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**THE HEALTH INDUSTRY  
BAR CODE (HIBC)  
PROVIDER APPLICATIONS STANDARD**

**Secretariat:**

**Health Industry Business Communications Council**

**2525 E. Arizona Biltmore Circle, Suite 127**

**Phoenix, Arizona 85016**



# THE HEALTH INDUSTRY BAR CODE (HIBC) PROVIDER APPLICATIONS STANDARD

## Secretariat



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## **THE HEALTH INDUSTRY BAR CODE (HIBC) PROVIDER APPLICATIONS STANDARD**

### **Foreword**

Automatic identification technology is continually evolving. As technological advances prove applicable to the health care industry, they will be incorporated into revisions of this standard, wherever possible. However, every attempt will be made to maintain the existing data structures, thereby allowing new technology to be introduced into systems in a non-disruptive manner.

With the proliferation of bar codes in healthcare, it has become increasingly problematic to be able to know for sure what bar code has been scanned. This standard is designed to be compatible with other bar code standards so that the scanning system can unambiguously identify a data element and hence reject it if it is not matched with the application.

### **Scope**

This document describes the voluntary Health Industry Bar Code Provider Applications Standard. This standard defines a list of attributes that can be used to identify the type of item or transaction within a provider facility. The standard also defines appropriate data structures, symbologies and print quality levels. Providers of health care services are strongly encouraged to use bar code labeling incorporating bar code symbols in accordance with the standards described herein.

## 1.0 HIBC Provider Applications Standard Data Structures

A distinction is drawn in this document between data structures and the encodation of the data structure in a machine-readable form. This section defines only the data structures encoded in the HIBC symbologies.

The HIBC Provider Applications (PAS) Data Structure Format uses the “+” characters as the identifier for the HIBC Provider Applications Data Structure where the “+” is a Data Identifier (DI) as registered in ISO/IEC 15418 and the “/” is ASCII character 47dec.

A set of application flag characters will identify the application and data by two criteria:

- Where the data structure is located (where it is or what it is on).
- The nature of the data structure (what it is).

Note: In a health care setting, the simple identity of a data field is often insufficient. An example would be that of a patient identity for the taking of specimens or upon commencement of a surgical procedure. It is not only necessary to identify the patient, but further verification is required of "where" the patient identity was taken from. Patient identity might occur on the patient chart or other medical records, but in the cases enumerated above, should be taken from the patient wristband or other identity physically affixed to the patient. The "where" portion of the data structure would verify that the identity was, in fact, taken directly from the patient.

Single flag characters are selected from the set of letters A through Z (except Y). Three character flag-characters begin with a "Y" and are followed by an additional two characters, as defined by HIBCC. These three character flag-character definitions will be assigned by HIBCC as future needs are defined.

All non-defined flag characters are reserved for future expansion by HIBCC.

The letter "Z" is reserved for non-conforming data formats, for purely internal use (within a specific health care facility) or within a "closed system." A "closed system" is defined as one where the user of a data structure can always be defined and where a central authority in the user's institution has final authority over the encoding, decoding, and processing systems.



Conversely, an "open system" is one typified by the absence of a central authority. Examples of "open systems" include:

- A specimen being sent to a private laboratory
- Transfer of patients between institutions
- Organs harvested from patients in one institution that are implanted in a patient at another institution.

In "open systems," a data structure encoded at one institution must be able to be decoded and referenced by the receiving institution.

It is recognized that data structures other than those identified in this standard may be in limited use in certain institutions. It is recommended that such non-conforming data structures be considered an interim method, with the HIBC Provider Applications Standard data structures as an ultimate uniform method. It is recommended that other data structures not be perpetuated except for some compelling pre-existing reasons.

No specific format is recommended for the individual data fields within the data structure with four exceptions:

- HIBCC assigned Labeler Identification Code (LIC); (see sec. 1.2.2 "A")
- Date; (see sec. 1.2.2 "M")
- Time; (see sec. 1.2.2 "M")
- Variable length fields will be limited to 15 characters maximum length

For all other data fields, the Character set for the HIBC Provider Applications Standard is the alphabetical characters A-Z, the numbers 0-9, and the three special characters. Three special characters have particular significance to the HIBC Provider Applications Standard:

- "+" - The plus sign is the reserved flag character to identify the HIBCC system

- "\*" - The asterisk character must never be encoded and can only be used in human-readable interpretation in accordance with Section 2.2
- "/" - The slash character is the PAS identifier character (In previous versions of this standard, this character was the reserved delimiter character to separate fields of data in an HIBC Provider Applications Standard Multiple Data Field "Concatenated" Format (see Section 1.1.3))

The check character employed in the HIBC Provider Applications Standard formats is a Modulus 43 Check Character. This character is generated as described in Appendix B and may assume any value in the character set of A-Z, 0-9, and the following seven characters -, ., \$, /, +, %, and Space.

