

**E91 Modbus Protocol**

www.xpcc.com | © 2022 Xtreme Power Conversion Corporation. All rights reserved. (Rev 6/3/22)

**Protocol in E91** .................................................................................................................................... 2

**1. Warning item**.......................................................................................................................... 2

**2. Capability setting**（**look for Application example 1**） ....................................................... 3

**3. Support Capability list** .......................................................................................................... 4

**4. Control item**（**look for Application example 2**） ............................................................... 4

**5. The result of control**............................................................................................................... 5

**6. Setting Parameter to default value** ....................................................................................... 5

**7. UPS working status** ............................................................................................................... 5

**8. UPS battery information (sys or rack info inquiry addr)** ............................................... 6

**9.The temperature inquiry**........................................................................................................ 7

**10. The three phase load inquiry** .............................................................................................. 7

**11. Load level inquiry** ................................................................................................................ 7

**12. The bypass three phase info** ................................................................................................ 8

**14. UPS working Mode**.............................................................................................................. 8

**15. UPS fault information** ......................................................................................................... 8

**16. Loss point**.............................................................................................................................. 8

**19. Setting Parameter succeed or fail** ....................................................................................... 8

**20. Remote shutdown and test** .................................................................................................. 9

**21. CPU information**.................................................................................................................. 9

**22. UPS model and rating information** .................................................................................... 9

**Note** ................................................................................................................................................... 10

1. Note1 ............................................................................................................................................. 10

2. Note2 ............................................................................................................................................. 10

3. Note3 ............................................................................................................................................. 11

**Application example** ........................................................................................................................ 13

**1. Audible alarm Enable or Disable** ....................................................................................... 13

**2. Setting buzzer beeps Silent.**................................................................................................. 13

**3. Setting control parameter to default value** ........................................................................ 13

**4. Get input voltage**.................................................................................................................. 13

**5. Output socket status** ............................................................................................................ 13

**6. Remote shut down the UPS**................................................................................................. 14

**7. Shut down UPS and auto restart later** ............................................................................... 14

**8. Setting Parameter item**........................................................................................................ 14

：unused

**Protocol in E91**

**1. Warning item**

Hex Dec Size Content Bit value type

bit15 Battery open 0:FALSE/1:TRUE Read only bit14 IP N loss 0:FALSE/1:TRUE Read only bit13 IP site fail 0:FALSE/1:TRUE Read only bit12 Line phase error 0:FALSE/1:TRUE Read only bit11 Bypass phase error 0:FALSE/1:TRUE Read only bit10 Bypass frequency unstable 0:FALSE/1:TRUE Read only bit9 Battery over charge 0:FALSE/1:TRUE Read only

bit8 Battery low 0:FALSE/1:TRUE Read only

0x0000 0

0x0001 1

bit7 Overload warning 0:FALSE/1:TRUE Read only bit6 Fan lock warning 0:FALSE/1:TRUE Read only bit5 EPO active 0:FALSE/1:TRUE Read only bit4 Turn on abnormal 0:FALSE/1:TRUE Read only bit3 Over temperature 0:FALSE/1:TRUE Read only bit2 CHGFail 0:FALSE/1:TRUE Read only bit1 Remote shut down 0:FALSE/1:TRUE Read only bit0 L1 IP fuse fail 0:FALSE/1:TRUE Read only bit15 L2 IP fuse fail 0:FALSE/1:TRUE Read only bit14 L3 IP fuse fail 0:FALSE/1:TRUE Read only bit13 L1 PFC positive error 0:FALSE/1:TRUE Read only bit12 L1 PFC negative error 0:FALSE/1:TRUE Read only bit11 L2 PFC positive error 0:FALSE/1:TRUE Read only bit10 L2 PFC negative error 0:FALSE/1:TRUE Read only bit9 L3 PFC positive error 0:FALSE/1:TRUE Read only bit8 L3 PFC negative error 0:FALSE/1:TRUE Read only bit7 CAN communication error 0:FALSE/1:TRUE Read only bit6 Synchronization line error 0:FALSE/1:TRUE Read only bit5 Synchronization pulse error 0:FALSE/1:TRUE Read only bit4 Host line error 0:FALSE/1:TRUE Read only bit3 Male connection error 0:FALSE/1:TRUE Read only bit2 Female connection error 0:FALSE/1:TRUE Read only bit1 Parallel line connection error 0:FALSE/1:TRUE Read only bit0 Battery connect different 0:FALSE/1:TRUE Read only bit15 Line connect different 0:FALSE/1:TRUE Read only

