the team to trust

user manual

# SmartDate X60

## Monochrome User Interface


en

Revision AB

10056252

www.markem-imaje.com

Markem-Imaje Industries Ltd.
Nottingham Science Park
University Boulevard
Nottingham NG7 2QN
Tel.: +44 (0)115 943 0055

markem·imaje
A DOVER COMPANY

User Documentation Department

markem·imaje
A DOVER COMPANY

# Contents

Contents

# Operation 75

# Operating Modes 99

# Printer configuration 155

# Contents

Contents

# Contents

# General

**CAUTION : Before using this printer, please read and fully comply with these instructions, the material safety data sheet (MSDS) for consumables used.**

## Introduction

This Manual along with the SmartDate X60 Instruction Booklet, set out to explain how to safely install, operate and service your SmartDate X60 Overprinters.
The Operator Manual is available in Adobe Acrobat PDF in various languages on the SmartDate X60 CD.
The manual format is designed to be printed onto 8» x 11» (203mm x 279.5mm) paper, but can also be printed onto 8.5» x 11» (216mm x 279.5) (Previous MARKEM manual paper size) or A4 (210mm x 297mm)
Alternatively a Hard bound copy of the manual can be purchased separately from Markem-Imaje.
Please contact your local supplier for details.

## Copyright Notice

## Contact

Thank you for choosing Markem-Imaje to provide printing solutions. If questions should arise, please contact the local business centre that assisted with your purchase.

Markem-Imaje Industries Ltd.
Nottingham Science Park
University Boulevard
Nottingham NG7 2QN
United Kingdom
Tel. : (44) 0115 943 0055
Fax : (44) 0115 968 3699
http://www.markem-imaje.com

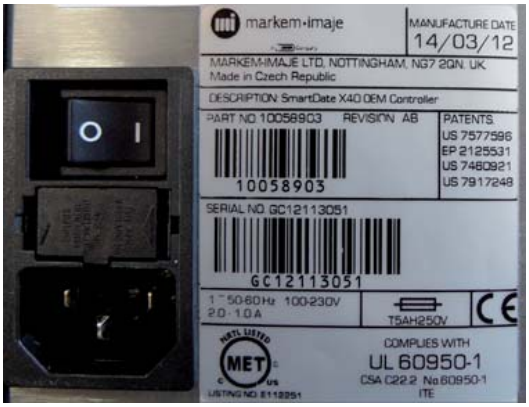
## Related Documentation

Below is a list of documents in the SmartDate X60 related documentation set.
CoLOS Create Pro
CoLOS Control
DCP (Device Communication Protocol)
NGPCL (Next Generation Print Control Language)
Ethernet
Customer Configurable I/O

Useful Web Sites
www.markem-imaje.com

# Patent and Regulatory Information

‘Markem-Imaje patent information for the controller can be found on the rating label’.




‘Markem-Imaje patent information for the printer can be found on the label which can be found between the ribbon drive dogs.’

# Description

# Description

# Introduction

This section provides an overview of the main features of the SmartDate X60.

Topics covered in the section include:

- Overview.
- SmartDate X60 Model Options.
- Main Components.
- Key Features.
- Printer types
- Print Designs.
- CoLOS Create Pro.
- Image Template Files.
- Device Settings Files.
- Jobs.
- Retrieving and Downloading jobs.
- USB Memory Stick
- Beacon Lights.

## Overview

SmartDate X60 is a small easy to use electronic coder. The three models available are designed to be suitable as a direct replacement for many different methods of coding.

SmartDate X60 consists of a printing device and a control device with an operator interface control panel.


SmartDate X60 prints batch codes, best before dates and other variable information directly onto packaging, substrate and other materials. The size, position and content of information can be fixed or altered at the SmartDate X60 user interface.

# SmartDate X60 Model Options

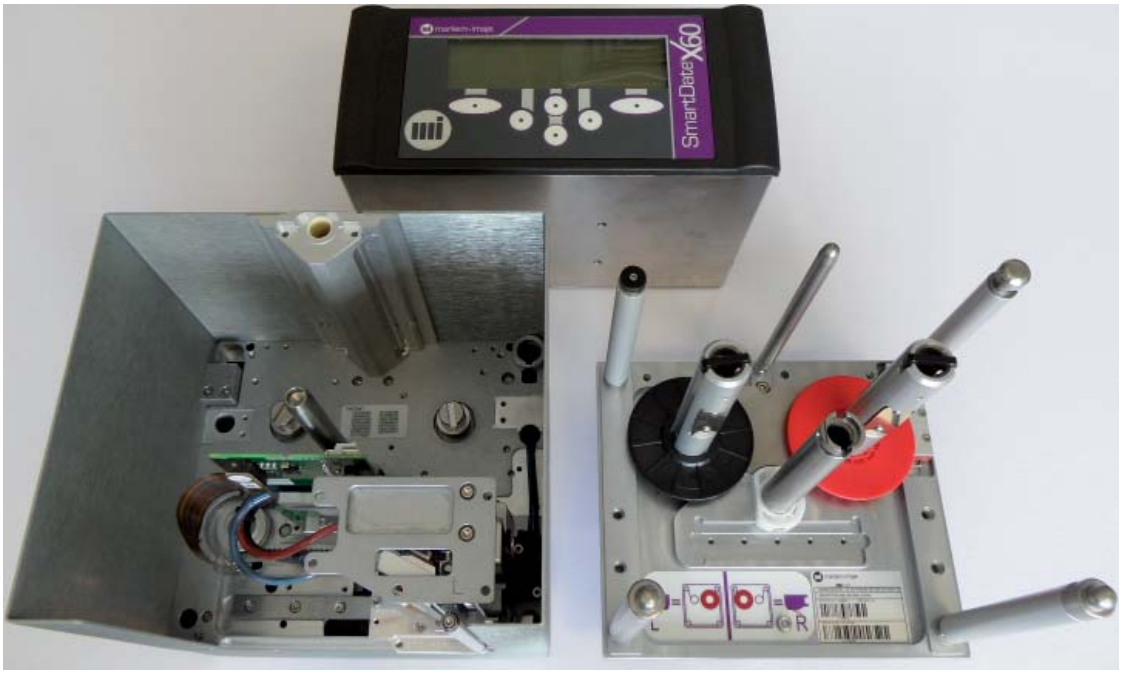
The SmartDate X60 is available in three printer types.

- SmartDate X60 Combined-Intermittent / Continuous (No Shuttle)
- SmartDate X60 Continuous with shuttle
- SmartDate X60-128 Combined-Intermittent / Continuous

The type of model required is dependent on the application.

SmartDate X60 - Combined Intermittent / Continuous

SmartDate X60 Continuous with shuttle




SmartDate X60-128 Combined-Intermittent / Continuous

# Main Components

The main components of the SmartDate X60 are as follows:

- Printer body unit containing drive system and thermal transfer printhead.
- Printer body cassette with ribbon supply and waste take up.
- Controller unit containing main operation PCBs and User Interface.
- Connecting cable for printhead power and control.
- Connecting cable for External I/O signals.
- Air supply connections for printhead operation.
- Encoder for substrate speed tracking.

## Key Features

- Cassette Ribbon Loading: using an easy to load Printer Cassette reduces line down-time when changing consumables.
- Efficient Ribbon Usage: SmartDate X60 automatically controls the ribbon feed, no manual adjustment is required, minimising ribbon usage. See Printer Parameters, for further details.
- Advanced Ribbon Length: (ARL) - available both models: SmartDate X60 now has the capacity for a 1100 metre length of ribbon, thus allowing for fewer ribbon changes, subsequently resulting in less downtime. (not available with the SmartDateX60 - 128 version)
- Self aligning printhead: The print platen/roller does not require precise alignment to the printhead, therefore reducing the need for periodic adjustment.
- Continuous Motion Version: SmartDate X60 (Continuous Mode) has accurate tracking of the substrate speed and sophisticated control of the printhead and ribbon feed provides the best possible print quality.
- Reduced set up / down time: The printhead data is changed at the control panel.
- High Reliability: the Markem-Imaje experience of thermal printing and the latest design eliminates the need for complex mechanical maintenance procedures.
- Flexibility: the control system allows product data to be stored in local memory or set remotely by a host PC or another computer.
- Networking: support for the Markem-Imaje Ethernet CoLOS Control Network is provided to allow centralised set up and control of a number of SmartDate X60 machines from a central PC or centralised data storage.

Printer Types

## SmartDate X60 - Combined Printer - Intermittent Mode

This version is used with intermittent motion packaging machines and prints onto the material when it is stationary.

The SmartDate X60 printer in this mode has a print area of 53mm x 75mm and print speed of 50 to 700 mm/s.

Moving the print-head during the dwell time when the packaging material is stationary prints the information.

The SmartDate X60 printer in intermittent mode prints text and bar codes at any position within the 53mm width by 75mm length print area.

SmartDate X60 uses a thermal print-head and thermal ink ribbon to print information onto materials held against a flat print platen.

## SmartDate X60 - Combined Printer - Continuous Mode

This version of the SmartDate X60 printer is designed to print on to moving substrate.

The SmartDate X60 printer in this mode has a print area of 53mm x 150mm and print speed of 50 to 1000 mm/s.

When in continuous motion mode the print-head is held in a fixed position and the ribbon is accelerated to match the substrate speed.

An encoder is used to establish the speed of the material being printed onto.

This makes it the ideal coder for continuous motion form fill and seal machines and horizontal flow wrappers, where larger images are required and fast print speeds are not an issue.

The SmartDate X60 printer in this mode prints text and bar codes at any position within the 53mm width by 150mm length print area.

SmartDate X60 uses a thermal print-head and thermal ink ribbon to print information onto materials held against a print roller.

## SmartDate X60 Shuttle Continuous Printer

This version of the SmartDate X60 printer is designed to print on to moving substrate.
The SmartDate X60 has a print area of 53mm x 100mm and print speed of:

50 - 1000 mm/s - High Pack Rate mode
800 - 1200 mm/s - High Speed mode
800 - 1800 mm/s - Digital Ribbon Save (DRS)

The print-head assembly has no linear motion, the ribbon is accelerated to match the substrate speed.
An encoder is used to establish the speed of the material being printed onto.
This version of the SmartDate X60 printer uses a ribbon shuttle mechanism similar to SmartDate 5s to attain the higher speeds required.
This makes it the ideal coder for continuous motion form fill and seal machines and horizontal flow wrappers, where the image size is below 100mm in length and high speed is an issue.
The SmartDate X60 prints text and bar codes at any position within the 53 mm width by 100 mm length print area.
SmartDate X60 uses a thermal print-head and thermal ink ribbon to print information onto materials held against a print roller

## SmartDate X60 / 128 printer - Intermittent Mode

This version functions the same as the SmartDate X60 Combined Printer in Intermittent mode but with the larger printhead.
The SmartDate X60 / 128 printer in this mode has a print area of 128 mm x 75 mm and print speed of 50 to 700 mm/s.

## SmartDate X60 / 128 printer - Continuous Mode

This version functions the same as the SmartDate X60 Combined Printer in Continuous mode but with the larger printhead.
The SmartDate X60 / 128 printer in this mode has a print area of 128 mm x 150 mm and print speed of 50 to 700 mm/s.

## Print Designs

Basic designs can be created at the SmartDate X60 user interface using up to 4 lines of text. The size and type of font is limited to 8 point Arial Bold.

The number of characters supported by the SmartDate X60 LCD screen is limited to approximately 104.

SmartDate X60 supports Unicode characters and the user now has a wide choice of language, although this may be limited to a Sub set of 128 characters.

This type of design does not support live updates, such as Time and Date fields, Best before Dates or Shift Codes.

For details see Section 4 - Operation.

In addition, you can create your own designs on a PC using the Markem-Imaje CoLOS Create Pro software.

These designs are then loaded into the SmartDate X60 using the Markem-Imaje CoLOS Create Pro software.

## Colos Create pro

The designs printed by SmartDate X60 can be created using the Markem-Imaje CoLOS Create Pro software.

N.B. Composer 5.XXX is not compatible with SmartDate X60, as these machines use Markem-Imaje NextGen Software for operation.

CoLOS Create Pro allows text, bar codes and graphics to be placed onto the SmartDate X60 print area. A brief description is given here relating to how CoLOS Create Pro operates in conjunction with SmartDate X60.

For further details refer to the Markem-Imaje CoLOS Create Pro Help Files.

CoLOS Create Pro deals with two types of information:

Image Templates and Job information.
Image Template files define the type, size and number of items, or fields, to be printed.

Job information stores fixed information specific to individual jobs.

This split of information is only important to users creating print designs. The SmartDate X60 itself generally deals with job information only, Image Templates are handled automatically.

## Supported Field Types

SmartDate X60 and CoLOS Create Pro for SmartDate X60 currently support the following field types:

- Text fields
- Bar codes
- Line fields
- Box fields
- Logo fields

SmartDate X60 and CoLOS Create Pro for SmartDate X60 currently support the following field styles:

- Static Text
- User Input Text
- Time - Date including Offset Dates (BBE) and Shift Codes
- Merged Text
- Calculated Text
- Maths Text
- Machine Setting Text

## SmartDate X60 and Fonts

SmartDate X60 supports True Type Fonts.
The characters that can be used is limited only by the Unicode character set selected.

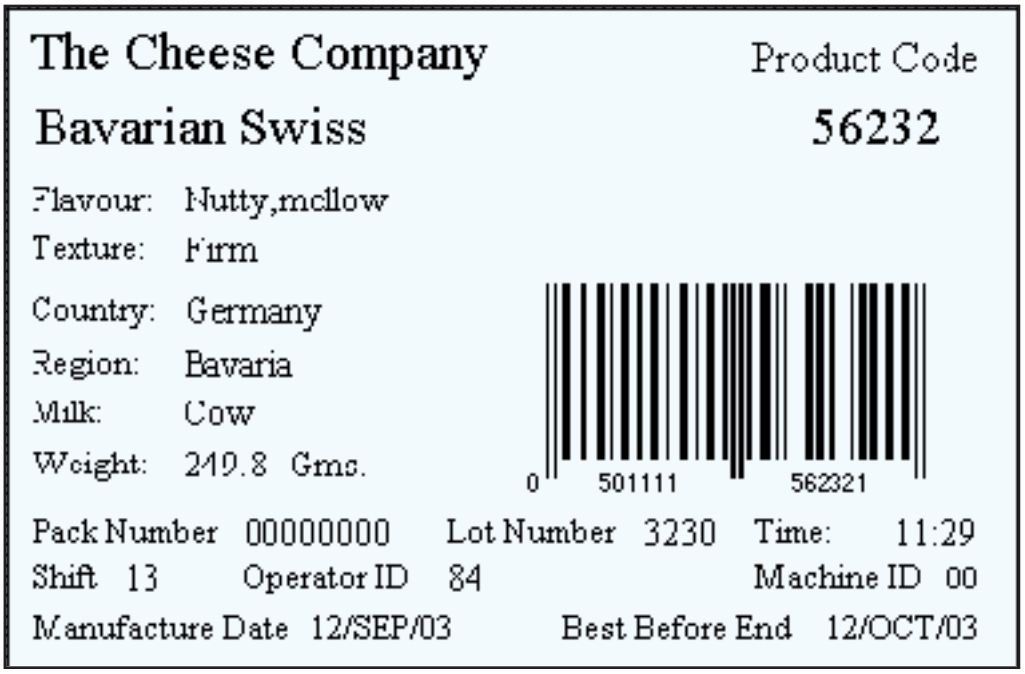
# Image Template Files

Image Templates are created using Markem-Imaje CoLOS Create Pro Image Design Software package.

When creating an Image Template the user can structure how the finished image will look.

The style and size of Font, the Bar code type if being used and other details about the image are established when creating the Image Template.

**Example:**




This information is then saved as a .ITF (Image Template File)
For full details about Image creation please consult the CoLOS Create Pro Help Files.

*NOTE: If an image is downloaded from CoLOS Create Pro using the job name "Test Image" it is not available for selection from the Select Job menu.*

## Device Settings Files

These are the specific parameter settings for the device.

Settings files are normally attached to a Job file which is downloaded to a device.

The settings may include information such as Print Darkness levels or Date offset rules for a particular product.

The configuration of individual settings will depend on the printing conditions required for specific Jobs.

The substrate being used or the speed required for printing a particular Job may require the Device settings to be altered.

By attaching a Device settings file to a Job the SmartDate X60 is configured accordingly when the Job is selected.

Device settings can be adjusted at the SmartDate X60 user interface but Device settings files can only be created by connecting CoLOS Control.
These files can then be saved as a .Settings file and can be attached to specific Jobs.

## Jobs

SmartDate X60 uses Job Files.

Jobs are a combination of a Product Code, Image Template and a Device Settings File.

A Device Settings file is used to configure the device parameters to suit a particular set of conditions.

**For example:**

**Job A** may be printing onto a Polypropylene substrate at a relatively slow print speed.

**Job B** may be printing onto a Metalized Polypropylene substrate at a much faster print speed.
The **Printer** (Device) setup for each job will be different.

In many cases the Job may only require a default Image Template and default Device Settings File.

When a Job is downloaded to the SmartDate X60 the data is stored as a **.job** file and includes a **.image** file and a **.settings** file.

The **Job Name** would normally be the same as the Product Code but can be different if required.

This is the name that is requested when performing a **SELECT JOB** command.
Job creation is performed with CoLOS Create Pro.

*NOTE: When after selecting jobs in producing mode, there will be a short period of time (order of 1 sec) during which printing will be disabled while the system is updated to print the new image.*

# Retrieving and Downloading Jobs

Job information can be downloaded by 2 methods:

- Using CoLOS Create Pro software.
- Using CoLOS Control software (for networking) and a direct link to a PC.
- Using a USB Memory Stick

## Data Storage Capacity

The SmartDate X60 internal memory is capable of storing around 20 Mb. The number of Job Files that can be stored depends upon the complexity of the Image Templates and the number of logos and downloadable fonts used.

**Job Files**

Typically, the standard memory is enough to store more than 2000 Job Files. However when logos or downloaded fonts are used these can take up a great deal of memory and restrict the number of files that can be stored.

**Font Files**

A standard downloadable font file size is approximately 50 Kb but a Unicode Font file can be anything from 100 Kb up to 13 Mb dependant on the number of characters in the font file.

**Logo Files**

To estimate the memory a logo requires you need to know the width and height of the logo in dots (pixels) or in millimetres.

The approximate size in Bytes is:

(width (mm) x height (mm) x 12) / 8
or width (dots) x height (dots) / 8
Where SmartDate X60 dots/mm = 12 and 1 Byte = 8 bits

# Using a USB Memory Stick

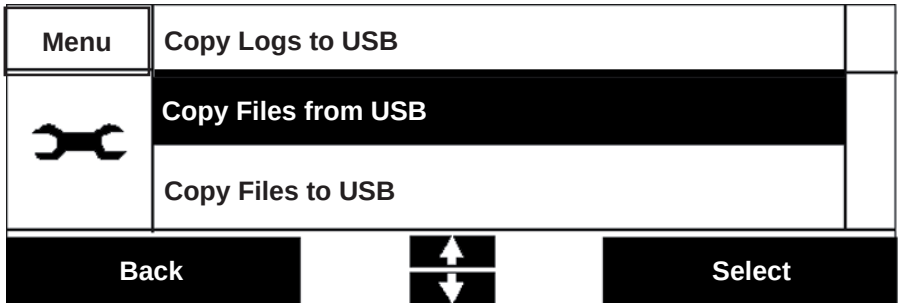
After creating an Image for an SmartDate X60 printer using the CoLOS Create software package, use the “Print to File” option in the File menu. The file can then be copied onto a USB memory stick ready for transfer to the printer.
For full details about Image creation please consult the CoLOS Create Pro Help Files.

## Downloading Images

Once you have loaded the USB memory stick with the required images you can download these to the SmartDate X60 local database.

Insert the pre-loaded USB memory stick into the USB connector on the back of the Controller.


From the menu screen select USB




Copy the required files from the USB stick.

## Cassette LEDs

Blue - Power  Red - Ready  Blue -Print (Flashes)  Green - Producing


## Beacon Light

The beacon light can be mounted in a fixed position on the production line.

The beacon has a three light system: Red, Orange and Green.

- When the red light is on, the SmartDate X60 has switched out of Run mode or there is a fault on the machine.
- When the Orange light is on, SmartDate X60 will still work normally, and warning messages are displayed, e.g. ‘low ribbon’, etc.
- When the Green light is on, SmartDate X60 is ready to carry out the print process or is awaiting a signal to start printing.

# Interface

# Introduction

This section describes how to operate the SmartDate X60 unit once it has been successfully installed.

Topics covered in this section include:

- The User Interface
- Keypad
- Icons
- Menu Icons
- Screen Types
- Menu Screens
- Warning and Problem Alert Screens
- Security Login Screens
- Data Entry Screens
- Date Entry Screens
- Setting Adjustment Screens
- Job Setup Screens
- Special Screens
- Speed Profiles

# The User Interface Panel

Liquid Crystal Display


SmartDate X60 ‘Soft keys’

The user interface screen comprises of an LCD screen and a six button membrane keyboard interface.

The buttons are «soft labelled” on the screen when usable.

The screen can support graphics and text and will normally have a three or four line display.

The interface allows the user to access the SmartDate X60 menu structure.

The following options are available:

- Time and Date configuration
- Job selection.
- User Input data entry
- Printer Settings configuration.
- Diagnosis of the system Inputs and Outputs
- Statistical information about the printers performance.

## LCD Screen

The SmartDate X60 LCD screen is a monochrome (1Bit) 240 x 64 pixel screen.

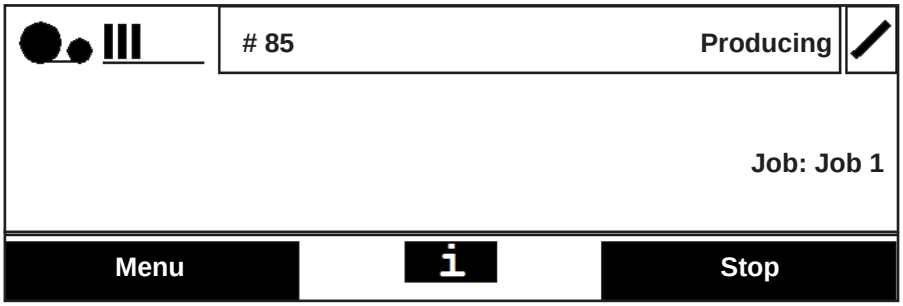
The screen supports graphics and Unicode characters.

The user has a choice of language, although this may be limited to a Sub set of 128 characters.

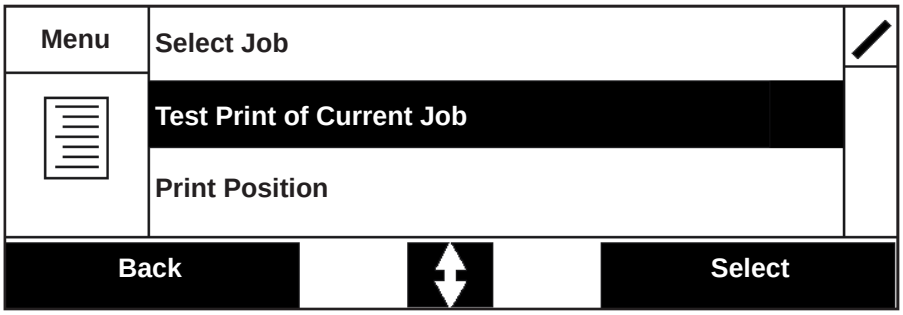
Dependant on the printer function at the time, the screen will normally display with 3 or 4 rows of Text / Graphics.

The look of the screen will also vary dependant on the screen type being used.

**Example of 3 row display:**




**Example of 4 row display:**

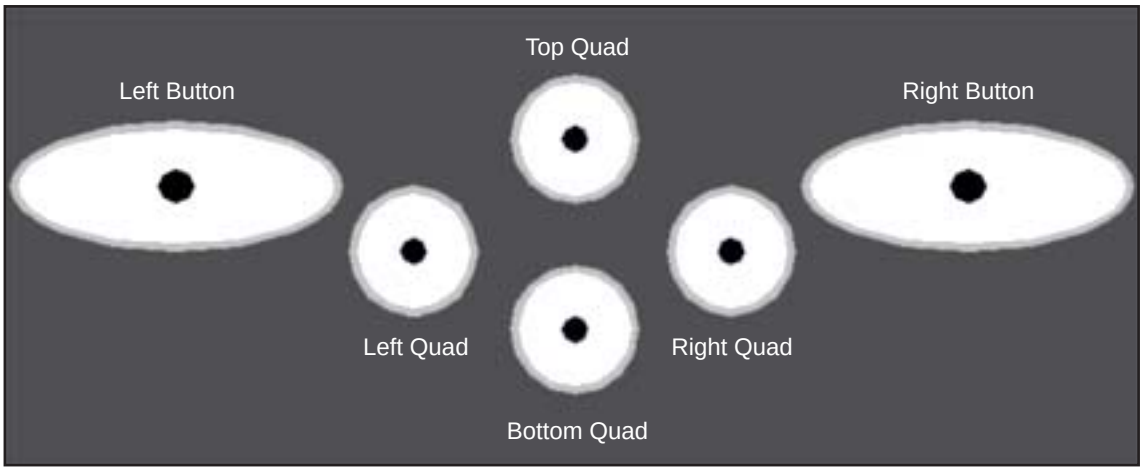


## Keypad

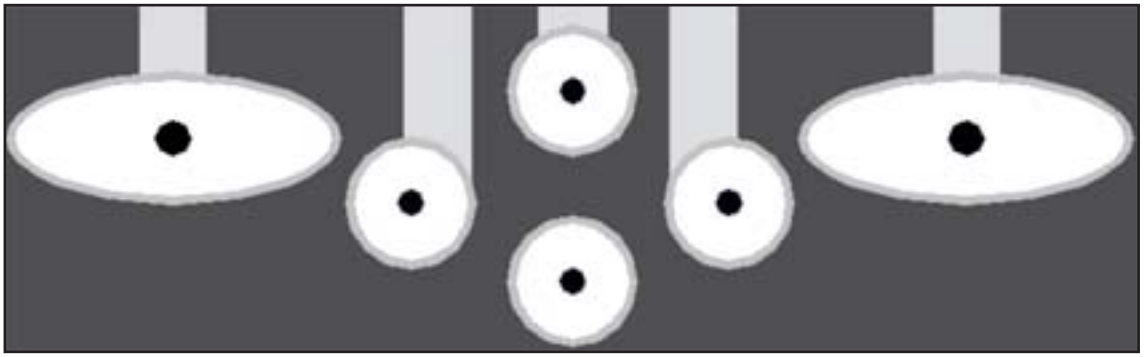
The keypad overlay consists of a transparent LCD viewing area and six «Soft key» buttons.

Each button may have more than one function dependant on the screen being viewed at the time.

For ease of reference the buttons have been given the following names:

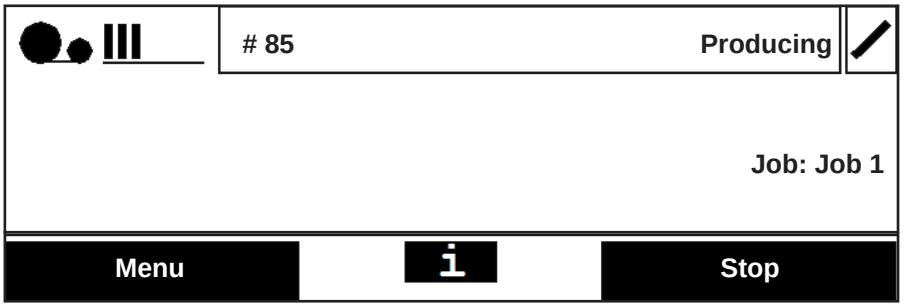



The faint upward lines indicate which screen option a particular button will activate.



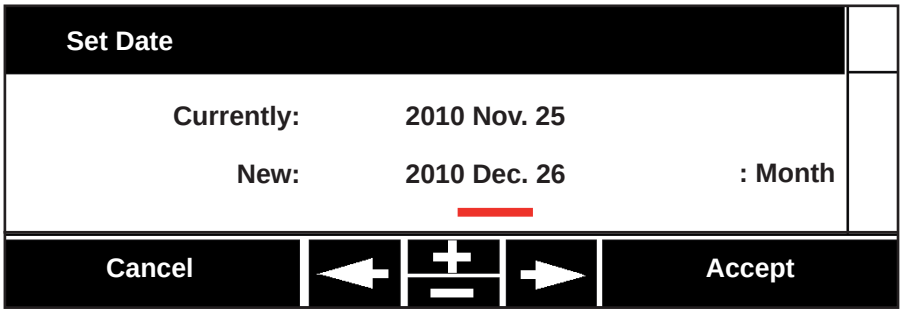
## Keypad Button Usage

In this example the **Left Button, Right Button and Top Quad Button** are available for use.




The **Left Quad, Bottom Quad** and **Right Quad** and inactive.

In this example all six buttons are active.




The **Left Quad** and **Right Quad** buttons directly under the Arrows move the cursor left or right.
The **Top Quad** and **Bottom Quad** buttons increment or decrement the month.

## Keypad Button Functions

The function of each button is described below:

Keypad Buttons

| Button Name | Meaning | Usage and Labels |
|---|---|---|
| **Left Button** | Back to last screen | (Home screen “Menus”<br>(Elsewhere) “Back/Cancel” |
| **Left Quad** | Move Cursor/Selection left | (Data entry) Move cursor left |
| **Right Quad** | Move Cursor/Selection right | (Data entry) Move cursor right |
| **Top Quad** | Increment one, Move up one | (Menu navigation) Previous menu (Data entry) Increase selection by one unit. |
| **Bottom Quad** | Decrement one, Move down one | (Menu navigation) Next menu (Data entry) Decrease selection by one unit. |
| **Right Button** | Action / Do it | (Home screen) Stop/Run<br>(Elsewhere) “Select/Accept/Confirm/Hide |

# Icons

Various Icons are used to indicate the state of the printer or menu options.
The Icons and their meanings are listed below:

**Ribbon Indicator**

The Ribbon Indicator is positioned at the top left hand corner of the screen.

The ribbon Indicator is followed by a gauge made up of 10 increments with a bar to indicate the extent of the gauge.

The span of the horizontal bar below the vertical bars indicates the maximum ribbon capacity of the printer.

(Markem-Imaje 3810 ribbon 900 Metres)

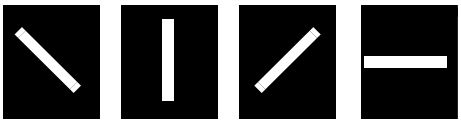
If the user loads a brand new 600 metre ribbon the gauge will indicate 2/3 capacity.

This is recorded when the ribbon is calibrated.

If a partly used ribbon is loaded the same procedure is followed and the gauge adjusted accordingly.

This gives the user an indication of how much ribbon is remaining.

**Status Indicator**



The Status Indicator is positioned at the top right hand corner of every screen.

On the Home screen the Status Icon supplements the Status Text.

i.e. Producing, Stopped, Problem.

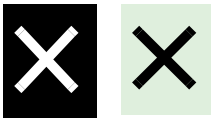
This Icon animates to give the impression of movement when the printer is producing.

**Warning Status Indicators**

This replaces the Status Indicator when a Warning occurs.

These flash alternately in time with the Status Text on the ”Warning Alert”

**Problem Status Indicators**



This replaces the Status Indicator when a Problem occurs.

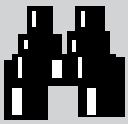
These flash alternately in time with the Status Text on the ”Problem Alert”

### Security Indicators

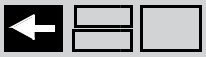
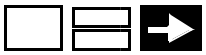
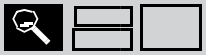
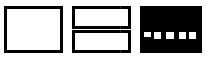
A Secured Menu is indicated via the presence of a padlock icon beside the menu item name.


A locked padlock indicates that when the “Select” right hand button is pressed the User Interface will display the Password entry screen and prompt the user for a password.

## Menu Icons

| Icon | Menu name |
|---|---|
|  | Main menu |
|  | Engineering Menus |
|  | View Menu |
|  | Settings Menu |
|  | Ribbon Menus |
|  | Reports Menus |

## Screen Quad Label Icons

| Quad Icon | Quad Button Action |
|---|---|
|  | Enter the View menus where Job and Device information is displayed. |
|  | Move up one menu place. |
|  | Move up or down one menu place |
|  | Move down one menu place. |
|  | Move the Cursor left one position. |
|  | Move the Cursor right one position. |
|  | In enumerated menus, indicates the user can move up to the next setting option. |
|  | In enumerated menus, indicates the user can move up or down to the next setting option. |
|  | In enumerated menus, indicates the user can move down to the next setting option. |
|  | Increment a setting one unit |
|  | Increment or decrement a setting one unit. |
|  | Decrement a setting one unit |
|  | Search for a Job beginning with..... |
|  | View the rest of a truncated menu. |

# Screen Types

The SmartDate X60 User Interface supports various Screen Types.

The screen is generally divided into a grid of four rows.

- The bottom row of the grid is always used for the “Button labels”.
- The top right hand corner cell is always used for the “System State”
- When in the Home screen, the top row displays the current printer status information, such as the batch counts and the amount of ribbon remaining.

The screen types can be grouped as follows:

| Screen Type | Description |
|---|---|
| Home Screen | The main screen from which the user starts |
| Menu Screens | Used to navigate between different menu options or screen types. |
| Reports Screens | Used to display a large amount of textual information. |
| Data Entry Screens | Used to enter data for Job setup or printer settings. |
| Diagnostic Screens | Used to display real time dynamic data. |
| Special Screens | Used to display special information such as Warnings or Problems. |

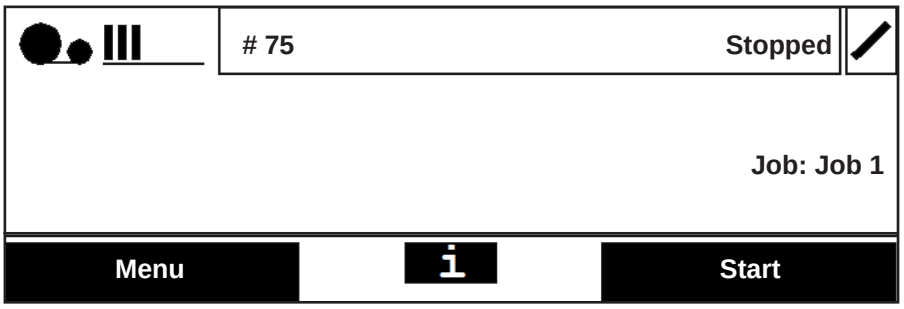
## Home Screen

The **Home** Screen is the main screen from which the user starts.

This can either be the **Stopped Screen** or the **Run Screen**.

The various menus can be accessed from both versions of this screen.

**Stopped Screen:**

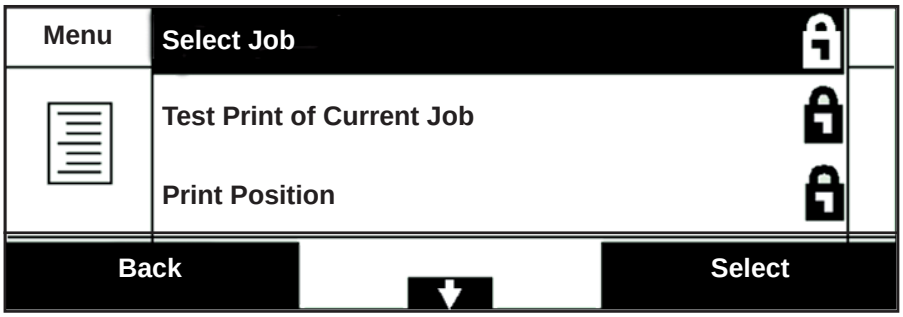



**Run Screen:**

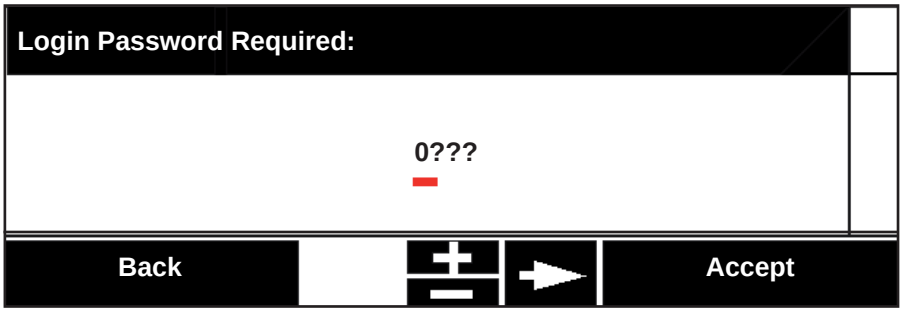
## Security Login Screen

This screen is displayed whenever a password is required.

If the Security level has been enabled the menu screen will display the options with a padlock symbol on the right of the screen.




If you select one of the options you will then be prompted for a Login Password.




Different levels of access can be configured for different users.
Configuration of passwords and access levels is done from CoLOS Control.

## Security Options

SmartDate X60 can be configured to prompt for a password before access to the various menu options is allowed.

Two security level options are available to gain access to the menus.

**- Open**
**- Medium**

If the security setting is Open no password prompt will be displayed.

If the security setting is Medium you will be prompted for an access password.

SmartDate X60 is shipped with three default passwords, these are 1111, 2222 and 3333.

The different passwords allow different levels of access.

For example:

The default 1111 password only allows access to Job selection and adjustment of the print darkness and print position.

The default 2222 level password only allows access to the options above and some additional features such as setting the SmartDate X60 default Date and Time.

The default 3333 level password allows access to all of the available menu options.

These passwords can be re-configured to allow more options or additional passwords can be added. This is done from Markem-Imaje CoLOS Control.

Please consult the relevant documentation for details.

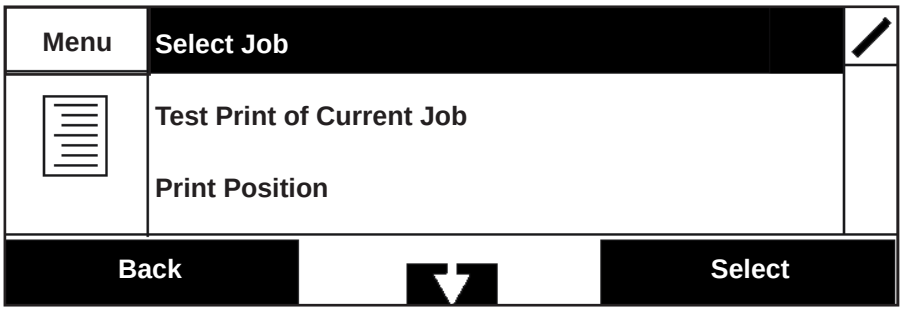
# Menu Screens

Menus are navigated by using the top and bottom quad buttons to move either up or down through the menu structure.

After entering a menu, the top item in the list will be highlighted.

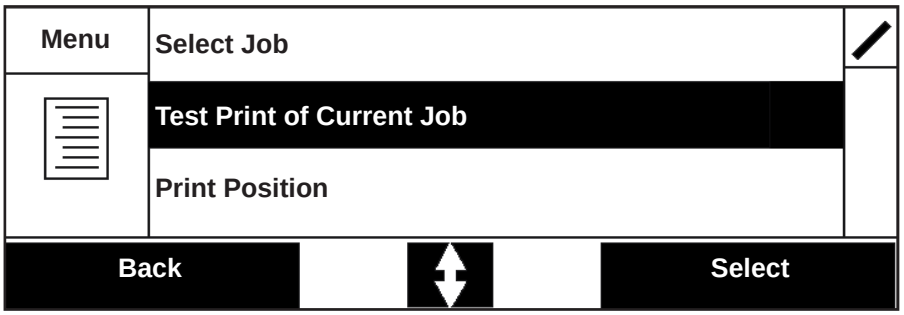
From this point the user can only scroll down.

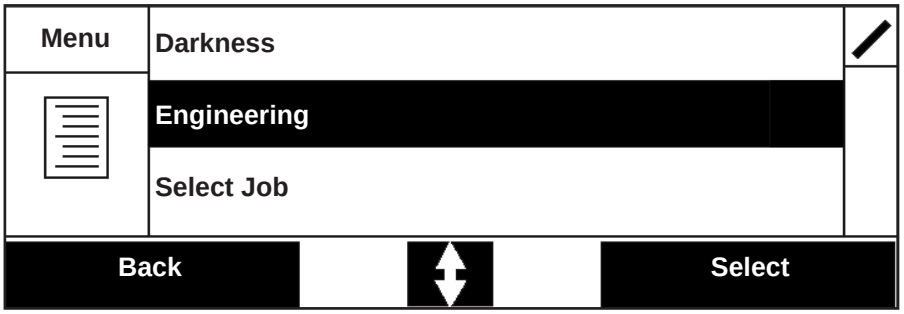
The user scrolls down through the menu topics by using the bottom quad button, or back up through the menu topics by using the top quad button.




Pressing the bottom quad button will select the menu item below it and move the highlight to the middle entry screen.

The icon will change to a full height double ended arrow.

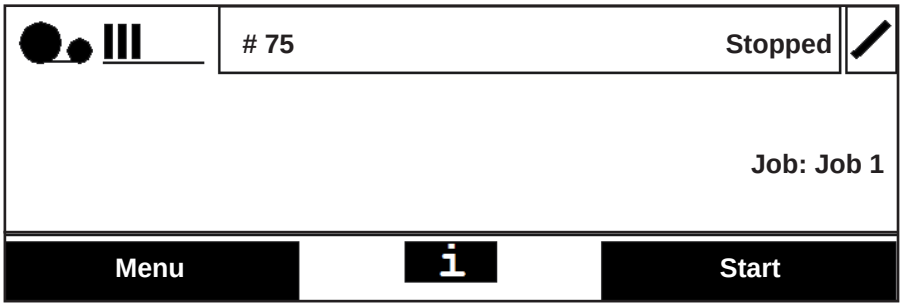


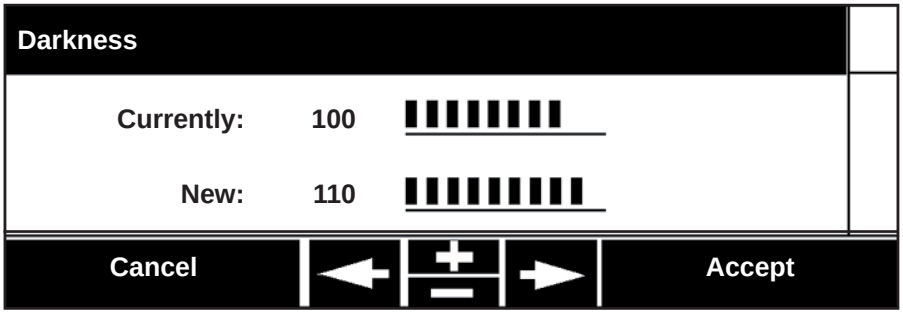




When the last topic is reached the first topic will reappear and the user can continue to scroll through again if required.

*NOTE: Once the first menu item is again at the top the user can only scroll downwards (The menu does not "Loop" upwards)*

Pressing the “**Back**” button will return the user to the last viewed screen, in this case the **Home** screen.




Pressing “**Select**” will take the user into the highlighted menu options screen, in this case the **Darkness** menu.

# Data Entry Screens

Data entry screens will vary dependant on the menu option that has been selected.

These screens can be grouped as follows:

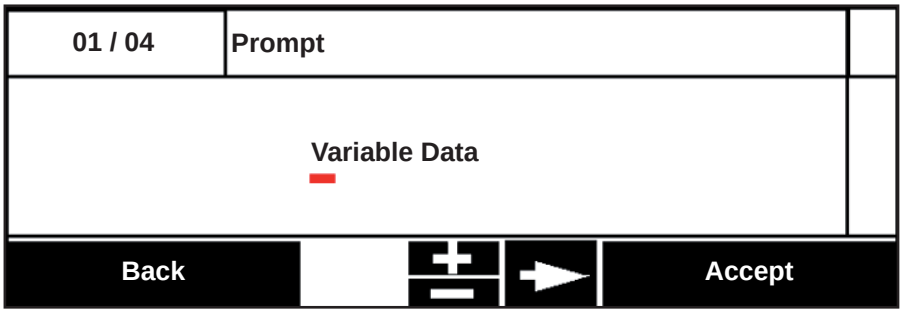
- Prompted Data Entry Screens
- Date Entry Screens
- Settings Adjustment Screens
- Job Setup Screens

## Prompted Data

Prompted data entry screens collect input from the user as a result of Job designs that requires variable data to be entered during the Job selection process.

Because the Job design can prompt for different types of input, the screen types vary.

**Alpha Data Entry Screens**



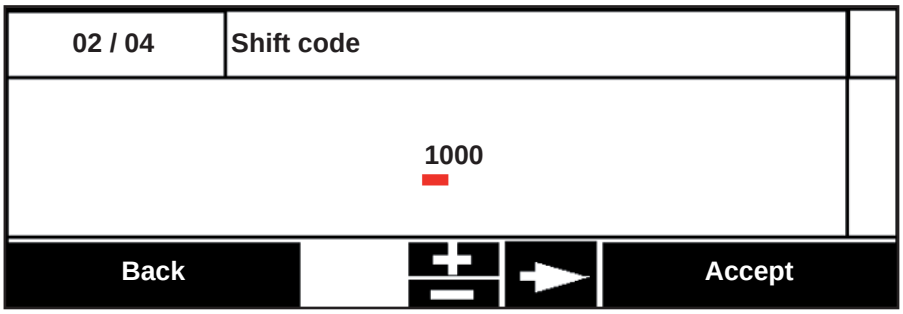

Here the numbers in the upper left hand box indicate that this is the first of four data entry prompts in the Job selection process.

The cursor sits under the first character in the variable data allowing for this to be edited by using the upper or lower Quad buttons.

The available characters that can be used will depend upon the language that has been selected.

By moving the cursor along the line of text, each character in turn can be edited.

