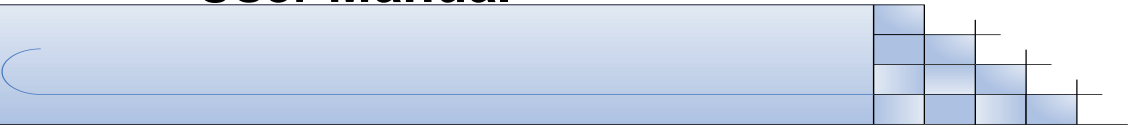


# MODBUS Communication Card



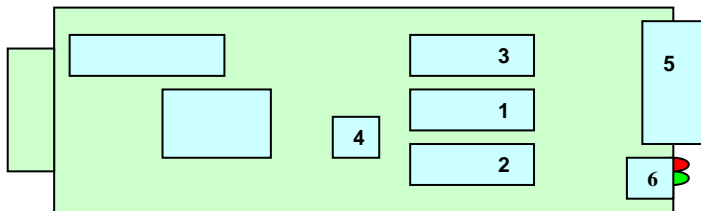
**User Manual**



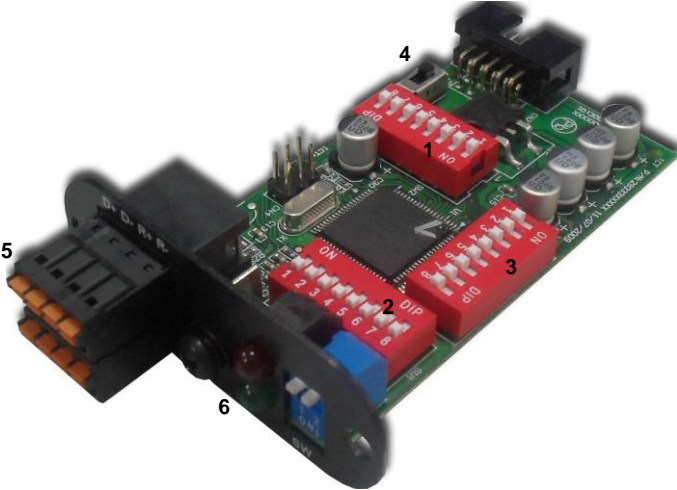
# 1 Presentation

## 1.1 Overview

MODBUS Card (Standard size):



**Mini MODBUS Card (Small size):**



1. MODBUS Card ID configuration switch
2. RS-232 Port configuration switch
3. RS-422 / 485 Port configuration switch
4. RS-422 / 485 selection switch
5. RS-422 / 485 and RS-232 communication port
6. Diagnostic LEDs

**Note: The Mini MODBUS card has an additional DIP switch, the DIP switch must be on when the Mini MODBUS card is working**

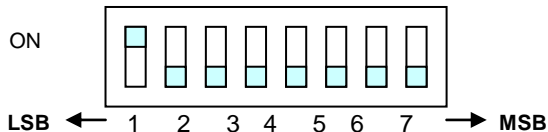
## 1.2 Function

- Provide UPS the functionality of communication with PC through MODBUS protocol
- Implementation of MODBUS RTU protocol
- Provide MODBUS function including Read Coils / Discrete Inputs / Holding Registers / Input Registers and Write Single Coil / Single Register
- Provide RS-422 / 485 and RS-232 interfaces. PC can communicate with UPS through RS-422 / 485 or RS-232 or both simultaneously.
- Provide alarm LEDs, users can tell communication status quickly.
- Except MODBUS protocol, also support 3Phase / Regular Protocols. Users can select communication protocol through function switches.
- Provide firmware upgrade functionality through RS-232 port.

## 2 Installation

### 2.1 ID Configuration of MODBUS Card

- Users can set card ID value from 0 to 255 through SW1.



As above setting, card ID will be 1.

- ID Configuration

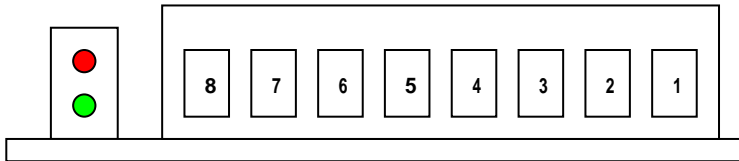
Protocol	Function	
MODBUS	Card ID is equal to 0	Use UPS ID to get UPS Info
	Card ID is not equal to 0	Use Card ID to get UPS Info
3Phase	Card ID is equal to 0	Use UPS ID to get UPS Info
	Card ID is not equal to 0	Use Card ID to get UPS Info
Regular	Card ID is equal to 0	Use UPS ID to get UPS Info
	Card ID is not equal to 0	Use Card ID to get UPS Info

## 2.2 Configuration of RS-232 Port

- Use SW2 to configure RS-232 interface.
- Pin-out

### MODBUS Card (Standard size):

CN3



## Mini MODBUS Card (Small size):



Pin	Function
6	Card TxD – transfer data to PC
7	Card RxD – receive data from PC
8	GND

Function	Switch		Value
ON/OFF	SW-1	SW-2	
	OFF	OFF	Mini-MODBUS OFF
	ON	ON	Mini-MODBUS ON



