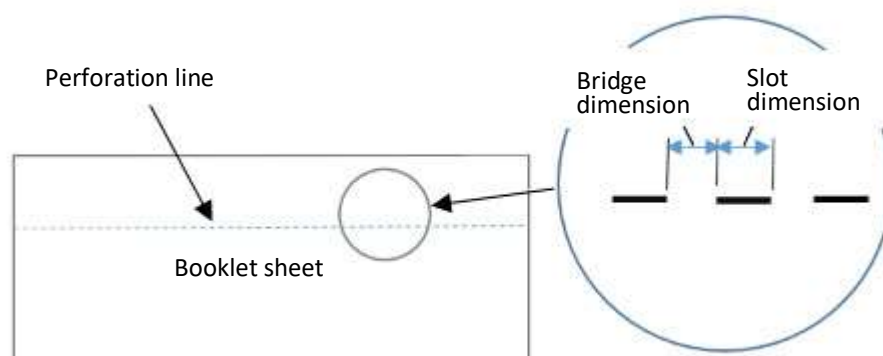


Perf cutting wheel options:

Normal perf: Part No. F314052
(Slot=1.70mm, Bridge=1.00mm)

Micro perf: Part No. F314358 (Slot=0.28mm, Bridge=0.23mm)

The slot is the perforator cut and the bridge is the distance between cuts, as shown below:



The DMP module adds 320mm to the length of the Smart-binder system and requires a 5-bar external high-pressure air supply.

The minimum distance from the perf line to the sheet center-fold is 6mm (0.24").

Floor Plans

Floor plan of Smart-binder with DMP-100 perforator [HERE](#)

Floor plan of Smart-binder with DMP-100 and SB-097 sheet pile feeder [HERE](#)

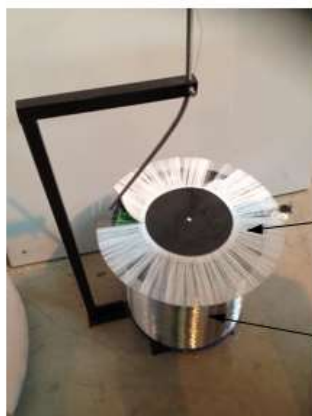
Videos

Sheets passing through the DMP-100 module and being perforated [HERE](#)

Selective tear-out sheet provided by the DMP-100 perforator module [HERE](#)

Appendix 12: Optional 100 kg wire spools/holders HKS-100 & trolley WST-100

To reduce the frequency of replacing wire spools, and to reduce wire 'pulling' force, it is recommended that 100 KG floor mounted wire spools are used instead of the standard 2.5 Kg machine-mounted spools:



Wire spool holder with brush to resist wire unwinding.

100Kg wire spool (mounted on floor behind Smart-binder).

The optional Wire Spool handling trolley is also offered for use with 100Kg wire spools to move the spools into position next to the Smart-binder stitcher.



Hydraulic lifting 'jack'

WST-100 loading trolley

100Kg wire spool

Trolley Wheels

The trolley includes a hydraulic jack to lift the spools.

Wheels allow easy movement around the factory floor.

Appendix 13: Optional folder F-100

The optional F-100 pre-folds sheets before they enter the Smart-binder (SB) infeed. The folder may be used either to produce small format books, increase SB page throughput, reduce the velocity of sheets entering the SB and/or reduce the minimum paper stock weight.

When using the F-100, then sheets are printed with 4 pages on each side (instead of the normal 2 pages on each side when not pre-folding). These 8-page sheets are then folded by the F-100 across the middle ('buckle'-folded) before they enter the SB and are folded again in the opposite direction by the SB plow-folder.



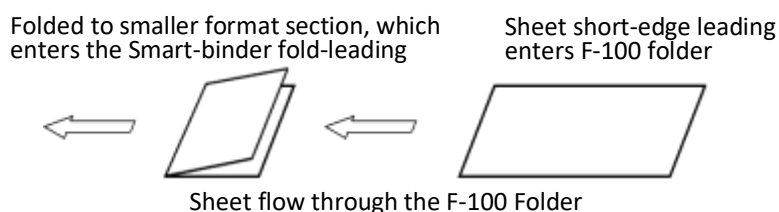
F-100 cross-folder unit used directly before SB infeed

For example: to produce **A5 (Digest – 5 ½" x 8 ½") books**, print oversize A3 sheets (or oversize 11 x 17"). These sheets must enter the F100 short-edge leading. The folder then folds the sheet in half to give an oversize A4 (or oversize 8 ½" x 11") section with the folded edge leading. These folded sections then enter the SB, and are processed normally thereafter into finished A5 5 ½" x 8 ½") books.

To produce **A4 (or Letter - 8 ½ x 11") books**, print oversize A2 sheets (or oversize 17 x 22"). These sheets must enter the F100 short-edge leading. The folder then folds the sheet in half to give an oversize A3 (or oversize 11 x 17") section with the folded-edge leading. These folded sections then enter the SB, and are processed normally thereafter into finished A4 or 'letter' size books.

Since sheets are folded into sections before entering the SB, and books can only be made from whole sections, it is only possible to make books with pages in multiples of 8-pages when using the F100 folder.

Folded sections are more bulky than flat sheets, so this technique may also reduce the maximum number of pages in the book..



The folding process may be deactivated when it is required to pass 4-page sheets through the F-100 without folding.

The F-100 folder may be fitted with optional anti-static bars to reduce the static charge on the sheets delivered to the SB.

When using ISG gluing together with pre-folded sheets, then a second cold-gluing nozzle must also be installed in the folder, option FGS-100, (to place a line of glue inside the folded sheet). See option FGS-100/FGS-101.

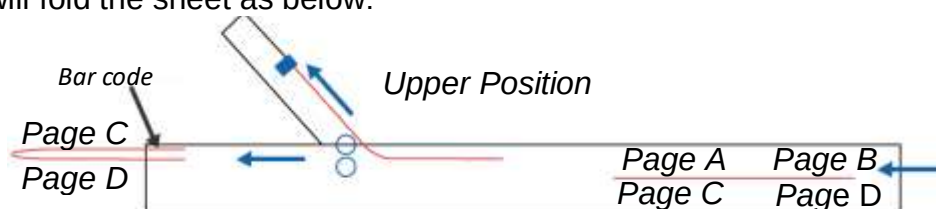
The F-100 enables the max web speed to be increased to about 150 metres/min or, if running from a sheet feeder the maximum page throughput can be increased. The F-100 also allows the minimum paper weight to be reduced to approximately 40 gsm (at reduced web speeds).

F-100 maximum and minimum infeed heights

Minimum infeed height	1000mm
Maximum infeed height	1100 mm

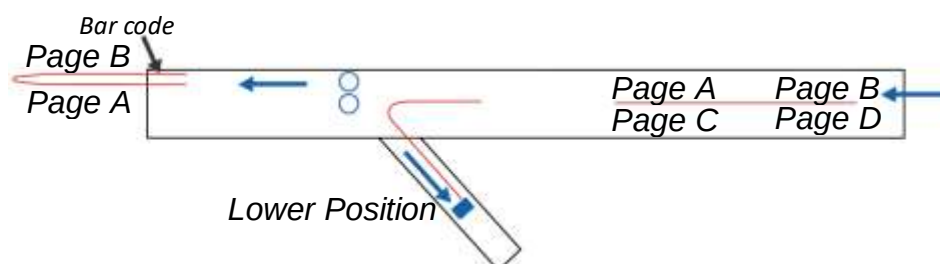
Fold Plates

The F-100 folder is normally supplied with one fold plate fitted in the upper position which will fold the sheet as below:



The imposition of pages printed on the web needs to be correct to suit the fold process as shown above. The bar code must be printed so as to appear on the upper side of the sheet after folding.

If a fold plate is needed in the lower position instead of the normal upper position then this is possible by special written request, and will fold the sheet as below.



Appendix 14: Optional rotator/folder SRF-100

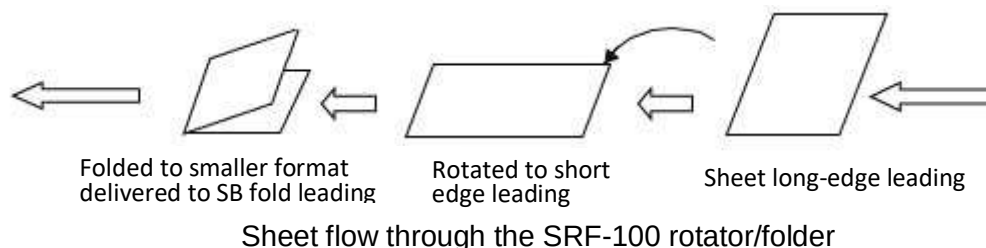
The optional high-performance SRF-100 rotator/folder (which consists of an SR-100 rotator and a F-100 folder) may be used with the Smart-binder to rotate sheets 90 degrees (to become short-edge leading), then buckle-fold sheets to produce small format booklets from normal width (440-460mm) web, in-line with a web printer. This allows the normal 'wide' web to be used when making small format booklets, instead of having to change to a 'narrow' paper web.

We will include an image, a floorplan, dimensions, more information and full specifications here as soon as possible.

For example: to produce A5 booklets, oversize A3 sheets with 8 pages on each printed sheet are delivered long-edge leading. The rotator/folder then rotates each sheet 90-degrees to short-edge leading. Each sheet is then folded in half to give an oversize A4 section with the folded edge leading. The folded sections are then fed into the Smart-binder, and processed normally.

Since sheets are folded into sections before entering the Smart-binder, and books can only be made from whole sections (8-pages per section), it is only possible to make books with pages in multiples of 8-pages, instead of the normal 4-page increments.

Folded sections are more bulky than flat sheets, so this technique may also reduce the maximum number of pages in the book.



Both the rotating and folding processes may be deactivated when it is required to pass sheets through the SRF-100 without rotating or folding.

The SRF-100 folder may be fitted with optional anti-static bars to reduce the static charge on the sheets delivered to the Smart-binder.

When using ISG gluing together with pre-folded sheets, then a second cold-gluing nozzle must also be installed in the folder (to place a line of glue inside the folded sheet). Use option FGS-100/FGS-101.

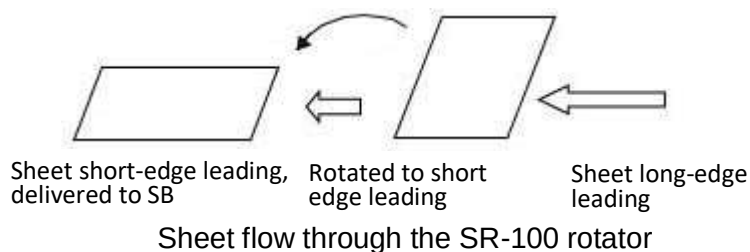
It is not recommended to use the SRF-100 for sheet rotation if the sheet weight is less than 60 gsm, or if sheet input rate is higher than approximately 300 sheets/min. The SRF-100 may be used at higher speeds when not rotating. For example, the SRF-100 may be used without rotation, ie just using the F-100, to buckle fold each sheet and thereby increase the maximum web speed to approximately 180 meters/min

Appendix 15: Optional rotator SR-100

The optional SR-100 rotator may be used to rotate long-edge leading sheets 90 degrees (to become short-edge leading) before feed into the Smarf-binder

The SR-100 is often used before an F-100 buckle folder, when fed from a web-cutter, to allow small format booklets to be produced from a normal width web (440-460mm), instead of having to change to a 'narrow' paper web.

We will include an image, a floorplan, dimensions, more information and full specifications here as soon as possible.



Rotation may be deactivated when it is required to pass sheets through the SR-100 without rotating.

Rotation with the SR-100 is not recommended if the sheet weight is less than 60 gsm, or if sheet input rate is higher than approximately 300 sheets/min

Appendix 16: Optional Sheet Rotator SR-50

The sheet rotator module SR-50 is designed to receive sheets long-edge leading from a cut sheet printer and rotate them 90 degrees to become short edge leading.



SR-50 Specifications

Modes	Rotate / Bypass
Max sheet size	In 'rotate mode': SRA4 In 'bypass' mode: SRA3
Paper weight	75 – 120 g/m ² (dependent on paper type and quality)

Dimensions

Position	In operation	On pallet	In crate
Height	1,080 mm	1,300 mm	1,800 mm
Width	650 mm	1,380 mm	1,380 mm
Depth	650 mm	730 mm	730 mm
Weight	100 Kg	130 Kg	220 Kg

Electrical

50 Hz	230V	2 A
60 Hz	208-240 V	1.5 A
60 Hz	120 V	3 A (specially tailored machine)

Note: The SR-50 should only be connected to an approved electrical system which is rated at a maximum of 16A and protected by circuit breakers

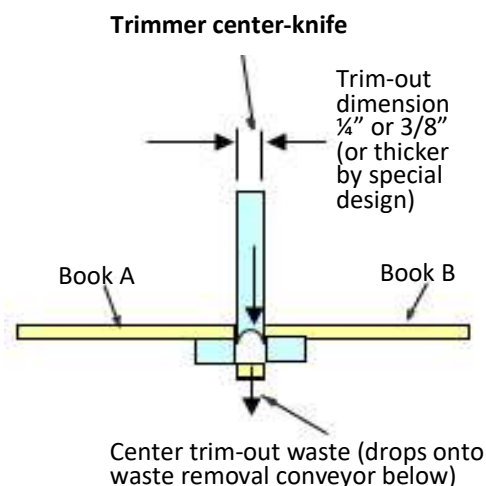
Appendix 17: Optional CKN center knife assembly

CKN-100, CKN-101 or CKN-102 Trimmer center-knife

The optional Smart-binder trimmer center-knife system may be used to produce book sizes which are less than 160mm (6 1/4") spine length (e.g.: A5 landscape or 8 1/2 x 5 1/2" oblong). Each sheet is printed with 8 pages instead of the normal 4 pages. These sheets are individually folded and then either stitched or glued together in the normal way. The center-knife then splits the resulting book into two smaller sized books, which are delivered in two parallel streams.

