SOFTWARE DATA SHEET

2200
DATA COLLECTION SOFTWARE UTILITY

INTRODUCTION

As more and more businesses are turning to computers to help process large amounts of information, the requirement of collecting accurate yet timely input data has become more demanding. Though computers are becoming more sophisticated and are being used for a wider variety of applications, data collection methods have remained very much the same. Most data collection methods are the outcome of manual procedures designed to support a manual-based information system. As a result, the speed and capability of the computer is now being limited by outdated data collection systems.

Unlike its manual counterparts, Wang's Data Collection Software utility provides automated data collection. It is designed specifically to support the input requirements for computer-based applications. The Data Collection Software utility is a Wang developed BASIC-2 software application designed to run on the following Wang 2200 Series systems: 2200VP, 2200LVP, and 2200MVP.

The Data Collection Software utility supports the centralized control and maintenance of an entire network or multiple networks of Smart Clock® devices. Primarily, the utility serves as a front-end data collection system using an automatic polling protocol that scans each clock for data and stores the collected data on disk. Data can be collected from both local and remote locations.

USAGE WITH APPLICATIONS

The data collection/transmission structure of the utility is an ideal data collection system for the following computer-based applications.

- Payroll
- Job Costing/Labor Distribution
- Work-In-Process
- Inventory Control
- Security Access
- Custom Applications

®Smart Clock is a registered trademark of Coastal Data Products, Inc. For further information on Smart Clock, write Coastal Data Products, Inc., 7370 N.W. 36 Avenue, Miami, Florida 33147.
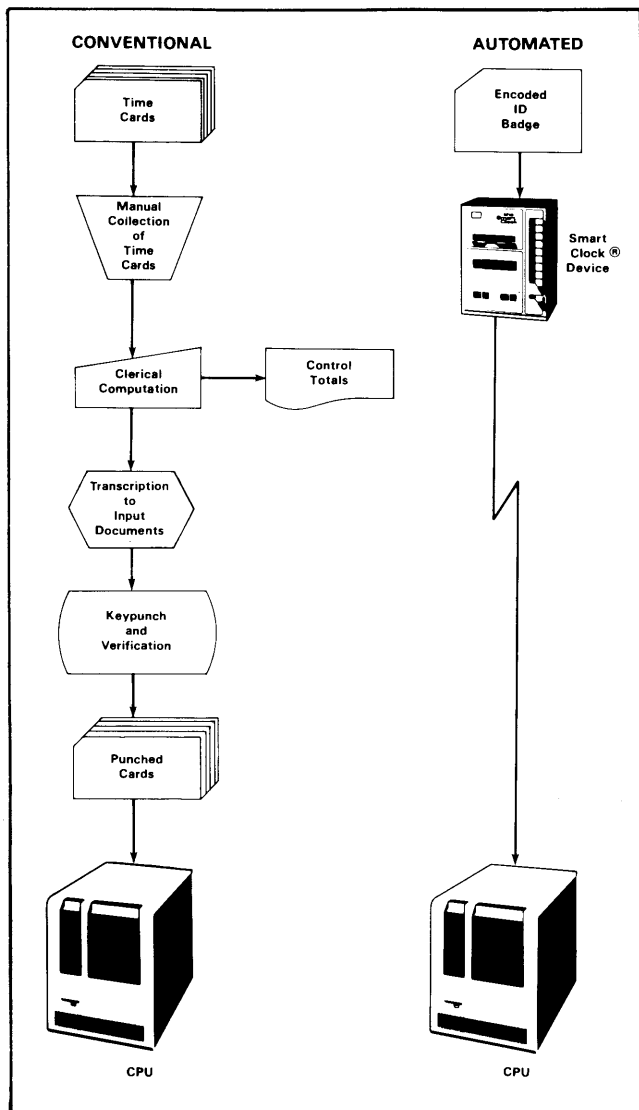
- **Fully Automated Interactive Data Collection**
- **Parameter Driven For Ease of Installation**
- **Minimal Operator Supervision**
- **Multiple Smart Clocks Supported**

```
                Smart Clock Data Collection

    Number          Program
    ----------------------------------------------------
     01      Remove clock from service
     02      Return clock to service
     03      List status of all clocks
     04      Change the number of clocks
     05      Reset the time in all clocks
     06      Close the data file for processing
     07      Open a new data file
     08      Set busy times
     09      Release to background
     10      Scan clocks for data
     11      Reset the date in all clocks
     15      Return to this menu
     31      Return to master menu
```

