Presentation Mode : <SYN>R<CR>AUTO1.

Manual Trigger Mode: <SYN>R<CR>AUTO0. * Default
where SYN = Hex code 0x16 and CR = Hex code 0x0d

The reader can be easily triggered by sending the below trigger command via USB or serial communications from the host:

Command: <SYN>T<CR>
where SYN = Hex code 0x16 and CR = Hex code 0x0d

On sending the above command the ER02 will begin looking for a tag in the readers RFID field. On sensing a tag, the readers yellow LED will begin blinking, the reader will read the tag and transmit the UID tag data to the host, and indicate a successful read with its' good read beeper and by flashing its' good read green LED. If the ER02 does not read a tag, RFID reading can be terminated by sending the reader the following deactivation trigger:

Command: <SYN>U<CR>
Where SYN = the Hex code 0x16 and CR = the Hex code 0x0d

Read Byte Data

The readers basic operation is to read the Tags' UID. To read data within the TAG other than the UID the Read Byte (RBYT) command can be used. This command allows the user to specify the starting address and byte length to read from a Tag's memory area. The memory area of each Tag is defined by the specific RFID chip manufacturer of the Tag. An example of the RBYT command for a NXP SLIX tag is shown below. In this example the command will read the first (5) bytes of the Tags memory area starting at byte (0). Note the ER02 will report the read data in Hex representation.

Command: <SYN>R<CR>RBYT00,05.
Where SYN is the Hex code 0x16 and CR is the Hex code 0x0d

Restore Default

The default code can be sent to the reader to revert the ER02 into it's default configuration.

Command: <SYN>C<CR>CDFT.

Quick Reference Guide

Model: ER02

Manual Version 1.01

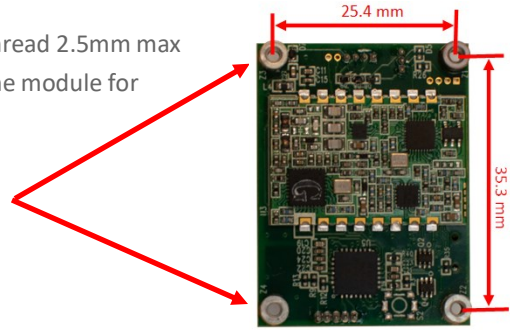
Diamond Technologies
Getting data where it needs to be.

The Diamond Technologies ER02 is an embedded RFID reader/writer designed for integration into OEM equipment such as Lab Instrumentation, Medical Devices, Kiosks, Automated Machines, and customer facing applications. This compact, reliable, RFID module supports both HF and LF frequencies and is able to read most common tags on the market. The reader supports common standards including EM 125kHz, ISO14443A, ISO14443B, ISO15693, and ISO18092. The reader includes on board antennas, good read LED, on board beeper, external trigger input, and power saving mode input.

The reader's data output is provided to the host system through either USB, or RS232 interface depending on model. The ER02's hardware and software have been designed for the user to easily integrate the module into a host system. This guide provides the basic instructions for that integration.

Physical Mounting:

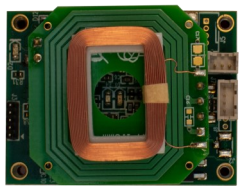
The ER02 provides (4) M2 X.4mm thread 2.5mm max depth standoffs on the bottom of the module for mounting. See image.



Electrical and Communication Connections:

The ER02 includes an on board trigger button as well as a 3 pole connector for a hardware trigger. The 3 pole hardware trigger utilizes a Hirose connector. The mate to this is a DF13-3S-1.25C connector. The HW_TRIGGER pin signal is internally pulled up to +3.3VDC. Switch to GND to initiate a reader trigger. Leave unconnected if not used. The other two pins on the connector are GND and enable reader low power mode. This is helpful to reduce power usage in applications such as battery powered devices.

The ER02 is powered and provides host communications on its' 4 pole connector. The 4 pole power and communications connector mate is the Hirose DF13-4S-1.25C. The mating Hirose connector identifies pin 1. Pin 1 is also noted on the ER02 board by a square solder pad.



ER02 3 Pole Connector all Models

Pin	Function
1	GND
2	Low Power
3	Trigger input

ER02 4 Pole Interface Connector all Models

ER02 USB Model Interface

Pin	Function
1	GND
2	D-, Data -
3	D+, Data +
4	VBUS+, 5V

ER02 RS232 Model Interface

Pin	Function
1	GND
2	RX
3	TX
4	VIN

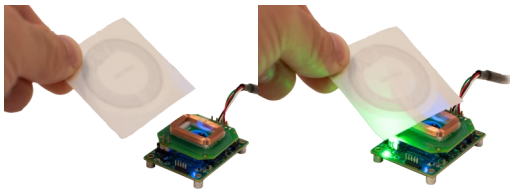
Model	Interface	Min	Max	Unit
ER02-003	USB DF13 Cable	4.5	5.5	VDC
ER02-004	RS232 DF13 Cable	4.5	26	VDC

RS232 default communication parameters are 115200 baud, 8 data bits, no parity, 1 stop bit.

An accessory RS232 communications cable **PN# CAB-DSE-005** . Or an accessory USB communications cable **PN# CAB-DSE-004** can be purchased from Diamond Technologies. www.diamondt.com

Reader Basic Operation

The ER02's basic default operation is to read LF/HF tags as they enter the readers RFID field. The RFID field will vary depending on the tag type but generally the read distance will be from contact to up to 4 inches directly above the readers antenna. In order to easily read tags the tags should be oriented parallel and directly above the readers antenna. Basic operation is depicted below.



The reader indicates to a user that a tag is in its read field by flashing its' yellow tag indication LED. By default once a tag is read, it cannot be read again until the tag is taken out of and then returns to the readers' RFID field. This is to eliminate reading a tag more than once. On reading a tag the reader will beep its' good read indication as well as flash the green good read LED. The reader will also pass the tag data it collected to the host. The ER02 can be programmed to read the Tags' UID or some specific data inside of the tag as defined by the read command.

Programming

The ER02 can be configured through a programmatic interface. This interface allows the readers configuration to be changed via simple commands sent from the host processor.

The ER02 supports two host interface modes when operating as a USB device. These include USBCOM, where the reader interfaces to the host as a USB serial interface device, and Keyboard, where the ER02 interfaces to the host as a keyboard input device. The following commands can be sent from the host to the reader to set these interface modes.

USB Serial Mode: <SYN>R<CR>TERMID130. * Default

USB Keyboard Mode : <SYN>R<CR>TERMID124.

where SYN = Hex code 0x16 and CR = Hex code 0x0d

On receiving a successful command the ER02 will respond with an acknowledgement. As an example, sending a successful TERMID124 command will result in the reader responding with the following:

Reader Response: TERMID124<ACK>

The ER02 can also operate in several operating modes. These include a Trigger mode, in which the ER02 will start its' reading phase on receiving a trigger from the host or through its' hardware trigger interface pin, and in Presentation mode in which the ER02 will read a tags value on sensing the tag in the reading field. The following commands can be used to change the scanners operating mode as desired.