## 1.1 Standard Data Structures

Depending on the length of the data structure and the available space to represent the data structure one of the following formats is recommended

### 1.1.1 Single Data Structure Format

**+ / F G D D D D D C**

**Table 1**

Field Descriptor	Field Length	Field Description
+/	2	Industry Standard Identifier for HIBC Provider Applications Standard
F	1 (or 3) †	Flag character(s) indicating "where" the data structure is located. (See Section 1.2.1)
G	1 (or 3) †	Flag character(s) indicating "what" the encoded data is (See Section 1.2.2)

D	Variable 1-15 characters	Data defined by the application
C	1	Modulus 43 Check Character
<p><b>†Note:</b> Single flag characters are the set of letters A through Z (except Y). Three character flag characters begin with a "Y" and are followed by an additional two characters, as defined by HIBCC (see Section 1.0)</p>		

The "F" field is used to define "where" the data structure is located. This is either a single alphabetic character from A to Z (see Section 1.2.1 for definition), or a 3-character sequence beginning with "Y". Three character flag characters begin with a "Y" and are followed by an additional two characters, as defined by HIBCC (see Section 1.0)<sup>1</sup>. If the field contains the letter "Z", this signifies that the data structure which follows does not conform to the HIBC Provider Applications Standard Data Structure Format.

The "G" field is used to identify the nature of or "what" is being encoded in the data. This is either a single alphabetic character from A to Z (see Section 1.2.2 for definition), or a 3-character sequence beginning with "Y". Three character flag characters begin with a "Y" and are followed by an additional two characters, as defined by HIBCC (see Section 1.0)<sup>2</sup>. If the field contains the letter "Z", this signifies that the data structure which follows does not conform to the HIBC Provider Applications Standard Data Structure Format but is provider application data.

### 1.1.2 Split Data Field Format (Obsolete)

Note: Previous versions of this standard which only specified linear symbologies required this feature. This version recommends the use of 2D symbologies and thus this section is now obsolete. Use of this field with 1D symbologies is acceptable until 1 January 2013 and the format information is included in Annex C for backward compatibility.

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<sup>1</sup> It should be noted that there are currently no three character flag data structures defined in this standard. The design of the standard to allow for three character flag data structures is to allow future expansion of this standard.

<sup>2</sup> See footnote 1 above.

### 1.1.3 Multiple Data Field (“Concatenated”) Format

The data structure may contain more than one type of data when they share the same “where” flag (see Section 1.2.1). If this is the case, the fields are separated by slash (/) characters, and the first character in each field is defined as in Section 1.2.2. (i.e., “what” the data is). The case of two data fields is illustrated in the following format: (see Table 4)

**+/ F G<sub>1</sub> D<sub>1</sub> D<sub>1</sub> / G<sub>2</sub> D<sub>2</sub> D<sub>2</sub> D<sub>2</sub> C**

**Table 4**

Field Descriptor	Field Length	Field Description
+/	2	Industry Standard Identifier for the HIBC Provider Application Standard
F	1 (or 3)	Flag Character(s) for Data. D <sub>1</sub> D <sub>1</sub> D <sub>1</sub> , D <sub>2</sub> D <sub>2</sub> D <sub>2</sub> etc., through the number of fields concatenated in the data structure. This flag represents “where” the data is located. (see section 1.2.1)
G <sub>1</sub>	1 (or 3) <sup>†</sup>	Flag character(s) for data D <sub>1</sub> D <sub>1</sub> D <sub>1</sub> . This flag represents “what” the encoded data is. (See Section 1.2.2)
D <sub>1</sub>	Variable 1-15 characters	First application data structure
/	1	Field delimiter
G <sub>2</sub>	1 (or 3) <sup>†</sup>	Flag character(s) for data D <sub>2</sub> D <sub>2</sub> D <sub>2</sub> . This flag represents “what” the encoded data is. (See Section 1.2.2)
D <sub>2</sub>	Variable 1-15 Characters	Second application data
C	1	Modulus 43 Check Character for the entire data structure
<sup>†</sup> <b>Note</b> Single flag characters are the set of letters A through Z (except Y). Three character flag characters begin with a “Y” and are followed by an additional two characters, as defined by HIBCC (see Section 1.0).		

## 1.2 Application Flag Character Definition

### 1.2.1 “Where” Flag Definitions

- **“A” Patient:** An identifying device affixed to the patient, e.g., identity imprinted and encased in a wrist-fastened bracelet.
- **“B” Patient Care Record:** Any document utilized as a unique patient record, including, but not limited to: medical abstract, patient chart, patient’s laboratory cumulative summary, medication administration record, discharge plan, progress notes, ancillary service documents, etc. May also include patient charges, subject to individual institution’s philosophy.
- **“C” Specimen Container:** An article (tube, jar, syringe, pan, etc.) used to hold and/or convey a non-reusable patient specimen from source of origin (patient) to another point (anatomical pathology, laboratories, etc.).
- **“D” Direct Patient Image Item:** Any image (film, recording, etc.) acquired in diagnostic testing, including, but not limited to: X-rays, ECG, EEG, Myelograms.
- **“E” Business Record:** Generic item to be sub-classified as required within each institution to reflect internal organization. Examples: purchasing, wage and salary, utilities, requisitions, forms, maintenance agreements, contracts, etc.
- **“F” Medical Administration Record:** Any record required by an institution in documentation/quality assurance, registration through discharge, utilization, staffing, management, human resources, etc.
- **“G” Library Reference material:** Books, periodicals, reference materials, journal, standards, report series, etc.

