

## Interleaved Two of Five Bar Code Symbology (ITF)

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This is a popular symbology.

It has certain advantages for a specific range of applications, however it also has several disadvantages and various factors must be considered when planning to use it.

### 1. Advantages of ITF

- It is dense. Much data can be packed into a short code length (although note that Code 128C [numeric-only Subset C] is even shorter for data lengths of 8 or more digits)
- It is very tolerant to bar width errors in printing. This feature is relied on in the outer case carton industry where the printing inks tend to soak into the cardboard. This causes "Bar Gain" where the bars grow wide at the expense of the spaces which become narrower.

### 2. Disadvantages of ITF

- It is numeric only. No Alpha characters are possible
- The start & stop characters are very short and therefore tend to occur unintentionally in the middle of the bar code. This results in the strong possibility of "partial scans" where the scanning laser beam enters/exits the top or bottom of the code halfway down its length but unluckily sees what it interprets as a start/stop sequence at the entry/exit and gives a valid, although short, data output. Experiment with this code:



- There is very little in-built redundancy, this allows the high density, but it makes it easy for a badly printed or a soiled code to give a substitution error (where it appears to read well, but the data is incorrect).

### Methods to increase data integrity in a system using ITF codes:

1. Use a different symbology. Code 128 is highly recommended.
2. Although two different lengths of code are allowed for ITF in a Microscan scanner (in SYMBOLOGIES menu), it is advisable to configure it to allow only one length, setting the second length to zero or the same length. This prevents partial scans.  
NOTE: The application will need to be restricted to just one code length for all operations and for all future times. The customer must be made aware of this at the outset.  
Even with these precautions taken if a 10 digit code is presented to a scanner set to 8 digits there is a strong possibility of an 8 digit good read.
3. Set the number of Reads Per Decode (in READ CYCLE menu) to greater than 1. 3 to 5 is recommended. This may slow the speed at which codes can be moved past the scanner so tests will be needed in a high speed application.
4. Use the in-built Check Digit (in SYMBOLOGIES menu). This requires an extra data digit for this purpose.
5. Use another self designed Check Digit in the application software. This will require another data digit and may be excessive, but it should be considered.

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