

Target Barcode Inspection System
Unit Dose Pharmaceutical Packaging
Users Guide

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Objective

Inspect unit dose strips to insure that barcodes are printed on packages, readable and correct. Also insure that the unit dose strip contains the correct number of dose packages. Maintain and display a count of the number of doses which pass inspection within a batch.

Component Narrative

The system consists of (1) a motorized conveyor operating at a controlled speed to deliver unit dose strips to a barcode inspection station, (2) a high speed, laser-type barcode scanner and (3) a system controller.

The conveyor is a table-top unit, 3 feet long, 4 inches wide, manufactured by Dorner Manufacturing Corp, Hartland WI, Series 2200. It has one guide bar for dose strip placement and a single mounting bracket for the barcode scanner. The conveyor is standard industrial grade, aluminum construction with FDA approved urethane-coated polyester belt.

The scanner is mounted above the conveyor at the inspection station and connected to the system controller via cable. It is manufactured by Microscan Corp, Renton WA, Series MS-9.

The controller has a six-digit numeric display to show the accumulating count of doses inspected and a two-digit display to show the number of doses within the current strip. It also has an audible signal that can indicate inspection success or failure, Red and Green indicator lights, a start/stop button and five keys used for setup. The controller includes necessary power supplies for conveyor motor and scanner. It has connectors for barcode scanner, motor drive and RS232 PC interface. The controller and the system operate independent of PC. The RS232 interface may be used to transfer inspection parameters and results between PC and system controller.

The controller stores inspection information in its memory: the *target barcode*, the barcode expected on each unit dose package, and the *strip count*, the number of doses expected in each strip.

The system and controller are powered from a single, grounded, six-foot line cord. A grounded 15 Amp 110 VAC receptacle is required. A table-top space approximately 4 feet by 3 feet is required for comfortable operation.

Operation

On power up, the system controller retrieves the stored target barcode from its memory and loads the barcode scanner with information necessary for inspection. It sets the motor speed and starts with the motor off, red light on. While setup is underway, the controller displays “HELLO”. Setup takes approximately 10 seconds. During that time, the controller display counts to show that activity is underway. When setup is complete and successful, it displays the current count “0”.

With the red light on, the operator can program a new target barcode, adjust the number of doses in a strip, communicate with a PC, or start inspecting with the current settings.

Pushing the start/stop button will start the conveyor motor. The operator places a unit-dose strip on the conveyor aligned with the guide bar. The conveyor moves the strip through the inspection station. Conveyor speed is set to deliver barcodes on the strip at intervals of less than one second, approximate speed is 30 feet/minute.

When a barcode enters the scanner’s view, the scanner reads the code and transmits the result to the system controller. The controller compares the code with the target barcode (the correct code) and if equal, counts the barcode. If not equal, the controller stops the conveyor, illuminates the Red light, sounds an audible error alarm and displays “EE” in its two-digit display. The operator is expected to take corrective action.

If additional barcodes are not read within one second, the control declares the end of the strip, compares the count of doses in the strip to the programmed preset and if equal, turns on the Green light, sounds a second audible OK signal, updates and displays the batch count total in the six-digit display, and allows the conveyor to continue running. The inspected strip will be delivered to the end of the conveyor. The operator can place the next strip on the conveyor for inspection. If the count of doses is not equal to the programmed preset value, the controller stops the conveyor, illuminates the Red light, sounds an audible error alarm and displays “EE” in its two-digit display. The operator is expected to take corrective action.

At the end of a batch, to take a break or to perform program operations, the operator can push the start/stop button to stop the conveyor and turn on the red light.

Program Key Functions

The system controller has 5 programming keys. Keys are active when the red light is on.

1. PR key – used to learn the target barcode.

Pushing the PR key initiates the learn target barcode procedure. The controller display shows “HELP”, a signal to present the barcode of the product to be inspected for reading.

The scanner attempts to read the presented code until it succeeds or DP Key 5 is pushed to exit the procedure. If a code is read, the information is transmitted to the controller, saved in controller memory and loaded as the current target barcode. All barcodes read during inspection will be compared to the target barcode. The target barcode information persists through a power down/power up sequence and continues to be used until a new target barcode is read with this procedure.