- **“H” Devices and Materials:** Generic term to cover a broad spectrum of both direct and indirect patient care items. May be consumable or non-consumable (from pacemaker to housekeeping bucket). **Note:** Does not include assets.
- **“I” Identification Card:** Identification card used in any non-patient capacity within the hospital environment.
- **“J” Product Container:** Container for administrable product.
- **“K” Asset:** Term used to denote tangible real estate and capitalized equipment by item and/or location.
- **“L” Surgical Instrument:** Items generally found in the surgery theatre which often require sterilization (e.g. scalpel).
- **“M” through “X”:** Reserved for future definition by HIBCC.
- **“Y” Expansion Flag Character:** This flag character will be used when further expansion is required by HIBCC. Two characters always follow this flag character.
- **“Z” User Defined:** This flag character signifies that the following data structure does not conform to the HIBC Provider Applications Standard.

### 1.2.2 “What” Flag Definitions

- **“A” Labeler Identification Code (LIC):** The LIC is used to define all health care locations, such as remote clinics, divisions of hospitals, ambulatory surgery sites, off-site warehouses, etc. The codes are assigned and maintained by HIBCC.

- **“B” Service Identification:** An internally assigned coding structure established by an institution to identify service areas, departments, or locations within a single institution or organization. Example of “service” may be nursing units, laboratories, operating rooms, patient rooms, etc.
- **“C” Patient Identification:** An internally assigned coding structure for differentiating a given patient from all other patients within the institution or organization. The patient identification should be a unique code assigned permanently to only one patient (see “V” for Patient Visit ID). The Patient ID is typically referred to as the Medical Record Number (MRN) or Universal Record (UR) by hospitals.
- **“D” Specimen Identification:** An internally assigned coding structure for differentiating a given sample of patient tissue, fluids, etc., from other samples. Examples of specimens include blood, serum, urine, and biopsy material. The specimen identification is usually a reusable code.
- **“E” Personnel Identification:** An internally assigned coding structure used to differentiate between individuals associated with that organization. Examples include employee code, visitor badge, security codes, and social security numbers.
- **“F” Administrable Product Identification:** An internally assigned coding structure used to identify or differentiate substances or products administered to a patient to achieve a desired therapeutic or diagnostic effect. Examples of administrable products include drugs, blood components, IV fluids, anaesthetic agents, oxygen, and diagnostic agents such as radionuclide. These identification codes are usually assigned on a permanent basis for the life of the product.
- **“G” Implantable Product Information:** An internally assigned coding structure used to identify or differentiate organs or devices that are intended for implantation or grafting in the patient. Examples of implantable or graft able products include pacemakers, artificial organs, prosthetic devices, and drug pumps. Examples of implantable or graft able organs include kidneys, hearts, cornea, liver, bone, bone marrow, skin, and blood vessels. These identification codes are usually assigned on a permanent basis for the life of the organ or device.

- **“H” Hospital Item Identification:** An internally assigned coding structure to identify medical/surgical materials used in the care of patients. Examples of products include tape, IV tubing, bandages, infusion pumps, surgical instruments, non-capital equipment, linens, and other patient supplies.
- **“I” Medical Procedure Identification:** An internally assigned coding structure used to identify the therapeutic or diagnostic processes, activities or interventions performed on the patient or patient specimen. An organization may choose to use a standard coding structure (such as the Hospitals-International Classification of Diseases Activity-10<sup>th</sup> Edition Examples of medical procedures include surgical procedures, laboratory procedures, nursing activities, therapeutic procedures (respiratory, physical, occupational therapies), and diagnostic procedures (ECG, EEG analyses).
- **“J” Reimbursement Category:** A coding structure, established by regulatory bodies or third party reimbursers, used to identify categories of health care services and the associated level of remuneration for goods and services provided to the patients. Information which may be encoded includes diagnosis, medical procedures, and discharge status. Examples of reimbursement categories include HMO, DRG, Blue Cross, Blue Shield, Medicare A and B, self-pay and commercial carriers.
- **“K” Blood Product Identification:** A blood type identification scheme, such as the two-digit numeric codes defined by the International Society of Blood Transfusion (ISBT) Standing Committee on Automation and Data Processing.
- **“L” Demographic Data:** All descriptive data pertaining to patients such as: name, age, sex, etc
- **“M” Date/Time:** The standard for the date is established as a six-digit Julian date where the first three digits represent the year and the last three present the day. Time is expressed with four digits in military time, representing local time in hours and minutes with the optional character “G” representing Greenwich Mean Time (GMT), i.e.:

**Y Y Y D D D H H M M G**



Note - This date format was established for several reasons. Three digits are used to encode the “year” to distinguish between the ages of a one-year-old patient and a 101-year-old patient. The “month, day, year” formats are avoided because they vary around the world (for example the ISO Standard is “day, month, year”) and because three digits are still required for the year. The use of Julian dates is not a problem because this HIBC coding structure is designed for computer interpretation only. The date in “month, day, year” form may still be printed on the item in another place, distinct from the HIBC Format. The time format is standardized as:

H H M M G – Hours, Minutes, GMT Option.

