



## ***Specification***

***Contactless Card Reader (Type-A)***

<b><i>QU-950-4-HF-2.0</i></b>	<b><i>Mifare® &amp; ISO-14443A</i></b>
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***Quick Ohm Küpper & Co. GmbH***



### Overview

**QU-950-4-HF-2.0** are compact size of manual proximity type radio frequency card Read/Write module.

### Features

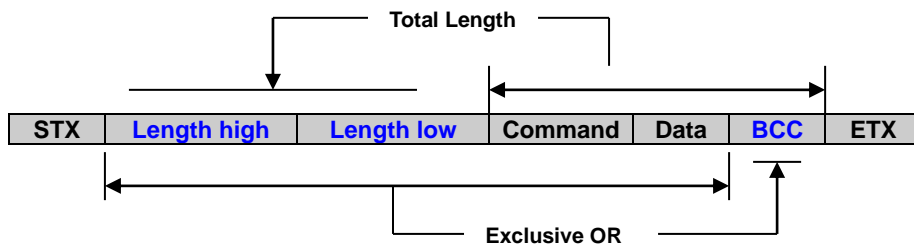
- Compact size module and ANT
- Card read/write frequency : 13.56Mhz
- Power consumption : 7~24[V]/300[mA]
- Operating Temperature : -10°C ~ 70°C
- Storage Temperature : -25°C~ 80°C
- Serial communication controlled  
RS485ModBus Communication Protocol :  
(RS-485/9600/19200/38400/115200bps/8BIT/1STOP/NONE PARITY)  
Default : 115200bps/8bit/none Parity.  
RS232C ModBus Control Setting :  
Default : 9600bps/8bit/none Parity.
- Based on ISO/IEC-14443A
- Available PICC (VICC) : Mifare® standard, ISO-14443A

**1. RS232C Communication**

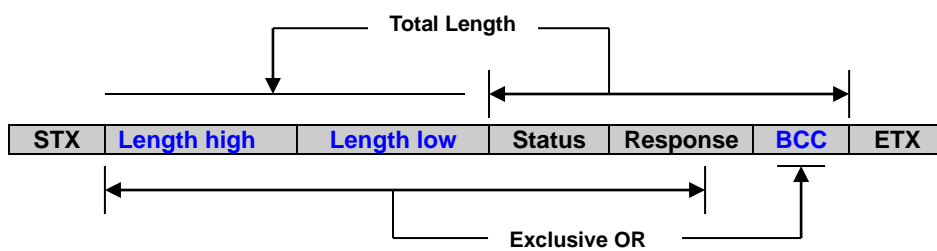
QU-950-4-HF-2.0 initialization value is set using RS232C communication port.

Communication basic frame format

HOST → **QU-950-4-HF-2.0**



**QU-950-4-HF-2.0** → HOST



**Response LIST**

Status	Result	Remark
0x00	Command operating success	
0x01	Command operating error	
0x10	Command Undefined	
0x11	TimeOut	

**Command LIST**

Command	Hex	Remark
CmdGetVersion	0x30	
CmdSetDeviceAddress	0x31	
CmdSetRS485	0x32	
CmdCardDataHoldTime	0x33	
CmdGetInitValue	0x34	

**1-1. CmdGetVersion**

Host

STX	LEN HIGH	LEN low	0x30	BCC	ETX
1	1	1	1	1	1

Response

STX	LEN HIGH	LEN low	Status	KEC4500 Version	BCC	ETX
1	1	1	1	16Bytes	1	1

**1-2. CmdSetDeviceAddress**

Host

STX	LEN HIGH	LEN low	0x31	DeviceAddress	BCC	ETX
1	1	1	1	1Bytes	1	1

Response

STX	LEN HIGH	LEN low	Status	BCC	ETX
1	1	1	1	1	1

**1-3. CmdSetRS485**

Host

STX	LEN HIGH	LEN low	0x32	ModBusCommSpeed	BCC	ETX
1	1	1	1		1	1

RS484 CommSpeed	Speed
0x00	2400bps
0x01	4800bps
0x02	9600bps
0x03	19200bps
0x04	38400bps
0x05	115200bps

