Production Monitoring With SD Memory Card Storage

The Production TimeKeeper TM

TAKT timer with production counter and production statistic history storage that will monitor up to 10 production lines simultaneously.

This reference guide covers the DD-117A0-PROD1 production monitoring system.

Programmable TAKT Timer and Scale Count

Traditionally, TAKT time is the time it takes to fabricate and ship one product, and is established by dividing the number of orders in hand by the number of working hours in a day. In addition to the programmable TAKT timer, the Production TimeKeeper™ also contains a user-settable scale counter which allows the user to set the TAKT time to the time it takes to fabricate product lots.

Processing lots. TAKT times of less than one second do not work well with this system. When it takes less than one second to process one production unit, it is advisable to setup the system to process in lots. In this case, set the **scale** factor to a standard lot size and set the TAKT time to the correct time to process one lot.

Running or Static/Shift Goals

The Production TimeKeeper™ allows production monitoring using running, or static/shift goals. The running goal is calculated from the TAKT time and scale count while the static, or shift goal is easily entered by the user.

Monitor and Save Production Data

The Production TimeKeeper™ monitors production and conveniently displays the results as a deviation, and percentage between the production goal and the amount actually produced. In addition to monitoring production the Production TimeKeeper™ also tracks down-time, and other critical time events like the number of times the TAKT time expired. All of this data is stored in a conveniently accessible history memory.

Recording User Events or Reason Codes

Sometimes specific events occur that need to be recorded that are in addition to the standard events. This system includes an external port to permit special events to be recorded. For example: Machine jammed, out of material, lunch break, fire drill, service door opened, or any other event. The events can be entered manually or directly from a machine output.

Buttons and Controls

The DD-117A has the following buttons and controls:

- The main unit has 6 buttons and one knob.
- The RJ11 jack on the side of the unit connects to remote buttons or machine inputs for Run, Pause, Stop and Next.
- In addition, optional remote buttons or machine inputs can be added for special events.

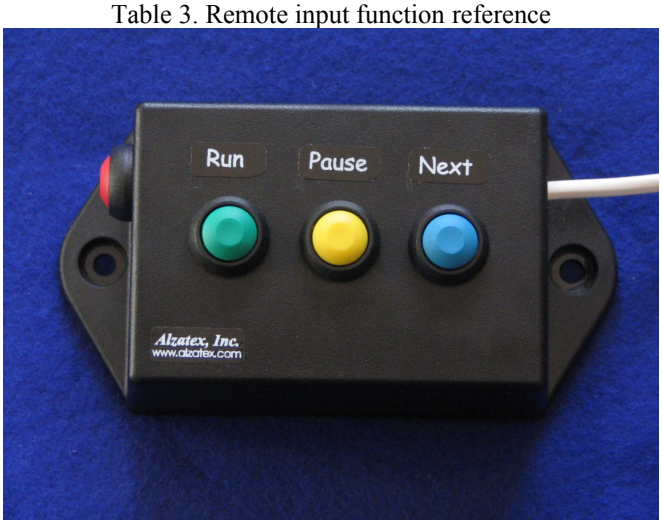
Front Panel Buttons		
Button Name	Momentary Press and Release	Press and Hold for 2 seconds
Save	Display SD Card File Name.	Save History Memory to SD Card.
History	Display history.	Store history and reset production counter to zero.
Recall	Recall stored setting.	Save stored setting.
Run/Pause/ Stop	Run/pause production counter	Stop the Production Timer.
Mode	Toggle display modes.	Select various setup choices.
Select	Cycle knob function.	Display the directory entries on the SD Memory card.

Table 2. DD-117AB button reference

Remote Inputs

Remote inputs on the RJ-11 connector on the side of the unit				
Remote Input	Operation	Effect on TAKT Timer	Effect on Down Timer	Effect on Actual Count
Input 1	Run	runs	pauses	None
Input 2	Pause	pauses	runs	None
Input 3	Stop	pauses	pauses	None
Input 4	Increment (Next)	None	None	Counts by the scale factor

Table 3. Remote input function reference



The remote inputs are ground closure type. The **Run**, **Pause** and **Stop** inputs are typically connected to operator buttons. The **Increment (Next)** button may be a button for the operator or may be connected directly to a machine trigger.