### Numeric Data Entry Screens




Here the numbers in the upper left hand box indicate that this is the second of four data entry prompts in the Job selection process.

The cursor sits under the first number in the variable data allowing for this to be edited by using the upper or lower Quad buttons.

The available numbers will be limited to 0 - 9.

By moving the cursor along the line of number, each number in turn can be edited.

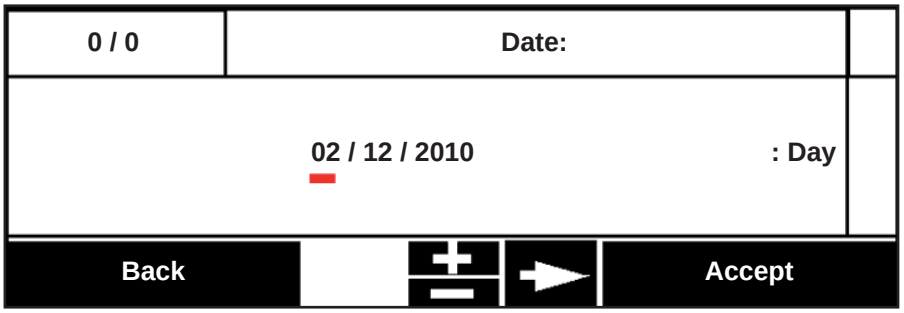
# Date Entry Screens

There are three types of “Date Entry” screens that the User Interface has to support:

- Literal Date Entry
- Offset Date Entry
- Fixed Format Prompted Date Entry

## Literal Date Entry

This screen is used to prompt the setting of a fixed date to be printed. There is no calculation made on this date, it is displayed (Prompted) in the format that it will be printed. This means that the fields that make up the date string, can appear in any order, depending on how it was set at the design stage.

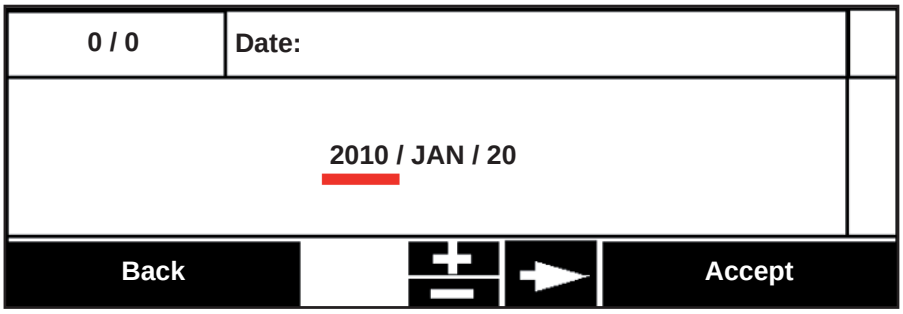



The cursor sits under the first set of numbers in the date string allowing for this to be edited by using the upper or lower Quad buttons.

In this case the available numbers will depend on the number of days in the selected month. (i.e. Dec. - 31 days)

Incrementing the Month may also affect the day number.

e.g. If the month in this date string 31/12/2010 is changed to 11, the day number would default to 30.




The cursor always defaults to the left of the date string, in this case the year.

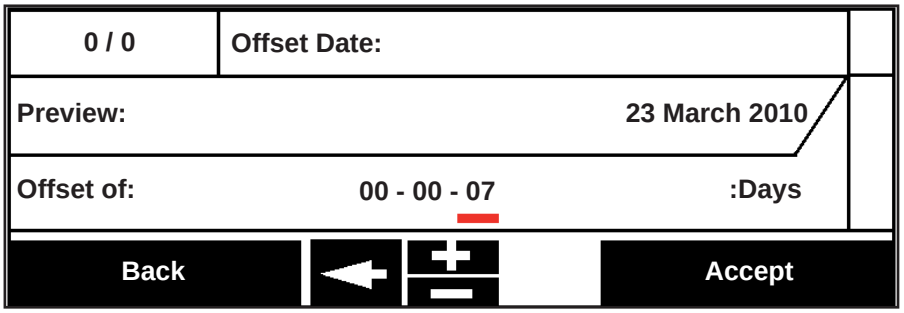
By using the upper or lower Quad buttons the year will increment or decrement by one year. (i.e. 2011 or 2009)

The text at the right hand side of the screen indicates which date option is active Day, Month or Year.

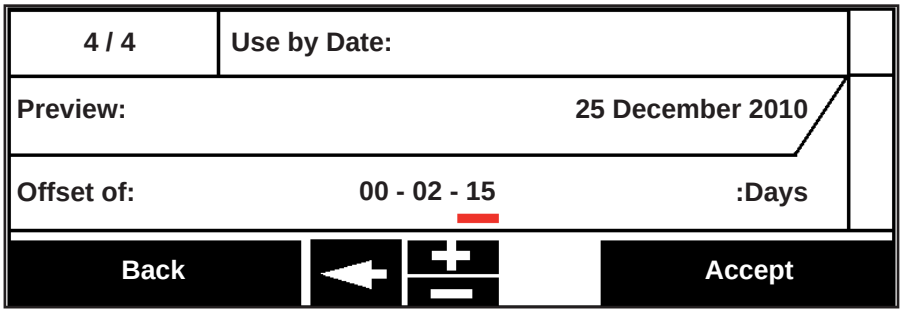
By moving the cursor along the date string, each option in turn can be edited.

## Offset Date Entry

This screen is used to set an offset from the SmartDate X60 internal clock and to preview what the resultant date would be.



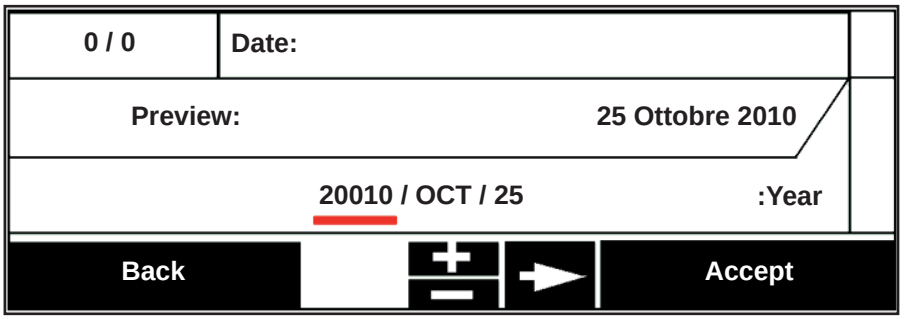

This example shows an offset of seven days, so the actual date that the SmartDate X60 internal clock is set to is the 16th March 2010.




This example shows an offset of 2 months and 15 days, so the actual date that the SmartDate X60 internal clock is set to is the 10th October 2010.

## Fixed Format Date Entry

This screen is used to set a literal date to be printed, but this time the date is displayed in a fixed format. An example of where this option may be used is where the product is destined for another country. The user can set the date in their native language, and the preview will display how it will be printed in the other language.



# Setting Adjustment Screens

There are three types of “Settings Adjustment” screens that the User Interface has to support:

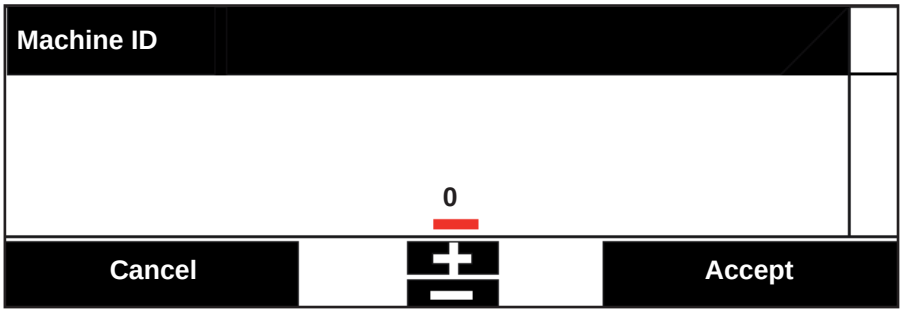
- Basic Definitive Value Input
- Current Setting Adjustment
- Enumerated Choice

All Setting change screens are characterised by a solid filled black “Title” bar with a slant.

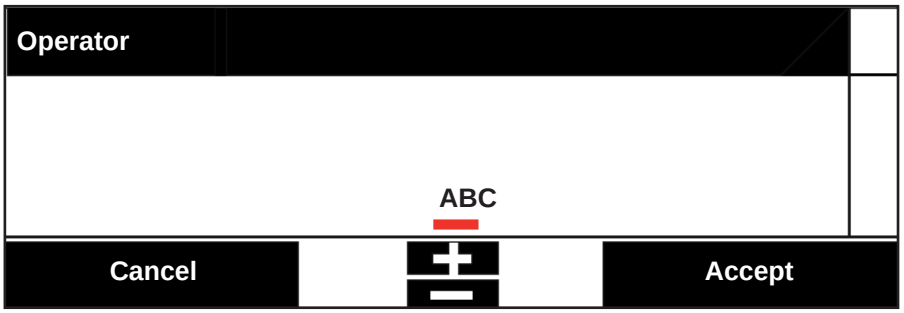
## Basic Definitive Value Input

This screen is used to set a definitive value that is usually relevant only to the user.

**Examples:**



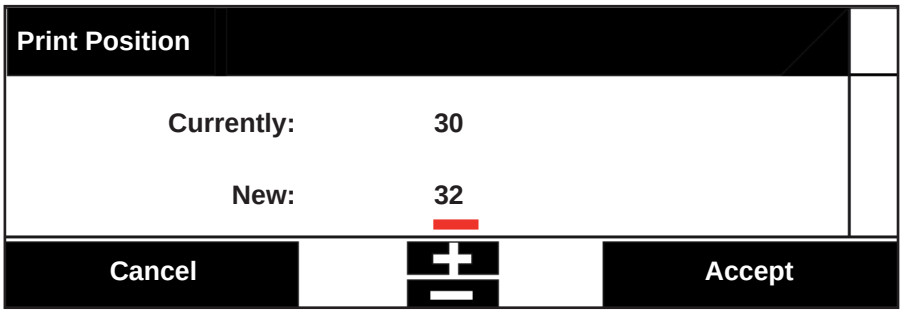

These screens support Alpha, Numeric or Alphanumeric characters.



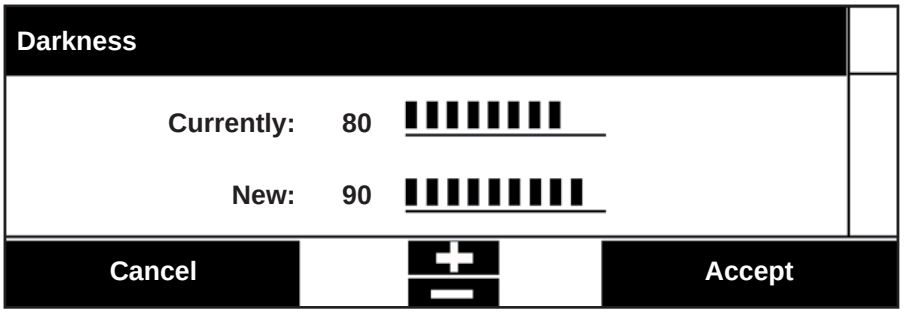
## Current Setting Adjustment

These screens are generally used to set a numeric value, where there is a range of values that can be selected.

They can also be used for Alphanumeric setting changes.



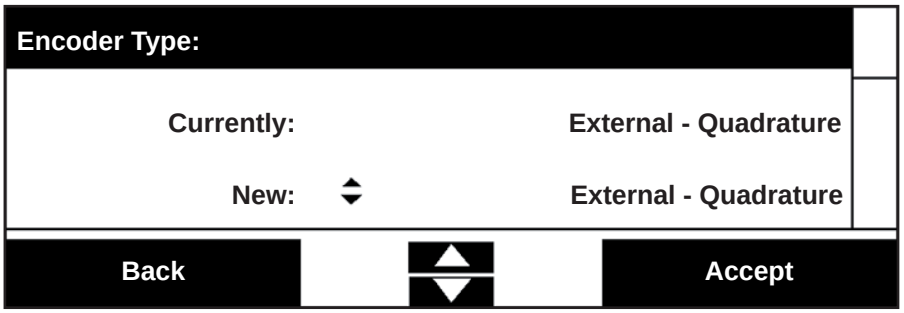

Graphical scales may also be shown alongside the numeric setting.



## Enumerated Choice Settings

This screen is used to select from a list of pre-defined setting options - “Enumerated Data”

**Example:**




The  symbol indicates that there are more options available, use the top or bottom Quad buttons to select the required option.
Press the right hand button to accept the option.

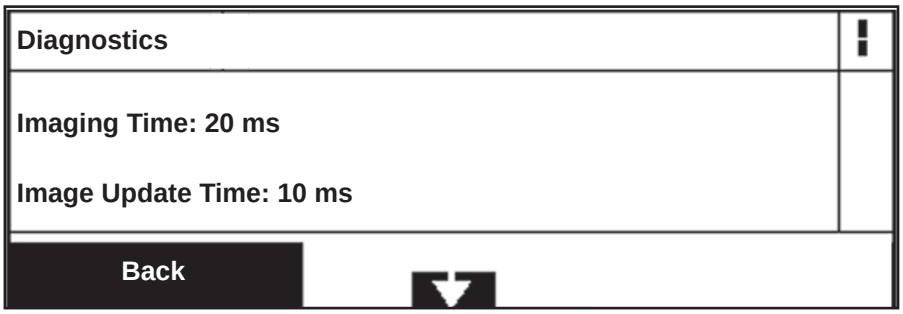
## Diagnostics Screens

The Diagnostics screen displays the current status and dynamically changing data which give an aid to troubleshooting.

The information is read only and can therefore not be altered.

This screen allows access to the following information:

- Printer configuration
- Inputs status
- Outputs status
- Temperatures
- Print timings
- Internal Sensor status




## Special Screens

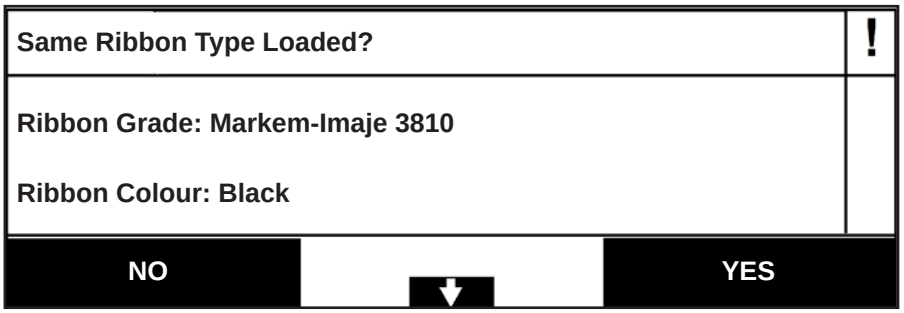
There are a number of special screens that may occasionally appear.

Examples of this may be if a print can not be completed or if a new type of ribbon is loaded.

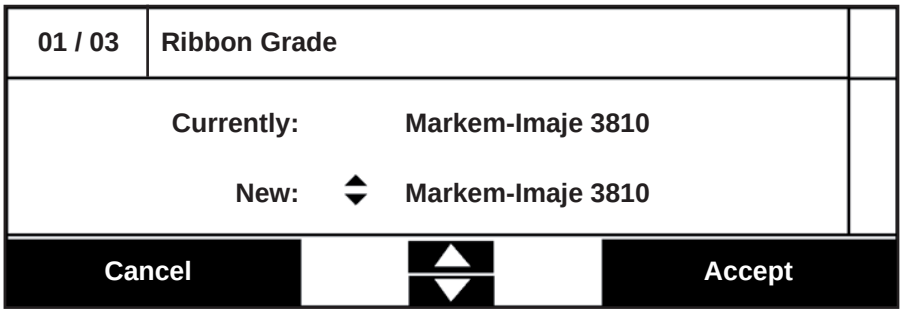
## Ribbon Type Verification

If SmartDate X60 detects that a new ribbon is loaded, it needs to confirm that the ribbon type is the same as the last type used.

You will be prompted to confirm this or input the relevant data for the new ribbon type.



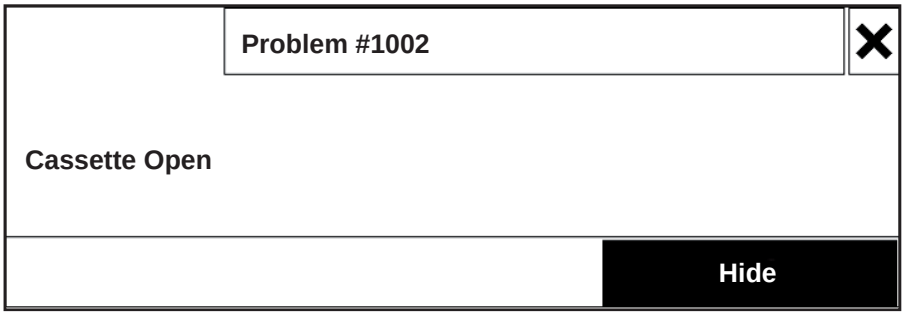

If you select **NO** you will then be prompted for the required information about the new ribbon type.



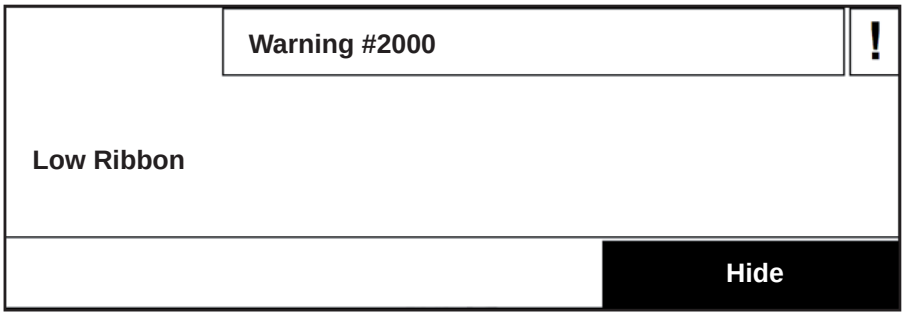

Select the correct ribbon type and press the right bottom to accept.

## Faults and Warnings Alert Screens

These screens inform you of problems or potential problems.
The whole screen will flash to indicate a problem. Pressing the right hand button “Hide” will stop this.
The Problem text and number will continue to flash to signify that attention is required to rectify the problem.
A description of the problem will be displayed on the screen.



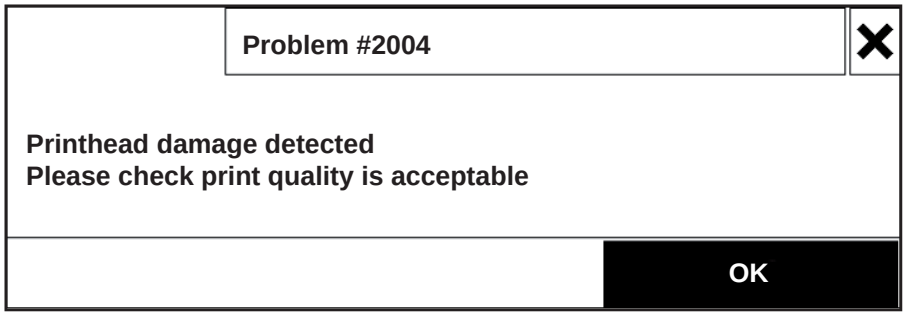

In the case of a Warning the SmartDate X60 will continue printing if in Producing mode.
The Warning does not stop the print cycle.
An example of a Warning might be “Low Ribbon”
If a Problem occurs the SmartDate X60 will stop printing if in Producing mode and the Problem Alert screen will appear.



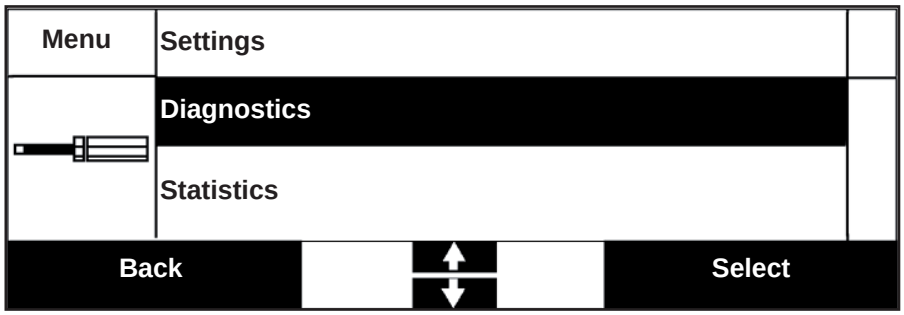
## Dead Dot Detection

On power up SmartDate X60 will automatically detect if any of the printhead dots have been damaged.
A description of the problem will be displayed on the screen.

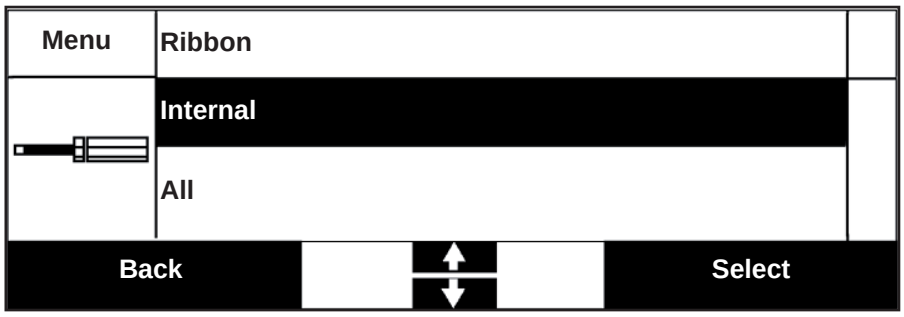
1



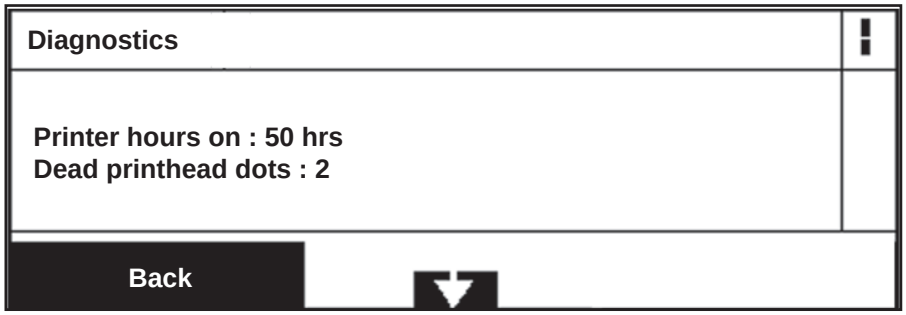

2 Use the Diagnostics screen to view the details.



3


Menu
Ribbon
Internal
All
Back
Select

4


Diagnostics
Printer hours on : 50 hrs
Dead printhead dots : 2
Back

# Speed Profiles

Speed profiles allow the user to assess if the print signal is being activated at the appropriate time.

The running speed of Continuous motion packaging machines will increase and decrease as the substrate is being run through.

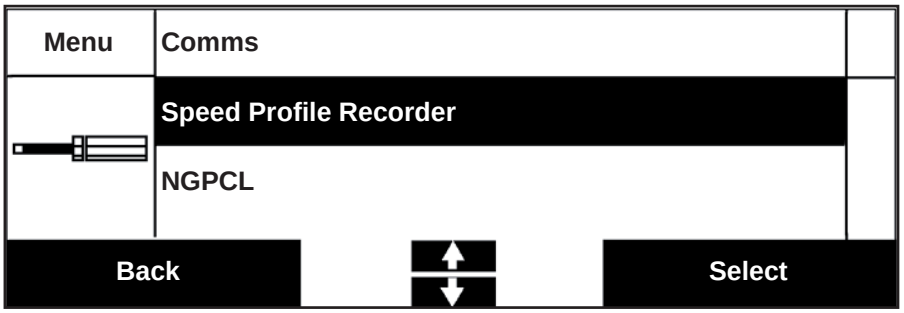
In some cases the substrate speed may be faster than the fastest print speed of the SmartDate X60.

If the Print signal is activated at this point in the cycle the resulting print will be unacceptable.

To avoid this problem, the print signal should be activated when the substrate is running at a lower speed.

Creating a “Speed Profile” allows the user to view the exact point in the cycle that the Print Go signal is activated.

If this is at the wrong point, the timing of the Print Go signal can be altered to coincide with a slower substrate speed.



# Operation

# Introduction

This section describes how to operate the SmartDate X60 unit once it has been successfully installed.

Topics covered in this section include:

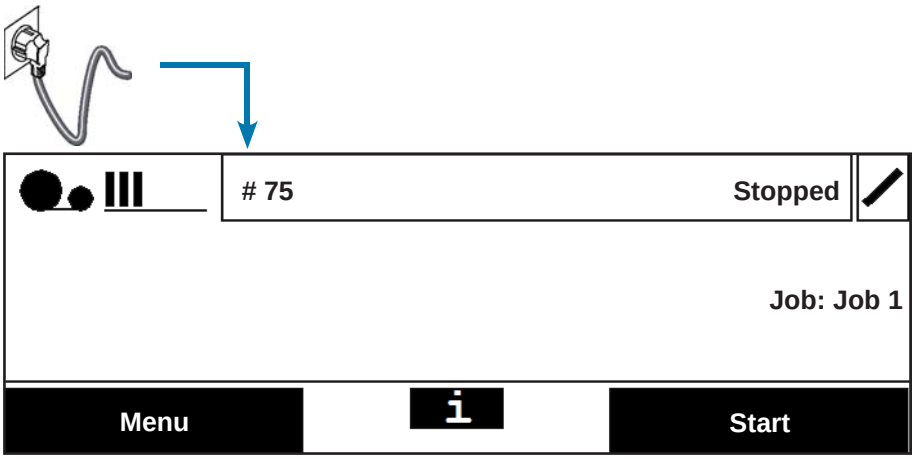
- Starting the SmartDate X60
- Stopping the SmartDate X60
- Report screen
- Changing the Ribbon
- Principles of printing
- Operating principles

# Start the printer

## Home Screen

The Home Screen is the main screen from which the user starts.
This can either be the Stopped Screen or the Run Screen.
The various menus can be accessed from both versions of this screen.
**Stopped Screen:**

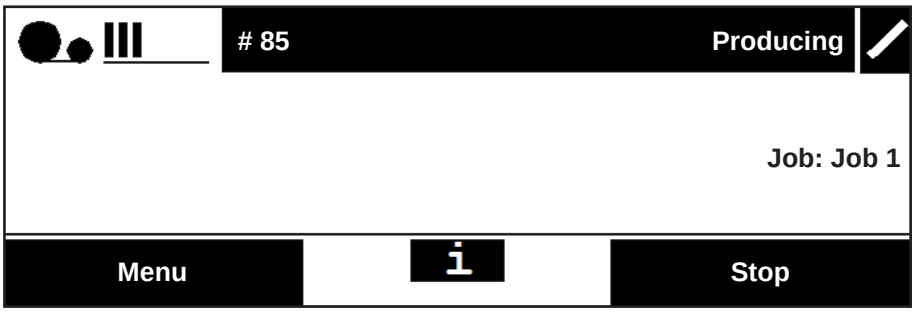
1




To start the printer press the left hand button under “Start”
This will put the SmartDate X60 into “Producing” mode.

Printing will only occur when the Host machine is in producing mode and a relative print signal is received.

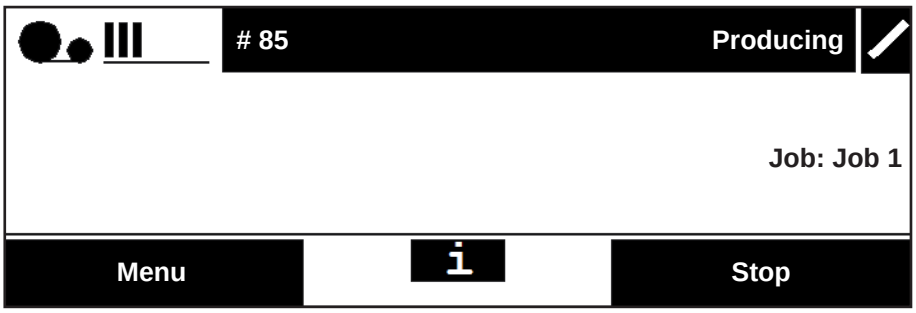
2



# Stop the printer

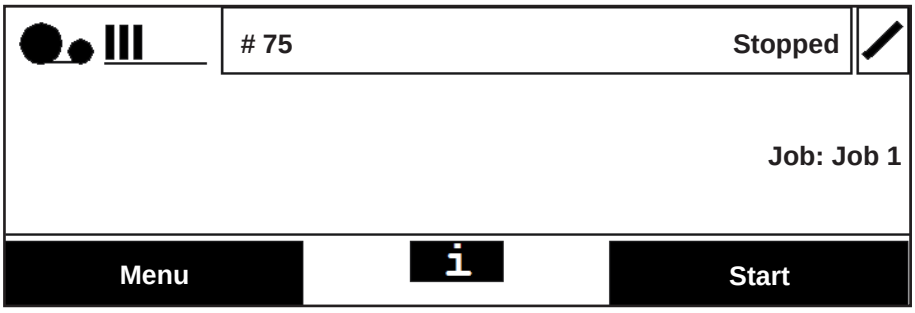
**Producing Screen:**

1




To stop the printer press the right hand button under “Stop”
This will put the printer into “Stop” mode and the SmartDate X60 will ignore any print signals form the Host machine.

2



# Reports Screens

These screens are available under the i menu and give full details of what is expressed in abbreviated form on the Home page.

This includes full information about Warnings and Problems.

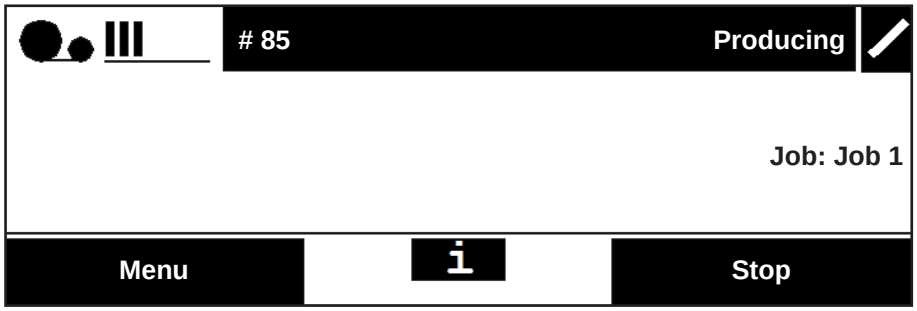
Information such the Software version number, Hardware serial numbers etc. are displayed here. The information is static unlike the Diagnostics screens which display real time status details.

This screen allows access to the following information:

- Full details of Problems and Warnings.
- Current Job details.
- Details of the current Printer settings
- Details of the Counts
- Printer Version Information

## View Menu Screen

1 The View Menu is available from the Home screen by selecting the i button.

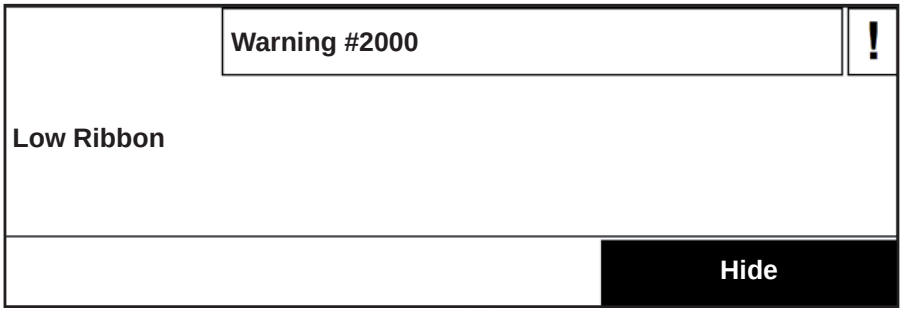



2 This menu works in the same way as other similar menus but the available options are for information only.

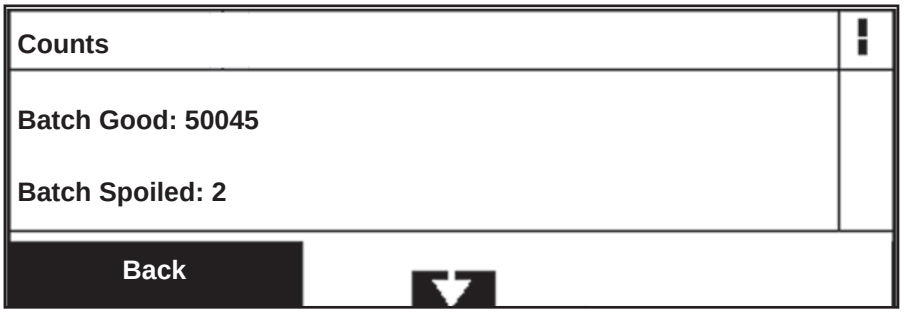
With this menu you can view:

- Problem and Warning details.
- Current Job details.
- Settings details.
- Counts details.
- Version Information

**Example of the Problems and Warnings**




**Example of the Counts**



## Warning and Problem Alert Screens

These screens inform you of problems or potential problems.

The whole screen will flash to indicate a problem. Pressing the right hand button “Hide” will stop this.

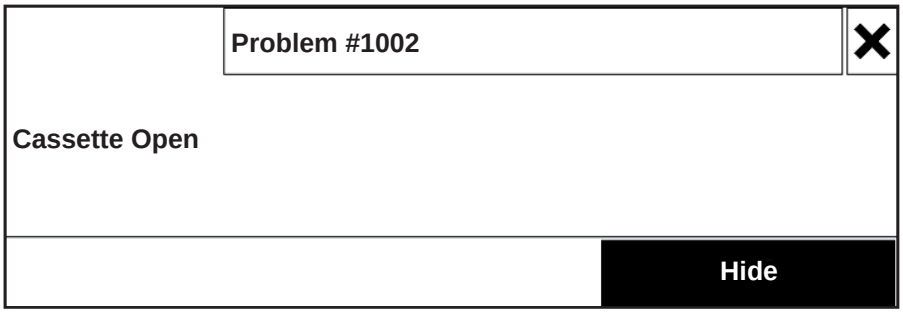
The Problem text and number will continue to flash to signify that attention is required to rectify the problem.

A description of the problem will be displayed on the screen.

In the case of a Warning the SmartDate X60 will continue printing if in Producing mode. The Warning does not stop the print cycle.

An example of a Warning might be “Low Ribbon”

If a Problem occurs the SmartDate X60 will stop printing if in Producing mode and the Problem Alert screen will appear.



## Removing the cassette

1

Rotate the locking lever on the cassette to the OPEN position.

2

Use the handle to withdraw the cassette.

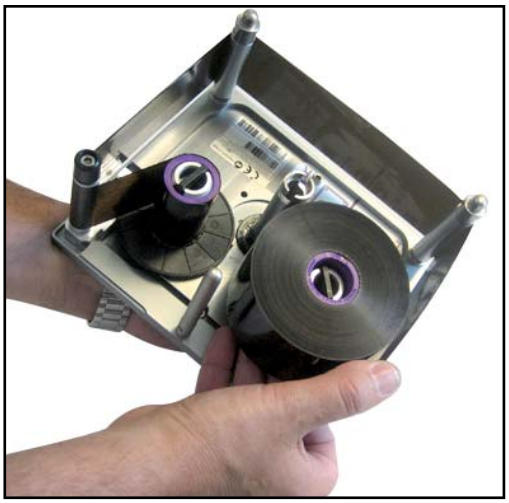
3

Remove the waste ribbon from the cassette.

# Loading or Replacing the Ribbon

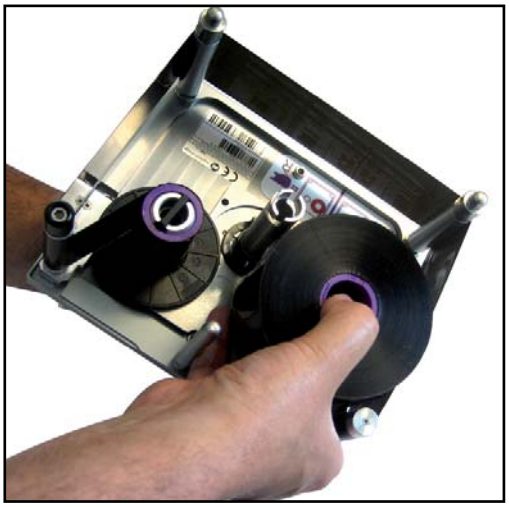
## Removing Waste Ribbon from the Waste Take up Core

1



Pull the ribbon forward using the ribbon take up reel flange located below the ribbon.

2

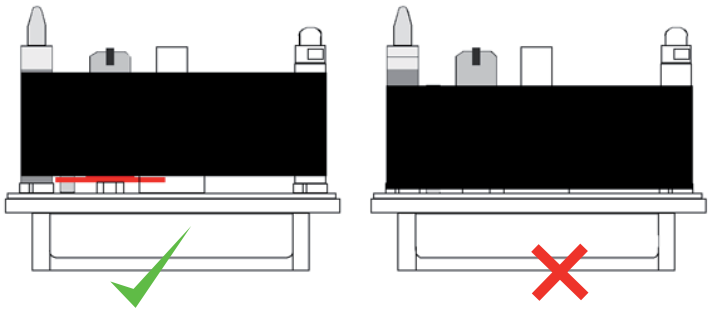


Push the flange back to its original position.
Pull off the ribbon by hand.

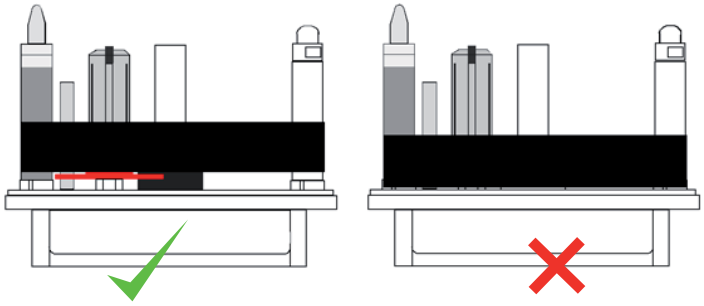
Do not use sharp objects such as screwdrivers to remove the ribbon as this may cause injury.

## Loading a New Ribbon

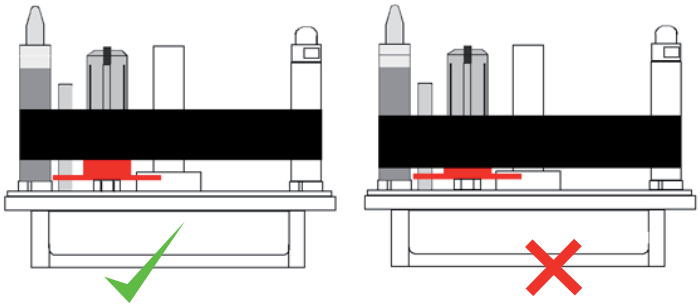
1. Fit a new waste take up core and load a new ribbon following the web pattern shown inside the cassette. (New ribbon on the red reel)
2. Remove sufficient ribbon from the new roll to make it unnecessary to pull additional ribbon while the cassette is partially loaded. This makes loading easier and, in extreme cases, prevents damage to the printer cassette.
3. Ensure that there are no creases in the ribbon by rotating the take up reel by hand.
4. Ensure that the ribbon is tracking parallel on the cassette rollers and is positioned correctly. The ribbon must be loaded so that it is only in contact with the movable parts of the rollers.
5. Ensure that the ribbon is wound forward enough so that the transparent lead section is not under the printhead.



Full width ribbon.



Narrow ribbon.



Narrow ribbon with spacer.

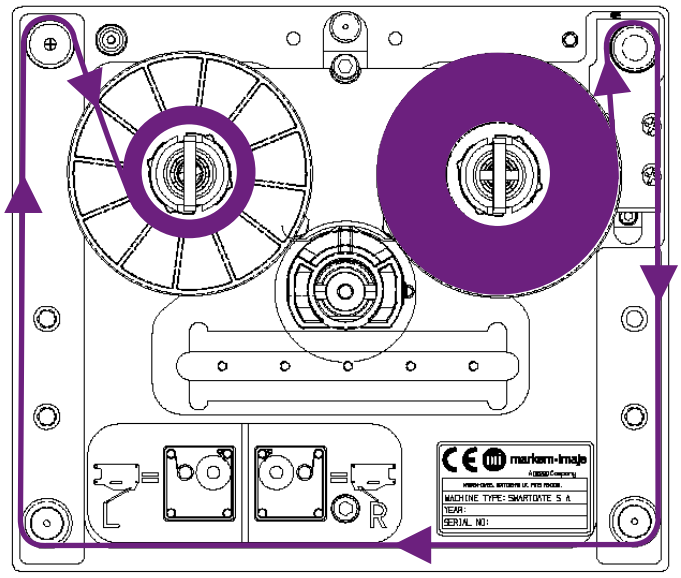
## Re- Connecting a Broken Ribbon

If a ribbon break occurs the following procedure should be used:

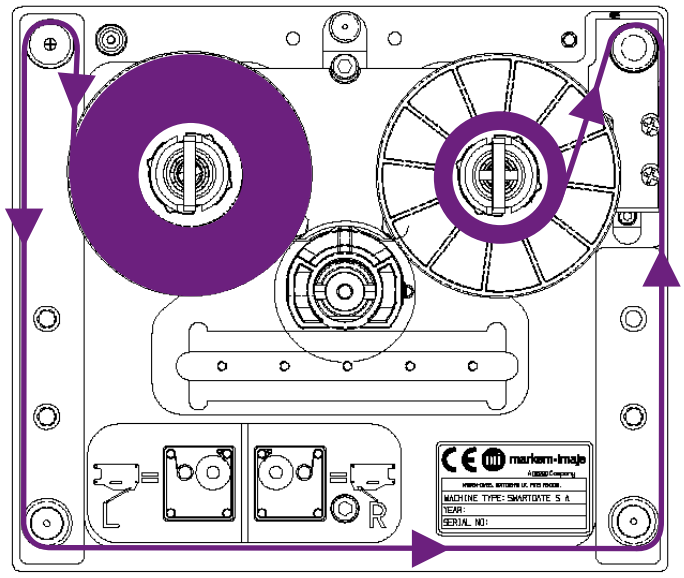
1. Do not tie a knot to re-connect the ribbon.
2. Wind the remaining waste ribbon onto the waste core.
3. Pull some of the unused ribbon from the ribbon supply and wind it onto the waste ribbon take up.
4. Turn the waste reel by hand at least one revolution and keep the join between the two as flat as possible.

Failure to follow this procedure may cause unacceptable eccentricity on the waste ribbon take up reel. This cannot be controlled by the printer and will produce ribbon tension problems.

## Cassette Webbing Diagrams




SmartDate X60 LH Cassette Ribbon Web Path




SmartDate X60 RH Cassette Ribbon Web Path RH

## Replacing the Cassette

1 Check that the cassette locking lever is in the **OPEN** position. Insert the printer cassette by aligning the two guide pins (see the appropriate webbing diagram) and pressing the unit home.

2 Check that the ribbon passes over the peel bar correctly.

3 Lock the unit shut by turning the locking lever to the **CLOSED** position.

4 When the cassette is back in position and the printer is set to **READY**, SmartDate X60 automatically drives the head to remove any creases and to calibrate the ribbon feed sensor.

5 If the message **CALIBRATION FAILED** is displayed, remove the cassette.

6 Check that the ribbon is threaded correctly and try again.

# Principles of Printing

## Thermal Transfer Technology

SmartDate X60 machines use Thermal Transfer printheads, similar to the ones used in Fax machines.

Thermal Transfer printers can also operate without ribbon by using specially treated paper which turns black when heated. This is the way fax paper reacts.

Overprinters however, almost always use ribbon.

Both SmartDate X60 machines use Thermal transfer printheads for printing.

Each printhead has a series of heating elements (resistors) along the print line. These printing dots are 12 per mm and are covered in a ceramic glaze for protection.

When printing, the printhead is moved out by activating a pneumatic cylinder. This causes the printhead to press the ink ribbon against the substrate or label. The heat from the printhead dots melt the ink and the pressure of the printhead against the substrate transfers the ink to the substrate.

SmartDate X60 machines use Stepper Motors for Printhead motion and Ribbon feed.

## Print Process

With the **Intermittent** printers, the step rate of the printhead carriage motor is in direct relationship with the linear motion of the carriage.

The length of time that the dots are energised for is determined by the linear speed of the printhead carriage.

With the **Continuous** motion versions of the printer, the length of time that the dots are energised is determined by the speed of the ribbon, which in turn is controlled by data from a speed encoder.

The print control processor determines which dots to energise and when to activate them.

In both cases the length of each dot should end up at 1/12 mm to maintain the aspect ratio of the character being printed.

An example of how this works is shown below:

If an **Intermittent** printer were to print the following sequence:

- Dots 1 to 12 are energised three times relative to the linear speed of the print carriage.
- Dots 4 to 8 are energised eighteen times relative to the linear speed of the print carriage.
- Dots 1 to 12 are again energised three times relative to the linear speed of the print carriage.

If a **Continuous** printer were to energise the dots in this sequence it would be relative to the ribbon speed.

