

IPR-D1 - MODBUS MEMORY MAP

Add (Hex)	MODBUS REG. ADD (Dec)	Size	Description	Unit	Range	Step	Initial Value	Format	Read/ Write
Product ID									
0000	300001	1 W	Product Code	---	---	---	12	F2	R
0001	300002	1 W	Product Model	---	---	---	6	F2	R
0002	300003	1 W	Version Number	---	---	---	1.00	F6	R
0003	300004	1 W	Product Language	---	---	---	1	F24	R
Commands									
0080	400129	1 W	Command Operation Code	---	---	---	---	F23	R/W
TimeSet									
0090	400145	3 W	Date & Time Preset Data	---	---	---	---	F8	R/W
Common Setpoints									
0100	400257	1 W	Access Code	---	111-999	1	111	F10	R/W
0101	400258	1 W	System Setup	BitField	---	---	1088	F9	R/W
0102	400259	1 W	Reserved						R/W
0103	400260	1 W	Ground CT Rating Primary	A	5-5000	5	100	F2	R/W
0104	400261	1 W	Reserved						R/W
0105	400262	1 W	Reserved						R/W
0106	400263	1 W	Output Relays Config	BitField	---	---	0	F11	R/W
0107	400264	1 W	TRIP Relay Pulse Time	ms	100 ~ 2000	100	200	F2	R/W
0108	400265	1 W	AUX1 Relay Pulse Time	ms	100 ~ 2000	100	200	F2	R/W
0109	400266	1 W	AUX2 Relay Pulse Time	ms	100 ~ 2000	100	200	F2	R/W
010A	400267	1 W	AUX3 Relay Pulse Time	ms	100 ~ 2000	100	200	F2	R/W
010B	400268	1 W	Block Trip Delay	Sec	0.05-1.00	0.01	0.15	F6	R/W
010C	400269	1 W	Reserved						R/W
010D	400270	1 W	Digital Inputs Config	BitField	---	---	0	F12	R/W
010E	400271	1 W	Input 1 Function		0-7	1	0	F13	R/W
010F	400272	1 W	Input 2 Function		0-7	1	0	F13	R/W
0110	400273	1 W	Input 3 Function		0-7	1	0	F13	R/W
0111	400274	1 W	Reserved						R/W
0112	400275	1 W	Reserved						R/W
0113	400276	1 W	Reserved						R/W
0114	400277	1 W	Event Recorder Config	BitField	---	---		F14	R/W
0115	400278	1 W	Breaker Discrepancy Relays	---	0-7	1	0	F15	R/W
0116	400279	1 W	Breaker Discrepancy Delay	ms	10-2500	10	1000	F2	R/W
0117	400280	1 W	Mechanical Operations Relays	---	0-7	1	0	F15	R/W
0118	400281	1 W	Mechanical Operations Maximum	---	5-9995	5	3000	F2	R/W
0119	400282	1 W	Reserved						R/W
011A	400283	1 W	Reserved						R/W
011B	400284	1 W	Reserved						R/W
011C	400285	1 W	Reserved						R/W
011D	400286	1 W	Reserved						R/W
011E	400287	1 W	Reserved						R/W
011F	400288	1 W	Slave Address	---	1-247	1	1	F2	R/W
0120	400289	1 W	Com1 (RS-232) Baud Rate	Baud	0-4	1	3	F17	R/W
0121	400290	1 W	Com2 (RS-485) Baud Rate	Baud	0-4	1	3	F17	R/W
0122	400291	1 W	Com3 (RS-485) Baud Rate	Baud	0-4	1	3	F17	R/W
Protections Setpoints									
018B	400396	1 W	Ground Timed OverCurrent Relays	---	0-7	1	1	F15	R/W
018C	400397	1 W	Ground Timed OverCurrent Pickup	%CT	4-300	1	12	F2	R/W
018D	400398	1 W	Ground Timed OverCurrent Curve	---	0-12	1	1	F16	R/W
018E	400399	1 W	Ground Timed OverCurrent Curve Multiplier	---	0.1-20.0	0.1	1.0	F4	R/W
018F	400400	1 W	Ground Timed OverCurrent Delay	Sec	0.05-600	0.01/0.1/1	1.0	F6	R/W
0190	400401	1 W	Ground Inst. OverCurrent Relays	---	0-7	1	1	F15	R/W
0191	400402	1 W	Ground Inst. OverCurrent Pickup	%CT	4-1800	1/10	120	F2	R/W