0x0002 2

bit14 Bypass connect different 0:FALSE/1:TRUE Read only bit13 Mode type different 0:FALSE/1:TRUE Read only bit12 Parallel inverter voltage setting different 0:FALSE/1:TRUE Read only bit11 Parallel output frequency setting different 0:FALSE/1:TRUE Read only bit10 Battery cell over charge 0:FALSE/1:TRUE Read only bit9 Parallel output parallel setting different 0:FALSE/1:TRUE Read only bit8 Parallel output phase setting different 0:FALSE/1:TRUE Read only bit7 Parallel Bypass Forbidden setting different 0:FALSE/1:TRUE Read only bit6 Parallel Converter Enable setting different 0:FALSE/1:TRUE Read only bit5 Parallel Bypass Freq High loss setting different 0:FALSE/1:TRUE Read only bit4 Parallel Bypass Freq Low loss setting different 0:FALSE/1:TRUE Read only bit3 Parallel Bypass Volt High loss setting different 0:FALSE/1:TRUE Read only bit2 Parallel Bypass Volt Low Loss setting different 0:FALSE/1:TRUE Read only bit1 Parallel Line Freq High Loss setting different 0:FALSE/1:TRUE Read only bit0 Parallel Line Freq Low Loss setting different 0:FALSE/1:TRUE Read only bit15 Parallel Line Volt High Loss setting different 0:FALSE/1:TRUE Read only bit14 Parallel Line Volt Low Loss setting different 0:FALSE/1:TRUE Read only bit13 Locked in bypass after overload 3 times in 30min 0:FALSE/1:TRUE Read only

Warning for three-phase AC input current

bit12

unbalance

0:FALSE/1:TRUE Read only

0x0003 3

0x0004 4

bit11 Battery Phase loss 0:FALSE/1:TRUE Read only bit10 Inverter current unbalance 0:FALSE/1:TRUE Read only bit9 P1 cut off pre-alarm 0:FALSE/1:TRUE Read only bit8 Warning for Battery replace 0:FALSE/1:TRUE Read only bit7 Warning for input phase error 0:FALSE/1:TRUE Read only bit6 Cover of maintain switch is open 0:FALSE/1:TRUE Read only bit5 Phase Auto Adapt Failed 0:FALSE/1:TRUE Read only bit4 Utility extremely unbalanced 0:FALSE/1:TRUE Read only bit3 Bypass unstable 0:FALSE/1:TRUE Read only bit2 Parallel protect warning 0:FALSE/1:TRUE Read only bit1 Discharger overly 0:FALSE/1:TRUE Read only bit0 Battery too high 0:FALSE/1:TRUE Read only bit15 Battery too low 0:FALSE/1:TRUE Read only bit14 Battery Volt High 0:FALSE/1:TRUE Read only bit13 Battery Volt Unbalance 0:FALSE/1:TRUE Read only