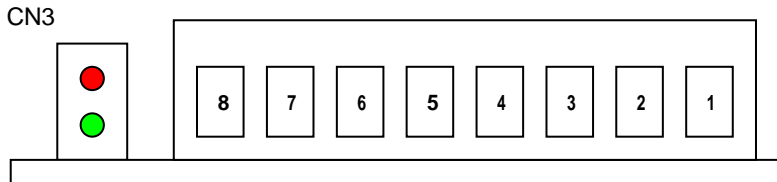
- RS-232 Port Configuration

Function	Switch		Value
Baud-rate	SW2-1	SW2-2	
	OFF	OFF	2400
	ON	OFF	4800
	OFF	ON	9600
	ON	ON	19200
Parity Check	SW2-3	OFF	Disable Parity Check
		ON	Enable Parity Check
	SW2-4	OFF	Even Parity
		ON	Odd Parity
Protocol	SW2-5	SW2-6	
	OFF	OFF	MODBUS Protocol
	ON	OFF	Regular Protocol
	OFF	ON	3Phase Protocol
	SW2-7	Reserved	
	SW2-8	Reserved	

## 2.3 Configuration of RS-422 / 485 Port

- Use SW3 to configure RS-422 / 485 interface
- Pin-out

### MODBUS Card (Standard size):



## Mini MODBUS Card (Small size):



Pin	Function
1	Card D+ (T+)
2	Card D- (T-)
3	Card R+
4	Card R-

- RS-485 / RS-422 Selection

Switch	Setting	Function
SW4	RS485	Enable RS-485
	RS422	Enable RS-422

- RS-422 / 485 Port Configuration

Function	Switch		Value
Baud-rate	SW3-1	SW3-2	
	OFF	OFF	2400
	ON	OFF	4800
	OFF	ON	9600
	ON	ON	19200
Parity Check	SW3-3	OFF	Disable Parity Check
		ON	Enable Parity Check
	SW3-4	OFF	Even Parity
		ON	Odd Parity
Protocol	SW3-5	SW3-6	
	OFF	OFF	MODBUS Protocol
	ON	OFF	Regular Protocol
	OFF	ON	3Phase Protocol

Termination Resistor	SW3-7	OFF	Disable RS-485 / 422 Termination Resistor
		ON	Enable RS-485 / 422 Termination Resistor
	SW3-8	OFF	Disable RS-422 Termination Resistor
		ON	Enable RS-422 Termination Resistor

## 2.4 LED Indicator

LED	Status	Description
Red LED	Dark	UPS is disconnected
	Flashing (1 second)	UPS is connected
Green LED	Light 0.2 second	When receive PC request

### 3 Operation

#### 3.1 Discrete Inputs (Range 0x0100 – 0x012F, Read Function 0x02)

Description	Address	Value 0	Value 1
Alarm Temperature	0x0100	OK	Over Temperature
Alarm Input Bad	0x0101	OK	Input Bad
Alarm Output Bad	0x0102	OK	Output Bad
Alarm Overload	0x0103	OK	Overload
Alarm Bypass Bad	0x0104	OK	Bypass Bad
Alarm Output Off	0x0105	Output On	Output Off
Alarm UPS Shutdown	0x0106	OK	Shutdown
Alarm Charger Failure	0x0107	OK	Charger Failure
Alarm System Off	0x0108	System On	System Off
Alarm Fan Failure	0x0109	OK	Fan Failure
Alarm Fuse Failure	0x010A	OK	Fuse Failure
Alarm General Fault	0x010B	OK	General Fault
Alarm Awaiting Power	0x010C	OK	Awaiting Power
Alarm Shutdown Pending	0x010D	OK	Shutdown Pending
Alarm Shutdown Imminent	0x010E	OK	Shutdown Imminent

Buzzer Status	0x010F	Silence	Alarm
Economic Mode	0x0110	No	Yes
Alarm Inverter Bad	0x0111	OK	Inverter Bad
Emergency Power Off	0x0112	Off	On
Buzzer State	0x0113	Disable	Enable
Battery Ground Fault	0x0114	OK	Battery Ground Fault
Reserved	0x0115		
Reserved	0x0116		
Reserved	0x0117		
Alarm Rectifier Main Fail	0x0118	OK	Rectifier Main Fail
Alarm Rectifier Hi DC Stop	0x0119	OK	Rectifier Hi DC Stop
Alarm Over Temperature or Fuse Fail	0x011A	OK	Over Temperature or Fuse Fail
Alarm Battery Low	0x011B	OK	Battery Low
Alarm Battery Low Stop	0x011C	OK	Battery Low Stop
Alarm Battery Ground Fault	0x011D	OK	Battery Ground Fault
Inverter ON	0x011E	Inverter OFF	Inverter ON
Alarm Inverter Overload	0x011F	OK	Inverter Overload