CONVENTIONAL

Time Cards

Manual Collection of Time Cards

Clerical Computation → Control Totals

Transcription to Input Documents

Keypunch and Verification

Punched Cards

CPU

AUTOMATED

Encoded ID Badge

Smart Clock ® Device

CPU

DATA COLLECTION METHODS

Payroll

The Data Collection Software utility can eliminate almost all of the complex, time-consuming manual procedures involved in payroll processing. With the use of encoded employee ID badges, each Smart Clock can be used in place of a conventional time clock to record employees' time and attendance information. The Data Collection Software utility can collect the time-card data automatically and transmit it to the computer for processing. This data collection/transmission eliminates the many "bottlenecks" inherent in manual-based payroll data collection and verification.

Job Costing/Labor Distribution

The Data Collection Software utility can make job costing – even under the most difficult conditions – a relatively simple task. Employees simply clock in and out with the Smart Clock as they work on various jobs. The Data Collection Software utility can then accumulate the data collected to help provide accurate job costs – even on a daily basis. In addition, labor cost reports could be computed by profit center, department, or assembly line as needed.

Work-In-Process

Similar to job costing, the Data Collection Software utility can be used to provide accurate and timely cost data as goods pass through various stages of production. At each processing step, a worker enters an encoded job card into a Smart Clock device. The resulting data can then be collected and stored on disk by the Data Collection Software utility for computer processing.

Inventory Control

As items are issued from stock, the number of units issued can be entered into a Smart Clock device (either by a manual keyboard entry or a pre-punched card). The Data Collection Software utility can then collect the data and make it available for up-to-the-minute inventory status reports.

Security Access

Access to restricted high-security areas can be controlled by entering an authorization code or badge into a Smart Clock. The Smart Clock can record the authorization code as well as the time of access. The Data Collection Software utility can then access the data collected for computer-generated exception reports showing time and access violations.

Custom Applications

The utility also can be used for other user-designed custom applications as needed. The Data Collection Software utility usually can support computer-based applications involving transactions that can be recorded/entered by an encoded ID badge, punched card, or manual keyboard entry. For example, hospitals can use the utility with Smart Clocks to record special employee time data (patient care versus nonpatient care) for Medicaid reimbursement. In most cases, the Data Collection Software utility, in conjunction with Smart Clock devices, provides more information more efficiently than most conventional data collection methods.

UTILITY SOFTWARE

The utility software is provided in both source and condensed form on a single diskette. The Data Collection Software utility can run from diskette or hard disk, depending on user needs. In general, the utility software consists of the following types of modules.

- Start Module
- Main Modules
- Overlay Modules

Start Module

The Start module is consistent with all Wang developed 2200 Series applications; it is the entry point to the system. The Start module initializes system addresses and operating parameters, and loads the "menu" program that provides access to all other programs in the system.

Main Modules

The Main modules are responsible for the major processing functions of the package and consist of three programs.

- Data Collection main program
- Programmer/Technician test program
- Build Network Status File program

The *Data Collection main program* is the heart of the Data Collection Software utility. The main program functions as the driver program working in conjunction with run-time loaded modules (program overlays) to control and maintain the Smart Clock devices. The program is responsible for scanning an entire network of clocks, retrieving the data stored in each clock's memory, performing system and status error checking, and storing the collected data on disk, in standard Wang 2200 Series telecommunications (TC) format. No attempt is made to interpret the data.

The Data Collection main program consists of the following menu-driven functions.

- Remove Clock From Service – Allows operator/user to designate a clock which is no longer an active part of a network.

- Return Clock to Service – Allows operator/user to designate a clock as an active part of a network.

- List Status of All Clocks – Allows operator/user to review the status of all clocks in each network. This function ensures data/system integrity.

- Change the Number of Clocks – Allows operator/ user to reset the maximum number of clocks in a particular network. This function is used primarily when expanding a network.

- Reset the Time in All Clocks – Allows operator/user to change the time displayed (and used) by all clocks in a single network or all networks.

- Close the Data File for Processing – Saves any transaction in memory and closes the transaction data file. This function allows the file to be used by user-specific software applications.