Center-knives are available in widths of 6.35mm (1/4") (CKN-100) and 9.52mm (3/8") (CKN-101). These trim 6.35mm (1/4") or 9.52mm (3/8") out of the middle of the book. Book thickness is limited to 3mm (1/8") (1/8") for the 6.35mm (1/4") knife and 4.5mm (3/16") for the 9.525mm (3/8") knife

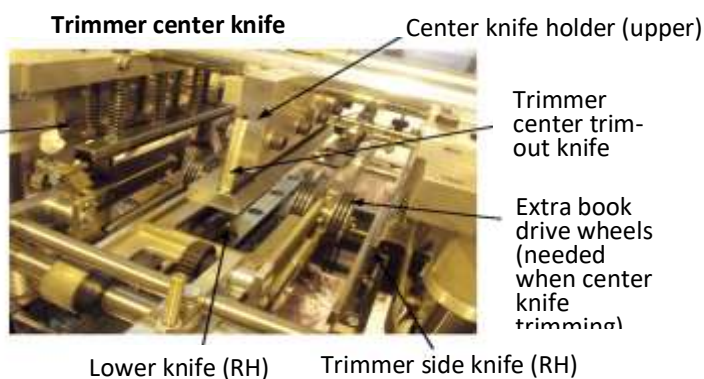
Option CKN-102 can separate the two books without any trim out. Thicker books may be produced if using the CKN-102 single knife center-split instead of a double-edged trim-out knife.



Double book stream on the SB delivery when using the trimmer center-knife



Trimmer side knife (LH)



Appendix 18: Optional cover matching system BCR-105 & DCR-101

BCR-105 is the MS-3 (1D) and the DCR-101 is the Minihawk 2D Datamatrix reader

Some production jobs require a separately fed cover which contains **personalized data** (such as an individual name and address) which must **'match' the data printed on the inside sheets**.

The optional BCR-105 (or Minihawk 2D Datamatrix reader DCR-101) cover matching system, uses a **code reader fitted in the Smart-binder cover feeder**. As each cover is fed from the bottom of the pile the code reader reads a numerical MS-3 (1D) bar code (2D code for the DCR-101) printed on the outside of the cover. This numerical code contains an ID number which is unique to that particular cover.

The inside sheets arriving from the web cutter (or sheet pile feeder) are also coded. These sheet codes also contain an ID number which is unique for each booklet. A separate reader mounted on the Smart-binder infeed (or in the sheet pile feeder) reads these inside sheet ID numbers.

If cover and inside sheet IDs match the cover is folded and placed on top of the collated set of inside sheets to form a complete and correct booklet with 'matching' cover.

If the cover and inside sheet IDs differ the Smart-binder stops and the control screen indicates a cover 'mismatch'. The operator must regain correct cover sequencing before the machine is restarted.

The cover matching system may be added to all existing or new Smart-binders that have a cover feeder fitted.



As an alternative to the BCR-105/DCR-101 cover matching system, covers may contain a 'cut-out window' which allows personalized details printed on the first page of the inside sheets to be visible from the outside of the book.

A special extra guide is available to allow the covers with cut-out windows to feed reliably from the cover feeder.

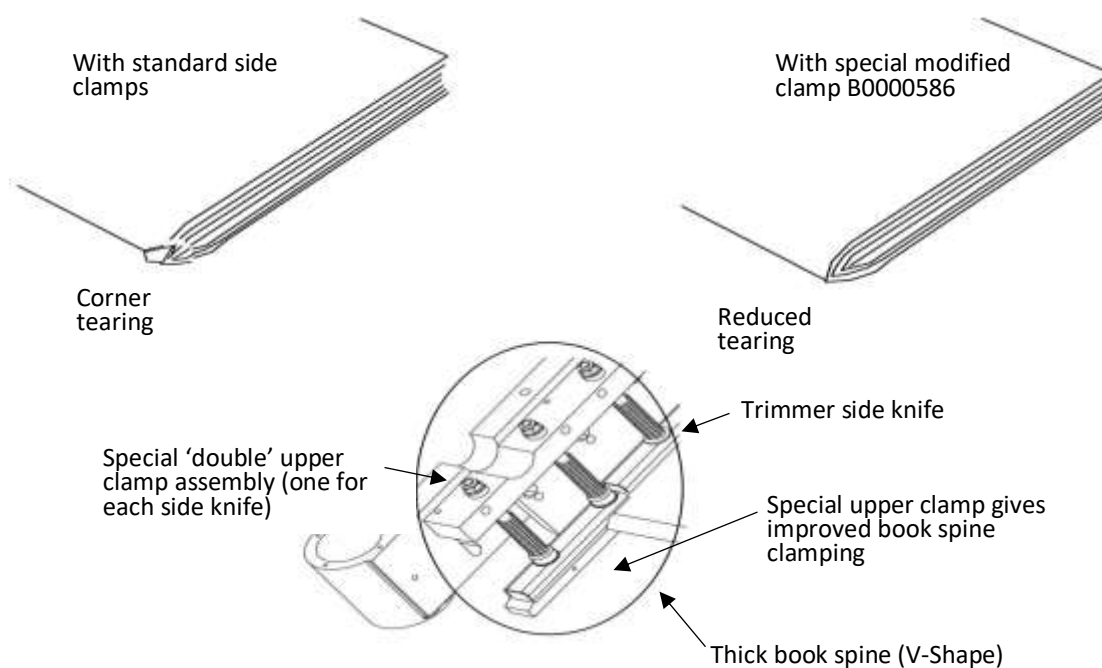


Appendix 19: Optional spine clamp kit TCA-100

The Spine Clamp Kit TCA-100 reduces book corner tearing when making very thick booklets.

All saddle-stitcher side-knives normally result in some tearing of the corner of the book spine. This results from the fact that the V shaped spine is not supported well by upper clamps.

The clamp kit modification ensures that the V spine is better clamped to reduce spine corner tearing by the side knives. The standard modification kit is designed to suit A4 or USA 8 ½ x 11" finished book sizes only. For other sizes refer to IBIS.

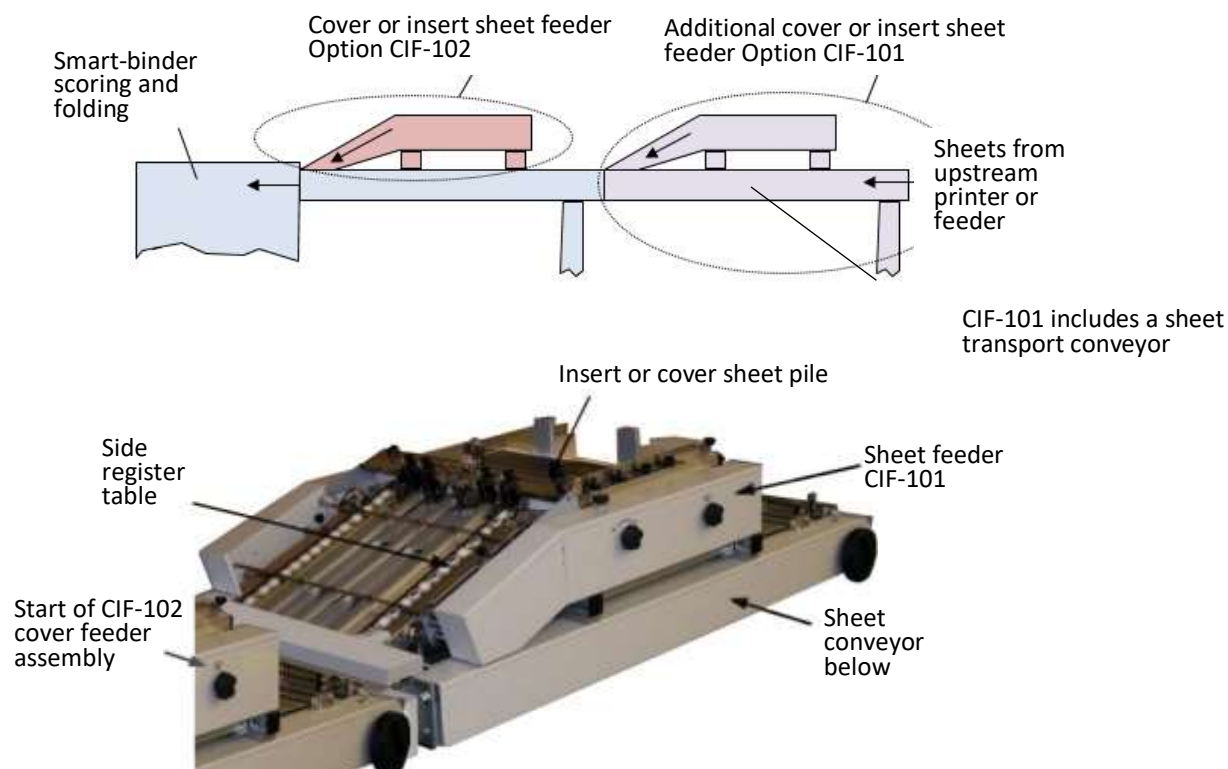


Appendix 20: Optional additional cover or insert sheet feeder CIF-101

The **CIF-101 Sheet Feeder** is designed to feed an extra cover or insert sheet as part of a booklet assembled by the IBIS Smart-binder.

The CIF-101 is mounted on **slide rails** on top of a sheet transport conveyor (the assembly includes both items supplied as one unit)

The CIF-101 is used in conjunction with the standard **Smart-binder cover feeder CIF-102**. Both are identical feeders, but the assembly CIF-101 includes a second sheet transport conveyor below. Note: CIF-102 cover feeder option does not include a sheet conveyor because this is part of the standard Smart-binder.



The CIF-101 feeds sheets from the bottom of the pile using a rotating vacuum wheel. Air-blow nozzles mounted at the sides and rear of the feeder help separate covers from each other in the pile. Inserts may be **reloaded on-the-run** without stopping the Smart-binder.

The insert or cover sheet is **independently side-registered** so that the width does not have to be the same as the 'content' sheets. However the insert/cover sheets must be the same length as the sheets on to which they are fed (same spine length). Insert sheets that are longer or shorter than the other sheets in the book will cause some loss of print registration between sheets.

After side register, then the insert/cover sheets join the stream of other 'content' sheets, pass below the CIF-102 cover feeder and enter the Smart-binder scoring and folding module. **Scoring pressure** may be adjusted to minimize color-toner cracking. However, the optimum way to eliminate cracking of color toner is to pre-crease the inserts.

The CIF-101 insert sheet feeder is controlled by a **coded digit** on the content sheets coming from upstream. This allows the CIF-101 to automatically feed the insert or cover at the correct position required inside or outside the book.

A **code reader** is available for the CIF-101 feeder if feeding **personalized inserts or covers**. The CIF-101 feeder will then compare the unique ID number in the insert/cover sheet code to the ID number in the barcode on the incoming text content sheets. The Smart-binder can be programmed to either stop on a mismatch, or reject the booklet (without stopping) via the trimmer reject gate.

The insert feeder CIF-101 is capable of feeding sheets in the range **90 – 230 gsm** (61 – 154lbs. offset or 24 -61lbs. bond). Sheet weights outside this weight range should be tested before use to check feeding performance.

If feeding sheets from the CIF-101 insert feeder and making **ISG cold-glued books**, or if feeding an insert sheet into the center of a book (**center spread**), then there must be sufficient space between sheets coming from upstream into which to feed the insert sheet. If running in-line with a high-speed digitally-printed web, then this may mean that the web cutter must be programmed to pause momentarily, to create this gap. If feeding from a pile feeder, then the gap in sheet feeding can be created automatically by the Smart-binder feeder control system.

Refer to IBIS if needed to feed more than one insert or more than one extra cover in each book.

Inserts or covers with **tear-off perforations** may be run depending on the type and position of the perforations. Check with IBIS first if wishing to run perforated covers. Note that an optional 'dynamic' micro-perforation system (option DMP-100) is available for installation just before the Smart-binder folder. This may be used to automatically perforate insert sheets (and any other sheets) if not already pre-perforated.

Feeding a center-insert: the standard cover feeder CIF-102 may be used to feed an insert sheet inside the booklet in any position except in the center of the booklet. The CIF-101 insert feeder must be used if the insert is required in the center of the booklet.

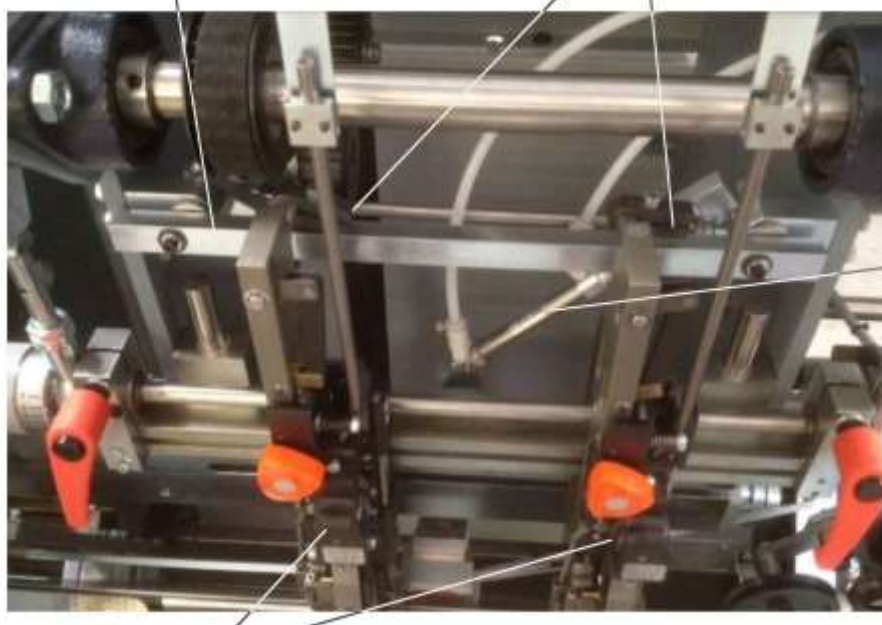
The optional additional **CAL-101 cover autoloader** is recommended for use with the CIF-101 cover feeder to increase the pile height from 20 to 200mm and to improve cover feed reliability.

Appendix 21: Optional automatic 'stop stitch' SDI-100

The optional stitcher wire draw inhibit system allows the stitching operation to be automatically inhibited on demand. It may be activated automatically under bar code control or manually from a switch on the outside of the machine. The system uses a pneumatic cylinder which rotates the wire draw inhibit arms on each stitch head.