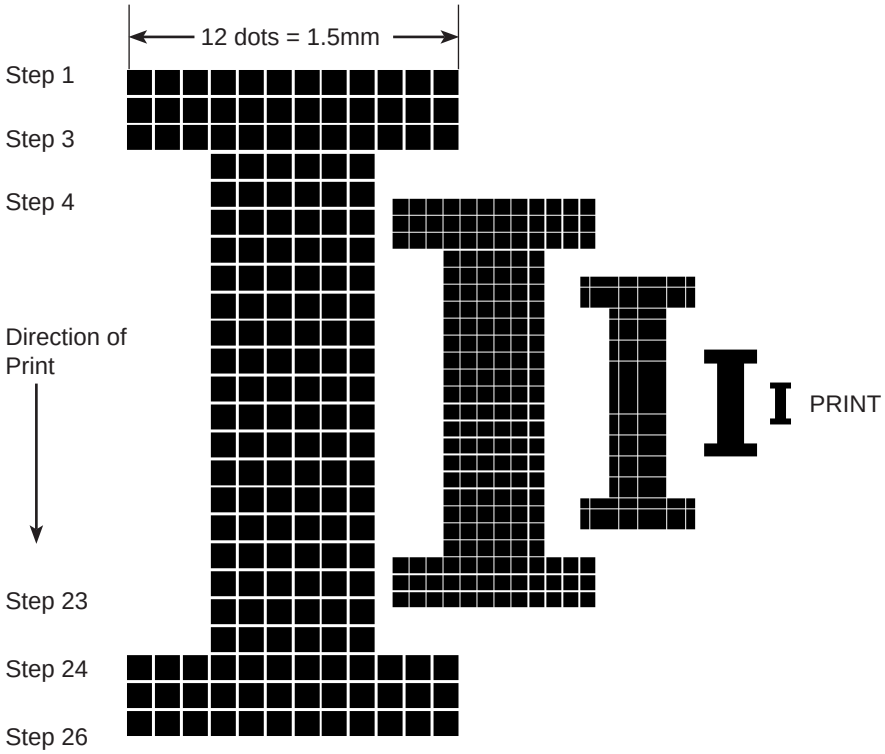
In both cases the printed image would then look as follows:

The resulting character may then be part of the design text or a part of a Graphic or a Logo. This process happens extremely fast and the printed character may only take a fraction of a second to print.

**For example:**

The above character is represented as 26 steps long, just over 2 mm. If the print speed were 100 mm/sec, this character would only take approximately 2/100 of a second to print.

SmartDate X60 in High Speed mode can print at 1000 mm/sec, however each dot occupies 1/6 mm.



## Operating Principles

The two printer types use different methods of operation specifically designed to suit the running methods of the packaging machines being used.

When the cassette is inserted into the printer body and secured, the ribbon supply shaft and ribbon waste rewind shaft, are connected to the ribbon drive motor couplings.

The SmartDate X60 Intermittent printer uses a thermal printhead and thermal ink ribbon to print information onto materials held against a flat Print platen.

The SmartDate X60 Continuous printer uses a thermal printhead and thermal ink ribbon to print information onto materials held against a Print roller.

## Print Cycle SmartDate X60 & X60 / 128 Intermittent Mode Printer

The SmartDate X60 in this mode has a print area of 53mm x 75mm and print speeds of 50 to 700mm/s.

The SmartDate 60 / 128 in this mode has a print area of 128 mm x 75 mm and print speeds of 50 to 700mm/s.

The SmartDate X60 Intermittent prints when the substrate or label is stationary.

The printhead is moved out during the dwell time of the packaging /labelling machine, and then moved across the substrate / label while printing takes place.

The Intermittent model advances the ribbon during the return movement of the printhead. The ribbon is only advanced by the same amount as it prints.

For example, if the image is 25mm long, the ribbon is advanced by 25 mm (plus any gap between prints). This keeps ribbon waste to a minimum.

The SmartDate X60 when configured to Intermittent Mode prints text and bar codes at any position within the 53mm width by 75mm length print area.

The SmartDate X60 / 128 when configured to Intermittent Mode prints text and bar codes at any position within the 128 mm width by 75 mm length print area.

The SmartDate X60 / 128 when configured to Intermittent Mode prints text and bar codes at any position within the 128 mm width by 75 mm length print area.

The operating sequence is:

1. A Print Go signal triggers the print delay timer.
2. The print delay elapses and the printhead moves into position.
3. The printhead moves along a linear slide and prints the required information.
4. The printhead retracts.
5. The printhead returns to its home position and the ribbon moves along ready for the next print.

SmartDate X60 is now ready for the next print sequence.

## Print Cycle SmartDate X60 & X60-128 Continuous Mode Printer

The SmartDate X60 in this mode has a print area of 53mm x 150mm and print speeds of 50 to 1000 mm/s.

The SmartDate X60 / 128 in this mode has a print area of 128 mm x 150 mm and print speeds of 50 to 700 mm/s.

The SmartDate X60 Continuous prints while the substrate is moving.

In this case the printhead only moves out to the print position and has no linear motion. A shaft encoder is used to track the substrate speed.

The ribbon speed is accelerated up to match the substrate speed before printing can occur. This is done by means of two stepper motors.

The SmartDate X60 Continuous prints text and bar codes at any position within the 53mm width by 150mm length print area.

The SmartDate X60 / 128 when configured to Continuous Mode prints text and bar codes at any position within the 128 mm width by 150 mm length print area

This makes it the ideal coder for continuous motion form fill and seal machines and horizontal flow wrappers, where larger images are required and fast print speeds are not an issue.

The operating sequence is:

1. A Print Go signal triggers the Print cycle
2. The encoder signal determines the speed of the substrate.
3. The ribbon is accelerated to match the substrate speed.
4. The printhead is moved to the print position.
5. The required information is printed. (The printhead has no linear motion).
6. The printhead retracts and the ribbon is returned ready for the next print.

SmartDate X60 is now ready for the next print sequence.

## Print Cycle SmartDate X60 - Shuttle Continuous Printer

The SmartDate X60 Shuttle Continuous has a print area of 53 mm x 100 mm and print speeds of 50 to 1000 mm/s.

High Speed mode 800 to 1200 mm/s

Digital Ribbon Save mode 800 to 1800 mm/s

The SmartDate X60 Shuttle Continuous prints while the substrate is moving. In this case the printhead only moves out to the print position and has no linear motion.

A shaft encoder is used to track the substrate speed.

The ribbon speed is accelerated up to match the substrate speed before printing can occur. This is done by means of the shuttle, which is driven by a stepper motor.

The use of a Shuttle enables the SmartDate X60 to print at very high print speeds.

This makes it the ideal coder for continuous motion form fill and seal machines and horizontal flow wrappers, where the image size is below 100mm in length and high speed is an issue.

One significant additional feature for this machine, however, is that it also has Cost Saving mode which increases print speed by 50% - from 1200 mm/s to 1800 mm/s of printing.

The operating sequence is:

1. A Print Go signal triggers the Print cycle.
2. The encoder signal determines the speed of the substrate.
3. The Shuttle is accelerated to match the substrate speed.
4. The printhead is moved to the print position.
5. The required information is printed. (The printhead has no linear motion).
6. A ribbon shuttle, in the Printer Cassette, is used to match the ribbon speed to the substrate.
7. The printhead retracts and the shuttle returns to its home position.
8. The ribbon is wound on so that unused ribbon is ready for the next print.

SmartDate X60 is now ready for the next print sequence.

# Operating Modes

# Introduction

This section describes how to operate the SmartDate X60 unit once it has been successfully installed.

Topics covered in this section include:

- Operating Modes
- Printer Specific Print Options
- Standard Mode Operation
- High Pack Rate
- High Speed
- Interlace Mode
- Radial Ribbon Save Mode
- Whitespace
- Radial Whitespace
- Radial Interlace
- Digital Ribbon Save
- Relative Motion
- Low Speed Print Mode

# Operating Modes

SmartDate X60 has one standard mode of operation, with the option to select additional ribbon save modes if required

These can be separated into two main groups:

## Non-Ribbon Save Modes

Non-Ribbon Save Modes include:

- High Pack Rate - speeds of up to 1000 mm/sec
- High speed mode - speeds of up to 1200 mm/sec

## Ribbon Save Modes

Ribbon Saving modes include:

- Radial Ribbon Save Mode
- Interlace Mode
- Digital Ribbon Save Mode

The choice of mode will depend on the type of application and the operator's main objectives:

- If saving ribbon is the main objective, choose one of the Ribbon Save mode options.
- If print quality or speed is the main objective, choose one of the Non-Ribbon Save mode options.

A brief explanation of the different modes follows.

## Printing Speeds

Low Speed: Print speed less than 100mm/s
Normal Speed: Print speed between 100mm/s and 1000mm/s
High Speed: Print speeds of up to 1200 mm/sec
DRS: Print speeds of up to 1800 mm/sec

# Printer Specific Print Options

## SmartDate X60 - Intermittent mode

This SmartDate X60 can be set to:

- High Pack Rate Operation
- Radial Ribbon Save Mode
- Interlace Mode

## SmartDate X60 - Continuous mode

This SmartDate X60 can be set to:

- High Pack Rate Operation
- Radial Ribbon Save Mode
- Interlace Mode
- High Speed Mode

## SmartDate X60 - Shuttle Continuous

This SmartDate X60 can be set to:

- High Pack Rate Operation
- Radial Ribbon Save Mode
- Interlace Mode
- High speed Mode
- Digital Ribbon Save Mode

Note: Hi Speed mode is disabled if Cost Saving Mode is selected.

Certain conditions will determine the standard of print quality achieved:

- The Substrate material being used
- The type of Ink Ribbon being used.
- The Speed at which printing is performed.
- The air pressure setting
- The Printer parameter settings

The correct combination of all of these will greatly improve print quality.

## Standard Mode Operation

SmartDate X40 transfers ink from the ribbon directly onto the substrate by means of a thermal transfer printhead.

In this mode the ink removed from the ink ribbon will be equal in size to the printed image on the substrate.

For example, a 2 mm long print will use 2 mm of ribbon.

This is the normal running mode for SmartDate X40 and will usually achieve the best print quality results.

SmartDate X40 printers use Digital Ribbon Management (DRM) this means that the processor is constantly monitoring the ribbon movement.

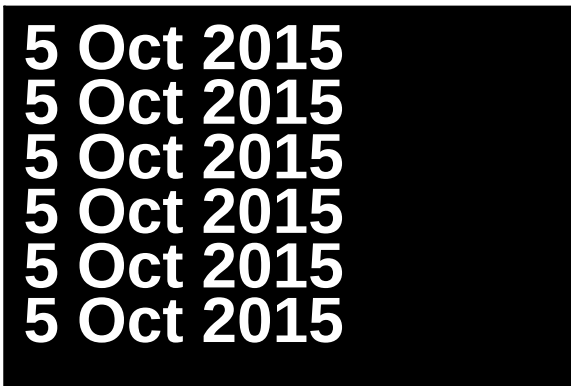
Digital Ribbon Advance (DRA) means that the gaps between each print is kept to a minimum. This is achieved by the way the printers move the ribbon forwards and backwards using the waste ribbon for acceleration.

The maximum print speed for this mode is 1000 mm/sec. (CHECK!)

Typical Print:

**5 OCT 2015**

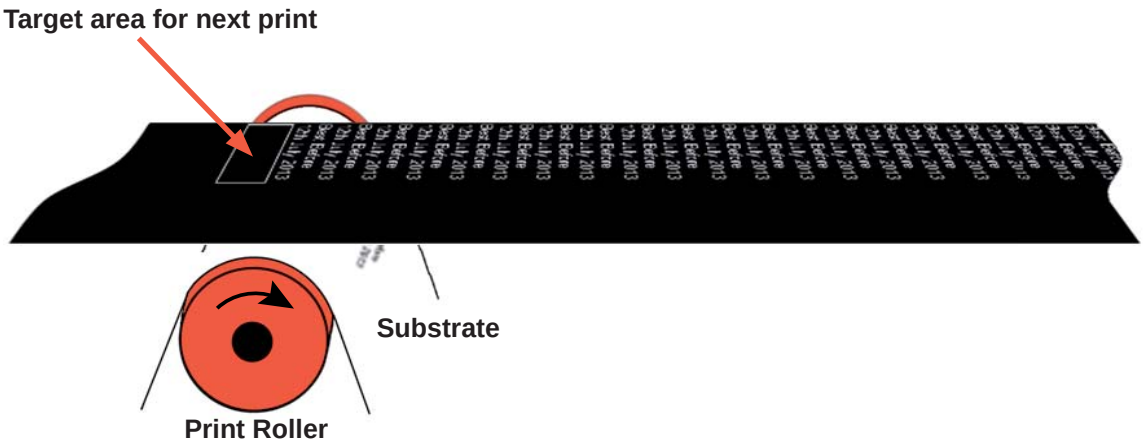
Used Ribbon



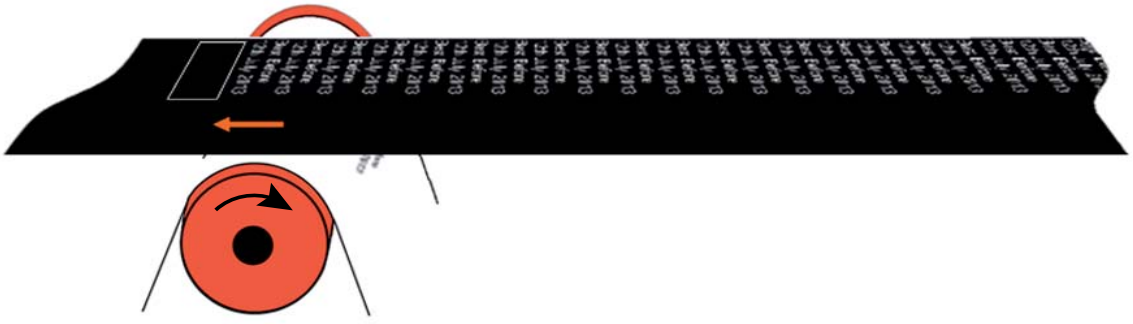

Uses an equal length of ribbon to the print.
Ribbon is rewound to minimise the gaps between prints (default 0.5mm)

# High Pack Rate

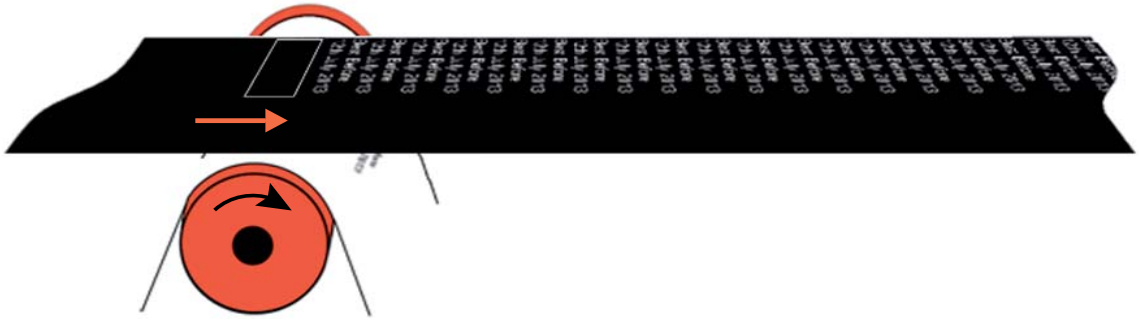
High Pack Rate is the default setting for the SmartDate X60 Continuous printer.
High Pack rate mode offers printing at the fastest possible rate at the highest quality level. This is the closest equivalent to the outdated Normal mode. The difference is that High Pack Rate mode can tune the acceleration times in accordance to the maximum substrate speed the printer is expected to print on.
With Continuous printers the ribbon has to be wound backwards far enough to allow it to be accelerated up to to the substrate speed ready for the next print.
The amount of ribbon wound back after a print has been performed directly affects the timing sequence.



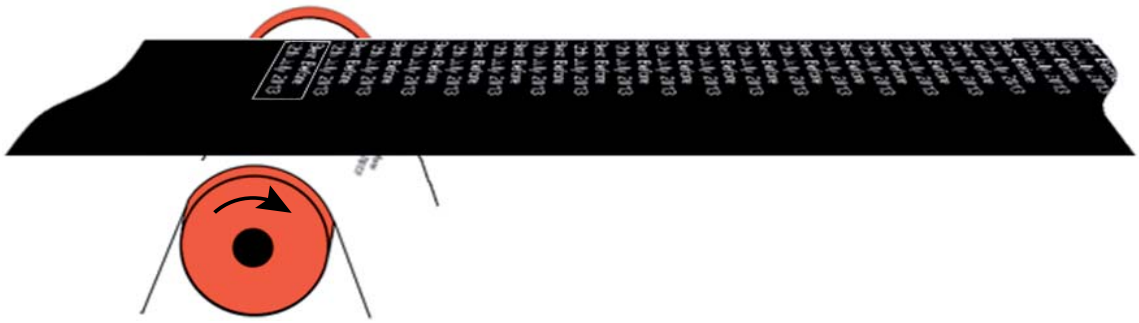

In this example the ‘Max Substrate Speed’ is set to 1000mm/s but the actual maximum substrate speed is 600mm/s
A print operation has been completed and the ribbon is wound back in preparation for the next print.



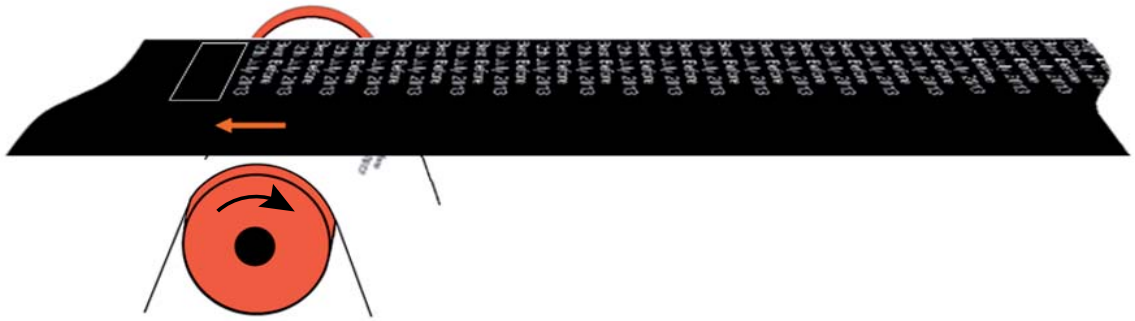
The ribbon is accelerated up to match the substrate speed.



The next print is performed when the ribbon speed is the same as the substrate speed.

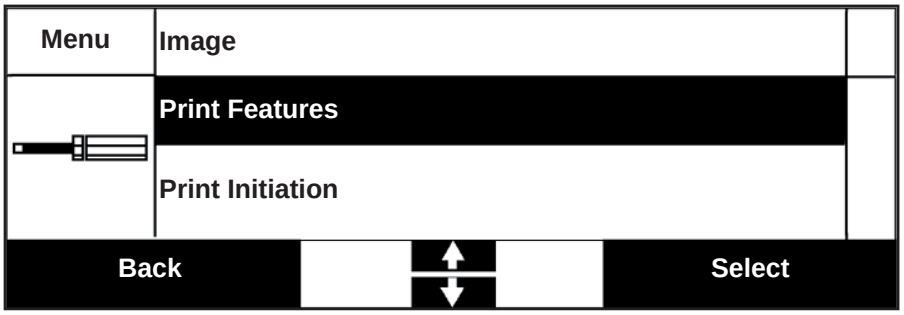


The ribbon is again wound back ready for the next print.

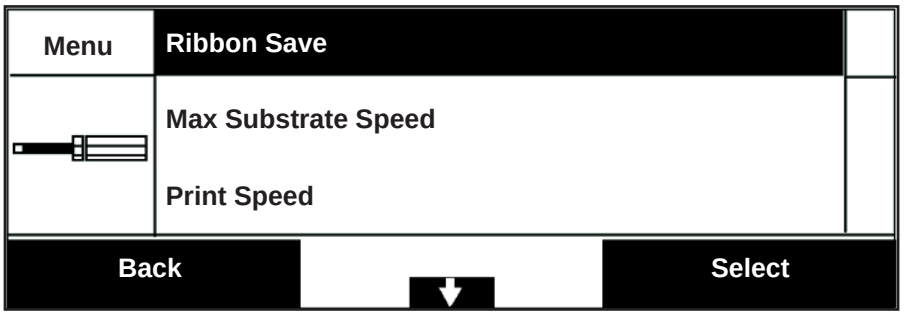


Matching the ‘Max substrate speed’ to the actual maximum substrate speed will allow the SmartDate X60 to run at the highest pack rate possible.

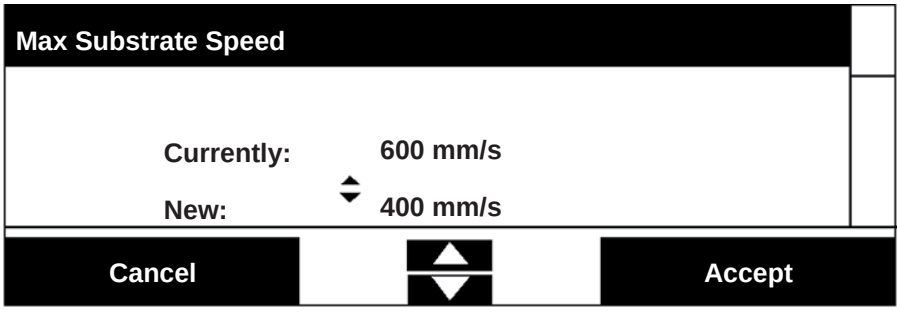
1 From the Settings menus screen select Print Features.




2 The Print Features menu options will be displayed.




Use the bottom Quad button to scroll to the required menu.
Select the menu by pressing the right button.




Adjust the setting to the actual maximum substrate speed.

## High Speed Mode

Not available with the SmartDate X60 when it is in Cost Saving mode.
The benefit of High Speed mode is that a print speed of up to 1200 mm/sec can be achieved.
This is accomplished by reducing the resolution of the print.
This option is useful when the substrate speed is high and a lower print resolution is acceptable.
High Speed mode is a unique Markem-Imaje feature that allows printing speeds of up to 1000 mm/s (dependent on the substrate and thermal ribbon used).
Using a unique way of driving the printhead, increased print speeds can now increase maximum speeds achievable, usually without regard to the thermal ribbon or substrate used.
When running in High Speed mode, print resolution will be lower than normal (current) operation. However, when enabled, this mode will:

- Increase the possible linear speed up to 1200 mm/s on ideal applications for SmartDate X60.
- Increase the speeds obtained with low speed, higher permanency, resin/ hybrid ribbons on all SmartDate X60 models.
- Increase the possibility of use for low speed coloured ribbons for SmartDate X60 models.

All of the above benefits are achieved with pure speed matching so that SmartDate X60 will maintain the current high reliability.

To access the High Speed mode setup menu, see section 6 Menus - Print Features - Print Mode.

## High Speed Options

High Speed mode is a menu-selected option.
When DISABLED, the printer runs as standard and produces the full density, high quality image as expected.
When the mode is ENABLED, the user can set the threshold from which it begins to operate.
This can range from 30 mm/sec to 700 mm/sec.
When High Speed mode is selected and the running speed reaches the selected threshold speed, the printer automatically changes to High Speed mode operation.
Once High Speed mode is operating, the resulting print quality is slightly lower than standard, but it offers all of the above listed benefits.
For information on how to enable High Speed mode, please refer to Section 6.
The following information is relevant to High Speed mode on the SmartDate X60:

## Threshold (ON/OFF)

The DEFAULT setting for High Speed mode is DISABLED.
When DISABLED, the machine operates in normal operating mode where the print speed remains constant.
When High Speed mode is ENABLED, a threshold speed must be set.
Once High Speed mode is enabled, settings such as background energy levels are adjusted to optimise operation in High Speed mode. However, on certain substrates these energy levels may need to be manually adjusted to optimise performance.
Contact your Markem-Imaje Business Centre before attempting to perform these adjustments.

## Materials and Applications

High Speed mode is designed for applications where a small reduction in perceived quality is acceptable so the customer may benefit from high running speeds. Primarily these applications are for simple Date & Lot type overprinting applications. High Speed mode can be used to print picket fence orientated barcodes, but must not be used to print Ladder format barcodes.
As for all applications, the customers material type should always be tested, however testing has proven SmartDate X60 High Speed mode to work well on various materials including: Polypropylene, Polythene, Premium labels and Laminated films. High Speed mode also increases the performance of the SmartDate X60 on “difficult to print on substrates” and “Harder to adhere ribbons“. High Speed mode will only operate reliably with Markem-Imaje-approved grades of Thermal Ribbon.

High Pack Rate Mode

High Speed Print Mode

## Limitations

The use of High Speed mode has major speed benefits to the customer, however, there are some points of this feature which must be considered when qualifying an application.

- When High Speed mode is selected, the maximum print speed is 1000mm/ sec.
- When High Speed mode is enabled the print quality will be reduced from the high quality achieved in standard mode.
- Just as today, where not all applications will achieve 700 mm/sec, for the new machines not all applications will achieve 1200 mm/sec. Application qualification is required to determine maximum speed, and the threshold speed at which the threshold should be set.
- You will not be permitted to print in High Speed mode at speeds lower than 30 mm/s. Printing in High Speed mode at very low speeds can lead to a damaged Printhead.
- High Speed mode may reduce the quality of certain bitmaps used.
- Due to the castellation of characters with High Speed mode, it is not recommended to print characters less than 2 mm high. The BOLD font types will typically provide more consistent results.

# Interlace Mode

This is a SmartDate X60 printer function which is used to save ribbon. When Interlace Mode is being used the ribbon is only advanced every second print, effectively saving 50% of the ribbon being used. This method of printing does however decrease the contrast quality of the print, as only half the normal amount of ribbon is being used to print with.

Interlace mode also has speed limitations - 400mm/sec, and is not suitable for Barcodes or Graphics for example.

Interlace mode is best suited to Date and Lot type Overprinting where a small reduction in print quality is acceptable.

Interlace Mode uses each piece of thermal ribbon twice to produce a reduced density “draft mode” print, and halves ribbon costs, and doubles the time between ribbon changeovers.

To access the Interlace mode setup menu, see section 6 Menus - Print Features - Ribbon Save.

**How it works**

Interlace mode is a menu selected option. When OFF, the printer runs as standard producing a full density, high quality image. If interlace mode is selected (ON), then for the “First Print” a pattern is used to only transfer half of the ink, giving a reduced contrast print.

For the “Second Print”, the Printhead is energised differently to print the alternate image. The result being two “draft mode” prints for half the price of a full density print.

What Interlace Mode prints look like...

## Setting up Interlace Mode

Once interlace mode is turned ON, settings such as background energy levels are automatically adjusted to optimise operation in interlace mode.

The settings should be optimised for a wide range of materials however a reality of interlace mode is that the first and second prints will differ slightly in contrast. Once the speed is set for the application, adjustment of the **Print Darkness** can be used to make these prints as equal as possible (balance the prints).

Typically, best results have been achieved with the printer set in the speed range of 150 mm/sec to 250 mm/sec. The maximum print speed is recommended as no more than 400 mm/sec (15.7”/sec). If the first print is much darker than the second, reduce the Print Darkness. If the first print is much lighter than the second, increase the Print Darkness.

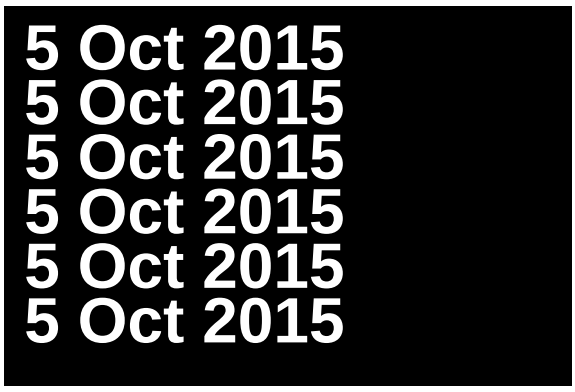
Only the **Print Darkness** parameter should be used to balance the prints. No other settings should be changed to balance the prints. When Interlace Mode is turned off, background energy levels etc. are restored to the standard non-interlaced values.

The same piece of ribbon is used to produce two prints.
The ribbon is then advanced before the next print.

Normal Print:


Interlaced Print:


1st and 2nd print
3rd and 4th print
5th and 6th print
7th and 8th print
9th and 10th print
11th and 12th print




To access the Interlace mode setup menu, see Printer Configuration - Print Features - Ribbon Save Mode.

## Materials and Applications

Interlace mode is designed for applications where a small reduction in perceived quality (reduced contrast) is acceptable so the customer may benefit from halved running costs and increased uptime. Primarily these applications are for simple Date & Lot type overprinting applications. Interlace mode is not designed for bar-codes, graphics etc. The unique print achieved with Interlace Mode is however, ideal for applications which require a small amount of anti-counterfeit security, such as unique numbers for competitions.

The material type should always be tested, however testing has proven SmartDate X60 interlace mode to work well on various materials including: Polypropylene, Polythene, Premium labels and Laminated films. Typically, surfaces such as poorly calendared (rough / porous) paper and card which give poor results with standard Thermal Transfer Overprinting are not suitable for Interlace Mode.

Interlace Mode will only operate reliably with Markem-Imaje approved grades of Thermal Ribbon.

## Limitations

The use of interlace mode has major cost and uptime benefits, however, there are limitations of this feature which must be considered when qualifying an application.

- Ensure the materials are printed at the correct speeds, and that an acceptable “First” and “Second” print can be achieved.
- Due to the lower density, Interlace mode should not be used to print critical barcodes or automatically readable information.
- If the information to be printed changes between first and second prints (e.g. BBE Date increments) then some sections of the second print may be solid (full density) print rather than the chequered image. This will not decrease readability.
- As with SmartDate5, it is not possible to achieve identical first and second prints. As the printer “warms up”, depending upon running speed the balance will change slightly. Also, as described above, the pattern will change first to second print giving a small difference.
- Due to the lower contrast achieved with interlace mode, it is not recommended to print characters less than 2 mm high. Check the legend depending upon font style selected. The BOLD font types will typically provide more consistent results in interlace mode.

## Radial Ribbon Save Mode

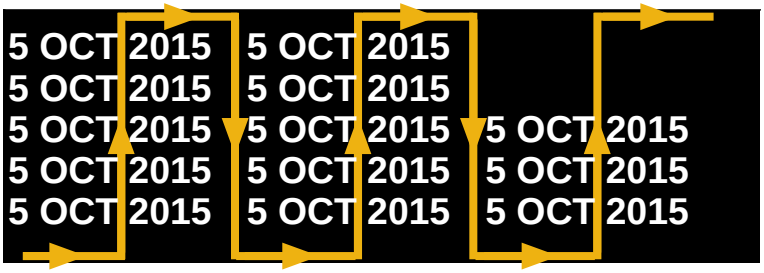
In this mode, the ribbon is advanced only after the whole of the printable area of the ribbon has been used. For example, if the ribbon being used is 55 mm wide and each print is 10mm wide, SmartDate X60 can effectively print five times before advancing the ribbon. The position of each print however will be different on the Substrate.
Two methods are available, one for example would print five times then move the image back to the first position, but with the ribbon advanced. (Similar to an old typewriter) The other would reverse the order of prints after advancing the ribbon and snake from side to side on the ribbon.
Dependent on the image size, up to eight prints can be performed across the ribbon width before the ribbon is advanced.
This mode is useful if Lot codes or Best Before End Dates are being printed and the final position of the text on the Substrate is not an issue. Using a larger ribbon than normally required will save downtime.



To access the Radial Ribbon Save mode setup menu, see Printer Configuration - Print Features - Ribbon Save Mode.

**Date text printed in a target box**

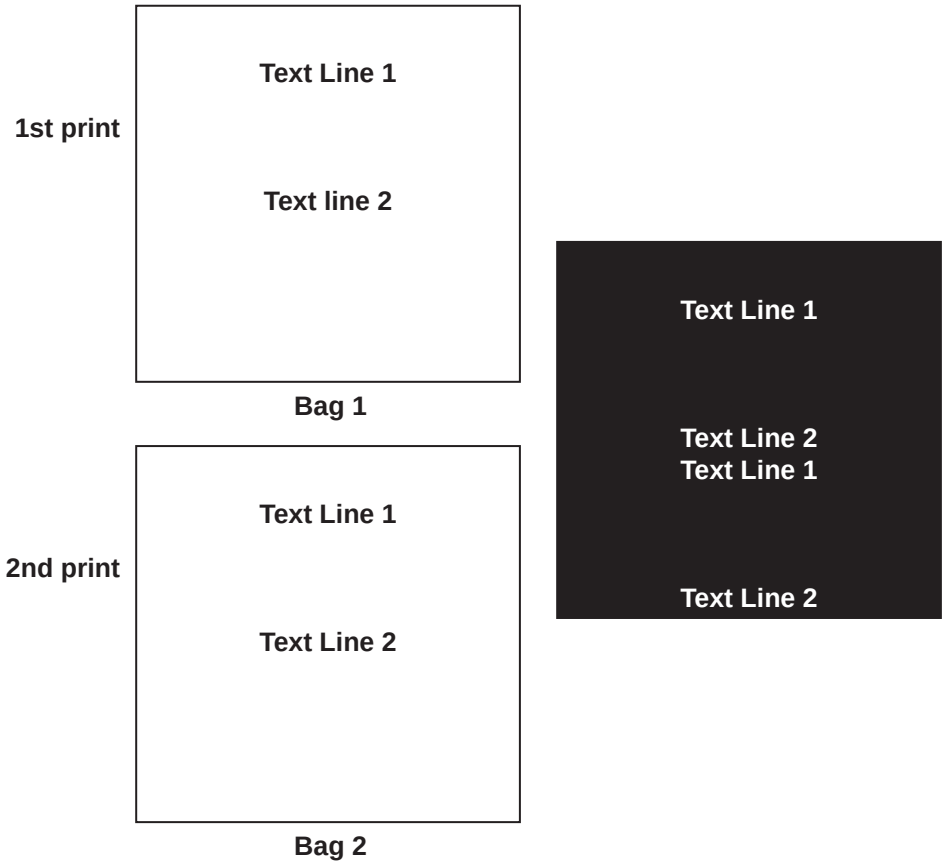

**Printing Method 1**




**Printing Method 2**

# Whitespace

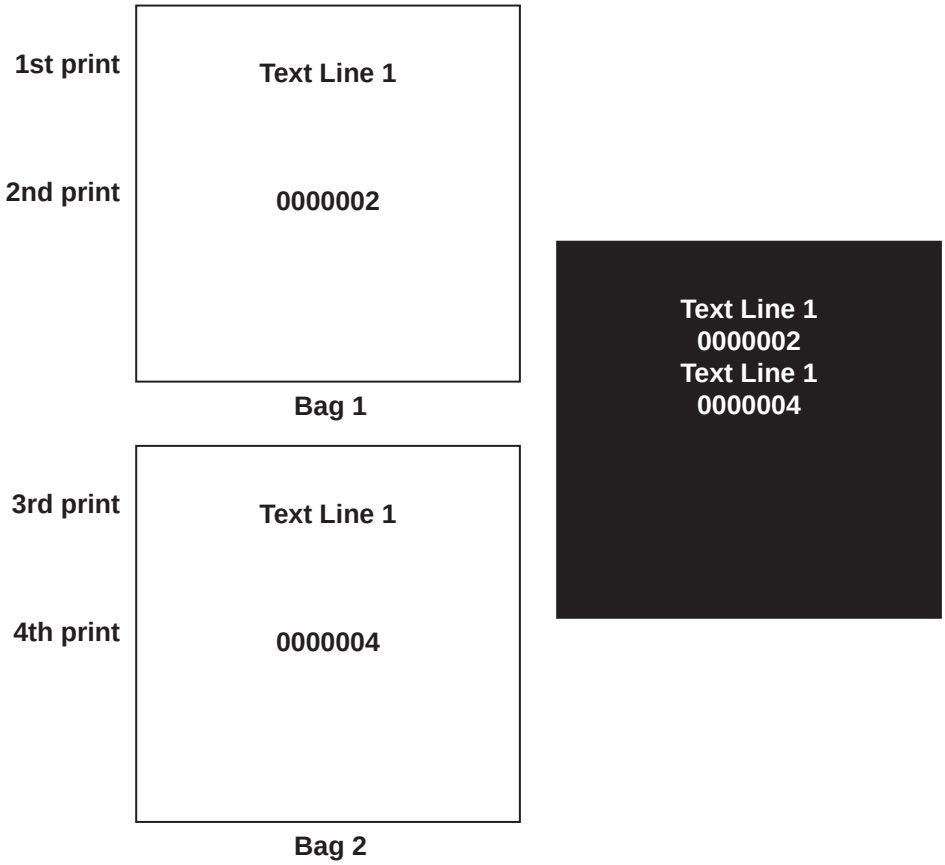
The “Whitespace mode” can be used where a packaging bag requires two or more separate lines of text on the same bag. The image design may have a significant amount of non printed area (whitespace) between the text.
With standard printing this would waste a unacceptable amount of ribbon.
The print signal is initiated only once for each packaging bag.
The printer could perform two prints per bag but timing may be an issue.




**Prints on Packaging Bags** **Ribbon Usage**

Another example of where two prints could be an issue would be where an incremental number is required on each bag. The increments are calculated from the number of prints.
Standard printing using two prints per bag would increment by two digits per bag.

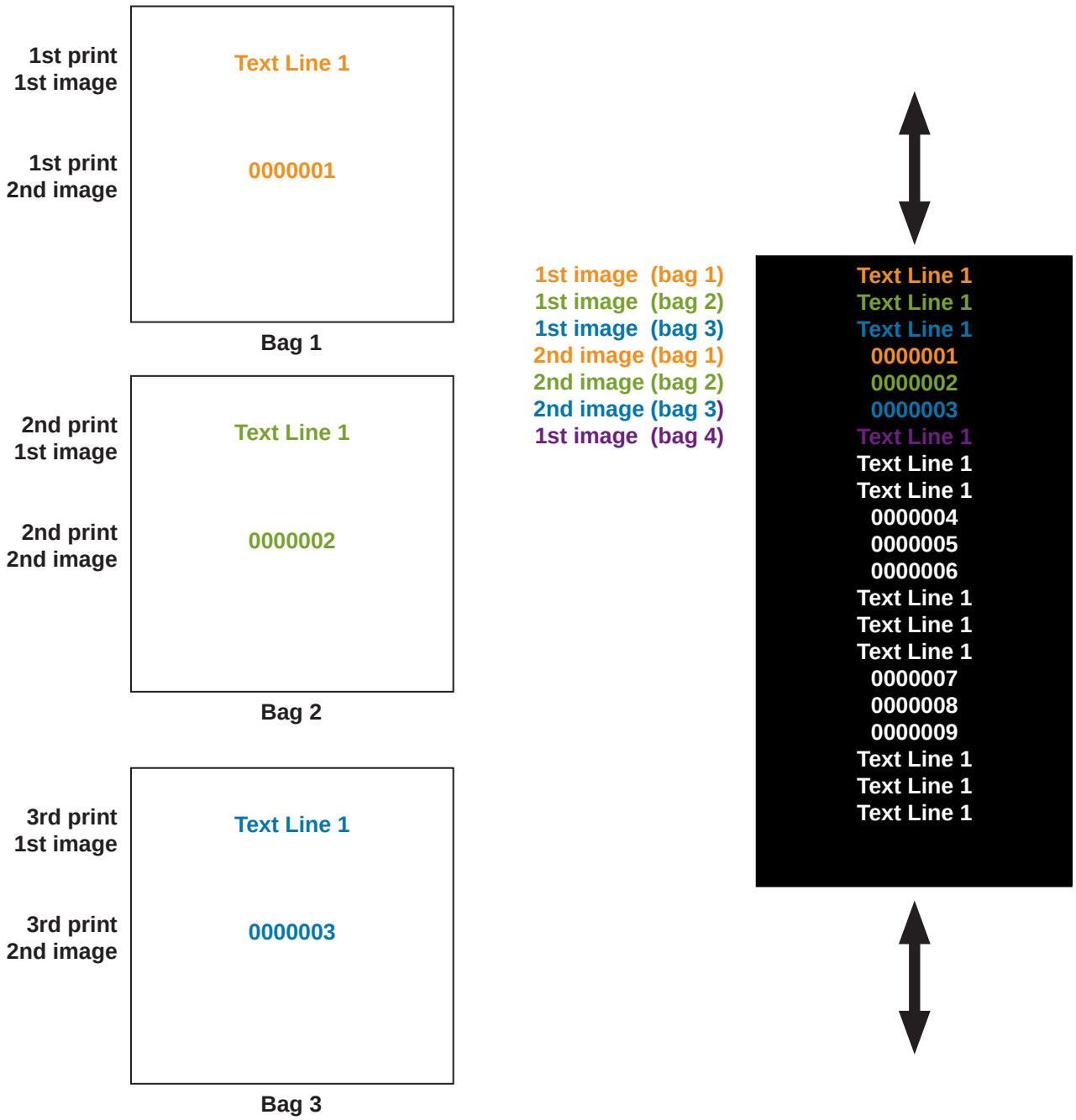
Note! The first and third prints would be regarded as increments.




**Prints on Packaging Bags** **Ribbon Usage**

Using the “Whitespace mode” these problems can be resolved.

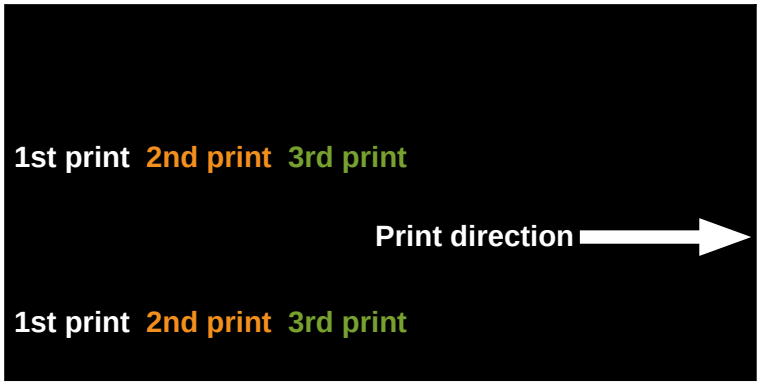
Note! The colours are for representation only.



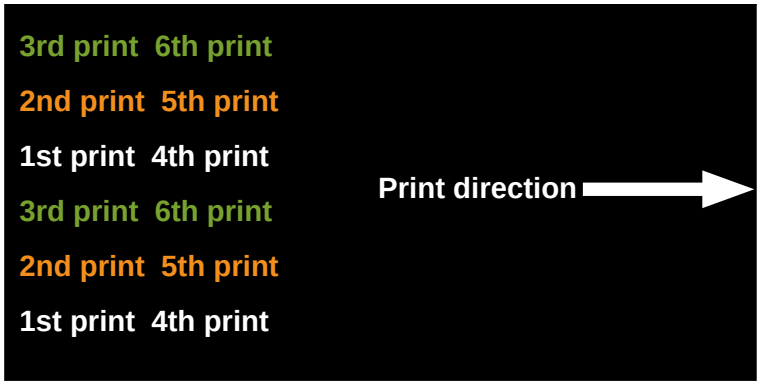

The ribbon is shuttled backwards and forwards until all of the available unused ribbon is utilised. The printer will then start the printing sequence again with bag 4.

## Radial Whitespace

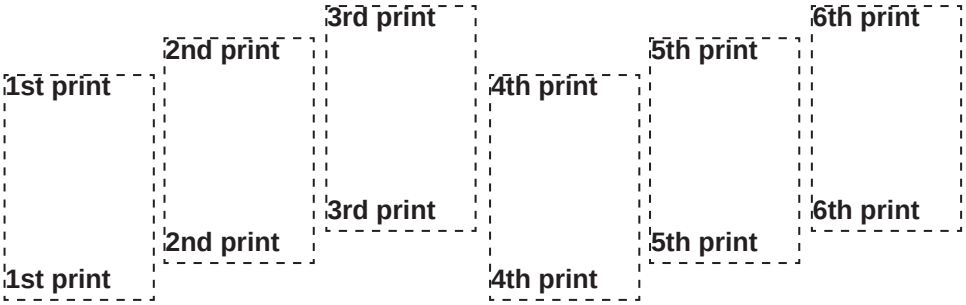
Radial whitespace can be used where images are printed radially and have a significant amount of whitespace on the image.
The image is moved accross the printhead until the unused ribbon is printed upon.




Without Radial whitespace



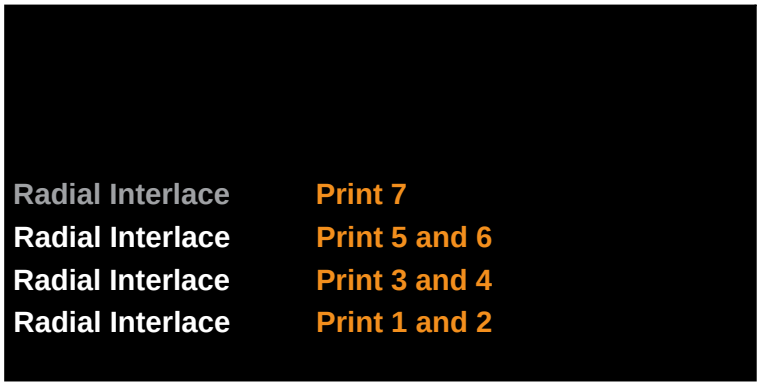

With Radial whitespace



## Radial Interlace Mode

This mode combines the standard interlace mode and the radial ribbon save mode 1

| | |
|---|---|
| Radial Interlace | Print 7 |
| Radial Interlace | Print 6 |
| Radial Interlace | Print 5 |
| Radial Interlace | Print 4 |
| Radial Interlace | Print 3 |
| Radial Interlace | Print 2 |
| Radial Interlace | Print 1 |



# Digital Ribbon Save Mode

Digital Ribbon Save (DRS) mode is a feature of the SmartDate X60 printer that allows you to reduce the amount of ribbon used for each print.

This is achieved by allowing the substrate to run at a faster speed than the ribbon. The difference between the ribbon speed and the substrate speed defines the amount of ribbon saving that can be achieved.

For example: If the substrate speed is 1.5 times that of the ribbon speed, then there is a ribbon saving of 1/3 (33%)

When the ribbon moves at a different speed to the substrate, the size of print is still as designed. This is achieved by stretching the amount of ink removed from the ribbon over a larger area.

An example of this might be as follows:

- Substrate running at twice the ribbon speed:
- A 10 mm long print on the substrate would only use 5 mm of ribbon.
- Substrate running at three times the ribbon speed:
- A 9 mm long print on the substrate would only use 3 mm of ribbon.

