Modbus Register Map: 3-Phase UPS Systems

990-3249 **10/2007**

//Absolute Starting Register Number, (Hexadecimal)	Absolute Starting Register Number, (Decimal)	Bit Position	Data Point	R/W	Length	Units	Valid Response
// Status Word 0							
40000	0	15–8	Reserved	R	1	BIT	
		7	1 = UPS ready to provide power to the load upon return of normal line voltage or upon user command			BIT	1 = State == Enable Load Disconnect (Output is off - But not due to delayed wakeup command)
		6	1 = UPS ready to provide power to the load upon user command			BIT	1 = State == Load Disconnect (Output is off) (Number of modules != 0) && (Bad Modules != Installed Modules)
		5	1 = UPS in bypass mode as a result of manual bypass control			BIT	1 = State == Manual Bypass (System bypass by front switch)
		4	1 = UPS returning from bypass			BIT	1 = State == Temporary Bypass (Bypass with intention of leaving bypass state)
		3	1 = UPS in bypass due to command			BIT	1 = State == Command Bypass (UPS Commanded into Bypass)
		2	Reserved				
		1	1 = UPS in bypass due to an internal fault (indicated through register 40002 or 40003)			BIT	1 = State == Temporary Bypass (Bypass with no intention of leaving)
		0	UPS turning on			BIT	1 = State == Wakeup (Output turning on - Waiting for modules to start, processing system overrides)
// Status Word 1							
40001	1	15–8	Reserved	R	1	BIT	
		7	1 = UPS fault - internal temperature exceeded nominal limits			BIT	Any battery is too hot (Cleared 2 minutes after battery cools off)
		6	Reserved			BIT	
		5	1 = Battery charger failure			BIT	Any module has reported a charger fault (Cleared when no module has a charger failure)
		4	1 = UPS in shutdown mode			BIT	State == Enable Load Disconnect (Output is off - Waiting for power to return)
		3	1 = UPS in sleep mode			BIT	State == Enable Load Disconnect (Output is off - By sleep with delayed wakeup command)
		2	Reserved			BIT	
		1	1 = UPS unable to transfer to on-battery operation due to overload			BIT	State == Load Disconnect (Output is off - No modules providing power to load, and bypass was not available)
		0	1 = UPS output not receiving power due to low battery shutdown			BIT	State == Enable Load Disconnect (Output is off - Due to low battery - Waiting for power to return)
// Status Word 2							
40002	2	15–6	Reserved	R	1	BIT	
		5	1 = UPS commanded out of bypass with no batteries connected – UPS in bypass			BIT	UPS Fault - UPS commanded to leave bypass state but no batteries were connected

//Absolute Starting Register Number, (Hexadecimal)	Absolute Starting Register Number, (Decimal)	Bit Position	Data Point	R/W	Length	Units	Valid Response
		4	1 = UPS fault - UPS in bypass			BIT	
		3	1 = Output voltage selection failure – UPS in bypass			BIT	1 = UPS fault - output voltage select failure, UPS in bypass
		2	Reserved			BIT	
		1	Reserved			BIT	
		0	1 = Fan failure			BIT	1 = UPS fault - UPS in bypass due to fan failure
// Status Word 3							
40003	3	15–8	Reserved	R	1	BIT	
		7	1 = Replace battery			BIT	
		6	1 = Low battery			BIT	Low Battery Runtime <= Low Battery Setting ("j" <= "q")
		5	1 = Overload			BIT	
		4	1 = On battery			BIT	1 = On battery - Any Module On Battery || Battery Discharging || Sim Power Failure || UPS Doing Self Test || Runtime Calibration
		3	1 = Online			BIT	
		2	Reserved			BIT	
		1	1 = Reboot/Sleep Mode			BIT	Symmetra sets this bit when in Reboot or Sleep Mode
		0	1 = Performing battery calibration discharge			BIT	
// Status Word 4							
40004	4	15–12	Reserved	R	1	BIT	
		11	1 = Backfeed relay open (fault)			BIT	
		10	1 = Site wiring fault			BIT	
		9	1 = Fault found in register 40033, 40034, 40035, or 40036			BIT	Fault found in abnormal condition register (second abnormal condition register)
		8	1 = Battery voltage high			BIT	
		7	1 = No batteries			BIT	
		6	1 = System not synchronized			BIT	
		5	1 = Output voltage out of range			BIT	
		4	1 = XR frame fault			BIT	Extended Run (XR) frame fault
		3	1 = Runtime below alarm threshold			BIT	
		2	1 = Load shutdown from bypass – Input frequency or voltage outside limits			BIT	
		1	1 = No good modules present			BIT	
		0	1 = Internal communication failure			BIT	
// Status Word 5							
40005	5	15	1 = RIM is in control	R	1	BIT	
		14	1 = System level fan failed			BIT	
		13	1 = Input CB tripped open			BIT	1 = Input circuit breaker tripped open
		12	1 = System is in maintenance bypass			BIT	
		11	1 = UPS in bypass due to overload			BIT	
		10	1 = UPS in bypass due to internal fault			BIT	
		9	1 = Bypass contactor stuck in online position			BIT	

