DCX Series User's Guide

INTRODUCTION

The DCX readers are stand-alone data collection readers which are available in fixed-mount and portable versions.

Major features of the DCX products include:

- 4 million bytes of non-volatile flash storage for saving transactional data.

- Time and Date stamping for all transactions.

- RS232 or USB serial port for uploading data on portable units.

- RS232, RS422, USB, or TCP / IP serial port for uploading data on fixed units.

- Easily programmed using serial commands or Ibc's utility software.

- Red and Green status leds.

- "J" series reader emulation.

- Programmable reader identifiers which can be included in each data transaction record.

- Available with barcode, magstripe, proximity, iclass, mifare, indala, and piv-II reading.

- Supports reading of Kronos and CAC / USID cards.

The DCX readers contain 4MB of memory in which data transactions are stored. Every time a supported card is read, the data read from the card is stored into the memory, along with an optional date/time stamp, and two optional reader identifiers. Data is stored in a circular buffer.

The reader can be programmed to accept specific barcode symbologies, magstripe tracks, or prox formats. Data can be masked before saving. Proximity cards are supported up to 64 bits.

There are four models of readers in the DCX Series:

- Smart Slot DCX (barcode)

- Smart Mag DCX (magstripe)

- Magbar DCX (barcode and mag)

- Smart Prox DCX (Prox, IClass, PIV, with optional barcode)

The Smart Slot DCX reader supports barcode reading only. The Smart Mag DCX supports magnetic stripe reading only. The Magbar DCX supports barcode and magnetic stripe reading. The Smart Prox DCX supports either proximity, iclass, piv-II, or mifare reading, with optional barcode and/or magstripe reading.

DCX readers are available as fixed-mount readers, or as portable readers.

Fixed mount readers are available with wire exits on the side or underneath, and can be mounted to a wall or tabletop. Available interfaces with fixed mount versions are RS232. RS422, usb, or Tcp/ip. Tcp/ip readers can be POE.

Portable readers are available with an internal 9 volt battery compartment (order suffix I), a power jack on the side of the reader for connecting an ac adapter or battery (order suffix J), or with both (order suffix A). The available interfaces with portable units are RS232 and USB.

For applications where the readers will be used to collect data at stationary points (time and attendance, trade show lead gathering, training class attendance), where ac power is available, the model with side jacks is the preferable model as an ac adaptor can be used to power the reader and the reader can be mounted tabletop. If ac power is unavailable for any short period of time, a 9-volt battery may also be used using a special 9-volt adaptor cable offered by IBC.

Models which have the internal battery operate off of a 9-volt battery, which is housed in a small compartment located on the bottom of the reader. This model also has an on/off switch located on the bottom of the reader, so you can turn the reader off and conserve power when the reader is not in use.

The SMAG-DCX will operate for approximately 8 hours with a 9-volt battery. The SSLOT-DCX will operate for about 5 hours using a fully charged battery. The SPROX-DCX will operate for about 4 hours using a fully charged battery.

All versions of the DCX readers can operate in an online mode, similar to a J series reader.

A built-in memory protection feature notifies you when the reader is full, and data must therefore be uploaded to a PC.

There are 2 leds (red and green) on the reader, which are used to notify you of a good or bad read, and notification of when the reader is full.

There are two reader identification fields which can be stored along with scanned data. One field is the reader id which is 5 characters in length. The 2nd field is the reader description field which is 10 characters in length. You can optionally store either or both fields along with each scanned data item.

You can upload the transactional information in the DCX reader into your computer by writing a simple program to upload the data using the command set, or use IBC's DCX utility software.

Note that data uploaded from a DCX reader is not cleared from reader memory until you specifically send the clear command to the reader.

DCX readers are flash downloadable, meaning you can update the reader with new versions of firmware when they are released.

It is suggested that you consult the programming commands for all features that you will be using. The programming commands provide additional detail for each of these functions.

COMMUNICATION

All DCX series readers communicate serially, either with RS232, RS422, usb, or TCP / IP. Non-fixed mount versions normally have a jack for connecting the communications cable. Fixed mount versions normally have a wire connected directly to the reader.

Some DCX readers may have 2 jacks on the side of the reader, one for power and one for communications. The communications wire is always the larger jack.

Do not plug the power wire into the communications jack or damage to the reader can occur.

The default RS232 / RS422 and usb communications parameters are 9600 baud, 8 data bits, no parity.

You can communicate with the readers using your own software, software provided by your dealer, or using IBC's DCX utility software, which is located on our website.

To initially test communications with the reader, send the reader the V command, followed by a carriage return (hex 0D). The reader will respond by sending it's firmware identification. If you do not have communications and you have a portable reader, make sure that the communication cable plug is seeded properly into the jack on the reader.

LEDS

DCX readers contain two leds on the front of the reader - one red and one green.

During normal operation, theses leds are off. The Green led will turn on after a good read. The red led will turn on if the unit is full, and also for a bad read.

While in the "J" emulation mode, both leds are normally off, and operate according to the "J" programming defaults which you have programmed the reader to.

WEATHERPROOFING

Weatherproofed units are weather-resistant and not completely weatherproof. Avoid direct contact with continuous rain and/or ice/snow by providing some protection.

If you have a unit with power and communication jacks on the side, be sure to protect them so that water cannot enter the reader.

Units which are not ordered as weatherproofed readers can become damaged if water enters the reader through one of the jacks. Avoid using the reader under any condition that will allow water to enter the reader.

READER SETUP

Prior to using the DCX reader, you should setup the reader using the programming commands or the utility software. In many cases, the factory defaults for the reader may be sufficient for your application, but it is always best to make sure the reader settings match your requirements.

For barcode reading, you can turn each supported barcode symbology on or off. By default, all symbologies are turned on. Also you can restrict the barcode reading to specific lengths only. For magnetic stripe reading, you can turn on or off any of the magstripe tracks, and also restrict the reading to only specific length cards. By default, only Track 2 reading is turned on.

For proximity reading, you must configure the reader so that it knows the acceptable prox formats that you want to read. This includes programming the complete bit structure for the format(s) you are reading. By default, the reader is setup to process standard 26 bit cards, and save the 5 digit ID number only from the card.