0192	400403	1 W	Ground Inst. OverCurrent Delay	ms	0-2000	10	0	F2	R/W
0193	400404	1 W	Ground OverCurrent Alarm Relays	---	0-7	1	0	F15	R/W
0194	400405	1 W	Ground OverCurrent Alarm Pickup	%CT	4-300	1	12	F2	R/W
0195	400406	1 W	Ground OverCurrent Alarm Delay	Sec	0.05-600	0.01/0.1/1	1.0	F6	R/W
Actual Values									
0200	300513	3 W	Relay Date & Time	---	---	---	---	F8	R
0203	300516	1 W	Front Panel Leds Status	BitField	---	---	---	F18	R
0204	300517	1 W	Front Panel Leds Blink Status	BitField	---	---	---	F18	R
0205	300518	1 W	Output Relays Status	BitField	---	---	---	F20	R
0206	300519	1 W	Digital Inputs Status	BitField	---	---	---	F21	R
0207	300520	1 W	Status Flags	BitField	---	---	---	F22	R
0208	300521	1 W	Pickup Flags	BitField	---	---	---	F22	R

IPR-D1 - MODBUS MEMORY MAP

Add (Hex)	MODBUS REG. ADD (Dec)	Size	Description	Unit	Range	Step	Initial Value	Format	Read/ Write
0209	300522	2 W	Reserved						R
020B	300524	2 W	Reserved						R
020D	300526	2 W	Reserved						R
020F	300528	2 W	Ground RMS Current	A	---	---	---	F6	R
0211	300528	3 W	Last Trip Cause, Date & Time	---	---	---	---	F8	R
0214	300530	2 W	Reserved						R
0216	300533	2 W	Reserved						R
0218	300535	2 W	Reserved						R
021A	300537	2 W	Pre-Trip Ground RMS Current	A	---	---	---	F6	R
Maintenance Data									
0280	300641	1 W	Trips Counter	---	---	---	---	F2	R
0281	300642	1 W	Reserved						R
0282	300643	1 W	Reserved						R
0283	300644	1 W	Reserved						R
0284	300645	1 W	Reserved						R
0285	300646	1 W	Ground O/C Trips	---	---	---	---	F2	R
0286	300647	1 W	Openning Counter	---	---	---	---	F2	R
Events									
0600	301537	1 W	Last Event Number	---	---	---	---	F2	R
0601	301538	3 W	Last Event Clear Date & Time	---	---	---	---	F8	R
0610	401553	1 W	Selected Event Number	---	1-65535	1	1	F2	R/W
0611	301554	3 W	Selected Event Date & Time	---	---	---	---	F8	R
0614	301557	2 W	Reserved						R
0616	301559	2 W	Reserved						R
0618	301561	2 W	Reserved						R
061A	301563	2 W	Selected Event Ground RMS Current	A	---	---	---	F6	R

IPR-D1 DATA FORMATS																																							
Format Code	Type	Value	Definition																																				
F1	Integer		Signed Integer Value Example: -123 saved as -123																																				
F2	Integer		Unsigned Integer Value Example: 123 saved as 123																																				
F3	Integer		Signed Integer Value with 1 decimals Example: -1.0 saved as -10																																				
F4	Integer		Unsigned Integer Value with 1 decimals Example: 1.0 saved as 10																																				
F5	Integer		Signed Integer Value with 2 decimals Example: -1.00 saved as -100																																				
F6	Integer		Unsigned Integer Value with 2 decimals Example: 1.00 saved as 100																																				
