



GIGA-TMS INC.
Quality, Delivery & Service

Programming Guide

for UHF® 860 v1.0

October 18, 2011

Communications protocol

Communications Baud Rate is 115200-8-N-1.

Master Query Package (HOST)

| Field | Header | Address | Query Function | Data length | DATA BYTES | Error Check | |
|-------|--------|---------|----------------|-------------|-------------|-------------|----------|
| Desc | SOH | 0~255 | 0~255 | 0~255 | | CRC16_Low | CRC16_Hi |
| Size | 1 BYTE | 1 BYTE | 1 BYTE | 1 BYTE | 0~255 BYTES | 1 BYTE | 1 BYTE |

Note:

SOH = 01h.

Address = Device Address (Slave Machine ID)

Slave Response Package (DEVICE)

| Field | Header | Address | Response Function | Data length | DATA BYTES | Error Check | |
|-------|--------|---------|-------------------|-------------|-------------|-------------|------------|
| Desc | SOH | 0~255 | ACK / NAK / EVN | 0~255 | | CRC16_Low | CRC16_High |
| Size | 1 BYTE | 1 BYTE | 1 BYTE | 1 BYTE | 0~255 BYTES | 1 BYTE | 1 BYTE |

Note:

SOH = 01h.

Address = Device Address (Slave Machine ID)

ACK = 06h, Acknowledge (Passive, in response to Master message)

NAK = 15h, Negative Acknowledge (Passive, in response to Master message)

EVN = 12h, Event Message(Active, For One Host to One Device Connection)



Response NAK Code Table (Common)

| Func | Len | Data Bytes | Description |
|------|-----|------------|------------------------------|
| NAK | 1 | E0h | Access Denied |
| NAK | 1 | E4h | Illegal Query Code |
| NAK | 1 | E6h | Overrun, Out of record count |
| NAK | 1 | E7h | CRC Error |
| NAK | 1 | ECh | Query Number no support |
| NAK | 1 | EDh | Out Of Memory Range |
| NAK | 1 | EEh | Address Number out of range |
| NAK | 1 | EFh | Unknown |
| | | | |

Response Event (For Active Slave)

| | Active Response (Slave) | | |
|-------|-------------------------|-----|-----------------------------|
| Desc | Func | Len | Data Bytes |
| Event | 12h | n | Customer Event Code or Data |

Commands Table

| Commands | Query (Master/Host) | | Response (Slave/Device) | Description |
|---------------------------|---------------------|--|--|--|
| | CMD (Hex) | Parameters (n chars) | Data Bytes (n bytes) | |
| Get Firm-/Hardware ID | 0x10 | Value (1 byte) | Return OEM Version String | Value 0 : Firmware 1 : Hardware |
| Active Mode | 0x12 | Mode ID (1 byte) | Return EPC Datas (n bytes) | ID=0 :Standalone ID=1 : GUI |
| Set Antenna Output Power | 0x18 | PWR(1byte) | 0 | PA/Power Auto Down Control |
| Write Register | 0x1A | Address(1 byte) Datas (1~3 bytes) | Replied as 0x00 (1 byte) rfu (reserved for further use) | Set Register Datas to Address |
| Read Register | 0x1C | Address (1byte) | Datas(n bytes) | Get Register |
| Set Channel | 0x1E | CN(1byte) | Channel Number(1 byte) | Set Channel |
| CONTROL DIDO | 0x20 | DO Channel/Enable (2 bytes) | DO/DI Status(1 byte) | GET DI OR SET DO |
| Write EEPROM | 0x22 | High Addr (1 byte) Low Addr (1 byte) Value (1 byte) | 0 | After Write EEPROM you must update EEPROM to register. |
| Update EEPROM To Register | 0x22 | 0xFF (1 byte) 0xFF (1 byte) [Value] (1 byte) | 0 | Value = any |
| Read EEPROM | 0x24 | High Addr (1 byte) Low Addr (1 byte) | 0 | |
| Select Tag | 0x33 | PC(2bytes) EPC(12bytes) | 0 | |
| Write Tag Data | 0x35 | MB(1byte) SA(1byte) AP(4bytes) DL(1bytes) DT(variable) | Datas(n bytes) | |
| Read Tag Data | 0x37 | MB(1byte) SA(1byte) DL(1bytes) | Datas(n bytes) | Read Tag Data from specified memory bank. |
| Lock Tag | 0x3B | LA(1bytes) LT(1bytes) AP(4bytes) | | Lock Tag |
| Kill Tag | 0x3D | KP(4bytes) | | |
| Set Frequency | 0x41 | Mask(1byte) Freq(3bytes) RSSI(1byte) | 0 | |
| Get Frequency Setting | 0x41 | Mask(1byte) | Profile ID (1 byte) ListenTime (2 bytes) MAX_Allocation (2 bytes) Idle Time (2 bytes) | |



