Application Guide for Product HTD-008

Wiegand RFID to 1-Wire Conversion Cable

The HeitechCS Wiegand to 1-Wire conversion cable allows RFID readers with Wiegand output to be translated to a 1-Wire interface that supports DS1990 style iButton functionality. This allows the device to recognize an ID from an RFID reader on the 1-Wire line in order to utilize the existing 1-Wire functionality available on most devices.

Cable Specifications:

- Input Voltage Range: 10 – 30VDC
- Input Enable Voltage Range: 2-5VDC
- Operating Temperature Range: -25C to 85C
- Output Voltage: 9VDC

Wiring Tables:

RFID Side

Connector	Color	Description
6-pin	Red	Power output line
6-pin	Black	Ground
6-pin	Blue	LED control line
6-pin	Green	Buzzer control line
6-pin	Orange	Data 0
6-pin	White	Data 1

1-Wire Side

Connector	Color	Description
5-pin	Red	Power input line
5-pin	Orange	3.3V power enable
5-pin	Black	Ground
Flying lead	Blue	LED control line
Flying lead	Green	Buzzer control line
2-pin	White	1-Wire line
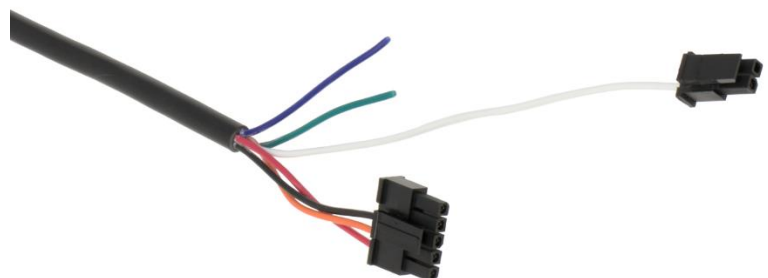
1-Wire Data Output:

The data output from the conversion cable follows the format of an iButton as shown below:

[CRC – 1-byte] [Serial Number – 6-bytes] [Family Code – 1-byte]

Decoding Examples for Different RFID Tags:

- Standard 26-bit EM125kHz card example (RFID Reader example for reference HTA-015)
    - Example 1-Wire ID received = 74465D59800001
    - ID of this read would be the middle 6-bytes 74465D5980000001
    - HEX = 465D598000
        - Convert to binary = 0100011001011101010110011000000000000000000000000
        - Take the first 26-bits = 01000110010111010101100110
        - Remove the parity bits = 100011001011101010110011
        - Convert this binary value to decimal to get ID value of 9222835
- Generic HID 26-bit card example (RFID Reader example for reference HTA-018)
    - Example 1-Wire ID received = 6F85816240000001
    - ID of this read would be the middle 6-bytes 6F85816240000001
    - HEX = 858162400000
        - Convert to binary = 100001011000000101100010010000000000000000000000000
        - Take the first 26-bits = 10000101100000010110001001
        - Remove the parity bits = 000010110000001011000100
        - This card format, the Facility Code is the first 8-bits = 00001011
            - Convert to decimal gives Facility Code = 011
        - This card format, the Card ID is the last 16 bits = 0000001011000100
            - Convert to decimal gives Card ID = 00708
- Keypad Reader manual input example (RFID Reader Example for reference HTA-017)
    - Example 1-Wire ID received = 43011F5021B40001
    - ID of this read would be the middle 6-bytes 43011F5021B40001
    - HEX = 011F5021B400
        - Converting this value to decimal = 1234000000000
        - User input = '1' + '2' + '3' + '4' + 'ENT'
        - Note: Maximum length of input is 12 digits, but total length will be 13 digits
            - The last '0' will be included but cannot be modified
        - Note2: IDs that end with a '0' will need to be determined by a set length, as the example above illustrates the value is populated with trailing zeros

Application Notes:

RFID read speed vs. 1-Wire read speed:

The RFID reader may have a read speed faster than the 1-wire line the reader is connected to. Our recommendation is that the LED and Buzzer wires be used by the device to signal when a successful 1-Wire ID read has occurred. Using an output to ground these wires can force the reader to emit a beep or LED blink pattern to confirm that the device and the RFID reader have both correctly identified the tag.

Enable Line Option:

The default option on the conversion cable utilizes a 3.3V enable line to control when the conversion cable and the RFID reader are powered on. There is a product variant available that removes the requirement of the enable line voltage to power the converter. For this variant, we recommend that power be connected to a variable source in order to limit the current draw when the reader is inactive.