Serial data I/O

RS-422 Serial data input for input from additional devices of input from a PLC or computer.
RS-422 Serial data output for operating displays, andon indicators, alarms, PLC or computer.

Monitoring Production Statistics

The Production Timekeeper™ can display the current production Data which is available on three screens. **Momentarily pressing** the **Mode** button toggles between the screens. The screen in step one is normally displayed during production monitoring.

To **display** the current production data:

1. **Momentarily press** the **Mode** button. A four-line display similar to the following display will appear:

Goal	nnnnnn	HH:MM:SS
Act	nnnnnn	HH:MM:SS
Dev	nnnnnn	Run Grn
Eff	nnnn	HH:MM:SS

Description
Line 1 – goal count; TAKT time (count down)
Line 2 – actual count; actual time (count up)
Line 3 – deviation; status (run/pause/stop)
Line 4 – efficiency; time of day

2. Momentarily press the **Mode** button again. Another four-line display similar to the following display will appear:

Act	nnnnnn	HH:MM:SS
Blnk	nnnnnn	Downtime
Yel	nnnnnn	Pause
Red	nnnnnn	SetClock

Description
Line 1 – actual count; down time (count up)
Line 2 – Yellow blink count
Line 3 – Yellow warning count
Line 4 – Red warning count (TAKT time expired)

3. Momentarily press the **Mode** button again. When counting production from multiple lines simultaneously, the actual count for individual lines will be recorded. Another four-line display similar to the following display will appear:

Line	Actual	4	98453
1	2345	5	56232
2	2433	6	12987
3	9432	7	29845

Description
Line 1 – Production
Line 2 – Line number, Actual count
Line 3 –
Line 4 – Turn knob to select

The individual production line counting feature requires either additional external hardware or connection to a PLC.

Analyzing and Improving productivity

There are three warning counts called Yellow Blink (Blnk), Yellow Warning (Yel) and Red Warning (Red).

These warnings can be used to indicate whether the actual time is longer or shorter than the TAKT time and determine whether there is a problem with production or whether a particular operator is slower or faster or whether the TAKT time is too long or too short.

Ideally, the TAKT time should be set such that the yellow blink count and the yellow warning count increments the same as the actual count, but that the Red warning count always remains at zero.

The production workers can observe the Green-Yellow-Red Andon indicators to determine whether they are ahead or behind the expected TAKT time. These indicators are great for **Slide-Lines** where several production workers need to synchronize together.

- The Yellow Blink (Blnk) warning indicates the number of times the Yellow Blink time was reached before the TAKT time expired to complete a production unit. If the TAKT time is 100 seconds and the Yellow Blink time is 20 seconds, then this count will be incremented if it takes 80 or more seconds to complete a production unit.
- The Yellow (Yel) warning indicates the number of times the Yellow Warning time was reached before the TAKT time expired to complete a production unit. If the TAKT time is 100 seconds and the Yellow Warning time is 10 seconds, then this count will be incremented if it takes 90 or more seconds to complete a production unit.
- The Red (Red) warning indicates the number of times it took longer than the TAKT time to complete a production unit.

The status field indicates the operational mode of the unit.

- Pause
- Stopped
- Run Grn
- Run Yel
- Run Red

One of several error messages may appear on the lower right corner of the display.

- SetClock Indicating that the time of day clock needs to be set.
- ClkError Indicating that the there is a problem with the TIME of day clock.
- LowBatt Indicating that the battery needs to be replaced. The battery can be replaced by removing the rear cover and replacing the battery with a new CR2032 coin cell type battery.

Storing and Resetting Production Data

The Production Timekeeper™ will **save** production data each time the Production Timekeeper™ is reset. The events 0 to 11 shown in table 1 are saved, and then the counters are reset to zero and the timers are set to their preset values.

1. **Press and Hold** the **History** button. The following display will appear:

Save to History and Clear Counters

2. **Press and Hold** the **History** button again. The following display will appear:

Goal	nnnnnn	HH:MM:SS
Act	0	00:00:00
Dev	0	Pause
Eff	0	HH:MM:SS

The Goal, Actual, Yellow Blink, Yellow Warning and Red Warning counters are set to zero. The Actual time and Down time is reset to zero. The TAKT time is set to the preset value.