bit12 CHG Short 0:FALSE/1:TRUE Read only

**2. Capability setting**（**look for Application example 1**）

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Hex | Dec | Size | Content | Bit value | Register value | type |
|  |  | bit15 | Enable/disable audible alarm | 0:FALSE/1:TRUE | E:8000/D:7FFF | Read/Write |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 0x00  06 | 6 | bit14 | Enable/disable battery mode audible  warning | 0:FALSE/1:TRUE | E:4000/D:BFFF | Read/Write |
| bit13 | Enable/disable battery open status  check | 0:FALSE/1:TRUE | E:2000/D:DFFF | Read/Write |
| bit12 | Enable/disable high efficiency mode  （ECO mode） | 0:FALSE/1:TRUE | E:1000/D:EFFF | Read/Write |
| bit11 | Enable/disable bypass forbidden | 0:FALSE/1:TRUE | E:800/D:F7FF | Read/Write |
| bit10 | Enable/disable inverter short clear  function | 0:FALSE/1:TRUE | E:400/D:FBFF | Read/Write |
| bit9 | Enable/disable bypass when UPS turn off.（bps enable/disable） | 0:FALSE/1:TRUE | E:200/D:FDFF | Read/Write |
| bit8 | Enable/disable bypass audible  warning | 0:FALSE/1:TRUE | E:100/D:FEFF | Read/Write |
| bit7 | Enable/disable auto-restart | 0:FALSE/1:TRUE | E:80/D:FF7F | Read/Write |
| bit6 | Enable/disable battery deep  discharge protect | 0:FALSE/1:TRUE | E:40/D:FFBF | Read/Write |
| bit5 | Enable/disable battery low protect  (if disable, the battery will discharge to 6V) | 0:FALSE/1:TRUE | E:20/D:FFDF | Read/Write |
| bit4 | Enable/disable converter mode | 0:FALSE/1:TRUE | E:10/D:FFEF | Read/Write |
| bit3 | Enable/disable period battery test | 0:FALSE/1:TRUE | E:8/D:FFF7 | Read/Write |
| bit2 |  | 0:FALSE/1:TRUE | E:4/D:FFFB | Read/Write |
| bit1 | Enable/disable battery test stop by  time | 0:FALSE/1:TRUE | E:2/D:FFFD | Read/Write |
| bit0 | Enable/disable battery test stop by  voltage |  | E:1/D:FFFE | Read/Write |
| 0x0007 | 7 | bit15 | Enable/disable frequency auto  detection | 0:FALSE/1:TRUE | E:8000/D:7FFF | Read/Write |
| bit14 | Enable/disable auto bateery test  function | 0:FALSE/1:TRUE | E:4000/D:BFFF | Read/Write |
| bit13 | Enable/disable waring mute | 0:FALSE/1:TRUE | E:2000/D:DFFF | Read/Write |
| bit12 | Enable/disable fault mute | 0:FALSE/1:TRUE | E:1000/D:EFFF | Read/Write |
| bit11 | Enable/disable all mode mute | 0:FALSE/1:TRUE | E:0800/D:F7FF | Read/Write |
|  | bit0 - b10 =Reservation |  |  |  |

**3. Support Capability list**

--

**4. Control item**（**look for Application example 2**）

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Hex | Dec | Size | Content | Bit value | Register value | Type |
| 0x001A | 26 | bit15 | bit15=Silence buzzer  beep | 0:FALSE/1:TRUE | Y:8000/N:7FFF | Read/Write |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | bit14 | bit14=buzzer beep open | 0:FALSE/1:TRUE | Y:4000/N:BFFF | Read/Write |
| bit13 | bit13=Test until battery  low | 0:FALSE/1:TRUE | Y:2000/N:DFFF | Read/Write |
| bit12 | bit12=Remote turn off  UPS | 0:FALSE/1:TRUE | Y:1000/N:EFFF | Read/Write |
| bit11 | bit11=Remote turn on UPS | 0:FALSE/1:TRUE | Y:800/N:F7FF | Read/Write |
| bit10 | bit10=Cancel shutdown | 0:FALSE/1:TRUE | Y:400/N:FBFF | Read/Write |
| bit9 | bit9=Cancel test | 0:FALSE/1:TRUE | Y:200/N:FDFF | Read/Write |
| bit8 | bit8=10 seconds test | 0:FALSE/1:TRUE | Y:100/N:FEFF | Read/Write |
| bit7 | bit7= Reservation |  |  |  |
| bit6 | bit6 = Reservation |  |  |  |
| bit5 | bit5= Reservation |  |  |  |
| bit4 | bit4 = Reservation |  |  |  |
|  | b3-b0 = Reservation |  |  |  |