Stop stitch actuator bar (moves up/down)

Stitch head wire draw inhibit arms



Pneumatic cylinder (stop stitch)

Stitch heads, modified for auto wire inhibit actuation

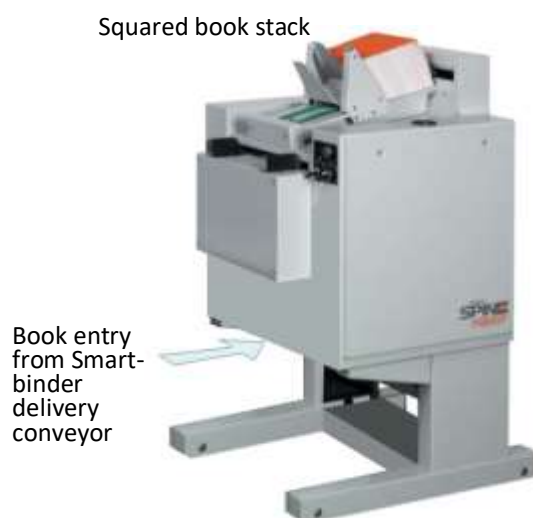
The benefits of the optional auto stop-stitch system are:

1/ It allows wire stitching to be automatically inhibited when not needed (i.e. when making a 4-page booklet, or an ISG cold glue bound booklet).

2/ It allows the stitching process to be automatically stopped when running books out of the machine at the end of a job. This prevents having to open the machine guard to manually deactivate the wire drive on each stitch head.

Appendix 22: Optional spine squaring module SM-101

The SM-101 in-line book spine-squaring module may be connected to the end of the Smart-binder delivery conveyor. Each book exiting the Smart-binder is transported into the SM-101 where it is stopped, clamped and the spine is compressed into a 'square' shape.



The book is then ejected onto a horizontal stack on top of the module

The maximum book thickness for spine squaring is 6.5mm. The maximum SM-101 throughput rate is 28 books/min, which reduces the Smart-binder booklet output rate when making thinner booklets.

Saddle-stitched book
before spine squaring



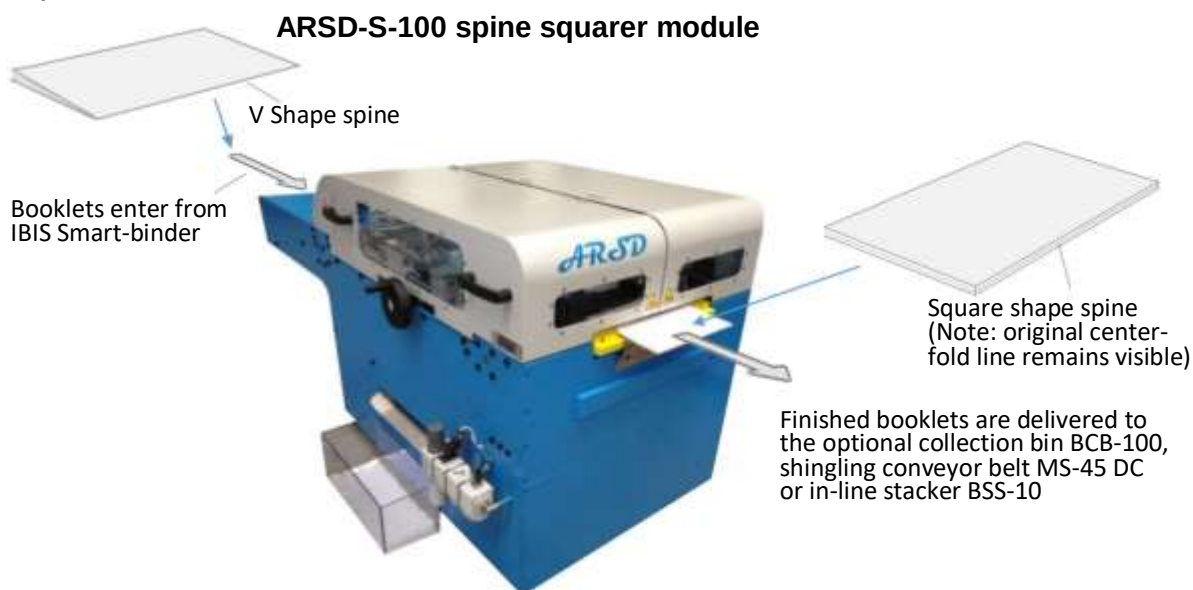
Saddle-stitched book after
spine squaring



Note: See the alternative ARSD-S-100 module if a higher performance and heavier-duty spine squaring system is needed

Appendix 23: Optional spine squarer ARSD-S-100

The **spine squarer module version ARSD-S-100** may be integrated into the Smart-binder delivery to press the booklet spine into a square shape using high pressure clamps

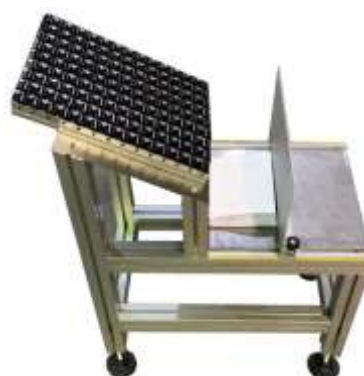


[View a video of the ARSD-S-100 in operation](#)

The finished 'squared' booklets are then delivered into a simple collection bin BCB-100 or onto an optional 1.2m long horizontal delivery conveyor MS-45 DC, or directly into the booklet stacker [BSS-10](#).

The ARSD-S-100 may be supplied with manual or automatic adjustment for changes in booklet thickness.

Note: the ARSD-S-100 is twice as fast, much more robust and can handle a booklet of double the thickness, compared with the lower-cost spine squarer option [SM-101](#).



Booklet collection bin

Technical specification:

Maximum speed	See 'Running speeds' table on next page
Minimum booklet thickness	3 mm (1/8")
Maximum booklet thickness	10 mm (3/8")
Minimum size	210 mm spine length – 150 mm width
Maximum size	420 mm spine length – 330 mm width
High pressure air supply required	7 Bar
Electrical power required	2 KW

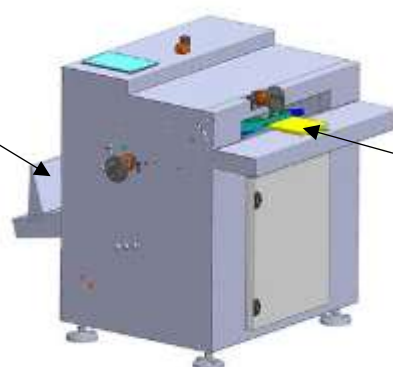
ARSD-S running speeds

Booklet Thickness	Number of spine pressure cycles	Max Speed (cycles/hr) <u>without</u> automatic thickness adjustment	Max Speed (cycles/hr) <u>with</u> automatic thickness adjustment
From 1 to 3 mm	0	5,000 (no squaring)	5,000 (no squaring)
From 3 to 4 mm	1	3,200	2,307
From 5 to 7 mm	2	1,978	1,651
From 8 to 10 mm	4	918	845

The **spine squarer module version ARSD-E-100** is a lower cost alternative to the ARSD-S-100

ARSD-E-100 spine squarer module

Booklet are delivered with a 'square' shape spine
(Note: The original center-fold line remains visible)



Booklets enter from the in-line IBIS Smart-binder
(V Shape spine)

[View a video of the ARSD-E-100 in operation](#)

ARSD-E-100 Technical specification:

Maximum speed	1500 booklets/hour (up to 5mm booklet thickness, or 900 booklets/hour (form 6-10 mm thickness))
Minimum booklet thickness	2 mm
Maximum booklet thickness	10 mm
Minimum size	105 x 140 mm
Maximum size	420 x 320mm
High pressure air supply required	7 Bar
Electrical power required	1.5 KW
Dimensions	1071 x 890 x 849mm

Appendix 24 Optional corner hole punch module CHP-101

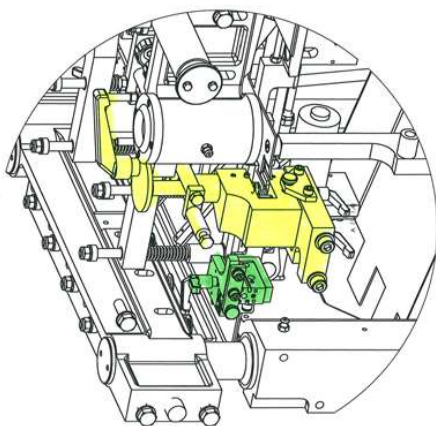
The single hole-punch system CHP-101 may be installed in the Smart-binder trimmer to punch a hole in either the left or right corner of each booklet.

It is installed in a location such that the hole is punched at the same time as the book front edge is trimmed. The punch is driven by the downward motion of the upper trimmer knives and this drive may be easily inhibited by a quick manual adjustment of the drive arm. The punch is spring driven back up out of the book as the knives move back up to their top position.

The system includes a set of new additional pneumatic-driven side joggers, which ensure that each book is correctly side-registered before the hole is punched.

The hole-punch can be supplied in three different versions:

- CHP-101H punches a hole in the head side of the booklet (and is fitted to the operator side of the trimmer)
- CHP-101F punches a hole in the foot side of the booklet (and is fitted to the non-operator side of the trimmer)
- CHP-101HF punches a hole in the head and/or the foot side of the booklet (and can be fitted to either side)
-

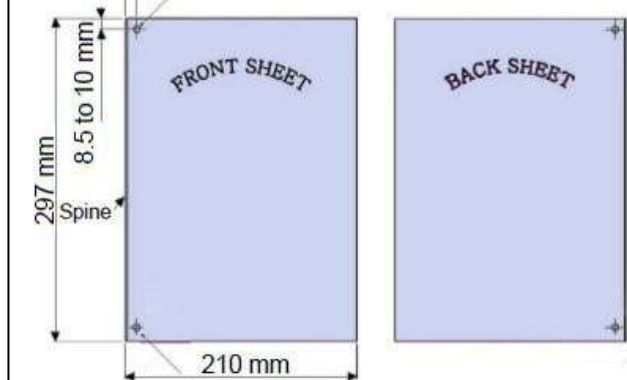


Hole punch installed in trimmer

Hole-punch CHP-101 Specifications

- Hole diameter : 6mm
- Finished trimmed booklet size = 297 spine length x 210 width (A4)
- Book thickness: 0 – 2mm
- Hole position measured from side-edge of book: 8.5-10mm
- Hole position measured from spine-edge of book : 8.5 – 26mm
- Speed: defined by Smart-binder trimming speed (does not introduce slow-down)

8.5 to 26 mm 6 mm punched hole



8.5 to 26 mm 6 mm punched hole



Booklets with punched holes
on trimmer delivery conveyor

Appendix 25: Optional smart-data analysis system SDA-100

The Smart-Data Analysis System SDA-100 displays detailed Smart-binder performance data in an easy-to-use format. It can be added to any IBIS Smart-binder and collects data from multiple Smart-binders and displays at one point. The system can also export data to enable users to create their own Excel reports.



Different production data reports available:

- Production output: shows sheets processed and booklets produced during each hour (see example below)
- Jobs: lists jobs run and booklets produced during each job
- Daily run times: shows when the machine was running
- Errors: shows which faults occurred
- Job Summary: shows duration and output for each job
- Reprint report: shows the IDs of rejected booklets

1/ Example of SDA 'Production Output' Report:

OUTPUT		JOBS		RUN TIMES		ERRORS	REPORTS	FILES
Date	Hour	Running minutes	Booklets delivered	Booklets rejected	Sheets delivered	Sheets rejected	Efficiency %	
7/10/2019	12:00	57	5698	2	17094	24	99.9	
7/10/2019	13:00	55	5481	18	16443	54	99.7	
7/10/2019	14:00	58	5789	8	17367	24	99.9	
7/10/2019	15:00	47	4693	6	14079	18	99.9	
7/10/2019	16:00	56	5593	5	16779	15	99.9	
7/10/2019	17:00	53	5296	0	15888	0	100	
8/10/2019	09:00	31	1222	1	7332	6	99.9	
8/10/2019	10:00	56	2363	3	14178	18	99.9	
8/10/2019	11:00	49	2058	0	12348	0	100	
8/10/2019	12:00	58	2445	0	14670	0	100	
8/10/2019	13:00	57	2401	0	7203	0	100	

2/ Example of SDA 'JOB' Report:

OUTPUT	JOB	RUN TIMES		ERRORS	REPORTS	FILES	
Job Number	Start time	Stop time	Booklets delivered	Booklets rejected	Sheets delivered	Sheets rejected	Efficiency %
0313581322	10/02/20: 12:10hrs	11/02/20 18:10hrs	28342	5	113348	20	99.9%
0213581322	11/02/20 18:10hrs	11/02/20 18:17hrs	466	1	1395	3	99.8%
0313581322	11/02/20 18:17hrs	11/02/20 18:55hrs	2531	4	10108	16	99.9%
2013581322	11/02/20 18:55hrs	12/02/20 13:05hrs	3632	7	72633	140	99.8%

3/ Example of SDA 'Run Times' Report:

OUTPUT	JOB	RUN TIMES		ERRORS	REPORTS	FILES	
Date	12:00	13:00	14:00	15:00	16:00	17:00	18:00
11/02/2020	10	53	55	45	53	54	25
12/02/2020	17	3	52	49	0	0	0
13/02/2020	0	0	0	0	0	0	0
14/02/2020	21	45	55	55	53	47	0
15/02/2020	0	0	0	0	0	0	0
16/02/2020	16	54	58	53	55	57	12
17/02/2020	55	52	53	54	56	10	0
18/02/2020	0	0	53	55	0	0	0
19/02/2020	10	54	55	57	52	50	12
20/02/2020	13	52	55	56	57	50	22
21/02/2020	0	0	0	0	0	0	0

4/ Example of SDA 'Errors' Report:

OUTPUT	JOB	RUN TIMES	ERRORS	REPORTS	FILES	
Date/Time	57 Too many misfeeds	62 Sheet Jam: Collator	74 Book Jam: Pusher	80 Book Jam: Transfer	82 Book Jam: Trimmer Upper Nip	86 Book Jam: delivery
13/02/20 11:00	0	1	0	0	0	0
13/02/20 12:00	1	0	2	0	0	0
13/02/20 13:00	0	1	0	1	0	0
13/02/20 14:00	0	0	0	0	1	0
13/02/20 15:00	0	0	0	0	0	0
13/02/20 16:00	1	0	0	0	0	0