F7	Floating Point		(4 Byte) Floating Point Value 4-byte floating-point format The memory layout of 4-byte floating-point numbers is: <div style="text-align: center;"> <table style="border-collapse: collapse; margin: auto;"> <tr> <td style="border: none;">31</td><td style="border: none;">30</td><td style="border: none;">23</td><td style="border: none;">22</td><td style="border: none;">0</td> </tr> <tr> <td style="border: none;">S</td><td style="border: none;">Exponent</td><td colspan="2" style="border: none;">Mantissa</td><td style="border: none;"></td> </tr> </table> </div> The value of the number is: $(-1)^S * 2^{(Exponent-127)} * 1.Mantissa$ Zero is represented by 4 bytes of zeros. The precision of the float operators (+, -, *, and /) is approximately 7 decimal digits.	31	30	23	22	0	S	Exponent	Mantissa																												
31	30	23	22	0																																			
S	Exponent	Mantissa																																					
F8	Clock		Date & Time Format <table style="width: 100%; border-collapse: collapse; font-size: small;"> <tr> <td style="width: 15%;"></td> <td style="width: 15%; text-align: center;">15</td> <td style="width: 15%;"></td> <td style="width: 15%; text-align: center;">8</td> <td style="width: 15%; text-align: center;">7</td> <td style="width: 15%; text-align: center;">0</td> </tr> <tr> <td>1st Word</td> <td colspan="2">Event Cause (Only for Events Date & Time Register) Otherwise NOT USED (0-512) See Events List</td> <td colspan="2">YEAR (00-99) Ex. 00 = 2000, 01=2001 ...</td> <td></td> </tr> <tr> <td style="border: none;"></td> <td style="border: none;">15</td> <td style="border: none;">14</td> <td style="border: none;">13</td> <td style="border: none;">10</td> <td style="border: none;">9</td> </tr> <tr> <td>2nd Word</td> <td style="text-align: center;">Not Used</td> <td colspan="2" style="text-align: center;">MONTH (1-12)</td> <td colspan="2" style="text-align: center;">DAYS (1-31/30/29/28) Depending on the Month & Year</td> </tr> <tr> <td style="border: none;"></td> <td style="border: none;">15</td> <td style="border: none;">10</td> <td style="border: none;">9</td> <td style="border: none;"></td> <td style="border: none;">0</td> </tr> <tr> <td>3rd Word</td> <td colspan="3" style="text-align: center;">MINUTES (00-59)</td> <td colspan="2" style="text-align: center;">SECONDS (00.0-59.9)</td> </tr> </table>		15		8	7	0	1st Word	Event Cause (Only for Events Date & Time Register) Otherwise NOT USED (0-512) See Events List		YEAR (00-99) Ex. 00 = 2000, 01=2001 ...				15	14	13	10	9	2nd Word	Not Used	MONTH (1-12)		DAYS (1-31/30/29/28) Depending on the Month & Year			15	10	9		0	3rd Word	MINUTES (00-59)			SECONDS (00.0-59.9)	
	15		8	7	0																																		
1st Word	Event Cause (Only for Events Date & Time Register) Otherwise NOT USED (0-512) See Events List		YEAR (00-99) Ex. 00 = 2000, 01=2001 ...																																				