//Absolute Starting Register Number, (Hexadecimal)	Absolute Starting Register Number, (Decimal)	Bit Position	Data Point	R/W	Length	Units	Valid Response
		8	1 = Bypass contactor stuck in bypass position			BIT	
		7	1 = Bypass not in range (either frequency or voltage unacceptable)			BIT	
		6	1 = Redundancy below threshold			BIT	
		5	1 = Loss of redundancy			BIT	
		4	1 = Load is above alarm threshold			BIT	
		3	1 = An installed battery has failed			BIT	
		2	1 = RIM is installed and failed			BIT	
		1	1 = IM is installed and failed			BIT	
		0	An installed Power Module has failed			BIT	
//							
40006	6		Line Quality	R	1	WORD	00FF = Acceptable utility line quality 0000 = Unacceptable utility line quality
40007	7		% Battery Capacity	R	1	WORD	%
40008	8		Runtime Remaining	R	1	WORD	Min
40009	9		Battery Voltage	R	1	WORD	V
4000A	10		UPS Internal Temperature		1	WORD	Present internal operating temperature (0-209°C) 00*XX* =Valid reading FF*XX* =Invalid reading (*XX* is sensor reading)
4000B	11		Amps Drawn By Load	R	1	WORD	A
4000C	12		Number of Battery Packs with Bad Batteries	R	1	WORD	Variable (1–99)
4000D	13		Number of Battery Packs	R	1	WORD	Variable (1–99)
4000E	14		% Power Drawn By Load	R	1	WORD	%
4000F	15		Maximum Input Voltage Since Last Reading	R	1	WORD	V
40010	16		Minimum Input Voltage Since Last Reading	R	1	WORD	V
40011	17		Nominal Battery Voltage	R	1	WORD	V
40012	18		Actual Battery Voltage	R	1	WORD	V
40013	19		Utility Input Frequency	R	1	WORD	Hz
40014	20		Utility Input Voltage Phase A	R	1	WORD	V
40015	21		Utility Input Current Phase A	R	1	WORD	A
40016	22		Bypass Input Voltage Phase A	R	1	WORD	V
40017	23		Percent of Maximum Output VA's Phase A @ n+0	R	1	WORD	%
40018	24		Percent of Maximum Output VA's Phase A @ n+x	R	1	WORD	%
40019	25		Output–Phase A	R	1	WORD	kVA
4001A	26		Output Voltage– Phase A	R	1	WORD	V
4001B	27		Output Current–Phase A	R	1	WORD	A
4001C	28		Peak Output Current–Phase A	R	1	WORD	A
4001D	29		Utility Input Voltage–Phase B	R	1	WORD	V