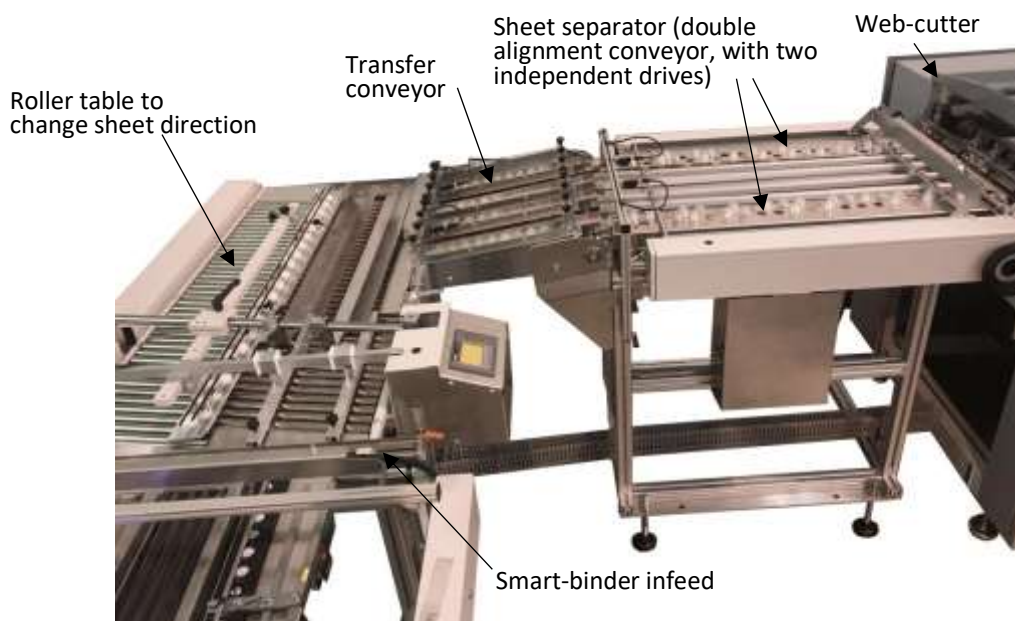
Note: the above example shows only 6 code errors. Additional code errors are available to view. The error report shows if there are any areas of the Smart-binder that are frequently causing machine stops and where remedial actions therefore need to be taken to reduce these types of stops.

Appendix 26: Optional 2-up sheet direction change system TUSDC-100

The TUSDC-100 modules may be installed in between a web cutter and the IBIS Smart-binder to enable A5 (or 5½ x 8½") booklets to be produced from a 450mm, (or 17½ - 18") wide web using 4-page sheets. This is an alternative to the SRF-100 solution which uses 8-page sheets.

The web is cut into sheets using both a cross-cut and a longitudinal center-slit. Two sheets approximately size 225 x 320mm (or approximately 9 x 12") are delivered side-by-side from the web cutter. The sheets are then separated by the double alignment conveyor to introduce a gap of about 20-30 mm between sheets.

The velocity of each sheet is adjusted to ensure the front edges of the pair of sheets are aligned. A separate transfer module then delivers the pair of sheets onto a roller table which changes their direction by 90-degrees so that they can enter the Smart-binder one behind the other.



The maximum web speed to ensure reliable direction change is approximately 60 meters/min (197 ft/min), which results in approximately 375 four-page sheets/min (1,500 pages/min). Paper stock weight must be at least 70 gsm for reliable direction change.

View an IBIS web-site video of the TUSDC-00 system with the Smart-binder producing 5 ½ x 8 ½" booklets from an 18" web [TUSDC-100 system](#)

Appendix 27: Optional sheet pile feeder SB-096

If feeding the Smart-binder from an SB-095 (or SB-097) sheet pile feeder, then an additional **side-fed SB-096 sheet pile feeder** is available. The SB-096 includes a roller table that changes sheet direction by 90-degrees:



The SB-096 feeder may be loaded with piles of pre-collated sheets and **optional loading trolley options** [PLT-100](#) and [HPL-100](#) are available to assist loading. The maximum pile height is approximately 550mm (21.65") but actual pile heights depends on a number of factors including the amount of toner used (the top sheet must remain relatively flat).

The SB-096 feeder must be stopped to reload the pile. Allow about 5 mins to reload without using the optional loading trolley, or approximately ½ min if using the loading trolley PLT-100. Each sheet requires a code printed on the edge.

When feeding sheets from the SB-096 then the feed rate is limited by the rate at which the sheets can change direction on the roller table.

Gaps will be created automatically in the stream of sheets fed from SB-095 to accommodate sheets fed from SB-096 and to give time for the SB-096 sheets to change direction on the roller table.

Appendix 28: Optional knife folder MS-45

The optional MS-45 knife folder is available to connect to the Smart-binder delivery conveyor.

The folder receives each booklet and knife folds it in the center. If 'down folding' then booklets are delivered to the left and if 'up folding' then booklets are delivered to the right (the fold unit can be rotated 180 degrees to allow either configuration)

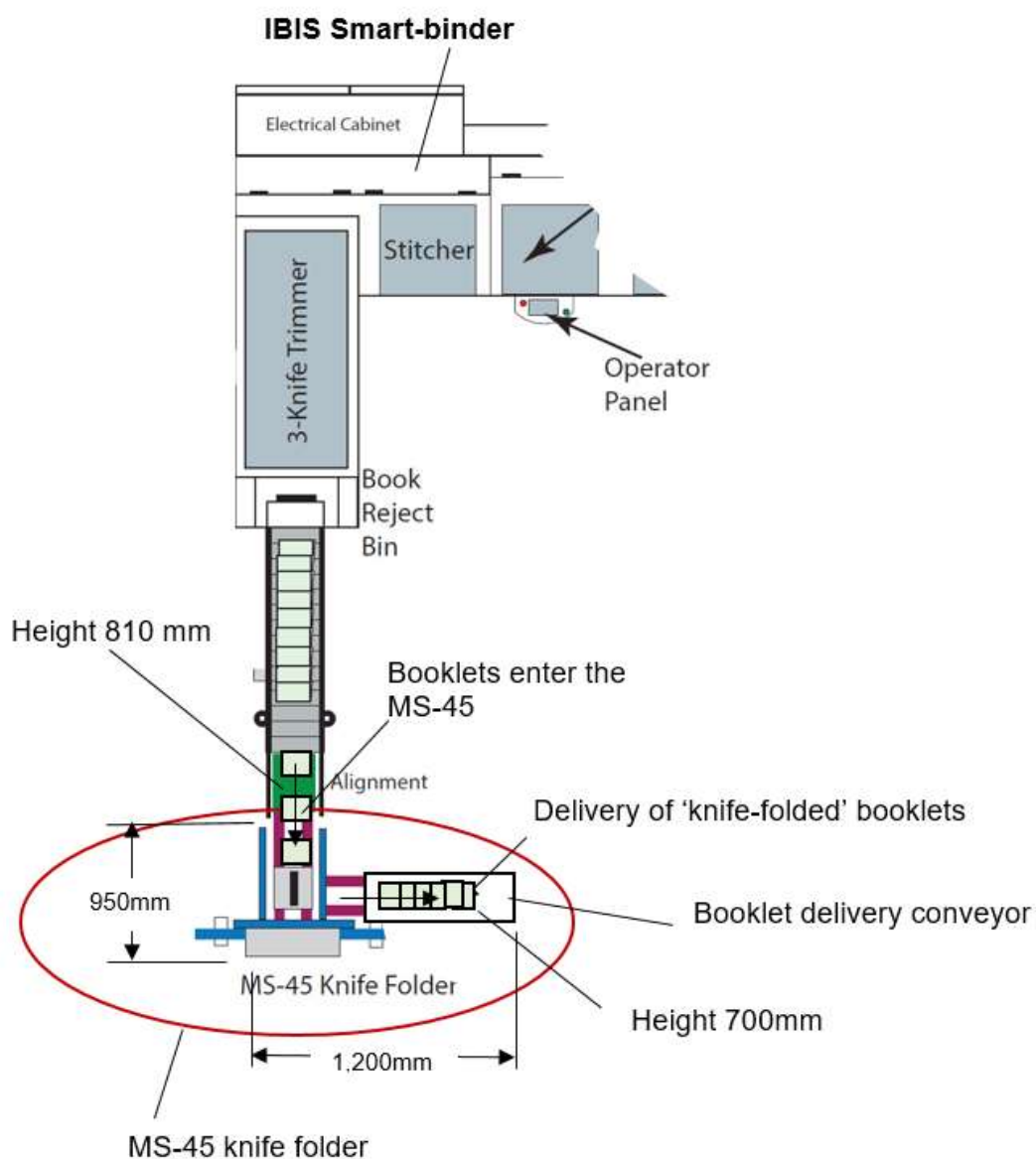


Booklet entry
from Smart-
binder delivery
conveyor

Booklet delivery
conveyor

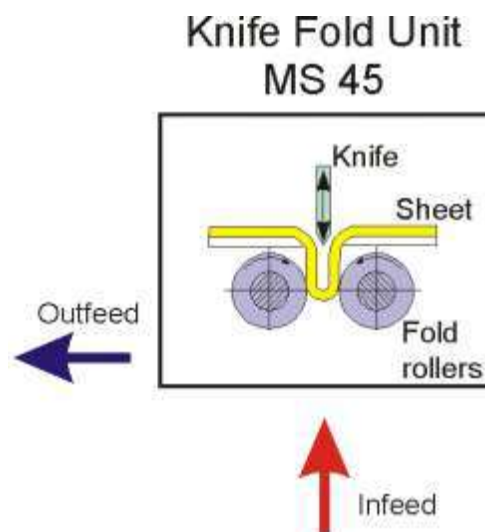
Outfeed from
knife folder

Smart-binder connected to in-line MS-45 knife folder delivering to the left (set for 'down fold')



Fold direction and heights

The MS-45 will be normally be set to do a 'down fold' and deliver to the left (note: if an up fold is preferred then the fold will deliver to the right which is not so convenient for the machine operator).



The infeed height to the knife-folder is about 810mm (requires the Smart-binder delivery conveyor to be raised slightly) and when 'down folding' the delivery conveyor height is 700mm.

MS-45 Basic Specifications (when connected to Smart-binder)

Booklet size before folding

Book Width : min 120mm max 225mm
Spine length: min 210mm max 320 mm

Maximum speed : 7000 books /hour
(to match maximum Smart-binder speed)

Heights

Infeed height: 810mm
Outfeed height (assuming down fold): 700mm

Maximum booklet thickness:

Approximately 20 pages (0.5mm)

Note: the thicker the booklet, the more evidence there will be of spine wrinkling at the corner of the booklet after the knife fold.

Appendix 29: Optional book stacker BSS-30

The BSS-30 book stacker allows non-stop Smart-binder operation without the need for the operator to continually have to remove books from the delivery conveyor. Books pass through the standard Smart-binder delivery conveyor into the BSS-30 stacker where they collect into piles up to 160 mm high. The number of books in each pile is selectable by the machine operator.

Book piles are delivered onto a roller table where they accumulate until removed by the operator. In-line (or off-line) pile 'banding' is also available.



Completed stacks contain booklets (or signatures) with spines all orientated in the same direction.

An alternative version of this stacker is available with an additional automatic stack reject facility. This ejects any bad stacks in one direction (stacks which do not contain the correct booklets of signatures in the correct sequence) and delivers all good stacks in a different direction. This version stacker includes a code reader to read incoming booklets or signatures.

If making book blocks for perfect binding, then a cold glue applicator may be added which glues the signatures inside each book block. This may be used to aid the transportation of these book blocks into a perfect binder.

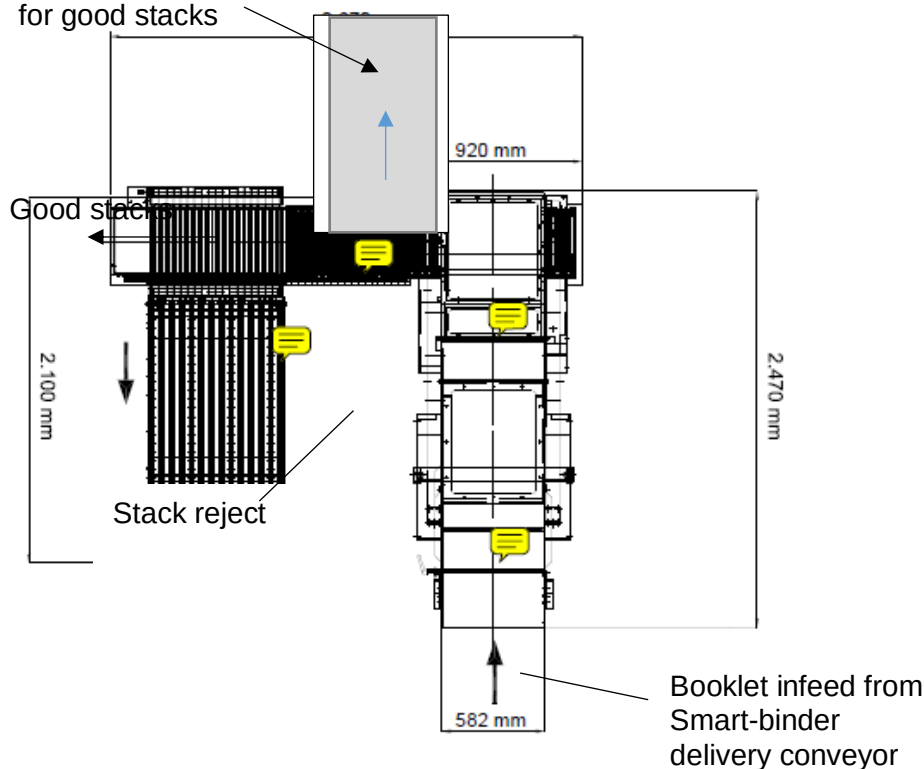
BSS-30 stacker specifications (2 versions available with different widths)

alpha	500plus	Formate: min 1 up max 2 up max (optional) 3 up max (optional)	Infeed width 80 mm (3 1/4") 510 mm (20") 235 mm (9 1/4") 150 mm (6")	Infeed length 95 mm (3 3/4") 330 mm (13") 330 mm (13") 330 mm (13")
alpha	700plus	Formate: min 1 up max 2 up max 3 up max (optional) 4 up max (optional)	Infeed width 80 mm (3 1/4") 760 mm (30") 350 mm (13 3/4") 235 mm (9 1/4") 155 mm	Infeed length 95 mm (3 3/4") 330 mm (13") 330 mm (13") 330 mm (13") 330 mm (13")
Max stack height		160 mm		
Min stack height		3 mm		
Speeds		15 - 205 m/min		
Performance		900 stacks per hour per up-work		
Electrical connection		16 A, 400/230 v, 3.5 kw		
Compressed air consumption <i>Signal connection is MBO 24 pin as standard</i>		100 l/min net, 6 bar (with air blast device 250 l/min) Dry filtered air on site		

