



**MODBUS Protocol implementation Guide**

**03/02/2004**

**Emission**

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## 1 Supported System List and Compatibility

SYSTEM NAME	System Type	SERIAL PROTOCOL	FRONT PANEL CODE	Firmware Revision
B1000I	UPS 3ph-1ph	SEC	FD0124	DMES_UPS.BIN Ver 4.XX
E2001.0	UPS 3ph-1ph	SEC	FD0092	DMES_UPS.BIN Ver 4.XX
			FD0120	
			FD0121	
			FD0122	
			FD0123	
			FD0124	
			FD0128	
B4000	UPS 3ph-3ph	SEC	FD0099	NCP 2V4.BIN
		BORRI	FD0101	UPS 7.0.4.BIN
		BORRI	FD0127	SFP_UPS.BIN Ver 1.X.X
		BAM	FD0153	SFP_UPS_BAM1.BIN Ver 2.X
B6000	UPS 3ph-3ph	BORRI	FD0078	V 6.23 BIN SEG
GMB	UPS 3ph-1ph	BORRI	FD0127	SFP_UPS.BIN Ver 1.X.X
		BAM	FD0153	SFP_UPS_BAM1.BIN Ver 2.X
GTB	UPS 3ph-3ph	BORRI	FD0127	SFP_UPS.BIN Ver 1.X.X
		BAM	FD0153	SFP_UPS_BAM1.BIN Ver 2.X
ITB	Inverter 3ph	BAM	FD0130 FD0132 FD0134	SFP_INV.BIN Ver 2.X
IMB	Inverter 1ph	BAM	FD0130 FD0132 FD0134	SFP_INV.BIN Ver 2.X
RTB	Rectifier	BAM	FD0151 FD0131 FD0133	SFP_RAD.BIN Ver 2.X.X
B4000FC	Frequency Converter (with battery)	BAM	FD0135	SFP_UPS_BAM1.BIN Ver 2.X
	Frequency Converter (without battery)	BAM	FD0136	SFP_UPS_BAM1.BIN Ver 2.X
B5000	UPS 3ph-3ph	BPCP	FS1128	SPNLAPPR.ABS Ver 1.X.X
B7000	UPS 3ph-3ph	BPCP	FD0150	SPNLAPPR.ABS Ver 1.X.X

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## 2 B10001 - UPS with FD0124 Panel (SEC Protocol)

Register	Description	Length	Format	Values	Units
97	QUERY BATTERY VOLTAGE	1	Integer	Example: 0432	Vdc
98	QUERY BATTERY CHARGE	1	Bool	00=Floating 01=Charging 03=Discharging	Status
99	QUERY ESTIMATED MINUTES	1	Integer	Example: 100	Min
100	QUERY ESTIMATED CHARGE	1	Integer	Example: 050	%
101	QUERY OUTPUT SOURCE	1	Bool	0=Normal 1=On Battery 2=On Bypass 5=Other	Status
102	QUERY OUTPUT FREQUENCY	1	Integer	Example: 050	Hz
103	QUERY OUTPUT VOLTAGE	1	Integer	Example: 0220	Vac
104	QUERY OUTPUT CURRENT	1	Integer	Example: 050	Iac
105	QUERY OUTPUT LOAD	1	Integer	Example: 050	%
106	QUERY ALARM INPUT BAD	1	Bool	01=Input Fault 00=Input OK	Status
107	QUERY ALARM OVERLOAD	1	Bool	01=UPS Overloaded 00=UPS not Overloaded	Status
108	QUERY ALARM BYPASS BAD	1	Bool	01=Bypass Fault 00=Bypass OK	Status
109	QUERY ALARM CHARGER FAILURE	1	Bool	01=Charger Fault 00=Charger OK	Status
110	QUERY ALARM GENERAL FAULT	1	Bool	01=System System Fault 00=General System OK	Status
111	QUERY ALARM SHUT DOWN PENDING	1	Bool	01=Shutdown Pending 00=No Shutdown Pending	Status
112	QUERY ALARM SHUT DOWN IMMINENT	1	Bool	01=Shutdown Imminent 00=No Shutdown Imminent	Status
113	QUERY TEST RESULT SUMMARY	1	Bool	00=No Test Peformed 01=Test Passed 02=Test in Progress 04=Battery Test Failed	Status

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## 3 E2001.0 - UPS with FD0124-122-121-128-092-123-120-140 Panel (SEC protocol)

Register	Description	Length	Format	Values	Units
97	QUERY BATTERY VOLTAGE	1	Integer	Example: 0432	Vdc
101	QUERY OUTPUT SOURCE	1	Bool	0=Normal 1=On Battery 2=On Bypass 5=Other	Status
102	QUERY OUTPUT FREQUENCY	1	Integer	Example: 050	Hz
103	QUERY OUTPUT VOLTAGE	1	Integer	Example: 0220	Vac
104	QUERY OUTPUT CURRENT	1	Integer	Example: 040	Iac
105	QUERY OUTPUT LOAD	1	Integer	Example: 050	%
106	QUERY ALARM INPUT BAD	1	Bool	01=Input Fault 00=Input OK	Status
107	QUERY ALARM OVERLOAD	1	Bool	01=UPS Overloaded 00=UPS not Overloaded	Status
108	QUERY ALARM BYPASS BAD	1	Bool	01=Bypass Fault 00=Bypass OK	Status
109	QUERY ALARM CHARGER FAILURE	1	Bool	01=Charger Fault 00=Charger OK	Status
110	QUERY ALARM GENERAL FAULT	1	Bool	01=System System Fault 00=General System OK	Status
111	QUERY ALARM SHUT DOWN PENDING	1	Bool	01=Shutdown Pending 00=No Shutdown Pending	Status
112	QUERY ALARM SHUT DOWN IMMINENT	1	Bool	01=Shutdown Imminent 00=No Shutdown Imminent	Status

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## 4 B4000 - UPS with FD0099 Panel (SEC protocol)

Register	Description	Length	Format	Values	Units
97	QUERY ESTIMATED MINUTES	1	Integer	Example: 0255	Min
98	QUERY ESTIMATED CHARGE	1	Integer	Example: 0100	%
99	QUERY OUTPUT SOURCE	1	Bool	0=Normal 1=On Battery 2=On Bypass 5=Other	Status
100	QUERY OUTPUT FREQUENCY	1	Integer	Example: 050	Hz
101	QUERY OUTPUT VOLTAGE PHASE R	1	Integer	Example: 0220	Vac
102	QUERY OUTPUT VOLTAGE PHASE S	1	Integer	Example: 0220	Vac
103	QUERY OUTPUT VOLTAGE PHASE T	1	Integer	Example: 0220	Vac
104	QUERY OUTPUT CURRENT PHASE R	1	Integer	Example: 050	lac
105	QUERY OUTPUT CURRENT PHASE S	1	Integer	Example: 060	lac
106	QUERY OUTPUT CURRENT PHASE T	1	Integer	Example: 080	lac
107	QUERY OUTPUT LOAD PHASE R	1	Integer	Example: 020	%
108	QUERY OUTPUT LOAD PHASE S	1	Integer	Example: 030	%
109	QUERY OUTPUT LOAD PHASE T	1	Integer	Example: 040	%
110	QUERY ALARM TEMPERATURE BAD	1	Bool	01=Over Temperature 00=Temperature OK	Status
111	QUERY ALARM INPUT BAD	1	Bool	01=Input Fault 00=Input OK	Status
112	QUERY ALARM OVERLOAD	1	Bool	01=UPS Overloaded 00=UPS not Overloaded	Status
113	QUERY ALARM BYPASS BAD	1	Bool	01=Bypass Fault 00=Bypass OK	Status
114	QUERY ALARM CHARGER FAILURE	1	Bool	01=Charger Fault 00=Charger OK	Status
115	QUERY ALARM GENERAL FAULT	1	Bool	01=System System Fault 00=General System OK	Status
116	QUERY ALARM SHUT DOWN PENDING	1	Bool	01=Shutdown Pending 00=No Shutdown Pending	Status
117	QUERY TEST RESULT SUMMARY	1	Bool	00=No Test Peformed 01=Test Passed 02=Test in Progress 03=General Test Failed 04=Battery Test Failed 05=Deep Battery Test Failed	Status

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## 5 B4000 - UPS with FD0101 Panel (BORRI protocol)

Register	Description	Length	Format	Values	Units
1	QUERY VOLTAGE PHASE R INPUT UPS <b>(1)</b>	1	Integer	Example: 0380	Vac
2	QUERY VOLTAGE PHASE S INPUT UPS <b>(1)</b>	1	Integer	Example: 0380	Vac
3	QUERY VOLTAGE PHASE T INPUT UPS <b>(1)</b>	1	Integer	Example: 0380	Vac
4	QUERY VOLTAGE PHASE R OUTPUT UPS	1	Integer	Example: 0220	Vac
5	QUERY VOLTAGE PHASE S OUTPUT UPS	1	Integer	Example: 0220	Vac
6	QUERY VOLTAGE PHASE T OUTPUT UPS	1	Integer	Example: 0220	Vac
7	QUERY CURRENT PHASE R OUTPUT UPS	1	Integer	Example: 0020	Iac
8	QUERY CURRENT PHASE S OUTPUT UPS	1	Integer	Example: 0030	Iac
9	QUERY CURRENT PHASE T OUTPUT UPS	1	Integer	Example: 0040	Iac
10	QUERY BATTERY VOLTAGE	1	Integer	Example: 0432	Vdc
12	QUERY UPS RATING	1	Integer	Example: 0120	Kva
13	QUERY CALCULATED BATTERY AUTONOMY	1	Integer	Example: 200	Min
15	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 1	1	Bool	01=Inverter Feeding 00=Inverter Not Feeding	Status
16	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 2	1	Bool	01=Inverter Synchronised 00=Inverter Not Synchronised	Status
18	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 4	1	Bool	01=Inverter Overloaded 00=Inverter Not Overloaded	Status
19	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 5	1	Bool	01=Inverter Overtemperature 00=Inverter Temperature OK	Status
20	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 6	1	Bool	01=Inverter OK 00=Inverter Not OK	Status
21	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 7	1	Bool	01=Battery Discharging 00=Battery Not Discharging	Status
22	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 8	1	Bool	01=Battery Switch Open 00=Battery Switch Close	Status
23	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 9	1	Bool	01=Rectifier ON 00=Rectifier OFF	Status
28	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit E	1	Bool	01=Retransfer Blocked 00=Retransfer Not Blocked	Status
29	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit F	1	Bool	01=Bypass Mains OK 00=Bypass Mains Not OK	Status
30	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit 0	1	Bool	01=Rectifier Mains OK 00=Rectifier Mains Not OK	Status
31	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit 1	1	Bool	01=Rectifier Failure 00=Rectifier OK	Status
32	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit 2	1	Bool	01=Rectifier Overtemperature 00=Rectifier Temperature OK	Status
33	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit 3	1	Bool	01=Rectifier Overloaded 00=Rectifier Not Overloaded	Status
34	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit 4	1	Bool	01=Boost Charge ON 00=Boost Charge OFF	Status
37	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit 7	1	Bool	01=Blown Fuses 00=Fuses OK	Status