**5. The result of control**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Hex | Dec | Size | Content | Bit value | Type |
| 0x0025 | 37 | bit15 | bit15=Flag:Silence buzzer beep | 0:FAIL/1:SUCCESS | Read only |
| bit14 | bit14=Flag:buzzer beep open | 0:FAIL/1:SUCCESS | Read only |
| bit13 | bit13=Flag:Test until battery low | 0:FAIL/1:SUCCESS | Read only |
| bit12 | bit12=Flag:Remote turn off UPS | 0:FAIL/1:SUCCESS | Read only |
| bit11 | bit11=Flag:Remote turn on UPS | 0:FAIL/1:SUCCESS | Read only |
| bit10 | bit10=Flag:Cancel shutdown | 0:FAIL/1:SUCCESS | Read only |
| bit9 | bit9=Flag:Cancel test | 0:FAIL/1:SUCCESS | Read only |
| bit8 | bit8=Flag:10 seconds test | 0:FAIL/1:SUCCESS | Read only |
| bit7 | bit7= Reservation | 0:FAIL/1:SUCCESS | Read only |
| bit6 | bit6 = Reservation | 0:FAIL/1:SUCCESS | Read only |
| bit5 | bit5= Reservation | 0:FAIL/1:SUCCESS | Read only |
| bit4 | bit4 = Reservation | 0:FAIL/1:SUCCESS | Read only |
|  | b3-b0 = Reservation | 0:FAIL/2:SUCCESS | Read only |

**6. Setting Parameter to default value**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Hex | Dec | Size | Content | Bit value | Type |
| 0x0030 | 48 | bit15 | bit15=Seting control parameter to default value | 0:FAIL/1:SUCCES  S | Read/Write |
|  | b14-b0 = Reservation |  |  |
| 0x003B | 59 | bit15 | bit15=Flag:Seting control parameter to default value | 0:FAIL/1:SUCCES  S | Read |
|  | b14-b0 = Reservation |  |  |

**7. UPS working status**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Hex | Dec | Size | Content | units | Type |
| 0x031E | 798 | 1 | R Input voltage | 0.1V | Read only |
| 0x031F | 799 | 1 | S Input voltage | 0.1V | Read only |
| 0x0320 | 800 | 1 | T Input voltage | 0.1V | Read only |
| 0x0321 | 801 | 1 | Input frequency | 0.1Hz | Read only |
| 0x0322 | 802 | 1 | R Output voltage | 0.1V | Read only |
| 0x0323 | 803 | 1 | S Output voltage | 0.1V | Read only |
| 0x0324 | 804 | 1 | T Output voltage | 0.1V | Read only |
| 0x0325 | 805 | 1 | Output frequency | 0.1Hz | Read only |
| 0x0326 | 806 | 1 | R Output current | 0.1A | Read only |
| 0x0327 | 807 | 1 | S Output current | 0.1A | Read only |
| 0x0328 | 808 | 1 | T Output current | 0.1A | Read only |
| 0x0329 | 809 | 1 | R Output load percent | 0.1% | Read only |
| 0x032A | 810 | 1 | S Output load percent | 0.1% | Read only |
| 0x032B | 811 | 1 | T Output load percent | 0.1% | Read only |
| 0x00AF | 175 | 1 | Total Output load percent | 0.1% | Read only |
| 0x032C | 812 | 1 | P Battery voltage | 0.1V | Read only |
| 0x032D | 813 | 1 | N Battery voltage | 0.1V | Read only |
| 0x032E | 814 | 1 | Max Temperature of the detecting pointers | 0.1C | Read only |
| 0x032F | 815 | 1 | status | Note1 | Read only |

**8. UPS battery information (sys or rack info inquiry addr)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 0x00BC | 188 | 1 | P Battery voltage | 0.1V | Read only |
| 0x00BD | 189 | 1 | P Battery Charging Current |  | Read only |
| 0x00BE | 190 | 1 | P Battery Discharging Current | Ah | Read only |
| 0x00BF | 191 | 1 | Battery Capacity | % | Read only |
| 0x00C0 | 192 | 1 | Battery Remain time(minute) | minutes | Read only |
| 0x00C1 | 193 | 1 | N Battery voltage | 0.1V | Read only |
| 0x00C2 | 194 | 1 | N Battery Charging Current |  | Read only |
| 0x00C3 | 195 | 1 | N Battery Discharging Current | Ah | Read only |
| 0x00C4 | 196 | 1 | -- | % | Read only |
| 0x00C5 | 197 | 1 | -- | minutes | Read only |
| 0x02ED | 749 | 1 | Battery mode work time | min | Read only |
| 0x0307 | 775 | 1 | Battery AH Number | AH | Read only |
| 0x0318 | 792 | 1 | -- | 0.01A | Read only |
| 0x0319 | 793 | 1 | -- | 0.01A | Read only |
| 0x0364 | 868 | 1 | Battery shutdown voltage | 0.1V | Read/Write |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 0x036A | 874 | 1 | Battery Low voltage | 0.1V | Read/Write |
| 0x05B0 | 1456 | 1 | Battery High voltage | 0.1V | Read/Write |
| 0x05B1 | 1457 | 1 | Battery max charging current | 0.1A | Read only |
| 0x05D5 | 1493 | 1 | Battery Bluk voltage | 0.1V | Read only |