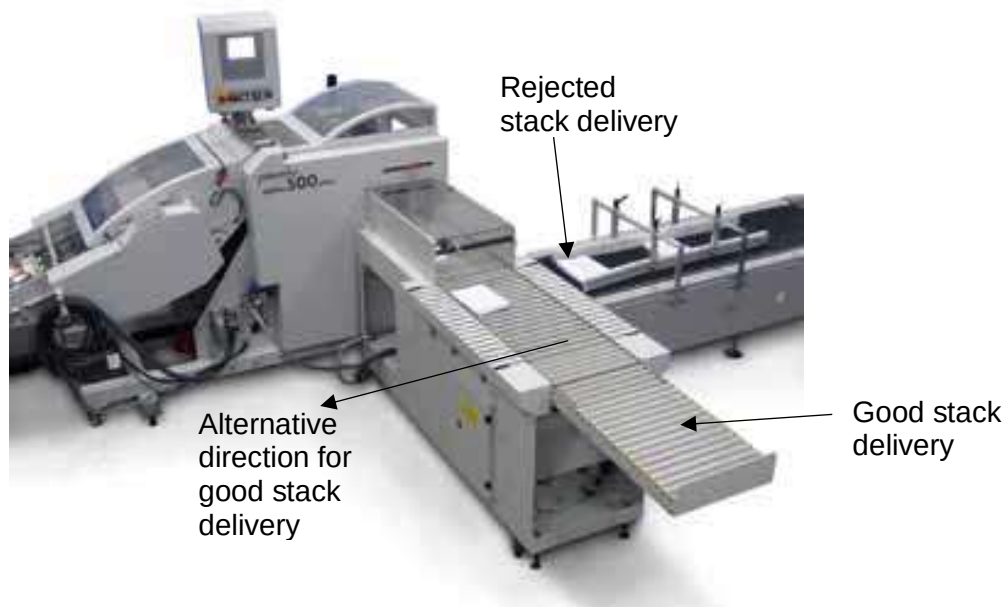
BSS-30 Floorplan, showing optional stack reject lane

(BSS-30 may be to the left as shown below, or to the right):

Alternative delivery
for good stacks



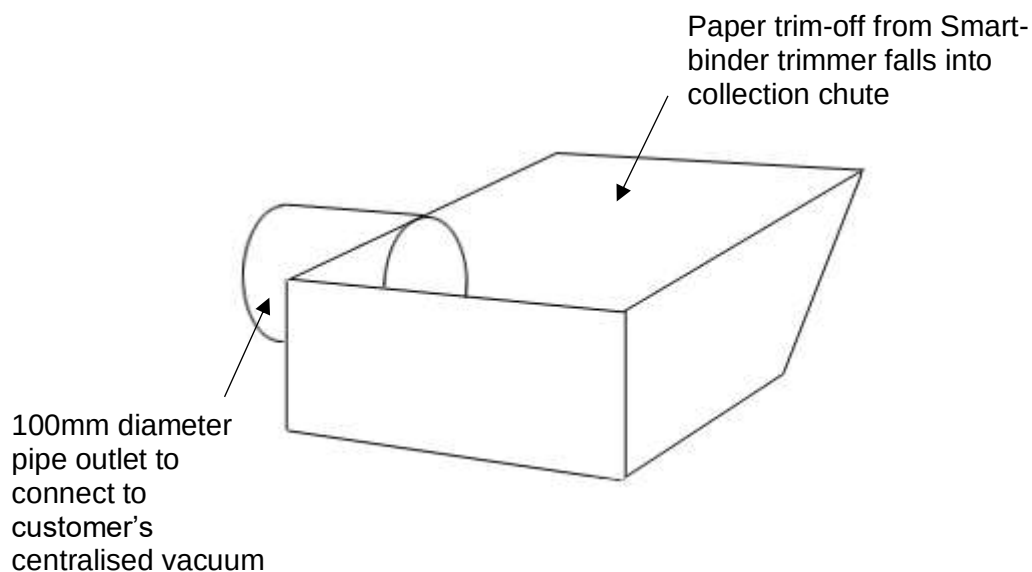
BSS-30 with Optional stack reject (shown below with delivery to the right, but may be provided also with delivery to the left):



The above image shows good books being delivered 'head leading', but an alternative configuration can deliver good books in a different direction if preferred.

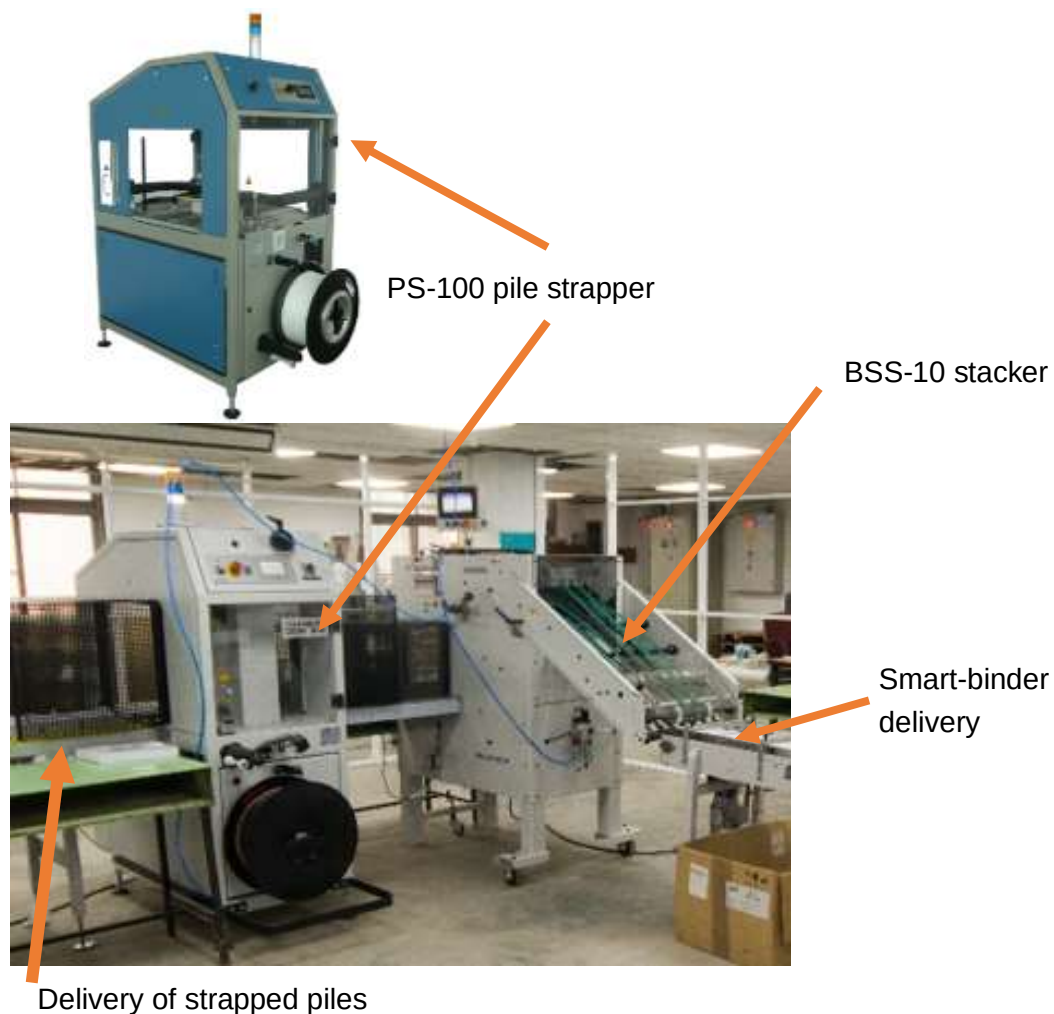
Appendix 30: Optional trimmer waste collection chute TCC-100

The waste collection chute TCC-100 may be installed below the Smart-binder 3-knife trimmer in place of the trimmer waste removal conveyor TWC-100:

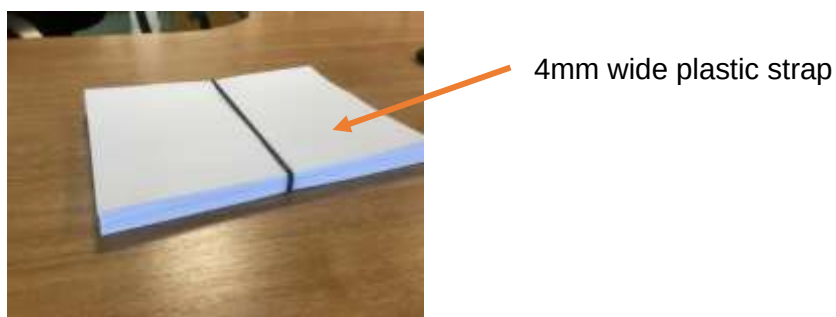


Appendix 31: Optional pile strapper PS-100

The PS-100 pile strapper may be used directly after the BSS-10 booklet stacker to apply a plastic material strap around each booklet pile:



The width of the plastic strap is typically about 4mm (5/32").



Appendix 32: Optional selective buckle folder F-200

The use of the F-200 dynamic version buckle-folder allows the max web speed of an in-line or near line Smart-binder to be increased, or may allow the minimum paper weight to be reduced. The benefit of the dynamic F-200 compared with the non-dynamic F-100 folder is that allows automatic switching between a single-fold or a double-fold under control of a code printed on each sheet.

The F-200 will single fold each 8-page sheet in half (1 fold) or double fold 12-page sheets into thirds (2 folds). These folded sheets (sections) then enter the Smart-binder infeed for folding/stitching and trimming.

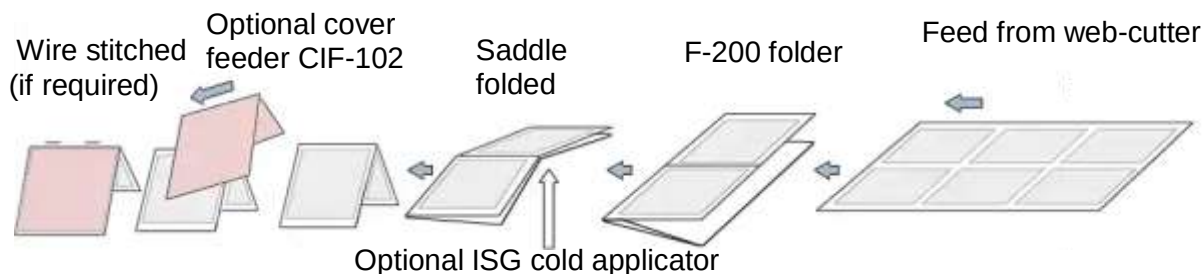


F-200 folder cross-folder unit used directly before SB infeed

By constructing the booklet from a mixture of 8-page and 12-page sheets (see examples in the table below) it is possible to gain the speed advantages of buckle folding while being able to vary the number of pages in 4pp steps. The non-dynamic F-100 folder results in page variations in steps of 8pp.

Number of pages in booklet	F-200 processing method
4	F-200 deactivated (sheet passes straight through)
8	One 8-page sheet (1 fold)
12	One 12-page sheet (2 folds)
16	Two 8-page sheets (both with 1 fold)
20	One 8-page sheet (1 fold) & one 12-page sheet (2 folds)
24	Three 8-page sheets (all with 1 fold) OR two 12-page sheets (both with 2 folds)
28	Two 8-page sheets (both with 1 fold) and one 12-page sheet (2 folds)
Etc:	

Sheet flow schematic for 12pp sheets

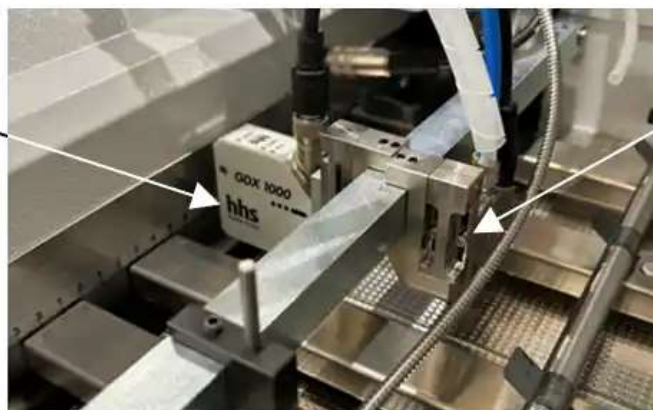


Folded sections are more bulky than flat sheets, so (like the F-100) the F-200 folder may reduce the maximum number of pages in the book.

The F-200 folder may be fitted with optional anti-static bars to reduce the static charge on the sheets delivered to the SB.

When using ISG gluing together with pre-folded sheets an additional cold-glue application nozzle must also be installed in the folder. This applies a line of glue inside the folded sheet. Two gluing options are available. Option FGS-100 simply applies a line of glue dots. Option FGS-101 applies a line of glue dots and also includes a separate UV sensor to detect the dots after they have been applied and stops the machine if glue dots are missing. See FGS-101 photo below.