The reader has a maximum programmable record length of 40. The 40 character max includes any masking characters, but does not include the date and time, reader id, or reader description fields.

OPERATIONAL MODES

Dcx readers support 3 different operational modes:

> Offlline Collection Mode
> Online Mode
> Hybrid Mode

In the Offline Collection mode, scanned data is saved in the non volatile memory and remains there until the host system asks for the data.

In the Online Mode ("J" emulation mode), the reader emulates and IBC J series reader. Scanned data is transmitted immediately and not stored in the non volatile memory.

The Hybrid mode is new to version 2.xx firmware. In the Hybrid mode, scanned data is both transmitted in real-time and stored in non volatile memory.

TCP TRANSMISSION OPTIONS

DCX readers with a tcp/ip interface are available with either the standard IBC tcp/ip firmware, or an extended tcp/ip firmware package built specifically for the DCX reader. The extended tcp/ip firmware acts as a tcp/ip client and transmits new DCX stored data to a server at user-programmable interval times.

PROGRAMMING COMMANDS

You program the DCX reader by sending serial commands. Each command must be followed by a carriage return (hex 0D). The reader will respond with OK if the command is accepted, or NOK if the command is not accepted.

If your reader also supports reading barcodes, you can also embed commands within a barcode. To make a barcode containing a command, the barcode must be in code39, and start with a %U.

Note that any spaces shown in the commands are not part of the command. They are used solely for readability.

To program any TCP/IP related parameters, refer to the IBC TCP/IP Programmers Guide.

Reset Record Size Command

\ x x d r s

xx	data size	min=4, max=40
d	include the date when saving data	0=no, 1=yes
r	include the reader id when saving data	0=no, 1=yes
s	include the reader description when saving data	0=no, 1=yes

This command clears all data in the reader, and sets the record size. The record size must be set to the largest size of any data that you will be storing. It is ok to read card data that is smaller than this size, but any card data larger than this size will be rejected.

When reading proximity style cards, you will need to program the reader to the field data that you want to read off of the card, and the length of each of these fields when they are converted into decimalized numbers. The total length of the fields which are converted cannot be larger than the maximum record size setting. See the proximity formatting commands for more information.

Version Command

V

This command returns the firmware version loaded in the reader.

Set Time Command

+ yy mm dd hh mm ss x

yy	year
mm	month
dd	day
hh	hour (24 hour format, 00 thru 23)
mm	minutes
ss	seconds
x	use a 1 always

This command sets the date and time in the reader.

Get Time Command

t

returns: YY MM DD HH MM SS

This command returns the current date and time set in the reader.

Get Number of Records

z

returns: aaaaa bbbbb ccccc

       aaaaa   number of total slots available in the reader for storage
       bbbbb   number of used slots
       ccccc   number of slots used but not uploaded

Returns the number of available slots for storage, the number of slots used, and the number of stored data records which have not been uploaded.

Set Reader ID

g xxxxx -or - X109 xxxxx

Sets the reader id field to xxxxx. 5 characters are required. If less than 5 characters, pad with blanks. The g command is used for backward compatibility with older IBC utility software. The preferred method to setting the ID is to use the X109 command.

Set Reader Description

h xxxxxxxxxx -or- X110 xxxxxxxxxx

Sets the reader id field to xxxxx 10 characters are required. If less than 10 characters, pad with blanks. The h command is used for backward compatibility with older IBC utility software. The preferred method to setting the Description is to use the X110 command.

Set Reader Mode

| x

x	**1**	online mode (use this also for Hybrid Mode in combination with the X108 command, page 42)
	2	prox dump mode
	5	collection mode

Sets the mode of the reader.

Mode 5 is the standard data collection mode.

Mode 1 is an online mode. Data from scanned cards is immediately transmitted out serially and is not stored, unless Hybrid Mode is also turned on.

Mode 2 is a special mode for dumping the bit pattern of proximity cards, including prox, iclass, piv, and mifare. The prox bits (1's and 0's) are transmitted through the serial interface when the card is presented. This mode is useful when attempting to identify the format of the prox card.

Get Reader Parameters

?

returns: **rr m 1 2 3 id**

rr	data record length, not including date/time, id, or description
m	current reader mode, 1, 2, or 5
1	0=date/time not being recorded, 1=date/time included
2	0=reader id not included, 1=reader id included
3	0=reader description not included, 1=reader description included
i	5 character reader id
d	10 character reader description

Returns the parameters set in the reader.

Get Log Item

l

Returns a logged data record. The format of the data record will be date/time, reader id, reader description, data. Date/time, reader id, and reader description are optional items and will only be in the data record if they were turned on using the \ command.

The date/time is in the format YYMMDDHHMMSS.
Reader Id is 5 characters
Reader Description is 10 characters
Data can be any length up to the maximum you have programmed.

When all data has been uploaded from the reader, the l command will return END.

Note that data is not cleared from the reader until you send the lc command.

Clear Log

lc

This command clears all of the log data in the reader.

Reset Log Position

lr

Causes the reader to start uploading data from the beginning of the log data. The reader remembers what position you are when uploading data, so every l command gets the next data record. If you issue the lr command, the next l command will return the first data record, and then continue upward.

Restart Reader

<null> X

Restarts the reader. Changing some parameters, such as the baud rate, requires the reader to be powered down and then restarted. Alternatively, you can issue the restart command to restart the reader.

<null> refers to the null character (hex 00)

Reset Reader

<null> U

Restarts the reader. Changing some parameters, such as the baud rate, requires the reader to be powered down and then restarted. Alternatively, you can issue the restart command to restart the reader.

