



Raychem NGC-UIT2

MODBUS PROTOCOL INTERFACE MAPPING FOR NGC-30 SYSTEMS

Firmware versions up to V2.0.X

Main	Setup	Status	Events	Network	System		
------	-------	--------	--------	---------	--------	--	--

Status - [08:05 04-Apr-08]

Ckt#	ID	°F	SetPt	DB	Amps	G.F.	Status
1	Pipe #1	65	80	5	6.0	3	On
2	Pipe #2	121	125	5	12.0	3	On
3	Pipe #3	113	110	5	0.0	0	Off
4	Pipe #4	63	56	5	0.0	0	Off
5	Pipe #5	33	50	5	12.3	3	On

Navigation icons: Home, Up, Down, Left, Right, Back


Alarm Relays: 1 2 3

Contents

Section I – Introduction	3
Modbus Communications	3
Section II – Modbus Register Map	5
Modbus Functions and General Organization of Data	5
Modbus Protocol Register Map	5
General Information – Coils	6
Device Status Change List	6
Circuit Database Change Flags	6
Circuit Alarm Status Change Flags	7
Circuit Latched Alarm Reset Flags	7
Circuit Min/Max Values Reset Flags	7
General Information – Input Status	9
General Information – Input Registers	9
Circuit/Device Setup Limits	10
Device List	15
Device Status Flags	17
NGC-UIT2 System Status Flags	18
NGC-UIT2 Circuit Status Flags	19
Circuit Resources	21
Circuit Status	23
General Information – Holding Registers	25
Database Synchronization / Global Alarm Status	27
Circuit Control Data	28

Section I – Introduction

The Raychem NGC-UIT2 is the primary user interface terminal for the Raychem NGC-30 heat trace controller system. The Raychem NGC-UIT maintains an extensive internal database including details of the system's current configuration, available resources, set-up parameters, current conditions, alarm status and numerous other fixed and variable data points. The Modbus Register Map is exhaustive and extensive. Most Modbus programmers and system integrators will only require limited access to some of the available data.

 **CAUTION:** The Raychem NGC-30 Modbus registers can be accessed by DCS systems. However, this should only be done by expert users who understand that the system makes use of extensive semaphore fields to assure synchronization between the possibility of multiple users and conflicting instructions. Pentair Industrial Heat Tracing Solutions has tested the system performance and synchronization when changes are made using the UIT touch screen and Raychem Supervisor. System Integrators should not attempt to make set-up changes via the UIT Modbus Interface unless they are prepared to re-validate system performance with their own resources.

The Raychem NGC-30 system has the capability to monitor and control up to 247 external hardware devices using an RS-485 network reserved for the system. The external Modbus user cannot directly access the internal network. All Modbus functions discussed in the following sections are interactions with the database maintained within the Raychem NGC-UIT2.

The Raychem NGC-UIT2 can monitor and control up to 260 Circuits. Although the Modbus map has space for 500 Circuits, these additional Circuits should not be employed as they have not been qualified and the system performance will be reduced. A Circuit can be a simple one to one association between an input sensor and an output device. A Circuit may have up to 4 temperature sensors but never more than one output. Some Circuits will be established as “monitor only” Circuits. This type of Circuit does not control an output device, but it retains the capability to monitor one or several temperature or current inputs and compare current values to alarm thresholds.

Most Modbus applications will be satisfied by READ ONLY access to the sections of the database highlighted on pages 15 and 19 (Circuit Status and Circuit Control Data). These portions of the Modbus register map provide access to the current set-up and real time values being measured by the system. A snap shot of current conditions, data for trending, alarm status, the current setting for alarm thresholds and set-points can be easily read without any risk to the system performance.

The entire Modbus register map is included in this document for completeness. Writing to the database is within the capability of most Modbus host devices. However, we strongly recommend that system integrators who write to the database must thoroughly test their system to ensure it is working properly and that there are no unintended consequences.

Modbus Communications

The Raychem NGC-UIT2 external communications serial port can be configured for use as an RS-232, RS-485 or Ethernet.

The host defaults are:

- Port Mode: RS-485
- Modbus Address: 1
- Baud Rate: 9600
- Transmit Delay: 0
- Receive Timeout: 50 milliseconds

The Raychem NGC-UIT2 mode of transmission is Remote Terminal Unit (RTU). The standard configuration is 8 data bits, no parity and 2 stop bits. To change the defaults listed above, refer to the Raychem NGC-30 Programming Guide (H58186)

Section II – Modbus Register Map

Modbus Functions and General Organization of Data

Modbus Protocol Register Map

 **IMPORTANT:**

1. System Integrators developing READ ONLY interfaces will be most interested in the sections below for Modbus Function Codes 2 and 4.
2. Each register map block has a brief description of the PRIMARY USE associated with that block's data.

Modbus Coils (Function Code 1, 5, 15)	Start	End	Size	Block Size	No. of Blocks
NGC-UIT2 General Information	1	5	5	5	1
NGC-UIT2 Device Status Change List	101	347	247	247	1
NGC-UIT2 Circuit Database Change Flags	1001	1500	500	500	1
NGC-UIT2 Circuit Alarm Status Change Flags	2001	2500	500	500	1
NGC-UIT2 Circuit Latched Alarm Reset Flags	3001	3500	500	500	1
NGC-UIT2 Circuit Min/Max Values Reset Flags	4001	4500	500	500	1

Modbus Input Status (Function Code 2)	Start	End	Size	Block Size	No. of Blocks
NGC-UIT2 General Information	1	10	10	10	1

Modbus Input Registers (Function Code 4)	Start	End	Size	Block Size	No. of Blocks
NGC-UIT2 General Information	1	100	100	100	1
NGC-UIT2 Circuit/Device Setup Limits	101	650	550	50	11
NGC-UIT2 Device List	1001	3470	2470	10	247
NGC-UIT2 Device Status Flags	6001	6988	988	4	247
NGC-UIT2 System Status Flags	7001	7004	4	4	1
NGC-UIT2 Circuit Status Flags	8001	10000	2000	4	500
NGC-UIT2 Circuit Resources	10001	14000	4000	8	500
NGC-UIT2 Circuit Status	20001	55000	35000	70	500

Modbus Holding Registers (Function Code 3, 6, 16)	Start	End	Size	Block Size	No. of Blocks
NGC-UIT2 General Information	1	100	100	100	1
NGC-UIT2 Synchronization / Global Alarm Status	101	101	1	1	1
NGC-UIT2 Circuit Control Data	1001	61000	60000	120	500