Table 1. Production data reference

Stored Data

The following data can be stored. The time and date is saved along with each history entry.

The following events and/or data are stored whenever the **Save to History and Clear Counters** command is executed.		
Event		Description
0	**Goal**	Production goal count. This can be either a running, or static goal.
1	**Act**	Actual production count. This can be incremented manually, or by machine.
2	**Dev**	Deviation count. (Goal – Actual).
3	**Eff**	Efficiency percent. (Goal/Deviation*100)
4	**Down**	Accumulated Machine Down Time in seconds.
5	**TAKT**	TAKT time in seconds.
6	**Time**	Actual Time since the most recent wigit was started. This value is in seconds.
7	**Red**	Red warning indicator count. This indicator occurs after the TAKT time has expired.
8	**Yel**	Yellow warning indicator count. This indicator occurs during the TAKT time prior to the red warning indicator. When this occurs is user-programmable.
9	**Blnk**	Yellow blink indicator count. This indicator occurs during the TAKT time prior to the red warning indicator. When this occurs is user-programmable.
10	**Gpre**	Current static/shift goal.
11	**Scal**	Current scale factor.

The following events are recorded whenever one of the remote inputs **Run**, **Pause**, **Stop** or **Next** is activated. The recording of these events can be individually enabled or disabled using the **Setup Event Save** menu.

Event		Description
12	**Run**	The RUN mode was started. The value field will be the downtime in seconds.
13	**Paus**	The RUN mode was paused. The value field will be the actual time in seconds.
14	**Stop**	The RUN mode was stopped. The value field will be the actual time in seconds.
15	**Wigi**	A new unit is completed. The value field will be the actual time in seconds to complete this wigit.

Other Events.

Event		Description
16	**Save**	The history memory was saved to the SD card. The value field contains the number of entries stored.
17	**Clr**	The history memory was cleared. The value field contains the number entries in the history memory at the time it was cleared.
18	**Key**	A remote “KPn command was received. The 'n' is the value portion of the event.
19	**---**	Reserved for future use.

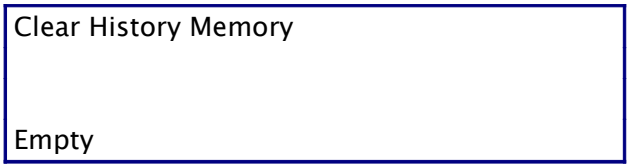
The following events and/or data are stored whenever the **Save to History and Clear Counters** command is executed. The following values are recorded when storing the actual counter values for production lines 1 through production line 10. These actual counters are incremented when one of the external “KP0 through “KP9 commands are received.		
20-29	---	Actual count values for production line 1 (20) through production line 10 (29).
30-255	---	Reserved for future use.

Clearing the History memory

To **reset** the production timers and counters:

3. **Press and Hold** the **History** button. The following display will appear:

4. Turn the **Knob** a number of clicks until the “Clear History Memory” message appears in the display.
5. **Press and Hold** the **History** button again. The following display will appear:



The entire history memory is cleared. A single message is added “**Clr 341**” where the number is the number of history entries that was in the history memory before it was cleared.

Recalling Stored Production Data

The Production Timekeeper™ can **recall** stored production data. The values shown in table 1 are monitored, and then **stored** each time the Production Timekeeper™ is **reset**:

Note: The Production Timekeeper™ has a history memory of 1023 or 4095 entries depending on model. This means that the Production Timekeeper™ can store many days of production data.

To **recall** production data:

1. **Momentarily press** the **History** button. A four-line display similar to the following display will appear:

2007/01/12	14:03:45
Goal nnnnnn	History
Act nnnnnn	12
Dev nnnnnn	Of 156

Note: The first line is the date and time. The remaining lines are 3 lines of historical data.

Turn the **knob** to scroll through the production history. As you scroll, the window will show 4 entries in sequence. It helps to think of the 4-line display as a sliding window over the history memory that rolls over to the beginning when it gets to the end.

LOC	Display Value		Desc.
00	Save 76		
01	Down 4398		
02	TAKT 122		
03	2007/10/22	08:22:54	line 1
04	Act 9	03	line 2
05	Grn 18	--	line 3
06	Act 24		line 4
07	Goal 44		
08	Time 4567		
09	Down 4422		
10	TAKT 288		
.			
.			
.			
31			

Selecting the Static/Shift or Running Goal Modes

The Production Timekeeper™ provides two different methods for management of Goal values:

- In the *running goal mode*, the Production Timekeeper™ calculates the running goal. It does this by adding the scale count to the goal count each time the takt time expires.