| | | | | |
|-------------------------|------|--|---|---|
| | | | Min Frequency (3 bytes) Max Frequency (3 bytes) Num of Frequency (1 byte) RSSI Threshold (1 byte) Active number of Frequency (1 byte) | |
| Get Reflect Power Level | 0x41 | Mask(1byte) Freq(3bytes) | I-Channel (1 byte) Q-Channel (1 byte) | |
| Inventory | 0x43 | Value(1 byte) | Number of found tags (1 byte) RSSI (1 byte) Frequency (3 bytes) Length of EPC (1 byte) EPC (n bytes) CN (1 byte) | Value=0x01 Start inventory round Value=0x01 0x02 RFU |
| ConfigGen2 | 0x59 | Linkfreq set (1 byte) Linkfreq (1 byte) miller set (1 byte) Miller (1 byte) Session set (1 byte) Session (1 byte) trext set (1 byte) Trest (1 byte) qbegin set (1 byte) qbegin (1 byte) Sensitivity set (1 byte) Sensitivity (1 byte) | Linkfrequency (1 byte) miller setting (1 byte) Session (1 byte) Trest (1 byte) qbegin (1 byte) Sensitivity (1 byte) | |
| Set Sensitivity | 0x59 | Linkfreq set (1 byte) Linkfreq (1 byte) miller set (1 byte) Miller (1 byte) Session set (1 byte) Session (1 byte) trext set (1 byte) Trest (1 byte) qbegin set (1 byte) qbegin (1 byte) Sensitivity set (1 byte) Sensitivity (1 byte) | Linkfrequency (1 byte) miller setting (1 byte) Session (1 byte) Trest (1 byte) qbegin (1 byte) Sensitivity (1 byte) | |

Get Firm-/Hardware ID (0x10)

Format :


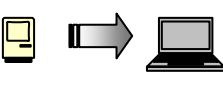


| | |
|---------------------|------|
| ID (1 byte) | 0x00 |
| Function (1 byte) | 0x10 |
| Data length(1 byte) | 0x01 |
| Datas (1 byte) | 0x00 |

※ Func = Function

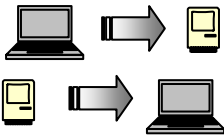
※ Data = 0x00 : Firmware , 0x01 : Hardware

Example :

| | | |
|--|---|--|
|  | <p>Hex</p> <p>01 00 10 01 00 71 00</p> | <p>ASCII</p> <p>.....q.</p> |
|  | <p>01 FF 06 1D 55 48 46 38 36 30 20 52 65 61 64 65</p> <p>72 20 46 69 72 6D 77 61 72 65 20 31 2E 30 31 52</p> <p>30 75 26</p> | <p>....UHF860 Reader Firmware 1.01R</p> <p>0u&</p> |

Active Mode (0x12)

Format :



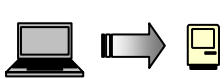
| | | | | | |
|-----|----|------|-------------|------------------|------------------|
| SOH | ID | Func | Data length | Mode ID (1 byte) | CRC 16 (2 bytes) |
|-----|----|------|-------------|------------------|------------------|

| | | | | | | | | |
|------|---------------------|------|-------------|---------------|----------------|------|------------------|------|
| SOH | ID | Func | Data length | Data (1 byte) | | | CRC 16 (2 bytes) | |
| 0x02 | EPC Datas (n bytes) | | | 0x2C | Ch (1 byte) | 0x0D | 0x0A | 0x03 |
| ... | | | | | | | | |

| | |
|---------------------|------|
| ID (1 byte) | 0x00 |
| Function (1 byte) | 0x12 |
| Data length(1 byte) | 0x01 |
| Mode ID (1 bytes) | 0x01 |

- ※ Func = Function
- ※ Mode ID = 0x00 : Standalone , 0x01 : GUI
- ※ Ch = Channel NO. (0x00~0x03)

Example :



Hex
01 00 12 01 00 B1 A1

ASCII
.....



01 FF 06 01 00 A1 D1 02 33 31 43 31 30 43 32 31
30 35 30 32 39 37 34 31 30 36 36 31 32 32 30 32
31 31 46 46 2C 33 0D 0A 03

.ÿ...jÑ.31C10C21
0502974106612202
11FF,3.