General Information – Coils

Modbus Function Code:	1, 5, 15
Modbus Start Address:	1
Modbus Block Size:	5
Number of Blocks:	1
Primary Use:	Initiate network scan for resources

Modbus Address	Description	Comments
1	Reserved	
2	Network sensor device scan	Write 1 = Perform network sensor scan Write 0 = No action Read 1 = Scan is in progress, Read 0 = Scan complete
3	Acknowledge Alarm	Write 1 = Acknowledge event/alarm, write 0 = no action
4	Spare	
5	Spare	

Device Status Change List

Modbus Function Code:	1, 5, 15
Modbus Start Address:	101
Modbus Block Size:	247
Number of Blocks:	1
Primary Use:	Data synchronization

Modbus Address	Description	Comments: Write a 1 to Clear Flag This flag is set when a field bus device is added or removed from the network.
101	Device 1 Status Change Flag	
102	Device 2 Status Change Flag	
....	Device xx Status Change Flag	
346	Device 246 Status Change Flag	
347	Device 247 Status Change Flag	

Circuit Database Change Flags

Modbus Function Code:	1, 5, 15
Modbus Start Address:	1001
Modbus Block Size:	500
Number of Blocks:	1
Primary Use:	Data synchronization

Modbus Address	Description	Comments: Write a 1 to Clear Flag
1001	Circuit 1 Data Base Change Flag	
1002	Circuit 2 Data Base Change Flag	
....	Circuit xx Data Base Change Flag	

1499	Circuit 499 Data Base Change Flag
1500	Circuit 500 Data Base Change Flag

Circuit Alarm Status Change Flags

Modbus Function Code:	1, 5, 15
Modbus Start Address:	2001
Modbus Block Size:	500
Number of Blocks:	1
Primary use:	Alarm notification

Modbus Address	Description	Comments: Write a 1 to Clear Flag
2001	Circuit 1 Status Change Flag	
2002	Circuit 2 Status Change Flag	
....	Circuit xx Status Change Flag	
2499	Circuit 499 Status Change Flag	
2500	Circuit 500 Status Change Flag	

Circuit Latched Alarm Reset Flags

Modbus Function Code:	1, 5, 15
Modbus Start Address:	3001
Modbus Block Size:	500
Number of Blocks:	1
Primary Use:	Alarm reset commands

Modbus Address	Description	Comments: Write a 1 to Clear Flag. This flag is set when a latched alarm can be reset on a Circuit. This flag is only used to reset the latched alarms on circuits which use a 5GF-C, NGC-30-CRM/-CRMS or NGC-20 relay output.
3001	Circuit 1 Latched Alarm Reset Flag	
3002	Circuit 2 Latched Alarm Reset Flag	
....	Circuit xx Latched Alarm Reset Flag	
3499	Circuit 499 Latched Alarm Reset Flag	
3500	Circuit 500 Latched Alarm Reset Flag	

Circuit Min/Max Values Reset Flags

Modbus Function Code:	1, 5, 15
Modbus Start Address:	4001
Modbus Block Size:	500
Number of Blocks:	1
Primary use:	Clear min/max registers on command

Modbus Address	Description	Comments: Write a 1 to Clear Flag Clears Min/Max values in status record for each Circuit
4001	Circuit 1 Min/Max Values Reset Flag	
4002	Circuit 2 Min/Max Values Reset Flag	
....	Circuit xx Min/Max Values Reset Flag	
4499	Circuit 499 Min/Max Values Reset Flag	
4500	Circuit 500 Min/Max Values Reset Flag	

General Information – Input Status

Modbus Function Code:	2
Modbus Start Address:	1
Modbus Block Size:	10
Number of Blocks:	1
Primary Use:	Read status of alarm relays on UIT

Modbus Address	Description	Comments
1	NGC-UIT2 Alarm Relay #1 status	0 = De-energized (Alarm) 1 = Energized (No alarm)
2	NGC-UIT2 Alarm Relay #2 status	0 = De-energized (Alarm) 1 = Energized (No alarm)
3	NGC-UIT2 Alarm Relay #3 status	0 = De-energized (Alarm) 1 = Energized (No alarm)
4	Spare	
5	Spare	
....	Spare	
9	Spare	
10	Spare	

General Information – Input Registers

Modbus Function Code:	4
Modbus Start Address:	1
Modbus Block Size:	100
Number of Blocks:	1
Primary Use:	Read firmware version

Modbus Address	Description	Comments
1	NGC-UIT2 Type	NGC-UIT2 = 0x300
2	NGC-UIT2 Firmware Version Major	Range 0 – 255
3	NGC-UIT2 Firmware Version Minor	Range 0 – 255
4	Build Number	Range 0 – 999
5	NGC-UIT2 OS Version Major	0 – 255
6	NGC-UIT2 OS Version Minor	0 – 255
7	NGC-UIT2 OS Version Build	0 – 999
8	NGC-UIT2 OS Version Revision	0 – 999
....	Spare	
99	Spare	
100	Spare	

Circuit/Device Setup Limits

Modbus Function Code:	4
Modbus Start Address:	101
Modbus Block Size:	50
Number of Blocks:	11
Primary Use:	Displays certain limits and index ranges [defaults in brackets]

General Limits

Modbus

Address	Description / Value	Units
101	Number of Device Limits (that follow starting at register 151)	4 (max 10)
102	Min Device Address [1]	
103	Max Device Address [247]	
104	Max 5GF-C/NGC-30-CRM/-CRMS Channels [5]	Relays are always present, not all RTDs may be present
105	Max RMC Channels [40]	Minimum always 0
106	Spare	
107	Spare	
108	Spare	
109	Spare	
110	Spare	
111	Spare	
122	Spare	
113	Spare	
114	Spare	
115	Spare	
116	Spare	
117	Spare	
118	Spare	
119	Spare	
120	Spare	
121	Spare	
122	Spare	
123	Voltage Min [500]	0.1 V, used for both Low/High Voltage Alarms
124	Voltage Max [3050]	0.1 V, used for both Low/High Voltage Alarms
....	Spare	
149	Spare	
150	Spare	