<null> refers to the null character (hex 00)

Code 39 Barcode Settings

X001 e c t s d ll x p s

e	1 = enable code39; 0 = disable code39 reading
c	1 = enable code39 check digit; 0 = disable check digit checking
t	1 = include check digit with data; 0 = don't include
s	1 = include start/stop characters with data; 0 = don't include
d	1 = include direction indicator; 0 = don't include
ll	read code39 barcodes only with a length of 11; set ll to 00 to read any length
x	extra bars setting, 0 thru 4
p	1 = code39 prefix on; 0 = don't include a prefix
s	1 = code39 suffix on; 0 = don't include suffix

NOTES

- If the direction indicator is turned on, then the code39 data is prefixed with a "f" to indicate that the card was read in a forward direction, "r" to indicate it was read in the reverse direction.
- If the code39 barcode has extra bars in it, before or after the barcode, you can set the extra bars parameter to the number of allowable extra bars. The reader will ignore the extra bars and "find" the code39 barcode within the bars.
- If you set the prefix or suffix on, the any prefix that you program for code39 will be prepended to the code39 data, and any suffix that you program will be appended to the code39 data.
- If you are reading code39 from cac or usid cards, set the prefix,suffix,direction, and check digits off.

Code 39 Prefix

X016 aaa bbb ccc ddd eee

aaa-eee 3-digit ascii value for a character, max=126, 000=end

You can program up to 5 characters to be prepended to code39 data. To set a character use the 3-digit decimal value for the character, i.e. "A" = hex 41 = 065 decimal. Use 000 to signify the end of the prefix data.

Example: X016049050000000000

Inserts a prefix of "12" in front of code39 data.

Code 39 Suffix

X017 aaa bbb ccc ddd eee

  aaa-eee 3-digit ascii value for a character, max=126, 000=end

You can program up to 5 characters to be appended to code39 data. To set a character use the 3-digit decimal value for the character, i.e. "A" = hex 41 = 065 decimal. Use 000 to signify the end of the suffix data.

  Example: X017065066000000000

  Inserts a suffix of "AB" at then end of code39 data.

Standard 2 of 5 Barcode Settings

X002 e c t d ll x p s

e	1 = enable S2of5; 0 = disable S20f5 reading
c	1 = enable S2of5 check digit; 0 = disable check digit checking
t	1 = include check digit with data; 0 = don't include
d	1 = include direction indicator; 0 = don't include
ll	read S2of5 barcodes only with a length of 11; set ll to 00 to read any length
x	extra bars setting, 0 thru 4
p	1 = S2of5 prefix on; 0 = don't include a prefix
s	1 = S2of5 suffix on; 0 = don't include suffix

NOTES

- If the direction indicator is turned on, then the S2of5 data is prefixed with a "f" to indicate that the card was read in a forward direction, "r" to indicate it was read in the reverse direction.
- If the S2of5 barcode has extra bars in it, before or after the barcode, you can set the extra bars parameter to the number of allowable extra bars. The reader will ignore the extra bars and "find" the S2of5 barcode within the bars.
- If you set the prefix or suffix on, the any prefix that you program for S2of5 will be prepended to the S2of5 data, and any suffix that you program will be appended to the S2of5 data.

S2of5 Prefix

X020 aaa bbb ccc ddd eee

aaa-eee 3-digit ascii value for a character, max=126, 000=end

You can program up to 5 characters to be prepended to S2of5 data. To set a character use the 3-digit decimal value for the character, i.e. "A" = hex 41 = 065 decimal. Use 000 to signify the end of the prefix data.

Example: X020049050000000000

Inserts a prefix of "12" in front of S2of5 data.

S2of5 Suffix

X021 aaa bbb ccc ddd eee

aaa-eee 3-digit ascii value for a character, max=126, 000=end

You can program up to 5 characters to be prepended to S2of5 data. To set a character use the 3-digit decimal value for the character, i.e. "A" = hex 41 = 065 decimal. Use 000 to signify the end of the suffix data.

Example: X021065066000000000

Inserts a suffix of "AB" at then end of S2of5 data.

ibc
International Bar Code

Industrial 2 of 5 Barcode Settings

X003 e c t d ll x p s

e	1 = enable ind2of5; 0 = disable ind20f5 reading
c	1 = enable ind2of5 check digit; 0 = disable check digit checking
t	1 = include check digit with data; 0 = don't include
d	1 = include direction indicator; 0 = don't include
ll	read ind2of5 barcodes only with a length of 11; set ll to 00 to read any length
x	extra bars setting, 0 thru 4
p	1 = ind2of5 prefix on; 0 = don't include a prefix
s	1 = ind2of5 suffix on; 0 = don't include suffix

NOTES
- If the direction indicator is turned on, then the ind2of5 data is prefixed with a "f" to indicate that the card was read in a forward direction, "r" to indicate it was read in the reverse direction.
- If the ind2of5 barcode has extra bars in it, before or after the barcode, you can set the extra bars parameter to the number of allowable extra bars. The reader will ignore the extra bars and "find" the ind2of5   barcode within the bars.
- If you set the prefix or suffix on, the any prefix that you program for ind2of5 will be prepended to the ind2of5 data, and any suffix that you program will be appended to the ind2of5 data.

Industrial 2 of 5 Prefix

X030 aaa bbb ccc ddd eee

aaa-eee 3-digit ascii value for a character, max=126, 000=end

You can program up to 5 characters to be prepended to ind2of5 data. To set a character use the 3-digit decimal value for the character, i.e. "A" = hex 41 = 065 decimal. Use 000 to signify the end of the prefix data.

Example: X030049050000000000

Inserts a prefix of "12" in front of ind2of5 data.

Industrial 2 of 5 Suffix

X031 aaa bbb ccc ddd eee

aaa-eee 3-digit ascii value for a character, max=126, 000=end

You can program up to 5 characters to be prepended to ind2of5 data. To set a character use the 3-digit decimal value for the character, i.e. "A" = hex 41 = 065 decimal. Use 000 to signify the end of the suffix data.

Example: X031065066000000000

Inserts a suffix of "AB" at then end of ind2of5 data.