※This mean EPC (“31C10C21050297410661220211FF”) is inventory by channel No.3

Set Antenna Output Power (0x18)

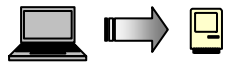
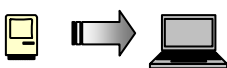
Format :



| | |
|---------------------|---------------------------------|
| ID (1 byte) | 0x00 |
| Function (1 byte) | 0x18 |
| Data length(1 byte) | 0x01 |
| PWR (1 bytes) | 0x00 (Disable) 0xFF (Enable) |

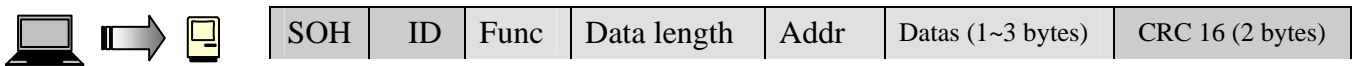
※ Func = Function

Example :

| | Hex | ASCII |
|---|----------------------|-------|
|  | 01 00 18 01 00 B3 81 | ..... |
|  | 01 FF 06 01 00 A1 D1 | ..... |

Write Register (0x1A)

Format :


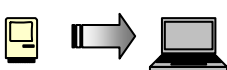


| | |
|----------------------|------|
| ID (1 byte) | 0x00 |
| Function (1 byte) | 0x1A |
| Data length (1 byte) | 0x02 |
| Address (1 byte) | 0x00 |
| Datas (1~3 bytes) | 0x0F |

※ Func = Function

※ Addr=Address

Example :

| | Hex | ASCII |
|---|-------------------------|-------|
|  | 01 00 1A 02 00 0F DC C2 | ..... |
|  | 01 FF 06 01 00 A1 D1 | ..... |

Read Register (0x1C)

Format :



| | | | | | |
|-----|----|------|-------------|------|------------------|
| SOH | ID | Func | Data length | Addr | CRC 16 (2 bytes) |
|-----|----|------|-------------|------|------------------|

| | |
|----------------------|------|
| ID (1 byte) | 0x00 |
| Function (1 byte) | 0x1C |
| Data length (1 byte) | 0x01 |
| Address (1 byte) | 0x00 |

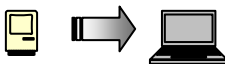
※ Func = Function

※ Addr=Address

Example :



| | |
|----------------------|---------|
| Hex | ASCII |
| 01 00 1C 01 00 72 C0 |f. |



| | |
|-------------------------------|-------|
| 01 FF 06 04 0F 00 00 00 BD E6 | |
|-------------------------------|-------|

Set Channel (0x1E)

Format :



| | | | | | |
|-----|----|------|-------------|------------|------------------|
| SOH | ID | Func | Data length | CN (1byte) | CRC 16 (2 bytes) |
|-----|----|------|-------------|------------|------------------|

| | |
|-------------------------|------|
| ID (1 byte) | 0x00 |
| Function (1 byte) | 0x1E |
| Data length (1 byte) | 0x01 |
| Channel Number (1 byte) | 0x00 |

※ Func = Function

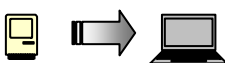
※ CN=Channel Number

※If you don't set any channel number to Device. Device will scan channel by sequential. (Ch1 ~ CH4)

Example :



| | |
|----------------------|--------|
| Hex | ASCII |
| 01 00 1E 01 00 B2 61 |a |



| | |
|----------------------|-------|
| 01 FF 06 01 00 A1 D1 | |
|----------------------|-------|

CONTROL DIDO (0x20)

Format :



| | | | | | |
|-----|----|------|-------------|-------------------|------------------|
| SOH | ID | Func | Data length | DO Channel/Enable | CRC 16 (2 bytes) |
|-----|----|------|-------------|-------------------|------------------|

| | |
|----------------------|------|
| ID (1 byte) | 0x00 |
| Function (1 byte) | 0x20 |
| Data length (1 byte) | 0x02 |
| DO Channel (1 byte) | 0x03 |
| DO Enable (1 byte) | 0x03 |

※ Preserve DO Channel, Enable datas : 0x00 , 0x00 mean Get DI/DO Status

※ Func = Function

※ CN=Channel Number

※ DO Channel (1 byte) : 4 bits to mean DO1~2

| Bit 7 | Bit 6 | Bit 5 | Bit 4 | Bit 3 | Bit 2 | Bit 1 | Bit 0 |
|-------|-------|-------|-------|-------|-------|-------|-------|
| 0 | 0 | 1 | 1 | 0 | 0 | DO2 | DO1 |

Ex. 00110001 => DO1 ON

Ex. 00110011 => DO1, DO2 ON

Ex. 00110011 => DO1, DO2, DO4 ON

※ Do Enable (1 byte) : 4 bits to mean DO1~2 Enable

| Bit 7 | Bit 6 | Bit 5 | Bit 4 | Bit 3 | Bit 2 | Bit 1 | Bit 0 |
|-------|-------|-------|-------|-------|-------|-------|-------|
| 0 | 0 | 1 | 1 | 0 | 0 | DO2 | DO1 |