5GF-C Limits Version before 1.10

Modbus Address	Description / Value	Units
151	Control Mode Min [0]	0 = Monitor Only 1 = On/Off 2 = Always Off 3 = Always On 4 = PASC 5 = Voltage
152	Control Mode Max [5]	0 = Monitor Only 1 = On/Off 2 = Always Off 3 = Always On 4 = PASC 5 = Voltage
153	Failsafe Mode Min [0]	
154	Failsafe Mode Max [1]	
155	Ground Fault Trip Enable Min [0]	
156	Ground Fault Trip Enable Max [1]	
157	Maintain Temp Low [-67]	0.1°C
158	Maintain Temp High [3155]	0.1°C
159	Low/High Temp Alarm Low [-728]	0.1°C
160	Low/High Temp Alarm High [4822]	0.1°C
161	Dead Band Low [6]	0.1°C
162	Dead Band High [278]	0.1°C
163	Low/High Current Alarm Low [0]	0.01 A, 0 disables alarm
164	Low/High Current Alarm High [10000]	0.01 A
165	Ground Fault Alarm/Trip Low [200]	0.1 mA
166	Ground Fault Alarm/Trip High [2000]	0.1 mA
167	PASC Min Ambient Temp Low [-728]	0.1°C
168	PASC Min Ambient Temp High [517]	0.1°C
169	Min Pipe Size Min [0]	None
170	Min Pipe Size Max [2]	None
171	Power Adjust Min [10]	%
172	Power Adjust Max [200]	%
173	Voltage Min [500]	0.1 V, used for both Low/High Voltage Alarms
174	Voltage Max [3050]	0.1 V, used for both Low/High Voltage Alarms
....	Spare	
199	Spare	
200	Spare	

5GF-C Limits Version 1.10 or Later

Modbus		
Address	Description / Value	Units
201	Control Mode Min [0]	0 = Monitor Only 1 = On/Off 2 = Always Off 3 = Always On 4 = PASC 5 = Voltage
202	Control Mode Max [5]	0 = Monitor Only 1 = On/Off 2 = Always Off 3 = Always On 4 = PASC 5 = Voltage
203	Failsafe Mode Min [0]	
204	Failsafe Mode Max [1]	
205	Ground Fault Trip Enable Min [0]	
206	Ground Fault Trip Enable Max [1]	
207	Maintain Temp Low [-728]	0.1°C
208	Maintain Temp High [4822]	0.1°C
209	Low/High Temp Alarm Low [-728]	0.1°C
210	Low/High Temp Alarm High [4822]	0.1°C
211	Dead Band Low [6]	0.1°C
212	Dead Band High [278]	0.1°C
213	Low/High Current Alarm Low [0]	0.01 A, 0 disables alarm
214	Low/High Current Alarm High [10000]	0.01 A
215	Ground Fault Alarm/Trip Low [200]	0.1 mA
216	Ground Fault Alarm/Trip High [2000]	0.1 mA
217	PASC Min Ambient Temp Low [-728]	0.1°C
218	PASC Min Ambient Temp High [517]	0.1°C
219	Min Pipe Size Min [0]	None
220	Min Pipe Size Max [2]	None
221	Power Adjust Min [10]	%
222	Power Adjust Max [200]	%
223	Voltage Min [500]	0.1 V, used for both Low/High Voltage Alarms
224	Voltage Max [3050]	0.1 V, used for both Low/High Voltage Alarms
....	Spare	
249	Spare	
250	Spare	

NGC-30-CRM/-CRMS Limits All versions

Modbus Address	Description / Value	Units
251	Control Mode Min [0]	0 = Monitor Only 1 = On/Off 2 = Always Off 3 = Always On 4 = PASC 5 = Voltage 6 = Proportional (NGC-30-CRMS only)
252	Control Mode Max [6]	0 = Monitor Only 1 = On/Off 2 = Always Off 3 = Always On 4 = PASC 5 = Voltage 6 = Proportional (NGC-30-CRMS only)
253	Failsafe Mode Min [0]	
254	Failsafe Mode Max [1]	
255	Ground Fault Trip Enable Min [0]	
256	Ground Fault Trip Enable Max [1]	
257	Maintain Temp Low [-728]	0.1°C
258	Maintain Temp High [4822]	0.1°C
259	Low/High Temp Alarm Low [-728]	0.1°C
260	Low/High Temp Alarm High [4822]	0.1°C
261	Dead Band Low [6]	0.1°C
262	Dead Band High [278]	0.1°C
263	Low/High Current Alarm Low [0]	0.01 A, 0 disables alarm
264	Low/High Current Alarm High [10000]	0.01 A
265	Ground Fault Alarm/Trip Low [200]	0.1 mA
266	Ground Fault Alarm/Trip High [2000]	0.1 mA
267	PASC Min Ambient Temp Low [-728]	0.1°C
268	PASC Min Ambient Temp High [517]	0.1°C
269	Min Pipe Size Min [0]	None
270	Min Pipe Size Max [2]	None
271	Power Adjust Min [10]	%
272	Power Adjust Max [200]	%
273	Power Limit Min [10]	%
274	Power Limit Max [100]	%
275	Voltage Min [500]	0.1 V, used for both Low/High Voltage Alarms
276	Voltage Max [3050]	0.1 V, used for both Low/High Voltage Alarms
....	Spare	
279	Spare	
300	Spare	

NGC-20 Limits All versions (European Only)

Modbus		
Address	Description / Value	Units
301	Local Temperature Sensor Range Min [-800]	0.1°C
301	Local Temperature Sensor Range Max [7000]	0.1°C
303	Current Range Minimum [30]	0.01 A
304	Current Range Maximum [3000]	0.01 A
305	GFI Range Minimum [100]	0.1 mA
306	GFI Range Maximum [2500]	0.1 mA
307	Voltage Range Minimum [500]	0.1 AC V
308	Voltage Range Maximum [3050]	0.1 AC V
309	Limiter Cutout Range Minimum [-600]	0.1°C
310	Limiter Cutout Range Maximum [5990]	0.1°C
311	Deadband Range Minimum [10]	0.1°C
312	Deadband Range Maximum [500]	0.1°C
313	Spare	
314	Spare	
315	Spare	
316	Spare	
317	Spare	
318	Spare	
319	Spare	
320	Spare	
321	Spare	
322	Spare	
323	Spare	
324	Spare	
325	Spare	
326	Spare	
....	Spare	
649	Spare	
650	Spare	

Device List

Modbus Function Code:	4
Modbus Start Address:	1001
Modbus Block Size:	10
Number of Blocks:	247
Primary Use:	Read list of connected devices and their associated resources. Note: 10 register block repeated for all 247 possible devices.