Seconds will not be encoded and no “:” will be embedded in the machine-readable data structure, though a human-readable interpretation embedding the “:” in a data structure placed elsewhere than the actual human-readable of the machine-readable data structure might be desirable. The time will be local in military 24-hour clock format. A leading zero is used, when necessary, to keep both the hours and minutes in sub-fields at exactly two-digits. The letter “G” is used when the time is encoded as GMT. This is important in some applications where the data is passed through different time zones. For example, an organ for transplant purposes needs to be encoded in a GMT format since it could be shipped to a recipient in a different time zone. Time is an important element to be captured in machine-readable form in areas such as drug administration schedules, items that have an extremely limited shelf-life, organ/tissue harvesting as described above, etc. A Julian Dating Calendar is included as Appendix A to this Standard.

- **“N” Asset Identification:** A code representing any capitalized asset such as equipment, furniture, buildings, and physical locations.
- **"O" Purchase Order Number:** A code associated with a source document utilized to purchase a product or service.
- **"P" Dietary Item Identification:** A code associated with human consumable internal products given for their nutritional value, i.e., patient menus, cafeteria items, infant formulae, and patient therapeutic diets.
- **"Q" Manufacturer Serial Number:** A code assigned by the manufacturer to differentiate identical products.

- **"R" Library Materials Identification:** A code utilized to catalog books, periodicals, journals, report series, newspapers, subscriptions, references, etc.
- **"S" Business Control Number:** Identification codes associated with forms, records, and materials in support of the health care facility's business, e.g., requisition codes, personnel records, maintenance records, bills, patient invoices, etc.
- **"T" Episode of Care Identification:** An internally-assigned coding structure for differentiating a specific episode of care from all other such episodes for a patient. See also, "C" Patient Identification. Examples of care episodes may be an outpatient visit, a series of outpatient visits, an emergency room visit, an in-patient admission, a clinic visit or a referral/specimen episode.
- **"U" Health Industry Number (HIN):** The Health Industry Number (HIN) is a nine character alphanumeric unique identifier that is assigned to every facility, delivery location and business activity in the healthcare supply chain. The first seven positions of the HIN comprise the "base HIN" which identifies a healthcare entity at a particular location. The seventh position is a check digit to verify the first six positions. The last two positions of the HIN comprise the suffix that uniquely identifies a specific ship-to location, alternative location or a functional affiliation with the entity.
- **"V" Patient Visit ID:** Unique number given to a patient for a given visit or stay (see "C" for Patient ID). Also commonly referred to as the Account Number, Accession Number, or Event Number.
- **"W":** Reserved for future definition by HIBCC.
- **"X" XML Document:** This flag character will be used when the data is formatted as an Extensible Markup Language (XML) Document.
- **"Y" Expansion Flag Character:** This flag character will be use when further expansion is required by HIBCC. Two characters always follow this flag character to provide further definition.

- **"Z" User Defined:** This flag character signifies this data structure does not conform to the HIBC Provider Applications Standard Data Structure Formats.

### 1.3 Examples of HIBC Provider Applications Standard Data Structures

#### Patient Identification Example:

Patient wristband included a patient identifier as well as the visit number.

**+/ACMRN123456/V2009121908334**

Where:

+/ is the industry standard identifier indicating a HIBC Provider Application Standard data structure

The letter A indicates the “where it is located” flag character, indicating that the data is placed on the device affixed to the patient (eg wristband).

The letter C indicates “what kind of data” flag character, indicating that what follows is the Patient Identification (e.g. Medical Record Number – MRN)

“MRN123456” is the patient identifier

/ is the data delimiter

The letter V after the data delimiter “/”, indicates “what kind of data” flag character, indicating that what follows is the Visit Number.

200912190833 is the Visit Number

4 is the check sum calculated using the modulus 43 algorithm

ISO/IEC 15434 encoding

An alternative method of encoding the same data using the industry standard Data Identifier (DI) format is as follows:

[ ]>Rs06Gs+/ACMRN123456/V2009121908334RsEoT

Note: the entire PAS data string is added after the “+” DI including the “/” and check characters (i.e. the “/” characters are not replaced by “Gs” characters). If additional DIs are required (e.g. “V” for Vendor) then a “Gs” character is used to separate the PAS data string from the other DI data.

#### Purchase Order Example:

A purchase order is generated that is transmitted to a vendor. It contains several fields of information, which are:

- The purchase order number
- The HIN of the ordering hospital

- Internal data
- The purchase order date and time

The purchase order number could be the following format:

**+ / E O 5 2 3 2 0 1 3**

Where,

"+/" is the industry standard identifier indicating a HIBC Provider Applications Standard data structure

The letter "E" is the "where is it located" flag character, indicating that the data structure is on a business record.

The letter "O" is the "what kind of data" flag character, indicating that what follows is a purchase order number.