**(1) Required optional measures card GMV / DMP (Part-Number : FS0903)**

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Register	Description	Length	Format	Values	Units
40	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit A	1	Bool	01=System Alarm ON 00=System Alarm OFF	Status
41	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit B	1	Bool	01=Common Alarm ON 00=Common Alarm OFF	Status
42	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit C	1	Bool	01=Bypass System Not Available 00=Bypass System Available	Status
43	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit D	1	Bool	01=IUG Opened 00=IUG Closed	Status
44	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit E	1	Bool	01=IBY Closed 00=IBY Opened	Status
45	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit F	1	Bool	01=Inverter or Paralleling Fault 00=Inverter and Paralleling OK	Status
46	QUERY FREQUENCY INVERTER	1	Integer	Example: 050	Hz
47	QUERY FREQUENCY UPS OUTPUT	1	Integer	Example: 050	Hz
54	QUERY MAINS VOLTAGE PHASE R <b>(1)</b>	1	Integer	Example: 0400	Vac
55	QUERY MAINS VOLTAGE PHASE S <b>(1)</b>	1	Integer	Example: 0400	Vac
56	QUERY MAINS VOLTAGE PHASE T <b>(1)</b>	1	Integer	Example: 0400	Vac
57	QUERY MAINS CURRENT <b>(1)</b>	1	Integer	Example: 0050	Iac
58	QUERY TOTAL OUTPUT POWER (VA)	2	Integer	Example: 050	Va
60	QUERY TOTAL OUTPUT POWER (%)	1	Integer	Example: 050	%

**(1) Required optional measures card GMV / DMP (Part-Number : FS0903)**

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## 6 B4000 and GTB - UPS with FD0153 Panel (BAM Protocol – Fw Release 2.x.x)

Register	Description	Length	Format	Values	Units
1	QUERY VOLTAGE PHASE R INPUT UPS <b>(2)</b>	1	Integer	Example: 0380	Vac
2	QUERY VOLTAGE PHASE S INPUT UPS <b>(2)</b>	1	Integer	Example: 0380	Vac
3	QUERY VOLTAGE PHASE T INPUT UPS <b>(2)</b>	1	Integer	Example: 0380	Vac
4	QUERY CURRENT PHASE R INPUT UPS <b>(2)</b>	1	Integer	Example: 0100	Iac
5	QUERY CURRENT PHASE S INPUT UPS <b>(2)</b>	1	Integer	Example: 0200	Iac
6	QUERY CURRENT PHASE T INPUT UPS <b>(2)</b>	1	Integer	Example: 0300	Iac
7	QUERY FREQUENCY INPUT UPS <b>(2)</b>	1	Integer	Example: 0050	Hz
8	QUERY VOLTAGE PHASE R OUTPUT UPS	1	Integer	Example: 0220	Vac
9	QUERY VOLTAGE PHASE S OUTPUT UPS	1	Integer	Example: 0220	Vac
10	QUERY VOLTAGE PHASE T OUTPUT UPS	1	Integer	Example: 0220	Vac
11	QUERY CURRENT PHASE R OUTPUT UPS	1	Integer	Example: 0050	Iac
12	QUERY CURRENT PHASE S OUTPUT UPS	1	Integer	Example: 0060	Iac
13	QUERY CURRENT PHASE T OUTPUT UPS	1	Integer	Example: 0070	Iac
14	QUERY FREQUENCY OUTPUT UPS	1	Integer	Example: 0050	Hz
15	QUERY MAINS VOLTAGE PHASE R <b>(2)</b>	1	Integer	Example: 0400	Vac
16	QUERY MAINS VOLTAGE PHASE S <b>(2)</b>	1	Integer	Example: 0400	Vac
17	QUERY MAINS VOLTAGE PHASE T <b>(2)</b>	1	Integer	Example: 0400	Vac
18	QUERY MAINS CURRENT PHASE R <b>(2)</b>	1	Integer	Example: 0020	Iac
19	QUERY MAINS CURRENT PHASE S <b>(2)</b>	1	Integer	Example: 0030	Iac
20	QUERY MAINS CURRENT PHASE T <b>(2)</b>	1	Integer	Example: 0040	Iac
21	QUERY MAINS FREQUENCY <b>(2)</b>	1	Integer	Example: 0050	Hz
22	QUERY INVERTER OUTPUT MEAN VOLTAGE	1	Integer	Example: 0220	Vac
23	QUERY INVERTER OUTPUT FREQUENCY	1	Integer	Example: 0050	Hz
24	QUERY BATTERY VOLTAGE	1	Integer	Example: 0432	Vdc
25	QUERY RECTIFIER CURRENT <b>(3)</b>	1	Integer	Example: 0100	I <sub>dc</sub>
26	QUERY BATTERY CURRENT <b>(3)</b>	1	Integer	Example: 0200	I <sub>dc</sub>
27	QUERY CALCULATED BATTERY AUTONOMY	1	Integer	Example: 100	Mins
28	QUERY TOTAL OUTPUT POWER	2	Integer	Example:	Va - %
30	QUERY OUTPUT POWER LOAD% PHASE R	1	Integer	Example: 100	Va
31	QUERY OUTPUT POWER LOAD% PHASE S	1	Integer	Example: 100	Va
32	QUERY OUTPUT POWER LOAD% PHASE T	1	Integer	Example: 100	Va
33	QUERY UPS RATING IN KVA	1	Integer	Example: 100	Kva

**(2) Required optional measures card SFP / ACM (Part-Number : FS1159)**

**(3) Required optional measures card SFP / DCM (Part-Number : FS1160)**

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Register	Description	Length	Format	Values	Units
34	QUERY BATTERY CAPACITY	1	Integer	Example: 100	Ah
86	CS121 AUX INPUT 1 STATUS	1	Bool	01=Aux Digital input 1 Close 00=Aux Digital Input 1 Open	Status
87	CS121 AUX INPUT 2 STATUS	1	Bool	01=Aux Digital input 2 Close 00=Aux Digital Input 2 Open	Status
88	CS121 AUX INPUT 3 STATUS	1	Bool	01=Aux Digital input 3 Close 00=Aux Digital Input 3 Open	Status
89	CS121 AUX INPUT 4 STATUS	1	Bool	01=Aux Digital input 4 Close 00=Aux Digital Input 4 Open	Status
96	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 0	1	Bool	01=Inverter OK 00=Inverter not OK	Status
97	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 1	1	Bool	01=Battery Discharging 00=Battery Not Discharging	Status
98	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 2	1	Bool	01=Inverter Overtemperature 00=Inverter Temperature OK	Status
99	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 3	1	Bool	01=Inverter Overloaded 00=Inverter Not Overloaded	Status
100	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 4	1	Bool	01=Inverter Synchronised 00=Inverter Not Synchronised	Status
101	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 5	1	Bool	01=Inverter Feeding 00=Inverter Not Feeding	Status
102	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 6	1	Bool	01=Retransfer Blocked 00=No Retransfer Blocked	Status
103	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 7	1	Bool	01=Any Inverter Ready 00=Any Inverter Not Ready	Status
104	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 8	1	Bool	01=Bypass Mains OK 00=Bypass Mains Not OK	Status
105	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 9	1	Bool	01=Bypass Synchronised 00=Bypass Not Synchronised	Status
106	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit A	1	Bool	01=Bypass Feeding 00=Bypass Not Feeding	Status
107	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit B	1	Bool	01=Bypass Available 00=Bypass Not Available	Status
108	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit C	1	Bool	01=Bypass System Not Available 00=Bypass System Available	Status

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Register	Description	Length	Format	Values	Units
109	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit D	1	Bool	01=Any IBY Closed 00=Any IBY Open	Status
110	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit E	1	Bool	01=Auxiliary Alarm 00=No Auxiliary Alarm	Status
111	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit F	1	Bool	01=IUG Close 00=IUG Open	Status
112	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit 0	1	Bool	01=Rectifier Failure 00=Rectifier OK	Status
113	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit 1	1	Bool	01=Rectifier Mains OK 00=Rectifier Mains Not OK	Status
114	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit 2	1	Bool	01=Rectifier Overloaded 00=Rectifier Not Overloaded	Status
115	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit 3	1	Bool	01=Rectifier Overtemperature 00=Rectifier Temperature OK	Status
116	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit 4	1	Bool	01=Battery Switch Open 00=Battery Switch Close	Status
117	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit 5	1	Bool	01=Manual Charge ON 00=Manual Charge OFF	Status
118	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit 6	1	Bool	01=Boost Charge ON 00=Boost Charge OFF	Status
119	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit 7	1	Bool	01=Blown Fuses 00=Fuses OK	Status
120	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit 8	1	Bool	01=Bypass Not Installed 00=Bypass Installed	Status
121	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit 9	1	Bool	01=Hot Stand-By 00=Not Hot Stand-By	Status
122	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit A	1	Bool	01=Battery Not Installed 00=Battery Installed	Status
123	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit B	1	Bool	01=Aux Battery Contact Inst. 00=Aux Battery Contact Not Inst	Status
124	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit C	1	Bool	01=Inverter OFF 00=inverter ON	Status
125	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit D	1	Bool	01=Paralleling Fault 00=Paralleling OK	Status
126	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit E	1	Bool	01=Single Unit 00=Paralleling Unit	Status
127	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit F	1	Bool	01=Rectifier OFF 00=Rectifier ON	Status
128	QUERY CALCULATED BATTERY AUTONOMY (PERCENT)	1	Integer	Example: 100	%
129	QUERY TOTAL OUTPUT POWER (PERCENT)	1	Integer	Example: 100	%