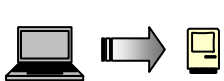
Ex. 00110001 => DO1 Enable

Ex. 00110011 => DO1, DO2 Enable

※ Replay DIDO Status(1 byte) :

| Bit 7 | Bit 6 | Bit 5 | Bit 4 | Bit 3 | Bit 2 | Bit 1 | Bit 0 |
|-------|-------|-------|-------|-------|-------|-------|-------|
| x | x | DO2 | DO1 | DI4 | DI3 | DI2 | DI1 |

Example :



Hex
01 00 20 02 03 03 F1 CE

ASCII

..



01 FF 06 01 3F B1 91

....?..

Write EEPROM (0x22)

Format :



| SOH | ID | Func | Data length | Addr_Hi | Addr_Low | data (1byte) | CRC 16 (2 bytes) |
|-----|----|------|-------------|---------|----------|--------------|------------------|
|-----|----|------|-------------|---------|----------|--------------|------------------|

| | |
|----------------------------|------|
| ID (1 byte) | 0x00 |
| Function (1 byte) | 0x22 |
| Data length (1 byte) | 0x03 |
| Address High byte (1 byte) | 0x00 |
| Address Low byte (1 byte) | 0x00 |
| Data (1 byte) | 0x01 |

※ Func = Function

※ Addr_Hi=Address high byte

※ Addr_Low=Address low byte

Example :



Hex
01 00 22 03 00 00 01 98 39

ASCII
..".....9

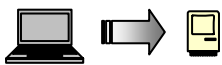


01 FF 06 01 01 61 10

.....a.

Update EEPROM To Register (0x22)

Format :



| SOH | ID | Func | Data length | Addr_Hi | Addr_Low | data (1byte) | CRC 16 (2 bytes) |
|-----|----|------|-------------|---------|----------|--------------|------------------|
|-----|----|------|-------------|---------|----------|--------------|------------------|





| | |
|----------------------------|------|
| ID (1 byte) | 0x00 |
| Function (1 byte) | 0x22 |
| Data length (1 byte) | 0x03 |
| Address High byte (1 byte) | 0xFF |
| Address Low byte (1 byte) | 0xFF |
| Data (1 byte) | 0x00 |

※ Func = Function

※ Addr_Hi=Address high byte

※ Addr_Low=Address low byte

Example :

| | | |
|---|----------------------------|----------|
|  →  | Hex | ASCII |
| | 01 00 22 03 FF FF 00 98 89 | .."..... |
|  →  | 01 FF 06 01 FF E1 91 | ..... |

Read EEPROM (0x24)





Format :

| | | | | | | | |
|---|-----|----|------|-------------|---------|----------|------------------|
|  →  | SOH | ID | Func | Data length | Addr_Hi | Addr_Low | CRC 16 (2 bytes) |
|---|-----|----|------|-------------|---------|----------|------------------|

| | |
|-------------------------------|------|
| ID (1 byte) | 0x00 |
| Function (1 byte) | 0x24 |
| Data length (1 byte) | 0x03 |
| Address High byte (1 byte) | 0x00 |
| Address Low byte (1 byte) | 0x00 |

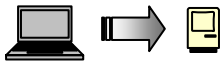
- ※ Func = Function
- ※ Addr_Hi=Address high byte
- ※ Addr_Low=Address low byte

Example :

| | | |
|---|-------------------------|---------|
|  →  | Hex | ASCII |
| | 01 00 24 02 00 00 30 8F | ..\$.0. |
|  →  | 01 FF 06 01 01 61 10 |a. |

Select Tag (0x33)

Format :



| | | | | | | |
|-----|----|------|-------------|------------|--------------|------------------|
| SOH | ID | Func | Data length | PC(2bytes) | EPC(12bytes) | CRC 16 (2 bytes) |
|-----|----|------|-------------|------------|--------------|------------------|

| | |
|---------------------|----------------------------|
| ID (1 byte) | 0x00 |
| Function (1 byte) | 0x33 |
| Data length(1 byte) | 0x0E |
| PC (2 bytes) | 0x3000 |
| EPC (12 bytes) | 0x001F3411B802111176348076 |

※ Func = Function

※ Data = 0x00 : Firmware , 0x01 : Hardware

Example :



Hex

01 00 33 0E 30 00 00 1F 34 11 B8 02 11 11 76 34

80 76 FF 12

ASCII

..3.0...4.....v4

.v..



01 FF 06 01 09 A7 11

.....