- Open a New Data File – Allows operator/user to open a data file with which to store the collected data from the clocks.

- Set Busy Times – Allows operator/user to specify up to five periods during the day when the program will not request data from clocks in a specified network.

- Release to Background – Allows the Data Collection main program to run in a background partition (MVP and LVP only), thus freeing the terminal for other tasks.

- Scan Clocks for Data – Causes automatic scanning of all clocks within a selected network or all networks. All data stored in each clock's memory is retrieved, printed on hard copy, and stored on disk in standard Wang 2200 TC format.

- Reset the Date in All Clocks – Allows operator/user to reset the date used by all clocks in a single network or all networks.

- Return to this Menu – Allows operator/user to return to the Data Collection main program menu. This function may also be used to restart the Data Collection main program without loss of data after the HALT/RESET key has been pressed.

- Return to Master Menu – Allows operator/user to return to the master menu; control is passed to the Start module.

The *Programmer/Technician test program* is available as a testing tool to help the programmer, analyst, or technician become familiar with the interaction between the clocks and the computer, and to evaluate the condition of a specific clock in a

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                    SMART CLOCK TEST PROGRAM

        ACTION CODES:
          1=Reset network
          2=Select clock
          3=Request time
          4=Reset clock's time
          5=Send initial dump request
          6=Acknowledge previous transaction
          7=N/Acknowledge, Request re-transmission
          8=Reset (Clear) clock memory
          9=Reset clock's date
          0=Select new network

        Current network number:  1        Current clock number:  3

        Previous action code = 3
          Return code = 01  Error Message =
          Return message from clock = 1331533