Modbus Address	Description	Comments: (1 entry for all 247 devices) Computed Devices address = 1001 + (Device Address - 1) X 10	
1001	Device 1 Type	0 = None 1 = 5GF-C 2 = RMM2 3 = RMC	4 = NGC-30-CRM 5 = NGC-30-CRMS 6 = NGC-20 7 = PLI-TT 8 = PLI-SES
1002	Device 1 Resources - # Relays/Digital Inputs	5GF-C - Low Byte No Relays (5) NGC-30-CRM/-CRMS - Low Byte No Relays (5) RMC - Low Byte No Relays (0 – 40) RMC - High Byte No Digital Inputs (0 – 40) NGC-20 - Low Byte No Relays (1)	
1003	Device 1 Resources - RTD Map	Bit 0 = 1 RTD1 present Bit 1 = 1 RTD2 present ... Bit 7 = 1 RTD8 present (5GF-C, NGC-30-CRM/-CRMS -Max 5 RTDs, RMM2 -Max 8 RTDs, NGC-20 – Max 2 RTDs) For PLI-SES and PLI-TT, Bits 0-7 are the maximum RTDs for that device PLI-SES 127 maximum RTDS PLI-TT 255 maximum RTDS Bit 15 = 1 Limiter Installed (NGC-20 only)	
1004	Device 1 Status	Bit 0 = 1 RTD1 fail Bit 1 = 1 RTD2 fail Bit 7 = 1 RTD8 fail	Bit 13 = 1 Device Updated via Comm. (local use only) Bit 14 = 1 Device Status Change Bit 15 = 1 Comm. Alarm
1005	Device Firmware Version Major	0 – 255	
1006	Device Firmware Version Minor	0 – 255	
1007	Device Firmware Version Build	0 – 999	
1008	Comm. Rate	0 – 100 %	
1009	Spare		
1010	Spare		
...			
3461	Device 247 Type	0 = None 1 = 5GF-C 2 = RMM2 3 = RMC	4 = NGC-30-CRM 5 = NGC-30-CRMS 6 = NGC-20 7 = PLI-TT 8 = PLI-SES
3462	Device 247 Resources - # Relays/Digital Inputs	5GF-C - Low Byte No Relays (5) NGC-30-CRM/-CRMS - Low Byte No Relays (5) RMC - Low Byte No Relays (0 – 40) RMC - High Byte No Digital Inputs (0 – 40)	

NGC-20 - Low Byte No Relays (1)

3463	Device 1 Resources - RTD Map	Bit 0 = 1 RTD1 present Bit 1 = 1 RTD2 present ... Bit 7 = 1 RTD8 present	(5GF-C, NGC-30-CRM/-CRMS -Max 5 RTDs, RMM2 -Max 8 RTDs, NGC-20 – Max 2 RTDs) For PLI-SES and PLI-TT, Bits 0-7 are the maximum RTDs for that device PLI-SES 127 maximum RTDS PLI-TT 255 maximum RTDS Bit 15 = 1 Limiter Installed (NGC-20 only)
3464	Device 1 Status	Bit 0 = 1 RTD1 fail Bit 1 = 1 RTD2 fail Bit 7 = 1 RTD8 fail	Bit 13 = 1 Device Updated via Comm. (local use only) Bit 14 = 1 Device Status Change Bit 15 = 1 Comm. Alarm
3465	Device Firmware Version Major	0 – 255	
3466	Device Firmware Version Minor	0 – 255	
3467	Device Firmware Version Build	0 – 999	
3468	Comm. Rate	0 – 100%	
3469	Spare		
3470	Spare		

Device Status Flags

Modbus Function Code:	4
Modbus Start Address:	6001
Modbus Block Size:	4
Number of Blocks:	247
Primary Use:	Read status codes by device address

Modbus Address	Description	Comments: Computed Devices address = $6001 + (\text{Device } \# - 1) \times 4$	
6001	Device 1 Status	Bit 0 = 1 RTD1 fail Bit 1 = 1 RTD2 fail	Bit 7 = 1 RTD8 fail Bit 14 = 1 Device Status Change Bit 15 = 1 Comm. Alarm
6002	Spare		
6003	Spare		
6004	Spare		
6005	Device 2 Status	Bit 0 = 1 RTD1 fail Bit 1 = 1 RTD2 fail	Bit 7 = 1 RTD8 fail Bit 14 = 1 Device Status Change Bit 15 = 1 Comm. Alarm
6006	Spare		
6007	Spare		
6008	Spare		
.....	Device xx Status		
....	Spare		
.....	Spare		
.....	Spare		
6985	Device 247 Status	Bit 0 = 1 RTD1 fail Bit 1 = 1 RTD2 fail	Bit 7 = 1 RTD8 fail Bit 14 = 1 Device Status Change Bit 15 = 1 Comm. Alarm
6986	Spare		
6987	Spare		
6988	Spare		

NGC-UIT2 System Status Flags

Modbus Function Code:	4
Modbus Start Address:	7001
Modbus Block Size:	4
Number of Blocks:	1

Modbus Address	Description	Comments
7001	System Status 1 Low Word	Bit 0 = Spare Bit 1 = 1 Ground Fault CT Failure Bit 2 = 1 Low Current Alarm Bit 3 = 1 High Current Alarm Bit 4 = 1 Ground Fault Alarm Bit 5 = 1 Ground Fault Trip Alarm Bit 6 = 1 Spare Bit 7 = 1 Fail safe Alarm Bit 8 = 1 Heater Time Alarm Bit 9 = 1 Relay Cycle Alarm Bit 10 = 1 Relay Failure Alarm Bit 11 = 1 Power Input Alarm Bit 12 = 1 Power Input Alarm State Bit 13 = 1 CB Trip Alarm Bit 14 = 1 Date/Time Error Bit 15 = 1 Relay Closed
7002	System Status 1 High Word	Bit 0 = 1 RTD A Failure Alarm Bit 1 = 1 RTD B Failure Alarm Bit 2 = 1 RTD C Failure Alarm Bit 3 = 1 RTD D Failure Alarm Bit 4 = 1 RTD A Low Temp Alarm Bit 5 = 1 RTD B Low Temp Alarm Bit 6 = 1 RTD C Low Temp Alarm Bit 7 = 1 RTD D Low Temp Alarm Bit 8 = 1 RTD A High Temp Alarm Bit 9 = 1 RTD B High Temp Alarm Bit 10 = 1 RTD C High Temp Alarm Bit 11 = 1 RTD D High Temp Alarm Bit 12 = 1 Low Voltage Alarm Bit 13 = 1 High Voltage Alarm Bit 14 = 1 Comm. Failure Bit 15 Spare
7003	System Status 2 Low Word	Bit 0 = 1 Limiter Trip Alarm (European NGC-20 Only) Bit 1 = 1 Limiter Sensor Failure (European NGC-20 Only) Bit 2 = 1 Limiter Comm. Failure (European NGC-20 Only) Bit 3 = 1 Load Shed Fail Alarm (European NGC-20 Only) Bit 4 = 1 Hardware Failure Alarm (European NGC-20 Only) Bits 5 – 15 Spare
7004	System Status 2 High Word	Spare