Interleaved 2 of 5 Barcode Settings

X004 e c t d ll x p s

e	1 = enable i2of5; 0 = disable i20f5 reading
c	1 = enable i2of5 check digit; 0 = disable check digit checking
t	1 = include check digit with data; 0 = don't include
d	1 = include direction indicator; 0 = don't include
ll	read i2of5 barcodes only with a length of 11; set ll to 00 to read any length
x	extra bars setting, 0 thru 4
p	1 = i2of5 prefix on; 0 = don't include a prefix
s	1 = i2of5 suffix on; 0 = don't include suffix

NOTES

- If the direction indicator is turned on, then the int2of5 data is prefixed with a "f" to indicate that the card was read in a forward direction, "r" to indicate it was read in the reverse direction.
- If the i2of5 barcode has extra bars in it, before or after the barcode, you can set the extra bars parameter to the number of allowable extra bars. The reader will ignore the extra bars and "find" the i2of5 barcode within the bars.
- If you set the prefix or suffix on, the any prefix that you program for i2of5 will be prepended to the i2of5 data, and any suffix that you program will be appended to the i2of5 data.

Interleaved 2 of 5 Prefix

X018 aaa bbb ccc ddd eee

aaa-eee 3-digit ascii value for a character, max=126, 000=end

You can program up to 5 characters to be prepended to ind2of5 data. To set a character use the 3-digit decimal value for the character, i.e. "A" = hex 41 = 065 decimal. Use 000 to signify the end of the prefix data.

Example: X018049050000000000

Inserts a prefix of "12" in front of i2of5 data.

Industrial 2 of 5 Suffix

X019 aaa bbb ccc ddd eee

aaa-eee 3-digit ascii value for a character, max=126, 000=end

You can program up to 5 characters to be prepended to ind2of5 data. To set a character use the 3-digit decimal value for the character, i.e. "A" = hex 41 = 065 decimal. Use 000 to signify the end of the suffix data.

Example: X031065066000000000

Inserts a suffix of "AB" at then end of i2of5 data.

Upc A Barcode Settings

X005 e d x p s

e	1 = enable upca; 0 = disable upca reading
d	1 = include direction indicator; 0 = don't include
x	extra bars setting, 0 thru 4
p	1 = upca prefix on; 0 = don't include a prefix
s	1 = upca suffix on; 0 = don't include suffix

NOTES

- If the direction indicator is turned on, then the upca data is prefixed with a "f" to indicate that the card was read in a forward direction, "r" to indicate it was read in the reverse direction.
- If the upca barcode has extra bars in it, before or after the barcode, you can set the extra bars parameter to the number of allowable extra bars. The reader will ignore the extra bars and "find" the upca barcode within the bars.
- If you set the prefix or suffix on, the any prefix that you program for upca will be prepended to the upca data, and any suffix that you program will be appended to the upca data.

Upc A Prefix

X026 aaa bbb ccc ddd eee

aaa-eee 3-digit ascii value for a character, max=126, 000=end

You can program up to 5 characters to be prepended to ind2of5 data. To set a character use the 3-digit decimal value for the character, i.e. "A" = hex 41 = 065 decimal. Use 000 to signify the end of the prefix data.

Example: X026049050000000000

Inserts a prefix of "12" in front of upca data.

Upc A Suffix

X027 aaa bbb ccc ddd eee

aaa-eee 3-digit ascii value for a character, max=126, 000=end

You can program up to 5 characters to be prepended to ind2of5 data. To set a character use the 3-digit decimal value for the character, i.e. "A" = hex 41 = 065 decimal. Use 000 to signify the end of the suffix data.

Example: X027065066000000000

Inserts a suffix of "AB" at then end of upca data.

Ean13 Barcode Settings

X006 e d x p s

e	1 = enable ean13; 0 = disable ean13 reading
d	1 = include direction indicator; 0 = don't include
x	extra bars setting, 0 thru 4
p	1 = ean13 prefix on; 0 = don't include a prefix
s	1 = ean13 suffix on; 0 = don't include suffix

NOTES

- If the direction indicator is turned on, then the ean13 data is prefixed with a "f" to indicate that the card was read in a forward direction, "r" to indicate it was read in the reverse direction.
- If the ean13 barcode has extra bars in it, before or after the barcode, you can set the extra bars parameter to the number of allowable extra bars. The reader will ignore the extra bars and "find" the ean13 barcode within the bars.
- If you set the prefix or suffix on, the any prefix that you program for ean13 will be prepended to the ean13 data, and any suffix that you program will be appended to the ean13 data.

Ean13 Prefix

X028 aaa bbb ccc ddd eee

aaa-eee 3-digit ascii value for a character, max=126, 000=end

You can program up to 5 characters to be prepended to ind2of5 data. To set a character use the 3-digit decimal value for the character, i.e. "A" = hex 41 = 065 decimal. Use 000 to signify the end of the prefix data.

Example: X028049050000000000

Inserts a prefix of "12" in front of the ean13 data.

Ean13 Suffix

X029 aaa bbb ccc ddd eee

aaa-eee 3-digit ascii value for a character, max=126, 000=end

You can program up to 5 characters to be prepended to ind2of5 data. To set a character use the 3-digit decimal value for the character, i.e. "A" = hex 41 = 065 decimal. Use 000 to signify the end of the suffix data.

Example: X029065066000000000

Inserts a suffix of "AB" at then end of the ean13 data.

Code128 Barcode Settings

X007 e c t d ll x p s

e	1 = enable code128; 0 = disable code128 reading
c	1 = enable code128 check digit; 0 = disable check digit checking
t	1 = include check digit with data; 0 = don't include
d	1 = include direction indicator; 0 = don't include
x	extra bars setting, 0 thru 4
p	1 = code128 prefix on; 0 = don't include a prefix
s	1 = code128 suffix on; 0 = don't include suffix

NOTES

- If the direction indicator is turned on, then the code39 data is prefixed with a "f" to indicate that the card was read in a forward direction, "r" to indicate it was read in the reverse direction.
- If the code128 barcode has extra bars in it, before or after the barcode, you can set the extra bars parameter to the number of allowable extra bars. The reader will ignore the extra bars and "find" the code128 barcode within the bars.
- If you set the prefix or suffix on, the any prefix that you program for code128 will be prepended to the code128 data, and any suffix that you program will be appended to the code128 data.