"523201" is the purchase order number.

"3" is the Modulus 43 Check Character of the data structure.

The HIN of the ordering hospital along with the associated PO could be as follows:

**+ / E U 7 2 0 0 6 0 F F 0 / O 5 2 3 2 0 1 W**

Where the new data is as follows,

"+" is the industry standard identifier indicating a HIBC Provider Applications Standard data structure.

"E" is the "where is it located" flag character, indicating that the data structure is on a business record.

"U" is the "what kind of data" flag character, indicating that what follows is a HIN.

"720060FF0" is the HIN for the ordering hospital. Note: The first seven positions of the HIN comprise the "base HIN" (e.g. 720060F) which identifies a health care entity at a particular location. The seventh position of a base HIN is a check-character (e.g. F) for verifying the first six positions. The last two positions of the HIN comprise the suffix (e.g. F2) that uniquely identifies a specific ship-to location, alternative location or a functional affiliation with the entity (e.g. Purchasing Department)

"W" is the Modulus 43 check character.

Note that in the PO field, the "E" is not repeated.

If the Hospital wanted to include further information, such as a department code indicating which internal department initiated the purchase order and the LIC of the vendor, the additional data structure format may then be:

**/ Z 3 4 H 1 5 9**

Where,

"Z" signifies what follows does not conform to the HIBC Provider Applications Standard Data Formats. In this example, external systems would ignore all the data following the "Z." Internal systems, however, would process the common data according to an internally defined procedure. For example, the procedure could be that the two-character field following the "Z" ("34") defines the Materials Management Department of the ordering institution and the next four characters are the LIC of the vendor ("H159").

A fourth data structure, for example time and date, on the purchase order could be the following format:

**/ M 9 8 4 2 4 3 1 3 4 0**

Where,

"M" is the "what kind of data" flag character, indicating that what follows is a date and possibly time.

"9842431340" indicates the year is 1984 ("984"), the 243rd day of the year ("243") and the time is 1:40 p.m. ("1340") local time (since the "G" does not appear). (See Section 1.2.2)

All of the data could appear as one data structure in a concatenated format utilizing the slash (/) character. The "where it is located" identifier "E" is only in the first field and there is only one check character for the entire data string. The data structure format would be:

**+/ E U 7 2 0 0 6 0 F F 0 / O 5 2 3 2 0 1 / Z 3 4 H 1 5 9 / M 9 8 4 2 4 3 1 3 4 0 V**

The last character of the data structure "V" is the Modulus 43 Check Character of the entire data structure.

### ISO/IEC 15434 encoding

An alternative method of encoding the same data using the industry standard DI format is as follows.

**[ ) > Rs 06 Gs +/ E U 7 2 0 0 6 0 F F 0/ O 5 2 3 2 0 1/ Z 3 4 H 1 5 9/ M 9 8 4 2 4 3 1 3 4 0 Rs  
EoT**

Note: the entire PAS data string is added after the "+" DI including the "/" and check characters (i.e. the "/" characters are not replaced by "Gs" characters). If additional DIs are required (e.g. "V" for Vendor) then a "Gs" character is used to separate the PAS data string from the other DI data.

### Asset Tag Example

**+/ K N 1 2 3 4 5 A**

Where,

"+/" is the industry standard identifier indicating a HIBC Provider Applications Standard data structure.



"K" is the "where is it located" flag character, indicating that the data structure is on the asset itself, as opposed to being on a document that refers to an asset (such as a packing slip).

"N" is the "what kind of data" flag character, indicating that what follows is an asset identification code.

"12345" is the internally defined asset identification code.

"A" is the Modulus 43 Check Character of the data structure.

If this same data structure was on the packing slip for this item, then the format would have a one data character change, plus the change of the Check Character:

**+ / E N 1 2 3 4 5 9**

The change from "K" to "E" identifies that the asset identification code was obtained from a business record and not from the asset itself. This is an important distinction for such applications as equipment maintenance recording.

#### Surgical Instrument Unique ID Example

Shown below is an example of a uniquely identified surgical instrument.

**+ / L A H 1 2 3 / N C 9 0 3 7**

Where,

"+" is the industry standard identifier indicating a HIBC Provider Applications Standard data structure.

"L" is the "where is it located" flag character, indicating that the data structure is on a surgical instrument.

"A" is the "what kind of data" flag character, indicating that the LIC that assigned the serial number is encoded insuring uniqueness everywhere.

"N" is the internally defined asset identification code (e.g. "C" indicates the item is a scalpel and "903" is the item serial number).

The "7" at the end is the Modulus 43 Check Character of the data structure.

## 2.0 HIBC Data Carriers

### 2.1 General

In Section 1.0 the data structures for provider applications are defined. This section defines the specific machine-readable encodation recommended for health care providers.