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## 7 B4000 and GTB - UPS with FD0127 Panel (Borri Protocol – Fw Release 1.X.X)

Register	Description	Length	Format	Values	Units
1	QUERY MEAN VOLTAGE INVERTER OUTPUT	1	Integer	Example: 0380	Vac
2	QUERY VOLTAGE PHASE R OUTPUT UPS	1	Integer	Example: 0220	Vac
3	QUERY VOLTAGE PHASE S OUTPUT UPS	1	Integer	Example: 0220	Vac
4	QUERY VOLTAGE PHASE T OUTPUT UPS	1	Integer	Example: 0220	Vac
5	QUERY CURRENT PHASE R OUTPUT UPS	1	Integer	Example: 0020	Iac
6	QUERY CURRENT PHASE S OUTPUT UPS	1	Integer	Example: 0030	Iac
7	QUERY CURRENT PHASE T OUTPUT UPS	1	Integer	Example: 0040	Iac
8	QUERY BATTERY VOLTAGE	1	Integer	Example: 0432	Vdc
9	QUERY BATTERY CAPACITY	1	Integer	Example: 0200	Ah
10	QUERY UPS RATING	1	Integer	Example: 100	Kva
11	QUERY CALCULATED BATTERY AUTONOMY	1	Integer	Example: 200	Mins
12	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 0	1	Bool	01=Inverter OK 00=Inverter not OK	Status
13	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 1	1	Bool	01=Battery Discharging 00=Battery Not Discharging	Status
14	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 2	1	Bool	01=Inverter Overtemperature 00=Inverter Temperature OK	Status
15	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 3	1	Bool	01=Inverter Overloaded 00=Inverter Not Overloaded	Status
16	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 4	1	Bool	01=Inverter Synchronised 00=Inverter Not Synchronised	Status
17	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 5	1	Bool	01=Inverter Feeding 00=Inverter Not Feeding	Status
18	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 6	1	Bool	01=Retransfer Blocked 00=No Retransfer Blocked	Status
19	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 7	1	Bool	01=Any Inverter Ready 00=Any Inverter Not Ready	Status
20	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 8	1	Bool	01=Bypass Mains OK 00=Bypass Mains Not OK	Status
21	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 9	1	Bool	01=Bypass Synchronised 00=Bypass Not Synchronised	Status
22	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit A	1	Bool	01=Bypass Feeding 00=Bypass Not Feeding	Status
23	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit B	1	Bool	01=Bypass Available 00=Bypass Not Available	Status
24	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit C	1	Bool	01=Bypass System Not Available 00=Bypass System Available	Status
25	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit D	1	Bool	01=Any IBY Closed 00=Any IBY Open	Status
26	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit E	1	Bool	01=Auxiliary Alarm 00=No Auxiliary Alarm	Status
27	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit F	1	Bool	01=IUG Close 00=IUG Open	Status
28	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit 0	1	Bool	01=Rectifier Failure 00=Rectifier OK	Status
29	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit 1	1	Bool	01=Rectifier Mains OK 00=Rectifier Mains Not OK	Status
30	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit 2	1	Bool	01=Rectifier Overloaded 00=Rectifier Not Overloaded	Status
31	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit 3	1	Bool	01=Rectifier Overtemperature 00=Rectifier Temperature OK	Status
32	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit 4	1	Bool	01=Battery Switch Open 00=Battery Switch Close	Status
33	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit 5	1	Bool	01=Manual Charge ON 00=Manual Charge OFF	Status
34	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit 6	1	Bool	01=Boost Charge ON 00=Boost Charge OFF	Status
35	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit 7	1	Bool	01=Blown Fuses 00=Fuses OK	Status

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Register	Description	Length	Format	Values	Units
36	QUERY FREQUENCY INVERTER	1	Integer	Example: 050	Hz
37	QUERY FREQUENCY UPS OUTPUT	1	Integer	Example: 050	Hz
44	QUERY TOTAL OUTPUT POWER (VA)	2	Integer	Example: 020000	VA
46	QUERY TOTAL OUTPUT POWER (%)	1	Integer	Example: 050	%

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## 8 GMB - UPS with FD0154 Panel (BAM Protocol – Fw Release 2.X.X)

Register	Description	Length	Format	Values	Units
1	QUERY VOLTAGE PHASE R INPUT UPS <b>(2)</b>	1	Integer	Example: 0380	Vac
2	QUERY VOLTAGE PHASE S INPUT UPS <b>(2)</b>	1	Integer	Example: 0380	Vac
3	QUERY VOLTAGE PHASE T INPUT UPS <b>(2)</b>	1	Integer	Example: 0380	Vac
4	QUERY CURRENT PHASE R INPUT UPS <b>(2)</b>	1	Integer	Example: 0100	lac
5	QUERY CURRENT PHASE S INPUT UPS <b>(2)</b>	1	Integer	Example: 0200	lac
6	QUERY CURRENT PHASE T INPUT UPS <b>(2)</b>	1	Integer	Example: 0300	lac
7	QUERY FREQUENCY INPUT UPS <b>(2)</b>	1	Integer	Example: 0050	Hz
8	QUERY VOLTAGE PHASE R OUTPUT UPS	1	Integer	Example: 0220	Vac
11	QUERY CURRENT PHASE R OUTPUT UPS	1	Integer	Example: 0050	lac
14	QUERY FREQUENCY OUTPUT UPS	1	Integer	Example: 0050	Hz
15	QUERY MAINS VOLTAGE PHASE R <b>(2)</b>	1	Integer	Example: 0400	Vac
18	QUERY MAINS CURRENT PHASE R <b>(2)</b>	1	Integer	Example: 0020	lac
21	QUERY MAINS FREQUENCY <b>(2)</b>	1	Integer	Example: 0050	Hz
22	QUERY INVERTER OUTPUT MEAN VOLTAGE	1	Integer	Example: 0220	Vac
23	QUERY INVERTER OUTPUT FREQUENCY	1	Integer	Example: 0050	Hz
24	QUERY BATTERY VOLTAGE	1	Integer	Example: 0432	Vdc
25	QUERY RECTIFIER CURRENT <b>(3)</b>	1	Integer	Example: 0100	Idc
26	QUERY BATTERY CURRENT <b>(3)</b>	1	Integer	Example: 0200	Idc
27	QUERY CALCULATED BATTERY AUTONOMY	1	Integer	Example: 100	Mins
28	QUERY TOTAL OUTPUT POWER	2	Integer	Example: 020000	Va %
30	QUERY OUTPUT POWER LOAD% PHASE R	1	Integer	Example: 100	Va
33	QUERY UPS RATING IN KVA	1	Integer	Example: 100	Kva
34	QUERY BATTERY CAPACITY	1	Integer	Example: 100	Ah

**(2) Required optional measures card SFP / ACM (Part-Number : FS1159)**

**(3) Required optional measures card SFP / DCM (Part-Number : FS1160)**

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Register	Description	Length	Format	Values	Units
86	CS121 AUX INPUT 1 STATUS	1	Bool	01=Aux Digital input 1 Close 00=Aux Digital Input 1 Open	Status
87	CS121 AUX INPUT 2 STATUS	1	Bool	01=Aux Digital input 2 Close 00=Aux Digital Input 2 Open	Status
88	CS121 AUX INPUT 3 STATUS	1	Bool	01=Aux Digital input 3 Close 00=Aux Digital Input 3 Open	Status
89	CS121 AUX INPUT 4 STATUS	1	Bool	01=Aux Digital input 4 Close 00=Aux Digital Input 4 Open	Status
96	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 0	1	Bool	01=Inverter OK 00=Inverter not OK	Status
97	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 1	1	Bool	01=Battery Discharging 00=Battery Not Discharging	Status
98	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 2	1	Bool	01=Inverter Overtemperature 00=Inverter Temperature OK	Status
99	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 3	1	Bool	01=Inverter Overloaded 00=Inverter Not Overloaded	Status
100	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 4	1	Bool	01=Inverter Synchronised 00=Inverter Not Synchronised	Status
101	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 5	1	Bool	01=Inverter Feeding 00=Inverter Not Feeding	Status
102	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 6	1	Bool	01=Retransfer Blocked 00=No Retransfer Blocked	Status
103	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 7	1	Bool	01=Any Inverter Ready 00=Any Inverter Not Ready	Status
104	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 8	1	Bool	01=Bypass Mains OK 00=Bypass Mains Not OK	Status
105	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 9	1	Bool	01=Bypass Synchronised 00=Bypass Not Synchronised	Status
106	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit A	1	Bool	01=Bypass Feeding 00=Bypass Not Feeding	Status
107	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit B	1	Bool	01=Bypass Available 00=Bypass Not Available	Status
108	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit C	1	Bool	01=Bypass System Not Available 00=Bypass System Available	Status

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Register	Description	Length	Format	Values	Units
109	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit D	1	Bool	01=Any IBY Closed 00=Any IBY Open	Status
110	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit E	1	Bool	01=Auxiliary Alarm 00=No Auxiliary Alarm	Status
111	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit F	1	Bool	01=IUG Close 00=IUG Open	Status
112	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit 0	1	Bool	01=Rectifier Failure 00=Rectifier OK	Status
113	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit 1	1	Bool	01=Rectifier Mains OK 00=Rectifier Mains Not OK	Status
114	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit 2	1	Bool	01=Rectifier Overloaded 00=Rectifier Not Overloaded	Status
115	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit 3	1	Bool	01=Rectifier Overtemperature 00=Rectifier Temperature OK	Status
116	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit 4	1	Bool	01=Battery Switch Open 00=Battery Switch Close	Status
117	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit 5	1	Bool	01=Manual Charge ON 00=Manual Charge OFF	Status
118	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit 6	1	Bool	01=Boost Charge ON 00=Boost Charge OFF	Status
119	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit 7	1	Bool	01=Blown Fuses 00=Fuses OK	Status
120	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit 8	1	Bool	01=Bypass Not Installed 00=Bypass Installed	Status
121	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit 9	1	Bool	01=Hot Stand-By 00=Not Hot Stand-By	Status
122	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit A	1	Bool	01=Battery Not Installed 00=Battery Installed	Status
123	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit B	1	Bool	01=Aux Battery Contact Inst. 00=Aux Battery Contact Not Inst	Status
124	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit C	1	Bool	01=Inverter OFF 00=inverter ON	Status
125	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit D	1	Bool	01=Paralleling Fault 00=Paralleling OK	Status
126	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit E	1	Bool	01=Single Unit 00=Paralleling Unit	Status
127	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit F	1	Bool	01=Rectifier OFF 00=Rectifier ON	Status
128	QUERY CALCULATED BATTERY AUTONOMY (PERCENT)	1	Integer	Example: 100	%
129	QUERY TOTAL OUTPUT POWER (PERCENT)	1	Integer	Example: 100	%