Code128 Prefix

X024 aaa bbb ccc ddd eee

aaa-eee 3-digit ascii value for a character, max=126, 000=end

You can program up to 5 characters to be prepended to ind2of5 data. To set a character use the 3-digit decimal value for the character, i.e. "A" = hex 41 = 065 decimal. Use 000 to signify the end of the prefix data.

Example: X024049050000000000

Inserts a prefix of "12" in front of the code128 data.

Code128 Suffix

X025 aaa bbb ccc ddd eee

aaa-eee 3-digit ascii value for a character, max=126, 000=end

You can program up to 5 characters to be prepended to ind2of5 data. To set a character use the 3-digit decimal value for the character, i.e. "A" = hex 41 = 065 decimal. Use 000 to signify the end of the suffix data.

Example: X025065066000000000

Inserts a suffix of "AB" at then end of the code128 data.

Codabar Settings

X008 e c t s d ll x i p s

e	1 = enable codabar; 0 = disable codabar
c	1 = enable check digit; 0 = disable check digit checking
t	1 = include check digit with data; 0 = don't include
s	1 = include start/stop characters with data; 0 = don't include
d	1 = include direction indicator; 0 = don't include
ll	read only codabar barcodes of length ll. Set ll to 00 for any length.
x	extra bars setting, 0 thru 4
i	1=enable clsi mode; 0=disable clsi mode
p	1 = codabar prefix on; 0 = don't include a prefix
s	1 = codabar suffix on; 0 = don't include suffix

NOTES

- If the direction indicator is turned on, then the codabar data is prefixed with a "f" to indicate that the card was read in a forward direction, "r" to indicate it was read in the reverse direction.
- If the codabar barcode has extra bars in it, before or after the barcode, you can set the extra bars parameter to the number of allowable extra bars. The reader will ignore the extra bars and "find" the codabar barcode within the bars.
- If you set the prefix or suffix on, the any prefix that you program for codabar will be prepended to the codabar data, and any suffix that you program will be appended to the codabar data.
- If clsi mode is on, then codabar barcodes in clsi format will be convereted.

Codabar Prefix

X022 aaa bbb ccc ddd eee

aaa-eee 3-digit ascii value for a character, max=126, 000=end

You can program up to 5 characters to be prepended to ind2of5 data. To set a character use the 3-digit decimal value for the character, i.e. "A" = hex 41 = 065 decimal. Use 000 to signify the end of the prefix data.

Example: X022049050000000000

Inserts a prefix of "12" in front of the codabar data.

Codabar Suffix

X023 aaa bbb ccc ddd eee

aaa-eee 3-digit ascii value for a character, max=126, 000=end

You can program up to 5 characters to be prepended to ind2of5 data. To set a character use the 3-digit decimal value for the character, i.e. "A" = hex 41 = 065 decimal. Use 000 to signify the end of the suffix data.

Example: X023065066000000000

Inserts a suffix of "AB" at then end of the codabar data.

Barcode Masking

X033 ll p1 ll1 p2 ll2		**(mask 1, part 1)**
X034 p3 ll3 p4 ll4 p5 ll5		**(mask 1, part 2)**
X035 ll p1 ll1 p2 ll2		**(mask 2, part 1)**
X036 p3 ll3 p4 ll4 p5 ll5		**(mask 2, part 2)**

ll	Lenth of the barcode. If any barcode matches this length, the barcode data is masked.
p1	1st position
ll1	data for 1st position
p2	2nd position
ll2	data for 2nd position
p3	3rd position
ll3	data for 3rd position
p4	4th position
ll4	data for 4th position
p5	5th position
ll5	data for 5th position

NOTES

- Barcode masking allows you to select specific portions of the barcode to include in the saved data. By using the masking, you can effectively "mask out" any unwanted portion of the barcode data. You can also insert characters into the data using this command.
- There are 2 masks for barcodes. Each mask specifies a specific length barcode. If the barcode which is read matches the length for the mask, then the mask is applied. If a barcode does not match either of the mask lengths, then it is not masked. Use a length value of 00 to turn off the mask (ll=00).
- To select a specific part of the barcode to include in the saved data, set the p(x) parameter to the starting position in the barcode, and set the ll(x) parameter to the length to select. You can also set the length to 000 which selects all of the data starting at the position p(x).

Example:	Barcode data is 1234567890			
	Command:	X033 10 06003.......	Result:	678
	Command:	X033 06000.......	Result:	67890

To insert a character in the masked data, set the p(x) parameter to 00 and in the ll(x) parameter specify the character to insert, using the 3-digit decimal value of the character.

Example:	Barcode data is 1234567890			
	Command:	X033 10 010050006505000...	Result:	12345A67890

Each barcode mask requires 2 commands to be sent to the reader - part 1 and part 2. The commands were broken into multiple parts to facilitate easy programming when using barcode control cards.

General Barcode Options

X037 t n a m k b c

t	barcode timeout value, 1 thru 9, default=5
n	0 = normalization off; 1 = normalization on, priority=small; 2 = normalization on, priority=large
a	0 = no alpha delete; 1 = alpha delete
m	0 = masking off; 1 = masking on
k	0 = kronos mode off; 1 = kronos mode on
b	0 = no good read beep; 1 = beep on a good barcode read
c	0 = don't convert usic/cac cards; 1 = convert usic/cac cards

NOTES

The barcode timeout is a configurable parameter that adjusts the amount of time the reader waits after seeing a barcode before it timeouts and processes the barcode. This value should be left at 5 which is the default, unless you have two barcodes next to each other. In that case, the timeout value should be shortened.

Serial Settings

X014 b p ttt ttt

b	1 = 1200 baud
	2 = 2400 baud
	3 = 4800 baud
	4 = 9600 baud (default)
	5 = 19200 baud
	6 = 38400 baud
	7 = 57600 baud
	8 = 115200 baud
p	1 = 8 data bits, no parity
	2 = 7 data bits, even parity
	3 = 7 data bits, odd parity
ttt	for future use, set to 000
ttt	for future use, set to 000

NOTES

Use this command to change the baud rate and parity/stop bits to something other than the default of 9600,N,8,1.

