Course Outline (8 Days)

TRAINING MATERIALS:

BPS M3 Course Outline for distribution
BPS M3 Training Manual
BPS M3 Training Supplement (USB)
Laptop with Windows 7 or Windows 10
USB stick (64GB preferable)

I. LESSON: Week 1/Day 1

II. TOPIC: Introduction and Getting to know the BPS M3. Complete Overview of the System including available processing operations. Menu options for Operator, Supervisor, and Service roles. Various operational disturbance demonstrations.

III. TRAINING OBJECTIVES:

Upon completion of this day of the course, the successful student should be able to:

- Identify the supporting documentation and supplemental training available for the BPS M3 product.
- Explain safety issues when operating and servicing the BPS M3.
- Identify the functional components that comprise the individual modules.
- Identify the different BPS M3 machine varients.
- Identify the optional and external equipment available for the BPS M3
- Identify the various components used to operate and control the system.
- Create System Users
- Create different modes of processing operations.
- Explain the Banknote Processing operational procedures
- Identify different operational disturbances
- Identify the configurations that will be used during training
- Demonstrate how to configure, modify, and operate the system

IV. INSTRUCTIONAL TASKS:

A. Review the outline for the BPS M3 Training Program

B. Identify the overall course goals, and the general course objectives.

C. Distribute the Training Manual and Technical Diagrams.

D. Distribute BPS M3 USB.

E. Identify the main sections in the Customer Documents

1. Operating Manual
2. Site and Facility Requirements

F. Identify the main sections in the Service Documents

1. Maintenance Manual
2. Repair Manual
3. Adjustment Procedures
4. Technical Diagrams
5. Software Installation
6. Control Center Documentation
7. LVM-S.3
8. Frequency Drive Converter

G. Identify the main sections in the Technical Documents

1. Quick Procedures

H. Identify the main sections in the Training Documents

1. Training Guide
2. Training Handouts

I. Terms and Abbreviations

J. Safety

K. External equipment - Printer, Reconciliation PC, Eco-Protect, et cetera.

L. Identify the following:

1. the Input Module
2. the Operating Module
3. the Delivery Module(s)
4. the Fail-Safe pocket
5. the Pneumatic Unit

M. Describe the method used to identify the different machine varients of the BPS M3

N. Identify how to power on/off the Pneumatic Unit.

O. Components used to operate and control the system (at the Machine)

1. Main Switch
2. Emergency Stop buttons
3. Safety Button (ZHT)
4. Drive Slow buttons
5. Hand wheel
6. Singler shaft
7. Touch Screen
    a. Header
    b. Machine view
    c. Selection bar
    d. Menu bar
    e. Content view
8. Bander keyboard
9. Lateral and Trailing edge guides
10. Fail Safe

P. Identify and describe the System Users:
1. Operator
2. Supervisor
3. Field Engineer
4. System Administrator
5. GD Expert

Q. Identify and describe the Accounting sections:
1.Shift
2.OpMode
3.Customer
4.Deposit

R. Banknote Processing Procedure
1. Logging on
2. Displaying / Hiding help
3. Changing the language
4. Selecting processing parmeters
5. Preparing Banknotes
6. Processing Banknotes
7. Emptying Stacker Compartments

8. Emptying Fail Safe Compartment
9. Using the Handwheel
10. Changing Configurations
11. Change Password
12. Getting Reports
13. Logging on/off an additional user
14. Checking Pending jobs
15. Copying Process Data
16. Logging Off
17. Switching Off the System

S. Opening and Closing the Machine

T. System Malfunctions
   1. Banknote Jam
   2. Power Failure
   3. Component Failure

U. Manner in which rejects are handled

V. Describe the difference between Header card processing and Deposit processing

W. Serial processing, parallel processing, and continuous feed processing.

X. Identify the three Currency modes that will be used fairly extensively during training
   1. BLK
   2. USD
   3. GDN

Y. Run a shift, and demonstrate the process of configuring the BPS M3.

Z. Proper procedures for shutting down

I. LESSON: Week 1/Day 2

II. TOPIC: Software Installation, Control Center MPC, and BPS EcoConfigurator

III. TRAINING OBJECTIVES:

Upon completion of this day of the course, the successful student should be able to:

- Perform and Image Installation.
- Install the Release.
- Explain how to perform other Installation tasks.
- Perform functions of the Control Center Production Plug-in
- Perform functions of the Control Center Security Plug-in
- Create a Configuration Project with BPS EcoConfigurator
- Create a Deployment Package with BPS EcoConfigurator
- Deploy and Activate Configuration Packages.