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## 9 GMB - UPS with FD0127 Panel (Borri Protocol – Fw Release 1.X.X)

Register	Description	Length	Format	Values	Units
1	QUERY MEAN VOLTAGE INVERTER OUTPUT	1	Integer	Example: 0380	Vac
2	QUERY VOLTAGE PHASE R OUTPUT UPS	1	Integer	Example: 0220	Vac
5	QUERY CURRENT PHASE R OUTPUT UPS	1	Integer	Example: 0020	Iac
8	QUERY BATTERY VOLTAGE	1	Integer	Example: 0432	Vdc
9	QUERY BATTERY CAPACITY	1	Integer	Example: 0200	Ah
10	QUERY UPS RATING	1	Integer	Example: 100	Kva
11	QUERY CALCULATED BATTERY AUTONOMY	1	Integer	Example: 200	Mins
12	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 0	1	Bool	01=Inverter OK 00=Inverter not OK	Status
13	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 1	1	Bool	01=Battery Discharging 00=Battery Not Discharging	Status
14	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 2	1	Bool	01=Inverter Overtemperature 00=Inverter Temperature OK	Status
15	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 3	1	Bool	01=Inverter Overloaded 00=Inverter Not Overloaded	Status
16	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 4	1	Bool	01=Inverter Synchronised 00=Inverter Not Synchronised	Status
17	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 5	1	Bool	01=Inverter Feeding 00=Inverter Not Feeding	Status
18	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 6	1	Bool	01=Retransfer Blocked 00=No Retransfer Blocked	Status
19	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 7	1	Bool	01=Any Inverter Ready 00=Any Inverter Not Ready	Status
20	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 8	1	Bool	01=Bypass Mains OK 00=Bypass Mains Not OK	Status
21	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 9	1	Bool	01=Bypass Synchronised 00=Bypass Not Synchronised	Status
22	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit A	1	Bool	01=Bypass Feeding 00=Bypass Not Feeding	Status
23	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit B	1	Bool	01=Bypass Available 00=Bypass Not Available	Status
24	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit C	1	Bool	01=Bypass System Not Available 00=Bypass System Available	Status
25	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit D	1	Bool	01=Any IBY Closed 00=Any IBY Open	Status
26	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit E	1	Bool	01=Auxiliary Alarm 00=No Auxiliary Alarm	Status
27	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit F	1	Bool	01=IUG Close 00=IUG Open	Status
28	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit 0	1	Bool	01=Rectifier Failure 00=Rectifier OK	Status
29	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit 1	1	Bool	01=Rectifier Mains OK 00=Rectifier Mains Not OK	Status
30	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit 2	1	Bool	01=Rectifier Overloaded 00=Rectifier Not Overloaded	Status
31	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit 3	1	Bool	01=Rectifier Overtemperature 00=Rectifier Temperature OK	Status
32	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit 4	1	Bool	01=Battery Switch Open 00=Battery Switch Close	Status
33	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit 5	1	Bool	01=Manual Charge ON 00=Manual Charge OFF	Status
34	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit 6	1	Bool	01=Boost Charge ON 00=Boost Charge OFF	Status
35	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit 7	1	Bool	01=Blown Fuses 00=Fuses OK	Status
36	QUERY FREQUENCY INVERTER	1	Integer	Example: 050	Hz
37	QUERY FREQUENCY UPS OUTPUT	1	Integer	Example: 050	Hz
44	QUERY TOTAL OUTPUT POWER (VA)	2	Integer	Example: 020000	VA
46	QUERY TOTAL OUTPUT POWER (%)	1	Integer	Example: 050	%

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## 10 ITB - Inverter with FD0130-132-134 Panel (BAM Protocol – Fw Release 2.X.X)

Register	Description	Length	Format	Values	Units
8	QUERY VOLTAGE PHASE R OUTPUT INVERTER	1	Integer	Example: 0220	Vac
9	QUERY VOLTAGE PHASE S OUTPUT INVERTER	1	Integer	Example: 0220	Vac
10	QUERY VOLTAGE PHASE T OUTPUT INVERTER	1	Integer	Example: 0220	Vac
11	QUERY CURRENT PHASE R OUTPUT INVERTER	1	Integer	Example: 0050	lac
12	QUERY CURRENT PHASE S OUTPUT INVERTER	1	Integer	Example: 0060	lac
13	QUERY CURRENT PHASE T OUTPUT INVERTER	1	Integer	Example: 0070	lac
14	QUERY FREQUENCY OUTPUT INVERTER	1	Integer	Example: 0050	Hz
15	QUERY MAINS VOLTAGE PHASE R <b>(2)</b>	1	Integer	Example: 0400	Vac
16	QUERY MAINS VOLTAGE PHASE S <b>(2)</b>	1	Integer	Example: 0400	Vac
17	QUERY MAINS VOLTAGE PHASE T <b>(2)</b>	1	Integer	Example: 0400	Vac
18	QUERY MAINS CURRENT PHASE R <b>(2)</b>	1	Integer	Example: 0020	lac
19	QUERY MAINS CURRENT PHASE S <b>(2)</b>	1	Integer	Example: 0030	lac
20	QUERY MAINS CURRENT PHASE T <b>(2)</b>	1	Integer	Example: 0040	lac
21	QUERY MAINS FREQUENCY <b>(2)</b>	1	Integer	Example: 0050	Hz
22	QUERY INVERTER OUTPUT MEAN VOLTAGE	1	Integer	Example: 0220	Vac
23	QUERY INVERTER OUTPUT FREQUENCY	1	Integer	Example: 0050	Hz
24	QUERY BATTERY VOLTAGE	1	Integer	Example: 0432	Vdc
28	QUERY TOTAL OUTPUT POWER	2	Integer	Example: 020000	Va - %
30	QUERY OUTPUT POWER LOAD% PHASE R	1	Integer	Example: 100	Va
31	QUERY OUTPUT POWER LOAD% PHASE S	1	Integer	Example: 100	Va
32	QUERY OUTPUT POWER LOAD% PHASE T	1	Integer	Example: 100	Va
33	QUERY INVERTER RATING IN KVA	1	Integer	Example: 100	Kva

**(2) Required optional measures card SFP / ACM (Part-Number : FS1159)**

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Register	Description	Length	Format	Values	Units
86	CS121 AUX INPUT 1 STATUS	1	Bool	01=Aux Digital input 1 Close 00=Aux Digital Input 1 Open	Status
87	CS121 AUX INPUT 2 STATUS	1	Bool	01=Aux Digital input 2 Close 00=Aux Digital Input 2 Open	Status
88	CS121 AUX INPUT 3 STATUS	1	Bool	01=Aux Digital input 3 Close 00=Aux Digital Input 3 Open	Status
89	CS121 AUX INPUT 4 STATUS	1	Bool	01=Aux Digital input 4 Close 00=Aux Digital Input 4 Open	Status
96	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 0	1	Bool	01=Inverter OK 00=Inverter not OK	Status
97	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 1	1	Bool	01=Battery Discharging 00=Battery Not Discharging	Status
98	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 2	1	Bool	01=Inverter Overtemperature 00=Inverter Temperature OK	Status
99	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 3	1	Bool	01=Inverter Overloaded 00=Inverter Not Overloaded	Status
100	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 4	1	Bool	01=Inverter Synchronised 00=Inverter Not Synchronised	Status
101	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 5	1	Bool	01=Inverter Feeding 00=Inverter Not Feeding	Status
102	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 6	1	Bool	01=Retransfer Blocked 00=No Retransfer Blocked	Status
103	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 7	1	Bool	01=Any Inverter Ready 00=Any Inverter Not Ready	Status
104	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 8	1	Bool	01=Bypass Mains OK 00=Bypass Mains Not OK	Status
105	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 9	1	Bool	01=Bypass Synchronised 00=Bypass Not Synchronised	Status
106	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit A	1	Bool	01=Bypass Feeding 00=Bypass Not Feeding	Status
107	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit B	1	Bool	01=Bypass Available 00=Bypass Not Available	Status
108	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit C	1	Bool	01=Bypass System Not Available 00=Bypass System Available	Status
109	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit D	1	Bool	01=Any IBY Closed 00=Any IBY Open	Status
110	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit E	1	Bool	01=Auxiliary Alarm 00=No Auxiliary Alarm	Status
111	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit F	1	Bool	01=IUG Close 00=IUG Open	Status
119	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit 7	1	Bool	01=Blown Fuses 00=Fuses OK	Status
120	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit 8	1	Bool	01=Bypass Not Installed 00=Bypass Installed	Status
121	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit 9	1	Bool	01=Hot Stand-By 00=Not Hot Stand-By	Status
124	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit C	1	Bool	01=Inverter OFF 00=inverter ON	Status
125	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit D	1	Bool	01=Paralleling Fault 00=Paralleling OK	Status
126	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit E	1	Bool	01=Single Unit 00=Paralleling Unit	Status
128	QUERY CALCULATED BATTERY AUTONOMY (PERCENT)	1	Integer	Example: 100	%
129	QUERY TOTAL OUTPUT POWER (PERCENT)	1	Integer	Example: 100	%

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## 11 IMB - Inverter with FD0130-132-134 Panel (BAM Protocol - Fw Release 2.X.X)