NGC-UIT2 Circuit Status Flags

Modbus Function Code:	4
Modbus Start Address:	8001
Modbus Block Size:	4
Number of Blocks:	500
Primary Use:	Read alarm status codes by Circuit number

Modbus Address	Description	Comments: (1 entry for all 500 Circuits) Computed Circuit address = 8001 + (Circuit # -1) X 4
8001	Circuit 1 Status 1 Low Word	Bit 0 = Spare Bit 1 = 1 Ground Fault CT Failure Bit 2 = 1 Low Current Alarm Bit 3 = 1 High Current Alarm Bit 4 = 1 Ground Fault Alarm Bit 5 = 1 Ground Fault Trip Alarm Bit 6 = 1 Spare Bit 7 = 1 Fail safe Alarm Bit 8 = 1 Heater Time Alarm Bit 9 = 1 Relay Cycle Alarm Bit 10 = 1 Relay Failure Alarm Bit 11 = 1 Power Input Alarm Bit 12 = 1 Power Input Alarm State Bit 13 = 1 CB Trip Alarm Bit 14 = 1 Date/Time Error Bit 15 = 1 Relay Closed
8002	Circuit 1 Status 1 High Word	Bit 0 = 1 RTD A Failure Alarm Bit 1 = 1 RTD B Failure Alarm Bit 2 = 1 RTD C Failure Alarm Bit 3 = 1 RTD D Failure Alarm Bit 4 = 1 RTD A Low Temp Alarm Bit 5 = 1 RTD B Low Temp Alarm Bit 6 = 1 RTD C Low Temp Alarm Bit 7 = 1 RTD D Low Temp Alarm Bit 8 = 1 RTD A High Temp Alarm Bit 9 = 1 RTD B High Temp Alarm Bit 10 = 1 RTD C High Temp Alarm Bit 11 = 1 RTD D High Temp Alarm Bit 12 = 1 Low Voltage Alarm Bit 13 = 1 High Voltage Alarm Bit 14 = 1 Comm. Failure Bit 15 Spare
8003	Circuit 1 Status 2 Low Word	Bit 0 = 1 Limiter Trip Alarm (European NGC-20 Only) Bit 1 = 1 Limiter Sensor Failure (European NGC-20 Only) Bit 2 = 1 Limiter Comm. Failure (European NGC-20 Only) Bit 3 = 1 Load Shed Fail Alarm (European NGC-20 Only) Bit 4 = 1 Hardware Failure Alarm (European NGC-20 Only) Bits 5 – 15 Spare
8004	Circuit 1 Status 2 High Word	Spare
8005	Circuit 2 Status 1 Low Word	See format above for Circuit 1
8006	Circuit 2 Status 1 High Word	See format above for Circuit 1
8007	Circuit 2 Status 2 Low Word	See format above for Circuit 1

8008	Circuit 2 Status 2 High word	Spare
....	Circuit xx Status 1 Low Word	See format above for Circuit 1
....	Circuit xx Status 1 High Word	See format above for Circuit 1
....	Circuit xx Status 2 Low Word	See format above for Circuit 1
....	Circuit xx Status 2 High word	Spare
9997	Circuit 500 Status 1 Low Word	See format above for Circuit 1
9998	Circuit 500 Status 1 High Word	See format above for Circuit 1
9999	Circuit 500 Status 2 Low Word	See format above for Circuit 1
10000	Circuit 500 Status 2 High word	Spare

Circuit Resources

Modbus Function Code:	4
Modbus Start Address:	10001
Modbus Block Size:	8
Number of Blocks:	500
Primary Use:	Read details of each control Circuit setup

Modbus Address	Description	Comments: (1 entry for all 500 Circuits) Computed Circuit address = 10001 + (Circuit # -1) X 8
10001	Circuit 1 Enable	High Byte = 0, Circuit Inactive Low Byte = 0, Disabled High Byte = 1, Circuit Active Low Byte = 1, Enabled Low Byte = 2, Deleted
10002	Circuit 1 Relay Address/Number	High Byte (1 – 247) Low Byte (1 – 5 for 5GF-C and NGC-30-CRM/-CRMS, 1– 40 for RMC, 1 for NGC-20 (European Only))
10003	Circuit 1 RTD-A Address/Number	High Byte (1 – 247) Low Byte (1 – 5 for 5GF-C and NGC-30-CRM/-CRMS, 1– 8 for RMM2, 1-127 for PLI-SES, 1-255 for PLI-TT, 1-2 for NGC-20 (European Only))
10004	Circuit 1 RTD-B Address/Number	High Byte (1 – 247) Low Byte (1 – 5 for 5GF-C and NGC-30-CRM/-CRMS, 1– 8 for RMM2, 1-127 for PLI-SES, 1-255 for PLI-TT, 1-2 for NGC-20 (European Only))
10005	Circuit 1 RTD-C Address/Number	High Byte (1 – 247) Low Byte (1 – 5 for 5GF-C and NGC-30-CRM/-CRMS, 1– 8 for RMM2, 1-127 for PLI-SES, 1-255 for PLI-TT, 1-2 for NGC-20 (European Only))
10006	Circuit 1 RTD-D Address/Number	High Byte (1 – 247) Low Byte (1 – 5 for 5GF-C and NGC-30-CRM/-CRMS, 1– 8 for RMM2, 1-127 for PLI-SES, 1-255 for PLI-TT, 1-2 for NGC-20 (European Only))
10007	Spare	
10008	Spare	
10009	Circuit 2 Enable	High Byte = 0, Circuit Inactive Low Byte = 0, Disabled High Byte = 1, Circuit Active Low Byte = 1, Enabled Low Byte = 2, Deleted
10010	Circuit 2 Relay Address/Number	High Byte (1 –247) Low Byte (1 – 5 for 5GF-C and NGC-30-CRM/-CRMS, 1– 40 for RMC, 1 for NGC-20 (European Only))
10011	Circuit 2 RTD-A Address/Number	High Byte (1 – 247) Low Byte (1 – 5 for 5GF-C and NGC-30-CRM/-CRMS, 1– 8 for RMM2, 1-127 for PLI-SES, 1-255 for PLI-TT, 1-2 for NGC-20 (European Only))
10012	Circuit 2 RTD-B Address/Number	High Byte (1 – 247) Low Byte (1 – 5 for 5GF-C and NGC-30-CRM/-CRMS, 1– 8 for RMM2, 1-127 for PLI-SES, 1-255 for PLI-TT, 1-2 for NGC-20 (European Only))
10013	Circuit 2 RTD-C Address/Number	High Byte (1 – 247) Low Byte (1 – 5 for 5GF-C and NGC-30-CRM/-CRMS, 1– 8 for RMM2, 1-127 for PLI-SES, 1-255 for PLI-TT, 1-2 for NGC-20 (European Only))
10014	Circuit 2 RTD-D Address/Number	High Byte (1 – 247) Low Byte (1 – 5 for 5GF-C and NGC-30-CRM/-CRMS, 1– 8 for RMM2, 1-127 for PLI-SES, 1-255 for PLI-TT, 1-2 for NGC-20 (European Only))
	Spare	
	Spare	

....