	15	14	13	10	9																																		
2nd Word	Not Used	MONTH (1-12)		DAYS (1-31/30/29/28) Depending on the Month & Year																																			
	15	10	9		0																																		
3rd Word	MINUTES (00-59)			SECONDS (00.0-59.9)																																			
F9	16 Bits BitMap		System Setup Register Format																																				
		Bit 0 ~ Bit 1	System Frequency: 0 = 50hz, 1 = 60hz																																				
		Bit 2 ~ Bit 9	Not Used																																				
		Bit 10	Out of Service on AUX3 ?: 0 = No, 1 = Yes																																				
		Bit 11 ~ Bit 15	Not Used																																				
F10	Integer		Unsigned Integer Access Code Value Register Format Example: 111 saved as 111 (only digits 1-9 accepted, digit 0 is NOT ALLOWED)																																				
F11	16 Bits BitMap		Outputs Relays Configuration Register Format																																				
		Bit 0	TRIP Relay Config.: "LATCHED", 1 = "PULSED" 0 =																																				
		Bit 1	Not Used																																				
		Bit 2	AUX1 Relay Config.: "LATCHED", 1 = "PULSED" 0 =																																				
		Bit 3	Not Used																																				
		Bit 4	AUX2 Relay Config.: "LATCHED", 1 = "PULSED" 0 =																																				
		Bit 5	Not Used																																				
		Bit 6	AUX3 Relay Config.: "LATCHED", 1 = "PULSED" 0 =																																				
		Bit 7 ~ Bit 15	Not Used																																				

IPR-D1 DATA FORMATS			
Format Code	Type	Value	Definition
F12	16 Bits BitMap		Digital Input Configuration Register Format
		Bit 0	INPUT 1 SET ON: 0 = "CONTACT CLOSED", 1 = "CONTACT OPEN"
		Bit 1	INPUT 2 SET ON: 0 = "CONTACT CLOSED", 1 = "CONTACT OPEN"
		Bit 2	INPUT 3 SET ON: 0 = "CONTACT CLOSED", 1 = "CONTACT OPEN"
		Bit 3	Not Used
		Bit 4	INPUT 5 SET ON: 0 = "CONTACT CLOSED", 1 = "CONTACT OPEN"
		Bit 5	INPUT 6 SET ON: 0 = "CONTACT CLOSED", 1 = "CONTACT OPEN"
		Bit 6 ~ Bit 15	Not Used
F13	Integer		Digital Input Functions
		0	NONE
		1	BREAKER EARTHED
		2	EXTERNAL RESET
		3	REMOTE TRIP
		4	BLOCK TRIP
		5	AUX1
		6	AUX2
		7	AUX3
F14	16 Bits BitMap		Events Recorder Configuration Register Format
		Bit 0	Not Used
		Bit 1	Gnd. Protections Events { 0 = Off , 1 = On }
		Bit 2	System Events { 0 = Off , 1 = On }
		Bit 3	Output Relays Events { 0 = Off , 1 = On }
		Bit 4	Digital Inputs Events { 0 = Off , 1 = On }
		Bit 5 ~ Bit 15	Not Used
F15	Integer		Output Relay Selection
		Bit 0	TRIP OUTPUT RELAY
		Bit 1	AUX.1 OUTPUT RELAY
		Bit 2	AUX.2 OUTPUT RELAY
		Bit 3	AUX.3 OUTPUT RELAY
F16	Integer		Protection Curve Definition Format
		0	DefiniteTime
		1	ANSI Moderate Inverse
		2	ANSI Normal Inverse
		3	ANSI Very Inverse
		4	ANSI Extrem Inverse
		5	IAC Moderate Inverse
		6	IAC Normal Inverse
		7	IAC Very Inverse
		8	IAC Extrem rInverse
		9	IEC ShortTime
		10	IEC A Normal Inverse
		11	IEC B Very Inverse
		12	IEC C Extrem Inverse
F17	Integer		BaudRate Definitions
