Xico, Inc. 9736 Eton Avenue Chatsworth, CA 91311-4305 USA

# SERIES 3600 SWIPE MAGNETIC STRIPE CARD READERS

**Note:** All 3890BP metal-case models have been replaced by equivalent 3680BP metal-case models. The new 3680BP models have the same metal case containing a new plastic module which has specially curved card guides to minimize card abrasion plus a provision for ISO Track #3 head location. The 3690BP plastic-case models are unchanged.

**Model Numbers:** 3681BP, 3682BP, 3683BP (Metal)
3691BP, 3692BP (Plastic)

**Description:** Swipe-type, self-enclosed magnetic stripe card readers with binary-pair output (BP). The 3680 models are waterproof.

## Specifications:

### Magnetic Stripe Card

| | |
|---|---|
| • Encoding Density | 75 to 210 BPI (data buffer capacity is 616 bits) |
| • Encoding Type | Aiken Biphase (F/2F) |
| • Track Location | 3680 (Metal): ISO Track #1 or #2 or #3<br>3690 (Plastic): ISO Track #1 or #2 |
| • Magnetic Specs | Per ISO/IEC 7811, high or low coercivity |
| • Card Thickness | 0.008 to 0.045 in. |
| • Permissible Jitter | ± 30% Max, ± 22% @ 80% Max speed |

### Card Read

| | |
|---|---|
| • Card Entry | Either end |
| • Read Direction | Either direction (see Format) |
| • Card Detect | None; read starts on flux reversals detect |
| • Read Speed | 1.69 to 162 IPS @ 75 BPI<br>1.21 to 116 IPS @ 105 BPI<br>0.85 to 81 IPS @ 150 BPI<br>0.61 to 58 IPS @ 210 BPI |
| • Low Amp. Card | Reliable @ 50% ISO/IEC 7811 |

## Mechanical

| | |
|---|---|
| • Dimensions | 3681/2/3 (Metal): 1.75"W x 1.50"H x 6.30"L<br>3691/2 (Plastic): 1.60"W x 1.50"H x 6.25"L |
| • Enclosure | 3681/2/3 (Metal): Die cast zinc, black texture powder coat, potted<br>3691/2 (Plastic): Injection molded ABS |
| • Material | Glass/PTFE filled polycarbonate (94V-1) |
| • Weight | 3681/2/3 (Metal): 12 oz (Nominal)<br>3691/2 (Plastic): 6 oz (Nominal) |
| • Orientation | Any position |
| • Mounting | Surface mountable, mullion mountable (screw slots under label) |
| • Connection | Insulated wire bundle, 8 conductor, exit from rear or through side channels |
| • Enclosure Color | 3681/2/3 (Metal): Black texture; other colors and finishes custom<br>3691/2 (Plastic): Black or Tan texture; other colors custom |

## Electrical

| | |
|---|---|
| • Voltage | +5 VDC, ±10% (Regulated) |
| • Current, Typ | 40 ma |
| • Microprocessor | CMOS |
| • Data Output | Binary pair (0,1) data lines; open collector, pull-up to +5 VDC required |
| • Data Timing | Pulse Width 45μs ± 10μs<br>Pulse Spacing 1ms ± 10% |
| • Signal LED | Bicolor, host controlled |
| • Reset | Automatic watchdog; provides hard Reset within 5 secs (nominal) if system hangs up |

| | | | |
|---|---|---|---|
| I/O Pinouts | Red | - | +5 VDC |
| | Black | - | Gnd |
| | Green | - | Data 0 |
| | White | - | Data 1 |
| | Brown | - | Bicolor LED (See Note) |
| | Blue | - | Format Select |
| | Orange | - | Format Select |
| | Yellow | - | Format Select |

Note: The LED GREEN state signifies CLEAR-TO-SEND when operating with Format #2 and Format #3 (+5 VDC = Red; Gnd = Green).

## Environmental

- Oper. Temperature: -40° to +85°C
- Oper. Rel. Humidity: 3681/2/3 (Metal); 100% (Waterproof)<br>3691/2 (Plastic); 95% (Non-Condensing)
- UL Rating: UL 94V-1, UL 746C

## Reliability

- Head Life: >1,000,000 Card Passes

## Format Select

| | | | Conductor Termination | | |
|---|---|---|---|---|---|
| Format | Type | Transmit | Blue | Orange | Yellow |
| 1 | XICO BIT | Arbitrary | GND | GND | GND |
| 2 | Multiple | Full | +5 VDC | GND | GND |
| 3 | XICO BIT | Arbitrary | GND | +5 VDC | +5 VDC |
| 4 | MII 4/5 BCD | 32 bit | +5 VDC | +5 VDC | +5 VDC |
| 5 | ISO BCD | 26 bit | +5 VDC | +5 VDC | GND |
| 6 | ISO BCD | 32 bit | GND | +5 VDC | GND |
| 7 | JIS II | 26 bit | +5 VDC | GND | +5 VDC |
| 8 | JIS II | 32 bit | GND | GND | +5 VDC |

Notes:

1. Formats 2 and 3 require CLEAR-TO-SEND for data transmission; other formats do not.

2. Format 3 is the same as Format 1, but requires CLEAR-TO-SEND for data transmission.

3. FORMAT SELECT CONDUCTORS MUST BE TERMINATED.

**Data Formats:**

Format #1 — XICO BIT OUTPUT FORMAT (ARBITRARY-BIT OUTPUT). This is a general purpose DEFAULT format for which a card can be encoded to output any desired bit-string. Transmits encoded arbitrary bit-string, read forward or reverse, transmits forward data (See Xico Data Formats, T87-103B). The BIT algorithm uses MOD BCD Data format to encode the arbitrary bit-string to be transmitted on card Read within the modified BCD framing characters. The framing characters are not transmitted. The card data is buffered on Read, then checked for framing and parity errors. If no errors, the encoded arbitrary bit-string is transmitted immediately on the binary-pair data lines (i.e., no Clear-To-Send required).