Set Frequency (0x41)

Format :



| | | | | | |
|-----|----|------|-------------|--|------------------|
| SOH | ID | Func | Data length | Mask(1byte) Freq(3bytes) RSSI(1byte) | CRC 16 (2 bytes) |
|-----|----|------|-------------|--|------------------|

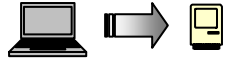

| | |
|----------------------|--|
| ID (1 byte) | 0x00 |
| Function (1 byte) | 0x41 |
| Data length (1 byte) | 0x05 |
| Mask (1 byte) | 0x08 |
| Frequency (3 bytes) | 0x5E 0xC6 0x0D (902750 kHz) Low byte, Mid byte , High byte |
| RSSI (1 byte) | 0xD8 [-40 dBm => 256 + (-40) = 0xD8] |

※ Func = Function

※ Mask 0x00: No specific value; - measurement skipped no valid dates in response

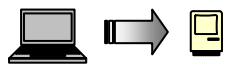
※ Mask 0x01: RSSI scan

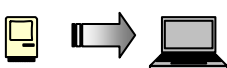
Example :

| | | |
|---|---|--------------|
|  | Hex | ASCII |
| | 01 00 41 01 11 AC 91 | ..A.... |
|  | 01 FF 06 3E FE FF 03 01 00 90 01 00 00 5E C6 0D | ...>.....^.. |
| | 12 26 0E 32 D8 32 00 00 00 00 00 00 00 00 00 | .&.2.2..... |
| | 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 | ..... |
| | 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 | ..... |
| | 00 00 69 5C | ..i\ |

Get Reflect Power Level (0x41)

Format :

| | | | | | | |
|---|-----|----|------|-------------|-----------------------------|------------------|
|  | SOH | ID | Func | Data length | Mask(1byte) Freq(3bytes) | CRC 16 (2 bytes) |
|---|-----|----|------|-------------|-----------------------------|------------------|

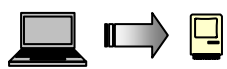
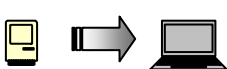
| | | | | | | | | |
|---|-----|----|------|-------------|-------------------|-------------------|---------------|------------------|
|  | SOH | ID | Func | Data length | I-Channel (1byte) | Q-Channel (1byte) | RFU (n bytes) | CRC 16 (2 bytes) |
|---|-----|----|------|-------------|-------------------|-------------------|---------------|------------------|

| | |
|----------------------|--|
| ID (1 byte) | 0x00 |
| Function (1 byte) | 0x41 |
| Data length (1 byte) | 0x05 |
| Mask (1 byte) | 0x02 |
| Frequency (3 byte) | 0x5E 0xC6 0x0D (902750 kHz) Low byte, Mid byte , High byte |

※ Func = Function

※ Mask 0x02: reflected power scan

Example :

| | | |
|---|---|-----------|
|  | Hex | ASCII |
| | 01 00 41 04 02 5E C6 0D DE 17 | ..A.^.... |
|  | 01 FF 06 3E B5 0A 00 00 00 00 00 00 00 00 00 00 | ...>..... |
| | 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 | ..... |
| | 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 | ..... |
| | 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 | ..... |
| | 00 00 4E 35 | ..N5 |

Inventory (0x43)

Format :



| | | | | | |
|-----|----|------|-------------|--------------|------------------|
| SOH | ID | Func | Data length | Value(1byte) | CRC 16 (2 bytes) |
|-----|----|------|-------------|--------------|------------------|



| | | | | | |
|-----|----|------|-------------|---|------------------|
| SOH | ID | Func | Data length | Number of found tags (1 byte) RSSI (1 byte) Frequency (3 bytes) Length of EPC (1 byte) EPC (n bytes) CN (1 byte) | CRC 16 (2 bytes) |
|-----|----|------|-------------|---|------------------|

| | |
|----------------------|------|
| ID (1 byte) | 0x00 |
| Function (1 byte) | 0x43 |
| Data length (1 byte) | 0x01 |
| Value (1 byte) | 0x01 |

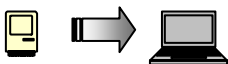
※ Func = Function

※ CN = Channel Number

Example :



| | |
|----------------------|---------|
| Hex | ASCII |
| 01 00 43 01 01 A0 31 | ..C...1 |



| | |
|---|-------------|
| 01 FF 06 15 01 BE 0A D4 0D 0E 30 00 00 1F 34 11 |0...4. |
| B8 02 11 11 76 34 80 76 02 C9 1B |v4.v... |

Get ConfigGen2 Setting (0x59)