Response

STX	LEN HIGH	LEN low	Status	BCC	ETX
1	1	1	1	1	1

**1-4. CmdCardDataHoldTime**

Host

STX	LEN HIGH	Length low	0x33	CardDataHoldTime	BCC	ETX
1	1	1	1	2Bytes	1	1

Response

STX	LEN HIGH	Length low	Status	BCC	ETX
1	1	1	1	1	1

 $((\text{CardDataHoldTime}[0]*256) + \text{CardDataHoldTime}[1])*10\text{msec}$ 
**1-5. CmdGetInitValue**

Host

STX	LEN HIGH	Length low	0x34	BCC	ETX
1	1	1	1	1	1

Response

STX	LEN HIGH	Length low	Status	ModBusInitalValue	BCC	ETX
1	1	1	1	4bytes	1	1

ModBusInitalValue

DeviceAddress	RS485 Speed	CardDataHoldTime
1bytes	1bytes	2bytes

## 2. QU-950-4-HF-2.0 ModBus

### 2-1. ReadCardData (Read Input Register 0X04)

Host → QU-950-4-HF-2.0

DeviceAddress	FunctionCode	StartAddressHi	StartAddressLo	QuantityHi	QuantityLo	CRC
0x01	0x04	0x00	0x00	0x00	0x0a	0x70,0x0d

Ex) \*\* DeviceAddress= 0x01,

StartAddress= (StartAddressHi \*256)+ StartAddressLo = 0x0000,

Quantity= (QuantityHi \*256)+ QuantityLo = 0x000A

QU-950-4-HF-2.0 → Host

DeviceAddress	FunctionCode	ByteCount	Data	CRC
0x01	0x04	0x14	0x76,0x40,0x9b,0xf0,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00	0x58, 0x2b

ByteCount= ((QuantityHi\*256)+ QuantityLo)\*2

Ex) \*\* \*\* DeviceAddress= 0x01, Card UID 4Byte = 0x76,0x40,0x9b,0xf0

PosSize= (((StartAddressHi\*256)+ StartAddressLo)\*2) + (((QuantityHi\*256)+ QuantityLo) \*2)

if(PosSize >= 101){

// error handling

DeviceAddress	FunctionCode	ByteCount	CRC
0x01	0x84	0x02	0xc1, 0xc2

}

else{

// normal processing

ByteCount= (((QuantityHi\*256) + QuantityLo) \*2);

ModBusBufPos= (((StartAddressHi\*256) + StartAddressLo)\*2); //ModBus Buffer Position

DeviceAddress	FunctionCode	ByteCount	Data	CRC
0x01	0x04	ByteCount	ModBusBuf[ModBusBufPos ]	

}

	0	1	2	3	4	5	6	7	8	9
0	Hex0	Hex1	Hex2	Hex3	Hex4	Hex5	Hex6	0x00	0x00	0x00
1	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00
2	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00
3	0x00	0x00	0x00	UID LEN	ASCII 0	ASCII 1	ASCII 2	ASCII 3	ASCII 4	ASCII 5
4	ASCII 6	ASCII 7	ASCII 8	ASCII 9	ASCII 10	ASCII 11	ASCII 12	ASCII 13	0x00	0x00
5	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00
6	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00
7	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00
8	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00
9	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00

Ex) UID 0x12, 0x34, 0x56,0x76

	0	1	2	3	4	5	6	7	8	9
0	0x12	0x34	0x56	0x78	0x00	0x00	0x00	0x00	0x00	0x00
1	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00
2	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00
3	0x00	0x00	0x00	0x04	0x31	0x32	0x33	0x34	0x35	0x36
4	0x37	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00
5	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00
6	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00
7	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00
8	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00
9	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00

**2-2. LED Red On(Write Single Coil 0X05)**
**LED Red On/ LED Blue Off**
**Host**                    **→**                    **QU-950-4-HF-2.0**

DeviceAddress	FunctionCode	OutPutAddressHi	OutPutAddressLo	OutValueHi	OutValueLo	CRC
0x01	0x05	0x00	0x01	0xff	0x00	0xdd,0xfa