- In the *static/shift goal mode*, the user enters the desired goal count as a preset value. In this mode, that value does not change until the user reconfigures it.

In either mode, the DD-117A will display the goal count, the actual count, the calculated deviation between the goal and actual counts, and the calculated efficiency (the percentage of actual production versus the production goal). The reader board displays the goal count, the actual count, and the efficiency.

NOTE: To select a running goal, the preset goal count must be set to 0. Any non-zero preset goal count will remain the static goal value.. Only a preset goal count of zero changes the goal calculation mode of the Production Timekeeper™ from static/shift mode to running mode.

1. When starting a new shift or new production run, Press and hold the **History** button to clear the counters and reset the timers.
2. **Momentarily press** the **Run/Pause/Stop** button on the DD-117A unit or press the remote **Run** button (remote input **IN1**) to start the TAKT, and actual timers. The TAKT timer will auto-restart when it expires.
3. **Increment** the production actual count by pressing the **Next** button (remote input **IN4**). See the following *Remote Inputs* section for details.
4. For unscheduled production stoppages, machine repairs or whenever you want downtime to accumulate, pause the TAKT and actual timers by momentarily pressing the **Run/Pause/Stop** button on the DD-117A, or press the remote **Pause** button (remote input **IN2**) .
5. **Resume** the timers by momentarily pressing the **Run/Pause/Stop** button on the DD-117A, or press the remote **Run** button (remote input **IN1**). See the following *Remote Inputs* section for details.

   *NOTE: the **Run/Pause/Stop** button is labeled as **Run/Stop** on the unit.*

   Note: Whenever the Production Timekeeper™ is in the pause mode the TAKT and actual timers are paused and the downtime timer starts running.

When the unit is resumed the downtime timer is paused and the TAKT and actual timers are resumed.

6. For scheduled breaks or shift changes, **Stop** the TAKT and actual timers without starting the downtime timer pressing the press and holding the **Run/Stop** button or press the remote **Stop** button (remote input, **IN3**).

User Programmable Presets

The Production Timekeeper™ can save and recall 8 user programmable setups. Each stored setup is labeled from 0 to 7, and contains the following items:

1. TAKT time.
2. Goal value.
3. Scale factor.
4. Yellow blink time.
5. Yellow warning time.
6. Beeper mode.

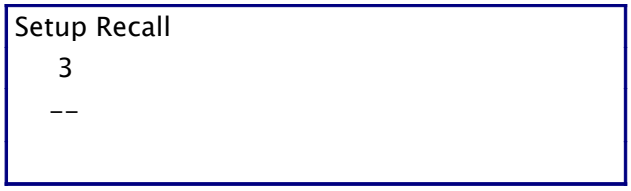
To **store** a setup:

1. **Press** and **hold** the **Recall Setting** button. The following display will appear:

2. **Turn** the **knob** to select the desired 0 to 7 location.
3. **Press** and **hold** the **Recall Setting** button again to store the current Production Timekeeper™ setup into the selected storage location.

To **recall** a setup:

1. **Momentarily press** the **Recall Setting** button. The following display will appear:



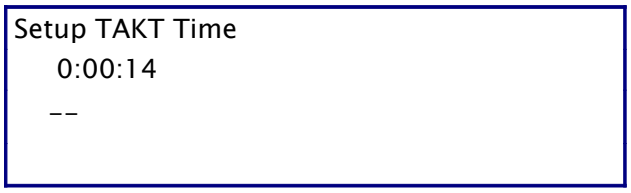
2. **Turn** the **knob** to select the desired 0 to 7 setup.
3. **Momentarily press** the **Recall Setting** button again to recall the Production Timekeeper™ setup from the selected storage location.

Setting Up the Production Timekeeper™

The Production Timekeeper™ contains user programmable timers and counters. Each programmable setting is selected using the **Mode** button, and modified using the **Select** button and the **knob**.