**9.The temperature inquiry**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 0x00CC | 204 | 1 | heatsink temperature 1 | ℃ | Read only |
| 0x00CD | 205 | 1 | heatsink temperature 2 | ℃ | Read only |
| 0x00CE | 206 | 1 | cabinet temperature | ℃ | Read only |
| 0x00CF | 207 | 1 | battery temperature | ℃ | Read only |

**10. The three phase load inquiry**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 0x00DD | 221 | 1 | R phase of load | 0.1% | Read only |
| 0x00FC | 252 | 1 | S phase of load | 0.1% | Read only |
| 0x00FD | 253 | 1 | T phase of load | 0.1% | Read only |
| 0x00FE | 254 | 1 | The whole load | 0.1% | Read only |

**11. Load level inquiry**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 0x00B7 | 183 | 1 | Total VA percent | 0.1% | Read only |
| 0x00B8 | 184 | 1 | Total Watt percent | 0.1% | Read only |
| 0x030C | 780 | 1 | Load VA R | VA | Read only |
| 0x030D | 781 | 1 | Load VA S | VA | Read only |
| 0x030E | 782 | 1 | Load VA T | VA | Read only |
| 0x030F | 783 | 1 | Load Watt R | W | Read only |
| 0x0310 | 784 | 1 | Load Watt S | W | Read only |
| 0x0311 | 785 | 1 | Load Watt T | W | Read only |
| 0x0312 | 786 | 1 | R VA percent | 0.1% | Read only |
| 0x0313 | 787 | 1 | S VA percent | 0.1% | Read only |
| 0x0314 | 788 | 1 | T VA percent | 0.1% | Read only |
| 0x0315 | 789 | 1 | R Watt percent | 0.1% | Read only |
| 0x0316 | 790 | 1 | S Watt percent | 0.1% | Read only |
| 0x0317 | 791 | 1 | T Watt percent | 0.1% | Read only |

**12. The bypass three phase info**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 0x011A | 282 | 1 | R voltage of bypass | 0.1V | Read only |
| 0x011B | 283 | 1 | S voltage of bypass | 0.1V | Read only |
| 0x011C | 284 | 1 | T voltage of bypass | 0.1V | Read only |
| 0x011D | 285 | 1 | R current of bypass | 0.1A | Read only |
| 0x011E | 286 | 1 | S current of bypass | 0.1A | Read only |
| 0x011F | 287 | 1 | T current of bypass | 0.1A | Read only |
| 0x0123 | 291 | 1 | frequency of bypass | 0.1Hz | Read only |

**14. UPS working Mode**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 0x00D0 | 208 | 1 | UPS Mode inquiry | Note2 | Read only |

**15. UPS fault information**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 0x02A3 | 675 | 1 | Fault kind ASC | Note3 | Read only |

**16. Loss point**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Hex | Dec | Size | Content | Units | Type |
| 0x034A | 842 | 1 | Line Voltage High | V | Read only |
| 0x034B | 843 | 1 | Line Voltage Low | V | Read only |
| 0x034C | 844 | 1 | Line Frequency High | 0.1Hz | Read only |
| 0x034D | 845 | 1 | Line Frequency Low | 0.1Hz | Read only |
| 0x034E | 846 | 1 | Bypass Frequency High | 0.1Hz | Read/Write |
| 0x034F | 847 | 1 | Bypass Frequency Low | 0.1Hz | Read/Write |
| 0x0350 | 848 | 1 | Bypass Voltage High | V | Read/Write |
| 0x0351 | 849 | 1 | Bypass Voltage Low | V | Read/Write |
| 0x0352 | 850 | 1 | ECO Voltage High | V | Read/Write |
| 0x0353 | 851 | 1 | ECO Voltage Low | V | Read/Write |
| 0x0354 | 852 | 1 | ECO Frequency High | 0.1Hz | Read/Write |
| 0x0355 | 853 | 1 | ECO Frequency Low | 0.1Hz | Read/Write |