Format :



| | | | | | |
|-----|----|------|-------------|--|------------------|
| SOH | ID | Func | Data length | Linkfreq set (1 byte) Linkfreq (1 byte) miller set (1 byte) Miller (1 byte) Session set (1 byte) Session (1 byte) trext set (1 byte) Trext (1 byte) qbegin set (1 byte) qbegin (1 byte) Sensitivity set (1 byte) Sensitivity (1 byte) | CRC 16 (2 bytes) |
|-----|----|------|-------------|--|------------------|



| | | | | | |
|-----|----|------|-------------|---|------------------|
| SOH | ID | Func | Data length | 0x00 (RFU 1byte) Link frequency (1 byte) 0x00 (RFU 1byte) miller setting (1 byte) 0x00 (RFU 1byte) Session (1 byte) 0x00 (RFU 1byte) Trext (1 byte) 0x00 (RFU 1byte) qbegin (1 byte) 0x00 (RFU 1byte) Sensitivity (1 byte) | CRC 16 (2 bytes) |
|-----|----|------|-------------|---|------------------|

| | |
|--------------------------|------|
| ID (1 byte) | 0x00 |
| Function (1 byte) | 0x59 |
| Data length (1 byte) | 0x0C |
| Link freq set (1 byte) | 0x00 |
| Link freq (1 byte) | 0x00 |
| miller set (1 byte) | 0x00 |
| Miller (1 byte) | 0x00 |
| Session set (1 byte) | 0x00 |
| Session (1 byte) | 0x00 |
| trext set (1 byte) | 0x00 |
| Trext (1 byte) | 0x00 |
| qbegin set (1 byte) | 0x00 |
| qbegin (1 byte) | 0x00 |
| Sensitivity set (1 byte) | 0x00 |
| Sensitivity (1 byte) | 0x03 |

※ Func = Function





※ CN = Channel Number

※ linkfrequency set : 0 = 40 kHz, 3 = 80 kHz not AS3992, 6 = 160 kHz, 8 = 213 kHz, 9 = 256 kHz,

12 = 320 kHz, 15 = 640 kHz

- ※ miller setting : 0 = FM0, 1 = Miller2, 2 = Miller4, 3 = Miller8
- ※ session : 0 = S0, 1 = S1, 2 = S2, 3 = SL
- ※ trest : 0 = short preamble, pilot tone, 1 = long preamble, pilot tone
- ※ qbegin : 0 .. 15. Initial gen2 round is 2^qbegin long. Please be careful with higher values.
- ※ Sensitivity for channel access : -90 .. -48 (dBm)

Example :

| | Hex | ASCII |
|---|---|-----------|
|  →  | 01 00 59 0C 00 00 00 00 00 00 00 00 00 00 00 03 | ..Y..... |
| | 2B 48 | +H |
|  →  | 01 FF 06 3E 00 06 00 01 00 00 00 00 00 00 00 B9 | ...>..... |
| | 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 | ..... |
| | 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 | ..... |
| | 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 | ..... |
| | 00 00 55 BF | ..U. |

Set Sensitivity (0x59)

Format :



| | | | | | |
|-----|----|------|-------------|--|------------------|
| SOH | ID | Func | Data length | Linkfreq set (1 byte) Linkfreq (1 byte) miller set (1 byte) Miller (1 byte) Session set (1 byte) Session (1 byte) trext set (1 byte) Trext (1 byte) qbegin set (1 byte) qbegin (1 byte) Sensitivity set (1 byte) Sensitivity (1 byte) | CRC 16 (2 bytes) |
|-----|----|------|-------------|--|------------------|



| | | | | | |
|-----|----|------|-------------|---|------------------|
| SOH | ID | Func | Data length | 0x00 (RFU 1byte) Link frequency (1 byte) 0x00 (RFU 1byte) miller setting (1 byte) 0x00 (RFU 1byte) Session (1 byte) 0x00 (RFU 1byte) Trext (1 byte) 0x00 (RFU 1byte) qbegin (1 byte) 0x00 (RFU 1byte) Sensitivity (1 byte) | CRC 16 (2 bytes) |
|-----|----|------|-------------|---|------------------|

| | |
|--------------------------|--------------------------------|
| ID (1 byte) | 0x00 |
| Function (1 byte) | 0x59 |
| Data length (1 byte) | 0x0C |
| Link freq set (1 byte) | 0x00 |
| Link freq (1 byte) | 0x00 |
| miller set (1 byte) | 0x00 |
| Miller (1 byte) | 0x00 |
| Session set (1 byte) | 0x00 |
| Session (1 byte) | 0x00 |
| trext set (1 byte) | 0x00 |
| Trext (1 byte) | 0x00 |
| qbegin set (1 byte) | 0x00 |
| qbegin (1 byte) | 0x00 |
| Sensitivity set (1 byte) | 0x01 |
| Sensitivity (1 byte) | 0xB9 (-71 dBm = 0xB9 - 0x100) |