Register	Description	Length	Format	Values	Units
8	QUERY VOLTAGE PHASE R OUTPUT INVERTER	1	Integer	Example: 0220	Vac
11	QUERY CURRENT PHASE R OUTPUT INVERTER	1	Integer	Example: 0050	Iac
14	QUERY FREQUENCY OUTPUT INVERTER	1	Integer	Example: 0050	Hz
15	QUERY MAINS VOLTAGE PHASE R <b>(2)</b>	1	Integer	Example: 0400	Vac
18	QUERY MAINS CURRENT PHASE R <b>(2)</b>	1	Integer	Example: 0020	Iac
21	QUERY MAINS FREQUENCY <b>(2)</b>	1	Integer	Example: 0050	Hz
22	QUERY INVERTER OUTPUT MEAN VOLTAGE	1	Integer	Example: 0220	Vac
23	QUERY INVERTER OUTPUT FREQUENCY	1	Integer	Example: 0050	Hz
24	QUERY BATTERY VOLTAGE	1	Integer	Example: 0432	Vdc
28	QUERY TOTAL OUTPUT POWER	2	Integer	Example: 020000	Va - %
30	QUERY OUTPUT POWER LOAD% PHASE R	1	Integer	Example: 100	Va
33	QUERY INVERTER RATING IN KVA	1	Integer	Example: 100	Kva
86	CS121 AUX INPUT 1 STATUS	1	Bool	01=Aux Digital input 1 Close 00=Aux Digital Input 1 Open	Status
87	CS121 AUX INPUT 2 STATUS	1	Bool	01=Aux Digital input 2 Close 00=Aux Digital Input 2 Open	Status
88	CS121 AUX INPUT 3 STATUS	1	Bool	01=Aux Digital input 3 Close 00=Aux Digital Input 3 Open	Status
89	CS121 AUX INPUT 4 STATUS	1	Bool	01=Aux Digital input 4 Close 00=Aux Digital Input 4 Open	Status
96	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 0	1	Bool	01=Inverter OK 00=Inverter not OK	Status
97	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 1	1	Bool	01=Battery Discharging 00=Battery Not Discharging	Status
98	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 2	1	Bool	01=Inverter Overtemperature 00=Inverter Temperature OK	Status
99	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 3	1	Bool	01=Inverter Overloaded 00=Inverter Not Overloaded	Status
100	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 4	1	Bool	01=Inverter Synchronised 00=Inverter Not Synchronised	Status
101	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 5	1	Bool	01=Inverter Feeding 00=Inverter Not Feeding	Status
102	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 6	1	Bool	01=Retransfer Blocked 00=No Retransfer Blocked	Status
103	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 7	1	Bool	01=Any Inverter Ready 00=Any Inverter Not Ready	Status
104	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 8	1	Bool	01=Bypass Mains OK 00=Bypass Mains Not OK	Status
105	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 9	1	Bool	01=Bypass Synchronised 00=Bypass Not Synchronised	Status
106	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit A	1	Bool	01=Bypass Feeding 00=Bypass Not Feeding	Status
107	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit B	1	Bool	01=Bypass Available 00=Bypass Not Available	Status
108	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit C	1	Bool	01=Bypass System Not Available 00=Bypass System Available	Status

### (2) Required optional measures card SFP / ACM (Part-Number : FS1159)

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Register	Description	Length	Format	Values	Units
109	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit D	1	Bool	01=Any IBY Closed 00=Any IBY Open	Status
110	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit E	1	Bool	01=Auxiliary Alarm 00=No Auxiliary Alarm	Status
111	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit F	1	Bool	01=IUG Close 00=IUG Open	Status
119	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit 7	1	Bool	01=Blown Fuses 00=Fuses OK	Status
120	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit 8	1	Bool	01=Bypass Not Installed 00=Bypass Installed	Status
121	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit 9	1	Bool	01=Hot Stand-By 00=Not Hot Stand-By	Status
124	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit C	1	Bool	01=Inverter OFF 00=inverter ON	Status
125	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit D	1	Bool	01=Paralleling Fault 00=Paralleling OK	Status
126	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit E	1	Bool	01=Single Unit 00=Paralleling Unit	Status
128	QUERY CALCULATED BATTERY AUTONOMY (PERCENT)	1	Integer	Example: 100	%
129	QUERY TOTAL OUTPUT POWER (PERCENT)	1	Integer	Example: 100	%

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## 12 RTB - Rectifier with FD0151-131-133 Panel (BAM Protocol – Fw Release 2.x.x)

Register	Description	Length	Format	Values	Units
1	QUERY VOLTAGE PHASE R INPUT RECTIFIER	1	Integer	Example: 0389	Vac
2	QUERY VOLTAGE PHASE S INPUT RECTIFIER	1	Integer	Example: 0389	Vac
3	QUERY VOLTAGE PHASE T INPUT RECTIFIER	1	Integer	Example: 0389	Vac
4	QUERY CURRENT PHASE R INPUT RECTIFIER	1	Integer	Example: 0050	lac
5	QUERY CURRENT PHASE S INPUT RECTIFIER	1	Integer	Example: 0060	lac
6	QUERY CURRENT PHASE T INPUT RECTIFIER	1	Integer	Example: 0070	lac
7	QUERY FREQUENCY INPUT RECTIFIER	1	Integer	Example: 050	Hz
8	QUERY BATTERY VOLTAGE	1	Integer	Example: 0432	Vdc
9	QUERY RECTIFIER CURRENT <b>(3)</b>	1	Integer	Example: 0300	Idc
10	QUERY BATTERY CURRENT <b>(3)</b>	1	Integer	Example: 0100	Idc
11	QUERY CALCULATED BATTERY AUTONOMY (MINUTES)	1	Integer	Example: 0255	Mins
12	QUERY CALCULATED BATTERY AUTONOMY (PERCENT)	1	Integer	Example: 0100	%
13	QUERY TOTAL OUTPUT POWER (KW)	2	Integer	Example: 020000	Kw
15	QUERY TOTAL OUTPUT POWER (PERCENT)	1	Integer	Example: 050	%
16	QUERY BATTERY CAPACITY	1	Integer	Example: 0300	Ah
59	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 0	1	Bool	01=Rectifier OFF 00=Rectifier ON	Status
60	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 1	1	Bool	01=Floating Charge ON 00=Floating Charge OFF	Status
61	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 2	1	Bool	01=Floating Imposition ON 00=Floating Imposition OFF	Status
62	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 3	1	Bool	01=Boost Charge Phase I ON 00=Boost Charge Phase I OFF	Status
63	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 4	1	Bool	01=Boost Charge Phase U ON 00=Boost Charge Phase U OFF	Status
64	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 5	1	Bool	01=Manual Charge ON 00=Manula Charge OFF	Status
65	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 6	1	Bool	01=4 <sup>th</sup> Level ON 00=4 <sup>th</sup> Level OFF	Status
66	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 7	1	Bool	01=Discharger OFF 00=Discharger ON	Status
67	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 8	1	Bool	01=Manual Discharge ON 00=Manual Discharge OFF	Status
68	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 9	1	Bool	01=Automatic Discharge ON 00=Automatic Discharge OFF	Status

### (3) Required optional measures card SFP / DCM (Part-Number : FS1160)

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Register	Description	Length	Format	Values	Units
69	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit A	1	Bool	01=Discharge Ended 00=Discharge Not Ended	Status
70	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit B	1	Bool	01=Rectifier OFF for Discharge 00=Rectifier ON	Status
71	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit C	1	Bool	01=Wait 00=Status Not Used	Status
72	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit D	1	Bool	01=Transition in Course 00=Status Not Used	Status
73	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit E	1	Bool	01= Boost Charge Failure 00= Boost Charge OK	Status
74	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit F	1	Bool	01= Common Alarm 00= No Common Alarm	Status
83	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit 8	1	Bool	01=Wrong Phase Rotation 00=Phase Rotation OK	Status
84	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit 9	1	Bool	01=Mains Frequency Out of Tolerance 00=Mains Frequency in Tolerance	Status
85	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit A	1	Bool	01=Mains Voltage Out of Tolerance 00=Mains Voltage in Tolerance	Status
86	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit B	1	Bool	01=Missing One or More Phases 00=Phases OK	Status
87	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit C	1	Bool	01=Rectifier Overloaded 00=Rectifier Not Overloaded	Status
88	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit D	1	Bool	01=Max Output Voltage 00=Output Voltage Normal	Status
89	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit E	1	Bool	01=SCR Fuse Failure 00=SCR Fuse OK	Status
90	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit F	1	Bool	01=Fan Failure 00=Fan OK	Status
91	QUERY STATUS OF DIGITAL INPUTS CHANNEL C Bit 0	1	Bool	01=Overtemperature 00=Temperature OK	Status
92	QUERY STATUS OF DIGITAL INPUTS CHANNEL C Bit 1	1	Bool	01=Missing 24 Vdc 00=24 Vdc OK	Status
93	QUERY STATUS OF DIGITAL INPUTS CHANNEL C Bit 2	1	Bool	01=Synchronism Failure 00=Synchronism OK	Status
94	QUERY STATUS OF DIGITAL INPUTS CHANNEL C Bit 3	1	Bool	01=RAM Missing or Failure 00=RAM OK	Status
95	QUERY STATUS OF DIGITAL INPUTS CHANNEL C Bit 4	1	Bool	01=Fuse Failure on Discharge 00=Status Not Used	Status
96	QUERY STATUS OF DIGITAL INPUTS CHANNEL C Bit 5	1	Bool	01=Software Failure 00=Software OK	Status
97	QUERY STATUS OF DIGITAL INPUTS CHANNEL C Bit 6	1	Bool	01=Battery Discharging 00=Battery Not Discharging	Status
98	QUERY STATUS OF DIGITAL INPUTS CHANNEL C Bit 7	1	Bool	01=Battery Switch Opened 00=Battery Switch Closed	Status
99	QUERY STATUS OF DIGITAL INPUTS CHANNEL C Bit 8	1	Bool	01=Minimum Output Voltage 00=Output Voltage OK	Status
100	QUERY STATUS OF DIGITAL INPUTS CHANNEL C Bit 9	1	Bool	01=Discharge Ended due to Alarm 00=Discharge Not Ended due to Alarm	Status
101	QUERY STATUS OF DIGITAL INPUTS CHANNEL C Bit A	1	Bool	01=EEPROM Missing or Failure 00=EEPROM OK	Status
102	QUERY STATUS OF DIGITAL INPUTS CHANNEL C Bit B	1	Bool	01=Discharge Not Possible 00=Discharge Possible	Status
103	QUERY STATUS OF DIGITAL INPUTS CHANNEL C Bit C	1	Bool	01=Discharge Ended due to Minimum Voltage 00=Discharge Not Ended due to Minimum Voltage	Status