Alarm Inverter Abnormal	0x0120	OK	Inverter Abnormal
Alarm Load On Reserve	0x0121	Load Not On Reserve	Load On Reserve
Alarm Reserve Mains Fail	0x0122	OK	Reserve Mains Fail
Alarm Reserve Freq. Abnormal	0x0123	OK	Reserve Freq. Abnormal
Alarm Test In Progress	0x0124	No Test In Progress	Test In Progress
Alarm Test Error	0x0125	No Test Error	Test Error
UPS In Sleep Mode	0x0126	UPS Not In Sleep Mode	UPS In Sleep Mode
Reserved	0x0127		
Alarm Bypass Volt/Freq. Bad	0x0128	OK	Bypass Volt/Freq. Bad
Alarm Bypass Phase Sequence Bad	0x0129	OK	Bypass Phase Sequence Bad
Alarm Bypass STS Overload	0x012A	OK	Bypass STS Overload
Alarm Bypass STS Over	0x012B	OK	Bypass STS Over Temperature
Alarm Bypass STS Fault	0x012C	OK	Bypass STS Fault
Reserved	0x012D		
Reserved	0x012E		
Reserved	0x012F		

Remark: UPS may not support all of fields



### 3.2 Coils (Range 0x0200 – 0x020F, Read Function 0x01, Write Function 0x05)

Description	Address	Value 0	Value 1
UPS Buzzer	0x0200	Silence	Alarm
Shutdown Type	0x0201	UPS Output	UPS System
Economic Mode Setting	0x0202	Disable	Enable
ATX PC Reboot Function	0x0203	Disable	Enable
AC Fail & Restore Auto-Reboot	0x0204	Disable	Enable
ATX PC Resume Function	0x0205	Disable	Enable
Enable/Disable Buzzer	0x0206	Disable	Enable
EPO Setting	0x0207	Disable	Enable
Enable/Disable Inverter	0x0208	Disable	Enable
Clear SRAM	0x0209	Clear SRAM	Clear SRAM
Cancel Shutdown Restart	0x020A	Cancel Shutdown Restart	Cancel Shutdown Restart
Set Output On / Off	0x020B	OFF	ON
Reserved	0x020C		
Reserved	0x020D		
Reserved	0x020E		
Reserved	0x020F		

Remark: UPS may not support all of fields

### 3.3 Holding Register (Range 0x0300 – 0x0321, Read Function 0x03, Write Function 0x06)

Description	Address	Value	Unit
Shutdown Action	0x0300	0 – 9999(0=Abort)	Seconds
Shutdown Restart	0x0301	0 – 65535	Minutes
Test	0x0302	0 : Abort Test 1 : General Test 2 : BTV Test 3 : Test for 10 seconds 4 : Test until battery low	
UPS Identification	0x0303	0 – 99	
Low Transfer Voltage	0x0304	0 – 999	Voltage
High Transfer Voltage	0x0305	0 – 999	Voltage
Voltage Sensitivity	0x0306	0 : Normal 1 : Reduced 2 : Low	
Last Battery Replace Date - Year	0x0307	0 – 9999	

Last Battery Replace Date - Month	0x0308	1 - 12	
Last Battery Replace Date - Day	0x0309	1 - 31	
Next Battery Replace Date - Year	0x030A	0 – 9999	
Next Battery Replace Date - Month	0x030B	1 - 12	
Next Battery Replace Date - Day	0x030C	1 - 31	
UPS Periodic Auto-Test	0x030D	1 : Disable 2 : Daily 3 : Weekly 4 : Bi-Weekly 5 : Monthly	
Buzzer Test	0x030E	1 – 99	Seconds
UPS Boot Delay	0x030F	0 – 999	Seconds
Bypass Freq. Tolerance	0x0310	5 – 50	0.1Hz
Select Output Voltage	0x0311	0 – 999	Voltage
Test Time	0x0312	1 – 60	Minutes
Test Voltage	0x0313	0 – 999	Voltage
Reserved	0x0314		

Reserved	0x0315		
External Battery Pack	0x0316	0 - 10	
Dry Contact W1	0x0317		
Dry Contact W2	0x0318		
Dry Contact W3	0x0319		
Dry Contact W4	0x031A		
Dry Contact W5	0x031B		
Dry Contact W6	0x031C		
Bypass Low Transfer Voltage	0x031D	0 - 999	Voltage
Bypass High Transfer Voltage	0x031E	0 - 999	Voltage
Bypass Voltage Tolerance	0x031F	0 - 999	Voltage
Dry Contact Input Status 1	0x0320		
Dry Contact Input Status 2	0x0321		

Remark: UPS may not support all of fields

### 3.4 Input Register (Range 0x0400 – 0x051C, Read Function 0x04) Rating Value

Description	Address	Value	Unit
Series	0x0400	0: T 1: H 2: NT 3: NH	
Rating Input Voltage	0x0401	0 – 999	Voltage
Rating Input Frequency	0x0402	0 – 999	0.1Hz
Rating Output Voltage	0x0403	0 – 999	Voltage
Rating Output Frequency	0x0404	0 – 999	0.1Hz
Rating VA	0x0405	0 – 65534	10 VA
Rating Output Power	0x0406	0 – 65534	10 Watt
Low Battery Time	0x0407	0 – 99	Minutes
Low Tx Voltage Point	0x0408	0 – 999	Voltage
High Tx Voltage Point	0x0409	0 – 999	Voltage
Low Tx Voltage Upper Bound	0x040A	0 – 999	Voltage
Low Tx Voltage Lower Bound	0x040B	0 – 999	Voltage