If you change these settings, you must restart the reader by cycling power, or use the restart command. THIS COMMAND IS NOT VALID FOR DCX READERS USING TCP/IP.

International Bar Code

Restart Command

X015 1

This command restarts the reader. Either this command or the NULL X command may be used to restart the reader.

Track 1 Settings Part 1

X039 e q c s l d a m b p x

e	1=track 1 enabled; 0=disabled
q	1=use track 1 character set (default); 0=use track 2 character set
c	1=use c start sentinel; 0=use standard start sentinel
s	1=include start/stop sentinels in data; 0=don't include
l	1=include lrc in data; 0=don't include
d	1=include direction indicator; 0=don't include direction indicator
a	1=delete alphas from data; 0=don't delete
m	1=masking on; 0=masking off
b	1=beep on a good read; 0=don't beep
p	1=use prefix; 0=don't use prefix data
x	1=use suffix; 0=don't use suffix data

NOTES

- Track 1 reading can be enabled or disabled. By default, the track 1 character set is used, however you can program the reader to decode track 1 using the track 2 character set .
- Set the c start parameter on if you need to read cards that start with a c start character rather than the standard b start character. Note this applies only if the track 2 character set is being used.
- You can include the start and stop sentinels, as well as the lrc, in the data.
- If the direction indicator is turned on, the data will be preceeded by a f (forward) or r (reverse) to indicate the direction of the scan.
- Turn on the option to delete alphas from the magstripe data if you want only the numeric data.
- To implement any masks that you may have programmed for track 1, masking must be explicitly turned on using this command.
- Turn on the prefix and suffix options if you want to prefix or suffix the data with your programmed prefixes or suffixes.

Track 1 Settings Part 2

X040 ll ss

ll   restrict track 1 reading to cards with a length of ll. Set to 00 for any length.

ss   seperator character translation. If this parameter is set to a non 00 value, then any seperator characters in the magstripe will be converted to this value. This parameter is a 2-digit (max 99) decimal equivalent of any ascii character (49 = 0, 65 = A).

Track 1 Prefix

X055 aaa bbb ccc ddd eee

aaa-eee 3-digit ascii value for a character, max=126, 000=end

You can program up to 5 characters to be prepended to ind2of5 data. To set a character use the 3-digit decimal value for the character, i.e. "A" = hex 41 = 065 decimal. Use 000 to signify the end of the prefix data.

Example: X055049050000000000

Inserts a prefix of "12" in front of the track 1 data.

Track 1 Suffix

X058 aaa bbb ccc ddd eee

aaa-eee 3-digit ascii value for a character, max=126, 000=end

You can program up to 5 characters to be prepended to ind2of5 data. To set a character use the 3-digit decimal value for the character, i.e. "A" = hex 41 = 065 decimal. Use 000 to signify the end of the suffix data.

Example: X058065066000000000

Inserts a suffix of "AB" at then end of the track 1 data.

Track 2 Settings Part 1

X041 e q c s l d a m b p x

e	1=track 2 enabled; 0=disabled
q	1=use track 1 character set (default); 0=use track 2 character set
c	1=use c start sentinel; 0=use standard start sentinel
s	1=include start/stop sentinels in data; 0=don't include
l	1=include lrc in data; 0=don't include
d	1=include direction indicator; 0=don't include direction indicator
a	1=delete alphas from data; 0=don't delete
m	1=masking on; 0=masking off
b	1=beep on a good read; 0=don't beep
p	1=use prefix; 0=don't use prefix data
x	1=use suffix; 0=don't use suffix data

NOTES

- Track 2 reading can be enabled or disabled. By default, the track 2 character set is used, however you can program the reader to decode track 2 using the track 1 character set .
- Set the c start parameter on if you need to read cards that start with a c start character rather than the standard b start character. Note this applies only if the track 2 character set is being used.
- You can include the start and stop sentinels, as well as the lrc, in the data.
- If the direction indicator is turned on, the data will be preceded by a f (forward) or r (reverse) to indicate the direction of the scan.
- Turn on the option to delete alphas from the magstripe data if you want only the numeric data.
- To implement any masks that you may have programmed for track 2, masking must be explicitly turned on using this command.
- Turn on the prefix and suffix options if you want to prefix or suffix the data with your programmed prefixes or suffixes.

Track 2 Settings Part 2

X042 ll ss

ll	restrict track 2 reading to cards with a length of ll. Set to 00 for any length.
ss	seperator character translation. If this parameter is set to a non 00 value, then any seperator characters in the magstripe will be converted to this value. This parameter is a 2-digit (max 99) decimal equivalent of any ascii character (49 = 0, 65 = A).

Track 2 Prefix

X056 aaa bbb ccc ddd eee

aaa-eee 3-digit ascii value for a character, max=126, 000=end

You can program up to 5 characters to be prepended to ind2of5 data. To set a character use the 3-digit decimal value for the character, i.e. "A" = hex 41 = 065 decimal. Use 000 to signify the end of the prefix data.

Example: X056049050000000000

Inserts a prefix of "12" in front of the track 2 data.

Track 2 Suffix

X059 aaa bbb ccc ddd eee

aaa-eee 3-digit ascii value for a character, max=126, 000=end

You can program up to 5 characters to be prepended to ind2of5 data. To set a character use the 3-digit decimal value for the character, i.e. "A" = hex 41 = 065 decimal. Use 000 to signify the end of the suffix data.

Example: X058065066000000000

Inserts a suffix of "AB" at then end of the track 2 data.

