GradeMaster User Manual

Tests • Ballots • Surveys



Test Scoring Machine Model 600



Apperson Education Products 800.827.9219 • www.appersonedu.com



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About GradeMaster

The GradeMaster is a versatile mark read scanner designed to score tests, process ballots and tabulate surveys. It can perform these functions in stand-alone mode or connected to a computer for advanced data collection.

GradeMaster uses reflective read technology for superior pencil mark recognition. Always use a No. 2 lead pencil when completing GradeMaster scan sheets. The scanner will not read marks from ink pens or markers, even if the marks are black.



A large selection of GradeMaster compatible answer sheets, ballots, surveys and analysis forms are available from Apperson Print Resources. These forms have been specifically designed to utilize the advanced features of GradeMaster including paper skew detection and reading student ID numbers. The classic 888 style answer sheets¹, ballots and surveys can also be scored using the GradeMaster in full compatibility mode.

¹The subjective score box on the classic 888 style forms is a patented process of the Scantron Corporation, therefore GradeMaster will not add subjective scores to the objective portion of classic style answer sheets.



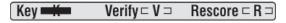
Scoring Tests

GradeMaster must be programmed with the correct answer pattern prior to scoring answers sheets. To program the scanner, simply insert the teacher key. When properly keyed, GradeMaster will display the number of questions keyed on the display window and you may begin inserting answers sheets for scoring. GradeMaster will score up to 200 questions keyed.

KEYED 30

Preparing the Key

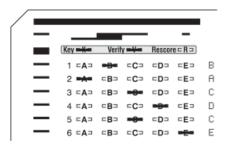
To designate an answer sheet as a key, mark the Key bubble [K] in the keyline as shown below.



When the Verify [V] option is marked on the keyline, correct answers are printed on individual student answer sheets. If the Verify [V] bubble is not marked, a dash (-) prints next to incorrect responses.

Mark the Rescore [R] bubble in the keyline to rescore a previously scored test. Rescoring a test automatically enables the verify option.

After marking the keyline, fill in the correct answer pattern for each question on the test. Multiple marks may be keyed as the correct answer for a question. Questions keyed with multiple marks will be indicated with an 'X' printed next to the question for verification purposes.



Key Reset Options

There are two key reset options available for test scoring. When GradeMaster is powered on it automatically enters into the Score Mode option. Pressing the *Reset Options* button will put the scanner in Rescore Mode. Rescore Mode

Scoring Tests . . .

has the identical effect as marking the Rescore [R] bubble in the keyline.

When using standard GradeMaster answer sheets Re score Mode is not necessary since rescoring can be activated by a keyline selection. When using the classic 888 style answer sheets, Rescore Mode is necessary in order to rescore answer sheets.

The scanner must be in either **Score** Mode or **Rescore** Mode to score answer sheets.

Scoring

When the key has been marked with the correct answers, insert it through the scanner. *Always verify the key has been properly recorded before inserting student answer sheets.* Once keyed, begin processing student answer sheets. Up to 9,999 answer sheets can be processed in a single batch.

If the test includes questions from both sides of the answer sheet, first process side 1 of the key immediately followed by side 2 (the Key [K] bubble **must** be marked on each side of the key in order to key multiple sides). When scoring multiple sides, each side of a test answer sheet must be processed before processing another answer sheet. You may score up to 200 questions in this manner.

As student forms are fed through GradeMaster, the total number of correct answers for each student appears in the window display and is also printed inside the *Score* box at the bottom of the form, *or inside the Rescore box if the Rescore* [R] bubble was marked.

If an answer sheet is rejected by the scanner, check the window display for the cause of the problem. Take corrective action and reinsert the answer sheet. If the problem persists, refer to the Troubleshooting section of the user manual.

Getting a Summary of the Test Results

There are several summary options available once a test has been scored. Summaries can be printed using an Item Analysis report form or viewed on the display panel. When viewing summary information you may insert additional answer sheets for continued scoring at any time.