High Tx Voltage Upper Bound	0x040C	0 – 999	Voltage
High Tx Voltage Lower Bound	0x040D	0 – 999	Voltage
UPS Type	0x040E	0 : On-Line 1 : Off-Line 2 : Line-Interactive 3 : 3Phase 4 : Split Phase 5 : Others	
Rating Battery Voltage	0x040F	0 – 999	Voltage
Low Tx Frequency Point	0x0410	0 – 999	0.1Hz
High Tx Frequency Point	0x0411	0 – 999	0.1Hz
Bypass Rating Frequency	0x0412	0 – 999	0.1Hz
Bypass Freq. Max Tolerance	0x0413	5 – 50	0.1Hz
Bypass Freq. Set Tolerance	0x0414	5 – 50	0.1Hz
Bypass Low Tx Voltage Point / Bypass Rating Voltage	0x0415	0 – 999	Voltage
Bypass High Tx Voltage Point	0x0416	0 – 999	Voltage

Bypass Low Tx Voltage Upper Bound / Bypass Voltage Max Tolerance	0x0417	0 – 999	Voltage
Bypass Low Tx Voltage Lower Bound / Bypass Voltage Set Tolerance	0x0418	0 – 999	Voltage
Bypass High Tx Voltage Upper Bound	0x0419	0 – 999	Voltage
Bypass High Tx Voltage Lower Bound	0x041A	0 – 999	Voltage
Reserved	0x041B		
Reserved	0x041C		
Reserved	0x041D		

## Battery Status

Description	Address	Value	Unit
Battery Condition	0x041E	0 : Good 1 : Weak 2 : Replace	
Battery Status	0x041F	0 : OK 1 : Low 2 : Depleted	
Battery Charge	0x0420	0 : Floating 1 : Charging 2 : Resting 3 : Discharging	
Seconds On Battery	0x0421	0 – 65534	Seconds
Estimated Minutes Remaining	0x0422	0 – 9999	
Estimated Charge Remaining	0x0423	0 – 999	
Battery Voltage	0x0424	0 – 9999	0.1Voltage
Battery Current	0x0425	0 – 9999	0.1Amp



Temperature	0x0426	0 – 999	Degree Celsius
Battery Level	0x0427	0 – 999	%
External Battery Pack #	0x0428	0 - 10	
Negative Battery Voltage	0x0429	0 – 9999	0.1 Voltage
Negative Battery Current	0x042A	0 – 9999	0.1 Amp
Negative Battery Temperature	0x042B	0 – 999	Degree Celsius
Negative Battery Level	0x042C	0 – 999	%
Reserved	0x042D		
Reserved	0x042E		
Reserved	0x042F		

## Input Status

Description	Address	Value	Unit
Input Number Lines	0x0430	0 – 9	
Input Frequency 1	0x0431	0 – 999	0.1Hz
Input Voltage 1	0x0432	0 – 9999	0.1 Voltage
Input Current 1	0x0433	0 – 9999	0.1 Amp

Input Power 1	0x0434	0 – 65534	10 Watt
Input Frequency 2	0x0435	0 – 999	0.1Hz
Input Voltage 2	0x0436	0 – 9999	0.1Voltage
Input Current 2	0x0437	0 – 9999	0.1Amp
Input Power 2	0x0438	0 – 65534	10 Watt
Input Frequency 3	0x0439	0 – 999	0.1Hz
Input Voltage 3	0x043A	0 – 9999	0.1Voltage
Input Current 3	0x043B	0 – 9999	0.1Amp
Input Power 3	0x043C	0 – 65534	10 Watt
Input Voltage 12	0x043D	0 – 9999	0.1Voltage
Input Voltage 23	0x043E	0 – 9999	0.1Voltage
Input Voltage 31	0x043F	0 – 9999	0.1Voltage
Reserved	0x0440		
Reserved	0x0441		

## Output Status

Description	Address	Value	Unit
Output Source	0x0442	0 : Normal 1 : Battery 2 : Bypass (Reserve) 3 : Reducing 4 : Boosting 5 : Manual Bypass 6 : Other 7 : None	
Output Frequency	0x0443	0 – 999	0.1Hz
Output Number Lines	0x0444	0 – 9	
Output Voltage 1	0x0445	0 – 9999	0.1Voltage
Output Current 1	0x0446	0 – 9999	0.1Amp
Output Power 1	0x0447	0 –65534	10 Watt
Output Load1	0x0448	0 – 999	%
Output Voltage 2	0x0449	0 – 9999	0.1Voltage