2. SET Key – used to learn the barcode type.

Five types are supported:

1. Code 39 – most common non-retail code
2. Codabar
3. International 2 of 5
4. UPC/EAN – most common retail code
5. Code 128

When set up to read a specific type, the scanner will read only barcodes of that type. For example, if set up for Code 128, the scanner will not read a UPC barcode.

Pushing the SET Key initiates the learn barcode type procedure. The controller six-digit display shows “HELP”, a signal to present a barcode for reading. The controller sets the scanner to read a single type in sequence, Code 39 first, followed by Codabar, etc.

After pushing the SET key, place a barcode in the red scan line on the conveyor.

The controller begins its sequence by displaying “1”, and attempting to read the barcode as Code 39. If the barcode is not Code 39, the controller then displays “2” and attempts to read the barcode as Codabar. The controller continues this sequence until it successfully reads a code or DP Key 5 is pushed by the operator to exit the procedure. If a code is read, the system controller saves the barcode type information and uses it to setup the barcode reader. The information persists through a power down/power up sequence.

We would expect most installations to use one and only one barcode type. After initial setup, this procedure would be used infrequently if at all.

3. UP Key – reset the batch count.

When pushed, the batch count displayed in the six-digit display is set to zero. Be sure to record a batch count before pushing UP Key. There is no re-do to this operation. Once reset to zero, the batch count is gone forever if not recorded.

4. DOWN Key – display and edit the preset value (number of doses on a strip).

Pushing DOWN Key displays the current preset value and enables keys 3, 4 and 5:

Key 3 (UP) push this key to increase the value by one

Key 4 (DOWN) push this key to decrease the value by one
Key 5 (DP) push this key to exit the procedure and save the displayed value.

5. DP Key – this is the all-purpose exit key.

If reading a barcode in procedure 1 or 2, use this key to end the procedure.

If programming the preset value in procedure 4, use this key to save the displayed value and end the procedure.

Suggested Procedures

Starting an Inspection Batch

To start a new batch, we would expect a procedure like this to be used.

1. Make sure the conveyor is stopped and the red light is on.
2. Press Key 3 (UP) to reset the batch count to zero
3. Press Key 4 to display the preset value, number of doses on a strip. Edit with keys 3 and 4 if necessary. Exit with Key 5.
4. Press Key 1 to learn the target barcode to be used for inspection. Present the barcode for reading. This may be a standard barcode such as a laminated card included with a production order or other source as dictated by site procedures.
5. Press the Start/Stop button to start the conveyor.
6. Place the first unit dose strip at the guide to begin inspection.

Completing an Inspection Batch

1. Press the Start/Stop button to stop the conveyor.
2. Record the batch count if necessary.
3. Transmit information to PC if necessary.

Specifications

Barcode Types: Five code types are available.

1. Code 39 – most common non-retail code
2. Codabar
3. International 2 of 5
4. UPC/EAN – most common retail code
5. Code 128

Other codes are available on special order. Contact Scanning Devices for advice.

Conveyor: 3 feet long, 4 inches wide with one guide bar for barcode alignment. Urethane/polyester, FDA approved belt with thermoformed finger splice.

Motor: Variable Speed DC drive, .06 hp. Powered by and controlled by the system controller. Motor/conveyor operates at approximately 30 feet per minute. Conveyor stops on error or on operating pushing stop button.

Barcode Reader: Laser-type with rotating mirror. Generates 2000 scans per second. Powered and controlled by the system controller.

System Controller: microcontroller-based with two numeric displays, 6 digit for batch count, 2 digit for strip packet count. Five programming keys for inspection setup. Red and green indicators, audible buzzer, start/stop push button, power switch and fuse, connectors for barcode reader, motor, PC interface. Fused at 4 Amps.

Power required: 110 VAC, one grounded power socket.

Footprint: Table-top, 3 feet by 2 feet

Inspection speed: Depends on strip and packet size. System requires consecutive strips to be separated by 1 second to recognize the next strip. Example: inspecting strips of ten 1.5” packets – throughput of 170 packets per minute may be achieved.

Audible sounds: Short chirp on successful strip, louder/longer audible on error.