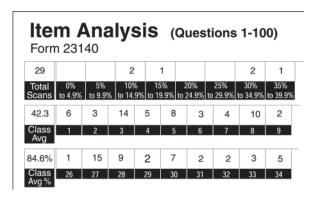
Class Average

Press **Summary Display** on the display panel to view the class average and number of sheets processed.

PROCESSED 28 RVG 42.7 85.4%

Tally of Incorrect Answers & Frequency Distribution Report

After processing a batch of answer sheets use Item Analysis Form 23140 to get a detailed report of the test. The Item Analysis report will provide a frequency distribution of scores in 5% increments. The report also lists the number of wrong answers selected for each test question.



If Item Analysis Form 23140 is not available, the number of wrong answers per question can be viewed in the display window. To view the number of wrong answers for each question, press the **Summary Display** button twice. Follow the

instructions displayed in the window for viewing the tally of wrong answers. While viewing this information you can continue processing additional answer sheets at any time.

Tally of all Marks Made

Use Tally Report Form 23300 to get a report listing a tally of all marks entered by students. This report can be useful for a detailed analysis of student selections on frequently missed questions. The scanner will keep a tally of all marks selected for up to 100 questions.

Tal Forn	ly 1		oor	't	(Questions 1-50)					
29	3	23	2	0	1	0	2	26	1	0
Total	1A	1B	1C	1D	1E	2A	2B	2C	2D	2E
	0	1	23	2	0	25	2	0	1	1
	6A	6B	6C	6D	6E	7A	7B	7C	7D	7E
	5	19	2	0	3	0	5	24	0	0
	11A	11B	11C	11D	11E	12A	12B	12C	12D	12E
	1	6	2	0	21	0	2	0	27	0
	16A	16B	16C	16D	16E	17A	17B	17C	17D	17E



Processing Ballots

Ballot Form 23120 is specifically designed for processing ballots with GradeMaster. This form tabulates the votes for up to 100 candidates. Election results can be obtained by inserting Item Analysis Form 23140 through the scanner when the batch processing is complete, or by viewing results on the display window. Up to 9,999 ballots can be processed in a single batch.

Ballot response bubbles are labeled 1 through 100. Assign each candidate a unique number which corresponds to a number on the ballot form. You have an option of allowing multiple votes per row or accepting only a single selection per row. Allowing only single selections per row can restrict students from voting for more than one candidate for an office. The Grade-Master default option allows multiple selections per row.

To accept only one selection per row, you must mark *the first ballot* processed as indicated below. In this mode, if a ballot contains multiple selections on a row, none of the selections for that row will be included in the tally. After

FOR OFFICE USE ONLY - When this box is marked on the first sheet, the scanner allows only one mark per horizontal row. each ballot is scanned, a verification number is printed inside the Ballot Verification box.

For information on how to process elections with more than 100 candidates or when using a standard GradeMaster answer sheet for elections, refer to the section titled **Data Collection Operation** on page 12.

Getting Election Results

To obtain the results of an election insert side 1 of Item Analysis Form 23140 through the scanner. The Item Analysis Form can be inserted at any time during or after batch processing without interruption of the tabulation process. Warning, pressing the *Reset Options* button will clear all election results.

In the event an Item Analysis Form 23140 is not available, the election information can be viewed in the display window. To view election results press the *Summary Display* button after batch processing and follow the instructions displayed in the window for viewing the results.

CANDIDATE 23 127 VOTES



Processing Surveys

Survey Form 23100 is specifically designed for processing surveys with GradeMaster. This form can be used for surveys with up to 40 questions. It includes 5 choices for each question. Survey results can be obtained by inserting Item Analysis Form 23140 through the scanner when the batch processing is complete, or by viewing results on the display window. Up to 9,999 surveys can be processed in a single batch.

Design your survey questions and selections to match the bubble pattern on the survey form. You have an option of allowing multiple selections per row or accepting only a single selection for each row. The GradeMaster default option allows multiple selections per row.