Output Current 2	0x044A	0 – 9999	0.1 Amp
Output Power 2	0x044B	0 – 65534	10 Watt
Output Load 2	0x044C	0 – 999	%
Output Voltage 3	0x044D	0 – 9999	0.1 Voltage
Output Current 3	0x044E	0 – 9999	0.1 Amp
Output Power 3	0x044F	0 – 65534	10 Watt
Output Load 3	0x0450	0 – 999	%
Output Voltage 12	0x0451	0 – 9999	0.1 Voltage
Output Voltage 23	0x0452	0 – 9999	0.1 Voltage
Output Voltage 31	0x0453	0 – 9999	0.1 Voltage
Reserved	0x0454		
Reserved	0x0455		

## Bypass Status

Description	Address	Value	Unit
Bypass Frequency	0x0456	0 – 999	0.1Hz
Bypass Number Lines	0x0457	0 – 9	
Bypass Voltage 1	0x0458	0 – 9999	0.1Voltage
Bypass Current 1	0x0459	0 – 9999	0.1Amp
Bypass Power 1	0x045A	0 – 65534	10 Watt
Bypass Voltage 2	0x045B	0 – 9999	0.1Voltage
Bypass Current 2	0x045C	0 – 9999	0.1Amp
Bypass Power 2	0x045D	0 – 65534	10 Watt
Bypass Voltage 3	0x045E	0 – 9999	0.1Voltage
Bypass Current 3	0x045F	0 – 9999	0.1Amp
Bypass Power 3	0x0460	0 – 65534	10 Watt
Bypass Voltage 12	0x0461	0 – 9999	0.1Voltage
Bypass Voltage 23	0x0462	0 – 9999	0.1Voltage
Bypass Voltage 31	0x0463	0 – 9999	0.1Voltage
Bypass STS Temperature	0x0464	0 - 999	Degree Celsius

Reserved	0x0465		
Reserved	0x0466		

### Test Status

Description	Address	Value	Unit
Test Result	0x0467	0 : No Test Performed 1 : Test Passed 2 : Test in Progress 3 : General Test Fault 4 : Battery Test Fault 5 : Deep Battery Test Fault 6 : Test Aborted	

### Output Relay

Description	Address	Value	Unit
Number of Output Relay	0x0468	0 : Not Available > 0 : Available (<=99)	

## Environment

Description	Address	Value	Unit
Temperature	0x0469	0 – 999	Degree Celsius
Humidify	0x046A	0 – 999	
Relay 1	0x046B	0 : Off 1 : On	
Relay 2	0x046C	0 : Off 1 : On	
Relay 3	0x046D	0 : Off 1 : On	
Relay 4	0x046E	0 : Off 1 : On	
Reserved	0x046F		
Reserved	0x0470		

## Select Voltage

Description	Address	Value	Unit
Selected Output Voltage	0x0471	0 – 999	Voltage
Select Output Voltage1	0x0472	0 – 999	Voltage
Select Output Voltage2	0x0473	0 – 999	Voltage
Select Output Voltage3	0x0474	0 – 999	Voltage

## SRAM EXIST

Description	Address	Value	Unit
SRAM EXIST	0x0475	0 : Not Exist    1 : Existed	

Remark: Currently, this field is not supported by UPS

## TempStatus

Description	Address	Value	Unit
TempStatus Byte 1,2	0x0476	Lo: Byte1    Hi: Byte2	
TempStatus Byte 3,4	0x0477		
TempStatus Byte 5,6	0x0478		
TempStatus Byte 7,8	0x0479		
TempStatus Byte 9,10	0x047A		
TempStatus Byte 11,12	0x047B		
TempStatus Byte 13,14	0x047C		
TempStatus Byte 15,16	0x047D		
TempStatus Byte 17,18	0x047E		
TempStatus Byte 19,20	0x047F		
Reserved	0x0480		



Reserved	0x0481		
----------	--------	--	--

Temp Byte1 (Lo): R Phase Inverter Temperature

Temp Byte2 (Hi) :

- B0: Temperature Warning ( $\geq 75^{\circ}\text{C}$ )
- B1: High Temperature Shutdown ( $\geq 85^{\circ}\text{C}$ )
- B2: Inverter Voltage too Low
- B3: Inverter Voltage too High
- B4: Overload Warning
- B5: Overload Shutdown
- B6: Inverter Fuse Fail Shutdown
- B7: Inv. PCB communication abnormal

Temp Byte3 (Lo): S Phase Inverter Temperature

Temp Byte4 (Hi) :

- B0: Temperature Warning ( $\geq 75^{\circ}\text{C}$ )
- B1: High Temperature Shutdown ( $\geq 85^{\circ}\text{C}$ )
- B2: Inverter Voltage too Low
- B3: Inverter Voltage too High
- B4: Overload Warning
- B5: Overload Shutdown
- B6: Inverter Fail Shutdown
- B7: Parallel Communication Abnormal