**19. Setting Parameter succeed or fail**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Hex | Dec | Size | Content | Bit value | type |
| 0x0384 | 900 | Bit15 | Flag:Bypass Frequency High | 0:FALSE/1:TRUE | Read only |
| Bit14 | Flag:Bypass Frequency Low | 0:FALSE/1:TRUE | Read only |
| Bit13 | Flag:Bypass Voltage High | 0:FALSE/1:TRUE | Read only |
| Bit12 | Flag:Bypass Voltage Low | 0:FALSE/1:TRUE | Read only |
| Bit11 | Flag:ECO Voltage High | 0:FALSE/1:TRUE | Read only |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Bit10 | Flag:ECO | | Voltage Low | 0:FALSE/1:TRUE | Read only |
| Bit9 | Flag:ECO | | Frequency High | 0:FALSE/1:TRUE | Read only |
| Bit8 | Flag:ECO | | Frequency Low | 0:FALSE/1:TRUE | Read only |
| Bit7 | Flag: | Battery shutdown voltage | | 0:FALSE/1:TRUE | Read only |
| Bit6 | Flag: | Battery Low voltage | | 0:FALSE/1:TRUE | Read only |
| Bit5 | Flag: | Battery High voltage | | 0:FALSE/1:TRUE | Read only |

**20. Remote shutdown and test**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Hex | | | Dec | | | Size | | | Content | | | Units/Bit value | | | Type | | |
| 0x03AB | | | 939 | | | 1 | | | Shutdown | | | minutes(ASCII) | | | Read/Write | | |
| 0x03AC | | | 940 | | | 1 | | | Test for specified time | | | minutes(ASCII) | | | Read/Write | | |
|  | 0x03AD |  |  | 941 |  |  | 1 |  |  | Shutdown and restore(N) |  |  | minutes(ASCII) |  |  | Read/Write |  |
| 0x03AE | | | 942 | | | 2 | | | Shutdown and restore(M) | | | minutes(ASCII) | | | Read/Write | | |
| 0x03DA | | | 986 | | | bit15 | | | B15=flag:Shutdown | | | 0:FAIL/1:SUCCESS | | | Read only | | |
| bit14 | | | B14=flag:Test for specified time | | | 0:FAIL/1:SUCCESS | | | Read only | | |
| bit13 | | | B13=flag:Shutdown and restore | | | 0:FAIL/1:SUCCESS | | | Read only | | |
|  | | | b12-b0=Reservation | | |  | | |  | | |

**21. CPU information**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Hex | Dec | Size | Content | Units | Type |
| 0x03E0 | 992 | 1 | Protocol ID Inquiry | ASCII | Read only |
| 0x03E1 | 993 | 10 | Main CPU Firmware version | ASCII | Read only |