13993	Circuit 500 Enable	High Byte = 0, Circuit Inactive High Byte = 1, Circuit Active	Low Byte = 0, Disabled Low Byte = 1, Enabled Low Byte = 2, Deleted
13394	Circuit 500 Relay Address/Number	High Byte (1 – 247) Low Byte (1 – 5 for 5GF-C and NGC-30-CRM/-CRMS, 1– 40 for RMC, 1 for NGC-20 (European Only))	
13395	Circuit 500 RTD-A Address/Number	High Byte (1 – 247) Low Byte (1 – 5 for 5GF-C and NGC-30-CRM/-CRMS, 1– 8 for RMM2, 1-127 for PLI-SES, 1-255 for PLI-TT, 1-2 for NGC-20 (European Only))	
13396	Circuit 500 RTD-B Address/Number	High Byte (1 – 247) Low Byte (1 – 5 for 5GF-C and NGC-30-CRM/-CRMS, 1– 8 for RMM2, 1-127 for PLI-SES, 1-255 for PLI-TT, 1-2 for NGC-20 (European Only))	
133976	Circuit 500 RTD-C Address/Number	High Byte (1 – 247) Low Byte (1 – 5 for 5GF-C and NGC-30-CRM/-CRMS, 1– 8 for RMM2, 1-127 for PLI-SES, 1-255 for PLI-TT, 1-2 for NGC-20 (European Only))	
13398	Circuit 500 RTD-D Address/Number	High Byte (1 – 247) Low Byte (1 – 5 for 5GF-C and NGC-30-CRM/-CRMS, 1– 8 for RMM2, 1-127 for PLI-SES, 1-255 for PLI-TT, 1-2 for NGC-20 (European Only))	
13999	Spare		
14000	Spare		

Circuit Status

Modbus Function Code:	4	
Modbus Start Address:	20001	
Modbus Block Size:	70	
Number of Blocks:	500	
Primary Use:	Read current value of real time analog data (temperature, current, ground fault current, voltage) read min/max values, operating hours, other parameters	
Modbus Address	Description	Comments: (1 entry for all 500 Circuits) Computed Circuit address = 20001 + (Circuit # – 1) X 70
20001	Circuit 1 Status 1 Low Word	Bit 0 = Spare Bit 1 = 1 Ground Fault CT Failure Bit 2 = 1 Low Current Alarm Bit 3 = 1 High Current Alarm Bit 4 = 1 Ground Fault Alarm Bit 5 = 1 Ground Fault Trip Alarm Bit 6 = 1 Spare Bit 7 = 1 Fail safe Alarm Bit 8 = 1 Heater Time Alarm Bit 9 = 1 Relay Cycle Alarm Bit 10 = 1 Relay Failure Alarm Bit 11 = 1 Power Input Alarm Bit 12 = 1 Power Input Alarm State Bit 13 = 1 CB Trip Alarm Bit 14 = 1 Date/Time Error Bit 15 = 1 Relay Closed
20002	Circuit 1 Status 1 High Word	Bit 0 = 1 RTD A Failure Alarm Bit 1 = 1 RTD B Failure Alarm Bit 2 = 1 RTD C Failure Alarm Bit 3 = 1 RTD D Failure Alarm Bit 4 = 1 RTD A Low Temp Alarm Bit 5 = 1 RTD B Low Temp Alarm Bit 6 = 1 RTD C Low Temp Alarm Bit 7 = 1 RTD D Low Temp Alarm Bit 8 = 1 RTD A High Temp Alarm Bit 9 = 1 RTD B High Temp Alarm Bit 10 = 1 RTD C High Temp Alarm Bit 11 = 1 RTD D High Temp Alarm Bit 12 = 1 Low Voltage Alarm Bit 13 = 1 High Voltage Alarm Bit 14 = 1 Comm. Failure Bit 15 Spare
20003	Circuit 1 Status 2 Low Word	Bit 0 = 1 Limiter Trip Alarm (European NGC-20 Only) Bit 1 = 1 Limiter Sensor Failure (European NGC-20 Only) Bit 2 = 1 Limiter Comm. Failure (European NGC-20 Only) Bit 3 = 1 Load Shed Fail Alarm (European NGC-20 Only) Bit 4 = 1 Hardware Failure Alarm (European NGC-20 Only) Bits 5 – 15 Spare
20004	Circuit 1 Status 2 High Word	Spare
20005	Control Temperature	0.1°C

20006	Circuit RTD-A Temperature	0.1°C (30000 = Invalid Temp, 30016 = PLI-SES CONT input)
20007	Circuit RTD-B Temperature	0.1°C (30000 = Invalid Temp, 30016 = PLI-SES CONT input)
20008	Circuit RTD-C Temperature	0.1°C (30000 = Invalid Temp, 30016 = PLI-SES CONT input)
20009	Circuit RTD-D Temperature	0.1°C (30000 = Invalid Temp, 30016 = PLI-SES CONT input)
Modbus		
Address	Description	Comments
20010	Current	0.01 A
20011	Ground Fault	0.1 mA
20012	Voltage	0.1 V
20013	Computed PASC On Count	Seconds
20014	Computed PASC Off Count	Seconds
20015	Next Relay Switch	Seconds
20016	Total Heater Time MSW	Hours
20017	Total Heater Time LSW	
20018	Relay Cycle Count MSW	Cycles
20019	Relay Cycle Count LSW	
20020	Power Input State	Value 0/1
20021	CB Trip State	Value 0/1
20022	Min Control Temp	0.1°C
20023	Max Control Temp	0.1°C
20024	Max Current	0.01 A
20025	Max Ground Fault	0.1 mA
20026	Control Low Temp Alarm Value	0.1°C, latched alarm value associated with Circuit Status above
20027	Control High Temp Alarm Value	0.1°C, latched alarm value associated with Circuit Status above
20028	Ground Fault Alarm Value	0.1 mA, latched alarm value associated with Circuit Status above
20029	Ground Fault Trip Alarm Value	0.1 mA, latched alarm value associated with Circuit Status above
20030	Low Current Alarm Value	0.01 A, latched alarm value associated with Circuit Status above
20031	High Current Alarm Value	0.01 A, latched alarm value associated with Circuit Status above
20032	Min Voltage Value	0.1 V [5GF/CRM/S when in voltage mode and European NGC-20]
20033	Max Voltage Value	0.1 V [5GF/CRM/S when in voltage mode and European NGC-20]
20034	Low Voltage Alarm Value	0.1 V [5GF/CRM/S when in voltage mode and European NGC-20]
20035	High Voltage Alarm Value	0.1 V [5GF/CRM/S when in voltage mode and European NGC-20]
20036	Limiter Temp	0.1°C [European NGC-20 Only]
20037	Limiter Min Temp Value	0.1°C [European NGC-20 Only]
20038	Limiter Max Temp Value	0.1°C [European NGC-20 Only]
20039	Monitor Temp	0.1°C
20040	Min Monitor Temp	0.1°C
20041	Max Monitor Temp	0.1°C
....	Spare	
20069	Spare	
20070	Spare	
20071	Circuit 2 status block start (see Registers 20001 – 20070 above)	
....		
20140	Circuit 2 status block end	