Digital Ribbon Save mode offers lower costs by using less ribbon per print than high pack rate mode. Five levels of ribbon saving can be selected. As less ribbon (and therefore less ink) is used per print there is a drop off in print quality as the ribbon saving level increases:

**Lowest:** Offers a 10% reduction in ribbon usage with a print quality comparable to High Pack Rate mode.
**Low:** Offers a 20% reduction in ribbon usage with a print quality slightly lower than High Pack Rate mode.
**Medium:** Offers a 30% reduction in ribbon usage with a print quality lower than the High Pack Rate mode.
**High:** Offers a 40% reduction in ribbon usage with a print quality noticeably lower than the High Pack Rate mode.
**Highest:** Offers a 50% reduction in ribbon usage with a print quality significantly lower than the High Pack Rate mode.

To access the Cost Saving mode setup menu, see section 6 Menus - Print Features - Print Mode.

Three main points must be clearly understood:

1. The print in Digital Ribbon Save mode will be fainter than with Normal or Hi Speed.

2. The higher the Digital Ribbon Save Mode setting the fainter the print will be as it is using less ribbon.

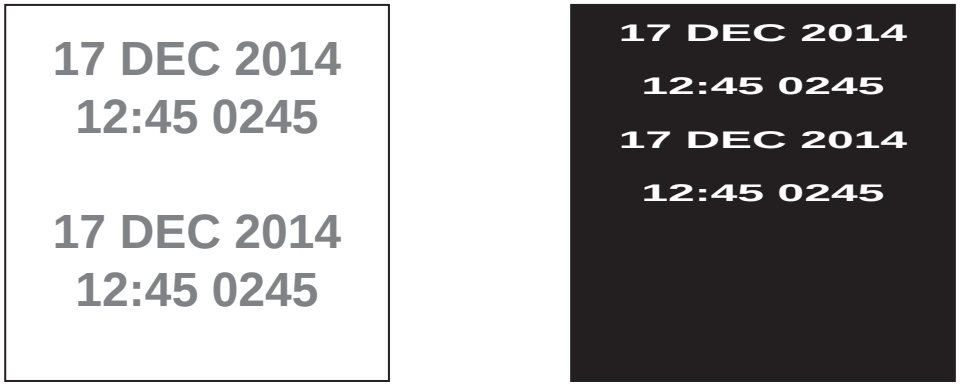
3. The correct set up of the SmartDate X60 is critical as the print gap distance and changes in air pressure for example will affect the print quality.

The prints as they would appear on the ribbon and substrate by using different Cost Saving Mode setting.

Image on Ribbon

Image on Substrate

None Medium Highest




**Note:** In situations where the substrate runs very slowly it is possible for the ribbon to run faster than the substrate in order to achieve a print.

**Minimum and Maximum Print Speeds**

There is a minimum and maximum print speed at which a particular ribbon saving will occur. For SmartDate X60 the minimum and maximum speeds are calculated as follows:

**Minimum speed** for selected ribbon save (mm/s) = 120 * substrate speed multiplier.

**Maximum speed** for selected ribbon save (mm/s) = 800 * substrate speed multiplier.

where:

substrate speed multiplier = 1 / (1 - (ribbon save percentage / 100)

For example:

If the Digital Ribbon Save Mode setting is “Medium” the substrate runs at approximately 1.5 times the ribbon speed. The substrate speed multiplier is 1.5 resulting in a Minimum speed of 180 mm/s (120 * 1.5) and a Maximum speed of 1200 mm/s (800 * 1.5)
Above the maximum ribbon save speed, SmartDate X60 automatically increases the substrate speed multiplier to achieve the closest possible ribbon saving to the initial value. This occurs until a speed of 1800 mm/s is reached - this is the absolute maximum print speed.
Below the minimum ribbon save speed, the SmartDate X60 automatically reduces the substrate speed multiplier to achieve the closest possible ribbon saving to the initial value. This occurs until a speed of 120 mm/s is reached at which point the substrate speed multiplier will remain at 1 (i.e. a ribbon saving of 0) down to 70 mm/s.

### Absolute Maximum Speed

The absolute maximum speed for Digital Ribbon Save Mode is specified as 1800mm/s. This speed can be achieved using a ribbon saving of 56%. The SmartDate X60 will allow ribbon saving above 56%, however the SmartDate X60 will only operate to a maximum speed of 1800mm/s. The maximum achievable ribbon saving is 67% (when the substrate is running at 3 times the ribbon speed).

### Absolute Minimum Speed

There is an additional function which Digital Ribbon Save Mode can provide to customers who want to keep printing while the packaging machine is slowing down (typically to ensure the last print is completed). If Cost Saving Mode is turned on, regardless of the ribbon save percentage, then the minimum print speed for the SmartDate X60 reduces from 70mm/s to 30mm/s. Below 70mm/s the SmartDate X60 reverses the Digital Ribbon Save Mode operation and runs the ribbon faster than the substrate, so that each dot is longer on the ribbon than on the substrate – this mode wastes ribbon but enables the SmartDate X60 to continue printing down to its absolute minimum print speed of 30mm/s and is typically used to complete the last print when the packaging machine is stopping.
This mode can only safely be used with images up to 42mm long. This is because the image on the ribbon is longer than the image on the substrate and at the absolute minimum speed of 30mm/s an image length of 42mm on the substrate requires 100mm of ribbon. The SmartDate X60 will not prevent this mode being used with longer images and will attempt to complete the print if possible (for example, if the speed is higher than 30mm/s or some of the image has been printed at a higher speed). The SmartDate X60 will issue a warning if it can not complete a print.

# Relative Motion

The Relative Motion option is available on the Combined versions of the SmartDate X60 only.
It can be used with both the Intermittent and Continuous options of the Combined printers.
Relative Motion allows the SmartDate X60 to finish off a print that has been interrupted during the normal printing process.

To access the Relative Motion mode setup menu, see section 6 Menus - Print Features.
When using standard printing conditions the SmartDate X60 will behave in the following ways:

**Intermittent mode:**

When printing with the SmartDate X60 in Intermittent mode, the substrate is required to be stationary while printing takes place. If the substrate starts to move before the print is complete, the resulting print will be elongated or compressed depending on the direction of the substrate motion.

- If the substrate is moving in the same direction as the printhead carriage the print will be compressed.
- If the substrate is moving in the opposite direction from the printhead carriagethe print will be elongated.
- In both cases there is a high risk that the ribbon will break.

**Continuous mode:**

When printing with the SmartDate X60 in Continuous mode, the substrate is required to be in motion while printing takes place. If the substrate stops moving during the printing process, the resulting print will be incomplete.

Relative Motion allows you to configure the SmartDate X60 so that it will complete the interrupted print. There will however be limitations in the length of the original print. This is because of the available movement of the printhead carriage.

With Intermittent mode this will depend on the amount of movement already used by the print carriage.

With Continuous mode this will depend on the limited amount of movement around the print roller.

**How does it work?**

Relative motion works in the following ways:

**Intermittent mode:**

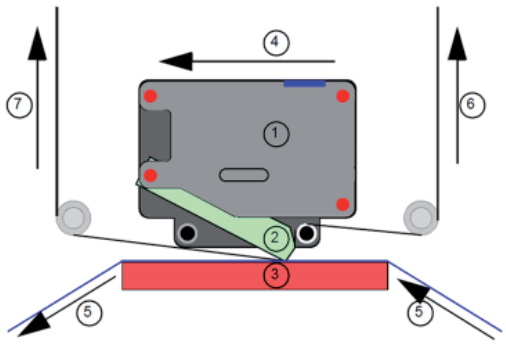
When using Intermittent mode the printer must be fitted with an encoder to monitor the subtrate speed. A high resolution encoder is recommended.

**Example:**

- The printer is set to print at a print speed of 300mm/sec.
- The substrate travels in the same direction as the printhead carriage.
- The normal speed of the substrate when in motion is 200mm/sec.
- The substrate starts to move before the print is complete.
- The SmartDate X60 then has to increase the print speed to match the new conditions (300 mm/sec + the substrate speed 200 mm/sec) 500 mm/sec.

The SmartDate X60 also has to accelerate the ribbon to match the substrate speed in order to complete the print without compressing it.

**Note:** If the substrate is moving when a Print Go signal is received, a warning is issued and no print occurs.

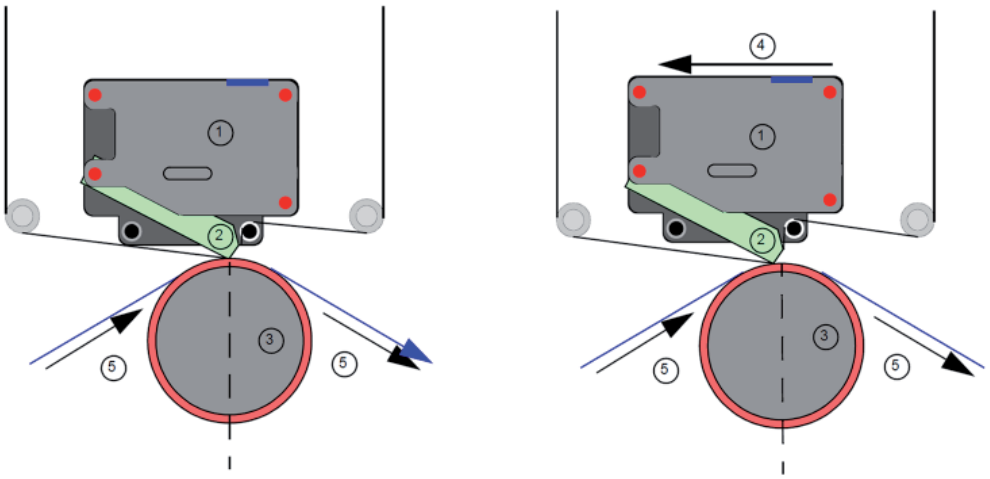



1. Printhead carriage.
2. Printhead.
3. Print platen.
4. Direction of carriage during printing.
5. Direction of Substrate when in motion.
6. Direction of ribbon travel after print (ribbon take up)
7. Direction of ribbon during Relative motion.

**Continuous mode:**

When using Continuous mode, the printer uses the encoder to determine if the substrate has stopped moving before the print is complete.

The SmartDate X60 will then move the printhead carriage in the direction of the unfinished print while following the contour of the print roller before returning to the normal print carriage position.




1. Printhead carriage.
2. Printhead.
3. Print roller.
4. Direction of carriage during relative printing.
5. Direction of Substrate.

The maximum amount of travel available for the printhead carriage is set via the SmartDate X60 menus.

For a standard Markem-Imaje 46 mm diameter roller this is 9 mm.
The Relative motion function will be initiated if the substrate speed drops below the minimum print speed setting, and the amount of print left is less than the maximum relative print travel minus the end border. If this is not achievable the normal low speed print handling will be initiated.

A high resolution encoder is recommended.

# Low Speed Print Mode

This is a Continuous printer option.

SmartDate X60 Continuous printer can be set to react in several different ways, if the Host packaging machine stops during the print cycle.

To access the Low Speed Print Mode setup menu, see Printer Configuration - Machine.

The options are:

- None
- Continue
- Reprint

**None**

This is the Default setting.

In this mode if the Host machine stops during a print cycle, the SmartDate X60 will lift the printhead and wait for the packaging machine to re-start.

During this time the option to Discard the print will be displayed on the screen.

If the print is not discarded, and the substrate starts to move again, the SmartDate X60 will continue with the print. The image in this case may have a small part of the print missing, as the printer requires time for the head to move.

### Continue

Associated with this mode is the Discard Print Time.

In this mode if the Host machine stops during a print cycle, the SmartDate X60 will lift the printhead, and wait for the Discard Print Time to elapse.

During this time the option to Discard the print manually will be displayed on the screen. If the substrate starts to move again before the Discard Print Time has elapsed the SmartDate X60 will continue with the print. The image will restart once the prithead is down and the ribbon speed is above the minimum print speed . This may mean a gap in the printed image without any loss of information.

If the print is not manually discarded and the packaging machine does not re-start before the Discard Print Time has elapsed the print will be automatically discarded.

SmartDate X60 will then continue with the next print signal.

### Reprint

If the previous situation is not acceptable, the Reprint option may be used.

In this case the procedure is as for Continue, but when the substrate starts to move again the whole image will be reprinted.

The position of the printed image will differ slightly from normal.

*NOTE: When low speed handling is set to Continue or Reprint the SmartDate X60 will track the substrate (once the print has started), even when the substrate speed has dropped below the minimum print speed. This means that if the substrate is jogged at low speed (i.e. less than min. print speed) past the printer the ribbon could wind indefinitely. To prevent this a limit of (image length +100mm) has been applied after which the print will be automatically discarded and the printer will wait for the next print go signal. In general if you want to pull substrate past the printer at below the minimum print speed you should first take the printer out of 'producing'.*

# Job selection

# Job selection

# Introduction

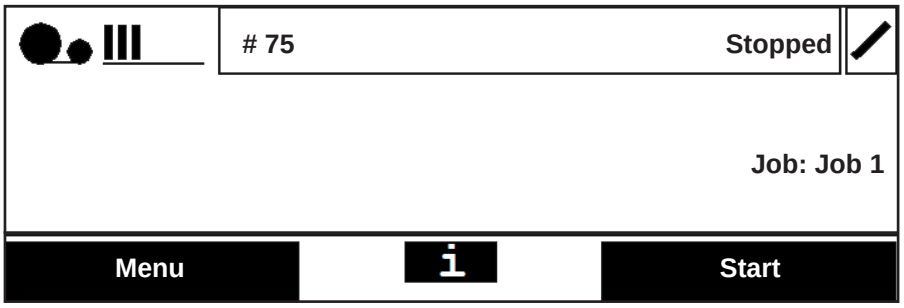
Topics covered in this section include:

- Job Setup Screens
- Data Entry Screens
- Date Entry Screens

# Job Setup Screens

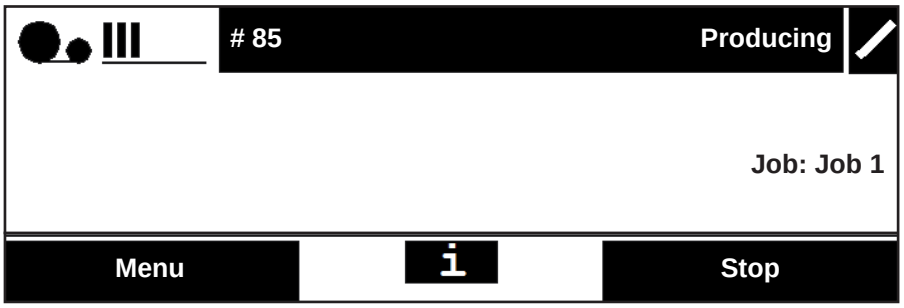
Job setup can be performed with the SmartDate X60 in a Stopped condition or with it in Run mode.

1 **Stopped**



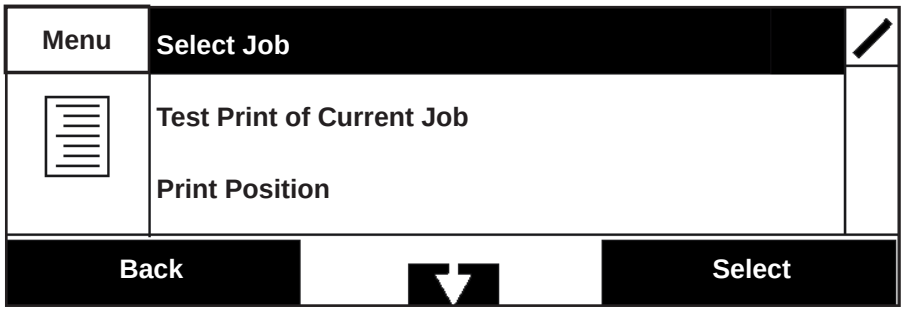

Select Menus by pressing the left button.

2 **Run**

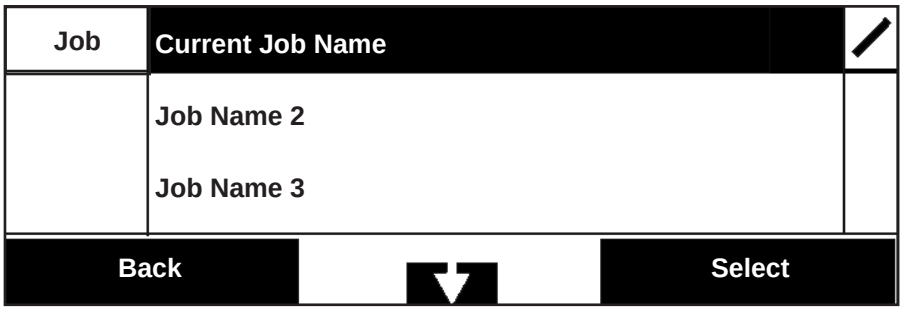



Select Menus by pressing the left button.

3 The first option in the Menu is Select Job




4 On choosing “Select Job” from the main menu, the first step is to select which Job you want to setup.




The Current Job is always the first in the list.
To select a new Job use the bottom Quad button to scroll through the options.

# Job Setup Menus

SmartDate X60 provides several different ways of selecting a new Job.

Job Setup depends if the Default Job is to be used or where Job information is stored.

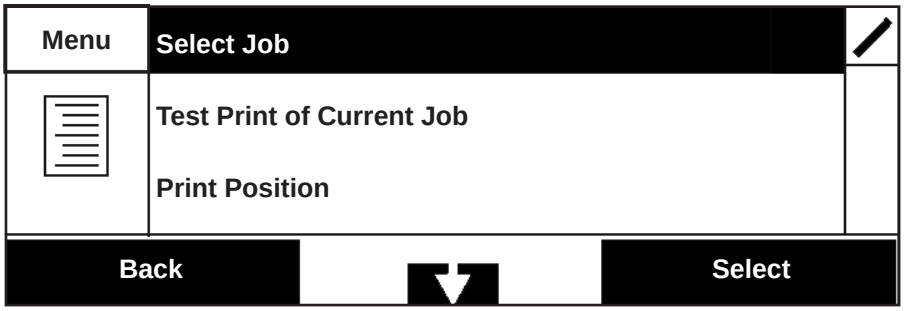
e.g. In the SmartDate X60 Local database or at a Host PC running CoLOS Control.

## Job Setup using the Default Print Design.

This option allows you to enter up to four lines of text at the User interface. The size and type of font is limited to 8 point Arial Bold.
The number of characters available on each line is approximately 20.
The number of different characters supported by the SmartDate X60 Default text screen is language dependant.
This type of design does not support live updates, such as Time and Date fields, Best before Dates or Shift Codes.
To create a Job with this method follow the procedure below

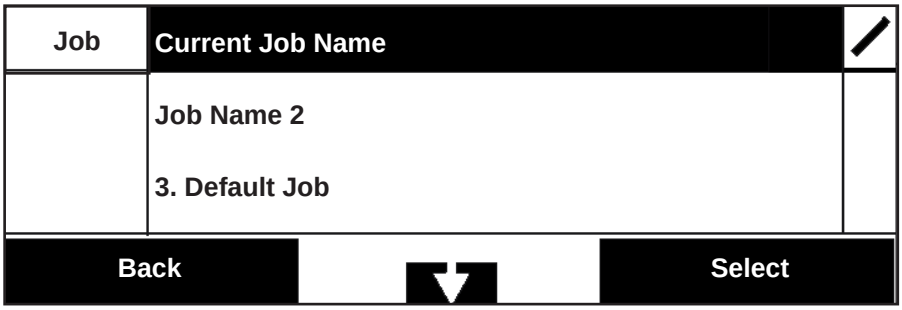
1. From the main screen select Menu by pressing the left button.

2. The Menu screen is displayed.



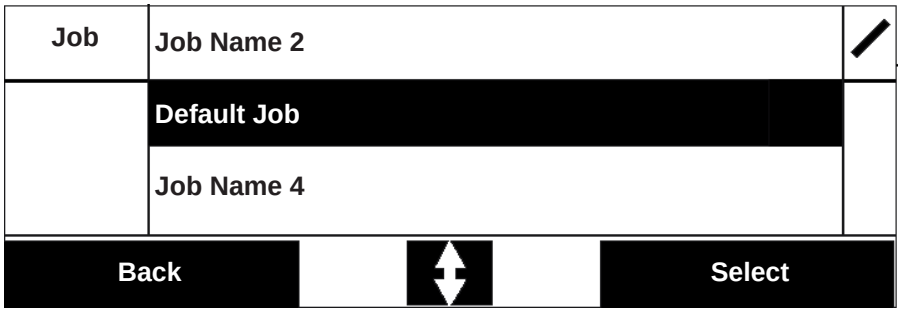

Configure a new job by pressing the right button (Select) while the “Select Job” option is highlighted.

3 A list of available Jobs appears.



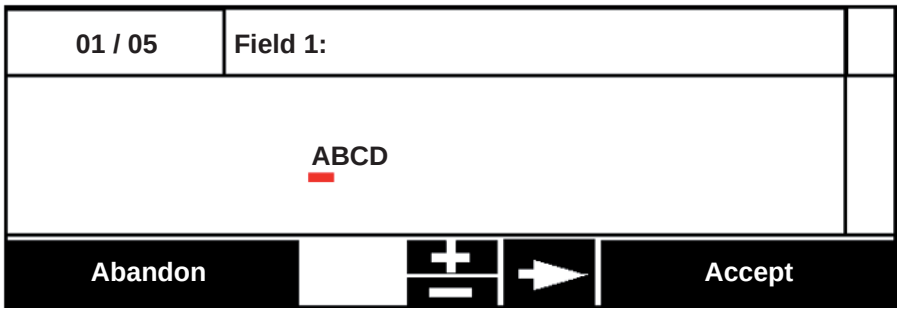

Use the bottom quad button to scroll to the Default Job.

4 Select the Default Job by pressing the right button.




Alternatively use the Filter function to find the Default Job.
See Machine Operation - Filtering the list of Job names

5 The Default Job Setup Screen appears.




Use the Quad buttons to select the required characters for each line of text.

6 Press the Accept button after each line is completed.

7 If no text is required on a particular line press Accept to leave it blank.

8 When complete select Confirm by pressing the right button.

9 If the printer was in Producing mode the new Job will now be printing, if not select Run to start printing.

## Using CoLOS Create Pro

These designs allow for much more functionality to be added to the Image such as:

- Bar codes
- Time Date fields
- Date Offset fields
- Machine ID fields
- Shift Codes

For full information about CoLOS Create Pro please consult the relevant documentation.

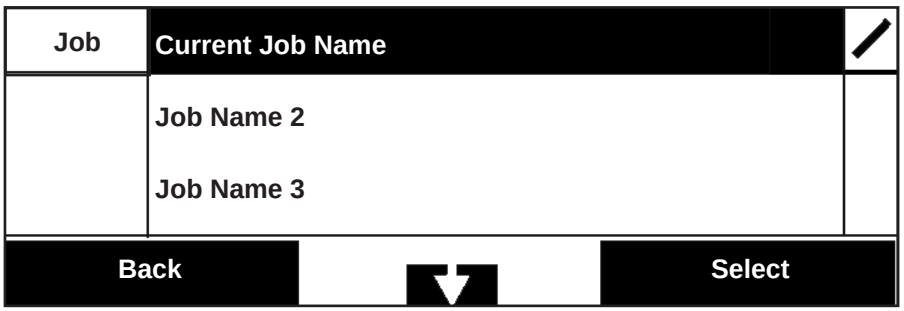
Print designs created on CoLOS Create Pro can be incorporated into a Job file and then stored in the SmartDate X60 local database or on a Host PC running CoLOS Control.

## Job Setup using the Local Database

To select a Job by this method follow the procedure below:

1 Configure a new job by pressing the right button (Select) while the “Select Job” option is highlighted.

2 A list of available Jobs appears.

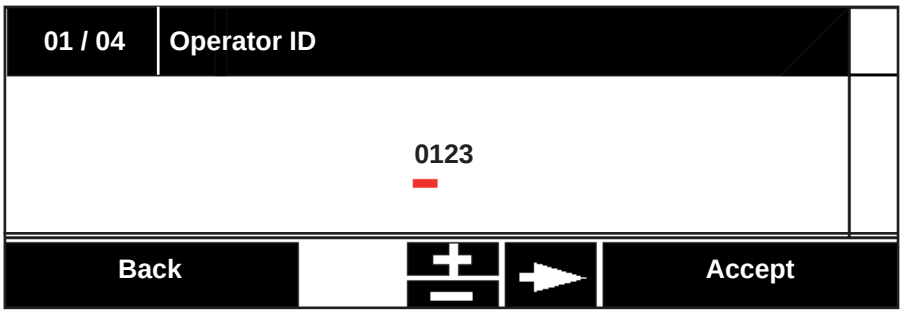



Use the bottom quad button to scroll to the required Job.

3 Select the required Job by pressing the right button.

> Alternatively use the Filter function to find the Default Job.
> See Machine Operation - Filtering the list of Job names

Once the required Job has been selected the user may be prompted to add additional information to the Job.




**For example:**

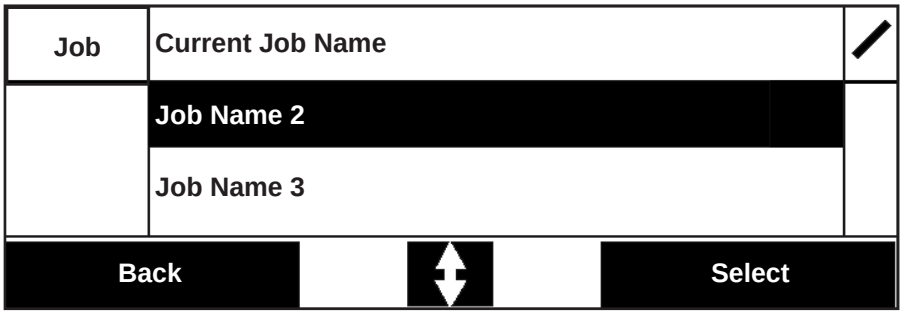
- User Input text. such as a Bar code number
- Operator Identification code.
- BBE information.

Use the **Quad buttons** to select the required characters for each line of text.
After each prompt action is complete press the right button to **Accept** and continue.
Once all are complete select **Confirm** by pressing the right button.

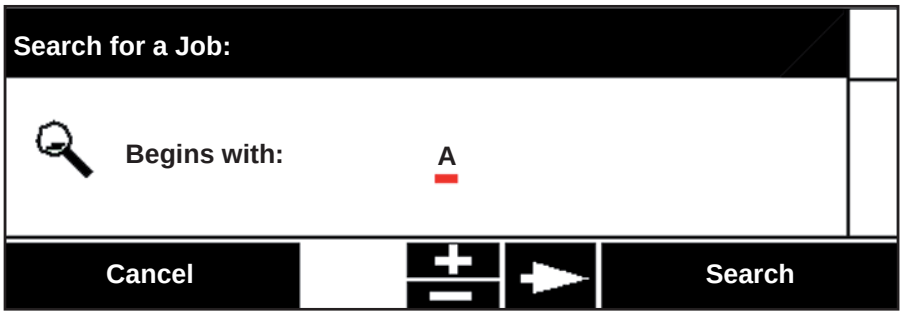
## Filtering the list of Job names

There may be hundreds of Jobs in the local SmartDate X60 database.

1 If the number of Jobs in the local database is greater than 10, the search engine appears above the left Quad button.

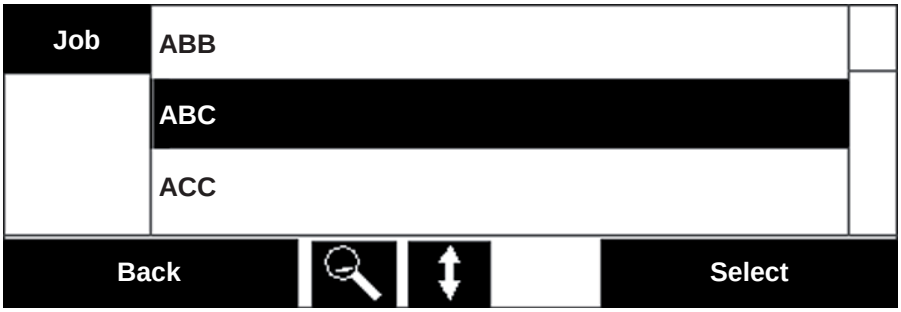



2 Pressing the left Quad button brings up the Search for Job screen.




Enter the required character by using the upper or lower Quad buttons, or if more characters are required use the right Quad button to move the cursor to the next position.
Press the right hand Search button to activate the search.

3




The Jobs beginning with the requested character/s are displayed.
If the list of Jobs is more than 10, the search can be refined again to limit the number displayed.

## Job Setup using a Host PC

To select a Job with this method follow the procedure below:

1. Configure a new job by pressing the right button (Select) while the “Select Job” option is highlighted.
2. The Job Name screen is displayed.
3. Enter the name of the required Job by using the Quad buttons.


When complete press the right button to Confirm.

The Job file will be retrieved from CoLOS Control and loaded into the SmartDate X60 printer memory ready for printing.

## Long Job Names

If it is necessary to have long Job names the name of the Job will be truncated in the list.

To indicate that there is more of the Job name to see, a series of five dots replace the last five characters.


The soft button label icon will appear over the right Quad button.

Press this button to view the rest of the Job name.

# Data Entry Screens

Data entry screens will vary dependant on the menu option that has been selected.

These screens can be grouped as follows:

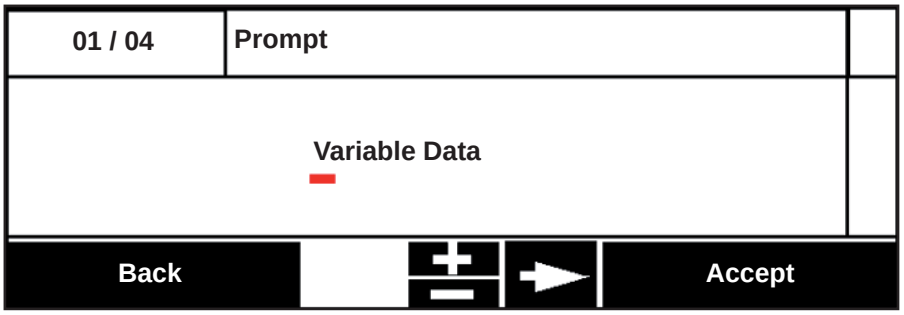
- Prompted Data Entry Screens
- Date Entry Screens
- Settings Adjustment Screens
- Job Setup Screens

## Prompted Data

Prompted data entry screens collect input from the user as a result of Job designs that requires variable data to be entered during the Job selection process.

Because the Job design can prompt for different types of input, the screen types vary.

### Alpha Data Entry Screens



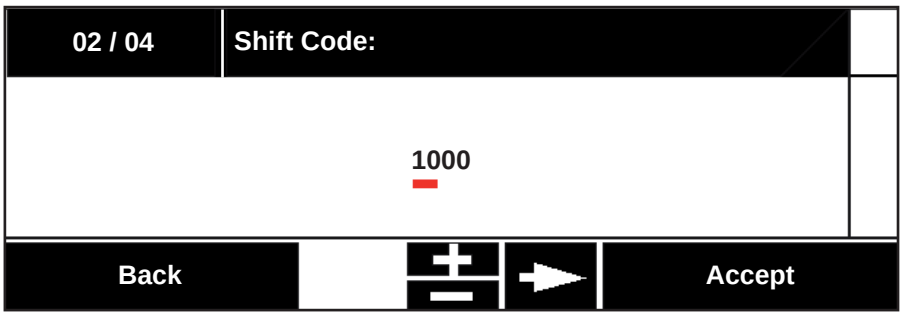

Here the numbers in the upper left hand box indicate that this is the first of four data entry prompts in the Job selection process.

The cursor sits under the first character in the variable data allowing for this to be edited by using the upper or lower Quad buttons.

The available characters that can be used will depend upon the language that has been selected.

By moving the cursor along the line of text, each character in turn can be edited.

■ Numeric Data Entry Screens




Here the numbers in the upper left hand box indicate that this is the second of four data entry prompts in the Job selection process.

The cursor sits under the first number in the variable data allowing for this to be edited by using the upper or lower Quad buttons.

The available numbers will be limited to 0 - 9.

By moving the cursor along the line of number, each number in turn can be edited.

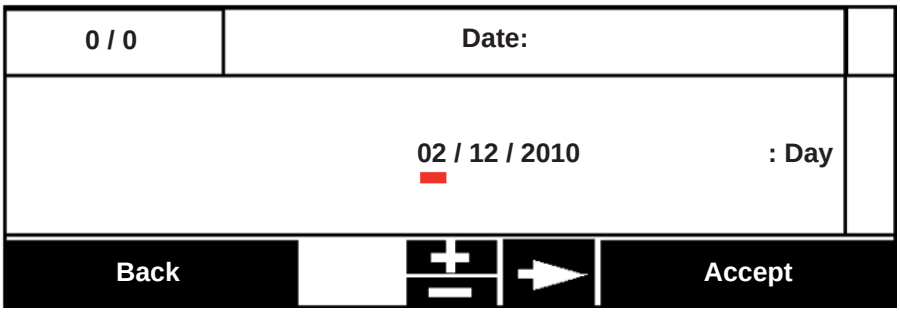
# Date Entry Screens

There are three types of “Date Entry” screens that the User Interface has to support:

- Literal Date Entry
- Offset Date Entry
- Fixed Format Prompted Date Entry

## Literal Date Entry

This screen is used to prompt the setting of a fixed date to be printed. There is no calculation made on this date, it is displayed (Prompted) in the format that it will be printed. This means that the fields that make up the date string, can appear in any order, depending on how it was set at the design stage.

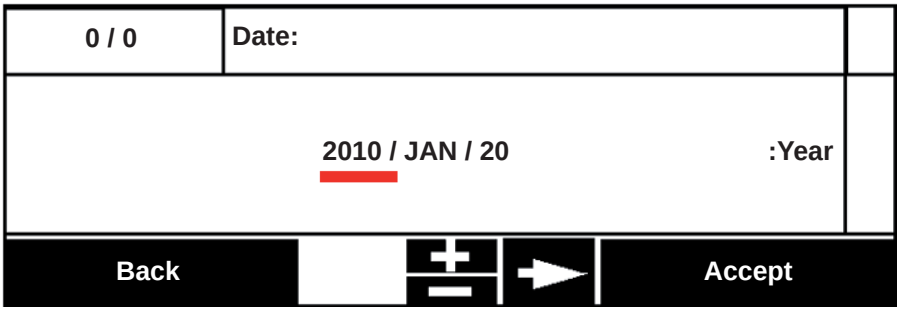



The cursor sits under the first set of numbers in the date string allowing for this to be edited by using the upper or lower Quad buttons.

In this case the available numbers will depend on the number of days in the selected month. (i.e. Dec. - 31 days)

Incrementing the Month may also affect the day number.

e.g. If the month in this date string 31/12/2010 is changed to 11, the day number would default to 30.




The cursor always defaults to the left of the date string, in this case the year.

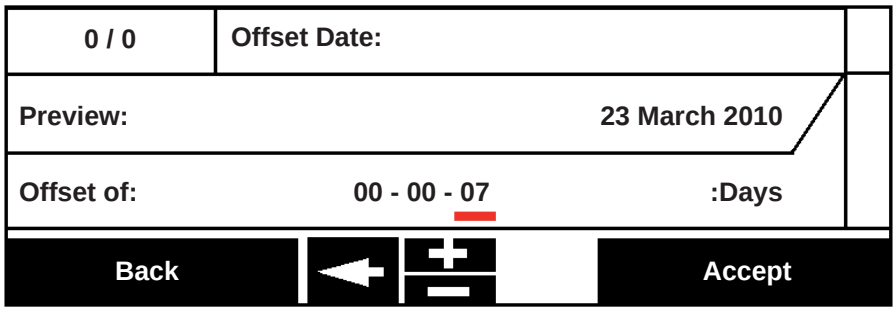
By using the upper or lower Quad buttons the year will increment or decrement by one year. (i.e. 2011 or 2009)

The text at the right hand side of the screen indicates which date option is active Day, Month or Year.

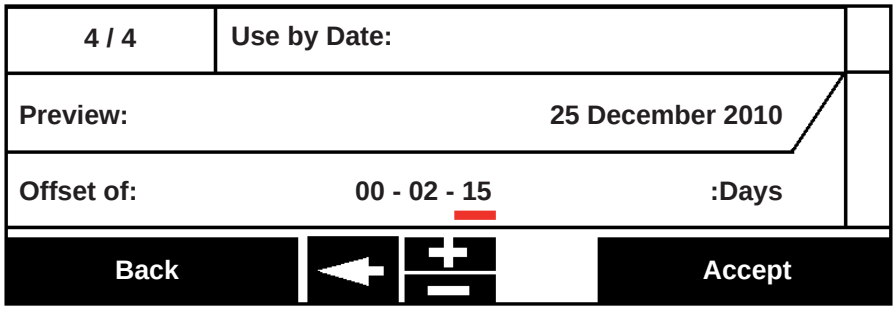
By moving the cursor along the date string, each option in turn can be edited.

## Offset Date Entry

This screen is used to set an offset from the SmartDate X60 internal clock and to preview what the resultant date would be.



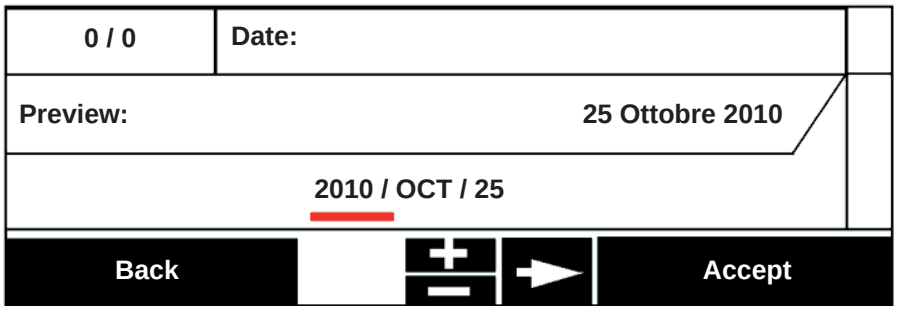

This example shows an offset of seven days, so the actual date that the SmartDate X60 internal clock is set to is the 16th March 2010.




This example shows an offset of 2 months and 15 days, so the actual date that the SmartDate X60 internal clock is set to is the 10th October 2010.

## Fixed Format Date Entry

This screen is used to set a literal date to be printed, but this time the date is displayed in a fixed format. An example of where this option may be used is where the product is destined for another country. The user can set the date in their native language, and the preview will display how it will be printed in the other language.

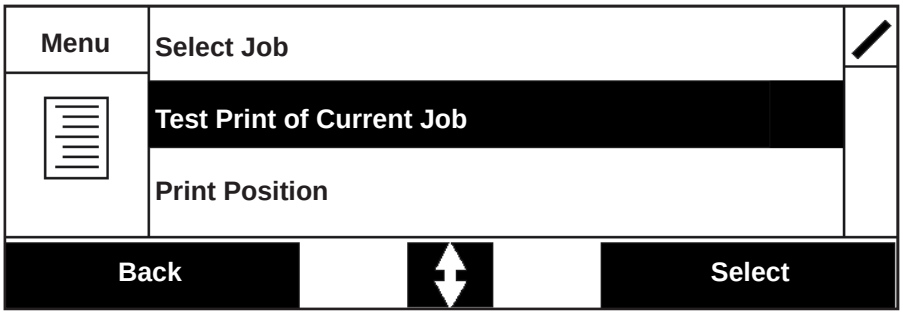


# Test Print of the Current Job

This option allows you to activate a test print of the current selected job.

To access the Test Print option:

From the Menu screen select **Test Print of the Current Job**.




If the machine type is an Intermittent printer the print will be activated immediately.

If the machine type is a continuous printer the target material must be in motion for the action to take place.

## Master-Slave Function

This allows you to configure one Smartdate (Set as the Master) to control the current job on another Smartdate (Set as the Slave)

When operating in this mode it is possible to:

Determine the basic operational state of the Slave printer from the Master SmartDate.

Determine if slaves are connected or not and if they are active printing.

Select jobs simultaneously across two SmartDates (One Master + One Slave)entering any required data once only.

Jobs can be resident in each SmartDate local database, or these can be downloaded to Masters and /or Slaves from CoLOS Control.

Optionally, synchronise Start/Stop printing across slaves.

Synchronise the clock date/time of the slaves to the master. The date and time are automatically synchronised when the Master connects to the Slave. The time / date can subsequently be adjusted either through the Master or from a third party host (eg CoLOS)

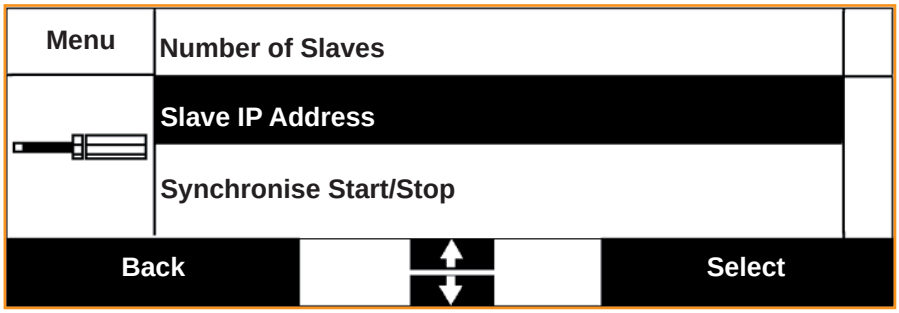
## Connecting Masters to Slaves

Master / Slave functionality uses Ethernet to support communication between units. When SmartDates need to be paired they can be connected to each other by using an Ethernet cross-over cable.
Machines can also be Networked together using a Switch / Hub. This configuration also allows connection of the SmartDates to Host software (e.g. CoLOS Control) as well as each other.

## Configuring the System

The Master / Slave function is configured on the SmartDate that is to be used as the Master. This is done through the NGPCL menu on the Master SmartDate.
The number of Slaves, IP address and Synchronise Start /Stop options are configured from this screen. (See Printer Configuration)

You can also configure the Master to be in control of the Slaves printing process. When Start or Stop is pressed each Slave behaves accordingly. Whether or not you choose to do this depends on the type of application you are running. If you are using more than one SmartDate to print onto a single pack this setting set to “Yes” will be beneficial.



# Job selection

# Printer configuration

# Introduction

This section describes how to navigate the menus and the options available.

Topics covered in this section include:

- Menu Structure.
- Accessing the menus.
- Main menu options.
- Engineering menus.
- Configuring Date and Time settings including Date Offsets.
- Manual Control of the printer.
- Digital I/O Control.
- Configuring various printer operation settings.
- Viewing Diagnostic information.
- Viewing statistics about the printers performance.
- Selecting a Test Image.
- Select the User Interface language.
- View and management Database Information.
- View Printhead Information
- View Printer Health

Most of these settings should only require configuring directly after installation.

Some others, such as the Print Darkness may require periodic adjustment.

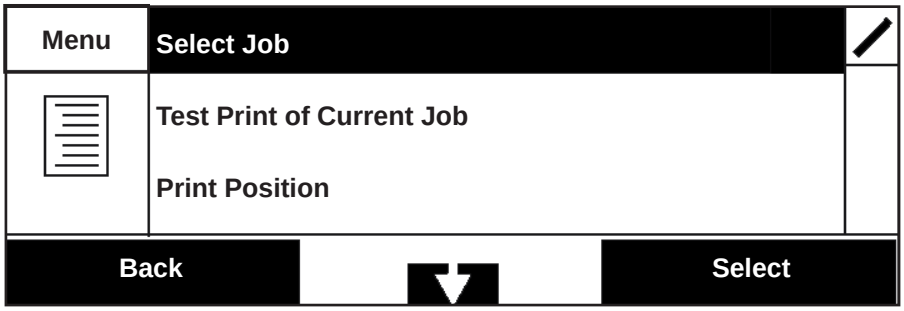
*NOTE: In the following menu tree (#) signifies that a constraint applies. See Settings constraints.*

# Accessing the Menus

1 From the main screen select Menus by pressing the left button.

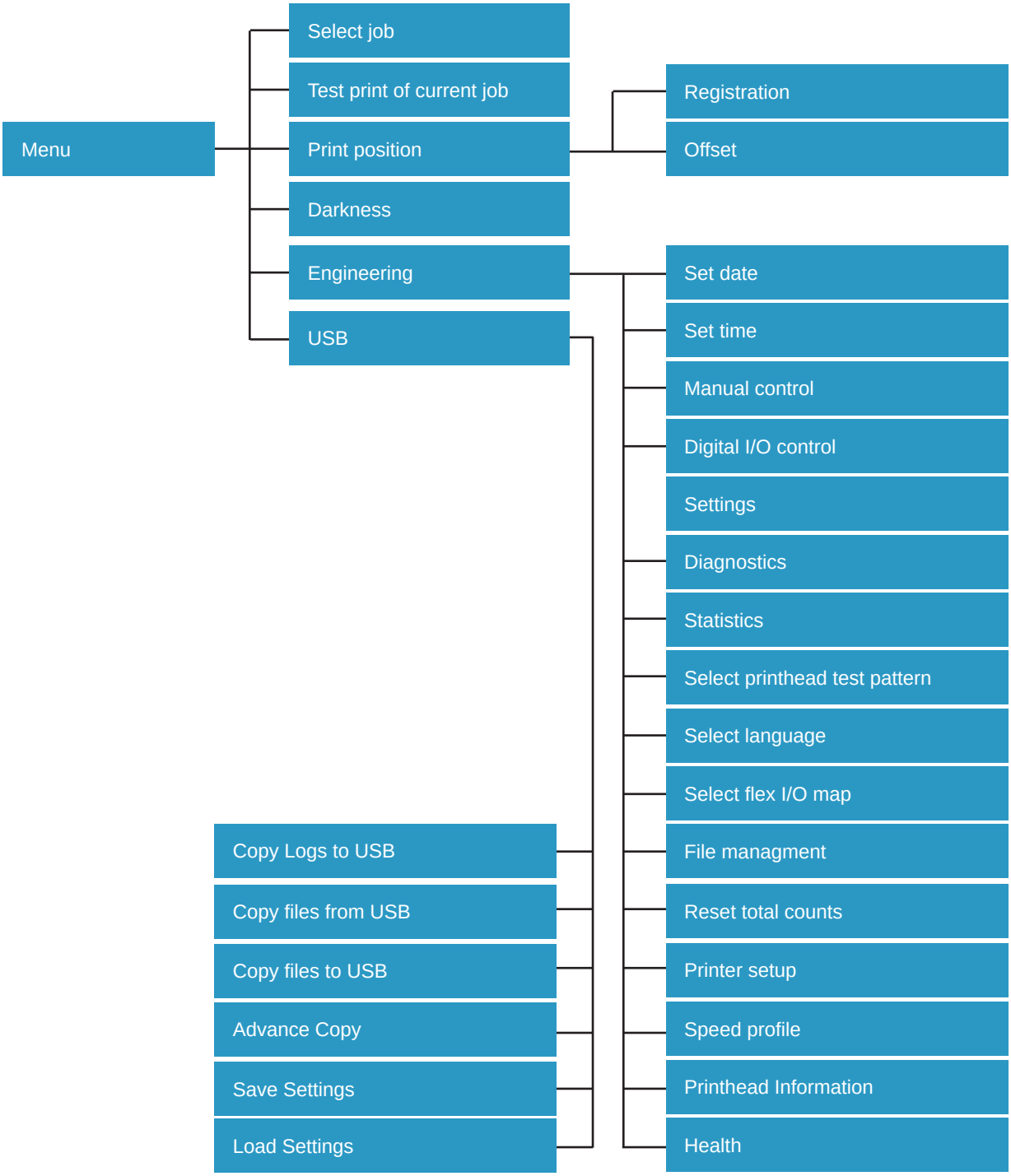
If an Access Code is prompted for enter the code.