To **setup** the Production Timekeeper™:

- **Press and hold** the **Mode** button. The following display will appear:



Instructions

Sets the TAKT timer.
1. **Turn** knob to set **seconds**
2. **Momentarily** press the **Select** button
3. **Turn** knob to set **minutes**
4. **Momentarily** press the **Select** button
5. **Turn** knob to set **hours**

- **Momentarily press** the **Mode** button. The following display will appear:

Instructions

Keep at 0 if a running goal is desired. If a static goal is desired, set this value to the desired goal.
1. **Turn** knob to set goal in steps of **1**
2. **Momentarily** press the **Select** button
3. **Turn** knob to set goal in steps of **100**
4. **Momentarily** press the **Select** button
5. **Turn** knob to set goal in steps of **10000**

- **Momentarily press** the **Mode** button. The following display will appear:

```
Setup Scale
   1
  --
```

*NOTE: Do not set the scale to 0. If you set the Scale to 0, the **Next** button will never increment the actual count.*

Instructions

The actual count increments by the scale count. The running goal calculation also uses the scale count.

1. **Turn** knob to set goal in steps of **1**
2. **Momentarily** press the **Select** button
3. **Turn** knob to set goal in steps of **100**
4. **Momentarily** press the **Select** button
5. **Turn** knob to set goal in steps of **10000**

- **Momentarily press** the **Mode** button. The following display will appear:

```
Setup Yel Warning
   0:00:04
  --
```

Instructions

Sets when the solid yellow occurs during TAKT time.

1. **Turn** knob to set **seconds**
2. **Momentarily** press the **Select** button
3. **Turn** knob to set **minutes**
4. **Momentarily** press the **Select** button
5. **Turn** knob to set **hours**

The yellow warning (solid yellow) occurs the set time before the TAKT time expires. This is measured from the start of the Actual timer, which is reset each time the Actual count is incremented. For example: If the TAKT time is set to 14 seconds, and the yellow warning time is set to 4 seconds, the solid yellow warning will occur 4 seconds before the TAKT time expires which is 14-4, or 10 seconds into the Actual time.

- **Momentarily press** the **Mode** button. The following display will appear:

```
Setup Yellow Blink
   0:00:07
  --
```

Instructions

Sets when the blinking yellow occurs during TAKT time.

1. **Turn** knob to set **seconds**
2. **Momentarily** press the **Select** button
3. **Turn** knob to set **minutes**
4. **Momentarily** press the **Select** button
5. **Turn** knob to set **hours**

The Blinking Yellow warning occurs the set time before the TAKT time expires. This is measured from the start of the Actual timer, which is reset each time the Actual count is incremented. For example: If the TAKT time is set to 14 seconds, and the Yellow Blink time is set to 8 seconds, the Blinking Yellow warning will occur 8 seconds before the TAKT time expires which is 14-8, or 6 seconds into the Actual time.

- **Momentarily press** the **Mode** button. The following display will appear:

```
Setup Clock
   0:00:00
  --

DD117A0-V1.00
```

Instructions

Sets up the time of day clock.

1. **Turn** knob to set **hours**
2. **Momentarily** press the **Select** button
3. **Turn** knob to set **seconds**
4. **Momentarily** press the **Select** button
5. **Turn** knob to set **minutes**

NOTE: If the clock is running slow or fast, it can be calibrated to be within 2.5PPM in most cases. Contact the factory for calibration information.

NOTE: The product version number also appears on the bottom line of this menu.

- **Momentarily press** the **Mode** button. The following display will appear:

```
Setup YYYY/MM/DD
  2007/01/01
  --
```

Instructions

Sets up the date.
Turn knob to select the desired Day.

1. **Turn** knob to set **year**
2. **Momentarily** press the **Select** button
3. **Turn** knob to set **Month**
4. **Momentarily** press the **Select** button
5. **Turn** knob to set **Day**

- **Momentarily press** the **Mode** button. The following display will appear:

```
Setup Beep
   Timer Zero
  --
```

Instructions

Sets up the beeper mode.
1. **Turn** knob to select the desired mode
The choices are: Off
Timer Zero
On Warnings
Actual < Goal

An optional external beeper must be installed for this function to produce an audible sound.

If the Actual<Goal option is selected, the Red and Green Andon indicators operate differently. When the actual count is greater than the goal count, the **Green** andon comes on.When the actual count is less than the goal count, the **Red** andon comes on.