Temp Byte5 (Lo): T Phase Inverter Temperature

- Temp Byte6 (Hi) : B0: Temperature Warning ( $\geq 75^{\circ}\text{C}$ )  
B1: High Temperature Shutdown ( $\geq 85^{\circ}\text{C}$ )  
B2: Inverter Voltage too Low  
B3: Inverter Voltage too High  
B4: Overload Warning  
B5: Overload Shutdown  
B6: Inverter Freq. Abnormal Shutdown  
B7: Parallel Communication Fail
- Temp Byte7 (Lo): B3 .. B0: The Summary of UPS Run at Inverter Test Mode  
B7 .. B4: The Summary of UPS Run at Inverter Mode
- Temp Byte8 (Hi) : B0: Power Fail  
B1: EPO Happen  
B2: MB\_ON (To Bypass)  
B3: Battery Low Warning  
B4: Battery Low Shutdown  
B5: Master UPS (Output Sync)  
B6: Inverter DC Bus Abnormal Shutdown  
B7: Short Circuit Happen Shutdown
- Temp Byte9 (Lo) : Heatsink Temperature
- Temp Byte10 (Hi) : B0: Bypass Voltage Over

B1: Bypass Voltage Under  
B2: Bypass Freq. Abnormal  
B3: Bypass Phase Abnormal  
B4: Rectifier Voltage Over  
B5: Rectifier Voltage Under  
B6: Rectifier Freq. Abnormal  
B7: Rectifier Phase Abnormal

Temp Byte11 (Lo) : Ambient Temperature

Temp Byte12 (Hi) : B0: Bypass Voltage Over  
B1: Bypass Voltage Under  
B2: SSW at Bypass Side  
B3: SSW at Inverter Side  
B4: Rectifier Voltage Over  
B5: Rectifier Voltage Under  
B6: Rectifier Input Over Current  
B7: Rectifier Input Current Unbalance

Temp Byte13 (Lo) : Battery Temperature

Temp Byte14 (Hi) : B0: Bypass Voltage Over  
B1: Bypass Voltage Under  
B2: Low Battery Shutdown

- B3: Low Battery Warning
- B4: Rectifier Voltage Over
- B5: Rectifier Voltage Under
- B6: Rectifier Fail
- B7: DC Bus Over Voltage

- Temp Byte15 (Lo) :
- B0: TR1 Over Temperature (O/P TR Over Heat Shutdown)
  - B1: TR2 Input Choke Over Heat (I/P TR Over Heat Shutdown)
  - B2: Rectifier Over Temperature Warning ( $\geq 75^{\circ}\text{C}$ )
  - B3: Rectifier Over Temperature Shutdown ( $\geq 85^{\circ}\text{C}$ )
  - B4: Static Switch Over Temperature Warning ( $\geq 75^{\circ}\text{C}$ )
  - B5: Static Switch Over Temperature Shutdown ( $\geq 85^{\circ}\text{C}$ )
  - B6: Static Switch Overload
  - B7: Static Switch Fail

- Temp Byte16 (Hi) :
- B0: Converter Board Power Abnormal
  - B1: EPO Happen
  - B2: Manual Bypass On
  - B3: Converter Board Communication Error
  - B4: Battery Cabinet Over Temperature Warning ( $\geq 75^{\circ}\text{C}$ )
  - B5: Battery Ground Fault
  - B6: Battery Test in Progress
  - B7: Battery Test Fail

Temp Byte17: Reserved

Temp Byte18: Reserved

Temp Byte19: Reserved

Temp Byte20 (Hi) : B5: Ambiance Over Temperature

B7: Auxiliary Power Fail

Remark: Currently, TempStatus is not supported by UPS

### Parallel Master ID

Description	Address	Value	Unit
Parallel Master ID	0x0482	0 - 99	

### Available Event Log

Description	Address	Value	Unit
UPS Event Log	0x0483	0 – 500	
Event Log Report Format	0x0484	0 - 1	
Event Reporting Method	0x0485	0 - 1	

Event Log Report Format: 0: NT 9 byte format

1: NH 8 byte format

## Power Module Attribute

Description	Address	Value	Unit
Power Module ID / Attribute	0x0486	Lo: ID (1-4), Hi: Attribute	
Power Module ID / Attribute	0x0487		
Power Module ID / Attribute	0x0488		
Power Module ID / Attribute	0x0489		
Reserved	0x048A		
Reserved	0x048B		

Power Module Attribute: which is used to identify the attribute of the power module.

B0: PFC

B1: Rectifier

B2: Charger

B3: Inverter

B4: Bypass

B5: TBD

B6: TBD

B7: TBD

## Power Module General Status

Description	Address	Value	Unit
Power Module ID / General Status	0x048C	Lo: ID (1-4), Hi: Status	
Power Module ID / General Status	0x048D		
Power Module ID / General Status	0x048E		
Power Module ID / General Status	0x048F		
Reserved	0x0490		
Reserved	0x0491		

Power Module General Status:

B0: The power module exist or the power module is powered

B1:

B2:

B3:

B4:

B5:

B6:

B7: Fault shutdown

## Power Module PFC Status

Description	Address	Value	Unit
Power Module ID	0x0492	1-4	
PFC Status 0,1	0x0493	Lo: Status 0, Hi: Status 1	
Power Module ID	0x0494		
PFC Status 0,1	0x0495		
Power Module ID	0x0496		
PFC Status 0,1	0x0497		
Power Module ID	0x0498		
PFC Status 0,1	0x0499		
Reserved	0x049A		
Reserved	0x049B		
Reserved	0x049C		
Reserved	0x049D		

PFC Status:

B0: PFC fuse open shutdown

B1: PFC over temperature warning



B2: PFC over temperature shutdown

B3: DC bus over voltage warning

B4: DC bus over voltage shutdown

B5: DC bus under voltage warning

B6: DC bus under voltage shutdown

B7: PFC circuit general fault

B8: Fan failure

B9: TBD

B10: TBD

B11: TBD

B12: Inner communication failure

B13: TBD

B14: TBD

B15: Not calibrated (used to indicate whether the power module has been calibrated)

## Power Module Inverter Status

Description	Address	Value	Unit
Power Module ID / Status 0	0x049E	Lo: ID (1-4), Hi: Status 0	
Inverter Status 1,2	0x049F	Lo: Status 1, Hi: Status 2	
Power Module ID / Status 0	0x04A0		
Inverter Status 1,2	0x04A1		
Power Module ID / Status 0	0x04A2		
Inverter Status 1,2	0x04A3		
Power Module ID / Status 0	0x04A4		
Inverter Status 1,2	0x04A5		
Reserved	0x04A6		
Reserved	0x04A7		
Reserved	0x04A8		
Reserved	0x04A9		

Inverter Status:

B0: Inverter fuse open

B1: Inverter over temperature warning

B2: Inverter over temperature shutdown

B3: Fan failure

B4:

B5: Inverter short circuit

B6: Inverter STS failure

B7: Inverter voltage abnormal

B8: Inverter circuit general fault

B9: DC bus over voltage shutdown

B10: Inverter overload

B11:

B12: Inner communication loss (includes the comm. to system or other modules)

B13: EPO shutdown

B14: Inverter parallel communication loss

B15: Inverter parallel failure (which may due to any of ID, or rating setting conflict, etc...)

B16: TBD

B17: TBD

B18: TBD

B19: TBD

B20: TBD

B21: TBD

B22: TBD

B23: Not calibrated (used to indicate whether the power module has been calibrated)

## Power Module Charger Status

Description	Address	Value	Unit
Power Module ID / Charger Status	0x04AA	Lo: ID (1-4), Hi: Status	
Power Module ID / Charger Status	0x04AB		
Power Module ID / Charger Status	0x04AC		
Power Module ID / Charger Status	0x04AD		
Reserved	0x04AE		
Reserved	0x04AF		

Charger Status:

B0: Charger circuit general fault

B1-B7: Reserved

## Power Module Temperature Status

Description	Address	Value	Unit
Power Module ID	0x04B0	1 - 4	
Temperature PFC	0x04B1	0 – 9999	Degree Celsius
Temperature TBD	0x04B2	0 – 9999	Degree Celsius
Temperature INV	0x04B3	0 – 9999	Degree Celsius
Temperature INV R	0x04B4	0 – 9999	Degree Celsius
Temperature INV S	0x04B5	0 – 9999	Degree Celsius
Temperature INV T	0x04B6	0 – 9999	Degree Celsius
Power Module ID	0x04B7	1 - 4	
Temperature PFC	0x04B8	0 – 9999	Degree Celsius
Temperature TBD	0x04B9	0 – 9999	Degree Celsius
Temperature INV	0x04BA	0 – 9999	Degree Celsius
Temperature INV R	0x04BB	0 – 9999	Degree Celsius
Temperature INV S	0x04BC	0 – 9999	Degree Celsius
Temperature INV T	0x04BD	0 – 9999	Degree Celsius
Power Module ID	0x04BE	1 - 4	

Temperature PFC	0x04BF	0 – 9999	Degree Celsius
Temperature TBD	0x04C0	0 – 9999	Degree Celsius
Temperature INV	0x04C1	0 – 9999	Degree Celsius
Temperature INV R	0x04C2	0 – 9999	Degree Celsius
Temperature INV S	0x04C3	0 – 9999	Degree Celsius
Temperature INV T	0x04C4	0 – 9999	Degree Celsius
Power Module ID	0x04C5	1 - 4	
Temperature PFC	0x04C6	0 – 9999	Degree Celsius
Temperature TBD	0x04C7	0 – 9999	Degree Celsius
Temperature INV	0x04C8	0 – 9999	Degree Celsius
Temperature INV R	0x04C9	0 – 9999	Degree Celsius
Temperature INV S	0x04CA	0 – 9999	Degree Celsius
Temperature INV T	0x04CB	0 – 9999	Degree Celsius
Reserved	0x04CC		
Reserved	0x04CD		
Reserved	0x04CE		
Reserved	0x04CF		

Reserved	0x04D0		
Reserved	0x04D1		
Reserved	0x04D2		
Reserved	0x04D3		
Reserved	0x04D4		
Reserved	0x04D5		
Reserved	0x04D6		
Reserved	0x04D7		
Reserved	0x04D8		
Reserved	0x04D9		