2 The Main Menu screen is displayed.

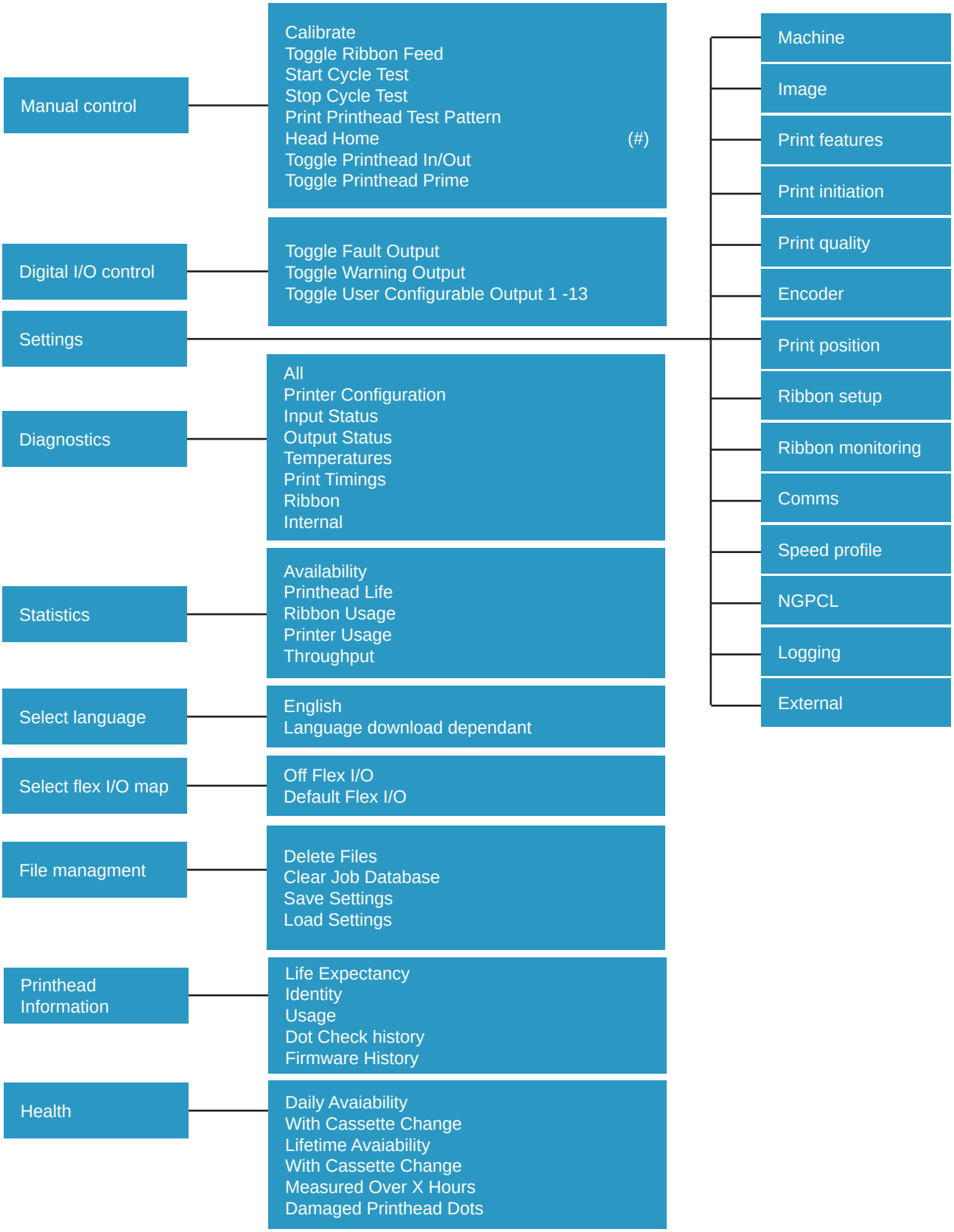


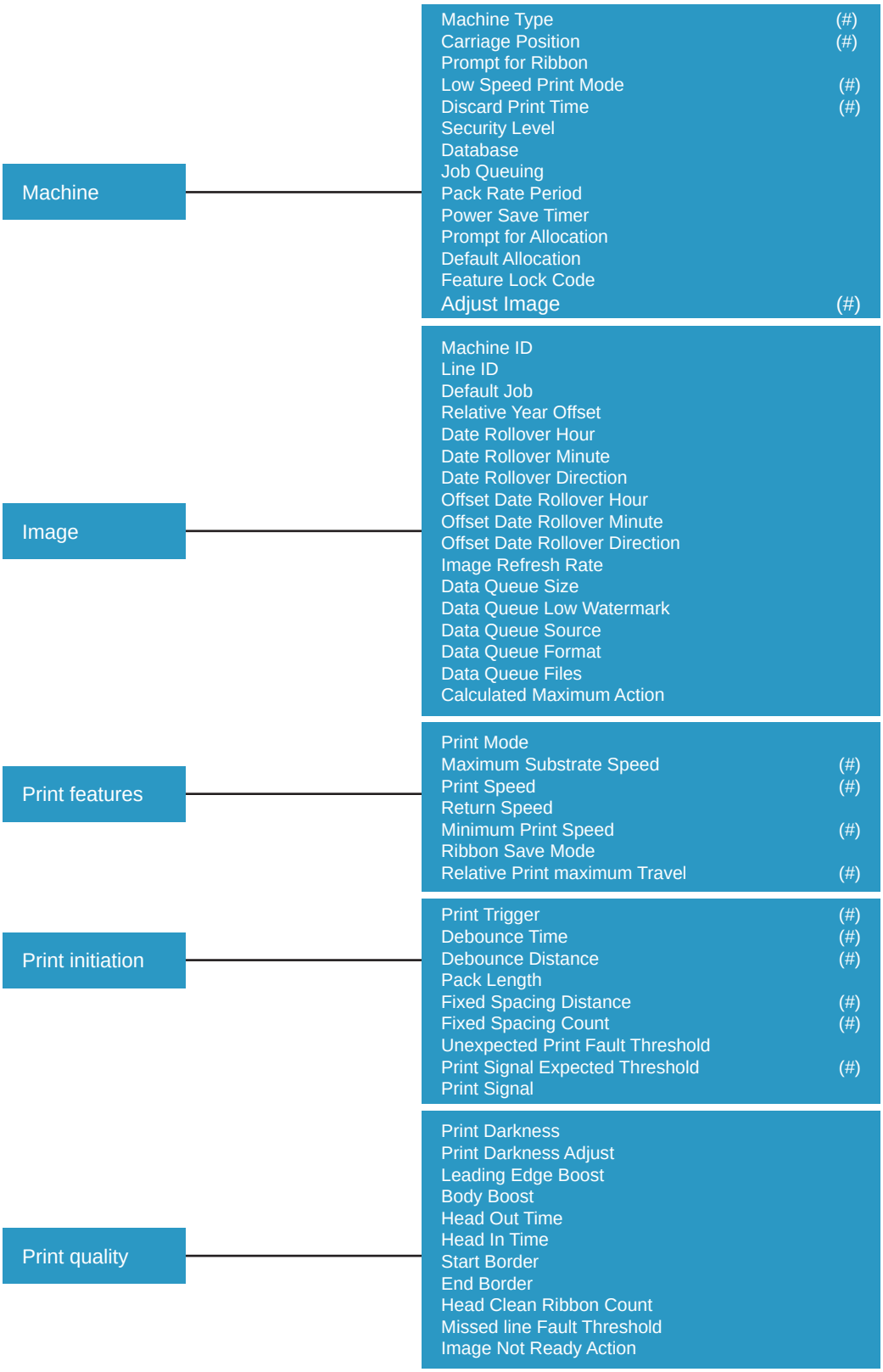

The Main Menu screen allows you to:
- Select a job
- Activate a Test print of the current job
- Adjust the print position.
- Adjust the print darkness level.
- Access the Engineering menus.

## Menu Structure

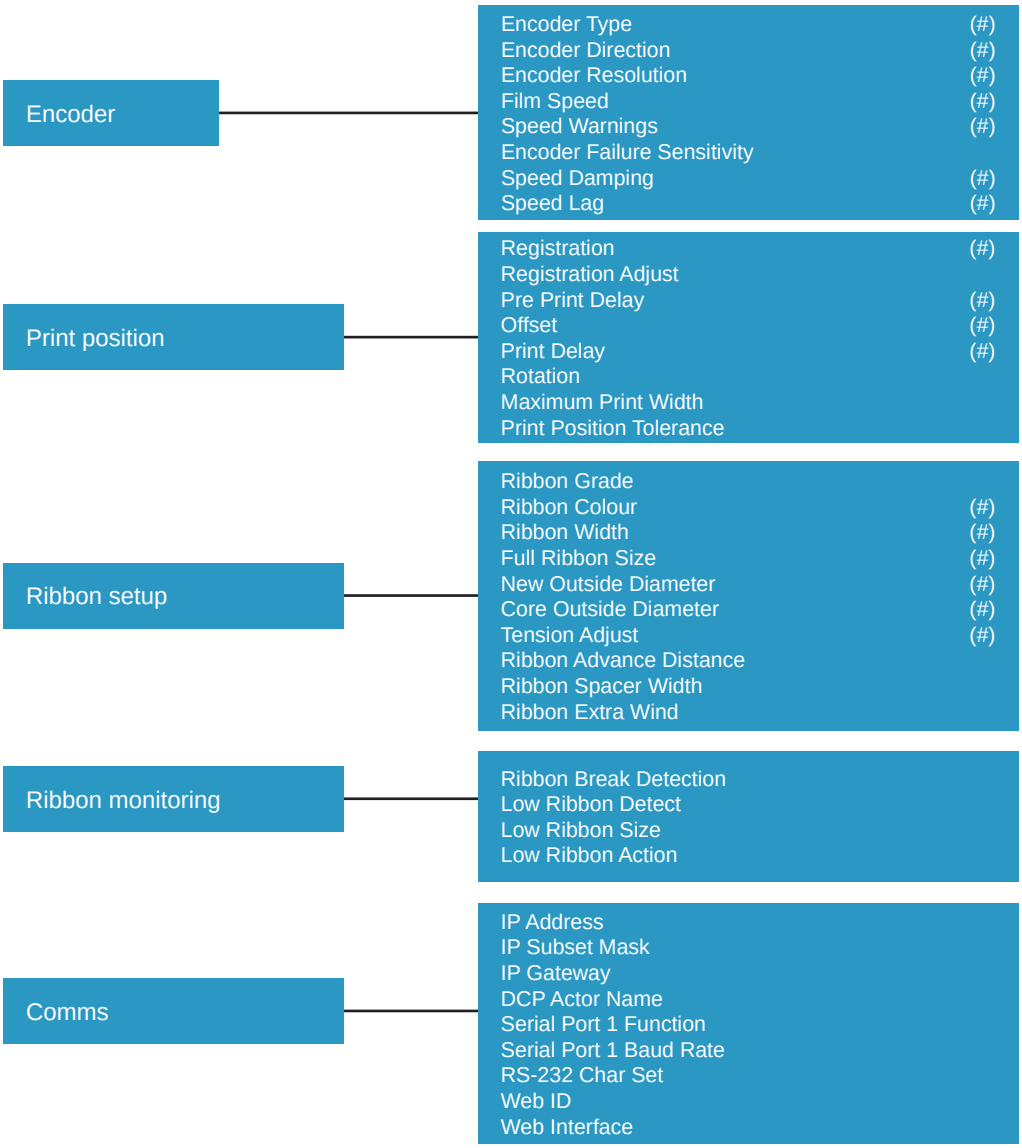


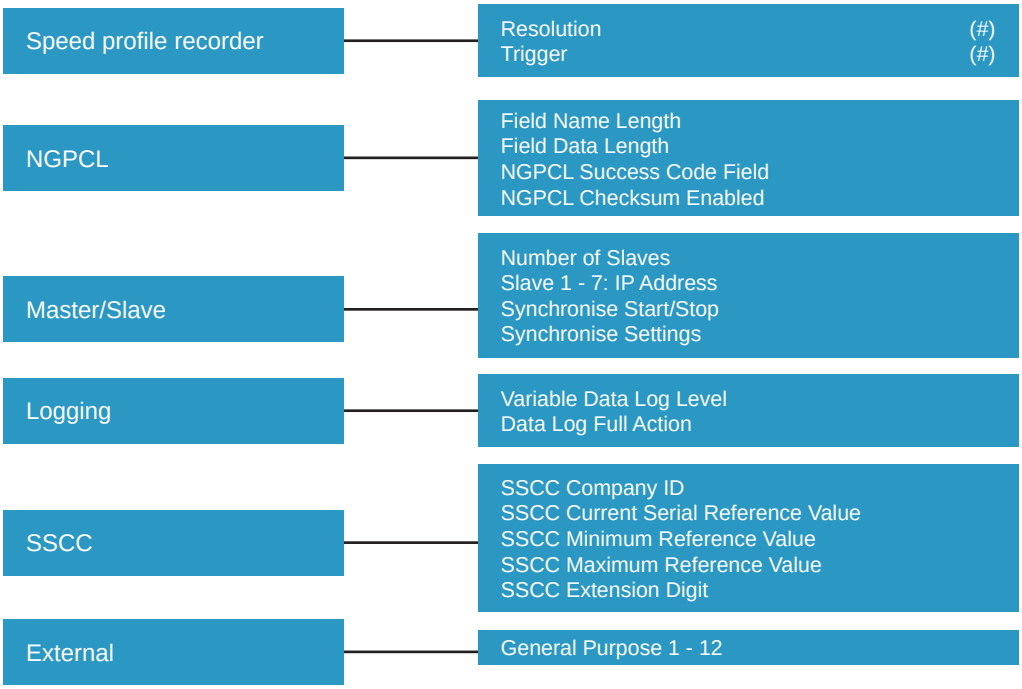
# Printer configuration




Machine
Machine Type (#)
Carriage Position (#)
Prompt for Ribbon
Low Speed Print Mode (#)
Discard Print Time (#)
Security Level
Database
Job Queuing
Pack Rate Period
Power Save Timer
Prompt for Allocation
Default Allocation
Feature Lock Code
Adjust Image (#)
Image
Machine ID
Line ID
Default Job
Relative Year Offset
Date Rollover Hour
Date Rollover Minute
Date Rollover Direction
Offset Date Rollover Hour
Offset Date Rollover Minute
Offset Date Rollover Direction
Image Refresh Rate
Data Queue Size
Data Queue Low Watermark
Data Queue Source
Data Queue Format
Data Queue Files
Calculated Maximum Action
Print features
Print Mode
Maximum Substrate Speed (#)
Print Speed (#)
Return Speed
Minimum Print Speed (#)
Ribbon Save Mode
Relative Print maximum Travel (#)
Print initiation
Print Trigger (#)
Debounce Time (#)
Debounce Distance (#)
Pack Length
Fixed Spacing Distance (#)
Fixed Spacing Count (#)
Unexpected Print Fault Threshold
Print Signal Expected Threshold (#)
Print Signal
Print quality
Print Darkness
Print Darkness Adjust
Leading Edge Boost
Body Boost
Head Out Time
Head In Time
Start Border
End Border
Head Clean Ribbon Count
Missed line Fault Threshold
Image Not Ready Action

# Printer configuration




Speed profile recorder
Resolution (#)
Trigger (#)
NGPCL
Field Name Length
Field Data Length
NGPCL Success Code Field
NGPCL Checksum Enabled
Master/Slave
Number of Slaves
Slave 1 - 7: IP Address
Synchronise Start/Stop
Synchronise Settings
Logging
Variable Data Log Level
Data Log Full Action
SSCC
SSCC Company ID
SSCC Current Serial Reference Value
SSCC Minimum Reference Value
SSCC Maximum Reference Value
SSCC Extension Digit
External
General Purpose 1 - 12

# Settings Constraints

Some Settings menu items have constraints. i.e. They will only be displayed if certain settings conditions apply.

The following list shows which menu items have constraints and the conditions that apply:

File Management: Maintenance Engineer Password Required.

| Machine | |
|---|---|
| Carriage Position | Continuous printer only. |
| Low Speed Print Mode | Continuous printer only. |
| Discard Print Time | Continuous printers only and Low Speed print mode set to Continue or Reprint |
| Print Features Group | |
| Maximum Substrate Speed | Continuous printer only. |
| Print Speed | Intermittent printer only. |
| Minimum Print Speed | Continuous printer only. |
| Relative Print Maximum Travel | Continuous printer only. |
| **Print Initiation Group** | |
| Print Trigger | Continuous printer only |
| Debounce Time | Intermittent printer |
| Debounce Distance | Continuous printer only |
| Pack length | Continuous printer only |
| Fixed Spacing Distance | Continuous printer only and print trigger set to Internal or Combined |
| Fixed Spacing Count | Continuous printer only and print trigger set to Combined |
| Print Signal Expected Threshold | Continuous printer only |

| | |
|---|---|
| **Encoder** | |
| Encoder Type | Continuous printer only. |
| Encoder Direction | Continuous printer and Encoder Type set to Quadrature. |
| Encoder Resolution | Continuous printer and Encoder Type set to Quadrature or Pulse Train. |
| Film Speed | Continuous printer and Encoder Type set to Internal. Printer Mode dependant. |
| Speed Warnings | Continuous printer only. |
| Print Position | |
| Registration | The maximum amount is dependant on the printer type. |
| Pre print Delay | Continuous printer only. |
| Offset | The maximum amount is dependant on the ribbon width. |
| Print Delay | Intermittent printer only. |
| Print Position Tollerance | Continuous printer only. |
| **Ribbon Setup** | |
| Ribbon Colour | Markem-Imaje ribbons only, some colours not available with certain grades.<br>Not available when Non Markem-Imaje selected. |
| Ribbon Width | Limited by printhead width selected. |
| Full Ribbon Size | Only displayed if Non Markem-Imaje ribbon selected. |
| New Outside Diameter | Only displayed if Non Markem-Imaje ribbon selected. |
| Core Outside Diameter | Only displayed if Non Markem-Imaje ribbon selected. |
| Tension Adjust | Maintenance Engineer Password Required. |
| **Speed Profile Recorder** | |
| Resolution | Continuous printer and Encoder set to External |
| Trigger | Continuous printer and Encoder set to External. |

## Job Setup Menus

See previous section (Job Selection)

## Test print of Current Job

With an Intermittent printer this will initiate a print of the current job.
With a Continuous printer the host machine must be running substrate for the print signal to be activated.

## Print Position

This menu allows you to make small adjustments to the position of the printed image on the target material.

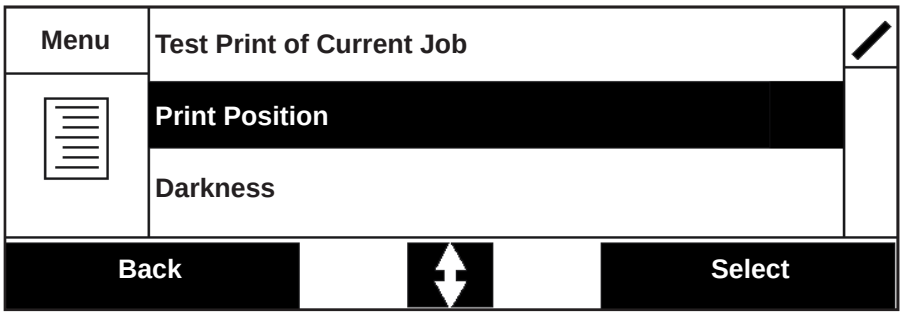
The print position can be split into two parts:
**- Registration**
**- Offset**

**Registration** is the position of the print relative to the direction of the substrate.
Increasing the registration will move the position of the print further back on the substrate.

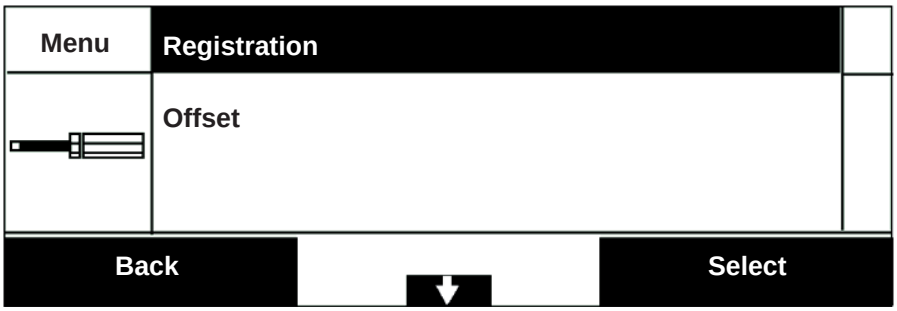
**Offset** is the position of the print relative to the Printhead.
Increasing the offset will move the position of the print across the printhead.

## Print Position Menu

1 From the Menu screen select Print Position.




2 The Print Position menus is displayed.




Use the bottom Quad button to scroll to the required menu.

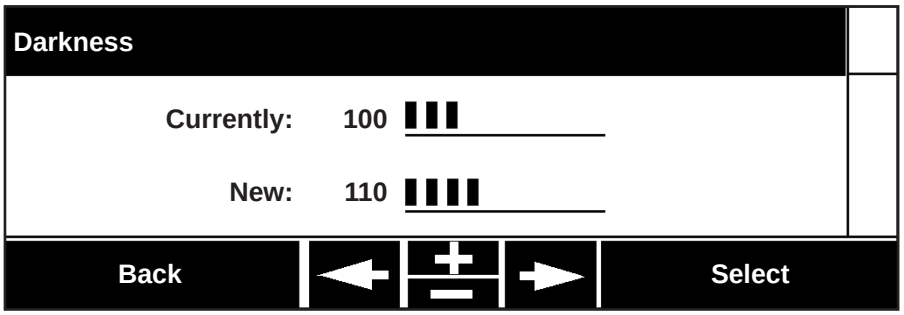
3 Press the right button to Select the menu.

# Print Darkness

The print darkness menu allows you to adjust the amount of energy used by the print-head. This will effectively change the contrast of the print on the substrate.
To access the Print Darkness menu:

1 From the Menu screen select Darkness


2 The Print Darkness screen is displayed.




Use the left and right Quad buttons to select the required increments i.e. 1 or 10 units at a time.
Use the top and bottom Quad buttons to increment or decrement the units.

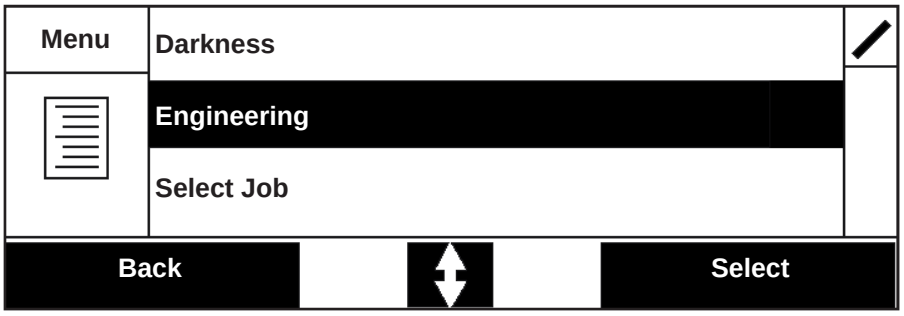
3 When finished press the right button to Accept the change.

# Engineering Menus

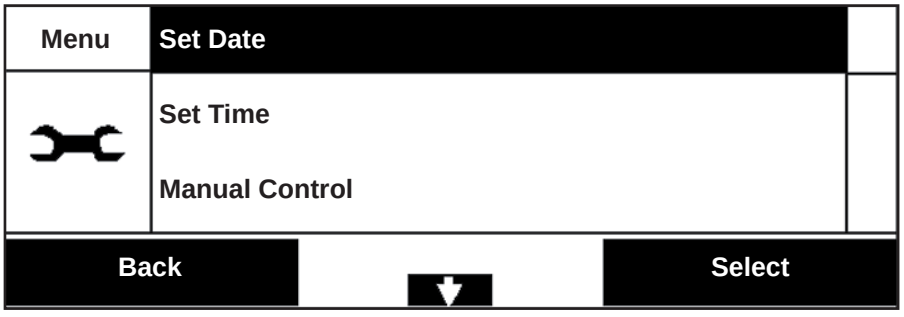
The Engineering Menus allow you to:

- Set the Date and Time.
- Manually operate the printer.
- Toggle various Digital Outputs.
- Configure various printer settings.
- View the Diagnostic functions.
- View various printer statistics.
- Select a Test Image
- Select the User Interface language.
- Configure FlexIO options
- Manage the Database files.
- Activate a Speed Profile
- View printhead and printer health information

1 From the Menus screen select Engineering.




2 The Engineering Menus screen is displayed.

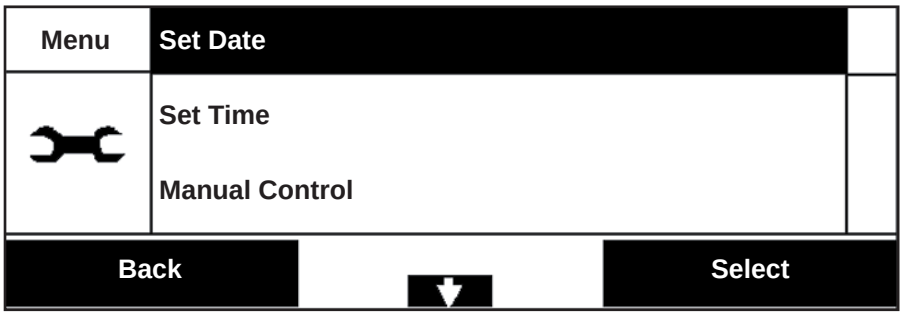



Use the bottom Quad button to scroll to the required menu.
Press the right button to Select the menu.

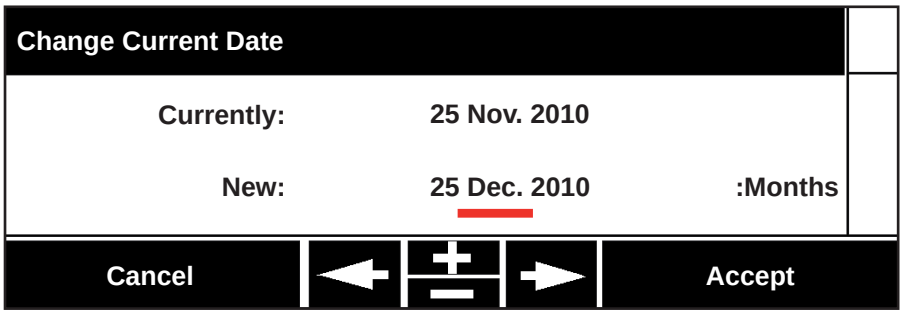
# Set Date and Time

## Date menu

1 Select Set Date from the Engineering Menu screen.



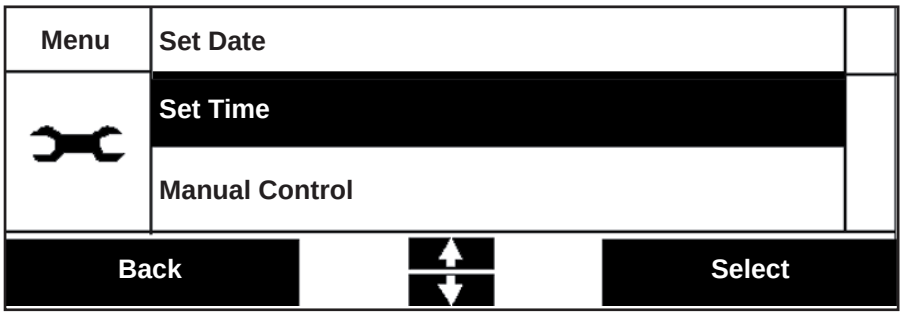

2 The Date menu screen is displayed.



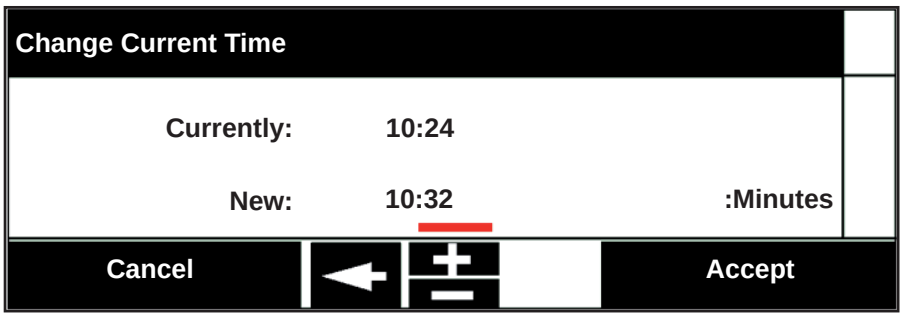

Use the left and right Quad buttons to move the cursor.
Use the top and bottom Quad buttons to change the date or time.
When finished press the right button to Accept the changes.

## Time menu

1 Select Set Time from the Engineering Menu screen.




2 The Time menu screen is displayed.



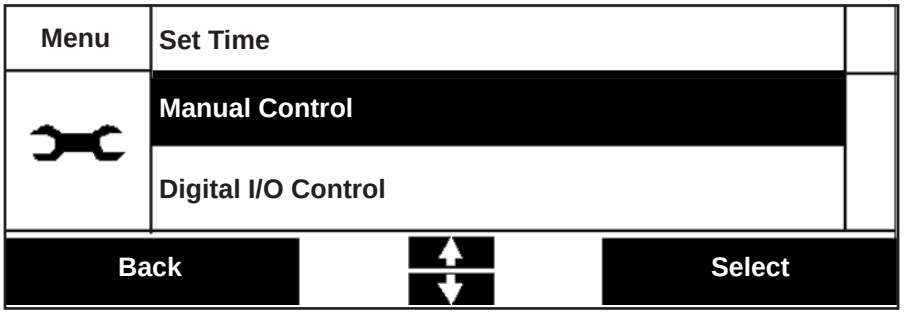

Use the left and right Quad buttons to move the cursor.
Use the top and bottom Quad buttons to change the date or time.
When finished press the right button to Accept the changes.

# Manual Control

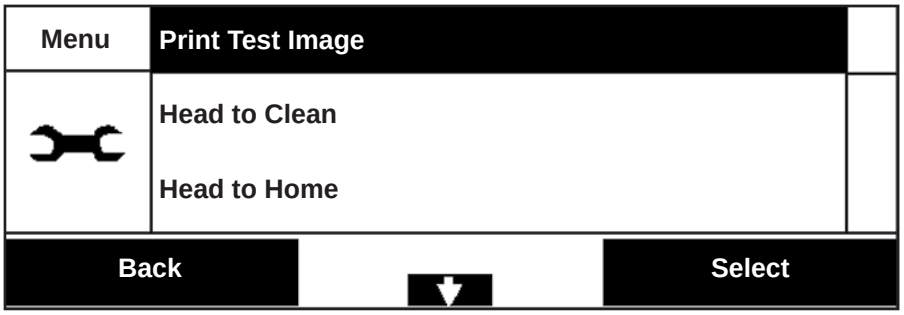
Dependant on the type of printer the Manual Control Menu allows you to:

- Print a Test Image.
- Move the printhead to the cleaning position.
- Calibrate the printer
- Manually feed the ribbon
- Activate the Test Print function
- Operate the Print module cylinders
- Cycle the printer.

1 From the Engineering screen select Manual Control.




2 The Manual Control Menu is displayed.

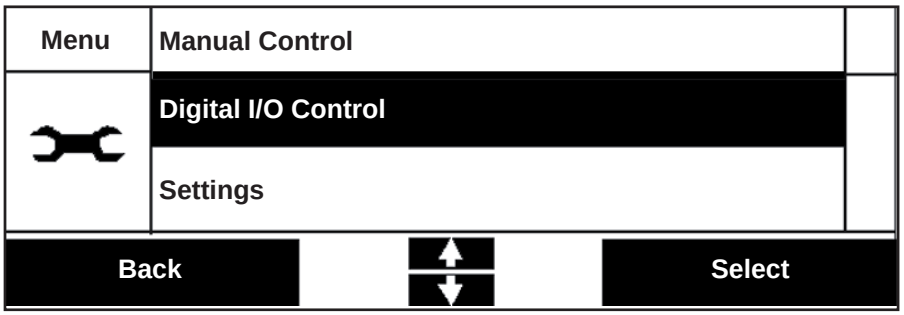



Use the bottom Quad button to scroll to the required function.
Select the function by pressing the right button.

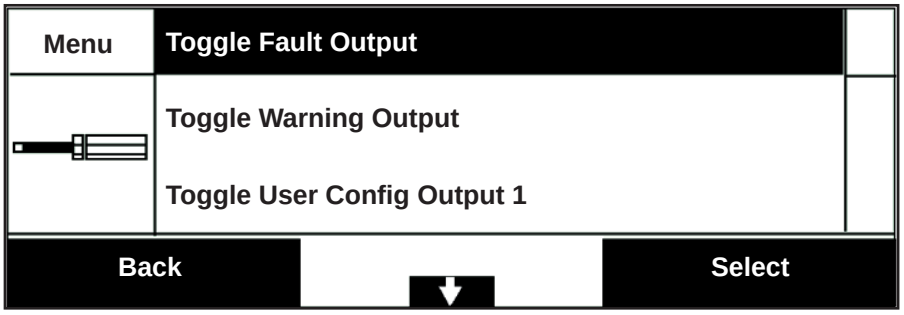
# Digital I/O Control

The Digital I/O Control Menu allows you to:
- Toggle various Digital Outputs.

1 From the Engineering screen select Digital I/O Control.




2 The Digital I/O Control Menu is displayed.




Use the bottom Quad button to scroll to the required function.
Select the function by pressing the right button.

## Printer Settings Menus

This is the largest of the menu groups.

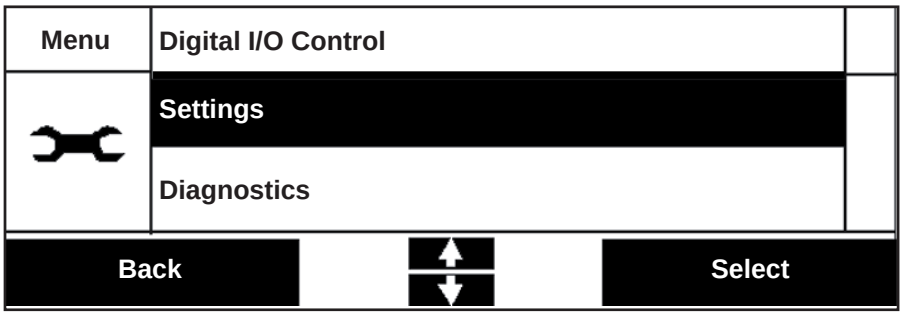
The Settings menu allows access to various printer set up options.

The Settings menus allow you to:

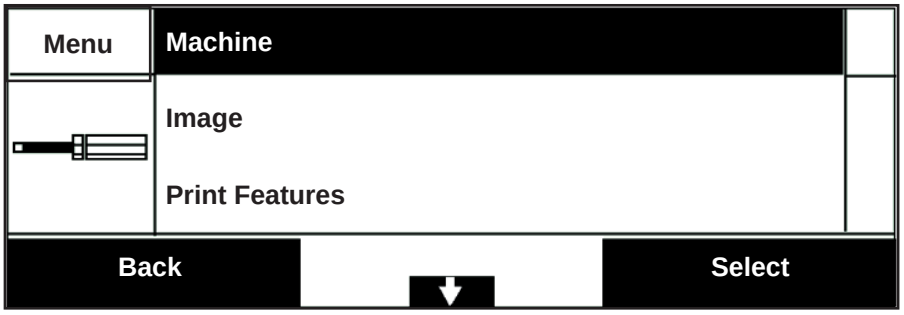
- Configure the Machine settings.
- Configure Image specific data
- Configure the Print Features options.
- Configure the Print Initiation options.
- Configure the Print Quality options.
- Configure the Encoder options. (Continuous printers)
- Configure the Print Position options.
- Configure the Ribbon Settings.
- Configure the Ribbon monitoring options.
- Configure the Communications.
- Activate the Speed Profile recorder.
- Configure the NGPCL functionality.
- Configure Logging.

## Printer Settings Menus:

1 From the Engineering screen select Settings




2 The Settings menu options are displayed

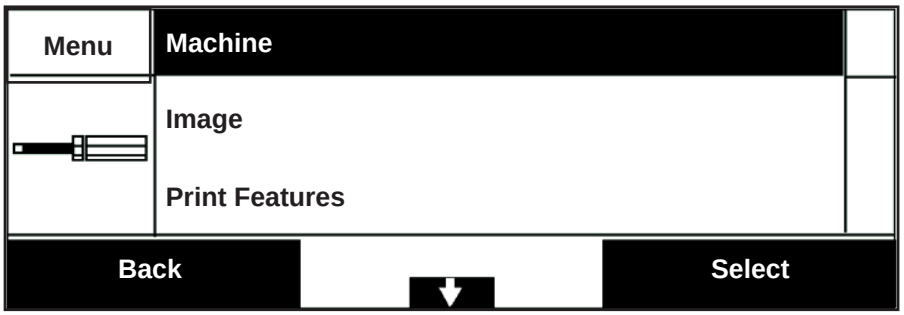



Use the bottom Quad button to scroll to the required menu.
Select the menu by pressing the right button.

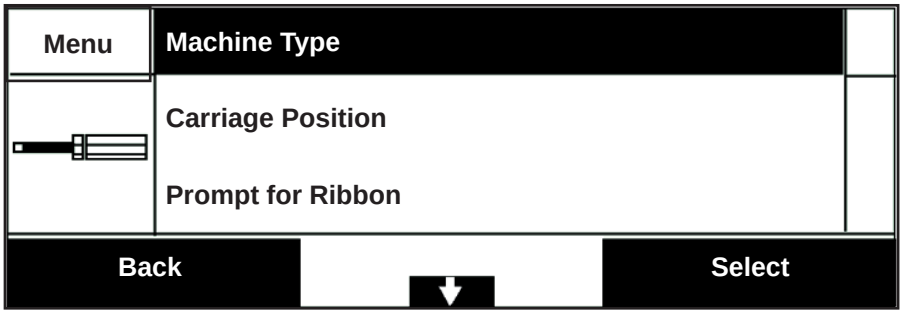
## Machine

The Machine menu allows you to configure various settings that are specific to the particular printer.

1 From the Settings menus screen select Machine




2 The Machine menu options are displayed.




Use the bottom Quad button to scroll to the required option.
Select the option by pressing the right button.

## Machine Options

| | |
|---|---|
| Machine Type<br>Range: Continuous or Intermittent<br>Default: Continuous | This allows you to configure the Non Shuttled printer as a Continuous or Intermittent. |
| Carriage Position<br>Range: 0 - 90mm<br>Default: 88mm | This is a Continuous Printer Option<br><br>This allows you to set the position the print module carriage on the linear slide. |
| Prompt for Ribbon<br>Range: Yes, No<br>Default: Yes | This allows you to enable the ribbon type prompt.<br>When set to YES the user must enter a ribbon type when changing ribbon. |
| Low Speed Print Mode<br>Range: None, Continue or Reprint<br>Default: None | This is a Continuous Printer Option<br><br>This allows you to set which action should be taken if the host machine speed drops below the Low Speed Threshold. |
| Discard Print Time<br>Range: 0 - 30s<br>Default: 0s | This allows you to set the time that the substrate must be stationary during a print before the print is discarded. |
| Security Level<br>Range: Open or Medium<br>Default: Open | This allows you to set a password level for your machine. Access codes are configured with CoLOS Control. |
| Database Level<br>Range: Local or Host<br>Default: Local | This allows you to select between using the local machine database or a remote host PC. |

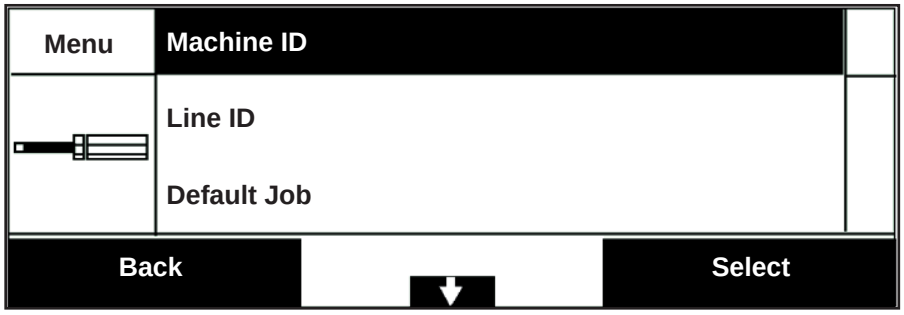
| | |
|---|---|
| Job Queuing<br>Range: On, Off, Repeat or Binary Select<br>Default: Off | This allows you to queue up to eight jobs to be printed in a sequence. For example: These jobs may have an allocation of 20 prints before the next job is selected. If repeat is selected each job in the queue will be printed once in the sequence.<br>Binary allows the jobs to be selected remotely and in any order from the queue. |
| Pack Rate Period<br>Range: 1 to 24 hours<br>Default: 1 hour | This allows you to set the time period over which the average pack rate is measured. |
| Power Save Timer<br>Range: Off, 2 mins, 30 mins, 1hr, 2hrs, 6hrs<br>Default: | This allows you to set a time before power saving is activated. This de-energises the motors and printhead until power saving is de-activated. |
| Prompt for Allocation<br>Range:: Yes or No<br>Default: No | When this option is set to Yes, you will be prompted to set an allocation for the number of prints required for the particular job |
| Default Allocation<br>Range: 0 to 999999<br>Default: 0 | This allows you to allocate a default number of prints as a standard setting. |
| Feature Lock Code<br>Range:<br>Default: 0 | This code allows you to unlock additional features for the SmartDate. Contact Markem-Imaje for details. |
| Image Adjust<br>Range: Enabled or Disabled<br>Default: Disabled | This screen allows you to adjust the position of specific fields on the image being printed. |

## Image

The Image menu allows you to configure various settings that relate to the image being printed.

1 From the Settings menus screen select Image.


2 The Image menu options are displayed.




Use the bottom Quad button to scroll to the required option.
Select the option by pressing the right button.