IV. INSTRUCTIONAL TASKS:

Review of the material covered to date with a Question and Answer session.

Software Installation:

1. Installation of Image
2. Installation of Release
3. Deployment and Activation of Configuration Package
4. Other Installation Tasks

A. Installation of Image

1. Requirements
2. Installing Image
3. Setting Date and Time- QP01
4. Setting Regional Keyboard Layout
5. Installing the Printer- QP03
6. Further Installation without Eco-Protect

B. Installation of Release

1. Requirements
2. Preparing Installation of Release
3. Starting Platform Installer
4. Uninstalling Packages

5. Installing Release Packages
6. Installing Languages
7. Configuring Hardcopy- QP04

C. Other Installation Tasks

D. Disabling/Enabling GDShell

1. Configuring Automatic Startup and Shutdown- QP06
2. Calling File Explorer Manually while Booting
3. Rebooting and Shutting Down Machine Manually via Desktop
4. Changing Network Settings
5. Exporting and Importing User settings

Control Center MPC:

A. Starting Control Center on BPS M3

B. Selecting Plug-ins

C. Adapting the Work Area

D. Production Plug-in

1. Overview of the Production Plug-in
2. Deploying a Configuration Package
3. Deploying FTP Settings
4. Retrieving and printing Manual Reports
5. Displaying Live Viewer Graphs

E. Security Plug-in

1. Overview of the Security Plug-in
2. System Start-up and Completion Procedure
3. Account Definitions
   a) Managing Users
   b) Assigning Users
4. Displaying and Creating Reports
5. Additional Functions of User Administration
6. Reports of Security Plug-in

A. Adjustment Plug-in

1. Overview of the Adjustment Plug-in
2. Overview of the Machine Topology window
3. Viewing and analyzing Timing and Async Graphs
4. Making adjustments to timing values/VE0MatDiff

5. Generating a Change Log

BPS EcoConfigurator:

1. Starting BPS EcoConfigurator on BPS M3
2. Creating a Configuration Project
   a) Configuring Hardware on the M-Platform
   b) Configuring Currencies
   c) Configuring Currency Settings
   d) Configuring Operation Modes
   e) Configuring Threshold Sets
   f) Configuring Reject Reasons
   g) Configuring Reports
   h) Configuring Machine Settings
3. Creating a Deployment Package
4. Deployment and Activation of Configuration Package
   a) Deploying Configuration Package- QP02
   b) Activating Configuration Package (Change Configuration Package)

I. **LESSON TITLE**: Week 1/Day 3

II. **TOPIC:** Real Time Control Elements and Control Center Service

III. **TRAINING OBJECTIVES**:

Upon completion of this day of the course, the successful student should be able to:

- Identify the various components comprising the Machine PC.
- Identify the individual Module Controllers and their functions.
- Identify the extension boards and their functions.
- Perform a Manual Production End.
- Execute the steps involved with Technical Bulletin 1.
- Execute the steps involved with Techical Information 1.
- Use the Control Center Download to determine a faulty Module Controller.

IV. **INSTRUCTIONAL TASKS**:

Review of the material covered to date with a Question and Answer session.

Machine PC:

1. List of Hardware Compnents
2. Layout of the MPC
3. Hardware Connections
4. MPC Housing
5. Power Supply
6. Housing Fan
7. Air Filter
8. SSD Drives

A. Motherboard / CPU Board
   1. Intel Core i5-3610ME/2.70 GHz/ Dual core (4 threads)
   2. CR2032 battery replacement

B. Interfaces of the CPU
   1. Serial Port Com 1
   2. Serial Port Com 2
   3. eSATA

4. USB
5. Ethernet Connector 1 (ETH 1)
6. Ethernet Connector 2 (ETH 2)
7. Ethernet Connector 3 (ETH 3)
8. VGA Interface
9. Display Port Interface