To accept only one selection per row, you must mark *the first survey* processed as indicated below. In this mode, if a survey contains multiple selections on a row, none of the selections for that row will be included in the tally.

After each survey is scanned, a verification number is

FOR OFFICE USE ONLY - When this box is marked on the first sheet, the scanner allows only one mark per horizontal row. printed inside the Survey Verification box.

For information on how to process surveys with more than 40 questions or when using a standard GradeMaster answer sheet for surveys, refer to the section titled **Data Collection Operation** on page 12.

Getting Survey Results

To obtain the results of a survey, insert side 1 (and side 2, if necessary) of Item Analysis Form 23140 (or Tally Report Form 23300) through the scanner. The Item Analysis Form can be inserted at any time during or after batch processing without interruption of the tabulation process. Warning, pressing the *Reset Options* button will clear all survey results.

In the event an Item Analysis Form 23140 is not available, the survey information can be viewed in the display window. To view survey results press the *Summary Display* button after batch processing and follow the instructions displayed in the window for viewing the results.

PROCESSED 310 18) 214 MARKS



Data Collection Operation

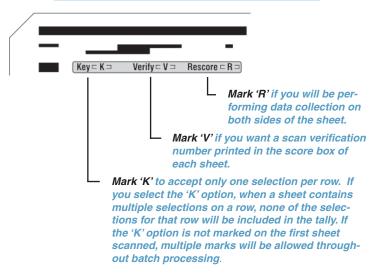
Placing GradeMaster in data collection mode disables standard test scoring operations. This can be useful when processing surveys, evaluations or ballots with standard Grade-Master test answer sheets or customized scan forms. When in data collection mode, the scanner will create a tally of all marks made on the sheets. The tabulation results can be obtained by inserting Tally Report Form 23300 through the scanner when the batch processing is complete, or by viewing results on the display window. Up to 9,999 scan sheets can be processed in a single batch.

To enter into Data Collection Mode press the **Reset Options** button 2 or 3 times until **Data Collection** appears in the display window.

In this mode, all selections for each question will be tabulated. Up to 100 questions can be tabulated in Data Collection mode. When tabulating questions which are on both sides of an answer sheet, scan side 1 of a sheet followed by side 2 before continuing onto the next sheet.

The following data collection options can be enabled by making the appropriate selection on the keyline of the *first* sheet scanned.

MARK THESE OPTIONS ON THE FIRST SHEET ONLY



To obtain the results from data collection processing, insert side 1 (and side 2, if necessary) of Tally Report Form 23300 through the scanner. This form will provide a tabulation of all marks entered during batch processing. The Tally Report Form can be inserted at any time during or after batch processing without interruption of the tabulation process. Warning,

Data Collection Operation . . .

pressing the **Reset Options** button will clear all data collection information.

In the event an Tally Report Form 23300 is not available, the results can be viewed in the display window. To view the results press the *Summary Display* button after batch processing and follow the instructions displayed in the window for viewing the tabulated results.



Print Cartridge Operations

GradeMaster uses a disposable Hewlett-Packard ink cartridge (Item # 26370) for print operations. Under normal operating conditions the cartridge should provide reliable service for up to a year.

Installing a New Print Cartridge

1. Squeeze the print cartridge cover and firmly press in the tab located on the right side to disengage the cover (Fig. 1). Lift the cover away from the scanner (Fig. 2, pg. 16).



Fig. 1

- 2. Remove the protective tape that covers the silver nozzle plate of the cartridge (Fig. 3, pg. 16).
- 3. Insert the print cartridge into the scanner (Fig. 4, pg. 16).

Continued on page 16

4. Replace the printer cover by aligning the locking tabs with their corresponding holes on the scanner housing. Firmly press in the tab on the right side of the cover and press into the housing until the tabs lock into place.



Fig. 2



Fig. 4

Fig. 3

Removing a Print Cartridge

1. Squeeze the print cartridge cover and firmly press in

the tab located on the right side to disengage the cover (Fig. 1, pg. 15). Lift the cover away from the scanner (Fig. 2).