## Image Options

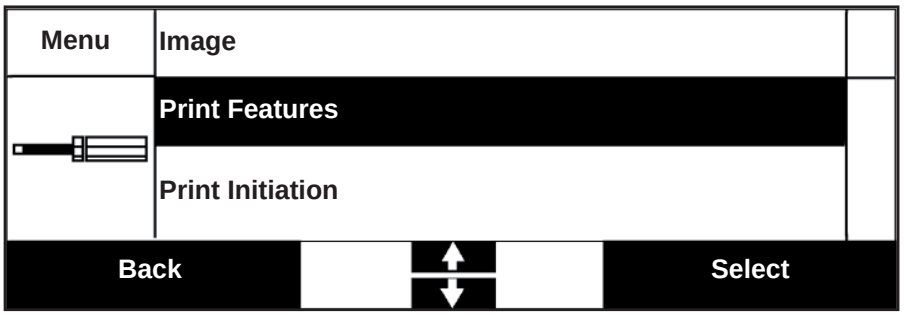
| | |
|---|---|
| Machine ID<br>Range: 0000 -9999<br>(Including other characters)<br>Default: 0000 | This allows you to set a four character, unique identification for each SmartDate X60.<br>The information is then printed in a specific field on the design.<br>This allows the same layout design to be used for several printers, with each printing a unique Machine ID.<br><br>The field in the design must be created as a Machine ID field in CoLOS Create Pro.<br><br>See CoLOS Create Pro for details. |
| Line ID<br>Range: 1 - 99<br>Default: 1 | This allows you to set a identifying number for the product line that the SmartDate X60 is being used on.<br>The information is then printed in a specific field on the design.<br>The field in the design must be created as a Line ID field in CoLOS Create Pro.<br><br>See CoLOS Create Pro for details. |
| Default Job<br>Range: Enabled or Disabled<br>Default: Enabled | This allows you to enable or disable the Default Job feature. |
| Relative Year Offset<br>Range:<br>Default: | This allows you to set a relative year offset for Japanese Emperor years.<br>E.g. 1998 will be printed as year 10 and 2004 will be printed as year 16. |
| Date Rollover Hour<br>Range: 0 to 11<br>Default: 0 | This allows you to set the hour at which the next day starts. |
| Date Rollover Minute<br>Range: 0 to 59<br>Default: 0 | This allows you to set the minute of the hour at which the next day starts. |
| Date Rollover Direction<br>Range: After Midnight or Before Midnight<br>Default: After Midnight | This allows you to set the period of the day that the rollover occurs. |
| Offset Date Rollover Hour<br>Range: 0 to 11<br>Default: 0 | (Best Before End)<br><br>This allows you to set the hour at which the next day starts. |
| Offset Date Rollover Minute<br>Range: 0 to 59<br>Default: 0 | Best Before End)<br><br>This allows you to set the minute of the hour at which the next day starts. |

| | |
|---|---|
| Offset Date Rollover Direction<br>Range: After Midnight or Before Midnight<br>Default: After Midnight | (Best Before End)<br><br>This allows you to set the period of the day that the rollover occurs. |
| Image Refresh Rate<br>Range: Every second or every minute<br>Default: Every minute | This allows you to set the update period for viewing the selected job on the home screen in producing mode. |
| Data Queue Size<br>Range: 0 to 200<br>Default: 0 | This is used with per-print variable data queueing. This allows the SmartDate to buffer field data for a number of packs ahead of the one being printed. Normally used in conjuction with weigh scale equipment and allows the weigh scale equipment to communicate information for the pack it has just weighed |
| Data Queue Low Water Mark<br>Range: 0 to 200<br>Default: 0 | This allows you to set the limit at which an update request is sent to the host machine |
| Data Queue Source<br>Range: Comms or USB Stick<br>Default: 0 | This allows you to configure the source of the Data Queue. |
| Data Queue Format<br>Range: Normal or Encrypted<br>Default: Normal | This allows you to configure if the data is to be encrypted or normal. |
| Data Queue Files<br>Range: Delete or Recycle<br>Default: Delete | This allows you to configure if the data is to be deleted or recycled. |
| Calculated Maximum Action<br>Range: Reset to Start or Stop and Fault<br>Default: Reset to Start | This allows you to configure the action to be taken after the Data Queue has been emptied. |

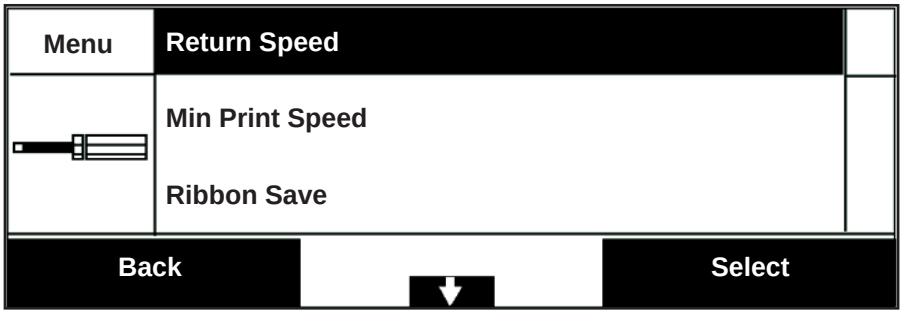
## Printer Features

The Print Features menu allows you to configure various settings that relate to the operation of the printer.

1 From the Settings menus screen select Print Features




2 The Print Features menu options will be displayed.




Use the bottom Quad button to scroll to the required menu.
Select the menu by pressing the right button.

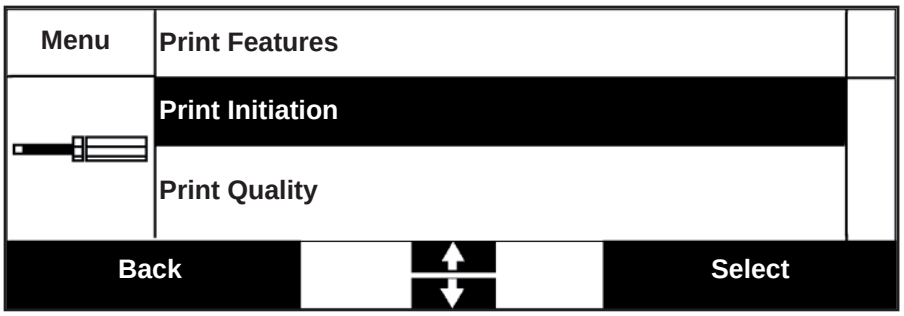
## Print Features

| | |
|---|---|
| Print Mode<br>Range: High Pack Rate, High Speed or Digital Ribbon Save mode<br>Default: High Pack Rate | This is a Continuous printer feature.<br><br>This allows you to set the printing mode to suit the customers requirements.<br><br>(See Operation for details) |
| Digital Ribbon Save<br>Range: Lowest, Low, Medium, High or Highest<br>Default: Medium | This allow you to configure required setting for use with the Digital Ribbon Save function. |
| Maximum Substrate Speed<br>Range: 100 mm/s to 1000 mm/s<br>Default: 600 mm/s | This is a Continuous printer feature.<br><br>This allows you to set the maximum substrate speed that the printer can achieve a good quality print. Setting this value too high can result in distorted prints.<br><br>(See Operation for details) |
| Print Speed<br>Range: 70 to 600 mm/s<br>Default: 100 mm/s | This is an Intermittent printer feature.<br><br>This allows you to set the print speed for Intermittent printers. |
| Return Speed<br>Range: 100 to 600 mm/s<br>Default: 100 mm/s | This is an Intermittent printer feature.<br><br>This allows you to set the speed of the printhead carriage during the return part of the print cycle. This also sets the ribbon wind speed |
| Minimum Print Speed<br>Range: 0 to 200 mm/s<br>Default: 70 | This is a Continuous printer feature.<br><br>This allows you to set the minimum print speed for continuous printers. |
| High Speed Threshold<br>Range: 100 - 800<br>Default: 600 | This allows you to configure the value that the SmartDate printhead will switch to High Speed Mode. |
| Ribbon Save Mode<br>Range: No Ribbon Save, Interlaced,Radial Mode 1, Radial Mode 2<br>Default: No Ribbon Save | This allows you set the type of ribbon save function that you require. (See Operation for details) |
| Relative Print Maximum Travel<br>Range: 0.0 mm to 30.0 mm<br>Default: 0.0 mm | This is a Combined printer continuous mode feature.<br><br>This allows you to set the maximum distance that the printhead module can move to complete a print if the host machine stops during the print cycle.<br><br>(See Operation for details) |

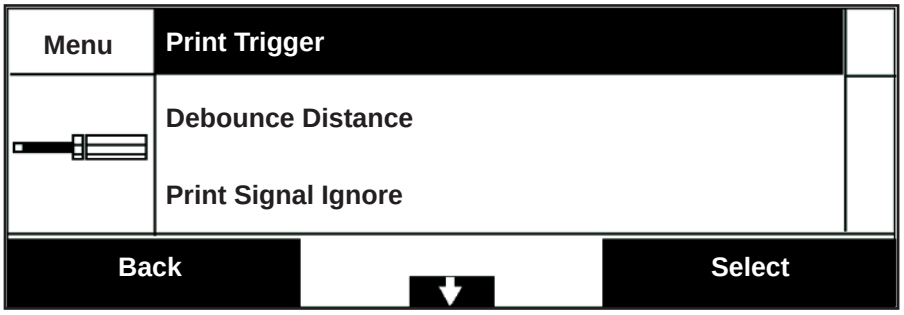
## Print Initiation

The Print Initiation menu allows you to configure the signal to start printing. The options available will depend upon which printer type is selected. (Intermittent or Continuous)

1 From the Settings menus screen select Print Initiation




2 The Print Initiation menu options are displayed.




Use the bottom Quad button to scroll to the required menu.
Select the menu by pressing the right button.

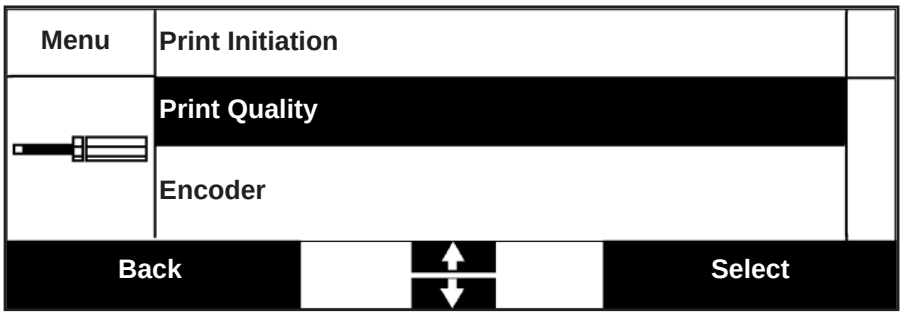
## Print Initiation

| Setting | Description |
|---|---|
| Print Trigger<br>Range: External, Internal or Combined.<br>Default: External | This is Continuous printer feature.<br><br>This allows you to set the print trigger source. |
| Debounce Time<br>Range: 0 to 5000 ms<br>Default: 0 | This is an Intermittent printer feature.<br><br>This allows you to set the time over which the print trigger must be active before it is accepted as valid.<br>This avoids electrical noise problems. |
| Debounce Distance<br>Range: 0 to 5 mm<br>Default: 0 | This is Continuous printer feature.<br><br>This allows you to set the distance over which the print trigger must be active before it is accepted as valid.<br>This avoids electrical noise problems. |
| Pack length<br>Range: 0mm to 1200 mm<br>Default: 0 | This is Continuous printer feature.<br><br>This allows you to set the distance following a valid print signal that the printer will ignore subsequent print signals. |
| Fixed Spacing Distance<br>Range: 10 - 2000 mm<br>Default: 150 mm | This is Continuous printer feature.<br><br>When the print trigger is set to Internal or Combined this allows you to define the distance between the leading edges of the prints on the substrate. |
| Fixed Spacing Count<br>Range: 1 - 65535<br>Default: 1 | This is Continuous printer feature.<br><br>When the print trigger is set to Combined this allows you to define the number of prints following a Print signal. |
| Unexpected Print Fault Threshold<br>Range: 0 - 100<br>Default: 10 | This allows you to set the number of acceptable missed prints before a fault is raised. |
| Print Signal Expected Threshold<br>Range: 0 - 1000 mm<br>Default: 0 | This is a Continuous printer feature.<br><br>This allows you to set the distance that the substrate is allowed to travel without an expected print signal and before a fault is raised. |
| Print Signal<br>Range: Active High or Active Low<br>Default: Active High | This allows you to configure if the print signal is activated when high or low. |

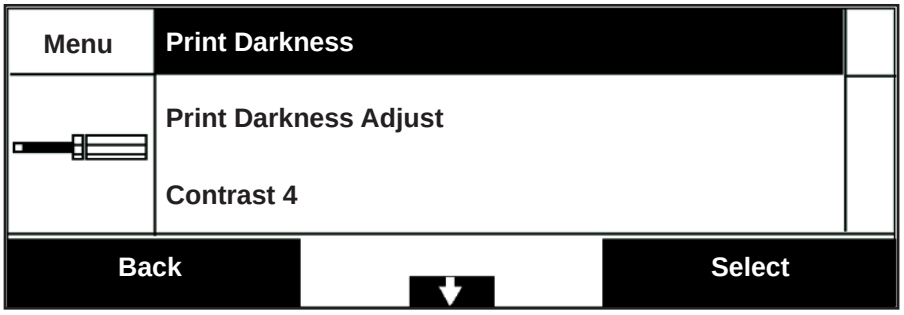
## Print Quality

The Print Quality menu allows you to configure settings that control the quality of the printed image.

1 From the Settings menus screen select Print Quality




2 The Print Quality menu options are displayed.




Use the bottom Quad button to scroll to the required menu.
Select the menu by pressing the right button.

## Print Quality Options

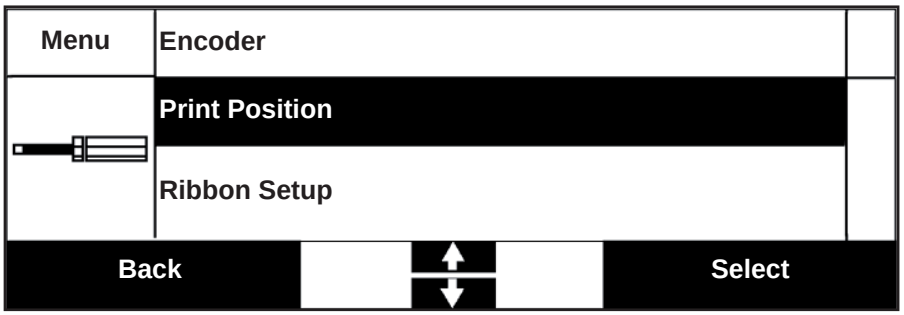
| Setting | Description |
|---|---|
| Print Darkness<br>Range: 80 to 140%<br>Default: 100% | This allows you to set the Darkness level for the print.<br><br>See Section 7 - Setup and Timing Issues |
| Print Darkness Adjust<br>Range: -25% to +25%<br>Default: 0 | This allows you to set a printer specific darkness level for the printer.<br>If a Job includes a print darkness setting this may produce different quality prints on individual machines.<br>This adjustment compensates for any differences.<br><br>See Section 7 - Setup and Timing Issues |
| Contrast 4<br>Range: 60 to 99%<br>Default: 75 | This defines the contrast weighting when the previous dot is driven.<br>(53mm printhead only) |
| Contrast 5<br>Range: 80 to 140%<br>Default: 90 | This defines the contrast weighting when the 2 previous dots are driven. |
| Leading Edge Boost<br>Range: 0 to 100%<br>Default: 50 | This defines the contrast weighting when subsequent dots are driven<br>(53mm printhead only) |
| Body Boost<br>Range: 0 to 100%<br>Default: 50 | This defines the contrast weighting when adjacent dots are driven. |
| Head Out Time<br>Range: 0 - 100ms<br>Default: 25ms | This allows you to set the time delay between moving the head out and starting to print. This ensures that the Printhead is in position before printing starts.<br>See Section 7 - Setup and Timing Issues |
| Head In Time<br>Range: 0 to 200 ms<br>Default: 3 ms | This allows you to set the time delay between the end of print and the next stage of the print cycle.<br>See Section 7 - Setup and Timing Issues |

| | |
|---|---|
| Start Border<br>Range:<br>0 to 20.0 mm<br>Default: 2.0 mm (Intermittent)<br>Default: 4.0 (Continuous) | This allows you to set the distance over which the printhead is allowed to settle after it has moved out, but before it starts to print. |
| End Border<br>Range:<br>0 to 20.0 mm<br>Default: 2.0mm (intermittent)<br>Default: 0.5 mm (Continuous) | This allows you to set the distance the printhead or ribbon is allowed to travel after printing, but before the printhead is retracted.<br>See Section 7 - Setup and Timing Issues section. |
| Head Clean Ribbon Count<br>Range: 0 to 1000<br>Default: 0 | This allows you to set the number of rolls of ribbon that must pass the printhead before the Head Clean warning is issued. |
| Missed Line Fault Threshold<br>Range: 0 to 5000<br>Default: 0 | This allows you to set the number of acceptable missed lines on an image before a fault is raised. |
| Image Not Ready Action<br>Range: Raise Warning or Raise Fault<br>Default: Raise Warning | This allows you to configure what action is to be taken if the image is not ready for printing. |

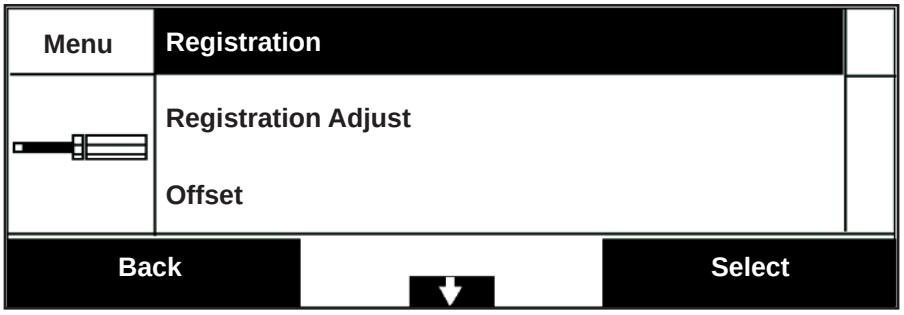
## Print Position

The Print Position menu allows you to fine tune the position of the print on the target material.

1 From the Settings menus screen select Print Position




2 The Print Position menu options will be displayed.




Use the bottom Quad button to scroll to the required option.
Select the option by pressing the right button.

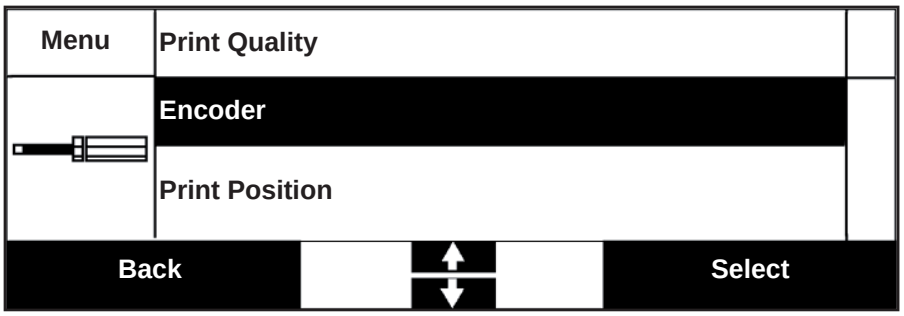
## Print Position

| Setting | Description |
|---|---|
| Registration<br>Range: Continuous<br>0.0 - 600.0mm<br>Intermittent<br>0.0 - 75.0mm<br>Default: 0mm | This is Continuous printer feature.<br><br>This allows you to set the start position of the print relative to the Print Signal position.<br>Intermittent printers<br>This allows you to set the start position of the print module. |
| Registration Adjust<br>Range: -10mm to +10mm<br>Default: 0mm | This allows you to set a printer specific registration level for the printer.<br>If a Job includes a registration setting this may produce different positioned prints on individual machines.<br>This adjustment compensates for any differences. |
| Pre print Delay<br>Range: 0 to 50<br>Default: 0 | This is Continuous printer feature.<br><br>This allows you to set the length of delay applied at the start of the print cycle. |
| Offset<br>Range: 0 to ribbon width<br>Default: 0mm | This allows you to adjust the print position perpendicular to the direction of print. (Across the printhead) |
| Print Delay<br>Range: 0 to 5000 ms<br>Default: 0 ms | This is an Intermittent printer feature.<br><br>This allows you to define the time between the Print signal and the start of the print. |
| Rotation<br>Range: 0 or 180º<br>Default: 0 | This allows you rotate the image through 180º |
| Maximum Print Width<br>Range: 0 to 32mm/55 mm<br>Default: 32/55 mm | This is used in conjunction with a ribbon spacer, where it is necessary to limit the amount of usable ribbon. |
| Print Position Tolerance<br>Range: 0 or 10 mm<br>Default: 2 mm | This is Continuous printer feature.<br><br>This allows you to configure the position tolerance of the print on the packaging.<br>A higher value here allows smaller gaps between the prints on the ribbon. |

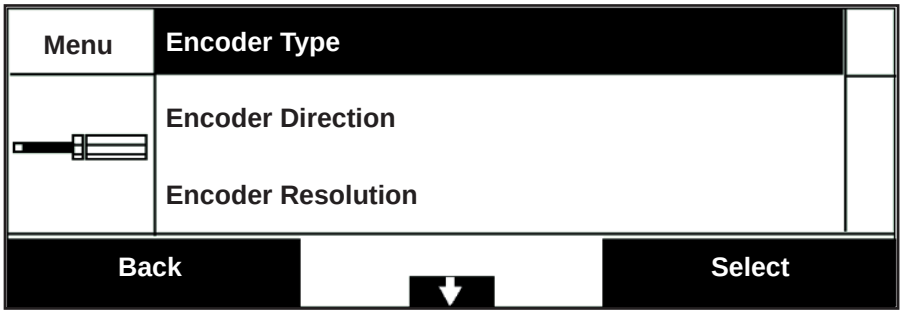
## Encoder

The Encoder menu allows you configure various settings related to the Continuous printer speed encoder.

1 From the Settings menus screen select Encoder




2 The Encoder menu options are displayed.




Use the bottom Quad button to scroll to the required option.
Select the option by pressing the right button.

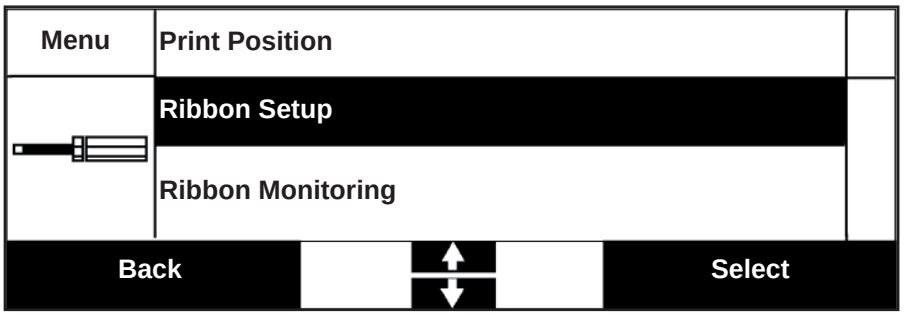
## Encoder

| Setting | Description |
|---|---|
| Encoder Type<br>Range: External Quadrature, Internal or External Pulse Train.<br>Default: External Quadrature | This allows your to set the Encoder type for Continuous printers. |
| Film Speed<br>Range: 70 mm/s to 1800 mm/s<br>Default: 300 mm/s | This allows you to define the substrate speed for an Internal encoder. |
| Encoder Direction<br>Range: Clockwise or Anti clockwise<br>Default: Clockwise | This allows you to set the forward direction of a quadrature encoder. |
| Encoder Resolution<br>Range: 2.8 to 150.00 pulses/mm<br>Default: 3.05 pulses/mm | This allows you to set the number of pulses per mm for an External encoder. |
| Speed Warnings<br>Range: Enabled or Disabled<br>Default: Enabled | This is Continuous printer feature.<br><br>This allows you to enable or disable the speed warnings option. When enabled this will provide a warning if the substrate is out of the acceptable speed range. |
| Encoder Failure Sensitivity<br>Range: Off, Low, Medium or High<br>Default: Off | This allows you to configure the sensitivity of the printer to incoming print signals when no encoder signal is detected. |
| Speed Damping<br>Range: Off, Low, Medium or High<br>Default: Off | For use on high-speed applications – controls smoothing of the encoder signal. |
| Speed Lag<br>Range: 3.0% to 20%<br>Default: 3.0% | For use on high speed applications – controls high-speed “tension control” |

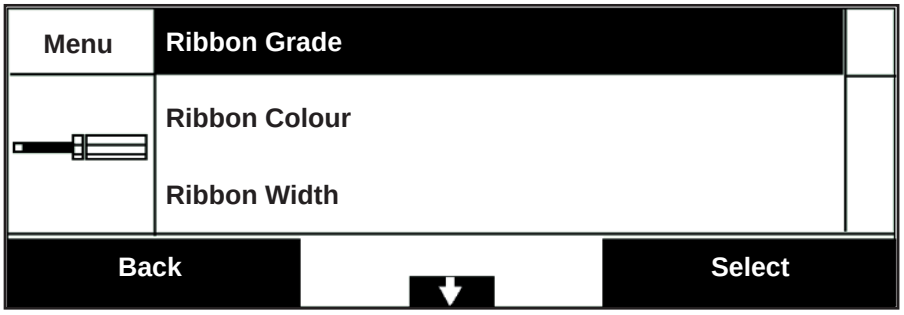
## Ribbon Setup

The Ribbon Setup menu allows you to configure various ribbon specific settings.
This enables the Controller to fine tune printer settings to suit individual ribbon types.

1 From the Settings menus screen select Ribbon Setup




2 The Ribbon Setup menu options will be displayed.




Use the bottom Quad button to scroll to the required option.
Select the option by pressing the right button.

## Ribbon Setup Options

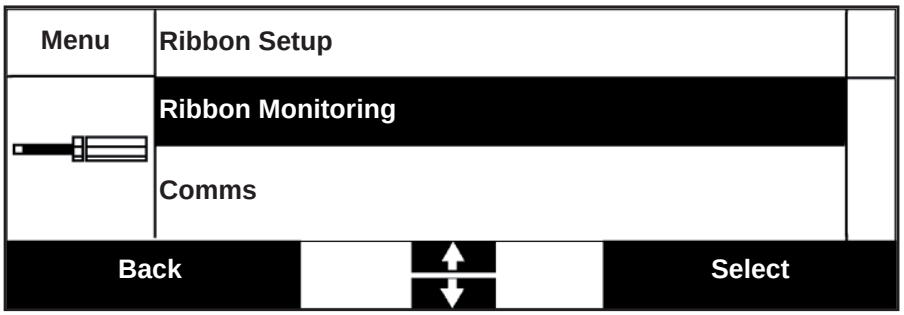
| Setting | Description |
|---|---|
| Ribbon Grade<br>Range: 3100, 3410, 3510, 3710, 3810, 3820, 3910, 4910, 5110, 5810, 7810 Non Markem-Imaje<br>Default: 3810 | This allows user to set the grade of the ribbon being used. . |
| Ribbon Colour<br>Range: BK, WE, GD, BE, BN, CN, GN, RD, YW.<br>Default: BK | This allows user to set the colour of the ribbon being used.<br>The options will depend upon the grade selected.<br>No options with Non Markem-Imaje ribbon. |
| Ribbon Width<br>Range: 20mm, 25mm, 30mm, 35mm, 40mm, 45mm, 50mm, 55mm. | This allows user to set the width of the ribbon being used.<br><br>The options will depend upon the printhead width selected. |
| New Ribbon Length<br>Range: 100 to 900<br>Default: 900 | This option is displayed if Non Markem-Imaje ribbon is selected.<br><br>This allows you to set the length of ribbon being used. |
| New Outside Diameter<br>Range: 40.0 to 100.0 mm<br>Default: 98.0 mm | This option is displayed if Non Markem-Imaje ribbon is selected.<br>This allows you to set the outside diameter of ribbon being used. |

| | |
|---|---|
| Core Outside Diameter<br>Range: 30.0 to 35.0 mm<br>Default: 32.0 mm | This option is displayed if Non Markem-Imaje ribbon is selected.<br><br>This allows you to set the outside diameter of ribbon core being used. |
| Ribbon Winding<br>Range: Inside Winding, Outside Winding<br>Default: Inside Winding | This option is displayed if Non Markem-Imaje ribbon is selected.<br><br>Depending on which side of the ribbon the ink positioned, this allows you to configure the Inside or Outside option. |
| Tension Adjust<br>Range: 0 to 100<br>Default: 50 | This allows you to make fine adjustments to the ribbon tension.<br>In situations where the printhead gap is more than 3 mm this should be reduced to 30. |
| Ribbon Advance Distance<br>Range: 1 - 10mm (1 - 1000 mm*100)<br>Default: 1mm | This allows you to set the distance the ribbon advances between prints (in addition to the length of the print)<br>When using Radial Ribbon Save this should be set to a minimum of 2 mm. |
| Ribbon Spacer Width<br>Range: 0 to 55 mm<br>Default: 0 | This allows you to configure the width of a ribbon spacer if one is being used. |
| Ribbon Extra Wind<br>Range: 0 to 600 mm<br>Default: 0 | This allows you to configure the amount of additional ribbon wound on when the cassette is closed and the calibration is complete. |

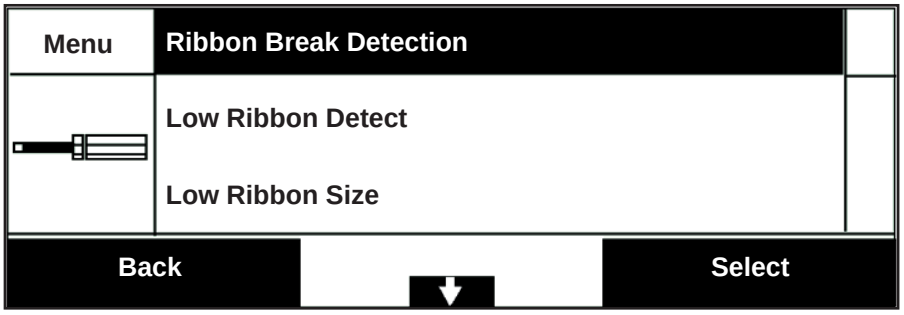
## Ribbon Monitoring

The Ribbon Monitoring menu allows you to configure various settings related to the condition of the ribbon.

1 From the Settings menus screen select Ribbon Monitoring




2 The Ribbon Monitoring menu options are displayed.




Use the bottom Quad button to scroll to the required option.
Select the option by pressing the right button.

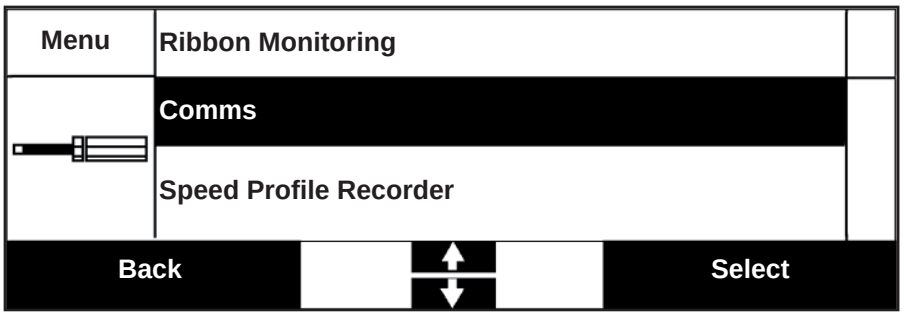
## Ribbon Monitoring Options

| Setting | Description |
|---|---|
| Ribbon Break Detection<br>Range: YES / NO<br>Default: YES | This allows you set the ribbon break detection function. |
| Low Ribbon Detection<br>Range: Yes / No<br>Default: Yes | This allows you to set the low ribbon detection function. |
| Low Ribbon Size<br>Range: 10 to 100m<br>Default: 10m | This allows you to set the point at which the Low Ribbon warning is activated. When the remaining ribbon is less than this value, and the printer is in Producing mode, the Status LED changes to Amber and the Low Ribbon warning is displayed.<br>A value of 0 m disables the Low ribbon sensing. |
| Low Ribbon Action<br>Range: Warning or Fault<br>Default: Warning | Raise Warning or raise Fault |

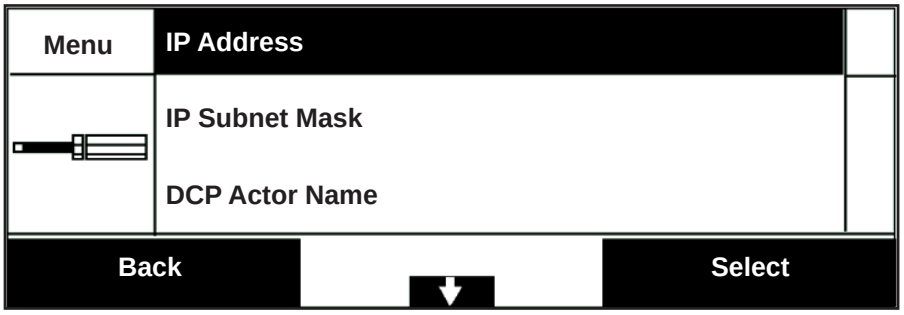
## Communications

The Comms menu allows you to configure the communications options.
To access the Comms Menu:

1 From the Settings menus screen select Comms




2 The Comms menu options are displayed.




Use the bottom Quad button to scroll to the required option.
Select the option by pressing the right button.

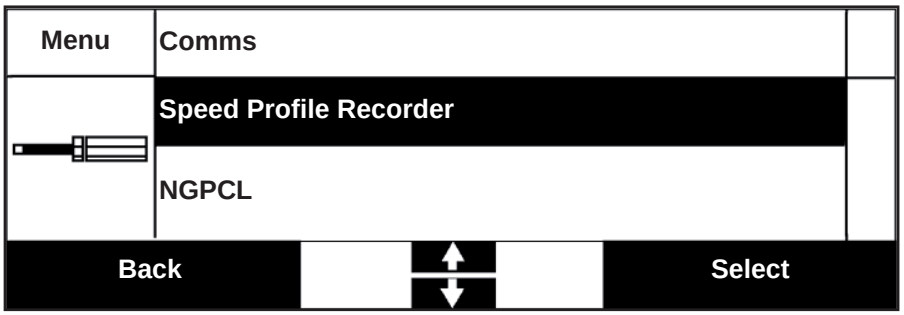
## Comms

| Setting | Description |
|---|---|
| IP Address<br>Range: LAN Specific<br>Default: 010.000.000.015 | This allows you to assign an IP address to the SmartDate X60.<br>Always consult your IT department before configuring an IP address. |
| IP Subnet Mask<br>Range: LAN Specific<br>Default: 255.255.255.000 | This allows you to define the Subnet Mask for your specific LAN |
| IP Gateway<br>Range: As required<br>Default: 010.000.000.001 | This allows you to define the IP Gateway for your specific LAN |
| DCP Actor Name<br>Range: As required<br>Default: Actor 1 | This allows you to assign a suitable Actor name as required when using DCP.<br>Re-power required after adding or changing the actor name. |
| Serial Port 1 Function<br>Range: NGPCL (RS-232) or NGCimComms<br>Default: NGPCL | This allows you to select the communication protocol required for Serial Port 1. |
| Serial Port 1 Baud<br>Range: 9600, 19200, 38400, 57600, 115000<br>Default: 9600 | This allows you to set the Baud rate for Serial port 1. |
| RS-232 Character Set<br>Range: ASCII or Unicode<br>Default: ASCII | This allows you to select the character set required for RS-232 communication. |
| Web ID<br>Range:<br>Default: | This allows you to assign a name or ID for the Web Interface. |
| Web Interface<br>Range: Classic or Colour UI<br>Default: Classic | This allows you to configure the look of the Web Interface. |

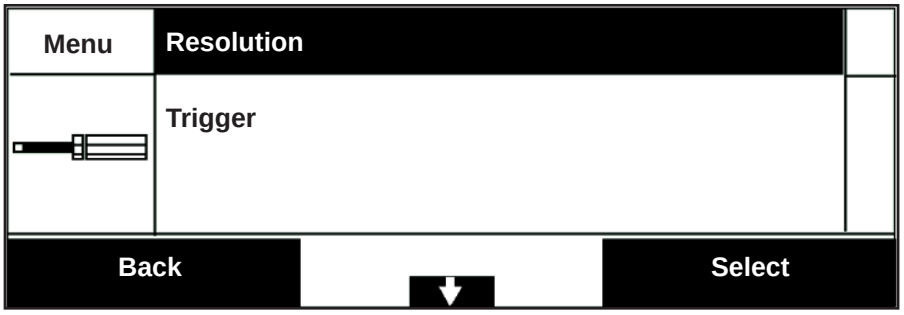
## Speed Profile Recorder

The Speed Profile Recorder allows you to configure the Speed Profile feature options.
To access the Speed Profile recorder menu

1 From the Settings menus screen select Speed Profile Recorder




2 The Speed Profile Recorder menu options are displayed.




Use the bottom Quad button to scroll to the required option.
Select the option by pressing the right button.

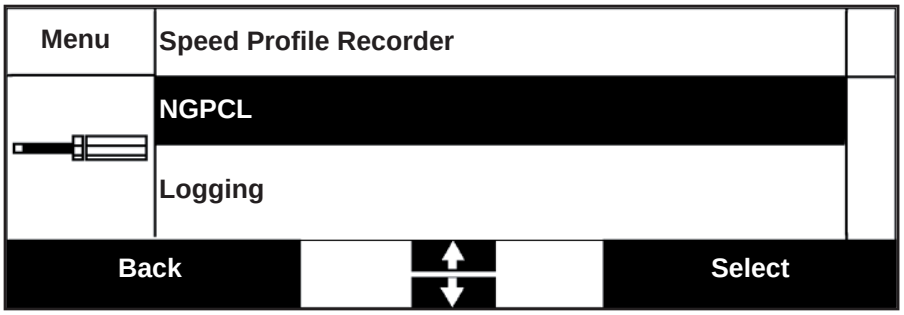
## Speed Profile Recorder

| Setting | Description |
|---|---|
| Resolution<br>Range: 1ms, 5ms, 10ms, 50ms or 100ms<br>Default: 1ms | This allows you to define the resolution for the speed profile. i.e. How often the speed is sampled. |
| Trigger<br>Range: Manual trigger, Print Signal trigger or Fault trigger.<br>Default: Manual trigger | This allows you to define a trigger to start the profile. |

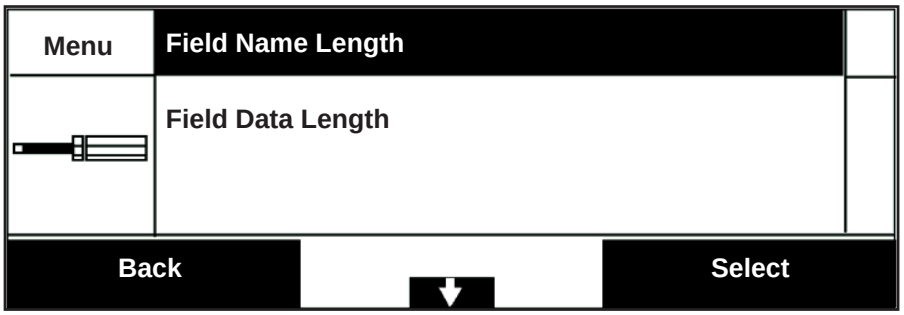
## NGPCL

(Next Generation Print Communication Language)
This is Markem-Imaje protocol for communicating with devices.
This can be used select products from the local database, update variable data fields on the image etc.
Where fields on the image template are updated on a regular basis, it may be necessary to limit the length of the field names and field data.
The NGPCL menu allows you to configure the lengths of data strings.
For full details regarding NGPCL please contact your local Markem-Imaje office or representative for detailed documentation.

1 From the Settings menus screen select NGPCL




2 The NGPCL menu options are displayed.




Use the bottom Quad button to scroll to the required option.
Select the option by pressing the right button.

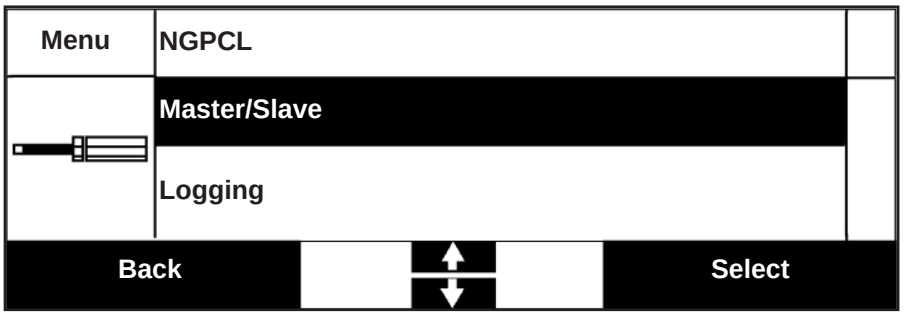
## NGPCL

| Setting | Description |
|---|---|
| Field Name Length<br>Range: 0 to 100<br>Default: 0 | This allows you to define the length of the field name string. |
| Field Data Length<br>Range: 0 to 100<br>Default: 0 | This allows you to define the length of the field data string. |
| NGPCL Success Request Field<br>Range: Yes or No<br>Default: Yes | This is used with NGPCL to control the content of responses. |
| NGPCL Checksum Enabled<br>Range: Yes or No<br>Default: No | This is used with NGPCL to enable or disable the Checksum option. |

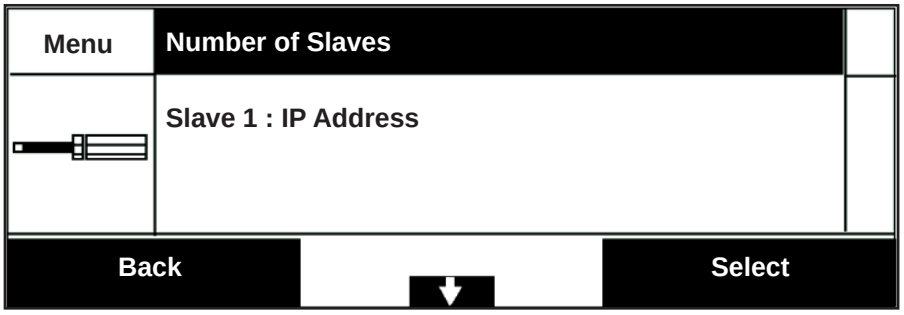
## Master/Slave

The Master / Slave function allows up to four additional SmartDate X60 printers to be controlled from a single Master SmartDate X60.
Once the Slave printers are configured, a Job selected on the Master will also be selected on the Slave printers.

1 From the Settings menus screen select Master/Slave




2 The Master/Slave menu options are displayed.




Use the bottom Quad button to scroll to the required option.
Select the option by pressing the right button.

## Master/Slave

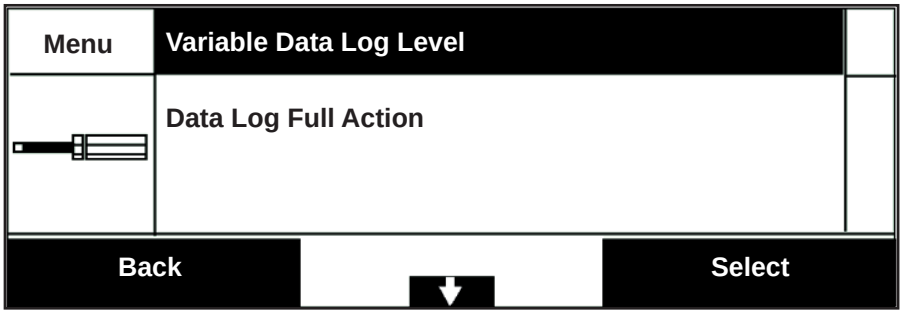
| | |
|---|---|
| Number of Slaves<br>Range: 0 or 4<br>Default: 0 | This allows you to set a second SmartDate printer to be controlled by the master SmartDate |
| Slave IP Address<br>Range: Input by user<br>Default:000.000.000.000 | This allows you to input the IP address of the Slave printer |
| Synchronise Start/Stop<br>Range: Yes or No<br>Default: No | When set to Yes the master printer will automatically activate Producing mode on the Slave when the Start button on the master is pressed. |
| Synchronise Settings<br>Range: Off or Print Adjust<br>Default: Off | This allows you to synchronise the Print Adjust settings with any connected Slave printers. |

## Logging

The Logging menu allows you to configure the Log file options.

1 From the Settings menus screen select Logging


2 The Logging menu options are displayed.




Use the bottom Quad button to scroll to the required option.
Select the option by pressing the right button.

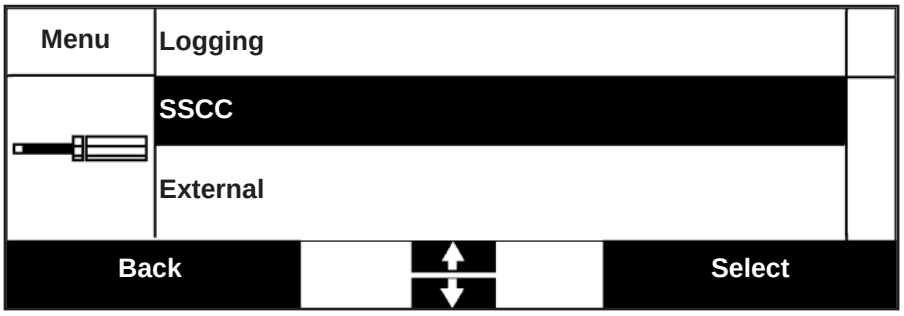
## Logging

| Setting | Description |
|---|---|
| Variable Data Log Level<br>Range: Job Selection/ Update, Per Print or None<br>Default: Job Selection/ Update | This allows you to define what is logged in the variable data log. |
| Data Log Full Action<br>Range: Stop Logging Delete Old Data or Stop Printing<br>Default: Stop Logging | This allows you to define what action will be taken if the log becomes full. |
| Event Log Level<br>Range: Full,Warnings, Faults, Information<br>Default: Full | This allows you to configure which events are to be logged. |

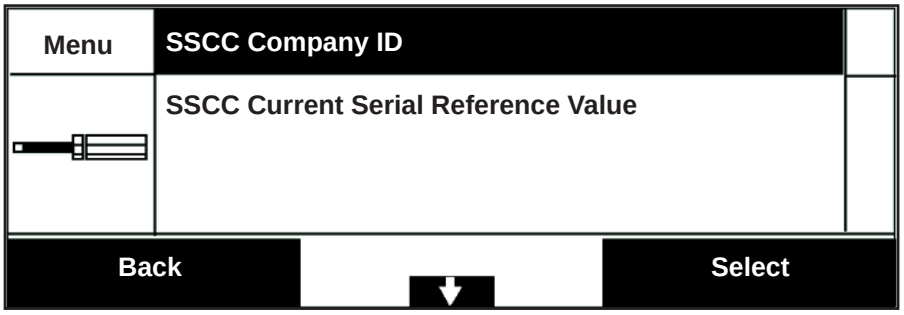
## SSCC

This feature allows you to configure the Serial Shipping Container Code parameters.

1 From the Settings menus screen select SSCC




2 The SSCC menu options are displayed.




Use the bottom Quad button to scroll to the required option.
Select the option by pressing the right button.