Track 3 Settings Part 1

X043 e q c s l d a m b p x

e	1=track 3 enabled; 0=disabled
q	1=use track 1 character set (default); 0=use track 2 character set
c	1=use c start sentinel; 0=use standard start sentinel
s	1=include start/stop sentinels in data; 0=don't include
l	1=include lrc in data; 0=don't include
d	1=include direction indicator; 0=don't include direction indicator
a	1=delete alphas from data; 0=don't delete
m	1=masking on; 0=masking off
b	1=beep on a good read; 0=don't beep
p	1=use prefix; 0=don't use prefix data
x	1=use suffix; 0=don't use suffix data

NOTES

- Track 3 reading can be enabled or disabled. By default, the track 2 character set is used, however you can program the reader to decode track 1 using the track 1 character set.
- Set the c start parameter on if you need to read cards that start with a c start character rather than the standard b start character. Note this applies only if the track 2 character set is being used.
- You can include the start and stop sentinels, as well as the lrc, in the data.
- If the direction indicator is turned on, the data will be preceeded by a f (forward) or r (reverse) to indicate the direction of the scan.
- Turn on the option to delete alphas from the magstripe data if you want only the numeric data.
- To implement any masks that you may have programmed for track 3, masking must be explicitly turned on using this command.
- Turn on the prefix and suffix options if you want to prefix or suffix the data with your programmed prefixes or suffixes.

Track 3 Settings Part 2

X044 ll ss

ll	restrict track 3 reading to cards with a length of ll. Set to 00 for any length.
ss	seperator character translation. If this parameter is set to a non 00 value, then any seperator characters in the magstripe will be converted to this value. This parameter is a 2-digit (max 99) decimal equivalent of any ascii character (49 = 0, 65 = A).

Track 3 Prefix

X056 aaa bbb ccc ddd eee

aaa-eee 3-digit ascii value for a character, max=126, 000=end

You can program up to 5 characters to be prepended to ind2of5 data. To set a character use the 3-digit decimal value for the character, i.e. "A" = hex 41 = 065 decimal. Use 000 to signify the end of the prefix data.

Example: X057049050000000000

Inserts a prefix of "12" in front of the track 3 data.

Track 3 Suffix

X059 aaa bbb ccc ddd eee

aaa-eee 3-digit ascii value for a character, max=126, 000=end

You can program up to 5 characters to be prepended to ind2of5 data. To set a character use the 3-digit decimal value for the character, i.e. "A" = hex 41 = 065 decimal. Use 000 to signify the end of the suffix data.

Example: X060065066000000000

Inserts a suffix of "AB" at then end of the track 3 data.

Magstripe Masking

X061 ll p1 ll1 p2 ll2	(track 1, mask 1, part 1)
X062 p3 ll3 p4 ll4 p5 ll5	(track 1, mask 1, part 2)
X063 ll p1 ll1 p2 ll2	(track 1, mask 2, part 1)
X064 p3 ll3 p4 ll4 p5 ll5	(track 1, mask 2, part 2)
X065 ll p1 ll1 p2 ll2	(track 2, mask 1, part 1)
X066 p3 ll3 p4 ll4 p5 ll5	(track 2, mask 1, part 2)
X067 ll p1 ll1 p2 ll2	(track 2, mask 2, part 1)
X068 p3 ll3 p4 ll4 p5 ll5	(track 2, mask 2, part 2)
X069 ll p1 ll1 p2 ll2	(track 3, mask 1, part 1)
X070 p3 ll3 p4 ll4 p5 ll5	(track 3, mask 1, part 2)
X071 ll p1 ll1 p2 ll2	(track 3, mask 2, part 1)
X072 p3 ll3 p4 ll4 p5 ll5	(track 3, mask 2, part 2)

ll	Lenth of the barcode. If any barcode matches this length, the barcode data is masked.
p1	1st position
ll1	data for 1st position
p2	2nd position
ll2	data for 2nd position
p3	3rd position
ll3	data for 3rd position
p4	4th position
ll4	data for 4th position
p5	5th position
ll5	data for 5th position

NOTES

- Magstripe masking allows you to select specific portions of the magstripe to include in the saved data. By using the masking, you can effectively "mask out" any unwanted portion of the magstripe data. You can also insert characters into the data using this command.

- There are 2 masks for each of the 3 magnetic stripe tracks. Each mask specifies a specific length magstripe. If the magstripe which is read matches the length for the mask (on that particular track), then the mask is applied. If a magstripe does not match either of the mask lengths, then it is not masked. Use a length value of 00 to turn off the mask (ll=00).

- To select a specific part of the magstripe to include in the saved data, set the p(x) parameter to the starting position in the magstripe, and set the ll(x) parameter to the length to select. You can also set the length to 000 which selects all of the data starting at the position p(x).

Example: Magstripe data is 1234567890

Command: X033 10 06003.......

Result: 678

Command: X033 06000.......

Result: 67890

To insert a character in the masked data, set the p(x) parameter to 00 and in the ll(x) parameter specify the character to insert, using the 3-digit decimal value of the character.

Example: Magstripe data is 1234567890

Command: X033 10 010050006505000...

Result: 12345A67890

Each magstripe mask requires 2 commands to be sent to the reader - part 1 and part 2.

Magstripe Requirements & Order

X045 1 2 3 O sss

1   1=track 1 required, 0=not required

2   1=track 2 required, 0=not required

3   1=track 3 required, 0=not required

O   order to concatenate track data

1=tracks 1,2,3

2=tracsk 1,3,2

3=tracks 2,1,3

4=tracks 2,3,1

5=tracks 3,1,2

6=tracks 3,2,1

sss   seperator character to use between track data.

NOTES

• Set parameters 1,2,3 to a 1 for each track that is required. If you read a card which does not decode on all of the tracks that you require, the card will be ignored.

• If you are reading multiple tracks to concatenate together, you can select the order in which the concatenation should take place.

• If multiple tracks are concatenated, you can specify a character (sss) to be placed between the data for each separate track. Use the 3-digit decimal value for any ascii character, i.e 048 = "0". Set sss to 000 to disable using separator characters.

Proximity General Input Settings

X073 m k b p s

m	1 = accept wiegand data only; 2 = accept only aba data; 3 = accept wiegand and aba
k	1 = masking on; 2=masking off
b	1=beep on good read; 0= no beep
p	1= parity check for 26 and 28 bit cards; 0 = no parity check
s	1=passthru mode on; 0=passthru mode off

NOTES

- Set the m parameter to 1 to read wiegand formatted cards only. Set to 2 for aba cards and 3 to read both.
- Set the k parameter to 1 to turn on masking for prox input data
- Set the b parameter to a 1 to turn on the good read beep
- If p is set to 1, then the reader will validate the parity for 26 bit and 28 bit cards. If the parity is incorrect, the reader will ignore the card.
- Set s to 1 to pass thru the wiegand data undisturbed (1's and 0's) out the serial connection when in mode 1.