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Register	Description	Length	Format	Values	Units
104	QUERY STATUS OF DIGITAL INPUTS CHANNEL C Bit D	1	Bool	01=Switch OFF the Recifier 00=Not Used	Status
105	QUERY STATUS OF DIGITAL INPUTS CHANNEL C Bit E	1	Bool	01=Switch OFF the Discharger 00=Not Used	Status
106	QUERY STATUS OF DIGITAL INPUTS CHANNEL C Bit F	1	Bool	01=Battery in Charging 00=Battery not in Charging	Status
115	QUERY OPTIONAL MEASURE CHANNEL 1 ( RECTIFIER VOLTAGE )	1	Integer	Example: 0110	Vdc
116	QUERY OPTIONAL MEASURE CHANNEL 2 ( BATTERY VOLTAGE )	1	Integer	Example: 0220	Vdc
117	QUERY OPTIONAL MEASURE CHANNEL 6 ( RECTIFIER CURRENT )	1	Integer	Example: 0100	Idc
118	QUERY OPTIONAL MEASURE CHANNEL 7 ( BATTERY CURRENT )	1	Integer	Example: 0200	Idc
119	QUERY OPTIONAL MEASURE CHANNEL 8 ( TOTAL CURRENT )	1	Integer	Example: 0300	Idc
120	QUERY OPTIONAL MEASURE CHANNEL 9 ( BATTERY VOLTAGE 1 )	1	Integer	Example: 0432	Vdc
121	QUERY OPTIONAL MEASURE CHANNEL 10 ( BATTERY VOLTAGE 2 )	1	Integer	Example: 0220	Vdc
122	QUERY OPTIONAL MEASURE CHANNEL 14 ( BATTERY CURRENT 1 )	1	Integer	Example: 0100	Vdc
123	QUERY OPTIONAL MEASURE CHANNEL 15 ( BATTERY CURRENT 2 )	1	Integer	Example: 0300	Vdc
124	QUERY OPTIONAL MEASURE CHANNEL 11 ( DISTRIBUTION 1 )	1	Integer	Example: 0220	Vdc
125	QUERY OPTIONAL MEASURE CHANNEL 12 ( DISTRIBUTION 2 )	1	Integer	Example: 0220	Vdc
126	CS121 AUX INPUT 1 STATUS	1	Bool		
127	CS121 AUX INPUT 2 STATUS	1	Bool		
128	CS121 AUX INPUT 3 STATUS	1	Bool		
129	CS121 AUX INPUT 4 STATUS	1	Bool		

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## 13 B6000 UPS with FD0078 Panel (Borri Protocol)

Register	Description	Length	Format	Values	Units
1	QUERY VOLTAGE PHASE R INPUT UPS <b>(1)</b>	1	Integer	Example: 0380	Vac
2	QUERY VOLTAGE PHASE S INPUT UPS <b>(1)</b>	1	Integer	Example: 0380	Vac
3	QUERY VOLTAGE PHASE T INPUT UPS <b>(1)</b>	1	Integer	Example: 0380	Vac
4	QUERY VOLTAGE PHASE R OUTPUT UPS	1	Integer	Example: 0220	Vac
5	QUERY VOLTAGE PHASE S OUTPUT UPS	1	Integer	Example: 0220	Vac
6	QUERY VOLTAGE PHASE T OUTPUT UPS	1	Integer	Example: 0220	Vac
7	QUERY CURRENT PHASE R OUTPUT UPS	1	Integer	Example: 0020	Iac
8	QUERY CURRENT PHASE S OUTPUT UPS	1	Integer	Example: 0030	Iac
9	QUERY CURRENT PHASE T OUTPUT UPS	1	Integer	Example: 0040	Iac
10	QUERY BATTERY VOLTAGE	1	Integer	Example: 0432	Vdc
13	QUERY CALCULATED BATTERY AUTONOMY	1	Integer	Example: 200	Min
15	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 1	1	Bool	01=Inverter Feeding 00=Inverter Not Feeding	Status
16	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 2	1	Bool	01=Inverter Synchronised 00=Inverter Not Synchronised	Status
18	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 4	1	Bool	01=Inverter Overloaded 00=Inverter Not Overloaded	Status
19	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 5	1	Bool	01=Inverter Overtemperature 00=Inverter Temperature OK	Status
20	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 6	1	Bool	01=Inverter OK 00=Inverter Not OK	Status
21	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 7	1	Bool	01=Battery Discharging 00=Battery Not Discharging	Status
22	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 8	1	Bool	01=Battery Switch Open 00=Battery Switch Close	Status
23	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 9	1	Bool	01=Rectifier ON 00=Rectifier OFF	Status
24	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit A	1	Bool	01=Inverter 2 Feeding 00=Inverter 2 Not Feeding	Status
25	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit B	1	Bool	01=Inverter 2 OK 00=Inverter 2 Not OK	Status
26	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit C	1	Bool	01=Inverter 2 Synchronised 00=Inverter 2 Not Synchronised	Status
27	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit D	1	Bool	01=Bypass Feeding 00=Bypass Not Feeding	Status
28	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit E	1	Bool	01=Retransfer Blocked 00=Retransfer Not Blocked	Status
29	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit F	1	Bool	01=Bypass Mains OK 00=Bypass Mains Not OK	Status
30	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit 0	1	Bool	01=Rectifier Mains OK 00=Rectifier Mains Not OK	Status
31	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit 1	1	Bool	01=Rectifier Failure 00=Rectifier OK	Status
32	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit 2	1	Bool	01=Rectifier Overtemperature 00=Rectifier Temperature OK	Status
33	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit 3	1	Bool	01=Rectifier Overloaded 00=Rectifier Not Overloaded	Status
34	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit 4	1	Bool	01=Boost Charge ON 00=Boost Charge OFF	Status
35	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit 5	1	Bool	01=Manual Charge ON 00=Manual Charge OFF	Status
36	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit 6	1	Bool	01=Float Charge ON 00=Float Charge OFF	Status
37	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit 7	1	Bool	01=Blown Fuses 00=Fuses OK	Status

**(1) Required optional measures card GMV / DMP (Part-Number : FS0903)**

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Register	Description	Length	Format	Values	Units
40	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit A	1	Bool	01=System Alarm ON 00=System Alarm OFF	Status
41	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit B	1	Bool	01=Common Alarm ON 00=Common Alarm OFF	Status
42	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit C	1	Bool	01=Bypass System Not Available 00=Bypass System Available	Status
43	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit D	1	Bool	01=IUG Opened 00=IUG Closed	Status
44	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit E	1	Bool	01=IBY Closed 00=IBY Opened	Status
45	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit F	1	Bool	01=Inverter or Paralleling Fault 00=Inverter and Paralleling OK	Status
46	QUERY FREQUENCY INVERTER	1	Integer	Example: 050	Hz
47	QUERY FREQUENCY UPS OUTPUT	1	Integer	Example: 050	Hz
54	QUERY MAINS VOLTAGE PHASE R <b>(1)</b>	1	Integer	Example: 0400	Vac
55	QUERY MAINS VOLTAGE PHASE S <b>(1)</b>	1	Integer	Example: 0400	Vac
56	QUERY MAINS VOLTAGE PHASE T <b>(1)</b>	1	Integer	Example: 0400	Vac
57	QUERY MAINS CURRENT <b>(1)</b>	1	Integer	Example: 0050	Iac
58	QUERY TOTAL OUTPUT POWER (VA)	2	Integer	Example: 020000	Va
60	QUERY TOTAL OUTPUT POWER (%)	1	Integer	Example: 050	%

**(1) Required optional measures card GMV / DMP (Part-Number : FS0903)**

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## 14 B400FC Frequency Conv. with battery: FD0135 Panel (BAM – Ver. 2.x.x)

Register	Description	Length	Format	Values	Units
1	QUERY VOLTAGE PHASE R INPUT CONVERTER <b>(2)</b>	1	Integer	Example: 0380	Vac
2	QUERY VOLTAGE PHASE S INPUT CONVERTER <b>(2)</b>	1	Integer	Example: 0380	Vac
3	QUERY VOLTAGE PHASE T INPUT CONVERTER <b>(2)</b>	1	Integer	Example: 0380	Vac
4	QUERY CURRENT PHASE R INPUT CONVERTER <b>(2)</b>	1	Integer	Example: 0100	Iac
5	QUERY CURRENT PHASE S INPUT CONVERTER <b>(2)</b>	1	Integer	Example: 0200	Iac
6	QUERY CURRENT PHASE T INPUT CONVERTER <b>(2)</b>	1	Integer	Example: 0300	Iac
7	QUERY FREQUENCY INPUT CONVERTER <b>(2)</b>	1	Integer	Example: 0050	Hz
8	QUERY VOLTAGE PHASE R OUTPUT CONVERTER	1	Integer	Example: 0220	Vac
9	QUERY VOLTAGE PHASE S OUTPUT CONVERTER	1	Integer	Example: 0220	Vac
10	QUERY VOLTAGE PHASE T OUTPUT CONVERTER	1	Integer	Example: 0220	Vac
11	QUERY CURRENT PHASE R OUTPUT CONVERTER	1	Integer	Example: 0050	Iac
12	QUERY CURRENT PHASE S OUTPUT CONVERTER	1	Integer	Example: 0060	Iac
13	QUERY CURRENT PHASE T OUTPUT CONVERTER	1	Integer	Example: 0070	Iac
14	QUERY FREQUENCY OUTPUT CONVERTER	1	Integer	Example: 0050	Hz
22	QUERY INVERTER OUTPUT MEAN VOLTAGE	1	Integer	Example: 0220	Vac
23	QUERY INVERTER OUTPUT FREQUENCY	1	Integer	Example: 0050	Hz
24	QUERY BATTERY VOLTAGE	1	Integer	Example: 0432	Vdc
25	QUERY RECTIFIER CURRENT <b>(3)</b>	1	Integer	Example: 0100	Idc
26	QUERY BATTERY CURRENT <b>(3)</b>	1	Integer	Example: 0200	Idc
27	QUERY CALCULATED BATTERY AUTONOMY	1	Integer	Example: 100	Mins
28	QUERY TOTAL OUTPUT POWER	2	Integer	Example: 020000	Va - %
30	QUERY OUTPUT POWER LOAD% PHASE R	1	Integer	Example: 100	Va
31	QUERY OUTPUT POWER LOAD% PHASE S	1	Integer	Example: 100	Va
32	QUERY OUTPUT POWER LOAD% PHASE T	1	Integer	Example: 100	Va
33	QUERY CONVERTER RATING IN KVA	1	Integer	Example: 100	Kva
34	QUERY BATTERY CAPACITY	1	Integer	Example: 100	Ah