※ Func = Function



※ CN = Channel Number



※ linkfrequency set : 0 = 40 kHz, 3 = 80 kHz not AS3992, 6 = 160 kHz, 8 = 213 kHz, 9 = 256 kHz,

12 = 320 kHz, 15 = 640 kHz

- ※ miller setting : 0 = FM0, 1 = Miller2, 2 = Miller4, 3 = Miller8
- ※ session : 0 = S0, 1 = S1, 2 = S2, 3 = SL
- ※ trest : 0 = short preamble, pilot tone, 1 = long preamble, pilot tone
- ※ qbegin : 0 .. 15. Initial gen2 round is 2^qbegin long. Please be careful with higher values.
- ※ Sensitivity for channel access : -90 .. -48 (dBm)

Example :

| | | |
|---|---|----------|
|  →  | Hex | ASCII |
| | 01 00 59 0C 00 00 00 00 00 00 00 00 00 00 01 B9 | ..Y..... |
| | 08 C8 | |

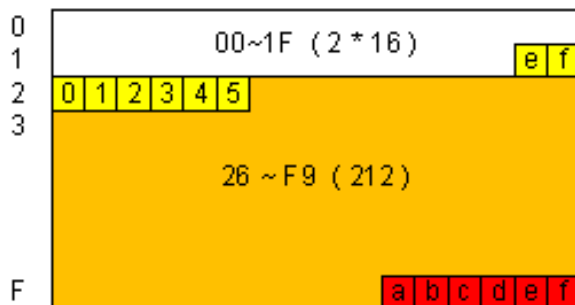
| | | |
|---|---|-----------|
|  →  | Hex | ASCII |
| | 01 FF 06 3E 00 06 00 01 00 00 00 00 00 00 00 B9 | ...>..... |
| | 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 | ..... |
| | 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 | ..... |
| | 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 | ..... |
| | 00 00 55 BF | ..U. |

Parameter EEPROM Address

| | |
|----|-------------------|
| 00 | RF POWER |
| 01 | RF SENSITIVITY |
| 02 | RF RX_DECODE |
| 03 | RF EPC_SESSION |
| 04 | RF LINK_FREQUENCY |
| 05 | RF CHANNEL12 |
| 06 | RF CHANNEL34 |
| 07 | RF EPC TREXT |
| 08 | RF EPC QBEGIN |
| 09 | |
| 0A | |
| 0B | |
| 0C | |
| 0D | |
| 0E | |
| 0F | |

| | |
|----|---------------------------|
| 10 | BAUDRATE |
| 11 | ADDRESS |
| 12 | ACTIVE MODE |
| 13 | |
| 14 | |
| 15 | |
| 16 | |
| 17 | |
| 18 | |
| 19 | |
| 1A | |
| 1B | |
| 1C | |
| 1D | |
| 1E | Frequencies profile |
| 1F | Frequencies Active number |

| | |
|----|-----------------------------|
| 20 | Frequencies Listen high |
| 21 | Frequencies Listen low |
| 22 | Frequencies Allocation high |
| 23 | Frequencies Allocation low |
| 24 | Frequencies Idle high |
| 25 | Frequencies Idle low |
| 26 | Frequencies0 high |
| 27 | Frequencies0 mid |
| 28 | Frequencies0 low |
| 29 | Frequencies0 RSSI |
| 2A | ⋮ |
| ⋮ | ⋮ |
| F9 | ⋮ |
| FA | Product SN0 |
| FB | Product SN1 |
| FC | Product SN2 |
| FD | Product SN3 |
| FE | Product SN4 |
| FF | .. |