2. Remove the cartridge from the scanner (Fig. 5).



Fig. 5

Servicing a Print Cartridge

1. Remove the cartridge using the instructions listed on page 15 and 16.

- 2. Gently wipe the silver nozzle plate of the cartridge with a lint free tissue (Fig. 6). Inspect the plate to ensure all dust and lint has been removed.
- 3. Replace the cartridge following instructions 3 and 4 on pg. 15 and 16 Installing a New Print Cartridge, and as shown in Fig. 4 and 5.



Fig. 6

If a cartridge continues to print poorly after wiping the nozzle plate, a new print cartridge may be necessary.



Connecting the GradeMaster to a Computer



GradeMaster can connect to a computer through USB or with a standard 9-pin serial cable. To use the USB connection, it is first necessary to install the DataLink software.

Using your Grade-Master scanner with DataLink™ software you can create ASCII files of

data transmitted from the scanner. DataLink™ is a software application developed by Apperson for retrieving data from Apperson's line of test scoring scanners. DataLink™ also includes test analysis reports and a survey tabulation report. Data collected using DataLink™ can be saved and used by spreadsheets, databases or statistical applications. DataLink™ is a PC application.

GradeMaster transmits ASCII data in a variety of formats. If you are building a customized interface for a specific applica-



Calibrating GradeMaster

tion, contact Apperson for documentation on communication specifications. To ensure consistent and accurate pencil mark recognition your GradeMaster scanner should be calibrated annually or after every 7,500 sheets processed, which ever comes first. A calibration sheet has been provided with your scanner for this purpose. Please keep the calibration sheet in a convenient location for easy retrieval as needed.

To determine how many sheets have been processed since last calibration, press the **Summary Display** button 3 times. The display window will show how many sheets have been scanned since the previous calibration.

If 7,500 sheets have been processed since your last calibration the following message will appear on your display

READY: RECOMMEND CALIBRATION SOON

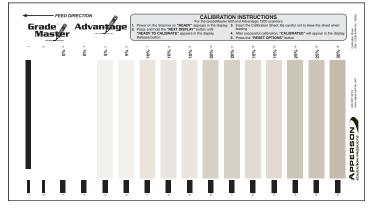
Calibrating GradeMaster . . .

window whenever the scanner is powered on. This message will no longer display after the scanner has been calibrated.

If you are experiencing irregular test scoring, take corrective action by calibrating the scanner. In most cases this will resolve the problem. We recommend cleaning the scanner read sensors prior to calibration (refer to page 21).

To calibrate GradeMaster follow the instructions printed on the calibration sheet.

Calibration Sheet





Cleaning the Read Sensors and Clearing Paper Path

Paper dust or erasure debris can interfere with normal operation of the read sensors. If you are experiencing inconsistent scoring or a blocked paper path, take the following steps to correct the problem. After cleaning, always calibrate the scanner (refer to page 19).

Removing Cover Assembly

- Unscrew the thumbscrew on the backside of the scanner (Fig. 1).
- 2. Remove the cover assembly from the back chassis.



Fig. 1

Cleaning the Scanner

1. Using a slightly damp tissue clean any paper dust or ink spray on the back chassis (Fig. 2, pg. 22).

Cleaning the Read Sensors and Clearing Paper Path . . .



Fig. 2

- Use canned air spray to clear any dust particles on the read sensors (Fig. 3).
- If there is dust build up in the printer slot then remove the print cartridges and clean the slot with an unfolded paperclip and tissue (Fig. 4).



Fig. 3



Fig. 4

Securing the Cover Assembly

1. Insert the tab located at the lower right of the cover into slot in the back chassis and pivot the cover downward and flush (Fig. 5a and 5b, pg. 23).







Fig. 5b

- 2. Tighten the thumbscrew (Fig. 1, pg. 21) securely and inspect to ensure the cover is secured flush onto the back chassis.
- 3. Always calibrate the scanner after cleaning (refer to page 19).