C. Memory
D. Softing CAN Pro USB controller
E. MPC Software
   1. Windows 10 IOT (Internet of Things)
   2. Oracle 11iR2 Database

Real Time Control – Distributed Controller System

A. Module controllers locations and functions:
   1. the Singler Module Controller (SMC)
   2. the Sensor Transport Controller (STC)
   3. the Gate Photodetector Controller (GPC)
   4. the Bander Printer Controller (BPC)Controller
B. Describe the method used to name the GPC and BPC
C. Basis Hardware MDCNG3-ARM
   1. Communication/CAN bus
   2. Wired Output Matrix (WOM)
   3. Serial Interface RS232
D. Extension Boards
   1. DSP3NG
   2. MCM3
   3. BPI3
E. BPS Field bus
F. Software Arhitecture of the Real Time Control
   1. Boot-Software / Firmware
   2. Module Addressing
G. Status Display of the Main Board
   1. MDC fuses
   2. Switch Groups
   3. Reset and Service Buttons

Control Center Service

A. System Maintnenance Plug-in

1. Manual Production End
    a) TI-01 Enable Manual Production End for Supervisors
    b) TB-01 Perform Manual Production End
2. Olymp System Info Console
    a) Download Control Center

I. **LESSON TITLE**:Week 1 / Day 4

II. **TOPIC:** Large Continuous Feeder and Singler components

III. **TRAINING OBJECTIVES**:

Upon completion of this day of the course, the successful student should be able to:

- Identify the components of the Large Continuous Feeder(LCF).
- Explain the functions of the LCF.
- Perform service and maintenance tasks on the LCF.
- Explain the different LCF Input Modes.
- Identify the components of the Banknote Singler.
- Understand the principles of Banknotes singling.
- Complete service and maintenance tasks on the LCF.
- Identify the components of the Banknote Transport.
- Identify the individual names of the Banknote tracking photodetectors and gates.
- Perform Gate Vane adjustments.
- Perform belt tension adjustments utilizing the frequency tuner.
- Complete service and maintenance tasks in the Input Module.

IV. **INSTRUCTIONAL TASKS**:

Review of the material covered to date with a Question and Answer session.

Large Continuous Feeder (LCF):

A. Removal and Replacement of modular LCF unit
B. LCF electrical components
C. Feeder Plate (FEPL)
D. Feeder Rake (FERA)
E. Sliding Door
F. LCF Stepper Motors
G. LCF Manual Input
H. LCF Feeding Process
I. LCF Singling Modes

Banknote Singler

A. Singler Construction
    1. Air Conducting Plate
    2. Lateral Air Bar
    3. Singler Drum
        i. VE0 proximity switch
    4. Retarding Block
    5. Pressure Rollers
B. Singling Principles
C. Singling Theory
D. Pneumatic Unit and its effect on banknote singling.
E. Pneumatic gauges monitoring the air supply system
F. Components used to feed banknotes into the system (tiger valves)

Banknote Transport

G. Flat Belts
H. Roundbelts
I. Toothed Belts
J. Banknote Tracking Photodetectors (iPPD)
    1. Photodetector nomenclature
K. Gates
    1. Gate Vane Adjustment Procedure
    2. PS_GT01 Adjusment Procedure

Flat Belt System

A. Adjusting Belt Tensions- QP08
B. Pnuematic Tensioner
C. Adjustment Procedures

I. **LESSON TITLE**:Week 2 / Day 5

II. **TOPIC:** Banknote Transport, Banknote Sensor System, and Operating Module Components

III. **TRAINING OBJECTIVES**:

Upon completion of this day of the course, the successful student should be able to:

- Remove and replace the round belts.
- Remove and replace transport rollers.
- Describe the principles of the Sensor System.
- Remove and replace the Sensor Suite.
- Remove and replace the Sensor Computer System(SCS).
- Complete service tasks on the Sensor System.
- Discribe how files are transferred between the SCS and MPC.
- Remove and replace components in the Operating Module.
- Implement service and maintenance tasks in the Operating Module.
- Remove and replace Stacker Wheels.
- Remove and replace the Frequency Unit (FU).
- Program the FCU.