Glue dot detector
(FGS-101 only)

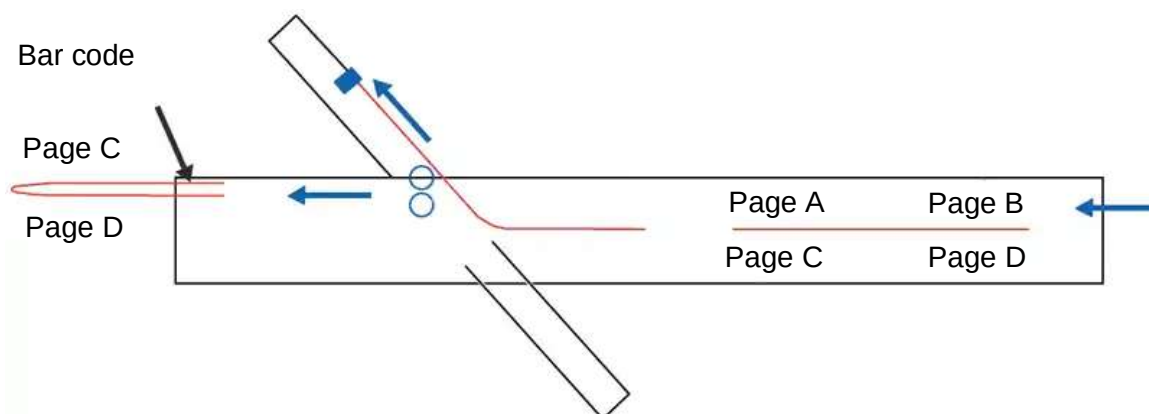


Glue detector
nozzle

F-200 length	1858mm (73")
Minimum infeed height	1000mm (39.5")
Maximum infeed height	1100mm (43.3")

Fold plates

The F-200 folder is normally supplied with two fold plates; one in the upper position and one in the lower position. This allows some sheets to be single-folded and others to be double-folded.



F-200 single-fold example

The imposition of pages printed on the web needs to be correct to suit the required fold process. The bar code must be printed so as to appear on the upper side of the sheet after folding.

Appendix 33: Optional wire stitch head 43/6-S SST-101

(or with clincher, wire guides & wire spools SST-100)

43/6-S wire stitch heads may be used for booklets up to 7 – 8 mm thick.

For 2-up booklet production using the trimmer center knife (and booklet thickness < 7mm) then 43/6-S stitch heads may be used (instead of 52/8-S stitch heads).

A 43/6-S stitch head, with clincher, guides and wire spool is part number SST-100. For 2-up booklet production four stitch heads are required. The additional two stitch heads (with clinchers, wire guides and spools) are part number SST-100-2.

We recommend customers carry a spare stitch head (ie without clincher, guides, spool) for their Smart-binder, part number SST-101.



43/6-S Wire Stitch Head

Technical Data	
Parameter	Standard Stitching
Crown width	12mm
Min distance between staples	43 mm (center-line to center-line)
Max stitching thickness	6mm
Max booklet thickness	7 – 8 mm
Wire diameter	0.4 – 0.6 mm (0.016 – 0.024")

Appendix 34: Optional wire stitch head 52/8-S SST-106

(or with clincher, wire guides & wire spools SST-105)

52/8-S wire stitch heads may be used for booklets up to 10mm thick.

Smart-binders are normally supplied with two 52/8s stitch heads. To produce booklets with three stitches then an additional SST-105 wire stitch head (that includes clincher, wire guides and wire spools) is required. For 2-up booklet production then four stitch heads are required. **The two additional stitch heads with clinchers, wire guides and spools are part number SST-105-2.**

We recommend that customers carry a spare stitch head (ie without clincher, guides or spool) for their Smart-binder, part number SST-106.



52/8-S Wire Stitch Head

Technical Data	
Parameter	Standard Stitching
Crown width	14mm
Min distance between staples	52 mm (center-line to center-line)
Max stitching thickness	8mm
Max booklet thickness	10mm
Wire diameter	0.4 – 0.6 mm (0.016 – 0.024")

Appendix 35: Optional missing stitch detection MSD-100

The MSD-100 missing stitch detection system is fitted as standard to all Smart-binders from serial number #195 onwards (manufactured from Summer/Autumn 2022), and may be available for field retrofit on some older Smart-binders.

The system includes a sensor which is mounted over the booklet spine and detects the wire metal in the staples. To ensure the sensor accurately detects the presence of the wire staples it is necessary to change the saddle-skirts and the gripper back-up bar to a synthetic material.

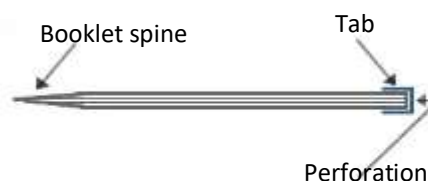
Missing stitch sensor mounted above the Smart-binder saddle, just after the stitch heads



If a staple is detected as being missing then the Smart-binder will reject this booklet. The machine will stop automatically, and display a message on the touch screen, if there are a 3 or 4 consecutive rejected booklets with missing staples.

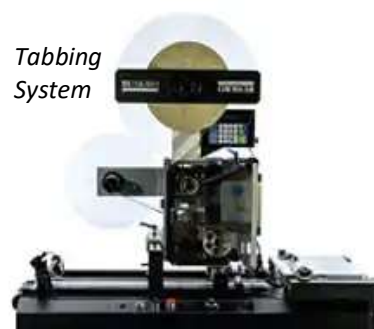
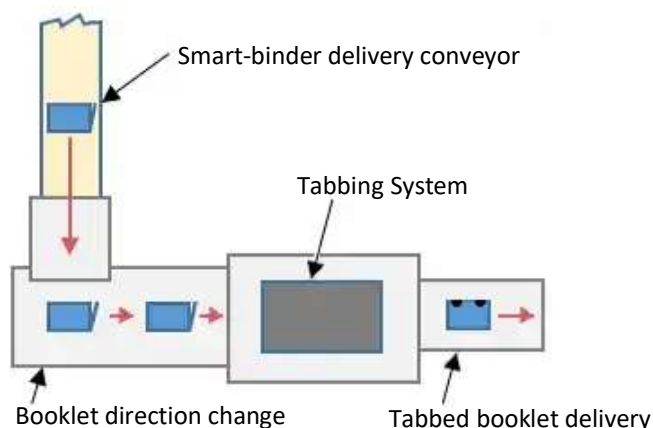
Appendix 36: Optional in-line booklet tabber module BTM-730

The **BTM-730 tabber module** applies one (or two) perforated circular tabs to the front edge of each booklet. This ensures that the booklets cannot be easily opened and read without breaking the tab(s). The tabs add a high level of security to the booklet production process for applications such as **examination test booklets**.



The adhesive-backed tabs may be either plastic or paper material and are supplied on a roll.

Booklets arrive from the Smart-binder with the spine leading. To apply the tabs to the front edge of the booklet the booklets must first be direction changed by 90 degrees:



The tabs are applied to the top side of the booklet and then folded underneath so they stick also to the underside.

This tabbing operation will function at the maximum Smart-binder booklet production speed of 7,000 booklets/hour (1-up production).

Note: After a booklet is opened by breaking the tab perforation it cannot be sealed closed again (it will be evident from the broken tab that the booklet has been opened).

Appendix 37: Guide to printing Smart-binder Codes

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1 Purpose of the code

Document integrity checking and individual sheet tracking are built into the Smart-binder system. The Smart-binder identifies each sheet by reading a code printed on it as it enters the machine. As well as using information in this code to determine which sheets should be collated together to form a specific book, and uniquely identify that book, the code can be used to selectively apply processes (eg Perforation) to individual sheets or books. Details of the processing of each sheet are logged and information can be recovered from the log files to identify which books have been correctly processed and delivered and which were rejected and the reason why.

The minimum requirement is that the code on each sheet identifies the position of the sheet within a book and the total number of sheets that the book contains.

1.1 Sheet Number and Number of Sheets

This information is contained in 2 fields of 2 or 3 numeric characters for example:



This sheet (sheet 1) would be followed by sheet 2 of 4, 3 of 4 and 4 of 4 to form a complete book containing 4 sheets.

This determines which sheets are collated together to form a book, and only books that contain all the sheets from 1 to the total number in the correct order will be delivered.

The positions of the Sheet Number & Number of Sheets fields are fixed in the first 4 digits of the code and must be present.

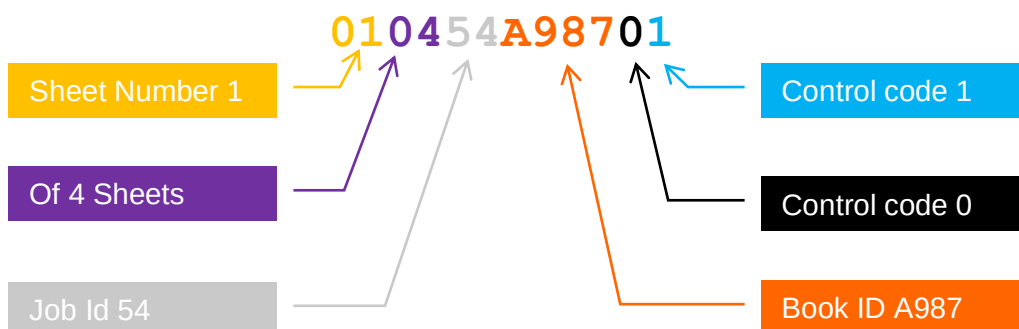
Additional characters (limited by the type of code used, and the capabilities of the code reader) can be used as:

2/ Book or Document Identifier (Book ID) – if the Smart-binder is set to check Book IDs it will ensure that all the sheets in a book have the same Book ID, rejecting any books that do not. This field can contain a unique book number and be used to ensure that sheets for different books are not collated together. It can also be used to match a separately fed cover or insert, which has the same Book ID printed on it, with content from the printer.

3/ Job Identifier (Job ID) – if the Smart-binder is set to check Job IDs it will create a gap on the delivery conveyor when the Job ID changes.

Book and Job Identifiers can overlap and may contain alphanumeric characters.

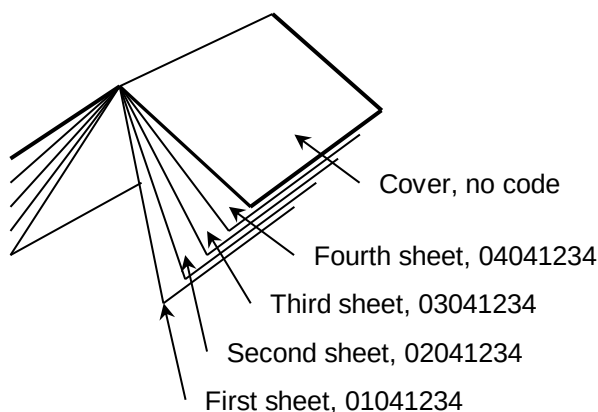
4/ Control codes for the various selective processing functions that the Smart-binder can perform.



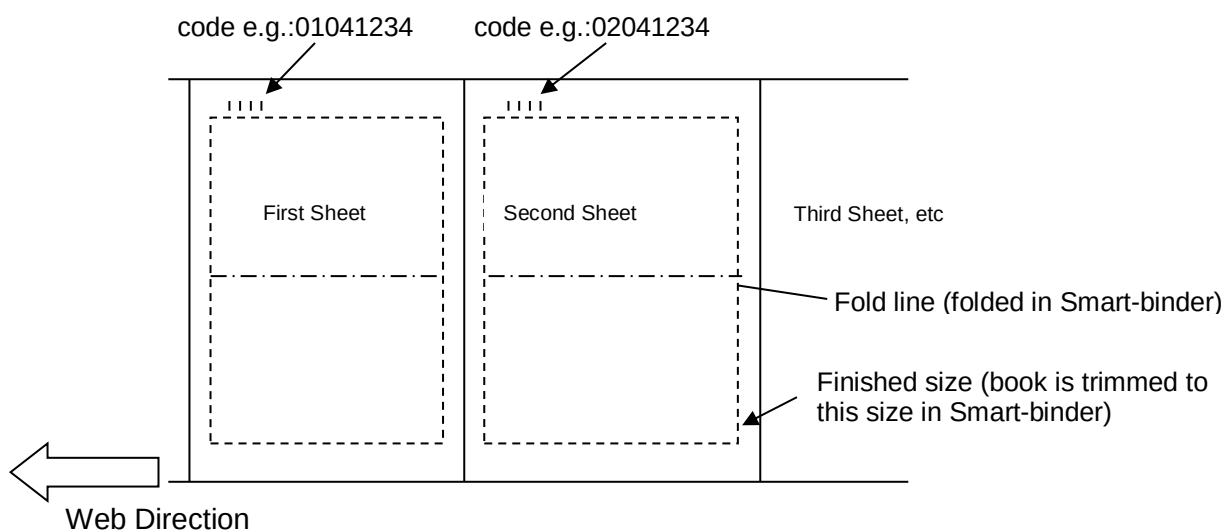
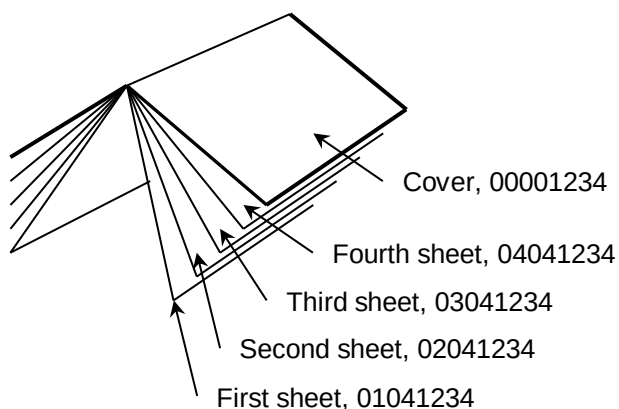
1.2 Example of 2 digit coding for saddle-bound books.

In this example, a “sheet” has 4 printed pages: the 16-page book is made up of 4 sheets of paper. The paper is printed on a web printer running in-line with the Smart-binder. If a separately-fed cover is added, then we describe this as a 16-page book plus cover. A book without a separate cover is usually described as ‘self-cover’.

16-page book, plus non-coded cover



16-page book, plus cover with Book ID



1.3 Selective functions

The characters that are used to perform these functions can be chosen from the Operator panel on the Smart-binder, and saved in a 'setup' so for example one application might use selective cover feeding and another not. The operator can change the setup in the Smart-binder, so that the control digit does not have to be included in the barcode when the function is not being used.

Selective functions only work if the appropriate options are fitted to the machine.

1. Selective perforation

A single digit selects: no perforation, and either or both heads for each sheet.