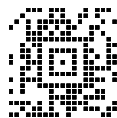
### 2.2 Symbolologies for use with the HIBC Provider Applications Standard Data Structures

The preferred symbolologies for use with the HIBC Provider Applications Standard Data Structure Formats are Data Matrix (ECC200), QR Code 2005 and Aztec Code. Code 39 or Code 128 may be used for single data field applications

#### Patient Identification Example

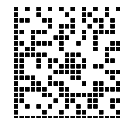
Shown below is the patient identification example encoded in Aztec Code and Data Matrix symbols. The actual encoded data is “+/ACMRN123456/V2009121908334”. Representation of the data can follow Provider norms, in this case just the MRN number is near the symbol and the visit number is elsewhere on the wristband. The data is intended to be scanned into the hospital IT system. If the symbol is unreadable, it should be replaced.

***Aztec Code***



**MRN: 123456**

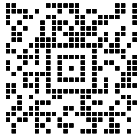
***Data Matrix***



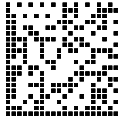
**MRN: 123456**

Below is the same hospital data encoded following the ISO/IEC 15434 protocol with both data elements shown as they might appear on a wrist band. The actual data encoded is “[ ] > Rs 06

Gs +/ACMRN123456/V2009121908334 Rs EoT” Note: Two different symbols are shown to demonstrate encoding differences and only one is necessary on an actual wristband. However, some wrist band applications encode the same data into more than one symbol (generally the same symbology) for ease of scanning since there would be less need to manipulate the wrist to get a scan.



Visit Number: 200912190833



Medical Record Number: 123456

**Purchase Order Example**

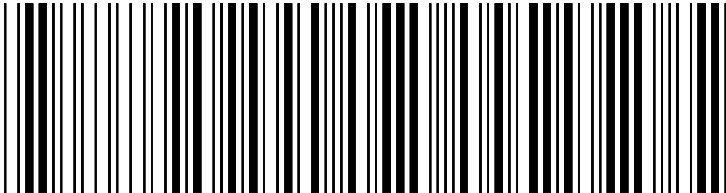
Shown below is the single data field purchase order example encoded in Code 39, Code 128, Aztec Code and Data Matrix symbols. The actual encoded data is “+/EO5232013”. Representation of the data can follow Provider norms, in this case just the PO number. The data is intended to be scanned into the hospital IT system. If the symbol is unreadable, it should be replaced.

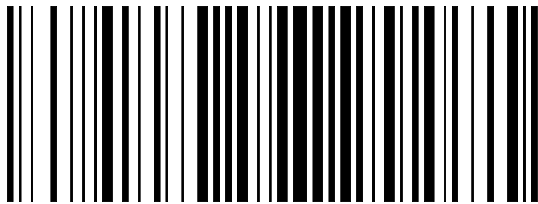
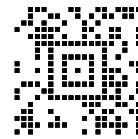
**Code 39**

**Data Matrix**

PO: 523201

PO: 523201



**Code 128****PO: 523201****Aztec Code****PO: 523201**

Note: When the exact data encoded in the symbol is printed immediately below (called Human Readable Interpretation) one asterisk "\*" immediately precedes the first character of the data and another asterisk "\*" immediately follows the last character of the data in order to insure that the possible existence of a trailing space, period or dash character is recognized. For example, the above symbols could have the following printed below the symbol.

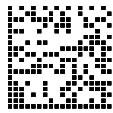
**\*+EO5232013\***

An asterisk is never encoded within a message format.

### Second Purchase Order Example

Shown below are the HIN of the ordering hospital with a suffix indication the ordering department and the purchase order number encoded in Data Matrix and QR Code 2005. The actual data encoded is “+/EU720060FF0/O523201W”.

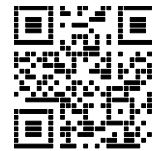
#### *Data Matrix*



**PO: 523201**

**HIN: 720060F**

#### *QR Code 2005*



**PO: 523201**

**HIN: 720060F**

Note: The actual data encoded in the symbols is as follows. **+/EAH783/Z34H159\$**

### Third Purchase Order Example

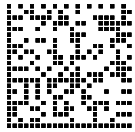
Shown below are the ordering hospital including ordering department, purchase order number, LIC of the vendor and a date/time field encoded in Data Matrix. The actual data encoded in the left symbol is “+/EU720060FF0/O523201/Z34H159/M9842431340V” and in the right symbol, the same data is encoded following the ISO/IEC 15434 protocol

“[ ] >Rs 06 Gs +/ EU720060FF0/O523201/Z34H159/M9842431340V Rs EoT”.

#### *Data Matrix*

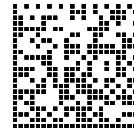
**PO: 523201**

**DATE: 31 AUGUST 1984**



**PO: 523201**

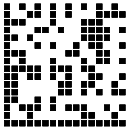
**DATE : 31 AUGUST 1984**



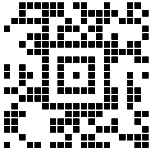
**Asset Tag Example**

Shown below is the asset tag example shown in Section 1.3 encoded in the three 2D symbols. The actual data encoded in the symbol is “+/KN12345A”.

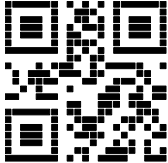
**Data Matrix**



**Aztec Code**



**QR Code 2005**



**Computer**

S/N 12345

**Asset Control**

#12345

**XYZ Hospital Property**

12345

**Surgical Instrument Example**

Shown below is an example of a uniquely identified surgical instrument. The actual encoded data is “+/LAH123/NC9037”.





