



# CodeFacts

AIDC (Automated Identification and Data Collection) Technical & Informational Documents  
Written for Everyone

## Shop Floor Data Collection Systems

---

Ever wonder where an in-process job is currently located on your factory floor? Do you think it's impossible to get exact, job and labour costing data on custom jobs that move through your shop? Do you believe there might be a better way to keep track of employee time and attendance data other than with that antique time clock?

The solution to *any* of the above problems may be solved through the use of a Shop Floor Data Collection System!

A Shop Floor Data Collection System (SFDCS) is an on-line, real-time system created by using small terminals, deployed throughout a factory or shop floor. The terminals are small and simple and are strung together in a cabled network. Unlike a PC LAN, the shop floor network uses simple wiring that is cheap, error-resistant and allows the network to be physically very long—up to 4000 feet long!

Shop Floor Data Collection System Terminals come in a number of configurations. Some are very simple, comprising only of a small LCD screen and attached bar code scanner. Other SFDCS Terminals may have an integral keypad, touchscreen input, a secondary bar code scanner, and input/output ports for controlling attached printers or electromechanical devices such as relays. The terminals have no internal fan to suck up factory dust and are reasonably durable. Some terminals are so tough they can operate outdoors or survive high-pressure washings.

The cost of the terminals can range anywhere from \$1000 to \$4000, depending on their options. The terminals are dependent upon a custom data collection software program, typically residing in a PC, to poll the terminals, extract the collected data and place it in a computer file, located on the host system.

How does the system work? Each one is somewhat different, but the following guidelines hold true for most systems:

A work order is created for a particular job. The work order number is printed in both text and bar code. Alternately or additionally, product nameplate labels are created with a serial number for each unique product. The labels are attached to the chassis or the skeletal structure of the manufactured item. As the job is taken on by each employee, they may, via a local SFDCS terminal, identify a number of things:

---

their identity (via a bar-coded badge or employee listing adjacent to the terminal), and the job they are working on (by scanning the work order and/or product bar codes). They may also scan, from a special bar code template near the terminal, a particular job function they are performing. This could be "welding" or "press number one." The LCD screen on the SFDCS terminal has prompted the employee for each entry and verified the response's validity as well as possible. This short "question and answer conversation" is termed a "transaction." Of course, all transactions are automatically time- and date-stamped by the host computer system to keep all records exact and coordinated.

These terminals can obviously be used by anyone with minimum training and supervision. Since they are not perceived as "computers" they are far more easily accepted by skeptical workers.

So, why spend thousands of dollars to put a bunch of high-end bar code readers out on the floor? We have found the justification for such systems is found in the answers to the following questions:

- ❖ *Where is that job?* Many job shops and custom fabrication factories have dozens or even hundreds of jobs in process at any one time in their operation. Should a client call and want to know at what stage their job is in a complex process, how does one find the job? Typically, by physically touring the shop floor, looking for the job. How much executive time does that waste?
- ❖ *How much did that job cost me to produce?* What we mean here is, 'If I were to add up all of the direct labour hours, as well as the costs associated with machine and process time, how much money would that be?' Imagine getting exact, to-the-minute time stamps at the beginning and end of each process, every time somebody in your shop began and ended work on a work order? Typically, some well-meaning soul will create a "time sheet" and ask each employee to manually complete the sheet progressively throughout the day, noting the time and work order number of every job he/she is working on. Such sheets are, in the end, filled out fifteen minutes before shift end, and the employee is thinking back to what they did eight hours ago! Not very accurate. Of course, even if they loyally completed the time sheets throughout the day with exact entries, somebody still has to manually transpose the handwritten information into a computer program, if it is to be fully utilized.
- ❖ *How much work did that employee do this day or week or month?* It stands to reason that, if you're keeping track of an employee's work against jobs, you might as well use it to create payroll records. SFDCS terminals clock a worker into work when they arrive at their workstation,

not at the factory door. Since there are multiple terminals, strategically deployed across the shop floor, lineups to the terminals are minimal.

Are there other benefits? Yes, quite a number.

- ❖ Employee production incentive programs can easily be set up and maintained.
- ❖ Bottlenecks in production can easily be spotted and acted-upon, if possible.
- ❖ Up-to-the-second information can be made available to any company manager with access to the corporate LAN.
- ❖ Statistical analysis data can be accumulated and crunched.
- ❖ Machine time can accurately be accumulated and used in preventative maintenance programs.
- ❖ Lot counts can be tracked through each stage of production.
- ❖ Lot tracking and component tracking data for audit and quality control purposes can be easily and accurately compiled.
- ❖ The system could be tied into raw or finished goods inventory programs for automatic updating of inventory levels.
- ❖ Shop employees can query the system for upcoming jobs in order to make their equipment ready while running the current job.

While it can be said that any operation needs a moderate number of transactions to make a Shop Floor Data Collection System viable, many small-scale systems can be justified based on accurate job costing alone. With shrinking margins on fabricated goods, manufacturers are looking at ways of making their operations more efficient and productive. Newer equipment and processes certainly help, but gauging the effectiveness of these things requires an accurate and timely method to equate their effectiveness. A well-designed and assembled Shop Floor Data Collection System is often the answer.