

# iCLASS® OEM50 Module

Contactless Smart Card Module • Read/Write • Wiegand/TTL Interface • 3131



## ACCESS flexibility.

Designed for embedding into OEM equipment as a component in upper level assemblies, the iCLASS® OEM50 Module is a 13.56 MHz contactless smart card reader/writer in an extremely compact printed circuit board form factor.

The OEM50 enables iCLASS technology to be used for multiple applications including cashless vending, biometrics, time and attendance, alarm system control, HVAC control, process control, and point-of-sale terminals.

With only a two-wire serial interface and a regulated power supply, an OEM has the power of iCLASS at their fingertips.

The OEM50 is designed to operate with a wide variety of antenna configurations. HID offers optional antenna PCBs in 3.15" x 3.15" (80 mm x 80 mm) and 1.34" x 1.89" (34 mm x 48 mm) sizes, and also provides a comprehensive antenna design guide for OEMs. Separating the antenna from the module allows the OEM to make the most efficient use of available space, and allows the module to be installed in a metal enclosure while the antenna is remotely located behind a non-conductive bezel.

Inputs and outputs are all TTL level logic. Transient suppression, voltage regulation, and output drivers will be provided by the Host device. A user guide (Part Number 3131-901) provides complete interface specifications.

When used with iCLASS cards, the OEM50 offers security features such as RF data encryption and mutual authentication using 64-bit keys for each application area and optional DES or Triple DES data encryption for the HID application area. HID provides key management for access control and other data stored in the HID application area.

For access control applications, the OEM50 can read either iCLASS credentials (transmitting the Wiegand formatted data as encoded), MIFARE® Standard, Ultralight, or DESFire® credentials (transmitting Wiegand data based on the card serial number in 26-, 32-, 34-, 40-, or 56-bit formats). For non-access control applications, the OEM50 module can read or write to any application area on the iCLASS credential, with all reader functions controlled by an external Host processor via the TTL port using the iCLASS Serial Protocol.

The OEM50 has a logic level control output which can be operated by serial commands via the TTL port. This can be used to control external devices or audiovisual indicators with the appropriate driver circuitry.

When the configurable Hold Control Line is asserted, either all card reading is disabled or the module will buffer one card read and ignore subsequent reads until the line is released.

## Features

### Card Compatibility

The iCLASS® OEM50 Module is compatible with all iCLASS credentials. The module's versatility allows it to read credentials meeting several ISO standards:

- I5693 – read/write (2k bit and 16k bit iCLASS credentials)
- I4443A – read only (MIFARE® card serial number)
- I4443B – read/write (16k bit iCLASS credential)

### Application Support

HID offers Certification Training, as well as a Software Developer's Kit (available separately; consult factory for details). See HID Application Note 28 for details.

### Mounting

The module can be mounted on standoffs, using the four slots located at each corner of the PCB, sized for a #2-56 screw (maximum screw head or standoff diameter is 0.20" or 5.0 mm). The module can also be mounted by installing PCB mount pin headers and installing compatible sockets on the host device.

Metal components located near the antenna may reduce the card reading distance of the module. The antenna will NOT read cards or tags if completely enclosed in a metal enclosure. (If a metal enclosure is required, the antenna can be remotely located behind a non-metallic bezel.)

### Environmental

If used in outdoor environments, the module must be epoxy potted or installed in a watertight enclosure.

### Warranty

Warranted against defects in materials and workmanship for one year. (See complete warranty policy for details.)

### Part Numbers

Base Part Number: 3131  
Antennae: Consult Factory

### Options:

Key Management - Standard or Custom  
Selectable Output Type (for MIFARE Cards)  
Standard Termination: none; solder pads and vias provided  
Programmable Control Output Operation (logic level)

## Specifications

### Typical Maximum Read Range

Dependent upon antenna design, enclosure design, exciter voltage, materials used, and proximity of metal components.

### Dimensions

PCB: 1.10" x 1.20" (27.94 mm x 30.48 mm)  
Large Antenna: 3.15" x 3.15" (80 mm x 80 mm)  
Small Antenna: 1.35" x 1.90" (34 mm x 48 mm)

### Component Height

Top: 0.10" (2.5 mm) max  
Bottom: 0.10" (2.5 mm) max

### Material

FR-4 Fiberglass laminate

### Power Requirements

Nominal input: 5VDC +/- 15%  
Regulated DC power required

### Input Voltage Range

Processor: 5VDC +/- 0.250 V  
Exciter: 4.75 - 8.0VDC

### Current Requirements

Peak current (based on exciter input)  
93 mAmp at 5VDC; 121 mAmps at 8VDC  
Average current: Consult Factory

### Operating Temperature

-35° to 65° C (-31° to 150° F)

### Operating Humidity

5% to 95% relative humidity non-condensing

### Weight

Consult Factory

### Transmit Frequency

13.56 MHz

### Pending Certifications

cURus - UL Recognized for electrical safety  
(US and Canada) OEM or integrator must secure regulatory approvals for the entire integrated device, consisting of the module and OEM components.  
IP55

### Cable Distance

I/O and power connections – 1' (30 cm)  
Wiegand/Serial TTL Interface – 1' (30 cm)  
Antenna Cable  
50-Ohm MCX Coax – Consult Factory  
24 AWG twisted pair – up to 3.0" (76 mm)

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