2. Selective binding

A single digit selects: no binding, stitching, or gluing. Gluing can be selected for each sheet.

3. Selective cover/insert feeding

A single digit selects: no cover, feeder 1, or feeder 2. Selective cover feeding can be operated in either:

Cover mode – only the control digit on the last sheet of the book is examined to determine if a cover should be fed.

Insert mode – every sheet is examined to see if a cover is to be fed and the cover is fed on top of the sheet that has the activating value in the control digit.

1.4 Cover matching functions

To perform Cover matching each cover must be printed with a Book ID to match the sheets. This must appear in the same 'position' in the code as it does on the sheet with '0' used to fill the places of sheet numbering or control codes.

Cover matching can be combined with Selective cover feeding, if the code on the sheet selects a cover but the code does not match the machine will stop with an error.

2 Format of the data in the code

2.1 Data Fields

Name	Description	Number of Characters	Type of characters	Required/Optional
SN	Sheet Number	2 or 3	Numeric	Required
NN	Number of sheets	2 or 3	Numeric	Required
CC	Control Code	1	Numeric	Optional, there can be several Control codes
BID	Book Identifier	Any	ASCII Printable	Optional
JOB	Job Identifier	Any	ASCII Printable	Optional

2.2 Composition of the fields into codes

The data format must be the same on all sheets or covers in a job.

2.2.1 Sheet Number (SN) & Number of sheets (NN)

Leading 0s must be printed (eg 01) white space is not permitted in the sheet number and number of sheets fields.

2.2.1.1 2 digit scheme for saddle binding

SN, in the range 01..NN, followed by NN, in the range 01..50. Optionally with by 'CC' , 'BID' and 'JOB' in any order.

2.2.1.2 3 digit scheme for perfect binding.

Typically used when perfect binding single sheets or once folded sheets from cut-sheet printers.

SN, in the range 001..NN, followed by NN, in the range 001..999. Optionally with 'CC', 'BID' and 'JOB' in any order.

2.2.1.3 2 digit scheme combining saddle binding and perfect binding

Typically used in SB4 systems in which the Smart-binder makes thin sections (of up to 9 sheets) which are then fed into a perfect binder which binds the sections together. The code is recognised automatically when the first digit is '9'.

Consists of a saddle binding part of 4 digits:

'9' followed by a single single digit (1..number of sheets) sheet number followed by '0' followed by single digit 'number of sheets' (1..9).

Followed by a perfect binding part of 4 digits:

SN, in the range 01..NN, followed by NN, in the range 01..50.

Optionally with by CC, 'BID' and 'JOB' in any order.

All schemes also support 'Reverse Numbering' in which sheet NN of NN arrives first followed by NN-1, NN-2.. and sheet 1 of NN is the last sheet. This is selectable at the machine setup.

2.2.2 Control codes (CC)

Control codes must be in the range 0..9, white space cannot be used. They can be placed at any position after the sheet number/number of sheets, and configured in the job setup at the Smart-binder, they must be on every sheet if configured, but can be un-configured simply by changing the setup in the Smart-binder.

Perforation codes – apply to the sheet on which they are printed.

0= No perforation

1= Perforation with the operator side head

2= Perforation with the non-operator side head

3 = Perforation with both heads.

See Appendix 3 for coding when using 4 heads.

Binding codes

0= No binding, the sheet will not be glued & the book will not be stitched.

1 = Stitch – the value on the first sheet of the book determines whether the book is stitched.

2 = Glue this sheet – applies specifically to the sheet, but will be ignored on the first sheet.

Cover selection codes

0 = No cover or insert

1= Cover/insert from first feeder (nearest the stitcher)

2= Cover or insert from second feeder (further from the stitcher).

In 'Cover' mode – only the last sheet is checked

In 'Insert' mode – every sheet is checked, note that you can only insert following a sheet so it is not possible to put a centre insert in using this system. It is possible to feed multiple inserts from one feeder and to add inserts from both feeders to the same book.

2.3 Book ID

Book IDs are used to identify the sheets of a specific document, if a Book ID is selected all the sheets (and the cover if cover matching is used) must have the same Book ID or the book will be rejected.

Software from version 1.7.24 allows the inclusion of generic sheets (without a Book ID) in a book by printing a Book ID consisting of the '*' character in each position of the Book ID. This will match any Book ID printed on the other sheets and the book will be delivered. For example a 3 sheet book with the following codes will be accepted:

```
01 03 540AZ
02 03 ****
03 03 540AZ
```

This would allow sheet 2 to be offset printed, collated with digitally printed sheets 1 & 2 to form a pile, and fed into the Smartbinder from a Pile feeder.

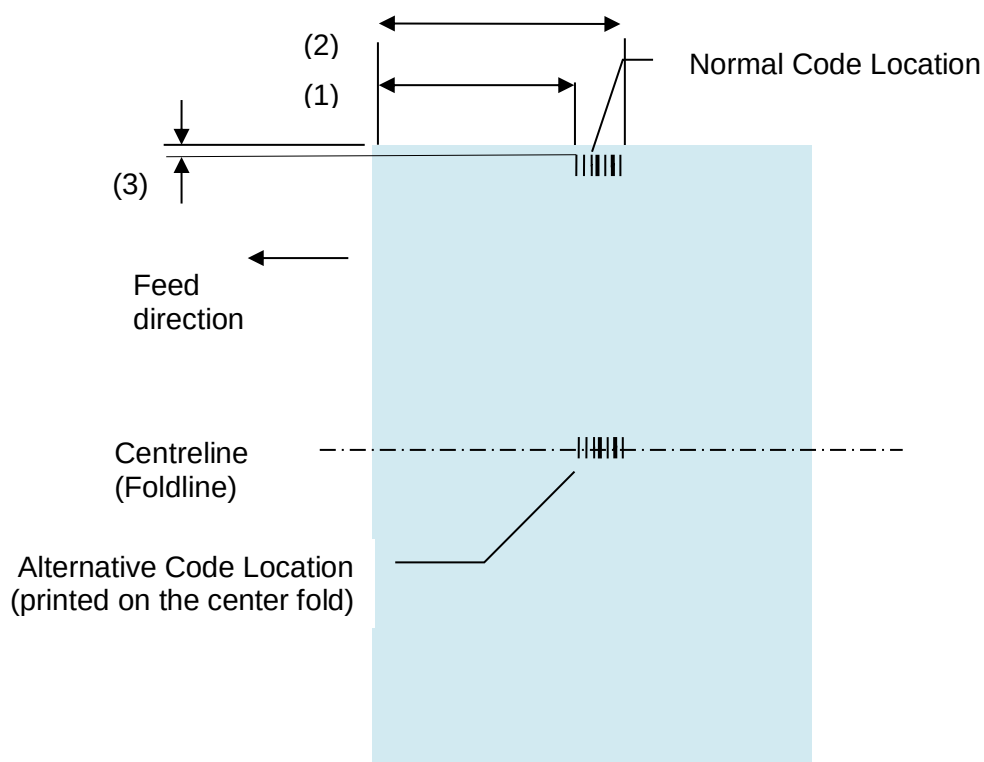
The generic Book ID feature cannot be used with ITF barcodes as they do not provide the '*' character. Use 2D codes, CODE39 or CODE128.

2.4 Job ID

Job IDs can be used to separate booklets on the delivery, by creating a gap when the Job ID changes, generic codes '*' are **not** recognised in the Job ID.

3 Where to print the code

3.1 When reading on the infeed of the Smart-binder



For inline operation with cutters (see Appendix 4 for position of code on Smart-binders up to serial #145).

Dimension	Linear code	2D code
(1) Minimum distance from leading edge of sheet	170mm (6.7")	170mm (6.7")
(2) Maximum distance from leading edge of sheet	Up to trailing edge of sheet	240mm (9.4")
(3) Minimum distance from edge of sheet	Can be printed to edge of sheet	Quiet zone defined for code (see 4.2)
Minimum width	Depends on reader (see 4.1)	

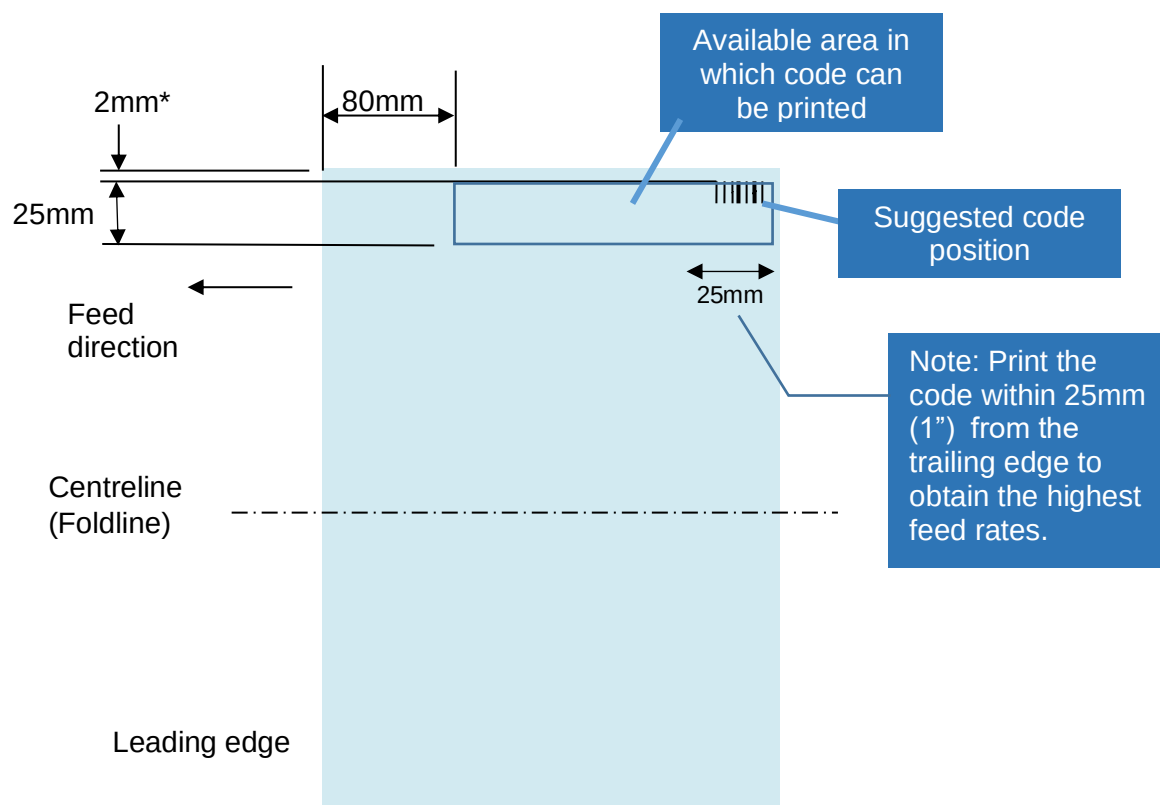
For SBS100 Buffer

Dimension	Linear code	2D code
(1) Minimum distance from leading edge of sheet	5mm (0.2")	5mm (0.2")
(2) Maximum distance from leading edge of sheet	15mm (0.6")	15mm (0.6")
(3) Minimum distance from side of sheet	Can be printed to edge of sheet	Quiet zone defined for code (see 4.2)
Minimum width	Depends on reader	

(see 4.1)

3.2 When reading the code in a sheet pile feeder

Applies to options: SB-095 (off-line operation) or SB-097.



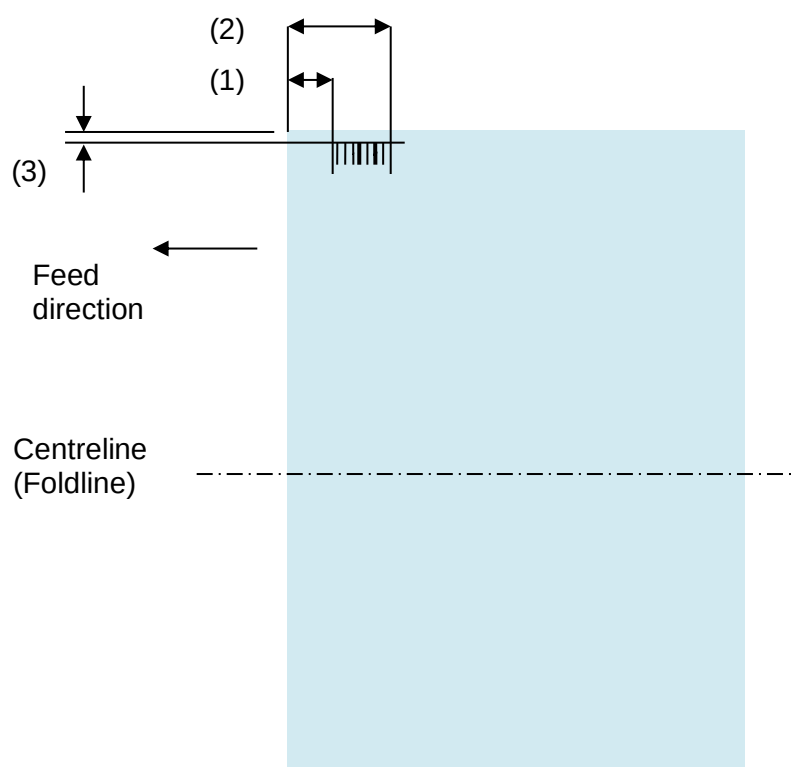
Notes

Minimum code width depends on the reader used (see 4.1)

* Codes must be printed a small distance away from the edge of the sheet. This is because the sheet moves slightly as it is picked up by the separator and this can expose the code on the sheet below, hence preventing the reader from decoding the code on the top sheet.

**The code must be positioned no more than about 25mm from the edge of the sheet. This is because there are parts of the feeder which prevent the code reader from being moved to these positions .

3.3 When reading the code in a cover/insert feeder



Dimension	Linear code	2D code
(1) Minimum distance from leading edge of sheet	50mm (2")	45mm (1.75")
(2) Maximum distance from leading edge of sheet	140mm (5.5")	65mm (2.5")
(3) Minimum distance from edge of sheet	Can be printed to edge of sheet	Quiet zone defined for code (see 4.2)
Minimum width	Depends on reader (see 4.1)	

4 Code types

4.1 Linear codes

ITF – Industrial 2of5, numeric characters only (0-9), digits are encoded in pairs so there must be an even number of them.