Wiegand Input Formats

X074 bbb sss sl b bss bl b	**1st format, part 1**
X075 iss il b sc ic uc	**1st format, part 2**
X076 bbb sss sl b bss bl b	**2nd format, part 1**
X077 iss il b sc ic uc	**2nd format, part 2**
X078 bbb sss sl b bss bl b	**3rd format, part 1**
X079 iss il b sc ic uc	**3rd format, part 2**

bbb	total number of bits on the card being read
sss	starting position of the site (facility) code
sl	number of bits for the site code
b	0=normal bit order (msb); 1=reverse bit order (lsb)
bss	starting position of the id code
bl	number of bits for the id
iss	starting position of the issue code
il	number of bits for the issue code
sc	number of characters for the site code
ic	number of character for the id
uc	number of characters for the issue code

NOTES

- There are 3 different card formats that can be programmed in. Cards which are read must match one of these formats to be considered a good card.
- Sss,bss,iss are the starting bit positions on the card for the site, id, and issue code fields. If you are not using all of these fields, leave the unwanted fields at 000. Sl,bl,il are the number of bits on the card used for the site, id, and issue code. Set any unused fields to 00.
- Sc, ic, uc are the number of digits to convert the site, id, and issue fields to.

Proximity Masking

X080 p1 ll1 p2 ll2	**(format 1, part 1)**
X081 p3 ll3 p4 ll4 p5 ll5	**(format 1, part 2)**
X082 p1 ll1 p2 ll2	**(format 2, part 1)**
X083 p3 ll3 p4 ll4 p5 ll5	**(format 2, part 2)**
X084 p1 ll1 p2 ll2	**(format 3, part 1)**
X085 p3 ll3 p4 ll4 p5 ll5	**(format 3, part 2)**

p1	1st position
ll1	data for 1st position
p2	2nd position
ll2	data for 2nd position
p3	3rd position
ll3	data for 3rd position
p4	4th position
ll4	data for 4th position
p5	5th position
ll5	data for 5th position

NOTES

- Proximity masking allows you to select specific portions of the decimalized proximity data to include in the saved data. By using the masking, you can effectively "mask out" any unwanted portion of the data. You can also insert characters into the data using this command.

- There is one mask for each of the programmable proximity formats. The mask is executed only if the prox card matches the length specified in the prox format,, and masking is explicitly turned on.

- To select a specific part of the data to include in the saved data, set the p(x) parameter to the starting position in the data, and set the ll(x) parameter to the length to select. You can also set the length to 000 which selects all of the data starting at the position p(x).

Example:	Decimalized prox data is 1234567890			
	Command:	X080 06 003 00 000	Result:	678
	Command:	X080 06 000 00 000	Result:	67890

To insert a character in the masked data, set the p(x) parameter to 00 and in the ll(x) parameter specify the character to insert, using the 3-digit decimal value of the character/

Example:	Decimalized prox data is 1234567890
	Command: X080 01 005 00 065 05 000
	Result: 12345A67890

Each mask requires 2 commands to be sent to the reader - part 1 and part 2.

Speaker Control

X095 s fff gg

s	1=beep on reader startup, 0=no beep
fff	speaker frequency, adjustable from 001 to 255
gg	speaker time for a good read, in 100ms increments

Speaker Duty Cycle

X102 oo ff

oo	on period, 01 to 15
ff	off period, 01 to 15

You can change the duty cycle of the speaker in order to conserve power. By default, the duty cycle is 01/04 which means the speaker is active 25% of the time when on, yielding a 75% reduction in speaker power use. Because a duty cycle is a timed period, changing the duty cycle will have an effect on the audio frequency of the speaker. We recommend leaving this value at it's default.

USID Card Options (21 Character Cards)

X104 1 2 3 4 5 6 7 8

1	Active personnel	1=on, 0=off
2	Retired	1=on, 0=off
3	Reserve	1=on, 0=off
4	Sponsor	1=on, 0=off
5	Dependent	1=on, 0=off
6	Civilian	1=on, 0=off
7	Retired Reserve	1=on, 0=off
8	Dependent data type	0=dependent's pdi, 1=sponsor's pdi

NOTES

- Each of the parameters above allow you to selectively turn on or off processing of specific usid cards. If the option is turned off, then the card data is left untouched and the pdi is not extracted.
- Note that this command affects on 21 character usid cards. The older 24 character cards are not supported at this time. 18 character usid and cac cards are selected using the X105 command.
- Note that for 21 and 18 character usid cards to the processed, the option must be set in the X037 command.

USID and CAC Card Options (18 Character Cards)

X105 1 2 3 4

1	Accept all cards (except dependents)	1=on, 0=off
2	Accept Dependents	1=on, 0=off
3	Datatype (non dependent)	1=edi, 0=pdi
4	Datatype (dependents)	1=Sponsor's edi, 0=dependent's edi

NOTES

- To convert non dependent usid18 and cac cards to either the pdi or edi number, option 1 must be turned on (1). To also accept dependent's cards, turn on option 2.
- For non-dependent cards, either the pdi or edi can be used. Dependent cards contain only the edi or the sponsor or of the dependent. Either one can be selected with option 4.
- Note that for 21 and 18 character CAC cards to the processed, the option must be set in the X037 command.

International Bar Code

Online Mode Hybrid Options

X108 x y

x	Transmit Time	1=on, 0=off
y	Store Data	1=on, 0=off

NOTES
- This command is only valid when the reader is in mode 1 (online mode).
- Setting the "transmit time" option to 1 turns on the transmission of date/time data along with the scanned data. The data will be transmitted real-time in the following format: YYMMDDHHMMSS data.
- Setting the "store data" option to 1 instructs the reader to also log the scanned data in non volatile memory, as well as transmit the real-time data. The stored data can later be retrieved with the l command.

SPACE FOR USER NOTES