**(2) Required optional measures card SFP / ACM (Part-Number : FS1159)**

**(3) Required optional measures card SFP / DCM (Part-Number : FS1160)**

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Register	Description	Length	Format	Values	Units
86	CS121 AUX INPUT 1 STATUS	1	Bool	01=Aux Digital input 1 Close 00=Aux Digital Input 1 Open	Status
87	CS121 AUX INPUT 2 STATUS	1	Bool	01=Aux Digital input 2 Close 00=Aux Digital Input 2 Open	Status
88	CS121 AUX INPUT 3 STATUS	1	Bool	01=Aux Digital input 3 Close 00=Aux Digital Input 3 Open	Status
89	CS121 AUX INPUT 4 STATUS	1	Bool	01=Aux Digital input 4 Close 00=Aux Digital Input 4 Open	Status
96	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 0	1	Bool	01=Inverter OK 00=Inverter not OK	Status
97	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 1	1	Bool	01=Battery Discharging 00=Battery Not Discharging	Status
98	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 2	1	Bool	01=Inverter Overtemperature 00=Inverter Temperature OK	Status
99	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 3	1	Bool	01=Inverter Overloaded 00=Inverter Not Overloaded	Status
101	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 5	1	Bool	01=Inverter Feeding 00=Inverter Not Feeding	Status
103	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 7	1	Bool	01=Any Inverter Ready 00=Any Inverter Not Ready	Status
110	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit E	1	Bool	01=Auxiliary Alarm 00=No Auxiliary Alarm	Status
111	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit F	1	Bool	01=IUG Close 00=IUG Open	Status
112	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit 0	1	Bool	01=Rectifier Failure 00=Rectifier OK	Status
113	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit 1	1	Bool	01=Rectifier Mains OK 00=Rectifier Mains Not OK	Status
114	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit 2	1	Bool	01=Rectifier Overloaded 00=Rectifier Not Overloaded	Status
115	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit 3	1	Bool	01=Rectifier Overtemperature 00=Rectifier Temperature OK	Status
116	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit 4	1	Bool	01=Battery Switch Open 00=Battery Switch Close	Status
117	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit 5	1	Bool	01=Manual Charge ON 00=Manual Charge OFF	Status
118	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit 6	1	Bool	01=Boost Charge ON 00=Boost Charge OFF	Status
119	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit 7	1	Bool	01=Blown Fuses 00=Fuses OK	Status
122	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit A	1	Bool	01=Battery Not Installed 00=Battery Installed	Status
123	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit B	1	Bool	01=Aux Battery Contact Inst. 00=Aux Battery Contact Not Inst	Status
124	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit C	1	Bool	01=Inverter OFF 00=inverter ON	Status
125	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit D	1	Bool	01=Paralleling Fault 00=Paralleling OK	Status
126	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit E	1	Bool	01=Single Unit 00=Paralleling Unit	Status
127	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit F	1	Bool	01=Rectifier OFF 00=Rectifier ON	Status
128	QUERY CALCULATED BATTERY AUTONOMY (PERCENT)	1	Integer	Example: 100	%
129	QUERY TOTAL OUTPUT POWER (PERCENT)	1	Integer	Example: 100	%

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## 15 B400FC Frequency Conv. without battery: FD0136 Panel (BAM – Ver. 2.x.x)

Register	Description	Length	Format	Values	Units
1	QUERY VOLTAGE PHASE R INPUT CONVERTER (2)	1	Integer	Example: 0380	Vac
2	QUERY VOLTAGE PHASE S INPUT CONVERTER (2)	1	Integer	Example: 0380	Vac
3	QUERY VOLTAGE PHASE T INPUT CONVERTER (2)	1	Integer	Example: 0380	Vac
4	QUERY CURRENT PHASE R INPUT CONVERTER (2)	1	Integer	Example: 0100	lac
5	QUERY CURRENT PHASE S INPUT CONVERTER (2)	1	Integer	Example: 0200	lac
6	QUERY CURRENT PHASE T INPUT CONVERTER (2)	1	Integer	Example: 0300	lac
7	QUERY FREQUENCY INPUT CONVERTER (2)	1	Integer	Example: 0050	Hz
8	QUERY VOLTAGE PHASE R OUTPUT CONVERTER	1	Integer	Example: 0220	Vac
9	QUERY VOLTAGE PHASE S OUTPUT CONVERTER	1	Integer	Example: 0220	Vac
10	QUERY VOLTAGE PHASE T OUTPUT CONVERTER	1	Integer	Example: 0220	Vac
11	QUERY CURRENT PHASE R OUTPUT CONVERTER	1	Integer	Example: 0050	lac
12	QUERY CURRENT PHASE S OUTPUT CONVERTER	1	Integer	Example: 0060	lac
13	QUERY CURRENT PHASE T OUTPUT CONVERTER	1	Integer	Example: 0070	lac
14	QUERY FREQUENCY OUTPUT CONVERTER	1	Integer	Example: 0050	Hz
22	QUERY INVERTER OUTPUT MEAN VOLTAGE	1	Integer	Example: 0220	Vac
23	QUERY INVERTER OUTPUT FREQUENCY	1	Integer	Example: 0050	Hz
25	QUERY RECTIFIER CURRENT	1	Integer	Example: 0100	Idc
28	QUERY TOTAL OUTPUT POWER	2	Integer	Example: 020000	Va - %
30	QUERY OUTPUT POWER LOAD% PHASE R	1	Integer	Example: 100	Va
31	QUERY OUTPUT POWER LOAD% PHASE S	1	Integer	Example: 100	Va
32	QUERY OUTPUT POWER LOAD% PHASE T	1	Integer	Example: 100	Va
33	QUERY CONVERTER RATING IN KVA	1	Integer	Example: 100	Kva
86	CS121 AUX INPUT 1 STATUS	1	Bool	01=Aux Digital input 1 Close 00=Aux Digital Input 1 Open	Status
87	CS121 AUX INPUT 2 STATUS	1	Bool	01=Aux Digital input 2 Close 00=Aux Digital Input 2 Open	Status
88	CS121 AUX INPUT 3 STATUS	1	Bool	01=Aux Digital input 3 Close 00=Aux Digital Input 3 Open	Status
89	CS121 AUX INPUT 4 STATUS	1	Bool	01=Aux Digital input 4 Close 00=Aux Digital Input 4 Open	Status
96	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 0	1	Bool	01=Inverter OK 00=Inverter not OK	Status
98	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 2	1	Bool	01=Inverter Overtemperature 00=Inverter Temperature OK	Status
99	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 3	1	Bool	01=Inverter Overloaded 00=Inverter Not Overloaded	Status
101	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 5	1	Bool	01=Inverter Feeding 00=Inverter Not Feeding	Status

(2) Required optional measures card SFP / ACM (Part-Number : FS1159)

(3) Required optional measures card SFP / DCM (Part-Number : FS1160)

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Register	Description	Length	Format	Values	Units
103	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit 7	1	Bool	01=Any Inverter Ready 00=Any Inverter Not Ready	Status
110	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit E	1	Bool	01=Auxiliary Alarm 00=No Auxiliary Alarm	Status
111	QUERY STATUS OF DIGITAL INPUTS CHANNEL A Bit F	1	Bool	01=IUG Close 00=IUG Open	Status
112	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit 0	1	Bool	01=Rectifier Failure 00=Rectifier OK	Status
113	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit 1	1	Bool	01=Rectifier Mains OK 00=Rectifier Mains Not OK	Status
114	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit 2	1	Bool	01=Rectifier Overloaded 00=Rectifier Not Overloaded	Status
115	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit 3	1	Bool	01=Rectifier Overtemperature 00=Rectifier Temperature OK	Status
119	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit 7	1	Bool	01=Blown Fuses 00=Fuses OK	Status
124	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit C	1	Bool	01=Inverter OFF 00=inverter ON	Status
125	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit D	1	Bool	01=Paralleling Fault 00=Paralleling OK	Status
126	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit E	1	Bool	01=Single Unit 00=Paralleling Unit	Status
127	QUERY STATUS OF DIGITAL INPUTS CHANNEL B Bit F	1	Bool	01=Rectifier OFF 00=Rectifier ON	Status
128	QUERY CALCULATED BATTERY AUTONOMY (PERCENT)	1	Integer	Example: 100	%
129	QUERY TOTAL OUTPUT POWER (PERCENT)	1	Integer	Example: 100	%

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## 16 B5000 and B7000 UPS with BPCP Protocol : FD0150 / FS1128 Panels

Register	Description	Length	Format	Values	Unit			
1	System Mode	1	Integer	01=Normal 02=Battery 03=Internal Bypass 04=Maintenance Bypass 06=High Efficiency 08=Module Fault 09=Off	Status			
2	State Flags 1	2	Word	Bit	Command Name	Bit	Command Name	Status
				0		16		
				1	UPS in double conversion	17		
				2	UPS on battery	18	Phase Locked	
				3		19		
				4		20	Bypass line is available	
				5		21		
				6		22	Inverter Feeding Load	
				7		23	Bypass Feeding Load	
				8		24		
				9	Mains line OK	25		
				10	Bypass Line OK	26	Battery Floating	
				11	Battery OK	27		
				12		28		
				13		29	Battery Switch Closed	
				14	Inverter OK	30		
15	Charger OK	31						
4	State Flags 2	2	Word	Bit	Command Name	Bit	Command Name	Status
				0		16		
				1		17		
				2		18		
				3		19		
				4		20		
				5	Audible Alarm Enabled	21		
				6	OK to perform Battery Test	22		
				7		23		
				8		24		
				9	Audible Test in progress	25		
				10	LED Test in progress	26	IRP Closed	
				11		27	IRE Closed	
				12	Quick Battery Test in progress	28	UPS in EPO	
				13		29	UPS Off	
				14		30		
15		31						
6	Alarm Code 1	2	Word	Bit	Alarm Name	Bit	Alarm Name	Status
				0	Low Battery	16	Inverter Failure	
				1	Near Low Battery	17		
				2	High Battery	18		
				3	Low Runtime remaining	19		
				4		20		
				5		21		
				6		22		
				7		23		
				8		24	High Heatsink Temperature	
				9		25		
				10	Battery Disconnected	26		
				11	UPS in Bypass	27		
				12		28		
				13		29		
				14	Battery Test Failure	30	Call Service Department	
15	Charger Failure	31						