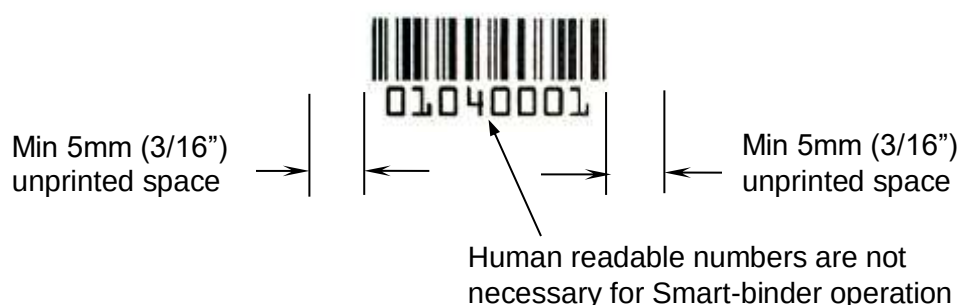
CODE39 – alphanumeric characters, however, it takes up more space because it encodes more characters.

CODE128 – has numeric only & alphanumeric forms, the reader automatically detects the correct type, the numeric form is compact like ITF.

Quiet zones

Linear codes require space ahead of and following the code to allow the reader to discriminate it from other printer marks.

For linear codes leave 5mm clear paper at either end.



Size

The minimum width of the code depends on the reader:

BL180	6mm
MS3	4mm

However, wider codes can always be read more reliably so we recommend that codes are as wide as possible.

For ITF codes:

When using a font based code we recommend that the font is at least 26pt (which produces a code approximately 29mm (1¹/₈") for an 8 digit code.

Do not include check digits in the code, ITF code generators add a padding digit because an ITF code must have an even number of digits, typically they place this at the start of the code which prevents the sheet number & number of sheets fields from being decoded.

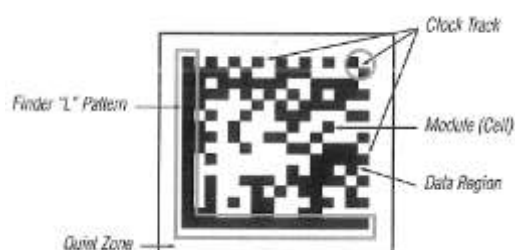
4.2 2D Codes

Datamatrix – 2D code is a compact way of encoding alphanumeric data, can contain hundreds of characters (whereas it is usually not possible to read linear codes containing more than 16 characters on moving sheets).

QR – similar to Datamatrix, commonly used in Japan as it can encode Kanji/Kana character sets. Widely used these days to encode URL's that you can scan with your phone.

Quiet Zone

2D codes require a quiet zone of at least 1 cell width all round which is why they cannot be printed up to the edge of the sheet.



Size

For web speeds up to 150m/min the minimum cell size for use with the 2D reader (Microscan Mini Hawk) is 0.4mm (0.015"). Larger cells can help to make reading more reliable.

Capacity of Datamatrix ECC200 codes

Size (cells)	Size (mm) for 0.4mm square cell	Numeric characters only	Alphanumeric characters
10x10	4	6	3
12x12	4.8	10	6
14x14	5.6	16	10
16x16	6.4	24	16
18x18	7.2	36	25
20x20	8	44	31
22x22	8.8	60	43

Larger capacity codes (using more cells) are available but they have to be more than 10mm (3/8") square to meet the minimum cell size needed to read the moving code.

DataMatrix codes can be rectangular (eg 8x32) which can be useful if trim-off is limited.

QR codes are approximately 15% larger than Datamatrix codes of the capacity, for example a 21x21 QR code holds 41 numeric or 25 alpha numeric characters (similar to an 18x18Datamatrix) with the lowest level of error correction. They take slightly longer to decode but that does not affect their use with Smart-binder as the readers decode much faster than sheets can be fed.

QR codes must be at least 21 modules square (so their minimum size is about 8mm (0.3”) square.

4.3 Selecting the reader

Code	BL180	MS3	Quadrus mini velocity	Quadrus mini hawk	Quadrus micro hawk
ITF	✓	✓	✓	✓	✓
CODE39	✓	✓	✓	✓	✓
CODE128	✓	✓	✓	✓	✓
DataMatrix			✓	✓	✓
QR			✓	✓	✓

BL180 CCD reader, fitted as standard to Smart-binders until 2014, will read codes of up to about 14 characters at web speeds up to 100m/min. The code must be 6mm wide for this reader.

MS3 Laser reader, fitted as standard to new Smart-binders from 2014 on, will read codes of up to about 16 characters at web speeds up to 150m/min.

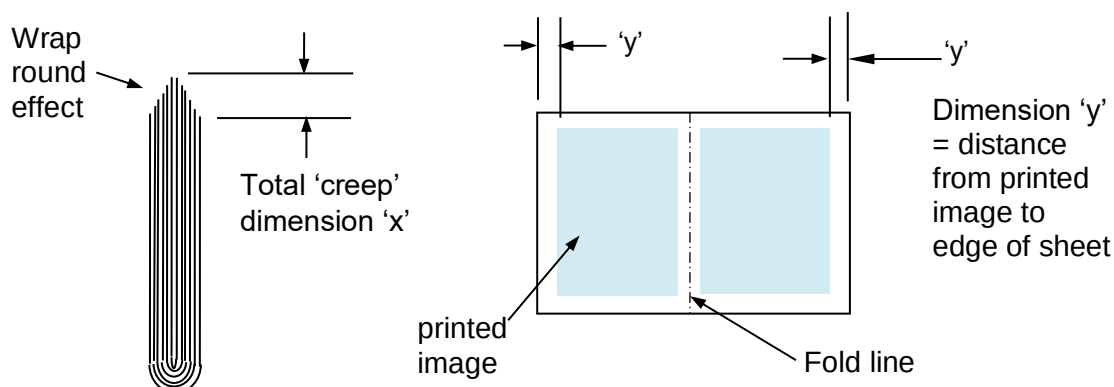
Quadrus mini velocity, fitted as an option to read 2D codes on Smartbinders and as standard on SCFs until 2014, will read on web speeds up to 100m/min.

Quadrus mini Hawk, fitted as an option to read 2D codes on Smart-binders and as standard on SCF's from 2014, will read on web speeds up to 150m/min.

Quadrus micro Hawk, fitted as an option to read 2D codes on Smartbinders from 2019, will read on web speeds up to 150m/min.

5 Image creep

When producing saddle-stitched or thin ISG-glued books, the thickness of the spine causes the outer sheets to appear shorter than the inner sheets when looking at the front edge of the untrimmed book. This is called the 'wrap round' effect. The Smart-binder trims this edge to create a square edge to the book, but, unless this effect is taken into account when imposing the pages of the book, the print on the inner pages will not line up with that on the outer pages. The effect of this is referred to as image 'creep'.



When imposing the printed image on each sheet dimension 'y' must increase by the amount 'x' from the outer sheet to the innermost sheet. If there are 32 sheets in the book then 'y' increases by 'x'/32 from one sheet to the next sheet.

The relationship between the total creep dimension 'x' and the total number of sheets and pages in the book for different paper weights is shown in the table below. For book thicknesses not shown, interpolate values from the table, e.g.: for a 9-sheet (36 page) book, use the value for 'x' half way between those for 6 and 12 sheets. For thinner books than those shown, it is not usually necessary to compensate for image creep.

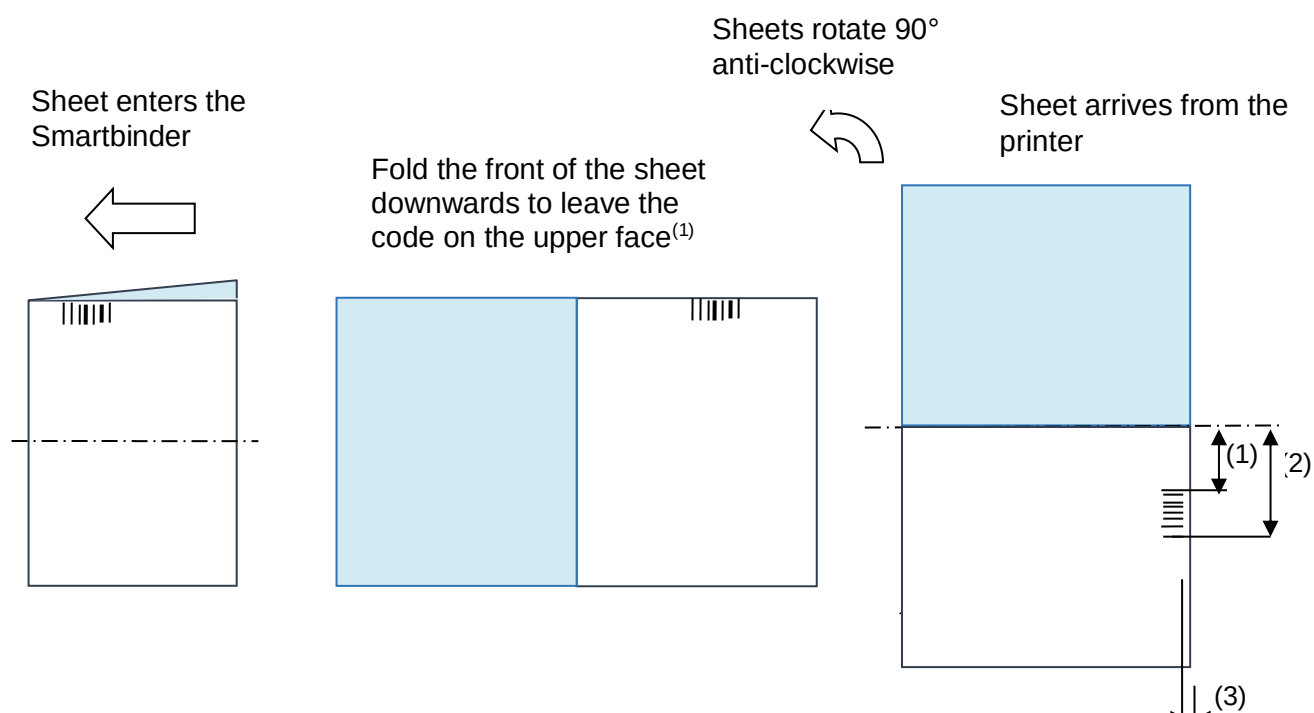
If a separate cover is used, its page layout should be arranged to align with the outer sheet.

Paper stock weight													
Gsm		60	70		80		90		100		110		
Lb bond		16	19		21		24		27		29		
Lb offset		41	47		54		61		67		74		
Sheets in book	Pages in book	Approximate total creep dimension 'x'											
		mm	inch	mm	Inch	mm	inch	mm	inch	mm	inch	mm	inch
6	24	1.2	0.05	1.4	0.06	1.6	0.06	1.8	0.07	2.0	0.08	2.2	0.09
12	48	2.3	0.09	2.7	0.11	3.1	0.12	3.5	0.14	3.9	0.15	4.3	0.17
18	72	3.5	0.14	4.1	0.16	4.7	0.19	5.3	0.21	5.9	0.23	6.5	0.25
24	96	4.7	0.19	5.5	0.22	6.3	0.25	7.1	0.28	7.9	0.31	8.7	0.34
30	120	5.9	0.23	6.9	0.27	7.9	0.31	8.9	0.35	9.9	0.39	10.9	0.43
36	144	7.1	0.28	8.2	0.32	9.4	0.37	10.6	0.42	11.8	0.46	NA	NA
42	168	8.3	0.32	9.6	0.38	11.0	0.43	NA	NA	NA	NA	NA	NA
48	192	9.5	0.37	11.0	0.43	NA	NA	NA	NA	NA	NA	NA	NA

NA = Not available (this is outside the Smart-binder SB-1, SB-2, SB-3 thickness specification)

6 Rotating and folding sheets in the RF100

Rotating and folding A3+ sheets to make 8pp A4+ signatures, shown in a typical right to left flow



⁽¹⁾It is also possible to fold the front half upwards, in which case the barcode must be printed on the under side of the front half of the sheet.

For inline operation with cutters (see Appendix 4 for position of code on Smartbinders up to serial #145).

Dimension	Linear code	2D code
(1) Minimum distance from centreline of sheet	170mm (6.7")	170mm (6.7")
(2) Maximum distance from centreline of sheet	Up to trailing edge of sheet	240mm (9.4")
(3) Minimum distance from edge of sheet	Can be printed to edge of sheet	Quiet zone defined for code (see 4.2)
Minimum width	Depends on reader (see 4.1)	

7 Control codes for 4 Perforator Heads

The 1 digit Control Code uses a hexadecimal representation of a 4 bit binary code in which bits 0-3 control heads 1-4 respectively.

CC 1 digit	Head 1	Head 2	Head 3	Head 4
0				
1	✓			
2		✓		
3	✓	✓		
4			✓	
5	✓		✓	
6		✓	✓	
7	✓	✓	✓	
8				✓
9	✓			✓
A		✓		✓
B	✓	✓		✓
C			✓	✓
D	✓		✓	✓
E		✓	✓	✓
F	✓	✓	✓	✓

The 2 digit Control Code (for use when only numeric characters are available) uses the numbers decimal (0-3) representation of 2 bits with the first digit controlling heads 1 & 2, and the second heads 3 & 4.

CC 1 st digit	CC 2 nd digit	Head 1	Head 2	Head 3	Head 4
0					
1		✓			
2			✓		
3		✓	✓		
	0				
	1			✓	
	2				✓
	3			✓	✓

1 or 2 digit Control codes can be selected on the Smart-binder touchscreen (and saved as part of a setup).

For example, to select all 4 heads:

With 1 digit **F**

With 2 digits **33**

8 Position of codes for operation inline (older machines).

For machines up to serial number #145 (unless retrofitted with cover autoloader)

Dimension	Linear code	2D code
(4) Minimum distance from centreline of sheet	50mm (2")	60mm (2.35")
(5) Maximum distance from centreline of sheet	Up to trailing edge of sheet	80mm (3.15")
(6) Minimum distance from edge of sheet	Can be printed to edge of sheet	Quiet zone defined for code (see 4.2)
Minimum width	Depends on reader (see 4.1)	

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