20141	Circuit 3 status block start(see Registers 20001 – 20070 above)
....	
20210	Circuit 3 status block end
....	Circuit xx status (see Registers 20001 – 20070 above)
54931	Circuit 500 status block start (see Registers 20001 – 20070 above)
....	
55000	End Circuit 500 status block

General Information – Holding Registers

Modbus Function Code:	3, 6, 16
Modbus Start Address:	1
Modbus Block Size:	100
Number of Blocks:	1
Primary Use:	Read/Write tag (name) assigned to UIT unit and other UIT parameters such as date, time, timeouts

Modbus Address	Description	Comments
1	NGC-UIT2 Tag 0	This 40 character tag cannot be modified from the touch screen. The default tag is NGC-UIT2. It is possible to input a new device name via Modbus using these registers.
2	NGC-UIT2 Tag 1	NGC-UIT2 Tag
3	NGC-UIT2 Tag 2	NGC-UIT2 Tag
....	NGC-UIT2 Tag xx	NGC-UIT2 Tag
38	NGC-UIT2 Tag 37	NGC-UIT2 Tag
39	NGC-UIT2 Tag 38	NGC-UIT2 Tag
40	NGC-UIT2 Tag 39	NGC-UIT2 Tag (writing this char triggers a internal write to database for the complete string)
41	Date YYYY	Date - YYYY
42	Date MM	Date - MM = 1 – 12
43	Date DD	Date - DD = 1 – 31
44	Time HH	Time - HH = 0 – 23
45	Time MM	Time - MM = 0 – 59
46	Spare	
47	Spare	
48	Spare	
49	Spare	
50	NGC-UIT2 Relay 1 Alarm Mask	Bit 0 = Any Alarm (this bit can only be set by itself) Bit 1 = Temp Alarm Bit 2 = Ground Fault Alarm Bit 3 = Current Alarm Bit 4 = Comm Alarm Bit 5 = RTD Fail Alarm Bit 6 = Digital Input Alarm
51	NGC-UIT2 Relay 2 Alarm Mask	Bit 0 = Any Alarm (this bit can only be set by itself) Bit 1 = Temp Alarm Bit 2 = Ground Fault Alarm Bit 3 = Current Alarm Bit 4 = Comm Alarm Bit 5 = RTD Fail Alarm Bit 6 = Digital Input Alarm

52	NGC-UIT2 Relay 3 Alarm Mask	Bit 0 = Any Alarm (this bit can only be set by itself) Bit 1 = Temp Alarm Bit 2 = Ground Fault Alarm	Bit 3 = Current Alarm Bit 4 = Comm Alarm Bit 5 = RTD Fail Alarm Bit 6 = Digital Input Alarm
53	Units	UIT Display Units 0 = °F 1 = °C	
54	Screen Saver Timeout	Min = 1 Minute, Max = 300 Minutes	
55	Main Menu Timeout	Min = 1 Minute, Max = 100 Minutes	
56	Language	0 = English, 1 = French, 2 = German, 3 = Spanish, 4 = Italian, 5 = Russian, 6 = Czech, 7 = Chinese	
Modbus			
Address	Description	Comments	
57	Mouse Enable/Disable	0 = Disable, 1 = Enable	
58	spare		
59	spare		
60	spare		
61	Circuit Delete Command	0x7001 – This value has to be written before Circuit number	
62	Circuit Number to Delete	Circuit number 2 – 500 (Circuit 1 cannot be deleted)	
63	Delete Device Command	0x7002 – This value has to be written before Device number	
64	Device Number to Delete	Device number 1 – 247	
65	Spare		
66	Spare		
67	Spare		
68	Spare		
69	Spare		
70	Reserved	0 = (default) UIT automatically disables NGC20 temp latching on NGC-UIT2 boot –up or NGC-20 reset. 23130 = UIT does not automatically disable NGC20 temp latching on NGC-UIT2 boot-up or NGC-20 reset.	
71	spare		
....	spare		
96	spare		
97	Field bus Number retrys	1 – 10 (default 3)	
98	Field bus Transmit Delay	0 – 1000 milliseconds (default 0)	
99	Field Bus Receive Msg Timeout	0 – 10000 milliseconds (default 0) Total Time for a receive message timeout. If the complete message is not received by this timeout, then the message is terminated. This is added to the minimum values already hardcoded in the UIT. This is included to extend delays for a radio modem.	
100	Field Bus Receive Msg Char Timeout	0 – 1000 milliseconds (default 0) Receive Message inter character gap timeout. When a character gap exceeds this time, then the message is terminated. This is added to the minimum values already hardcoded in the UIT. This is included to extend delays for a radio modem. Note: The Field Bus Receive Msg Timeout must be greater than the Field Bus Receive Msg Char Timeout or it will have no effect.	