				Bit	Alarm Name	Bit	Alarm Name	
				0	Replace Battery	16	Retransfer Blocked	
				1		17		
				2	Common Alarm	18		
				3	UPS Off	19	Ups Overloaded	
				4	Mains Line Fault	20	IUG Open	
				5		21	IRE Open	
				6		22	Thermal Image Exceeded	
				7	Bypass Line Fault	23	UPS in EPO	
				8		24	IRP Open	
				9		25		
				10	Syncronization Failure	26		
				11		27		
				12		28		
				13		29		
				14		30		
				15	Maintenance Switch Closed	31		
8	Alarm Code 2	2	Word					Status
14	Input Frequency	1	Integer	Example: 050				Hz
15	Output Frequency	1	Integer	Example: 050				Hz
16	Battery Voltage	1	Integer	Example: 0432				Vdc
17	Battery Current	1	Integer	Example: 0040				Idc
18	Estimated Charge	1	Integer	Example: 0100				%
19	Runtime Remaininig	1	Integer	Example: 0200				Sec
20	Seconds on Battery	1	Integer	Example: 0100				Sec
21	Battery Temperature	1	Integer	Example: 040				°C
22	Vac Input R-N	1	Integer	Example: 0220				Vac
23	Vac Input S-N	1	Integer	Example: 0220				Vac
24	Vac Input T-N	1	Integer	Example: 0220				Vac
25	Vac Output R-N	1	Integer	Example: 0230				Vac
26	Vac Output S-N	1	Integer	Example: 0230				Vac
27	Vac Output T-N	1	Integer	Example: 0230				Vac
28	AC Input Current	1	Integer	Example: 0020				lac
29	AC Input Current Phase R	1	Integer	Example: 0010				lac
30	AC Input Current Phase S	1	Integer	Example: 0020				lac
31	AC Input Current Phase T	1	Integer	Example: 0030				lac
32	AC Output Current Phase R	1	Integer	Example: 0040				lac
33	AC Output Current Phase S	1	Integer	Example: 0050				lac
34	AC Output Current Phase T	1	Integer	Example: 0060				lac
35	Apparent Power Out Phase R	1	Integer	Example: 0005				Kva
36	Apparent Power Out Phase S	1	Integer	Example: 0006				Kva
37	Apparent Power Out Phase T	1	Integer	Example: 0007				Kva

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38	True Power Out Phase R	1	Integer	Example: 0040	Kva
39	True Power Out Phase S	1	Integer	Example: 0050	Kva
40	True Power Out Phase T	1	Integer	Example: 0060	Kva
41	Percent Load Phase R	1	Integer	Example: 0100	%
42	Percent Load Phase S	1	Integer	Example: 0100	%
43	Percent Load Phase T	1	Integer	Example: 0100	%
119	Rated KVA	1	Integer	Example: 0010	Kva
120	Rated KW	1	Integer	Example: 0020	Kw

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**17 Appendix 1 : MODBUS Adaptor Overview**



**Ethernet Port**

**RS485 Port**

**Status Leds - Green (communications ok)  
- Red (communications failure)**

**AUX port with up to four digital input customizable**



**Supply Connector**

**Serial Port COM1 – (communications with UPS)**

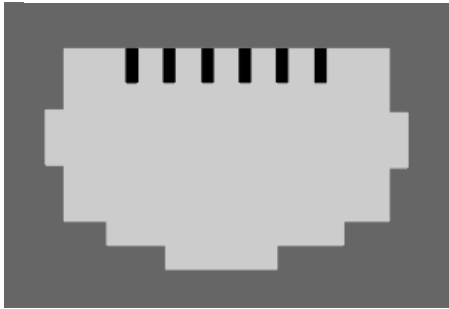
**Configuration Dip switches ( see manual)**

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**18 Appendix 2 : Pinout and connections draws for the CS-121 Modbus Ports**

**18.1 6-Pole RJ11 Auxiliary Port**

Pin 1 2 3 4 5 6

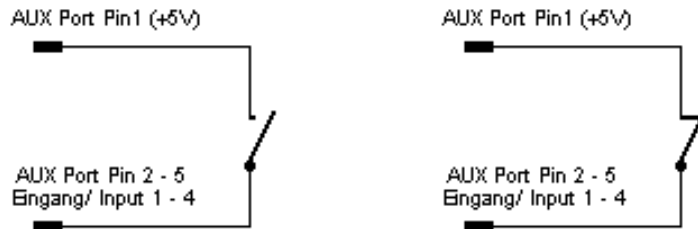


- Pin1: -> +V
- Pin2: -> Input 1
- Pin3: -> Input 2
- Pin4: -> Input 3
- Pin5: -> Input 4
- Pin6: -> GND

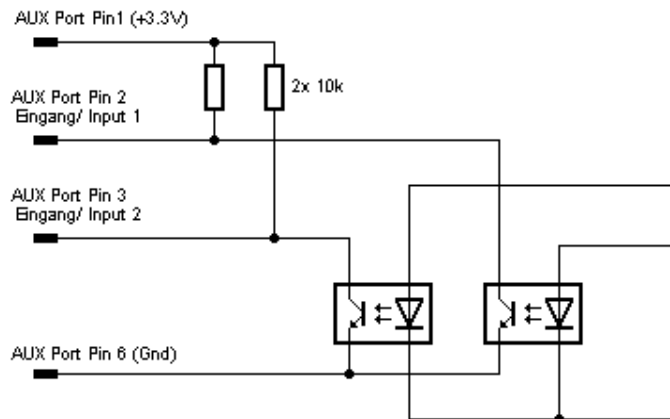
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When using a opto coupler switch, a Pull up resistor of 10kOhm has to be used.

**Example (Inputs):  
Opener or closer contact**



**Opto Coupler logic**

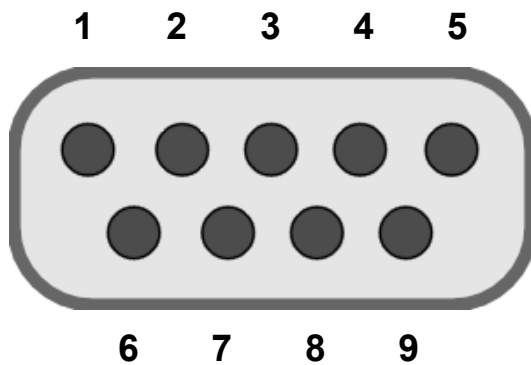


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**18.2 COM1 DB9 Main Serial Port for UPS Connection****Pin COM1**

External

D-SUB 9-polig male



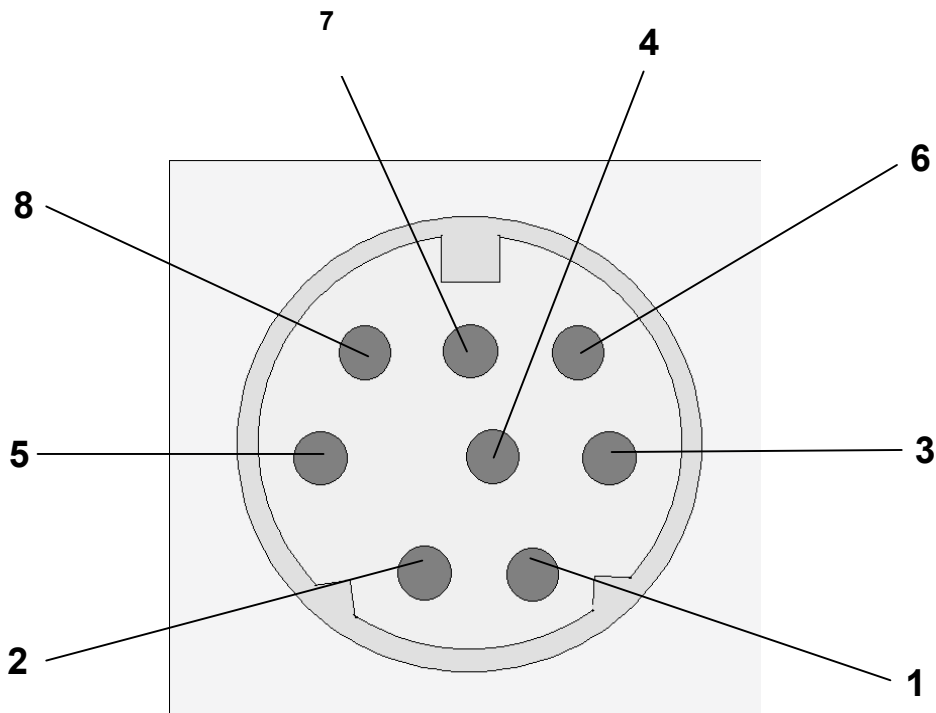
Pin1: -> DCD  
Pin2: -> RxD  
Pin3: -> TxD  
Pin4: -> DTR  
Pin5: -> GND  
Pin6: -> DSR  
Pin7: -> RTS  
Pin8: -> CTS  
Pin9: -> RI

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## 18.3 COM2 Circular Mini-Din RS485 Serial Modbus Connector

### Pin COM2

Mini-DIN 8 poles



#### RS-485:

Pin1: -> RS485-A

Pin5: -> RS485-B

#### RS-422:

Pin1: -> RS422-TX-A

Pin5: -> RS422-TX-B

Pin2: -> RS422-RX-A

Pin6: -> RS422-RX-B

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