		0	1200 Bps
		1	2400 Bps
		2	4800 Bps
		3	9600 Bps
		4	19200 Bps
F18	16 Bits BitMap		Led Status 1 Register Format
		Bit 0	TRIP LED: 0 = "OFF", 1 = "ON", 2 = "BLINKING"
		Bit 1	ALARM LED: 0 = "OFF", 1 = "ON", 2 = "BLINKING"
		Bit 2	OUT OF SERVICE LED: 0 = "OFF", 1 = "ON", 2 = "BLINKING"
		Bit 3	BREAKER CLOSED LED: 0 = "OFF", 1 = "ON", 2 = "BLINKING"
		Bit 4	BREAKER OPEN LED: 0 = "OFF", 1 = "ON", 2 = "BLINKING"
		Bit 5	BREAKER EARTHED LED: 0 = "OFF", 1 = "ON", 2 = "BLINKING"
		Bit 6	Not Used

IPR-D1 DATA FORMATS			
Format Code	Type	Value	Definition
		Bit 7	Not Used
		Bit 8	Not Used
		Bit 9	PICKUP Io> (51N/G) LED: 0 = "OFF", 1 = "ON", 2 = "BLINKING"
		Bit 10	PICKUP Io>> (50N/G) LED: 0 = "OFF", 1 = "ON", 2 = "BLINKING"
		Bit 11 ~ Bit 15	Not Used
F20	16 Bits BitMap		Output Relays Status Register
		Bit 0	Trip Output Relay { 0 = "Energized", 1 = "De-energized" }
		Bit 1	Aux1 Output Relay { 0 = "Energized", 1 = "De-energized" }
		Bit 2	Aux2 Output Relay { 0 = "Energized", 1 = "De-energized" }
		Bit 3	Aux3 Output Relay { 0 = "Energized", 1 = "De-energized" }
		Bit 4 ~ Bit 15	Not Used
F21	16 Bits BitMap		Digital Input Status Register
		Bit 0	Digital Input 1 { 0 = "OPEN", 1 = "CLOSE" }
		Bit 1	Digital Input 2 { 0 = "OPEN", 1 = "CLOSE" }
		Bit 2	Digital Input 3 { 0 = "OPEN", 1 = "CLOSE" }
		Bit 3	Breaker Status Digital Input { 0 = "OPEN", 1 = "CLOSE" }
		Bit 4	Digital Input 5 { 0 = "OPEN", 1 = "CLOSE" }
		Bit 5	Digital Input 6 { 0 = "OPEN", 1 = "CLOSE" }
		Bit 6 ~ Bit 15	Not Used
F22	16 Bits BitMap		Status & Pickup Flags Format
		Bit 0	Not Used
		Bit 1	Not Used
		Bit 2	Not Used
		Bit 3	Ground Timed OverCurrent Protection { 0 = OFF, 1 = ON }
		Bit 4	Ground Inst OverCurrent Protection { 0 = OFF, 1 = ON }
		Bit 5	Ground OverCurrent Alarm Protection { 0 = OFF, 1 = ON }
		Bit 6	Not Used
		Bit 7	Not Used
		Bit 8	Not Used
		Bit 9	Not Used
		Bit 10	Not Used
		Bit 11	Not Used
		Bit 12	Not Used
		Bit 13	Breaker Driscrepancy Function { 0 = OFF, 1 = ON }
		Bit 14	Mechanical Operations Function { 0 = OFF, 1 = ON }
		Bit 15	Not Used
F23	Integer		Commands Operation Codes
		0	No Command
		1	Remote Reset
		2	Remote Trip
		5	Activate Date & Time Preset Data
		8	Clear Maintenance Data
		9	Clear All Events
		20	Set Aux1
		21	Set Aux2
		22	Set Aux3
F24	Integer		Product Language
		1	English

IPR-D1 Event Cause List :	
0	No Event
1	Events Clear
4	Trip Relay OFF
5	Trip Relay ON
6	Aux.1 Relay OFF
7	Aux.1 Relay ON
8	Aux.2 Relay OFF
9	Aux.2 Relay ON
10	Aux.3 Relay OFF
11	Aux.3 Relay ON
20	Digital Input 1 Deactive
21	Digital Input 1 Active
22	Digital Input 2 Deactive
23	Digital Input 2 Active
24	Digital Input 3 Deactive
25	Digital Input 3 Active
26	Breaker Status "OPENED"
27	Breaker Status "CLOSED"
32	Earth Released
33	Breaker Earthed
34	Remote Trip
35	Serial Communication Trip
36	Block Trip Reset
37	Block Trip Set
43	Ground Timed OverCurrent
44	Ground Inst OverCurrent
45	Ground OverCurrent Alarm
51	Breaker Discrepancy Alarm
52	Mechanical Operation Alarm
54	Maintenance Data Clear