| Item | Revision 1.0 | Default | Remark |
|-------------------------------|---|----------------------------|---------------------------------|
| RF Power Output Level [00] | 0x00 ~ 0x13 : (-0) ~ (-19) dBm Other : 0 dBm | 0xFF : 0 dBm | |
| RF RX Sensitivity [01] | 0x00~0x7F : 0 ~ 127 dBm 0x80~0xFE : (-128) ~ (-2) dBm 0xFF : -84 dBm | 0xFF : -84 dBm | When Bit7 = 1 2's complement |
| RX Decode [02] | 0x00 : FM0 0x01 : Miller 2 0x02 : Miller 4 0x03 : Miller 8 Other : Miller 2 | 0xFF : Miller 2 | |
| EPC Session [03] | 0x00 : S0 0x01 : S1 0x02 : S2 0x03 : S3 0x04 : SL Other : S0 | 0xFF : Session = S0 | |
| EPC Link Frequency [04] | 0x00 : 40kHz 0x03 : 80kHz 0x06 : 160kHz 0x08 : 213.3kHz 0x09 : 256kHz 0x0C : 320kHz 0x0F : 640kHz Other : 160kHz | 0xFF : 160kHz | |
| RF Scan 1,2 [05] | 0xAB : Scan1 = chA Scan2 = chB 0xFF : Scan1,2 = Ch1 (Fix Channel) | 0xFF : Scan1,2 = ch1 | |
| RF Scan 3,4 [06] | 0xAB : Scan3 = chA Scan4 = chB 0xFF : Scan3,4 = Ch1 (Fix Channel) | 0xFF : Scan3,4 = ch1 | |
| EPC TREST [07] | 0x00 : Don't use 0x01~0xFF : Use long pilot tone | 0xFF : Use long pilot tone | |
| EPC QBEGIN [08] | 0x00 ~ 0xFE : Q value 0xFF : Q = 4 | 0xFF : Q = 4 | |



| Item | Revision 1.0 | Default | Remark |
|--------------------------|---|------------------------|--------|
| Baudrate [10] | 0x00~0x03: 115200 bps 0x04: 2400 bps 0x05: 4800 bps 0x06: 9600 bps 0x07: 19200 bps 0x08: 38400 bps 0x09: 57600 bps 0x0A: 115200 bps 0x0B~0xFF: 115200 bps | 0xFF : 115200 bps | |
| ADDRESS [11] | 0x01~0xFF : ADDRESS 0x00 : For Broadcast | 0xFF : address | |
| Active Mode [12] | 0x00 : GUI Mode 0x01~0xFF : Standalone mode | 0xFF : Standalone mode | |



| Item | Revision 1.0 | Default | Remark |
|---|--|---|---|
| Profile [1E] | 0x01 : Europe 0x02 : Japan 0x03 : USA 0x04 : China920 0x05 : China840 0x06 : Korea 0x07 : Taiwan 0x00 , 0x08~0xFE : User Define 0xFF : Europe | 0xFF : Europe | Default by Europe |
| Frequency Active Number [1F] | 0x01 ~ 0x35 : 1 ~ 53 channel 0x36 ~ 0xFF : 4 channel 0x00 : 4 channel | 0xFF : 4 channel | Default by Europe |
| LBT Listen Time [20][21] | [20] : HIGH [21] : LOW But when: [20][21] = 0xFFFF = 1ms | [20] : 0xFF [21] : 0xFF Listen Time = 1ms | Default by Europe |
| LBT Allocation Time [22][23] | [22] : HIGH [23] : LOW But when: [22][23] = 0xFFFF = 0ms | [22] : 0xFF [23] : 0xFF Listen Time = 0ms | Default by Europe |
| LBT Idle Time [24][25] | [24] : HIGH [25] : LOW But when: [24][25] = 0xFFFF = 10000ms | [24] : 0xFF [25] : 0xFF Listen Time = 10000ms | Default by Europe |
| Fixed Frequency AUX [26+n*4] [27+n*4] [28+n*4] [29+n*4] n = 0 ~ 52 | [26+n*4] : Frequency high byte of CHn [27+n*4] : Frequency mid byte of CHn [28+n*4] : Frequency low byte of CHn Frequency= [26+n*4][27+n*4][28+n*4] /1000 (Mhz) [29+n*4] : RSSI Thres hold of CHn | When Profile = 0xFF or Active Number > 53 [26+n*4][27+n*4][28+n*4] n=0~3 for Europe Frequency [29+n*4] N=0~3 for Europe RSSI [26+n*4] : 0xFF [27+n*4] : 0xFF [28+n*4] : 0xFF [29+n*4] : 0xFF | [26+n*4][27+n*4][28+n*4] [00][35][A4] = 866.700 Mhz [00][C6][5E] = 902.750 Mhz [29+n*4] When bit7=1 2's complement [D8] = -40 dBm [A0] = -87 dBm |



| Item | Revision 1.0 | Default | Remark |
|---|------------------------------------|---------------------------------------|--------|
| Product Serial Number [FA]~[FE] | [F A]~[FE] : Product Serial Number | [F A]~[FE] : Product Serial Number | |

Federal Communication Commission Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- . Reorient or relocate the receiving antenna.
- . Increase the separation between the equipment and receiver.
- . Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- . Consult the dealer or an experienced radio/TV technician for help.

FCC Caution: To assure continued compliance, any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment. (Example - use only shielded interface cables when connecting to computer or peripheral devices).

FCC Radiation Exposure Statement

This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

The antennas used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesired operation.

RP SMA have to be used for antenna connection.