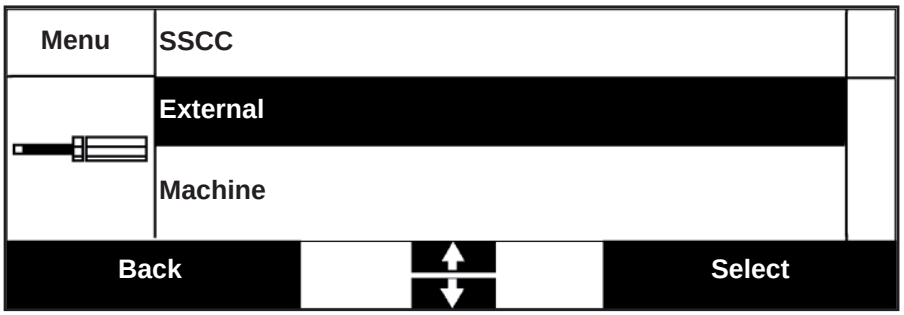
## SSCC

| Setting | Description |
|---|---|
| SSCC Company ID<br>Range: 1 - 16 digits<br>Default: 1 | This allows you to enetr the allocated Company ID code. |
| SSCC Current Reference Value<br>Range: 1 - 16 digits<br>Default: 1 | This allows you to define the current serial number to be used. |
| SSCC Minimum Serial Reference Value<br>Range: 1 - 16<br>Default: | This allows you to define the start value of the incremental number section of the code. |
| SSCC Maximum Serial Reference Value<br>Range: 1 - 16 digits<br>Default: 1 | This allows you to define the end value of the incremental number section of the code. |
| SSCC Extension Digit<br>Range: 0 - 1<br>Default: 0 | This allows you to define the SSCC extension digit. |

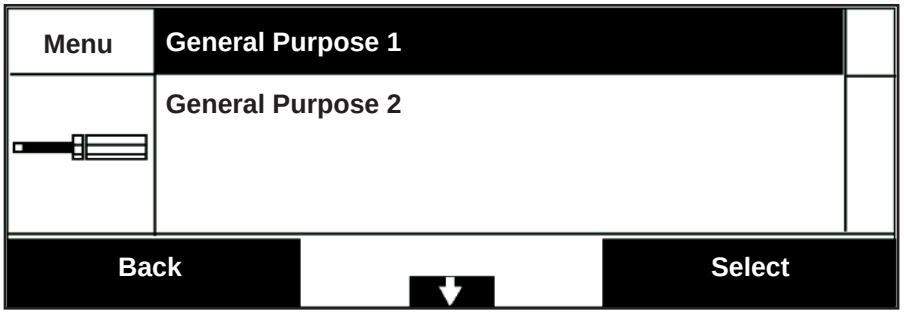
## External

The External menu allows system Integrators to store information.

1 From the Settings menus screen select External




2 The External menu options are displayed.

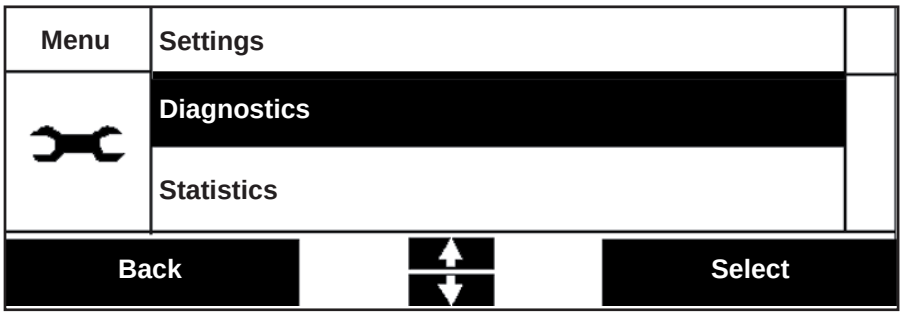



Use the bottom Quad button to scroll to the required option.
Select the option by pressing the right button.

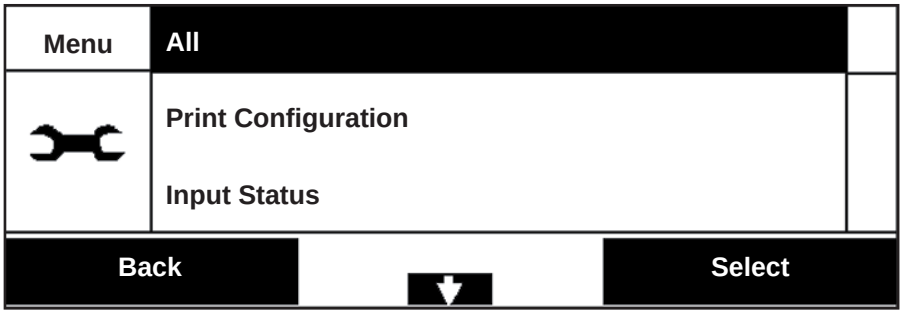
# Diagnostics

The Diagnostics menu allows you to view various information about the status of the printer.

1 From the Engineering menus screen select Diagnostics




2 The Diagnostics menu options are displayed.

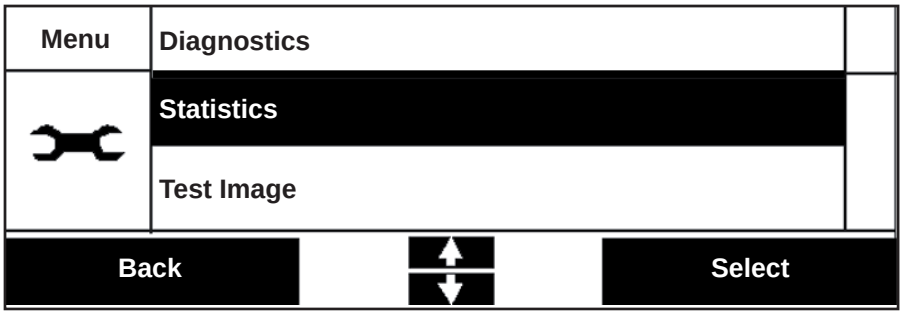



For full details see Diagnostics

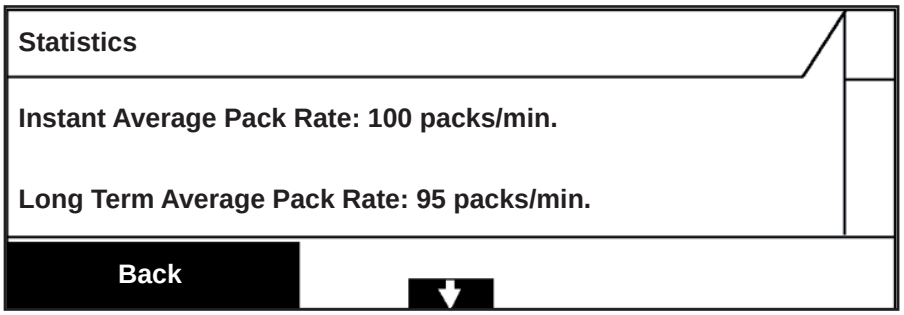
# Statistics

The following Statistical information can be viewed:

1 From the Engineering menus screen select Statistics




2 The Statistics menu information is displayed.

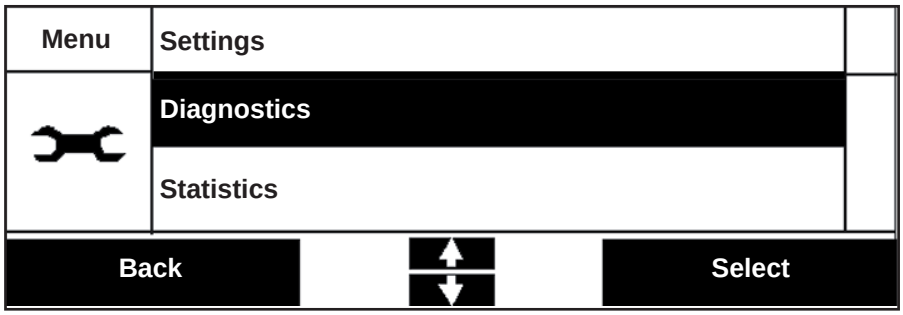



For full details see History

# Test Image

The Test Image menu option allows you to select a specialized Test Image pattern.

1 From the Engineering menus screen select Test Image




2 The Test Image is selected and the screen is returned to the home screen.
The size of the Image will be specific to the maximum size for the printer type. This Image when printed will enable you to diagnose the condition of the print.

**For example:**

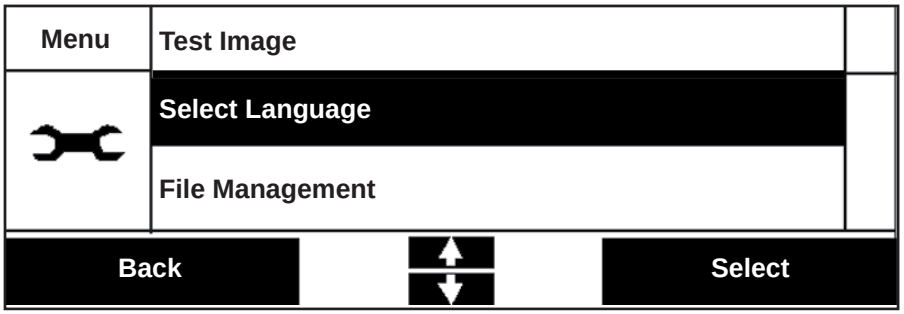
- If printhead dots are damaged these will not print and will appear as white lines through the image.
- If the start or end of the print is smudged the start or end border settings may have to be altered.

For full information regarding print quality issues please consult Section 7 Setup and Timing Issues

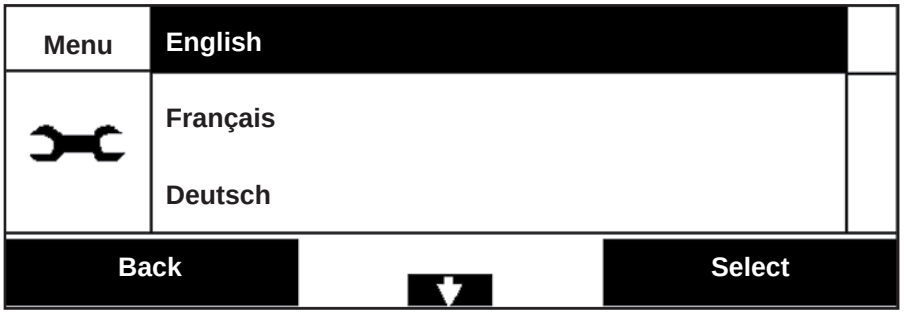
# Select Language

The Select Language menu options allow you to select the User Interface language for the machine.
The languages menu strings are downloaded to the controller and the options are therefore dependant on which languages are being used.

1 From the Engineering menus screen choose Select Language



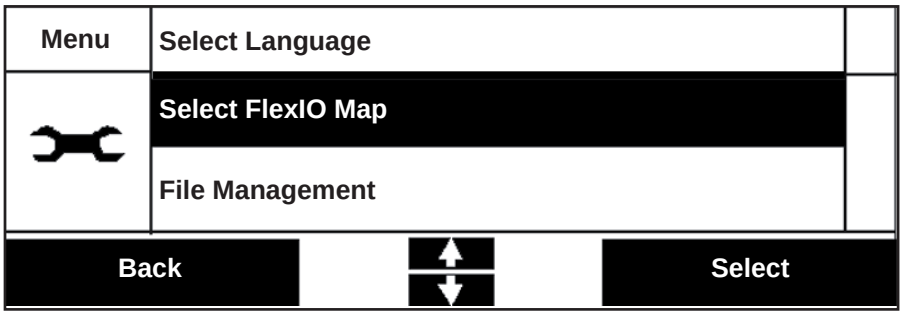

2 The Language menu options are displayed..



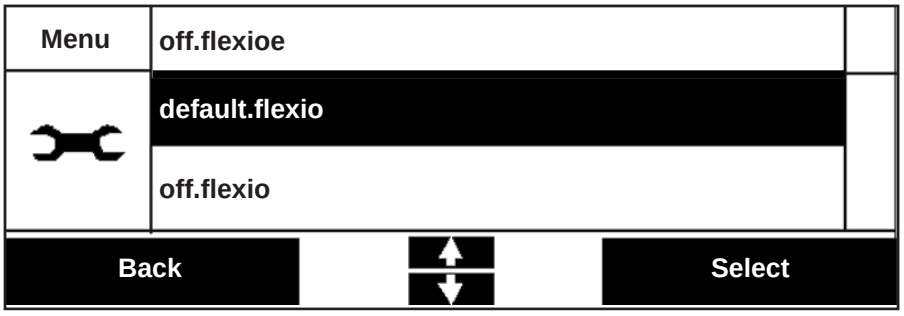
# Select FlexIO Map

This allows you to use the standard settings (Off) or to select a pre-configured (Default) Flex I/O map. The Default can be re-configured to suit customer requirements.
For further information please consult the Flex I/O documentation on the CD.

1 From the Engineering menus screen select FlexIO Map



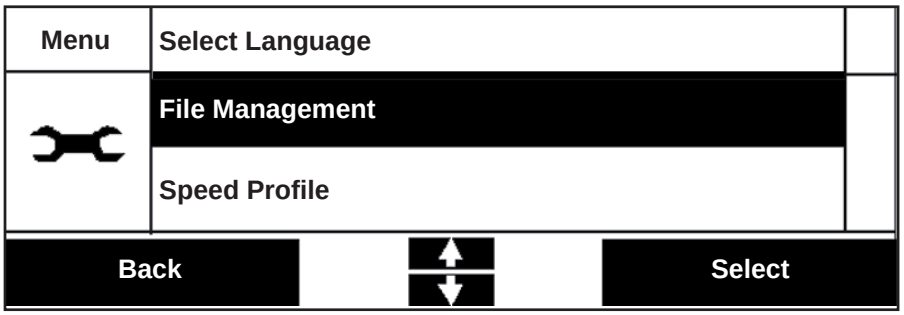

2 The FlexIO Map options are displayed.



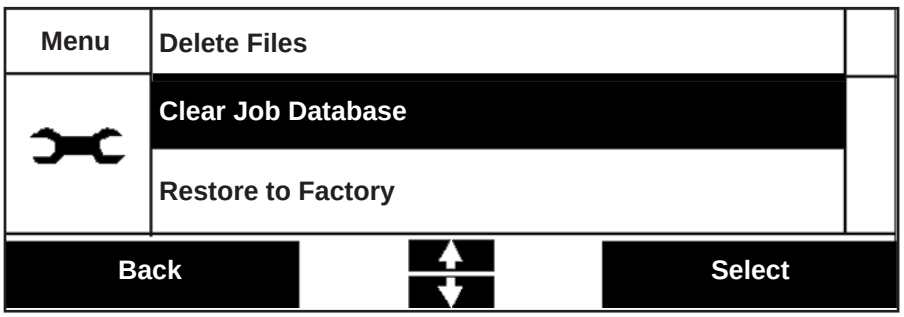
# File Management

The File Management menu options allow you to delete files or clear the SmartDate X60 Local Database.

1 From the Engineering menus screen select File Management




2 The File Management menu options are displayed.

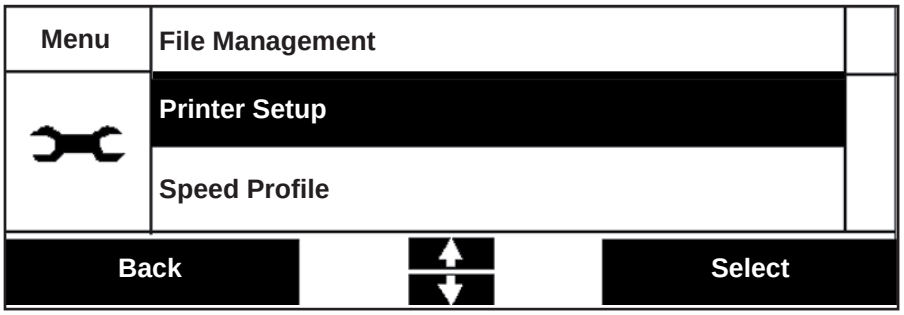


## File Management

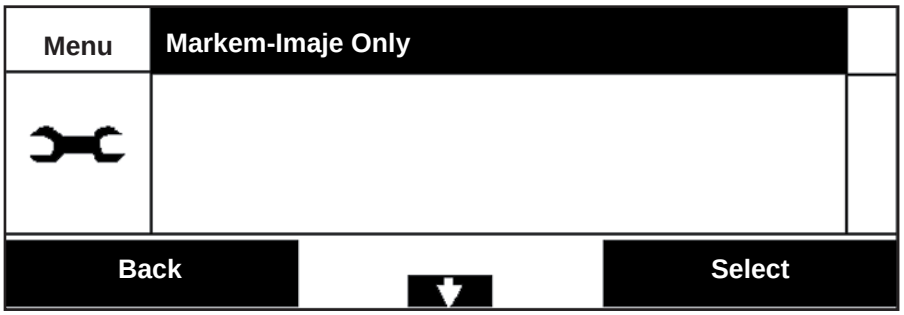
| Setting | Description |
|---|---|
| Delete Files | This allows you to delete individual files from the database. |
| Clear Job Database | This allows you to delete all of the files from the database. |
| Restore to Factory | This allows you to restore the system to the factory default configuration.<br>All files will be deleted and the system will be reset. |
| Save Settings | This allows you to save any pre-configured settings. |
| Load Settings | This allows you to load any pre-saved settings |

# Printer Setup

1 From the Engineering menus screen select Printer Setup




2 The Printer Setup menu options are displayed.




**Printer Setup**

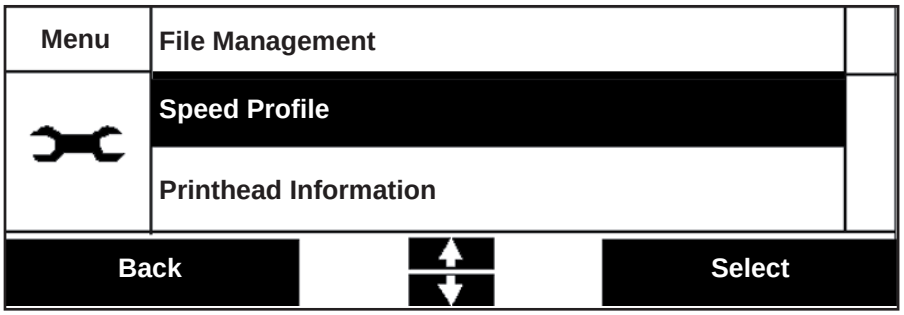
| Setting | Description |
|---|---|
| Carriage Position<br>Range: 0 - 90mm<br>Default: 88mm | This is a Continuous Printer Option<br><br>This allows you to set the position the print module carriage on the linear slide. |
| Markem-Imaje Only | Used for Tension Logging. |

# Speed Profile

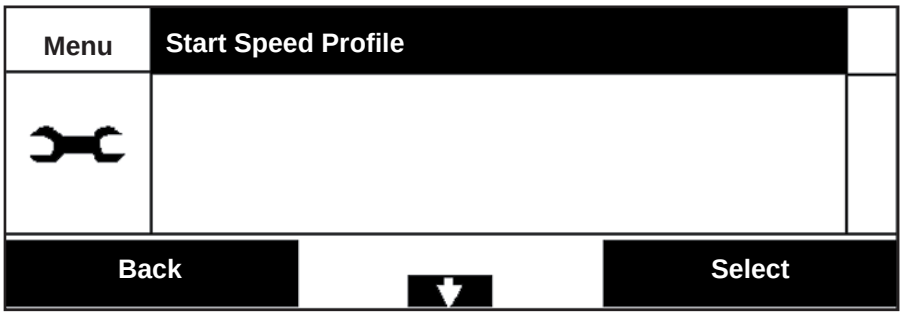
This is a Continuous printer function.

The Speed Profile menu allows you to activate and de-activate the speed profile function.

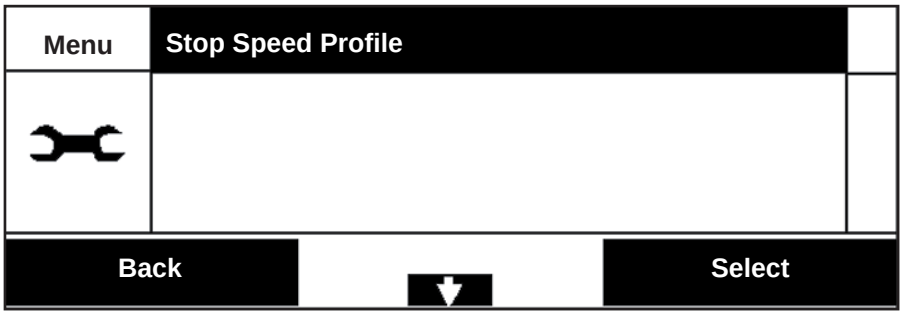
1 From the Engineering menus screen select Speed Profile




2 The Speed Profile menu options are displayed.




3

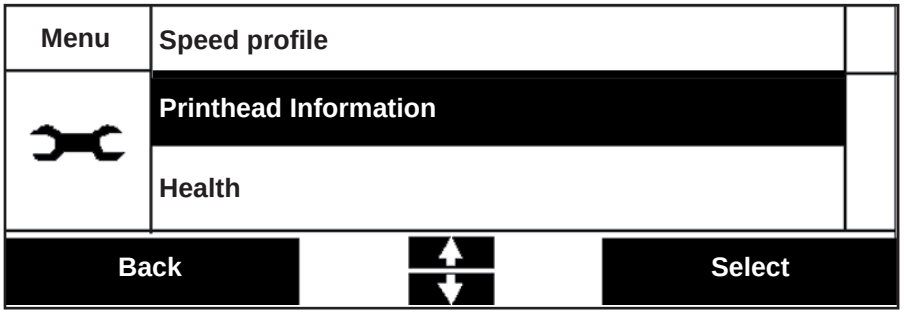


# Printhead Information

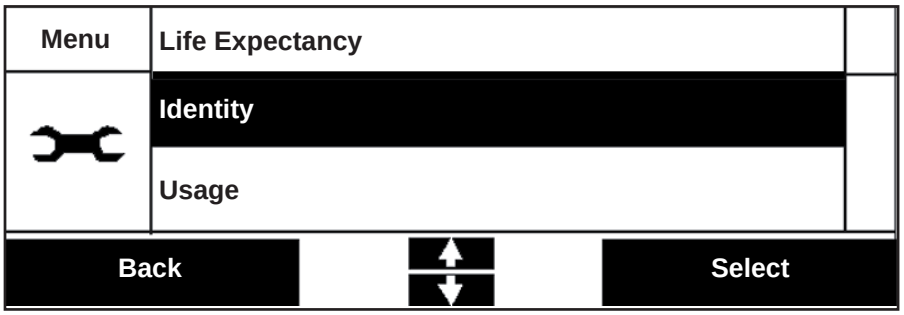
This is an option that is displayed if a Markem-Imaje Smartchip printhead is fitted.

The printhead Information Screen displays details of information stored in Markem-Imaje Smartchip thermal transfer printheads. This includes details of the printhead's identity, usage and printhead dot check health.

1 From the Engineering menus screen select Printhead Information




2 The Printhead Information menu options are displayed.



### Life Expectancy

This screen allows you to view information with regard to the expected working life of the printhead fitted.

| Information | Description | Details |
|---|---|---|
| Average Life | The estimated average printhead life. | Written once at manufacture. |
| Aging Rate | The calculated aging rate of the current printhead fitted. | Calculated from the number of prints per day. |
| Estimated Replacement Date | The estimated replacement date of the current printhead fitted. | Calculated from the Aging rate. |

### Identity

This screen allows you to view information with regard to serial numbers, model numbers and dates of printhead changes.

| Identity | Description | Details |
|---|---|---|
| Serial Number | New printhead serial number | Written once at manufacture |
| Type | Numeric model number | Written once at manufacture |
| Manufacture Date | Date of manufacture | Written once at manufacture |
| Manufacture ID | Numeric ID of manufacturer | Written once at manufacture |
| Initial Printer Serial Number | Serial number of the first printer within which the printhead was fitted | Written once at fitting |
| Initial Printer Date | Date at which the printhead was first fitted to the printer | Written once at fitting |
| Final Printer Serial Number# | Last known printer to which the printhead was fitted | Updated when fitted in a different printer |
| Final Printer Date | Date at which the printhead was first fitted in the final printer | Updated when fitted in a different printer |

**Usage**

This screen allows you to view information with regard to the performance of the printer.

| Usage | Description |
|---|---|
| Print Count | Number of print cycles performed |
| Ribbon KM | Amount of ribbon fed past the printhead |
| Direct Thermal KM | Amount of substrate fed past the printhead |
| Darkness | Last known printhead darkness setting value used to print |
| Print Speed | The current print speed being used |
| Maximum Print Speed | Last known print speed averaged over one hour of production |
| Minimum Ribbon Width | Minimum ribbon width fitted while printing |
| Temperature | Last known temperature while printing |
| Maximum Temperature | Maximum temperature value recorded while printing |

## Dot Check History

If a printhead dot (resistor) is damaged the Smartdate will record the printhead width and the date that any new printhead damage occurred.
This data can be recorded to a Log file if required.

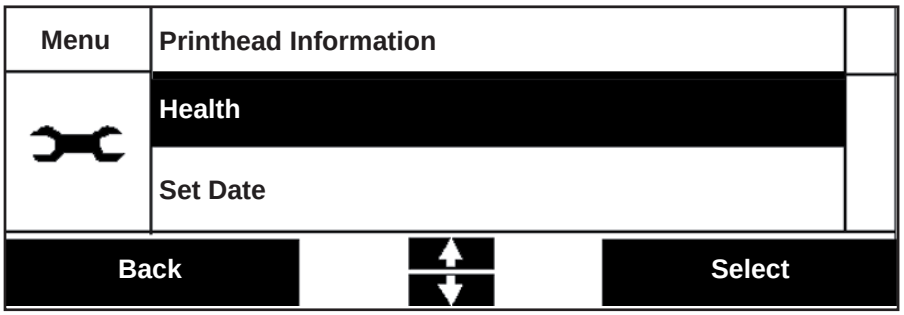
## Firmware History

This screen displays the date of any firmware changes that have taken place.

# Health

This option allows you to view the performance of the SmartDate printer.

1 From the Engineering menus screen select Health




The following details can be viewed

| Information | Description |
|---|---|
| Daily Availability | The percentage of uptime achieved by the system during one day |
| With Cassette Change (daily) | The percentage of uptime achieved with cassette changes over the daily availability period |
| Lifetime Availability | The percentage of uptime achieved by the system. |
| With Cassette Change (lifetime) | The percentage of uptime achieved with cassette changes over the lifetime availability period |
| Measured Over | Number of hours or days over which the lifetime availability is measured |
| Damaged Printhead Dots | The number of damaged printhead dots (If any) |

The Health screen displays metrics relating to the operational efficiency of your installation. In order to compute these metrics the SmartDate distinguishes between and measures, the time spent in different states.

Uptime is the duration for which the SmartDate is available and ready to print if configured to do so. Uptime accumulates when the SmartDate is fault free. This includes time spent powered off with no faults.

Downtime is the duration for which the SmartDate is unavailable due to an operational fault, not related to ribbon change. Downtime includes the time spent switched off with this fault.

Ribbon Change Time is the duration for which the SmartDate is not able to print due to the ribbon being replaced. Ribbon time starts accumulating as soon as the (1208 - End of Ribbon fault) or (1212 - Low Ribbon Detected) is detected. It stops increasing once the system has re-entered the READY state.

Two machine efficiency measures are derived from these times:

% Availability measures % uptime achieved by the system having excluded Ribbon Change Time from the calculation.

**% Availability = Uptime / (Uptime + Downtime)**

This gives a good overall measure of the SmartDate's health. A low availability metric implies a configuration issue that is compromising the amount of time you can successfully use the machine.

% Uptime measures the uptime efficiency achieved by the system and includes Ribbon Change Time in the calculation.

**% Uptime = Uptime / (Uptime + Downtime + Ribbon Change Time)**

This gives a good overall measure of the operational efficiency achieved by the system taking into account routine maintenance. A low metric implies that operational efficiency may be improved by (eg) using longer ribbon, better planning of ribbon replacement times etc.

Both of these metrics are calculated over two different time periods.

**Lifetime metrics** are measured from the time the firmware was installed or the system restored to the factory setup.

**Daily metrics** are measured from either midnight or when the printer was last power cycled - which ever happened last.

# Diagnostics

# Introduction

This section describes the Diagnostics features of the SmartDate X60.

Topics covered in this section include:

- Printer Configuration
- Input Status
- Output Status
- Temperatures
- Print Timings
- Ribbon
- Internal

# Diagnostics Screens

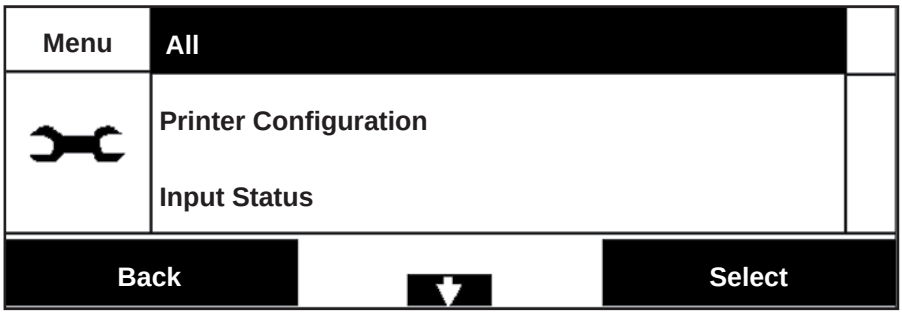
The Diagnostics screen displays the current status and dynamically changing data which give an aid to troubleshooting.

The information is read only and can therefore not be altered.

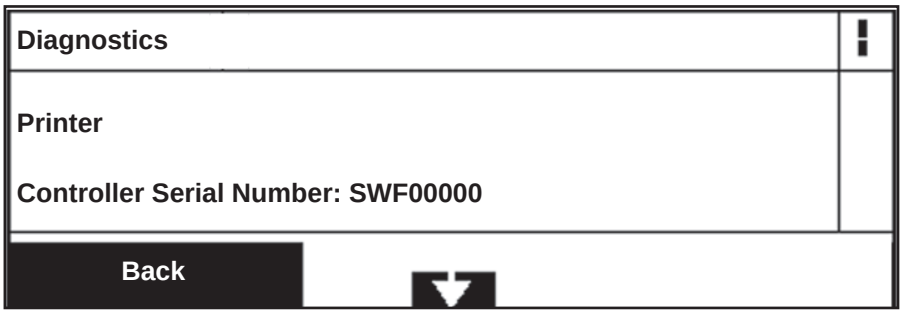
This screen allows access to the following information:

- Printer configuration
- Inputs status
- Outputs status
- Temperatures
- Print timings
- Ribbon
- Internal Sensor status

## The Diagnostics Screen

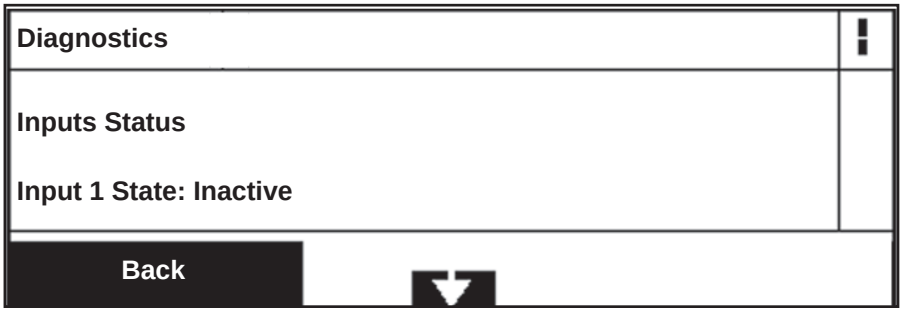


## Printer Configuration Screen



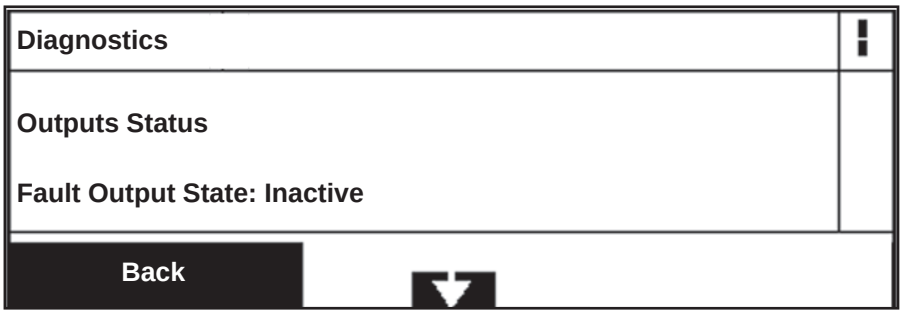

| Setting | Description |
|---|---|
| Controller Serial Number | Controller specific |
| End of Ribbon Sensor | Present or Not Present |
| Flexible IO Map | Off.flex IO or name specific |
| Printer Orientation | Left or Right |
| Printer Serial Number | Printer specific |
| Printer Type | Intermittent or Continuous |
| Printhead Technology | Genuine or Non Markem-Imaje printhead |
| Printhead Width | Width in mm |

## Inputs Status Screen



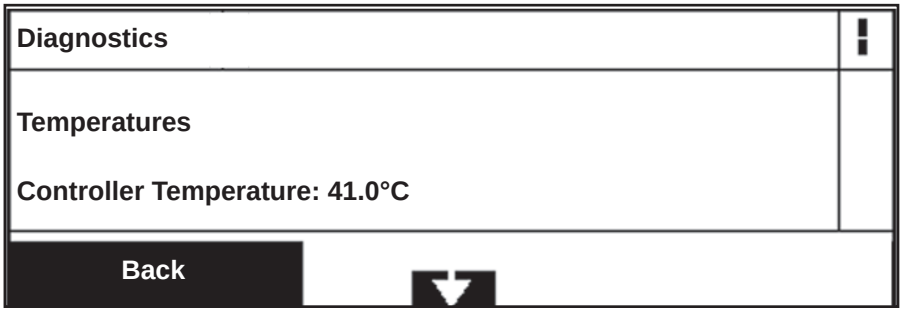

| Setting | Description |
|---|---|
| Input 1 State | Active or Inactive |
| Print Go State | Active or Inactive |

## Outputs Status Screen



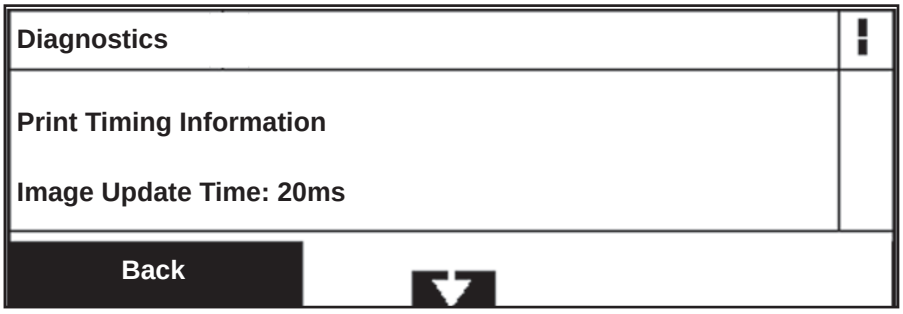

| Setting | Description |
|---|---|
| Fault Output State | Active or Inactive |
| Output 1 State | Active or Inactive |
| Output 2 State | Active or Inactive |
| Warning Output State | Active or Inactive |

## Temperatures Screen




| Setting | Description |
|---|---|
| Controller Temperature | Displayed in °C |
| Printer Temperature | Displayed in °C |
| Printhead Temperature | Displayed in °C |

## Print Timings




| Setting | Description |
|---|---|
| Image Update Time | The time taken to update any variable fields on the current image. E.G. Time/Date fields |
| Imaging Time | The time taken to initiate the image when first selected |
| Print Cycle Time | The time taken for a complete print cycle, including the time to move the printhead |
| Printing Time | The time taken to complete the actual print. |

# Ribbon Supplies

The Diagnostics screen provides information about the available ribbon and number of prints that can be completed before a ribbon change is required.

When the printer is in producing mode the remaining time will also be displayed with respect to the current print cycle time.

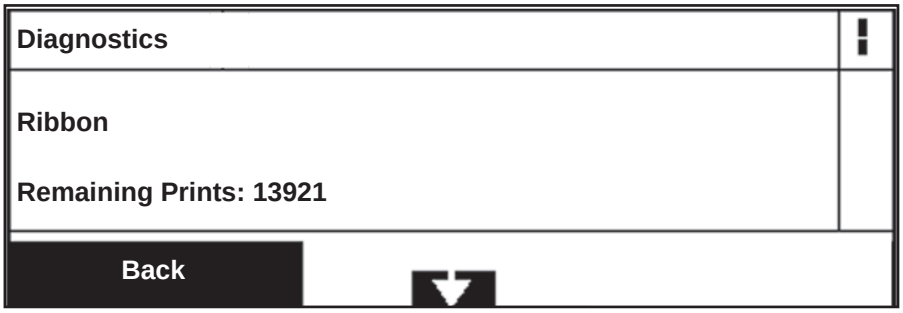
The ribbon supplies monitoring screen can be accessed from the Diagnostics - Ribbon screen.

The following information can be viewed:

Remaining Prints on Ribbon
This is calculated as the number of prints that can be completed with the existing ribbon prior to requiring replacement. This calculation is based on the assumption that the current job settings and rate of production are held constant.

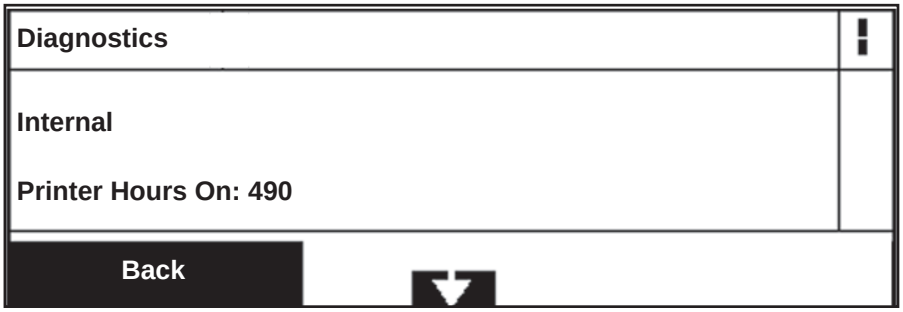
Remaining Time
This figure shows the amount of time left until the ribbon runs out. The calculation of this figure is based on the assumption that production continues at the current pack rate, with the same length of image and settings values affecting the ribbon usage.
This time is calculated and updated every ten seconds.

## Ribbon




| Setting | Description |
|---|---|
| Remaining Prints | The number of prints that can be completed with the current selected job before a ribbon change is required |
| Remaining Time | The time remaining at the current pack rate before a ribbon change is required |
| Ribbon Thickness | The thickness of the ribbon being used |
| Supply Diameter | The current diameter of the unused ribbon left on the supply reel |
| Takeup Diameter | The current diameter of the used ribbon on the take up reel |
| Ribbon Core Diameter | The outside diameter of the ribbon core being used |
| Ribbon Supply Length | The length of the ribbon remaining on the supply reel |

## Internal




| Setting | Description |
|---|---|
| Printer Hours On | The total amount of time the printer has been in a powered up state |
| Damaged Printhead Dots | The number of damaged printhead resistors |
| Tension Controller Position | |
| Cassette Switch State | Active or Inactive |
| Encoder Input A | Active or Inactive |
| Encoder Input B | Active or Inactive |
| Generic 1 | Internal diagnostics function |
| Generic 2 | Internal diagnostics function |
| Generic 3 | Internal diagnostics function |
| Generic 4 | Internal diagnostics function |
| Generic 5 | Internal diagnostics function |
| Keypad | Internal diagnostics function |

| | |
|---|---|
| Left Limit Switch State | Active or Inactive |
| Motor Voltage | Supply voltage to the motors |
| Printhead Voltage | Supply voltage to the printhead fitted |
| Printer Board Links | Internal diagnostics function |
| Printer Internal Fuse | OK or Not OK |
| Printer Supply Fuse | OK or Not OK |
| Printhead Resistance | Resistance setting for the printhead fitted |
| Movement Sensor Value | Internal diagnostics function |
| Ribbon Movement Sensor State | Active or Inactive |

# History

# History

## Special Screens

There are a number of special screens that may occasionally appear.
Examples of this may be if a print can not be completed or if a new type of ribbon is loaded.

## Counts

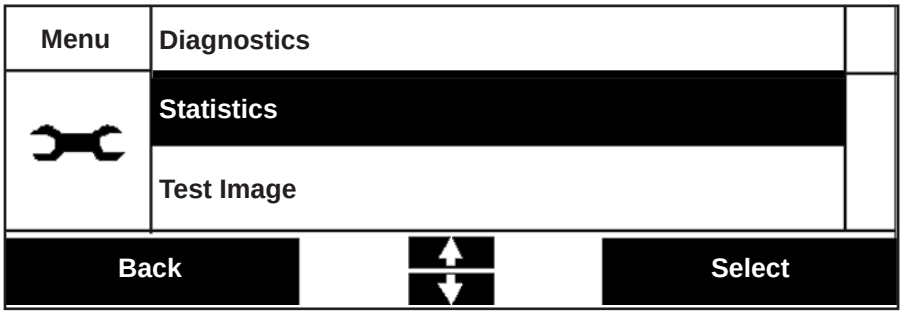
| | |
|---|---|
| Batch Good Counts | This is the number of successful prints with current selected image |
| Batch Spoiled Counts | This is printed image with part of the image missing e.g. A field that is off the image. |
| Batch Missed Count | This is the number of print signals received that could not be actioned. |
| Batch Discarded Count | This is the number of prints that have been discarded either manually or automatically because of low speed. |
| Batch Low Speed Count | This is the number of prints that have been achieved at low print speeds. |
| Batch Failed Count | This is the number of prints that failed because of the above reasons. |
| Total Good Counts | This is the total number of successful prints. |
| Total Spoiled Counts | This is the total number of spoiled prints. |
| Total Missed Count | This is the total number of missed prints. |
| Total Discarded Count | This is the total number of discarded prints. |
| Total Low Speed Count | This is the total number of Low speed prints. |
| Total Failed Count | This is the total number of failed prints. |

# Statistical Information

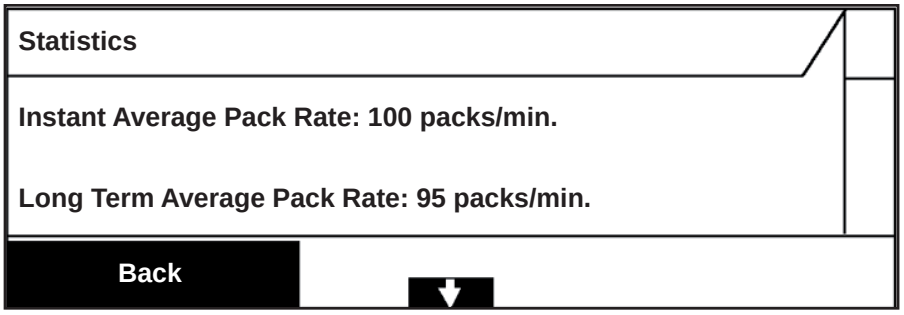
The Statistics Menus allow you to view information about the printers producing performance.

## Statistics

1 From the Engineering menus screen select Statistics




2 The Statistics menu information is displayed.



The following Statistical information can be viewed:

| Information | Description |
|---|---|
| Instant Average Pack Rate | The packs per minute at the current pack rates |
| Long Term Average Pack Rate | The average packs per minute over a specified time period set by the user. |
| Actual prints on Current Ribbon | The number of prints achieved on the current ribbon being used |
| Actual Prints on Previous Ribbon | The number of prints achieved on the previous ribbon being used |
| Time that the Motors have been running | Total hours that the printer motors have been active |
| Printheads Fitted | Number of printheads that have been fitted since new |
| Total Print Cycles | Total number of print cycles completed |

# History

# Maintenance

# Introduction

The SmartDate series of Overprinters are extremely successful, however as with any machine, if it is not set up and maintained correctly, problems can occur.

This section is designed to provide information about how to keep your SmartDate X60 in good working order.

Topics covered in this section include:

- General cleaning and care.
- Maintenance schemes.
- Care of the printhead.
- Replacing the printhead.
- Replacing the ribbon guide rollers.
- Replacing the peel roller.
- Replacing the ribbon movement roller.
- Replacing the ribbon movement sensor.
- Replacing the ribbon tension roller.
- Replacing the ribbon tension sensor.
- Replacing the Micro switches
- Replacing the Solenoid Valves
- Replacing the drive belt.
- Changing the printer hand.
- Replacing the PCBs

# Cleaning and Care

To ensure that your SmartDate X60 operates correctly, the entire unit should be cleaned on a regular basis.

**Printer**:

Particular attention should be given to the inside of the printer body, especially if food products are able to fall into the unit.

- Turn off the power to the controller.
- Turn off and isolate the air supply to the printer body.
- Remove the printer cassette and clean inside the printer body. Since there are electronic components inside this casing, DO NOT use water to clean the unit. Isopropanol cleaning wipes can be used for this purpose.
- To clean debris from the inside of the printer body, Markem-Imaje recommend the use of a soft bristle brush.

# Maintenance Scheme

These recommended actions will ensure consistent high quality from the Markem-Imaje SmartDate X60 technology for package identification.

## Quick/Regular Checks

- Check and clean printhead (daily check). Use Isopropanol wipes.
- Check that the ribbon is tracking through the cassette correctly. Pull the ribbon through by hand, and visually check to see if the ribbon is creasing across the width of the ribbon.
- Check the Peel Roller for any ink build up and clean if necessary. Use Isopropanol wipes
- Check that Darkness / Speed settings are site standard. This will ensure that the print remains a good quality, and it may also highlight any potential problems. For example, if the darkness is unusually high, the printhead may need cleaning. The darkness has probably been set high to compensate.
- Check Air is set to recommended pressure.
- Check condition of Platen rubber (SmartDate X60 - Intermittent printer). Clean or replace it if necessary. The platen rubber needs to be smooth, flat and free from debris. - To change the platen rubber, first take the old platen rubber off. All the adhesive should be removed from the metal platen base. Replace with a Markem-Imaje platen rubber for best results.
- Check for wear or internal debris.
- The 37 way D-type cable must be fitted in a manner so that a tool is required to remove it. The unit should not be powered until it is securely attached to each unit.