### **2.3 RFID Tags to carry the HIBC Provider Applications Standard Data Structures**

HIBCC recognizes the potential use of RFID in healthcare applications such as Patient Identification, and Implant Identification and Tracking. Any RFID tags used in healthcare applications must be able to carry the HIBC Provider Applications Standard data structure without modification.

## **2.4 Symbol print quality**

### **2.4.1 X-dimension**

The minimum symbol cell size for 2D symbols should be 0.015 in (15 mils) and 0.010 inches (10 mils) for linear symbols.

For direct part marking on surgical instruments, the minimum X-dimension is 0.005 in (5 mils) but should be larger if there is marking room on the instrument.

### **2.4.2 Grade level**

The minimum bar code print quality grade for 2D symbols as per ISO/IEC 15415 should be 1.5/10/660 and for 1D symbols per ISO/IEC 15416 should be 1.5/05/660.

The minimum DPM grade level is DPM1.5/03 -10/660/(30T&30T|90) where the 30T requirements are orthogonal to each other.

### **3.0 References**

#### **3.1 References for the HIBC Provider Applications Standard**

Specifics relating to implementing the HIBC Provider Applications Standard are contained within the Application Specifications for the HIBC Provider Applications Standard.

Copies of the HIBC Guidelines can be obtained from:

Health Industry Business

Communications Council

2525 E. Arizona Biltmore Circle, Suite 127

Phoenix, AZ 85016

Tel: 602-381-1091

Fax: 602-381-1093

Email: [info@hibcc.org](mailto:info@hibcc.org)

#### **3.2 Technical standards for data syntax, symbologies and print quality**

ISO/IEC 15434 Information technology -- Automatic identification and data capture techniques -- Syntax for high-capacity ADC media

ANSI/HIBC 5.0 The Health Industry Bar Code (HIBC) Syntax Standard

ISO/IEC 16022 Information technology -- Automatic identification and data capture techniques -- Data Matrix bar code symbology specification

ISO/IEC 24778 Information technology -- Automatic identification and data capture techniques -- Aztec Code bar code symbology specification

ISO/IEC 18004 Information technology -- Automatic identification and data capture techniques -- QR Code 2005 bar code symbology specification

ISO/IEC 15415 Information technology -- Automatic identification and data capture techniques -- Bar code print quality test specification -- Two-dimensional symbols

AIM DPM-1 Direct Part Mark (DPM) Quality Guideline

ISO/IEC 16388 Information technology -- Automatic identification and data capture techniques -- Code 39 bar code symbology specification

ISO/IEC 15417 Information technology -- Automatic identification and data capture techniques -- Code 128 bar code symbology specification

ISO/IEC 15416 Information technology -- Automatic identification and data capture techniques -- Bar code print quality test specification -- Linear symbols

## APPENDIX A

## JULIAN DATING CALENDAR

Table A1

DAY OF MONTH	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	001	032	060	091	121	152	182	213	244	274	305	335
2	002	033	061	092	122	153	183	214	245	275	306	336
3	003	034	062	093	123	154	184	215	246	276	307	337
4	004	035	063	094	124	155	185	216	247	277	308	338
5	005	036	064	095	125	156	186	217	248	278	309	339
6	006	037	065	096	126	157	187	218	249	279	310	340
7	007	038	066	097	127	158	188	219	250	280	311	341
8	008	039	067	098	128	159	189	220	251	281	312	342
9	009	040	068	099	129	160	190	221	252	282	313	343
10	010	041	069	100	130	161	191	222	253	283	314	344
11	011	042	070	101	131	162	192	223	254	284	315	345
12	012	043	071	102	132	163	193	224	255	285	316	346
13	013	044	072	103	133	164	194	225	256	286	317	347
14	014	045	073	104	134	165	195	226	257	287	318	348
15	015	046	074	105	135	166	196	227	258	288	319	349
16	016	047	075	106	136	167	197	228	259	289	320	350
17	017	048	076	107	137	168	198	229	260	290	321	351
18	018	049	077	108	138	169	199	230	261	291	322	352
19	019	050	078	109	139	170	200	231	262	292	323	353
20	020	051	079	110	140	171	201	232	263	293	324	354
21	021	052	080	111	141	172	202	233	264	294	325	355
22	022	053	081	112	142	173	203	234	265	295	326	356
23	023	054	082	113	143	174	204	235	266	296	327	357
24	024	055	083	114	144	175	205	236	267	297	328	358
25	025	056	084	115	145	176	206	237	268	298	329	359
26	026	057	085	116	146	177	207	238	269	299	330	360
27	027	058	086	117	147	178	208	239	270	300	331	361
28	028	059	087	118	148	179	209	240	271	301	332	362
29	029	*	088	119	149	180	210	241	272	302	333	363
30	030		089	120	150	181	211	242	273	303	334	364
31	031		090		151		212	243		304		365

\*Every leap year has 366 days with February having 29. Julian dating in leap years is the same through February 28 (059) with February 29 as 060. All dating from March 1 through December 31 is incremented by one during leap years.