Displaying Machine Information

To display information about your GradeMaster scanner, power on the scanner and press the **Summary Display** button. Successively pressing **Summary Display** will show additional information.

The following information will be displayed:

- The machine serial number
- The GradeMaster firmware version of your scanner
- The total number of sheets processed
- The number of sheets processed since the last calibration
- The number of sheets processed since the last factory service



Ordering Supplies

You can order GradeMaster supplies from Apperson Print Resources. General supplies available from Apperson include:

- Standard GradeMaster compatible forms
- Customized GradeMaster compatible forms
- Print cartridges
- Serial or USB computer cables
- DataLink[™] software
- Calibration sheets

For a detailed description of test answer sheets, ballots, surveys and supporting forms, call your Apperson representative, or visit our web site at www.appersonedu.com.

GradeMaster Supplies 800.827.9219 www.appersonedu.com



Troubleshooting

Obtaining Service for GradeMaster

If you are experiencing inconsistent operation or irregularities with GradeMaster, try re-calibrating the scanner using the calibration sheet provided with the machine. In many cases a simple calibration will resolve the problem.

Use the following guide to troubleshoot basic operational problems that you have encountered. If you are unable to resolve the problem or have service questions, please call the number below and ask for Technical Support.

For Service and Repair, call...

800.827.9219

Problems and Solutions

Poor Print Quality

Refer to page 15 — Print Cartridge Operations

- 1. Remove the print cartridge cover.
- 2. Remove the print cartridge from the scanner.
- Gently wipe the silver nozzle plate of the cartridge with a lint free tissue. Inspect the plate to ensure all dust and lint has been removed.
- Replace the print cartridge and the print cartridge cover.
 Make sure the print cartridge cover is securely seated and locks into place.

Marks are Not Detected

Very light or thin pencil marks may not be recognized by the sensors. If the marks are made in ink (blue, black or other color) the scanner will not detect the marks. Mark over the intended marks with a No. 2 pencil. If the marks appear to be valid but are not recognized, try cleaning the read sensors and re-calibrating the scanner (refer to page 19 — Calibrating GradeMaster).

Inconsistent Scoring

Check the marks that are being scored inconsistently. Make sure the marks are dark and fill in the entire bubble area. Check erasure marks for completeness. If you continue to experience inconsistencies, clean the read sensors and re-calibrate the scanner (refer to page 19 — Calibrating GradeMaster).

Paper Jams

Check the paper path for materials that may be lodged between the plates. If you see an object blocking the pathway, carefully remove it by inserting a stiff sheet of paper through the plates. If you are unable to remove the object, remove the cover assembly (refer to page 21 — Removing Cover Assembly).

Invalid ID Number

Check the ID number marked by the student for accuracy. An invalid ID number message will appear if a row totals greater than 9. If you receive an invalid ID message for a form that does not have an ID grid try re-calibrating the scanner (refer to page 19 — Calibrating GradeMaster).

Paper Misfed

There may be an object interfering with the paper path which is causing the scan sheet to skew. If there is an object blocking the paper path, carefully remove it with a stiff sheet of paper. If you are unable to remove the object, refer to page 21 to remove the front cover. Always make sure the guide edge of the scan sheet is laying flat in the insertion channel. If scan sheets are fed crooked a paper misfed message will appear. If this error message continues, try re-calibrating the scanner. If this error message persists even though the sheet is being fed properly, you can press the **Next Display** button after the error occurs to override the error on the next sheet. Pressing **Next**

Display twice will disable this error for the remaining batch. Take care to insert sheets properly after disabling this error detection.

GradeMaster Will Not Power On

Check the power supply to ensure it is firmly inserted into the scanner's power socket and into the electrical outlet. Make sure the power supply is labeled with the GradeMaster logo. The power supply should be rated as 24 volts DC, 400mA.