**QU-950-4-HF-2.0**                    **→**                    **Host**

DeviceAddress	FunctionCode	OutPutAddressHi	OutPutAddressLo	OutValueHi	OutValueLo	CRC
0x01	0x05	0x00	0x01	0xff	0x00	0xdd,0xfa

**2-2. LED Blue On(Write Single Coil 0X05)**
**LED Red Off/ LED Blue On**
**Host**                    **→**                    **QU-950-4-HF-2.0**

DeviceAddress	FunctionCode	OutPutAddressHi	OutPutAddressLo	OutValueHi	OutValueLo	CRC
0x01	0x05	0x00	0x01	0x00	0x00	0x9c,0x0a

**QU-950-4-HF-2.0**                    **→**                    **Host**

DeviceAddress	FunctionCode	OutPutAddressHi	OutPutAddressLo	OutValueHi	OutValueLo	CRC
0x01	0x05	0x00	0x01	0x00	0x00	0x9c,0x0a

Status= (OutValueHi\*256)+ OutValueLo;

If(Status!=0){

RedLED\_On\_BlueLED\_Off();

}

else{

BlueLED\_On\_RedLED\_Off();

}

**2-3. Buzzer On(Write Single Coil 0X05)**
**Host**                    **→**                    **QU-950-4-HF-2.0**

DeviceAddress	FunctionCode	OutPutAddressHi	OutPutAddressLo	OutValueHi	OutValueLo	CRC
0x01	0x05	0x00	0x00	0xff	0x00	0x8c,0x3a

**QU-950-4-HF-2.0**                    **→**                    **Host**

DeviceAddress	FunctionCode	OutPutAddressHi	OutPutAddressLo	OutValueHi	OutValueLo	CRC
0x01	0x05	0x00	0x00	0xff	0x00	0x8c, 0x3a

**2-4. Buzzer On(Write Single Coil 0X05)**
**Host**                    **→**                    **QU-950-4-HF-2.0**

DeviceAddress	FunctionCode	OutPutAddressHi	OutPutAddressLo	OutValueHi	OutValueLo	CRC
0x01	0x05	0x00	0x00	0x00	0x00	0xcd,0xca

**QU-950-4-HF-2.0**                    **→**                    **Host**

DeviceAddress	FunctionCode	OutPutAddressHi	OutPutAddressLo	OutValueHi	OutValueLo	CRC
0x01	0x05	0x00	0x00	0x00	0x00	0xcd, 0xca

**2-5. Case Sensor On (Read Discrete Input 0X02)**
**Host**                      **→**                      **QU-950-4-HF-2.0**

DeviceAddress	FunctionCode	StartAddressHi	StartAddressLo	OutValueHi	QuantityLo	CRC
0x01	0x02	0x00	0x00	0x00	0x01	0xb9,0xca

**QU-950-4-HF-2.0**                      **→**                      **Host**

Case Open

DeviceAddress	FunctionCode	ByteCount	Data	CRC
0x01	0x02	0x01	0x01	0x60, 0x48

Case Close

DeviceAddress	FunctionCode	ByteCount	Data	CRC
0x01	0x02	0x01	0x00	0xa1, 0x88

**2-6. DeviceAddressSet (Write Single Register 0X06)**
**Host**                      **→**                      **QU-950-4-HF-2.0**

DeviceAddress	FunctionCode	RegisterAddrHi	RegisterAddrLo	OutValueHi	OutValueLo	CRC
0x01	0x06	0x00	0x00	0x00	0x01	0x48,0x0a

DeviceAddress= OutValueLo;

\*\* OutValueHi is always 0x00

**QU-950-4-HF-2.0**                      **→**                      **Host**

DeviceAddressSet Ok

DeviceAddress	FunctionCode	RegisterAddrHi	RegisterAddrLo	OutValueHi	OutValueLo	CRC
0x01	0x06	0x00	0x00	0x00	0x01	0x48,0x0a

DeviceAddress Fail

DeviceAddress	FunctionCode	ExceptionCode	CRC
0x01	0x86	0x02	0xc3, 0xa1

**Changed values take effect immediately**
**2-7. RS485 Communication Speed (Write Single Register 0X06)**
**Host**                      **→**                      **QU-950-4-HF-2.0**