- **Momentarily press** the **Mode** button. The following display will appear:

```
Setup Event Save
Run Pause Stopped Wigit
  --
And Clear Counters
```

Instructions

Turn the knob until the desired selections appear.
- Save Run event. Each time the **Run** button (remote IN1) is pressed, an event is stored.
- Save Pause event. Each time the **Pause** button (remote IN2) is pressed, an event is stored.
- Save Stopped Event. Each time the **Stop** button (remote IN3) is pressed, an event is stored.
- Save Wigit count event. Each time the **Next** button (remote IN4) is pressed, an event is stored.

"And Clear Counters" is a special feature that causes the counter values to be stored to internal memory at midnight. In addition, all the counters to be automatically reset at midnight.

- **Momentarily press** the **Mode** button. The following display will appear:

```
Setup Remote Display
00 Addr 1 Mode 0
--
```

Various types of information can be displayed on a large display or reader board. This configuration menu selects which data is transmitted on the serial port.
The first entry is the type of data to be displayed. The value ranges from 00 to 15 as listed in the instructions below.

Types of Data Output

Turn the knob until the desired value 0 to 15 appears.
00 = Running or static goal
01 = Actual Count
02 = Deviation (Goal – Actual)
03 = Efficiency Percent (Goal/Deviation*100)
04 = Machine Down Time
05 = TAKT Time
06 = Actual Time
07 = Red Warning Count
08 = Yellow Warning Count
09 = Yellow Blink Count
10-15 = Spares for additional results.

The second entry is the display address. You can use any address here so long as it matches the address that is configured into the display. See the display documentation for configuring display addresses. The Addresses are in ASCII characters starting at '0' and going up to and including 'O'.

- Output is OFF '/'
- Digits include 0-9.
- Characters include A-O
- Special characters include: :;<=>?@

Note: For example, the DSP1016A display default addresses are A-D for lines 1-4 respectively.

The third entry is the number of digits displayed.

- 0 = 6 digit display. When displaying time values, hours, minutes and seconds will be displayed.
- 1 = 4 digit display, right justified. When displaying time values, minutes and seconds will be displayed.
- 2 = 4 digit display left justified. When displaying time values, hours and minutes will be displayed.

- Momentarily press the **Mode** button. The following display will appear:

```
Setup File Name
  HISTA000.TXT
  _
```

The file format is always A-Z for the first 5 characters and 000 to 999 for the last three characters. The numbers will auto-increment each time data is stored. To change an individual character in the File Name use a **momentary** press of the **Select** button to move to the character position then use the **Knob** to select the character value. To change the file type between **CSV** and **TXT**, press the **Select** button until cursor is under the file extension. Turn the **Knob** to select the desired file type.

Instructions

- Turn the knob to select the desired character.
- Press the Select button to advance to the next character
- Repeat until the desired file name is entered.
- The data may be stored in one of 2 formats plain text (TXT) or Comma separated values (CSV).

Saving History to an SD Memory Card

The history memory can be stored on an SD (Secure Digital) card.


```
Save to SD Card File
  HISTA000

Saved
```

Make sure that the SD card is inserted into the unit. Press the **Save** button to see the name of the file to be saved to the SD card. Press and hold the **Save** button to store the contents of the history memory on to the SD card. The history file name will auto increment. The name in the display after the save is completed is the name of the next file to be saved. You may remove the SD card from the unit and put it into any computer that supports FAT12 or FAT16 type files. The message "Saved" will appear once the save is completed.

A single message is added to the history memory "**Save 227**" where the number is the number of history entries that was in the history memory at the time the save was executed.

See the example below for a sample of the saved data.

NOTE: If the SD card is not inserted, or if the card is not formatted properly an error message "SD Card Error" will appear on the display.

NOTE: Because all files are stored in the root directory of the SD card only about 500 files can be stored (this is an SD card limitation when used formatted for use with MS Windows).

Typical data stored on the SD memory card.