        Enter next action code:  3
```

network. During installation, this program provides an easy mechanism to verify that all installation-defined parameters have been selected properly and that the transaction validation routine has been set up correctly. Secondly, it allows the programmer or technician to determine the operating condition of any particular clock within any given network.

The *Build Network Status File program* is provided to create a disk status file for each operational network. Each file created maintains long-term status information regarding the controlled network.

Overlay Modules

The utility software utilizes five program overlay modules. This modularity facilitates changes to the system by allowing installation-dependent parameters to be defined within the overlay modules utilized by the Data Collection main program. Almost any operational change may be made in processing parameters with no change required in the main program.

The five program overlays are as follows.

• Program overlay used by the "menu" program to describe each program in the system

• Subroutine to verify transactions

• Subroutine to save transaction on disk

• Subroutine to communicate with clocks

• Subroutine to declare installation-dependent parameters

For ease of installation and program maintenance, all operating parameters are contained in one program overlay. Each parameter's value can be modified, as needed, to tailor the utility software to each installation site. Some parameters defined by each installation prior to system operation are as follows.

• Communication speed (baud rate)

• Number of networks

• Pause between polling cycles

• Maximum number of busy times

• Maximum acceptable error in clock's time

• Length of average transaction from the clocks

• Flag to control reporting transmission errors

• Read/write address of master clock

• Device address of TC controller boards

• Device address of data files

• Device address of status files

• Device address of printer

• Data file name

• Status file name

SMART CLOCK

The Smart Clock, developed, marketed, installed, and maintained by Coastal Data Products, Inc., is an intelligent terminal designed to reduce data entry costs and time by capturing information at the source – as it happens. Much like a conventional time clock, the Smart Clock displays the time of day and allows data to be entered by inserting a punched card or encoded badge.

The Smart Clock is actually a real-time device since it captures and stores data as it is being entered. Microprocessor controlled, the Smart Clock can operate either as a stand-alone device or as an on-line terminal to almost any computer. By using an external modem, collected data can be transmitted from remote locations over standard voice-grade telephone lines. Up to 64 Smart Clocks can be connected on a line to a single modem; use of additional modems will provide multiple networks of Smart Clocks.

In either local or remote transmissions, the host computer is responsible for polling each Smart Clock and retrieving the data stored in the clock's random access memory. The Data Collection Software utility provides the software interface to poll the Smart Clocks for data. The utility can link Smart Clock devices to the following Wang 2200 Series computer systems.

- 2200VP
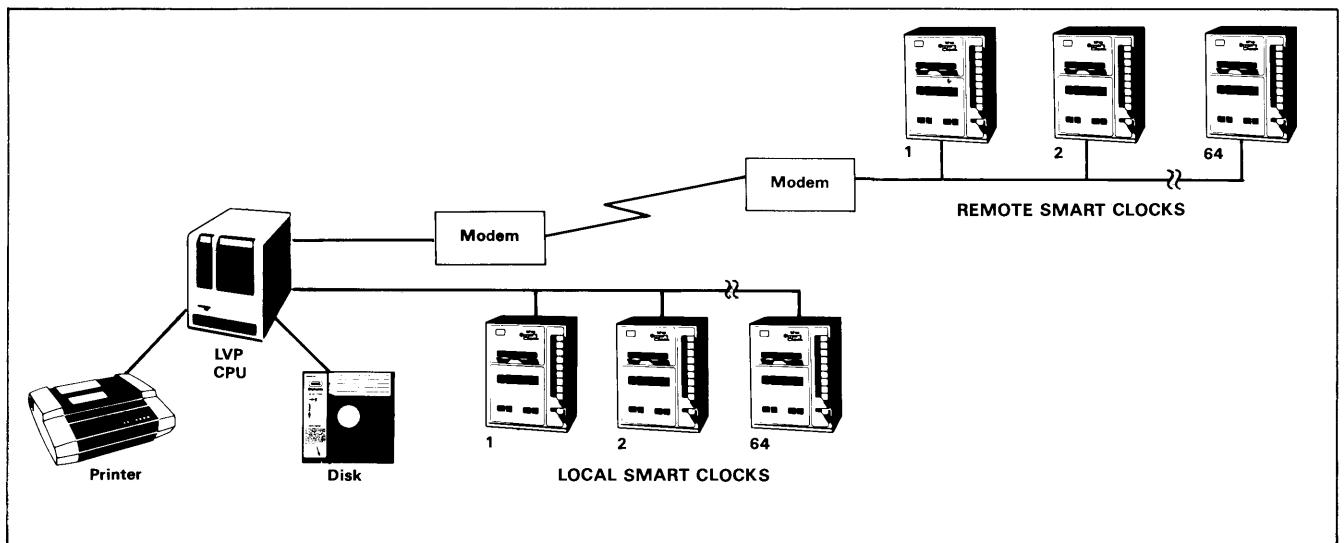- 2200LVP
- 2200MVP

Wang 2200VP

The 2200VP is an interactive, CRT-based system which can be programmed and controlled from the system keyboard/CRT-screen. It is a versatile, high performance machine which offers high speed processing capabilities at a fraction of the cost of large mainframe computers. The 2200VP uses the popular high-level BASIC language and is available with a wide array of peripherals.

Wang 2200LVP

The 2200LVP is a high performance system which supports as many as four users concurrently. Programmable in Wang's high-level BASIC-2 language, the 2200LVP offers computing speed and power unavailable on other machines in its price range. Based on the 2200MVP processor, the 2200LVP also offers state-of-the-art disk storage, telecommunication capabilities, and an extremely low-overhead operating system.

Wang 2200MVP

The 2200MVP is a fixed-partition, multi-user system designed to meet the needs of small businesses. Programmed in BASIC-2, up to 16 jobs can be run concurrently. Overall, the system supports up to 12 terminals, 256K memory, and over 300 megabytes of disk storage, as well as a full line of asynchronous and synchronous telecommunications in a variety of industry-standard protocols.

A SAMPLE SMART CLOCK CONFIGURATION USING 2200 SERIES COMPUTER

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┌─────────MINIMUM HARDWARE REQUIRED─────────┐
│                                           │
│ •Wang 2200 Series Computer                │
│      2200VP CPU with 32K memory           │
│      2200LVP CPU with 18K partition       │
│      2200MVP CPU with 18K partition       │
│                                           │
│ •Wang Printer                             │
│                                           │
│ •9020 I/O Board                           │
│                                           │
│ •2227B, 2228B, 2228C or equivalent TC Controller │
│  Board                                    │
│                                           │
│ •2227N Null Modem                         │
│                                           │
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For further details contact: _____

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The materials contained herein are summary in nature, intended for general information only, and subject to change. Details and specifications regarding the use and operation of Wang equipment and software can be found in the appropriate technical manuals, available through local sales offices. In no event shall Wang Laboratories, Inc. have any liability or responsibility for the implementation, maintenance, or support of a Smart Clock device or any special, incidental, or consequential damages resulting from its use.

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│     Package Number        │
│       195-2160            │
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