DeviceAddress	FunctionCode	RegisterAddrHi	RegisterAddrLo	OutValueHi	OutValueLo	CRC
0x01	0x06	0x00	0x01	0x00	0x05	0x18,0x09

Communication Speed= OutValueLo;

\*\* OutValueHi is always 0x00

OutValueLo	Speed
0x00	2400bps
0x01	4800bps
0x02	9600bps
0x03	19200bps
0x04	38400bps
0x05	115200bps

**QU-950-4-HF-2.0**                      **→**                      **Host**

DeviceAddressSet Ok

DeviceAddress	FunctionCode	RegisterAddrHi	RegisterAddrLo	OutValueHi	OutValueLo	CRC
0x01	0x06	0x00	0x01	0x00	0x05	0x18,0x09

DeviceAddress Fail

DeviceAddress	FunctionCode	ExceptionCode	CRC
0x01	0x86	0x02	0xc3, 0xa1

**Changed values take effect immediately**

**2-8. Card Data Hold Time (Write Single Register 0X06)**
**Host**       $\longrightarrow$       **QU-950-4-HF-2.0**

DeviceAddress	FunctionCode	RegisterAddrHi	RegisterAddrLo	OutValueHi	OutValueLo	CRC
0x01	0x06	0x00	0x02	0x00	0x64	0x29,0xe1

CardDataHoldTime= (OutValueHi\*256)+OutValueLo;

10msec/unit

Ex) 1 second when CardDataHoldTime=100

**QU-950-4-HF-2.0**       $\longrightarrow$       **Host**

DeviceAddressSet Ok

DeviceAddress	FunctionCode	RegisterAddrHi	RegisterAddrLo	OutValueHi	OutValueLo	CRC
0x01	0x06	0x00	0x02	0x00	0x64	0x29,0xe1

DeviceAddress Fail

DeviceAddress	FunctionCode	ExceptionCode	CRC
0x01	0x86	0x02	0xc3, 0xa1

**Changed values take effect immediately**
**3. Input/Out Signal**
**3-1. BEEP**

Input signal

When Low, Buzzer is On.

**3-2. Tamper**

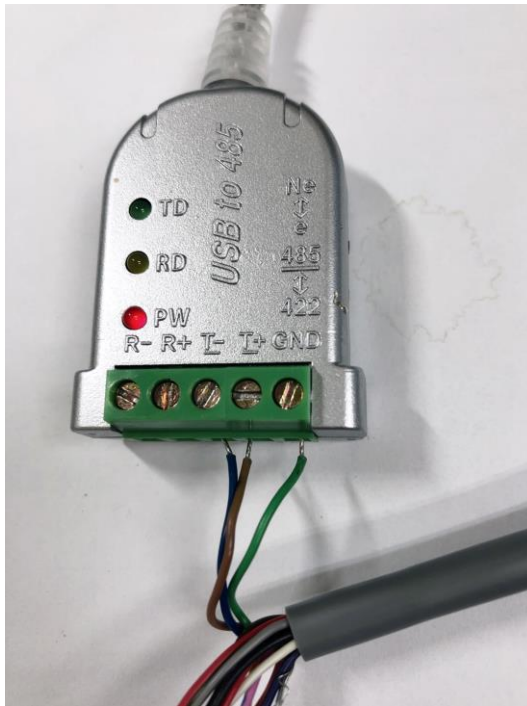
Output as LOW when Tamper Sensor is detected.

**3-3. LED**
**Input signal**
**When Low, Blue LED/ Red LED Blinking**
**4. Connection**

Color	PIN NO	Description		
Red	1	Power In	7~24VDC	
Black	2	GND		
Grey	3	RS232 RXD		RS232C Communication
White-Green	4	RS232 TXD		
Green	5	WIEGAND DATA0	5VDC HIGH:1mA	Output(no function)
White	6	WIEGAND DATA1	5VDC HIGH:1mA	Output(no function)
Blue	7	GND		
Brown	8	LED		
Yellow	9	BUZZER		
Purple(Violet)	10	TAMPER		
Orange	11	RS485+(A)		RS485 Communication
Sky Blue	12	RS485-(B)		



RS-485 TEST Connection



RS232 Connection