Format #2 — XICO READ-BUFFER OUTPUT FORMAT. This is a multi-format mode in which the buffered Read data is first checked for several valid formats, then transmitted, unmodified, starting with the first ones-bit. The data is preceded by a 4-bit Header as given below. Transmission on the binary-pair data lines occurs when the Host Clear-To-Send is granted (i.e., BROWN conductor is at Gnd). Reads forward or reverse. If valid Format, bit-buffer is shipped with forward data. If no valid Format, bit-buffer is shipped backwards from end of buffer which will always give the shortest bit-string.

| Header-bits | Format |
|---|---|
| 0000 | Valid ISO BCD Format |
| 0001 | Valid XICO BIT Format |
| 0010 | Valid JIS Type II Format |
| 0100 | Valid ISO Alpha Format |
| 1000 | None of above formats are valid |

Format #3 XICO BIT OUTPUT FORMAT (ARBITRARY-BIT OUTPUT). This is a general purpose DEFAULT format for which a card can be encoded to output any desired bit-string. Transmits encoded arbitrary bit-string, read forward or reverse, transmits forward data (See Xico Data Formats, T87-103B). The BIT algorithm uses MOD BCD Data format to encode the arbitrary bit-string to be transmitted on card Read within the modified BCD framing characters. The framing characters are not transmitted. The card data is buffered on Read, then checked for framing and parity errors. If no errors, the encoded arbitrary bit-string is transmitted on the binary-pair data line when the Host CLEAR-TO-SEND is granted (i.e., BROWN conductor is at Gnd).

Format #4 XICO BANK CARD OUTPUT FORMAT (32-BIT OUTPUT). This is ISO BCD Format, for use with bank cards, in which the eight (8) BCD Characters following the ISO Start Sentinel are transmitted on the binary-pair data lines (without parity). The card data is checked for framing and parity errors. Transmission follows a valid Read without any Clear-To-Send. No transmission occurs unless the first character following the ISO Start Sentinel is either a 4 or a 5. The 4-bit BCD characters are transmitted MSB first.

Format #5 XICO 26-BIT ISO/WIEGAND OUTPUT FORMAT. This is ISO BCD Format which accepts, as valid, cards encoded with a minimum of five (5) and a maximum of seven (7) BCD characters between the Start Sentinel and the End Sentinel. The card data is checked for framing and parity errors. The first one to three decimal digits are converted to an 8-bit binary number Site Code, and the last four decimal digits are converted to a 16-bit binary number Card Code. The 26-bit output is a 1-bit, followed by the Site Code, followed by the Card Code and terminated with an even parity bit for the Card Code. The binary numbers are transmitted MSB first. Transmission follows a valid Read without any Clear-To-Send.

Format #6 XICO 32-BIT ISO/WIEGAND OUTPUT FORMAT. This is ISO BCD Format which accepts, as valid, cards encoded with a minimum of nine (9) BCD characters following the Start Sentinel. Read data is checked for framing and parity errors. The first five (5) BCD characters are converted to a 16-bit binary number, and the next four (4) BCD characters are converted to a second 16-bit binary number. The binary numbers are transmitted MSB first. Transmission follows a valid Read without any Clear-To-Send.

Format #7 XICO 26-BIT JIS/WIEGAND OUTPUT FORMAT. This is JIS Type II Format which accepts, as valid, cards encoded with a minimum of five (5) and a maximum of seven (7) ASCII characters between the Start Sentinel and the End Sentinel. The card data is checked for framing and parity errors. The first one to three decimal digits are converted to an 8-bit binary number Site code, and the last four decimal digits are converted to a 16-bit binary number Card Code. The 26-bit output is a 1-bit, followed by the Site Code, followed by the Card Code and terminated with an even parity bit for the Card Code. The binary numbers are transmitted MSB first. Transmission follows a valid Read without any Clear-To-Send.

Format #8 XICO 32-BIT JIS/WIEGAND OUTPUT FORMAT. This is JIS Type II Format which accepts, as valid, cards encoded with a minimum of nine (9) ASCII characters between the Start Sentinel and the End Sentinel. Read data is checked for framing and parity errors. The first five (5) decimal characters are converted to a 16-bit binary number, and the next four (4) decimal characters are converted to a second 16-bit binary number. The binary numbers are transmitted MSB first. Transmission follows a valid Read without any Clear-To-Send.

**General Notes:**

1. Units are set to read the full encoding density range of 75 to 210 BPI. The data buffer capacity of 616 bits is sufficient to handle a standard encoded ISO ID-1 card track at 210 BPI and a standard encoded JIS Type II card track at 210 BPI.

2. The watchdog delay of 5 seconds (nominal) before automatic Reset is set to allow completion of read data transmission for the longest card at the slowest read speed.

3. Format #4 permits the use of standard bank cards (VISA, MasterCard, etc.) to yield a 32-bit output from the first eight digits in the bank card Account Number.

4. Format #5 permits the use of magnetic stripe security cards encoded on standard ISO Track #2 ABA (BCD) encoders to yield a 26-bit Site Code/Card-Code output.

5. Format #6 permits the use of ISO BCD encoded cards, in which the first nine digits are the Social Security Number, to yield a 32-bit output.

6. Formats #7 and #8 permit the use of magnetic stripe cards encoded on standard JIS Type II (ASCII@210 BPI) encoders to yield a 26-bit Site-Code/Card-Number output (Format #7) or a 32-bit Site-Code/Card-Code output (Format #8).