IV. **INSTRUCTIONAL TASKS**:

Review of the material covered to date with a Question and Answer session.

Round Belts

A. Round belt removal and replacement procedures
B. Roller removal and replacement
    1. Idler roller
    2. Drive roller

Sensor System

A. NotaScan in One 2 (NSCIO2) Sensor suite
    1. Overview of the Sensor suite
    2. Removal and Replacement
    3. Servicing DIS felts
    4. Roller removal and replacement

N. Sensor PC application
O. Interfaces between components
P. SCS Interfaces
Q. SCS Backplane
R. SEP5 board
    1. Removal/Installation
S. External Interfaces of the SCS
T. File Interface
U. Maintenance and Error Diagnosis
SS. Technical Data
TT. Centering Elements
UU. Sensor Cleaning
VV. Sensors

Operating Module Components

A. Touchscreen removal and replacement
    1. Transport On/Off buttons
    2. Singler start/Rerun/Pause buttons
B. Reject compartment components
    1. Stacker wheel removal and replacement
C. Emergency stop button removal and replacement
D. Hardware components connected to the USB Hub
E. Frequency Converter Unit (FCU)
    1. Installation/wiring
    2. Intregal keypad
    3. Viewing and editing parameters
    4. Parameter Organization
    5. Steps occurring upon transport start/run
    6. Steps occurring upon transport jam clearing
    7. Steps occurring when the LVM.S-2 is active

I. **LESSON TITLE**:Week 2 / Day 6

II. **TOPIC:** Delivery Module Componenets and Large Vacuum Module (LVM)

III. **TRAINING OBJECTIVES**:

Upon completion of this day of the course, the successful student should be able to:

- Identify the components in the Delivery Module
- Explain the banding process.
- Describe the package extraction process.
- Perform service and maintenance tasks in the Delivery Module.
- Identify the components of the Large Vacuum Module (LVM).
- Complete service and maintenance tasks on the LVM.
- Decode error messages on the LVM.

IV. **INSTRUCTIONAL TASKS**:

Review of the material covered to date with a Question and Answer session.

Delivery Module:

A. Operating Controls in the Delivery Module
B. Stacker
    1. Stacker Synchronization-QP07
    2. Stacker Drive System
    3. Adjustment Procedures
C. Bander
    1. Banding Process
    2. Pneumatic Actuators
    3. Magnetic Switches
    4. Mirror Reflective Photodetectors
    5. Adjustment Procedures
D. Package Delivery
    1. Extracting process
    2. Pneumatic Actuators
    3. Magnetic Switches

4. Mirror Reflective Photodetectors
5. Adjustment Procedures

E. Large Delivery Module
1. Magnetic Switches
2. Capacitve Switches
3. Actuator Motors
4. Adjustment Procedures

F. Coupling Module

G. Fail-Safe Compartment

Air Supply System LVM.S-2/3/4:

1. LVM.S-2/3/4 Description
2. Conditions for Operation
3. Focus Control Unit

A. LVM.S-2/3/4 Operation
1. Boge Concept

B. Checking System Functionality
1. Service menu display
2. Date/time setting
3. Version information

C. Parameter Setting

D. Tan (Display) Test

E. Warning and Fault messages

F. Compressed Air Dryer (DR 8-2)

G. Oil/Water Seperator (OWAMAT)

H. Condensate Drain (Bekomat 31)

I. LVM.S-2/3/4 Maintenance and Service
1. Compressor Sevice
2. Reciever/Tank Service
3. Cyclone Filter
4. Filter Mats
5. Owamat Service
6. Bekomat Testing and Service

I. **LESSON TITLE**:Week 2 / Day 7

II. **TOPIC:** Technical Diagrams Manual, Electrical Supply System, Security Systems

III. **TRAINING OBJECTIVES**:

Upon completion of this day of the course, the successful student should be able to:

- Interpret the Technical Diagrams Manual.
- Identify the components in the Power Control Unit (PCU).
- Explain the distribution of power throughout the entire system.
- Identify the components of the Machine Safety System (MSS).
- Describe the preparation and reconciliation process of BPS Connect Casino.
- Describe how to configure BPS Connect Casino for use with the BPS M3.
- Explain how to configure the BPS M3 for use with BPS Connect Casino.
- Explain how to troubleshooting file transfer issues related to BPS Connect Casino.
- Describe how to install and configure the Zebra printer.
- Complete service and maintenance tasks on the Zebra printer.