The HIBC Provider Applications Standard Format for use of Julian dating includes the last three digits of the year followed by a three digit “day of the year” code. For example, November 7, 2003 2011 is represented as”011311” (the 311th day of 2011).

## APPENDIX B

### MODULUS 43 CHECK CHARACTER GENERATION

Each of the HIBC Standards’ data structures employs a Modulus 43 Check Character for additional data security. The Check Character is the Modulus 43 sum of all the character values in a given message, and is printed as the last character value in a given message. Check Character generation is illustrated by the following example with the table below:

Provider Applications Data Structure: +/EAH783

Sum of values:  $41+40+14+10+17+7+8+3 = 130$

Divide 130 by 43. The quotient is 3 with a remainder of 11. The Check Character is the character responding to the value of the remainder (see table below), which in this example is 11, or B. The complete Provider Applications data structure, including Check Character, would therefore be:

+/EAH783B

Table of Numerical Value Assignments for Computing the HIBC Standards’ Data Format Check Character

**Table B1**

0 = 0	F = 15	U = 30
1 = 1	G = 16	V = 31
2 = 2	H = 17	W = 32
3 = 3	I = 18	X = 33
4 = 4	J = 19	Y = 34
5 = 5	K = 20	Z = 35
6 = 6	L = 21	- = 36
7 = 7	M = 22	. = 37

8 = 8	N = 23	Sp = 38
9 = 9	O = 24	\$ = 39
A = 10	P = 25	/ = 40
B = 11	Q = 26	+ = 41
C = 12	R = 27	% = 42
D = 13	S = 28	
E = 14	T = 29	

## APPENDIX C

### BACKWARD COMPATIBILITY

#### C.1 Stacked symbologies

Every effort has been made to insure this standard is backwardly compatible. Some infrequently used aspects of the previous standard were dropped or replaced and will be acceptable until August 1, 2004 (three years from the date of publication of this version of this document). Among these are the use of stacked symbologies Code 16K and Code 49, and the absence of the HIBC PAS Identifier '+' characters.

Information about the previous version of this standard is available from HIBCC.

The recommended human-readable format should always begin and end with an asterisk ('\* ') and should be phased in. Previously designed labels are acceptable.

#### C.2 Split data fields

Note: Previous versions of this standard which only specified linear symbologies required this feature. This version recommends the use of 2D symbologies and thus this section is now obsolete. Use of this field with 1D symbologies is acceptable until 1 January 2013 and the format information is included in Annex C for backward compatibility.

If the length of the data field requires that a dual data structure ("split") format be used, encodation should be performed using the following format:

First Data Structure Format

**+ / 1 F G D D D D C**

**Table 2**

Field Descriptor	Field Length	Field Description
+ /	2	Industry Standard Identifier for the HIBC Provider Application Standard
1	1	The digit "1" indicates that this is the first data structure
F	1 (or 3)	Flag Character(s) indicating "where" the data structure is located
G	1 (or 3)	Flag Character(s) indicating "what" the encoded data is. (see section 1.2.2)
D	Variable -1-15 Characters	First portion of the data defined by the application
C	1	Modulo 43 Check Character
<p><sup>†</sup><b>Note:</b> Single flag characters are the set of letters A through Z. Three character flag characters begin with a "Y" and are followed by an additional two characters, as defined by HIBCC</p>		

Second Data Structure Format

**+ / 2 D D D D L C**

**Table 3**

Field Descriptor	Field Length	Field Description
+ /	2	Industry Standard Identifier for the HIBC Provider Application Standard
2	1	The digit "2" indicating that this is



		the second data structure
D	Variable 1-15 characters	Remainder of application data
L	1	Link Character which is the check character for the first data structure
C	1	Modulus 43 Check Character for the data structure

A maximum of two data structures may be used in the split format.

The link character is designed to reduce the possibility of association from reading the first and second data structures from two unrelated places. The link character is the next to last character in the second data structure. It is the same as the check character from the first data structure. It is intended that software be provided to allow the two data structures to be read in either order.

**APPENDIX D****ERRATA #1**

to

**ANSI/HIBC 1.3-2010**

The Health Industry Bar Code (HIBC) Provider Applications Standard

**Purpose**

The purpose of this errata sheet is to clarify what is currently published. Although not an official part of the standard, the committee approved the following and intends to add this errata item to the next full revision of the American National Standard.

**Page Erratum**

27 Appendix B, paragraph 2, make changes as follows

*(Additions are shown in underline and deletions in strikethrough.):*

Provider Applications Data Structure: +/EAH783

Sum of values:  $41+40+14+10+17+7+8+3 = \del{439} \underline{140}$

Divide ~~439~~ 140 by 43. The quotient is 3 with a remainder of 11. The Check Character is the character responding to the value of the remainder (see table below), which in this example is 11, or B. The complete Provider Applications data structure, including Check Character, would therefore be:

+/EAH783B

Table of Numerical Value Assignments for Computing the HIBC Standards' Data Format Check Character