## Monthly Checks

- Check condition of peel roller: Remove roller and inspect internally for wear. Replace if necessary.
- Check condition of the ribbon guide rollers: Check that bearings are smooth.
- Check condition of ribbon sensor roller. Inspect the roller coating for wear and damage. If worn or damaged, replace the roller.
- Ensure all rollers are square to the Cassette or Printer.
- Check the magnet for any damage or non-alignment. This magnet is used for ribbon detection and ribbon calibration.
- Print a test image to check printhead quality and alignment. See Section 6 - Menus.
- Check condition of printhead carriage drive belt and associated components: pulleys, bearings, retainers and shafts.
- Check Air cylinder.
- Check that the tension roller slide is free to move.

## Care of the Printhead

Although purpose-built for its application, the printhead is still subject to wear and tear. Careful consideration at the time of installation and regular preventative maintenance can significantly help to maximise printhead life.

The most frequent cause of printhead damage is abrasion - either from ingress of airborne particles or from an abrasive substrate surface. Consequently, printhead life varies considerably among substrate materials and among applications.

The thermal ribbon protects the printhead against wear. With use of various ribbon widths and an abrasive substrate, it is possible that the unused, unprotected, section of the printhead is subjected to wear and damage. Usually, abrasive substrates have pre-printed inks. Particularly, some red inks may be more abrasive than other colours.

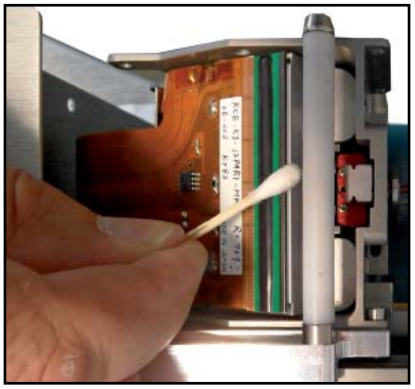
Procedures for all thermal transfer printers follow:

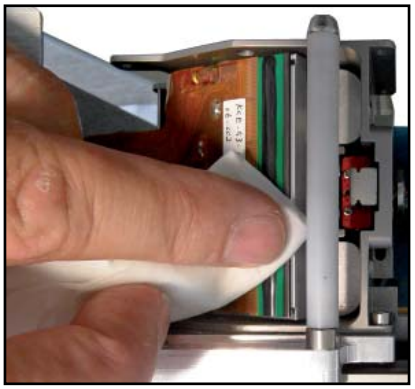
- Regularly clean the printhead. The frequency of cleaning is entirely application and environment specific.
- To minimise printhead wear, always use the minimum air pressure that delivers an acceptable print quality. Never exceed the maximum air pressure recommended for the particular SmartDate X60 used.
- Use the minimum darkness setting that delivers the required print quality.

## Cleaning the Printhead

The printhead should be cleaned at regular intervals. These depend on machine use, operating environment, and choice of thermal ribbon.

1 Turn off the power to the controller and remove the ribbon cassette.
Allow the printhead to cool to normal room temperature before proceeding in order to prevent the possibility of thermal shock damage.

2 



Use a cotton swab or a soft cloth soaked in Isopropanol solvent to remove any residue from the printhead. Take care not to use excessive amounts of solvent.

The print line is located on the bevelled edge of the printhead.

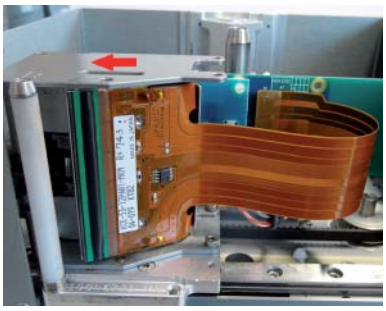
Use great care not to damage the printhead during cleaning. UNDER NO CIRCUMSTANCES should abrasive materials, or tools such as screwdrivers, be used for cleaning the printhead.
Replace the ribbon cassette and check the print quality. If the overall quality is poor, or some of the dots are not printing, the printhead may need to be adjusted or changed.

# Replacing the Printhead

The SmartDate X60 printhead can be changed quickly and easily.
Turn off the power to the controller and isolate the air supply to the printer body.
Remove the ribbon cassette.
Always ensure anti static precautions are used when handling new printheads.

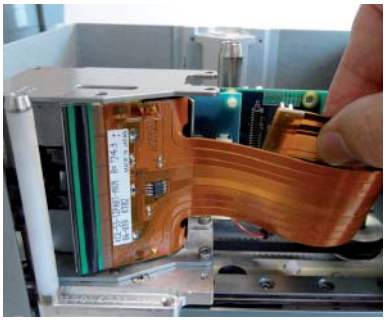
## Removing the damaged printhead (Combined)

1



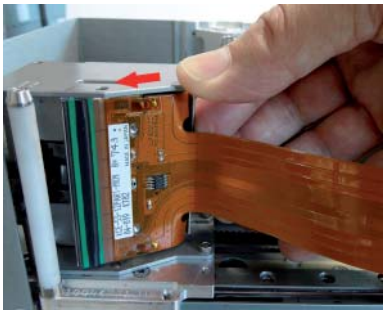
Move the print module to the side to allow access to the ribbon cable connector.

2



Disconnect the ribbon cable from the printer interconnection PCB.

3

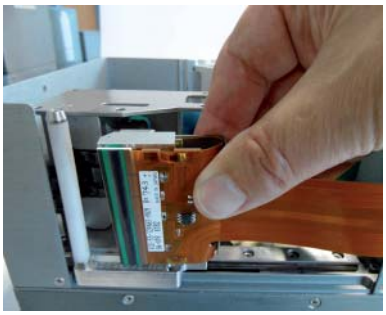


Push the printhead forward towards the peel roller and rotate the rear of the printhead outwards as shown above.

4

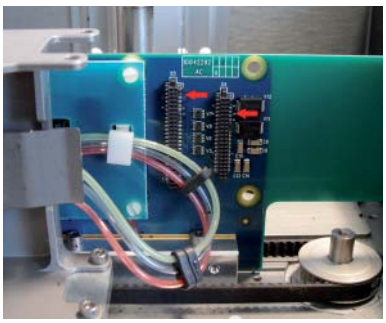
Swing the printhead out from the print module.

5



Remove the printhead from the print module.

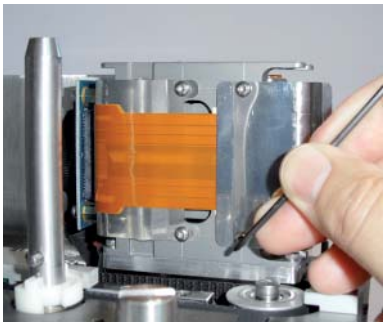
6



Note the different connectors:
X5 Smarthead
X4 Standard Head

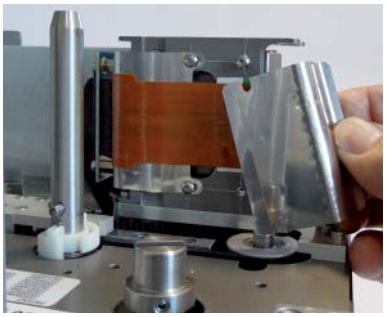
## Removing the damaged printhead (Shuttle)

1



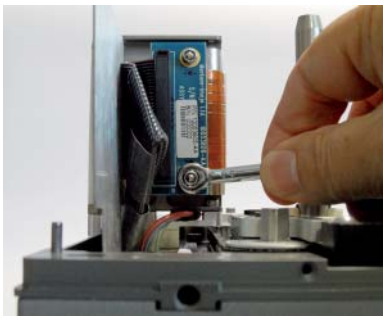
Remove the retaining screws from the printhead ribbon cable guide.

2



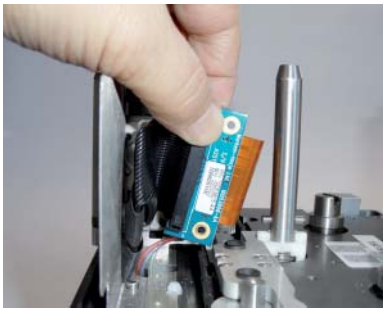
Remove the ribbon cable guide.

3



Remove the two retaining screws from the ribbon connector block.

4

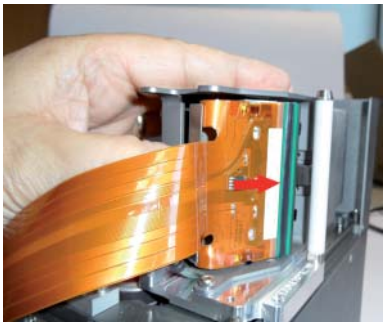


Disconnect the ribbon cable from the PCB.

5

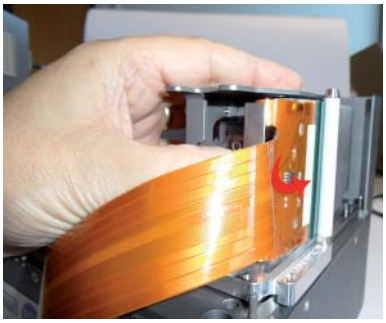
Remove the ribbon cable from the connector.

6



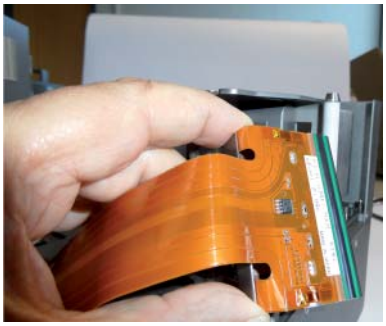
Push the printhead forward towards the peel roller and rotate the rear of the printhead outwards as shown here.

7



Swing the printhead out from the print module.

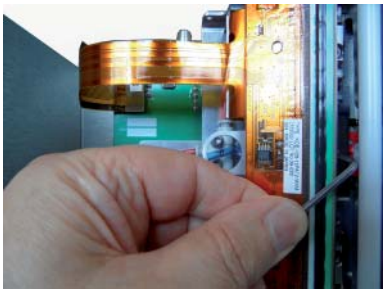
8



Remove the printhead from the print module.

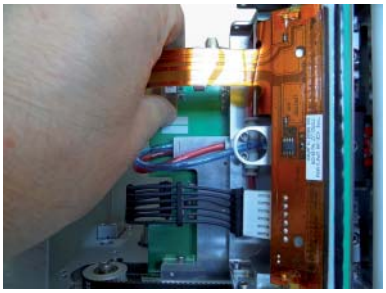
## Removing the damaged printhead (128 mm)

1



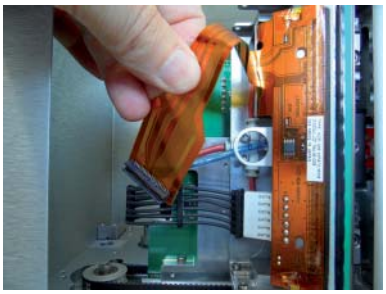
Remove the retaining screw from the printhead

2



Remove the ribbon connector from the printer interface PCB.

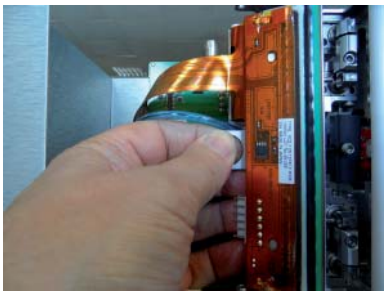
3



4

Remove the power connector from the Printhead.

5

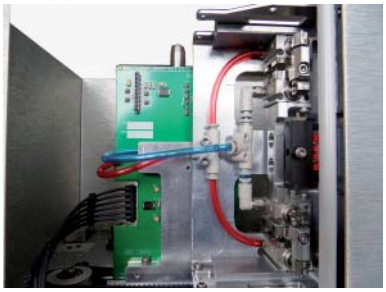


6

7

Remove the printhead from the print module.

8



Remove the printhead from the printer body.

## Setting the correct Printhead resistance

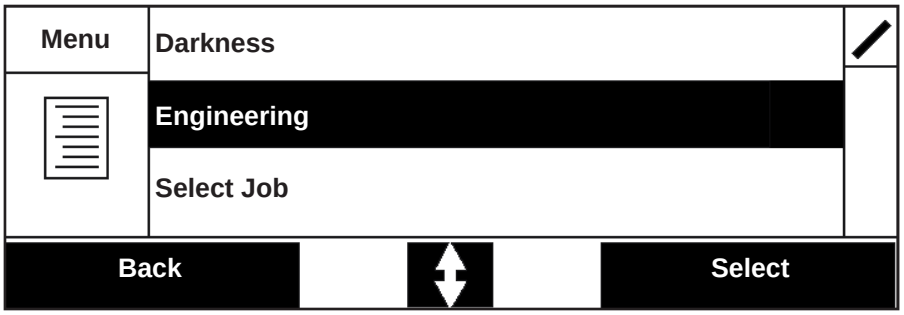
*NOTE: with Smarthead printheads the resistance setting is automatic.*

*NOTE: with non markem-Imaje printheads the resistance value is printed on the PCB side of the new Printhead. This value must be entered into the controller menu structure.*

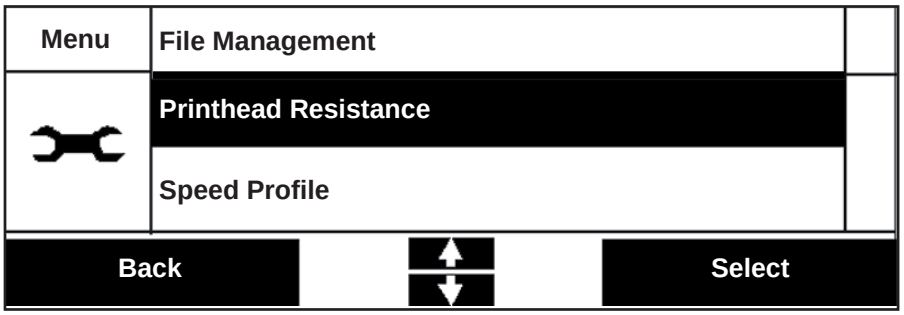
Each Printhead has an individual Resistance level, and the voltage level setting required for each is different.
A label on the printhead displays the rating for that particular one.
In this case, R = 1272

The Printhead resistance option can be accessed from the Engineering menus.

1 From the Menus screen select Engineering.

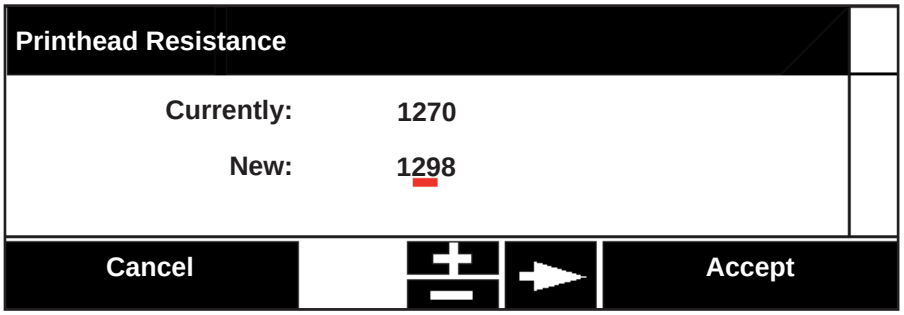


2 The Engineering Menus screen is displayed.




Use the bottom Quad button to scroll to the Printhead Resistance menu.

3 Press the right button to Select the menu.
The Printhead Resistance menu screen is displayed.

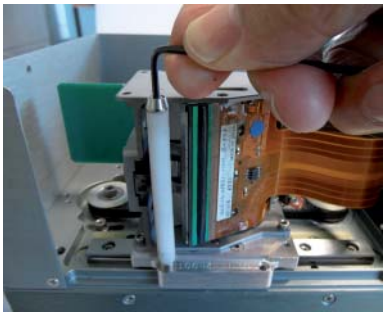



Use the left and right Quad buttons to move the cursor..
Use the top and bottom Quad buttons to change the date or time.
When finished press the right button to Accept the changes.

# Replacing the Peel Roller

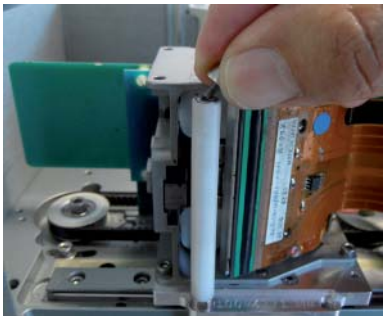
The Peel Roller body is a wear part and should be checked for damage and changed if necessary..

1



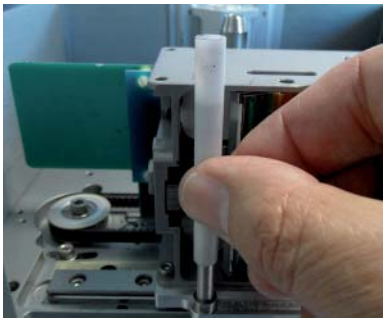
Remove the retaining screw from the end of Peel roller.

2



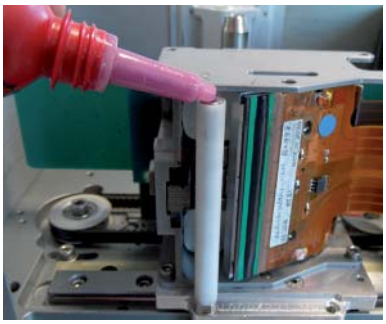
Remove the screw and washer.

3



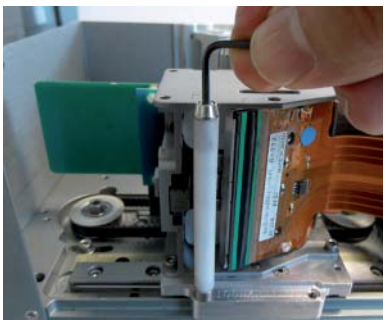
Lift off the roller body.

4



Fit a new Peel roller body over the shaft and secure the screw with Loctite 222.

5

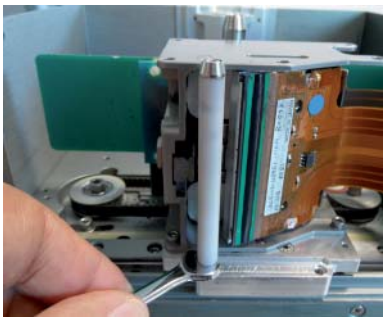


Secure screw.

6

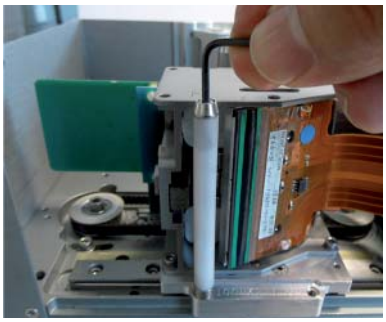
Clean off any excess fluid and ensure the roller is free to rotate.

1



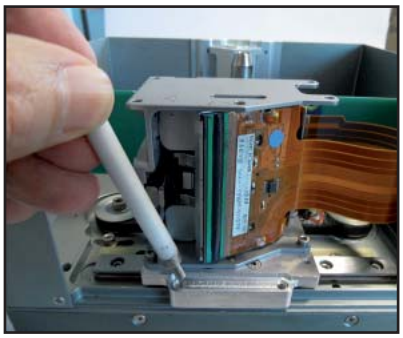
If the peel roller shaft has been damaged, undo the retaining nut at the base and remove the complete assembly.

2



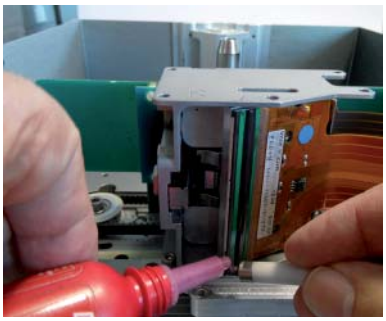
Once the seal has been broken at the base of the screw, use an Allen key to unscrew the Peel roller.

3



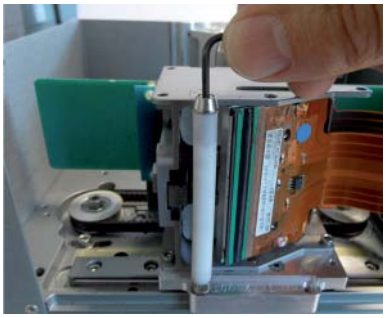
Remove the roller from the printer carriage plate.

4



Fit a new peel roller assembly and ensure that it is secure and free to rotate. Secure with Loctite 222.

5



Tighten the screw.

6

Clean off any excess fluid and ensure the roller is free to rotate.

# Replacing the Ribbon Guide Rollers

The ribbon guide rollers are vulnerable to damage through misuse and may have to be changed if they become bent or damaged.

1

Remove the damaged roller by applying a spanner to the two flat surfaces at the base of the roller.

2

Place the damaged roller to the side.

2

Before fitting a replacement roller, apply Loctite to the screw thread at the base of the roller.

3

Place the new roller in position and tighten.

Ensure that the Roller is free to rotate.

4

Clean off any excess fluid and ensure the roller is free to rotate.

# Replacing the Ribbon Movement Roller

## Replacing the Roller Magnet

If the magnet on the movement roller has been damaged it will have to be replaced.

1

Remove the securing screw on the end of the roller.

2

Remove the screw and securing washer.

3

Remove the damaged magnet and rubber washer.

4

Fit a new magnet and rubber washer.

5

Replace the Securing washer and tighten the screw.

## Replacing the Movement Roller

The procedure for replacing the ribbon movement roller is the same as for the ribbon guide rollers.

1

Remove the damaged roller by applying a spanner to the two flat surfaces at the base of the roller.

2

Before fitting a replacement roller, apply Loctite 222 to the screw thread at the base of the roller.

3

Place the new roller in position and tighten.

4

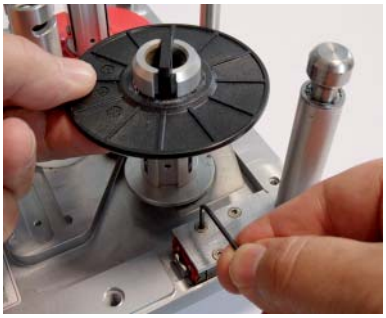
Secure the roller in position.

Clean off any excess fluid and ensure the roller is free to rotate.

# Replacing the Ribbon Tension Roller

If the tension roller becomes damaged the whole assembly will require changing. Dependant on the hand of the cassette the ribbon supply flange (red) may have to be removed to gain access to the securing screws.

1



Remove the four retaining screws from the tension roller carriage.

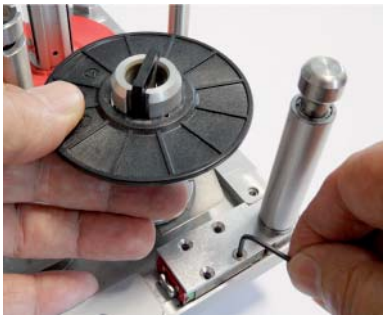
2

Remove the damaged tension roller assembly.

3

Replace with a new assembly.
Ensure the spring is inserted correctly.

4



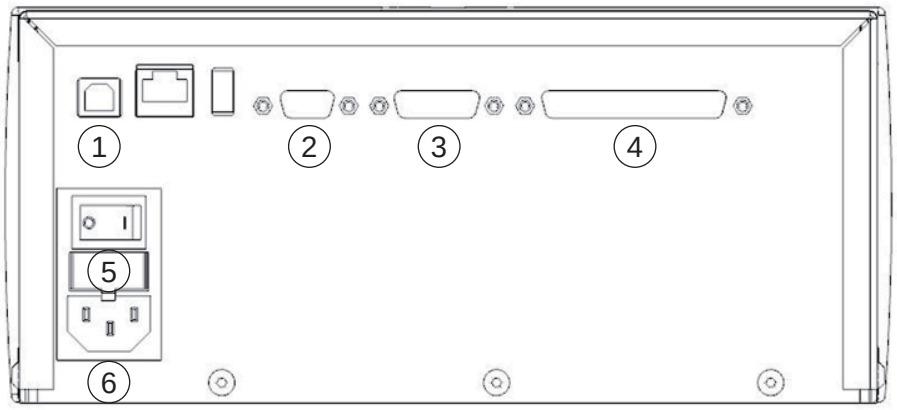
Secure the screws with Loctite 222.

# External links

# External links

# Controller and Printer Connection Points

The main connection points for the Controller unit are shown below:



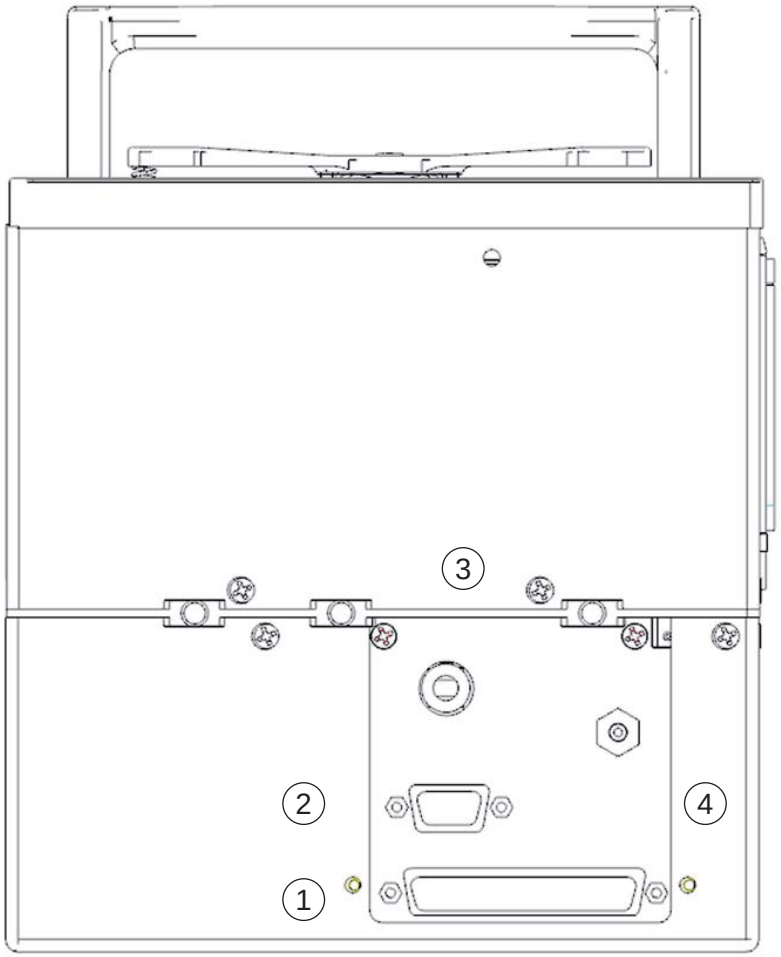

Controller Connection Points (Rear View)

1. Ethernet
2. Serial Comms
3. I/O Port
4. Printer Power and Control Signal
5. Mains Fuse
6. Mains Power

*The D-Type connectors must be fitted such that a tool is required to undo them. At no point should the unit be powered until these are securely attached to each unit.*

## Printer

The main connection points for the Printer unit are shown below:




Printer Connection Points

1. Printer Power and Signals.
2. Encoder.
3. Air Inlet.
4. Air Exhaust.

# Printer Power and Control Signals

A single cable connects the Controller and the Printer Body.

This cable can be up to 10 metres in length.

Both power and signals are present in the single multi-core cable.
To ensure robust signal integrity, the Controller to Printer link is via a twisted-pair RS-422 interface.
The cable is terminated at each end by 37 way D type connectors, one male one female.
The cable must be inserted into Controller and Printer Body and firmly secured prior to switching on the unit.

## Control I/O Connections

A 15-way cable with a D-type plug connector on the rear of the Controller provides:

– Connection to the PRINT GO input.
– Access to the Fault and Warning Status outputs.
– Access to the User configurable Digital I/O

| Pin | Description |
|---|---|
| 1 | +24 VDC - I/O |
| 2 | PRINT GO Input<br>(PNP sensor or +24V Switched)<br>Controller PCB Link - X11<br>Position A -PNP |
| 3 | 0 V - I/O |
| 4 | User Configurable Digital Input 1<br>(PNP sensor or +24V Switched)<br>Controller PCB Link - X12<br>Position A -PNP |
| 5 | Reserved |
| 6 | Reserved |
| 7 | Fault Output (Contacts Open for Fault) |
| 8 | Fault Output (Contacts Open for Fault) |
| 9 | Warning Output (Contacts Close on Warning) |
| 10 | Warning Output (Contacts Close on Warning) |
| 11 | User Configurable Digital Output 1# (24V PNP) |
| 12 | 0 V - I/O |
| 13 | User Configurable Digital Output 2# (24V PNP) |
| 14 | Reserved |
| 15 | Reserved |

## Print Go Input Wiring

**Print Go Input using a voltage free contact**

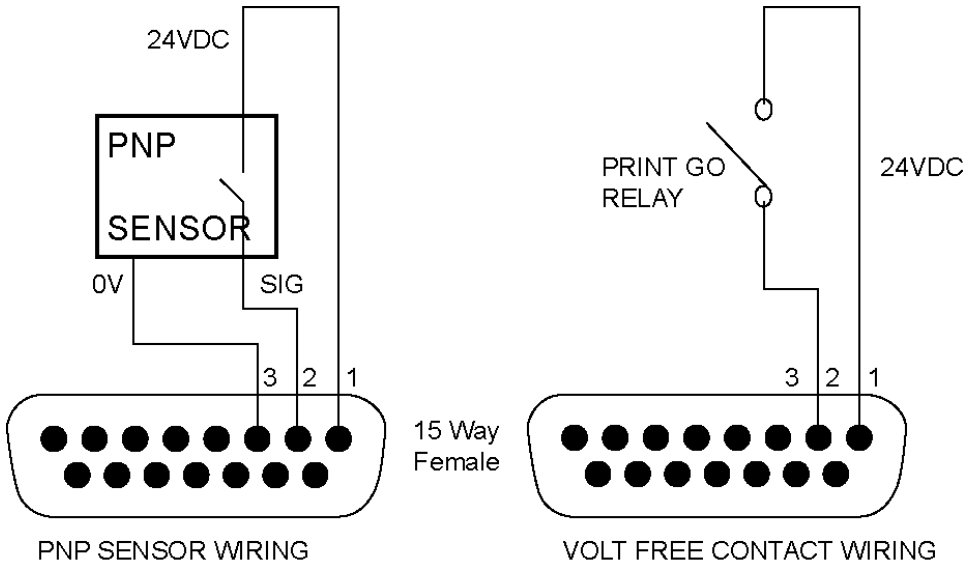
If a voltage free contact is used it should be wired between terminals 1 (24 V DC) and 2 (PRINT GO). SmartDate X60 is edge triggered and prints whenever the contacts close, but will not print again until the contacts have opened and closed again after printing is complete.

**Print Go Input using a PNP sensor**

If a PNP sensor is used connect as follows:

– Signal cable into terminal 2 (PRINT GO)
– Ground cable into terminal 3 (GND)
– Power cable to terminal 1 (+24 V)

SmartDate X60 prints each time the sensor changes from low state to high state. The input draws a maximum of 13 mA at 25 VDC.




PNP SENSOR WIRING

VOLT FREE CONTACT WIRING

## Fault and Warning Outputs

**Fault - (Problem)**
Pins 7 and 8 on the 15-way connector are the open relay contacts for FAULT.
Fault relay contacts open when SmartDate X60 is:

– In **READY** mode.
– Not in a position to print because of a **PROBLEM**

**READY mode:**
The Unit OK signal is switched off when the SmartDate X60 is switched out of PRODUCING mode and into **READY** mode.

**ABORTED mode: (Fault)**
If a problem occurs the SmartDate X60 will automatically switch to **ABORTED** mode and indicate that there is a problem.

**PRODUCING mode:**
The contact is closed when the printer is ready to print.
The contacts should be used to provide an interlock to the overall control of the packaging machine.
It is recommended that this signal is always used to prevent unmarked products being produced.

**Warning**
The Warning relay contacts close when a warning such as a low ribbon condition is detected.
Pins 9 and 10 on the 15-way connector are the closed relay contacts for Warnings.
The contact is open when the printer is ready to print.

*The relay contacts are suitable for a current between 10mA and 1A. The maximum rating is 1A at 30VAC/DC. Control of higher voltages (e.g. 100VAC) or currents must use intermediate external control relays or contactors.*

# Encoders

For continuous printers, an encoder is required to monitor the speed of the substrate. It is essential that the encoder measures the speed of the substrate at the point of printing.
The encoder should be mounted so that the wheel of the encoder is running against the print roller.
Markem-Imaje recommend that a Quadrature encoder is used.
This measures the substrate movement in both directions (forwards and backwards) ensuring that any backward drift when the packaging machine is stopped is accounted for.
The Encoder setup can be configured from the Engineering Mode Settings menu screen.
SmartDate X60 requires the encoder to provide:

– Between 2.8 - 150 pulses per mm of substrate travel.
– The output connects to an NPN open collector output, operating at 24 V DC.
– The standard SmartDate X60 encoder is 613 pulses per rev. with a 63.6 mm tracking wheel, giving a resolution of 3.05 pulses/mm. (The printer default setting)

A high resolution encoder (6122 pulses/rev) should be used where print speeds lower than 70mm/s are experienced during the print cycle. This is also the case if the packaging machine exhibits high acceleration from low speeds.

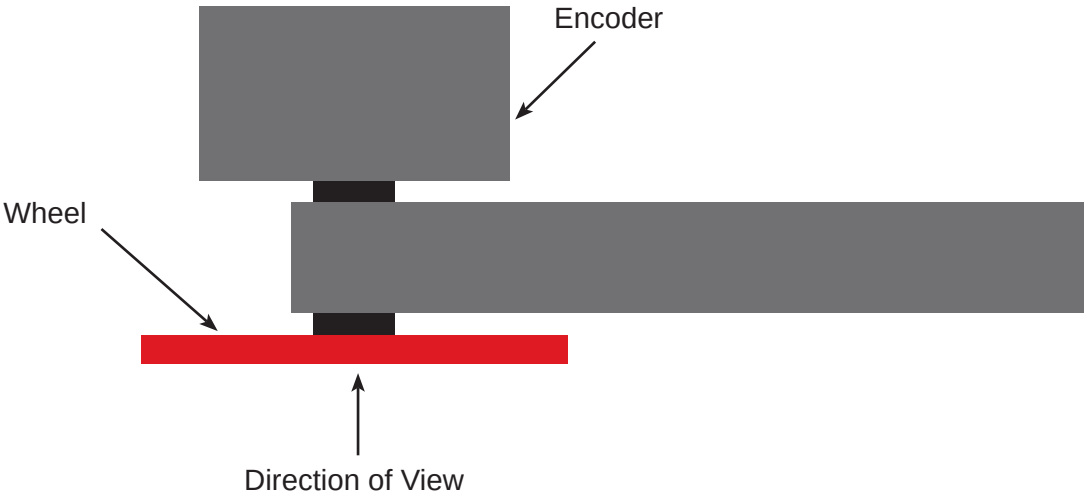
*With images that are longer than 50mm the encoder must be re-calibrated.*

## Quadrature Encoders

A quadrature encoder has two electrical channels that allow it to report distance / speed and direction. This is the preferred type of encoder in that it allows the SmartDate X60 to take care of any changes in direction.

**Encoder Direction**

When using a quadrature encoder it is important that the SmartDate X60 is aware of the normal operating direction.
When used with an Idler wheel the setting will define the direction of the encoder wheel (Clockwise or Anti - clockwise) when viewed towards the encoder wheel when the machine is printing normally.
This can be validated by viewing the substrate speed on the Diagnostics screen inputs. An incorrect setting will display a negative speed value.




For details of the pin connections please refer to Section Electrical Schematics.

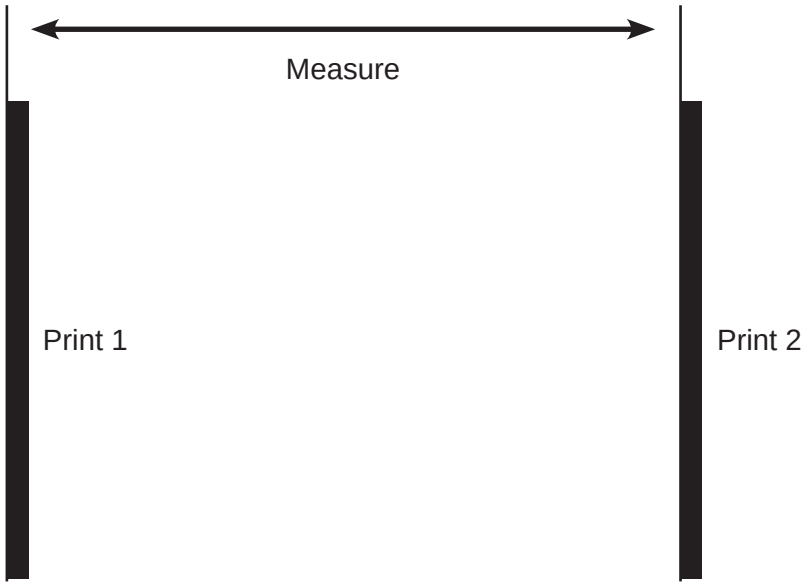
## Encoder Resolution

The encoder resolution is expressed in stripes (pulses) per mm and can be set to between 2.8 stripes / mm and 150 stripes / mm.
The standard SmartDate X60 encoder has an idler wheel of 52.5 mm mounted on a 500 stripes per revolution encoder. This gives an encoder resolution of 3.05 stripes / mm.

**Encoder Setup**

The idler wheel typically runs on a rubber roller and in the case of the SmartDate X60 has a rubber tyre on the wheel. It is difficult to determine the exact measurements, therefore the following procedure can be used to validate the setting.

1. Create an image containing one horizontal line.
2. Set the SmartDate X60 to fixed spacing mode by setting the Print trigger setting to 3. Internal. (This can be found in the Engineering -Settings menus under Print Initiation)
3. Set the fixed spacing distance to 100 mm or greater.
4. Run the substrate at a constant speed and allow the printer to print a number of prints.
5. Stop the substrate and measure the distance between the leading edges of the two adjacent prints as shown below.
6. The distance should equal the configured fixed spacing distance.
7. If it is more than 0.5 mm out the encoder resolution should be adjusted.



### Single Channel Encoders

Single channel encoders can be used with SmartDate X60 continuous printers, but will not be as efficient as quadrature encoders.

The substrate movement is recorded in one direction only, any drift backwards is not accounted for.

The setting for this type of encoder is External - Pulse train. This covers single channel encoders and bagging machines that output a single channel movement signal.

### Fixed Speed settings

This setting can be used if the substrate runs at a constant known speed. The setting for this method of running is Internal, and the substrate speed must be manually entered.

*With images that are longer than 50mm the encoder must be re calibrated*

# Communication Links

The standard recommended Comms connection for SmartDate X60 is Ethernet.
The method of communication is via Markem-Imaje Device Communication Protocol (DCP)
RS-232 communication is also available but only for use with Markem-Imaje Next Generation Printer Control Language (NGPCL)
This is used for remote selection of Jobs in the local database, updating field data on the image etc.

## NGPCL Communication

(Next Generation Print Control Language)
NGPCL is a protocol that is used to connect Markem-Imaje NextGen based printers to simple line control equipment.
This equipment is typically PLC based and is not capable of handling more complex message structures such as DCP (Device Communication Protocol)
An example where NGPCL might be used is where a SmartDate X60 is being used to print information that changes from one print to the next.
A check weigh machine could be used to send specific information about the weight of individual packs.
This data would be used to complete the updated field information on the print design.
Another example might be where the line device informs SmartDate X60 to select a specific Job and set an Allocation of 10.
SmartDate X60 would then limit the number of times that the Job was printed to 10.
Printer Status information can also be supplied to the line device.
NGPCL can be connected via RS-232 or Ethernet.

For more information about NGPCL please contact your local Markem-Imaje office or agent.

# Communication Options

Several communication options are available:
These include the following:

– Ethernet from a PC or Server to a SmartDate X60.
– Ethernet Network from a PC or Server to a series of SmartDate X60 printers.

**Controlling SmartDate X60 from a PC**

By using CoLOS Control all SmartDate X60 printers can be controlled from a single PC. This allows the user to setup Jobs for the SmartDate X60 printers or configure printers settings from the PC.
Job setup can be done individually or printers can be grouped together to enable several SmartDate X60 printers to be setup at the same time with the same job.
For full details about CoLOS Control please consult the Markem-Imaje CoLOS Control documentation.

# Technical specifications

# Machine Specification

## SmartDate X60

| Specification | |
|---|---|
| Print Area | SmartDate X60 - Combined Intermittent Mode<br>53 mm x 75 mm<br>SmartDate X60 - Combined Continuous Mode<br>53 mm x 150 mm<br>SmartDate X60 Shuttle Continuous<br>53 mm x 100 mm<br>SmartDate X60 / 128 - Combined Intermittent Mode<br>128 mm x 75 mm<br>SmartDate X60 / 128 - Combined Continuous Mode<br>128 mm x 150 mm |
| Substrate Area | Unlimited. |
| Print Speed | SmartDate X60 -Combined Intermittent printer<br>50 - 700 mm/s<br>SmartDate X60 -Combined Continuous printer<br>50 - 1000 mm/s<br>SmartDate X60 -Shuttle Continuous printer<br>50 - 1200 mm/s<br>SmartDate X60 / 128 - Combined Intermittent Mode<br>50 - 700 mm/s<br>SmartDate X60 / 128 - Combined Continuous Mode<br>50 - 700 mm/s |
| Max Pack Rate | SmartDate X60 - Intermittent Mode<br>200 ppm with a 10 mm image<br>SmartDate X60 - Continuous Mode<br>280 ppm with a 10 mm image (148 mm bag) |
| Printhead Resolution | 300 dpi (12 dots/mm). |
| Printhead Gap | Intermittent Printers - 0.5mm - 5mm (Max) |
| Print Method | Thermal Transfer. |
| Power Supply | ~ 100 - 230V (+/- 10%) 50 - 60 Hz |
| IP Rating | Controller IP 41<br>Printer IP 2X |
| Environmental | Operating environment of:<br>32° F to 104° F(0° C to 40° C) |

# Technical specifications

| | |
|---|---|
| Noise Levels | Test Standard BS EN ISO 3746:1996<br>SmartDate X60 Intermittent printer<br>199 ppm with a 10 mm Image<br>(700 mm/s) <70 dB (A)<br>SmartDate X60 Continuous printer<br>299 ppm with a 10 mm Image (160 mm bag)<br>(800 mm/s) 70 dB (A) |
| Air Supply | 6 bar / 90 psi (maximum) dry,<br>uncontaminated. |
| Air Consumption | Max at 5 bar with 4.0 mm (1.6”) printhead gap<br>= 8.8 ml/cycle (0.15 cubic inches/cycle).<br>Typical at 3 bar with 1.5 mm (0.06 “) printhead gap<br>= 2.0 ml/cycle (0.123 cubic inches/cycle) |
| Printer Dimensions | SmartDate X60<br>180 mm (7.08”) length x 209 mm (8.22”) width x 197 mm (7.75”) height.<br>Allow a minimum of 100 mm above the printer for extension of the handle and ribbon cassette removal. |
| Controller Dimensions | 195 mm (7.67”) length x 255 mm (10.3”) width x 115 mm (4.5”)<br>Allow a minimum of 80 mm (3.15 ”) for the connector and cable access to both printer and controller. |
| Printer Weight | SmartDate X60 - 7.82 kg<br>SmartDate X60 / 128 - 9.1 kg |
| Controller Weight | 4.0 kg |
| Ribbon | Cassette loaded:<br>Maximum ribbon length 1100 metres (3820 Grade)<br>Maximum ribbon width 55 mm<br>Minimum ribbon width 20 mm |
| Colours | An extensive range of approved Markem-Imaje ribbons are available including Black, White and a selection of other colours. Only Markem-Imaje approved ribbon types must be used to enable / maintain / and sustain the quality / adhesion / performance of the printer. |
| Font Styles | Any True Type font + Speedo and TI Corpus Christi |
| Font Sizes | Scalable to specific point sizes. |
| Orientation | Any mix of orientation. |
| Barcodes | Code 39, EAN 8, EAN 13, EAN 128, UPC A and UPC E, RSS-14 QR, RSS-Expanded |

| | |
|---|---|
| Graphics | Lines, Boxes and Logos (*.bmp format) |
| Special Functions | Automatic Real Time, Date, Batch and Shift Information. Automatic ‘Best Before End’ offset calculation and coding. Incremental alphanumeric text and barcodes. |
| Local SmartDate X60 Memory | 20Mb. |
| Machine Interface | Inputs: ‘Print’ input signal status.<br>Outputs: Interlock Output<br>User Configurable I/O |
| Operator Interface | Monochrome 240 x 64 pixel backlit LCD display with six hard buttons. Wipe Clean Key Panel for local entry of variable information, complete with Full Diagnostics capability. |
| Computer Interface | Ethernet |
| Design Software | Markem-Imaje CoLOS Create Pro for Windows design package, for IBM compatible PC Operation. |
| Network Software | Markem-Imaje CoLOS Control for Windows network, for data transfer, remote operation and machine monitor / data logging operations, for IBM compatible PC Operation. |
| Options | Expansion I/O card<br>Low Power Beacon Lights |

# SmartDate X60 (MUI) User Manual - Revision

. The revision AA index corresponds to the first  edition of this manual.
. The revision index changes with each update.

| Date published | Revision index documentation |
|---|---|
| 11-2011 | AA |
| 06-2014 | AB |
| | |
| | |
| | |
| | |
| | |

For Marking & Coding Equipment. Photographs and drawings are not binding in detail. This document was originally written in Eng;lish. The English text of this document shall alone be authentic and shall prevail in the event of a dispute. Markem-Imaje reserves the right to modify the specifications of its products without prior notice. Any reproduction, even partial, of this document is prohibited. Original manual: