

SPECIFICATIONS

INPUT:

MCC proximity cards with MCC generic/standard, MCC PROX1/10, or "open" ABA emulation format, up to 15 characters.

READING DISTANCE:

Six inches typical at 12 VDC (five if mounted on metal)

Five inches typical at 5 VDC (four if mounted on metal)

DATA OUTPUT:

Standard Wiegand 5-wire format. Optional "Clock and Data" format.

LED CONTROL:

Red/Green control on one LED control line. Amber/dark control with optional second LED control line.

WIRE LENGTH:

200 feet with #22 AWG wire

500 feet with #18 AWG wire

TEMPERATURE RANGE:

-35 TO +66 degrees Celsius (-31 to 150 degrees Fahrenheit).

POWER:

75 mA at +4.75 VDC to +24.0 VDC

READ SPEED:

80 milliseconds

DIMENSIONS:

Reader: 4.70" H x 3.00" W x 1.54" D.

BUZZER:

Activates momentarily upon card acceptance and keystroke activation.

WARRANTY INFORMATION

Micron Communications warrants to the original purchaser that card readers are free from defects in material and workmanship under normal use and service for two years from date of manufacture. Unless otherwise agreed in writing by MCC, the buyer shall be responsible to assure the proper installation environment is provided, and MCC assumes no responsibility for malfunctions or damages due to improper installation of products.

Micron Communications' obligation under this warranty shall be limited to the repair or replacement of any returned product provided that the claim must be presented within two years

from the date code marked on the product. This warranty is lieu of all other warranties, expressed or implied, including the warranties of merchant ability, or fitness for any particular use. In no event shall MCC be liable for any breach of warranty in an amount exceeding the net selling price of any defective products.

RETURNED MATERIAL

Readers returned with the two year warranty period will be repaired at our discretion, or replaced from a warranty parts pool. Items out of warranty will be replaced at special pricing. The date code appears at the upper right of the green circuit board in a box marked S/N. The code consists of year and week, in the form "9840" for 1998 and 40th week.

FCC NOTICE

FEDERAL COMMUNICATIONS COMMISSION RADIO FREQUENCY INTERFERENCE STATEMENT.

Warning: This equipment complies with the limits for a Class A computing device in accordance with the specifications in Subpart J of Part 15 of FCC rules. These Specifications are designed to minimize radio frequency interference in a residential installation; however, there is no guarantee that radio or television interference will not occur in any particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on when the radio or television is on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient the radio or television receiving antenna.
- Relocate the equipment.
- Move the equipment away from the receiver.
- Plug the equipment into a different outlet so that the equipment and receiver are on different branch outlets.

If necessary, the user should consult the dealer or an experienced radio or television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful:

"How to Identify and Resolve Radio-TV Interference Problems."

This booklet is available from the:

U.S. Government Printing Office
Washington, DC 20402

Order stock number: 004-000-00345-4

Card Reader kit consists of:

- 1-Reader assembly
- 1-Installation Kit
- 1-Instructions

GENERAL

The Model MB-I-WM Card Reader reads proximity cards that have been encoded with MCC's secure encrypted proximity card coding format or other standard MCC proximity card formats.

The readers are normally wall mounted and designed for indoor or outdoor use.

Cards are placed in front of the reader and read at a distance of five inches (at 5.0 VDC) and six inches (at 12.0 VDC). Mounting the readers on metal will typically reduce the distance by one inch. The data is transmitted to any host controller that can supply a +5 to +24 VDC operating voltage to the reader and that can accept the standard Wiegand 26-bit or 34-bit format or Clock and Data format.

BEFORE INSTALLING

1. Reader installation and wiring must conform to applicable local codes, ordinances, and regulations.
2. The host coordinator must supply +5 to +24 VDC operating voltage to the reader. The voltage drop as measured across the reader must be within 4.75 to 24.0 VDC.
3. The maximum recommended reader distance from the host is:

200 feet with #22 AWG 5 or 6-wire cable
500 feet with #18 AWG 5 or 6-wire cable

Unshielded wire is acceptable. Some host controllers may require tighter standards.

4. Reader options are selected by four DIP switches located on the lower left of the reader circuit board. See Options section.

MOUNTING

1. The reader is designed to be mounted with the slot facing the floor. The user places the card in front of the reader.
2. The reader can be mounted on a standard single-gang handy box (the preferred method) or on any firm flat surface. The mounting screws should be firmly tightened, but not excessively. See figure 1.

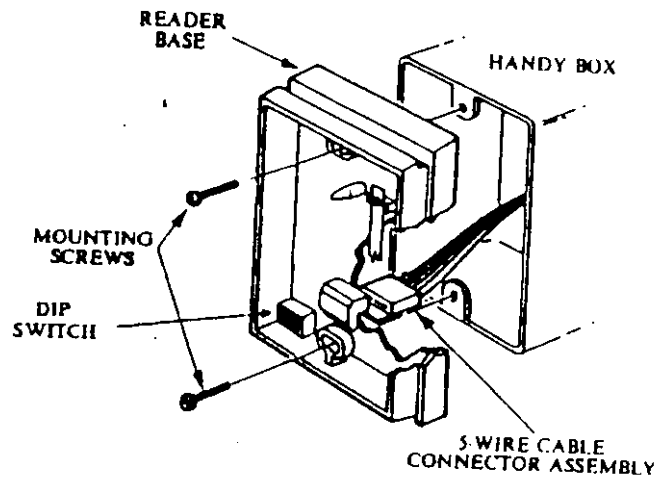


Figure 1

3. For outdoor applications, use a suitable weather-proof back box, or handy box, and install the weather seal (provided) on the back of the readers' base by pushing it securely and evenly into the "U" shaped recess. See figure 2.

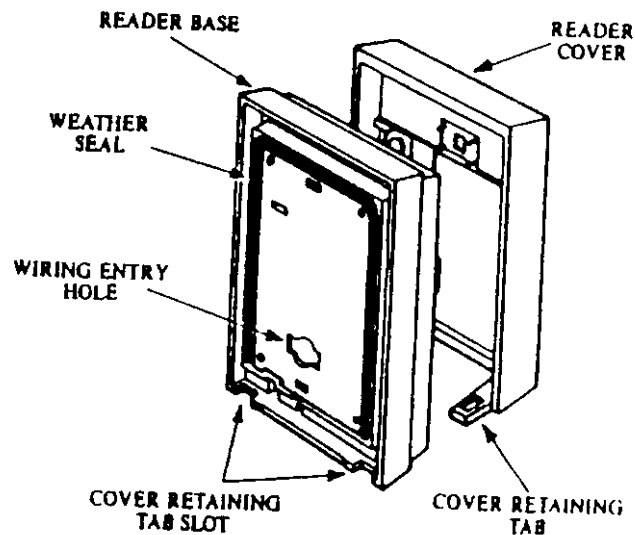


Figure 2

4. Recommended reader mounting height from the floor is "shoulder height" or about 60 inches. A lower height may cause significant user inconvenience. Reader height may be lowered to accommodate ADA requirements.

EXHIBIT B.4

Brief Description of Circuit functions.
Description of how the System Operates.
Description of Ground System.
Description of Antenna System.

MICROBADGE MODEL MB-I-WM CARD READER

The RFID Reader is used in conjunction with the MCC RFID Tag. The reader generates a 125 kHz carrier signal that provides enough energy to power the tag at short ranges, and this carrier also synchronizes the tag with the reader.

Once the tag has sufficient operating voltage, it will sequentially scan its internally stored code and inject either a 12.5 kHz (logic 0), or a 15.625 kHz (logic 1) signal on a parallel resonant L-C circuit. Since this circuit is within the magnetic field of the reader, the injected signals from the tag will appear as a varying load to the reader antenna.

The varying load presented to the reader is detected as an amplitude variation in the 125 kHz carrier; this variation is demodulated, and the 125 kHz signal is filtered out. The demodulated signal is then passed through a bandpass filter and a comparator to convert the 12.5 kHz and 15.625 kHz signals to logic levels.

The comparator output is fed to the PIC microcontroller where the data is decoded and a CRC check is performed on the code. If a valid code is detected, an audible signal (buzzer) and a visual signal (red and green LEDs) is generated. In addition, the valid digital code is transmitted to the control panel.

The PIC microcontroller also responds to the voltage level of the two LED Control lines. The LED control lines are buffered by comparators and fed into the microcontroller. Depending on the logic levels of the two control lines, the microcontroller will turn on or off the red and/or green LED.

ANTENNA

The antenna system consists of a 0.5 (+/- 5%) millihenry inductor and a capacitor of approximately 3000 picofarads. The inductor and capacitor are connected in series to form a series resonant L-C circuit at 125 kHz. The capacitance value is varied to provide maximum output voltage as 125 kHz. This variation of the capacitance value is necessary to account for stray capacitance and inductance in the resonant circuit and also for mounting the reader on different materials, in particular, metal.

GROUND PLANE

The ground from the power supply is connected to the ground plane on the back of the reader PCB. All ground connections are made to this ground plane.

EXHIBIT B.5

**Block and Schematic Diagrams
Showing Frequency of all Oscillators**

Label information & Location