Rows in Sheet Differs from Key

This error generally occurs when the student answer sheet does not match the form used as a key. If the answer sheets differ from the key either remark the answer sheets onto forms which match the key or remark the key to match the form used on the answer sheets. If the sheets are identical, erase any extraneous marks made on the answer sheet or the key that appear near the black timing marks on the left edge or the black markings at the top of the sheets. If the problem persists try cleaning the read sensors and re-calibrating the scanner (refer to page 19 — Calibrating GradeMaster).

Motor Runs Continuously

Power off the scanner, by unplugging the power supply. Wait 5 seconds and replug the power supply. If the motor continues to run, call 800.827.9219 and ask for the Technical Support Department.



FCC Compliance Statement

FCC Compliance

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference, and
- (2) This device must accept any interference received, including interference that may cause undesired operation.

Industry Canada Regulations

This Class A digital apparatus meets all requirements of the Canadian Interference Causing Equipment Regulations.

Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.



Warranty Information

WHAT IS THE WARRANTY FOR MY SCANNER?

Your Scanner is covered by a 1 year limited warranty. You are entitled to the following services while your scanner is under warranty coverage.

- Unlimited telephone support.
- Free parts and labor for repair work.
- If necessary, a loaner machine will be provided while your scanner is being repaired.
 Loaner machines are subject to availability and freight charges.

WHAT ARE THE TERMS OF THIS LIMITED WARRANTY?

Apperson warrants that the Scanner you have purchased is free from defects in materials or workmanship under normal use during the warranty period. The warranty period commences on the 1st of the month following the shipping date for 1 year. During the warranty period, Apperson will repair or replace defective parts with new parts, or with service able used parts that are equivalent or superior to new parts in performance. Warranty service may be fulfilled by shipping user-replaceable parts, such as power transformer, print cartridge cover, and similar components directly to you.

HOW DO I OBTAIN WARRANTY SERVICE OR TECHNICAL SUPPORT?

To arrange for warranty services or to receive free technical support during your warranty period, call the Apperson Technical Support Center at 800.827.9219. In the event your scanner needs factory repair you will receive instructions on packaging and shipping.

WHAT IS NOT COVERED BY THIS LIMITED WARRANTY?

- Routine cleaning, or normal cosmetic and mechanical wear.
- Damage from acts of God.
- Damage from misuse, abuse or neglect.
- Damage from repair or replacement of warranted parts by non-Apperson personnel.
- Damage from modification or incorporation of other products.

TERMS OF THE WARRANTY

The warranty is void on any product which the original identification marks or serial numbers have been altered. All exchanged parts replaced under this warranty will become the property of Apperson.

EXCEPT AS EXPRESSLY SET FORTH IN THIS WARRANTY, APPERSON MAKES NO OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING ANY IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. APPERSON EXPRESSLY DISCLAIMS ALL WARRANTIES NOT STATED IN THIS LIMITED WARRANTY. ANY IMPLIED WARRANTIES THAT MAY BE IMPOSED BY LAW ARE LIMITED TO THE TERMS OF THIS EXPRESS LIMITED WARRANTY.

LIMITATION OF REMEDY

Apperson is not liable for any damages by the Scanner or the failure of the scanner to perform, including any lost profits, lost savings, incidental damages, or consequential damages. Apperson is not liable for any claim made by a third party or made by you for a third party.

This limitation applies whether damages are sought, or a claim made, under this warranty or as a tort claim (including negligence and strict product liability), a contract claim, or any other claim. This limitation cannot be waived or amended by any person. This limitation of liability will be effective even if Apperson or an authorized representative of Apperson has been advised by you of the possibility of such damages.

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800.827.9219

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Maximize GradeMaster's features... Interface GradeMaster with your PC with DATA→LINK™



Featuring:

- Data can be saved in ASCII format which can be imported into many popular database & spread sheet applications.
- DataLink[™] includes several reporting options for detailed evaluation of test results:
 - Item Analysis Report
 - Frequency Chart

- Class Roster
- Student Report
- DataLink™ survey analysis tools provide for tabulation of basic item analysis reports of data.
- Design your own data entry template.
- Preset templates for existing OMR documents.
- Windows[™] compatible.

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PC Compatible