IV. **INSTRUCTIONAL TASKS**:

Review of the material covered to date with a Question and Answer session.

Technical Diagrams

Provide an overview of the electrical drawings:

A. Complete Machine
    1. Pnuematic Module Connnections
    2. Main Switch Connections
    3. CAN cabling
    4. Fuse (UPS) Assignment
    5. Sensor Power Supply Fuses (SSV)
    6. Batteries and the Battery box circuit breaker
    7. Connection Diagram UPS
    8. MDC3NG-ARM Assignment diagram
    9. Plug Connections MDC3NG-ARM WOM
    10. MDC3NG-ARM Power Supply circuit diagram
    11. MDC3NG-ARM Digital Output circuit diagram

12. MDC3NG-ARM Digital Input circuit diagram
13. MDC3NG-ARM Analog Input circuit diagram
14. Schematic diagram PCU

B. Input Module
   1. Cable connections
   2. External I/O interface
   3. SMC Connectin Diagram
   4. SMC MCM Assigment Diagram
   5. SMC DSP Assignment Diagram
   6. MSS-MESS Assignment Diagram
   7. Data Connections between Machine PC and Operating area
   8. Input Module Pnuematic Diagram

C. Operating Module
   1. STC Connection Diagram
   2. Cable Connections
   3. STC Plug Assignments
   4. FCU Schematic Diagram

D. Delivery Modue
   1. LDM Cable Connections
   2. DM410 Delivery Module Connections
   3. GPC Connection Diagram
   4. BPC Connection Diagram
   5. BPC Input/Output Signals
   6. BPI Assignment Diagram
   7. BPC BPI Input/Output Signals
   8. MSS Unit BAND Assignment Diagram
   9. Delivery Module Pnuematic Diagram

Electrical Power Supply and Control:

A. Power Control Unit (PCU) junction box

B. Power control elements
   1. Circuit breakers
   2. Service switch
   3. Transport on Hour Meter

C. Voltage distribution between individual electrical components

1. Signals to and from the Power Control Unit (PCU)

D. The Uninteruptable Power Supply (UPS)
   1. Power Supply Unit
   2. Battery box

E. Sensor Computer System (SCS) power

Security Systems:

A. Protective Covers
B. Doors, Flap Doors, and Activated Doors
C. Fail Safe Compartment
D. Machine Safety System (MSS)
   1. MSS Units
   2. Door Circuit
   3. E-stop Circuit
   4. Principles of MSS Door
   5. Principles of MSS E-Stop
   6. Troubleshooting MSS

BPS Connect Casino

A. Demonstrate how to use BPS Connect Casino to process rejects
B. Demonstrate how to set up the BPS Connect Casino for BPS M3, utilizing the BPS Connect Casino Installation Manual
C. Configuring TCP/IP Protocols of the BPS Connect Casino Server
D. Demonstrate how to set up BPS M3 for BPS Connect Casino, utilizing the BPS Connect Casino Installation Manual
E. Demonstrate how to install the Zebra printer
F. Demonstrate how to configure Zebra printer printing preferences
G. Demonstrate how to change the Zebra printer paper roll
H. Demonstrate how to change the Zebra printer print ribbon
I. Demonstrate how to change the Zebra printer print head
J. Demonstrate how to change the Zebra printer cutter

I. **LESSON**:Week 2 / Day 8

II. **TOPIC**: Course completion, final review, critique, and graduation.

III. **TRAINING OBJECTIVES**:

Upon completion of this day of the course, the successful student should be able to:

- Demonstrate proficiency in preparing the BPS M3 for production.
- Demonstrate proficiency in creating configuration packages with EcoConfigurator.
- Demonstrate proficiency in troubleshooting the BPS M3.
- Demonstrate proficiency in preparing manual reports in Control Center.
- Demonstrate working knowledge in relation to all aspects of the BPS M3.

IV. **INSTRUCTIONAL TASKS**:

A. Review
B. Final Test
C. Practical Test
D. Training Critique
E. Graduation