**22. UPS model and rating information**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 0x03EB | 1003 | 7 | Main Production type | ASCII | Read only |
| Sub Production type | ASCII | Read only |
| VA type | ASCII | Read only |
| H/LV type | ASCII | Read only |
| Year | ASCII | Read only |
| Month | ASCII | Read only |
| Manufacturer ID | ASCII | Read only |
| Serial number | ASCII | Read only |
| 0x03F2 | 1010 | 1 | Battery Piece Number |  | Read only |
| 0x03F3 | 1011 | 1 | Battery standard voltage per unit | 0.1V | Read only |
| 0x03F4 | 1012 | 1 | Input phase |  | Read only |
| 0x03F5 | 1013 | 1 | Output phase |  | Read only |
| 0x03F6 | 1014 | 1 | Nominal I/P Voltage | V | Read only |
| 0x03F7 | 1015 | 1 | Nominal O/P Voltage | V | Read only |
| 0x03F8 | 1016 | 1 | Output power factor |  | Read only |
| 0x03F9 | 1017 | 2 | Output rated VA | W | Read only |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0x03FB | | | 1019 | | | 8 | | | | Device model | | | | ASCII | | | Read only | | |
| 0x048A | | | 1162 | | | 1 | | | | Battery Voltage | | | | 0.1V | | | Read only | | |
|  | 0x048B |  |  | 1163 |  |  | 1 | |  |  | Rating Output Current | |  |  | 0.1A |  |  | Read only |  |
| 0x048C | | | 1164 | | | 1 | | | | Rating Output Frequency | | | | 0.1Hz | | | Read/Write | | |
| 0x048D | | | 1165 | | | 1 | | | | Rating Output Voltage | | | | 0.1V | | | Read/Write | | |
|  | 0x048E |  |  | 1166 |  |  | 1 |  | |  | The parallel number. |  | |  | | |  | Read only |  |

**Note**

**1. Note1**

|  |  |
| --- | --- |
| Note 1: | |
| 815  （bit15-bit8） | bit15 bit14：  00: standy;  01: line-interactive;  10: on-line. |
| bit13: Utility Fail bit12: Battery Low  bit11: Bypass/Boost Active bit10: UPS Failed  bit9: EPO  bit8: Test in Progress |
| 815  （bit2-bit0） | Bit2: Shutdown Active bit1: bat silence  bit0: Bat test OK |

**2. Note2**

|  |  |  |
| --- | --- | --- |
| Note 2: | | |
| 0x00D0H | 0x50 | Power on mode |
| 0x53 | Standby mode |
| 0x59 | Bypass mode |
| 0x4C | Line mode |
| 0X42 | Battery mode |
| 0X54 | Battery test mode |
| 0X46 | Fault mode |
| 0X45 | HE/ECO mode |
| 0X43 | Converter mode |

0X44 Shutdown mode

**3. Note3**

|  |  |  |
| --- | --- | --- |
| Fault Kind | Fault  Number | Fault Name |
| Bus fault | 0x3031 | Bus start fail |
| 0x3032 | Bus volt over |
| 0x3033 | Bus volt under |
| 0x3034 | Bus volt unbalance |
| 0x3035 | Bus short |
| 0x3036 | PFC over current |
| 0x3037 | PFC IGBT over current |
| 0x3038 | Input contact fault |
| Inverter fault | 0x3131 | Inverter soft fail |
| 0x3132 | Inverter volt high |
| 0x3133 | Inverter volt low |
| 0x3134 | L1 inverter short |
| 0x3135 | L2 inverter short |
| 0x3136 | L3 inverter short |
| 0x3137 | L1L2 inverter short |
| 0x3138 | L2L3 inverter short |
| 0x3139 | L3L1 inverter short |
| 0x313A | L1 inverter negative power |
| 0x313B | L2 inverter negative power |
| 0x313C | L3 inverter negative power |
| Electric link fault | 0x3231 | Bat SCR short fault |
| 0x3232 | Line SCR short fault |
| 0x3233 | Inverter relay open fault |
| 0x3234 | Inverter relay short fault |
| 0x3235 | Wiring fault |
| 0x3236 | Battery reverse fault |
| 0x3237 | Battery too high |
| 0x3238 | Battery too low |
| 0x3239 | Battery Fuse |
| 0x3330 | Open-Circuit Fault |
| Parallel  system fault | 0x3331 | CAN communication fault |
| 0x3332 | Host line fault |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | 0x3333 | Synchronization line fault | | |
| 0x3334 | Synchronization pulse line fault | | |
| 0x3335 | Parallel communication line loss | | |
| 0x3336 | Output circuit fault | | |
| Others | 0x3431 | Over temperature | | |
| 0x3432 | CPU communication fault | | |
| 0x3433 | Overload fault | | |
| 0x3434 | Fan fault | | |
| 0x3435 | Charger fault | | |
| 0x3436 | Model fault | | |
| 0x3437 | MCU communication fault | | |
| 0x3438 | DSP firmware version incompatible | | |
| 0x3439 | IpOPPhaseError | | |
| 0x3441 |  |  |  |
| 0x3442 |  |  |  |
| 0x3443 |  |  |  |
| 0x3444 |  |  |  |
| 0x3445 |  |  |  |
| 0x3446 |  |  |  |
| 0x3630 | Inverter over current | | |
| 0x3631 | BypScrShort | | |
| 0x3632 | BypScrOpen | | |
| 0x3633 | RINVWaveAbnormal | | |
| 0x3634 | SINVWaveAbnormal | | |
| 0x3635 | TINVWaveAbnormal | | |
| 0x3636 | CTSatiation | | |
| 0x3637 | OPShort\_BYP | | |
| 0x3638 | OPLineShort\_BYP | | |
| 0x3639 | InvScrShort | | |
| 0x3641 | BusVoltVaryFault | | |