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4001E	30		Utility Input Current–Phase B	R	1	WORD	A
4001F	31		Bypass Input Voltage–Phase B	R	1	WORD	V
40020	32		Percent of Maximum Output VA's Phase B @ n+0	R	1	WORD	%
40021	33		Percent of Maximum Output VA's Phase B @ n+x	R	1	WORD	%
40022	34		Output–Phase B	R	1	WORD	kVA
40023	35		Output Voltage–Phase B	R	1	WORD	V
40024	36		Output Current–Phase B	R	1	WORD	A
40025	37		Peak Output Current–Phase B	R	1	WORD	A
40026	38		Utility Input Voltage–Phase C	R	1	WORD	V
40027	39		Utility Input Current–Phase C	R	1	WORD	A
40028	40		Bypass Input Voltage–Phase C	R	1	WORD	V
40029	41		Percent of Maximum Output VA's Phase C @ n+0	R	1	WORD	%
4002A	42		Percent of Maximum Output VA's Phase C @ n+x	R	1	WORD	%
4002B	43		Output–Phase C	R	1	WORD	kVA
4002C	44		Output Voltage–Phase C	R	1	WORD	V
4002D	45		Output Current–Phase C	R	1	WORD	A
4002E	46		Peak Output Current–Phase C	R	1	WORD	A
4002F	47		Measure-UPS Temperature Reading (sensor 1)	R	1	WORD	°C
40030	48		Measure-UPS Humidity Reading (sensor 1)	R	1	WORD	%
40031	49		Measure-UPS Temperature Reading (sensor 2)	R	1	WORD	°C
40032	50		Measure-UPS Humidity Reading (sensor 2)	R	1	WORD	%
40033	51		Reserved	R	1	WORD	
40034	52		Reserved	R	1	WORD	
// Status Word 8							
40035	53	15–2	Reserved	R	1	BIT	
		1	1 = Battery Charger Shut Down Externally			BIT	
		0	1 = System Startup Configuration Failed			BIT	
// Status Word 9							
40036	54	15	1 = Static bypass switch module removed	R	1	BIT	
		14	1 = UPS in forced bypass state			BIT	
		13	1 = System ID card failed			BIT	
		12	1 = System ID card removed			BIT	
		11	1 = Static bypass switch module fault			BIT	
		10	1 = Internal DC disconnect switch tripped			BIT	
		9	1 = Switchgear communication card removed			BIT	
		8	1 = Switchgear communication card failure			BIT	

//Absolute Starting Register Number, (Hexadecimal)	Absolute Starting Register Number, (Decimal)	Bit Position	Data Point	R/W	Length	Units	Valid Response
		7	1 = XR communication card removed			BIT	
		6	1 = XR communication card failure			BIT	
		5	1 = Battery monitor card removed			BIT	
		4	1 = Battery monitor card failure			BIT	
		3	1 = System power supply card failure			BIT	
		2	1 = External DC disconnect switch tripped			BIT	
		1	1 = Isolation transformer over temperature			BIT	
		0	1 = Maintenance bypass failure			BIT	
//							
40037	55		Measure-UPS Contact Position	R	1	WORD	
40038	56		Minimum Return Battery Capacity	R	1	WORD	%
40039	57		Lower Transfer Point	R	1	WORD	V
4003A	58		Upper Transfer Point	R	1	WORD	V
4003B	59		Nominal Output Voltage	R	1	WORD	V
4003C	60		Shutdown Delay	R	1	WORD	Sec
4003D	61		Low Battery Duration	R	1	WORD	Min
4003E	62		Turn On Delay	R	1	WORD	Sec
4003F	63		Sensitivity	R	1	WORD	Sensitivity
40040	64		UPS ID Character #1	R	1	WORD	
40041	65		UPS ID Character #2	R	1	WORD	
40042	66		UPS ID Character #3	R	1	WORD	
40043	67		UPS ID Character #4	R	1	WORD	
40044	68		UPS ID Character #5	R	1	WORD	
40045	69		UPS ID Character #6	R	1	WORD	
40046	70		UPS ID Character #7	R	1	WORD	
40047	71		UPS ID Character #8	R	1	WORD	
40048	72		Battery Current	R	1	WORD	A
40049-4004F	73–79		Reserved	R	1	WORD	
40050-FFFF	80–65535		INVALID ADDRESS				