



## Batch vs. Radio Frequency

In the data collection industry, there are generally two types of technologies employed to collect information on handheld terminals and transfer that information to a computer system – batch and radio frequency (known as RF).

In a batch system, an operator uses a handheld terminal to collect data that is then stored inside the terminal. At some point, the operator must then walk to a docking station that is wired to some kind of computer (in our case, a PC). The terminal must then send the stored data from its memory out the docking station to the PC. The software running on the PC then receives that data from the terminal and stores it on disk. After the data is transmitted (also known as uploading), the PC software must then process each record received one at a time, possibly uploading each record to another software package (like ERP). Then, as each record is processed by the ERP software, any errors in that record must be communicated back to the data collection software for logging. When all records have been processed, an operator must then run an error report from the error log and correct all errors manually on the ERP screens.

In an RF system, an operator uses a handheld terminal with an antenna to collect data. Each time a record of data is collected, the program inside the terminal transmits the record to a radio transceiver (known as an access point), which in turn transmits the record to the data collection software running on the PC. The PC software then immediately communicates that data to ERP, receives an immediate response, and transmits that response (good or bad) back to the operator. If, for some reason, the ERP system is unavailable, then the PC software will typically store that information and post that data later (similar to the batch system) when the ERP system becomes available.

The following is a comparison of several categories relating to batch and RF systems:

1. Terminal costs
  - RF terminal = approximately \$3500
  - Batch terminal with extra memory needed for local data storage = approximately \$2800
2. Communication with PC
  - RF access point = \$900 for office or \$2500 for industrial; either version can also be used for other wireless LAN applications as well as phone traffic
  - Batch docking station = approximately \$425 plus the cost of the networked PC

3. Programming costs
  - RF is 1/2 to 1/3 times the costs of batch due to elimination of programming for terminal programming and data transfer
  - Batch is 2 to 3 times the costs of RF due to additional programming for terminal programming and data transfer
4. Software licenses
  - RF software resides on a single PC server and is licensed by concurrent users (i.e. how many terminals are running at any one time); in a remote site with limited users, you will probably not require any additional software or user licenses if the terminals are communicating with the main PC server over an internal wide-area network (WAN)
  - Batch software resides not only on the main PC server but also on each PC that is used as a docking station, including remote sites; there is a software license for the server and for each PC
5. Data transmission loss
  - RF data is transmitted to the PC host as soon as a transaction is completed; if the RF system or PC goes down, the most data you could lose is the current transaction
  - Batch data is stored in the terminal until it is docked and uploaded to a PC; if anything happens to the terminal before the data is safely uploaded, you risk losing all of your collected data since the last upload
6. Operator feedback
  - With an RF system, there is a real-time connection to both the PC and ERP system; collected data is validated immediately and the operator is notified if there is an error; this could be critical in the example of a shipping application where a shipment error could cost the company if it was not caught in time
  - With a batch system, there is no real-time connection to any computer system, so real-time feedback for error notification or other required information is not available to the operator
7. Software upgrades
  - In an RF environment, the only software that has to be reloaded for upgrades or servicing is on the main PC server
  - In a batch environment, software upgrades and fixes may have to be loaded onto the PC server, each PC docking station, and each handheld terminal