**Application example**

**1. Audible alarm Enable or Disable**

Look for Enable audible alarm, It in table address 0x000E bit15.Then you may write 0x8000 to

0x000E to Enable audible alarm or write 0xEFFF to 0x0E to disable audible alarm.

For example:

[XX 10 00 0E 00 01 02 80 00 CRCL CRCH]Mean: Enable audible alarm. [XX 10 00 0E 00 01 02 7F FF CRCL CRCH]Mean: Disable audible alarm.

Inquire the result of execute, you may read the follow address 0x10 bit15. For example:

[XX 03 00 10 00 01 CRCL CRCH]

[XX 03 02 80 00 CRCL CRCH]Mean: Execute success

[XX 03 02 00 00 CRCL CRCH]Mean: Execute fail

**2. Setting buzzer beeps Silent.**

Look for silence buzzer beep in address 0x001A bit 15 。Then you may write 0x8000 to

0x001A.

For example:

[XX 10 00 1A 00 01 02 80 00 CRCL CRCH]Silence buzzer beep. Inquire the execution result. You may read 0x0025

[XX 03 00 25 00 01 CRCL CRCH] to inquire the results of command.

**3. Setting control parameter to default value**

Look for setting control parameter to default value it ,then write 0x8000 to 0x0030.If execute success then set 0x003B bit15 to 1;

For example:

[XX 10 00 30 00 01 02 80 00 CRCL CRCH]Setting control parameter to default value.

[XX 03 00 3B 00 01 CRCL CRCH]to inquire the results of command.

**4. Get input voltage**

Look for input voltage in address 0x00AA, when read 0x00AA to get input voltage and it units is 0.1V

For example:

PC:[XX 03 00 AA 00 01 CRCL CRH] DEVICE:[XX 03 02 08 89 CRCL CRCH]

Mean: HEX [0x0889] to DEC[2185] .Input voltage:218.5V.

**5. Output socket status**

Inquire output socket status, Write socket number to 0x0345,then read 0x0346 to inquire socket status.

For example:

PC:[XX 10 03 45 00 01 02 01 00 CRCL CRCH] 01:Means inquire socket 1 status. PC:[XX 03 03 46 00 01 CRCL CRCH]

DEVICE:[XX 03 02 01 00 CRCL CRCH] 01:Means socket1 was on.

**6. Remote shut down the UPS**

Remote shut down the UPS, then write is a number ranging from (.2, .3, ..., 01, 02,..., to 10)to the 0x3AB.If execute success then 0x003DA bit0 was set to 1.

For example:

PC:[XX 10 03 AB 00 01 02 2E 32]Mean: Shut down the UPS in 0.2 minutes

**7. Shut down UPS and auto restart later**

Cut UPS output off in <n> minutes and waiting for <m> minutes and then turn on UPS output again. Then write n to 0x03AD and write m to 0x003AE.

For example:

PC:[XX 10 03 AD 00 03 06 2E 32 30 30 30 32 CRCL CRCH]Mean: Shut down the

UPS in 0.2 minutes and waiting

for 0002 minutes turn on the UPS.

**8. Setting Parameter item**

Set The bypass Voltage high loss point of UPS ,You want to Set the value 286V . Then write

0x011E to 0x0350 .

For example:

PC:[XX 10 03 50 00 01 02 01 1E CRCL CRCH]Mean: Set The bypass Voltage high loss point of UPS for 286V.