HISTA023.TXT

```
2007-10-10 06:29:57 Time   255
2007-10-10 06:29:49 Down   714
2007-10-10 06:28:49 Save    77
2007-10-10 06:28:42 Scal     1
2007-10-10 06:28:42 Gpre     0
2007-10-10 06:28:42 Eff     55
2007-10-10 06:28:42 Dev    -17
2007-10-10 06:28:42 Act     21
2007-10-10 06:28:42 Goal    38
2007-10-10 06:28:42 Grn      6
2007-10-10 06:28:42 Yel      6
2007-10-10 06:28:42 Red      5
```

HISTA024.CSV

```
"2007-10-10 06:28:27","Paus","241"
"2007-10-10 06:28:26","Run","539"
"2007-10-10 06:28:26","Paus","240"
"2007-10-10 06:27:49","Save","54"
"2007-10-10 06:27:10","Time","240"
```

Displaying files on an SD Memory Card

The directory listing on an SD (Secure Digital) card.

```
Files                1
  HISTA000.CSV
 Size:                34232
```

Make sure that the SD card is inserted into the unit. Press and hold the **Select** button to see the name of the file on the SD card. Turn the Knob to scroll through the list of files on the SD card.

When done, press any other button to exit this menu.

Remote Inputs

To **connect** remote inputs to the Production Timekeeper™:

1. Connect an RJ-11 wall plate jack to the Production Timekeeper™ remote input jack using either a six conductor modular crossover, or a six conductor modular standard telephone cord.
2. Connect a momentary (or push button) switch, or switches between the desired remote input and ground using the diagram (see installation instructions) as a guide.

The remote inputs are used as follows:

- IN-1 Put the timer into RUN mode. This is the same as pressing the **RUN/PAUSE/STOP** button.
- IN-2 Put the timer into PAUSE mode. This is the same as pressing the **RUN/PAUSE/STOP** button.
- IN-3 Put the timer into STOPPED mode. This is the same as pressing and holding the **RUN/PAUSE/STOP** button.
- IN-4 Increment the Actual Count. It also resets the actual count timer. This is labeled the **Next** button on the remote button module.

Note: As the diagram (in the installation instructions) portrays, the individual colored wires on the RJ-11 wall plate jack will function differently depending which six conductor modular telephone cord is chosen.

Remote Serial Input

Remote serial devices may be connected to the serial input on the Production Timekeeper™.

This unit has 2 choices for serial data input. Only one of them may be used at a time. If commands are received on both serial inputs at the same time, the data will become corrupted and neither command will be processed.

- The DB-9 connector can be used for RS-232 serial data.
- The RJ-45 connectors can be used for RS-422 serial data.

This unit can be connected to an Alzatex input device, PLC, Computer or any device having a serial port. The data OUT is always the display data. The data IN may be used to generate events or to control the unit remotely. Some of the options include:

- Connect a remote button module to the RS422 input for generating special events. Assign the buttons to specific meanings like paper jam, lunch break, change over to new product, etc.
- Connect the output of a PLC that has a serial output or other machine outputs to a ground closure to serial adapter to record specific machine events like door open, out of material, roller not turning, etc.

The buttons on the DD-117A can be operated remotely using the following commands.

“KPK	Save to SD card File Display
“KPk	Press and hold to Save to SD card
“KPH	History Display
“KPh	Press and hold to Save History and Clear Counters
“KPG	Recall Stored Setting
“KPg	Press and hold to Save Stored Setting
“KPL	Run/Pause
“KPl	Press and hold to enter Stopped mode.
“KPA	Mode
“KPA	Press and hold to Enter the setup mode.
“KPB	Select
“KPb	Press and hold to display Directory Entries
“K+	Rotate knob clockwise.
“K-	Rotate knob counter clockwise.
“KPU	Put the unit into RUN mode. (Remote input IN1)
“KPV	Put the unit into PAUSE mode. (Remote input IN2)
“KPW	Put the unit into STOPPED mode. (Remote input IN3)
“KPX	Increment the Actual count and reset the actual timer. (Remote input IN4)
“KPY	Decrement the Actual count. (There is no corresponding button on the unit for this command)
“KP0 to “KP9	Increment the Actual count for a specific production line 1 (“KP0) through 10 (“KP9). These commands also increment the overall actual count, the same as “KPX. (There are no corresponding buttons on the unit for these commands)
“KP0 to “KPz	All other key codes in the range of ASCII “0” (Decimal=48) to ASCII “z” (Decimal=122) not listed above generates an event **Key xxx**, where the number will be the corresponding decimal value for the character that is stored in the history memory.