## Power Module Inverter Voltage

Description	Address	Value	Unit
Power Module ID	0x04DA	1 – 4	
Inverter Voltage R	0x04DB	0 – 9999	0.1Voltage
Inverter Voltage S	0x04DC	0 – 9999	0.1Voltage
Inverter Voltage T	0x04DD	0 – 9999	0.1Voltage
Power Module ID	0x04DE	1 – 4	
Inverter Voltage R	0x04DB	0 – 9999	0.1Voltage
Inverter Voltage S	0x04DC	0 – 9999	0.1Voltage
Inverter Voltage T	0x04DD	0 – 9999	0.1Voltage
Power Module ID	0x04DE	1 – 4	
Inverter Voltage R	0x04DF	0 – 9999	0.1Voltage
Inverter Voltage S	0x04E0	0 – 9999	0.1Voltage
Inverter Voltage T	0x04E1	0 – 9999	0.1Voltage
Power Module ID	0x04E2	1 – 4	
Inverter Voltage R	0x04E3	0 – 9999	0.1Voltage
Inverter Voltage S	0x04E4	0 – 9999	0.1Voltage

Inverter Voltage T	0x04E5	0 – 9999	0.1Voltage
Power Module ID	0x04E6	1 – 4	
Inverter Voltage R	0x04E7	0 – 9999	0.1Voltage
Inverter Voltage S	0x04E8	0 – 9999	0.1Voltage
Inverter Voltage T	0x04E9	0 – 9999	0.1Voltage
Reserved	0x04EA		
Reserved	0x04EB		
Reserved	0x04EC		
Reserved	0x04ED		
Reserved	0x04EE		
Reserved	0x40EF		
Reserved	0x04F0		
Reserved	0x04F1		

## Battery Cabinet Temperature

Description	Address	Value	Unit
Battery Cabinet #1 Temperature	0x04F2	0 – 999	Degree Celsius
Battery Cabinet #2 Temperature	0x04F3	0 – 999	Degree Celsius
Battery Cabinet #3 Temperature	0x04F4	0 – 999	Degree Celsius
Battery Cabinet #4 Temperature	0x04F5	0 - 999	Degree Celsius
Reserved	0x04F6		
Reserved	0x04F7		

## Manufacture

Description	Address	Value	Unit
Manufacture Byte 0, 1	0x04F8	Lo: Byte0, Hi: Byte 1	
Manufacture Byte 2, 3	0x04F9	Lo: Byte2, Hi: Byte 3	
Manufacture Byte 4, 5	0x04FA	Lo: Byte4, Hi: Byte 5	
Manufacture Byte 6, 7	0x04FB	Lo: Byte6, Hi: Byte 7	
Manufacture Byte 8, 9	0x04FC	Lo: Byte8, Hi: Byte 9	
Manufacture Byte 10, 11	0x04FD	Lo: Byte10, Hi: Byte 11	
Manufacture Byte 12, 13	0x04FE	Lo: Byte12, Hi: Byte 13	
Manufacture Byte 14, 15	0x04FF	Lo: Byte14, Hi: Byte 15	
Reserved	0x0500		
Reserved	0x0501		
Reserved	0x0502		

## Model

Description	Address	Value	Unit
Model Byte 0, 1	0x0503	Lo: Byte0, Hi: Byte 1	
Model Byte 2, 3	0x0504	Lo: Byte2, Hi: Byte 3	
Model Byte 4, 5	0x0505	Lo: Byte4, Hi: Byte 5	
Model Byte 6, 7	0x0506	Lo: Byte6, Hi: Byte 7	
Model Byte 8, 9	0x0507	Lo: Byte8, Hi: Byte 9	
Model Byte 10, 11	0x0508	Lo: Byte10, Hi: Byte 11	
Model Byte 12, 13	0x0509	Lo: Byte12, Hi: Byte 13	
Model Byte 14, 15	0x050A	Lo: Byte14, Hi: Byte 15	
Reserved	0x050B		
Reserved	0x050C		
Reserved	0x050D		

## Firmware Version

Description	Address	Value	Unit
Firmware Version Byte 0, 1	0x050E	Lo: Byte0, Hi: Byte 1	
Firmware Version Byte 2, 3	0x050F	Lo: Byte2, Hi: Byte 3	
Firmware Version Byte 4, 5	0x0510	Lo: Byte4, Hi: Byte 5	
Firmware Version Byte 6, 7	0x0511	Lo: Byte6, Hi: Byte 7	
Firmware Version Byte 8, 9	0x0512	Lo: Byte8, Hi: Byte 9	
Firmware Version Byte 10, 11	0x0513	Lo: Byte10, Hi: Byte 11	
Firmware Version Byte 12, 13	0x0514	Lo: Byte12, Hi: Byte 13	
Firmware Version Byte 14, 15	0x0515	Lo: Byte14, Hi: Byte 15	
Reserved	0x0516		
Reserved	0x0517		
Reserved	0x0518		

## CPU

Description	Address	Value	Unit
CPU Byte 0, 1	0x0519	Lo: Byte0, Hi: Byte 1	
CPU Byte 2, 3	0x051A	Lo: Byte2, Hi: Byte 3	
Reserved	0x051B		

## UPS Connection Status

Description	Address	Value	Unit
UPS Connection Status	0x051C	0: Disconnection 1: Connection	

Remark: Filed value 0xFFFF in Input Registers represents that field is not supported by UPS



5011347201