Database Synchronization / Global Alarm Status

Modbus Function Code:	3, 6, 16
Modbus Start Address:	101
Modbus Block Size:	1
Number of Blocks:	1
Primary Use:	Data synchronization

Modbus		
Address	Description	Comments: Write 1 to bit position to clear flag
101	Database Synchronization/Alarm Status Flags	0x0001 = General Information Change Flag 0x0002 = Circuit Database Change Flag 0x0004 = Circuit Alarm Status Change Flag 0x0008 = Circuit Alarm Reset Change Flag 0x0010 = Device Alarm Change Flag 0x0020 = Device List Change Flag (after a scan) 0x0040 = Spare 0x0080 = Spare

Circuit Control Data

Modbus Function Code:	3, 6, 16
Modbus Start Address:	1001
Modbus Block Size:	120
Number of Blocks:	500
Primary Use:	Read/Write Circuit tag (name), set point, alarm limits and other key set-up parameters by Circuit

Modbus Address	Description	Comments: Contains both Read only and Read/Write data Computed Circuit address = 1001 + (Circuit # - 1) X 120
1001	CIRCUIT 1 Tag 0	Circuit Tag (Unicode 40 chars.)
1002	CIRCUIT 1 Tag 1	Circuit Tag
1003	CIRCUIT 1 Tag 2	Circuit Tag
...		
1038	CIRCUIT 1 Tag 37	Circuit Tag
1039	CIRCUIT 1 Tag 38	Circuit Tag
1040	CIRCUIT 1 Tag 39	Circuit Tag (Writing this character triggers a internal write to database for the complete string)
1041	Circuit Enable	The user can only write a 0 to Disable, or a 1 to Enable a Circuit. However, you may read back a different value. If a Circuit is deleted, the register may read back as a 2, which indicates the Circuit has been deleted. Otherwise, the High Byte contains a 0/1, which indicates whether a Circuit is inactive (0) or active (1). Even though the Circuit may be disabled, it is still being used by the NGC-UIT2. Low Byte: 0 = Disabled 1 = Enabled 2 = Deleted (Can only read this value, not set this value) High Byte: (Status Read Only) 0 = Circuit Inactive 1 = Circuit Active
1042	Relay Address/Number	High Byte (1 – 247), Low Byte (1 – 5 for 5GF-C, NGC-30-CRM/-CRMS, 1 – 40 for RMC, 1 for NGC-20 European Only)
1043	Fail Safe State	0 = Off 1 = On
1044	Ground Fault Trip	0 = Disable 1 = Enable
1045	Maintain Temp	0.1°C Range is device specific. Refer to range information above.
1046	High Temp Alarm	0.1°C Range is device specific. Refer to range information above.
1047	Low Temp Alarm	0.1°C Range is device specific. Refer to range information above.
1048	Deadband	0.1°C Range is device specific. Refer to range information above.
1049	High Current Alarm	0.01 A
1050	Low Current Alarm	0.01 A
1051	Ground Fault Alarm	0.1 mA
1052	Ground Fault Trip	0.1 mA
1053	PASC Min Ambient Temp	0.1°C

1054	PASC Min Pipe Size	0 = .5 inch 1 = 1 inch 2 = ≥2 inches
1055	Power Adjust	10 – 200%
1056	Spare	

Modbus Address	Description	Comments
1057	Control Mode	0 = Monitor Only 1 = On/Off 2 = Always Off 3 = Always On 4 = PASC 5 = Voltage 6 = Proportional (NGC-30-CRM/-CRMS only)
1058	RTD-A Address/Number	High Byte (1 – 247) Low Byte (1 – 5 for 5GF-C, 1 – 5 for NGC-30-CRM/CRMS, 1 – 8 for RMM2, 1-27 for PLI-SES, 1-255 for PLI-TT, 1 for NGC-20 European Only) Note: Local NGC-30-CRM/CRMS RTDs and NGC-20 RTDs are added to a circuit automatically; they cannot be overwritten. NGC-20 RTDs cannot be used on another circuit.
1059	RTD-B Address/Number	High Byte (1 – 247) Low Byte (1 – 5 for 5GF-C, 1 – 5 for NGC-30-CRM/CRMS, 1 – 8 for RMM2, 1-27 for PLI-SES, 1-255 for PLI-TT, 2 for NGC-20 European Only) Note: Local NGC-30-CRM/CRMS RTDs and NGC-20 RTDs are added to a circuit automatically; they cannot be overwritten. NGC-20 RTDs cannot be used on another circuit.
1060	RTD-C Address/Number	High Byte (1 – 247) Low Byte (1 – 5 for 5GF-C, 1 – 5 for NGC-30-CRM/CRMS, 1 – 8 for RMM2, 1-27 for PLI-SES, 1-255 for PLI-TT)
1061	RTD-D Address/Number	High Byte (1 – 247) Low Byte (1 – 5 for 5GF-C, , 1 – 5 for NGC-30-CRM/CRMS, 1 – 8 for RMM2, 1-27 for PLI-SES, 1-255 for PLI-TT)
1062	Heater Time Alarm MSW	Hours Min = 1 Max = 1,000,000
1063	Heater Time Alarm LSW	
1064	Relay Cycle Alarm MSW	Cycles Min = 1 Max = 2,000,000
1065	Relay Cycle Alarm LSW	
1066	Power Cycle Start	High Byte 0 – 23 Hours Low Byte 0 – 59 Minutes
1067	Power Cycle Interval	1 – 1000 Hours
1068	Power Input Device Address/ Number	High Byte (1 – 99, RMC device only) Low Byte (1 – 40, RMC device only) Note: This requires the circuit to have RMC Relay Output located on same RMC Power Input device.
1069	CB Trip Device Address/Number	High Byte (1 – 99, RMC device only) Low Byte (1 – 40, RMC device only) Note: This requires the circuit to have RMC Relay Output located on same RMC CB Trip Input device.
1070	CB Trip State	0 = Disable 1 = Enable
1071	Power Limit	10 – 100 Percent
1072	Low Voltage Alarm	0.1 AC V (50 – 305)
1073	High Voltage Alarm	0.1 AC V (50 – 305)

1074	High Limit Temp Cutout Enable	0 = Disable 1 = Enable
1075	High Limit Temp Cutout	0.1°C Range: -80°C (-800) to 700°C (7000)
1076	Temp Alarm Filter	0 – 59940 seconds
1077	Heater Time Reset	1 = Reset, 0 = No Effect
1078	Relay Cycle Reset	1 = Reset, 0 = No Effect

Modbus Address	Description	Comments
1079	Load Shed Configuration	[NGC-20 European Only] Bit 0 = 1 Load Shed Enabled Bit 1 = 1 Load Shed Failsafe Enabled
1080	Load Shed Mask	[NGC-20 European Only] Bit 0 = 1 Zone 1 Load Shed Enabled Bit 1 = 1 Zone 2 Load Shed Enabled Bit 2 = 1 Zone 3 Load Shed Enabled Bit 3 = 1 Zone 4 Load Shed Enabled Bit 4 = 1 Zone 5 Load Shed Enabled Bit 5 = 1 Zone 6 Load Shed Enabled Bit 6 = 1 Zone 7 Load Shed Enabled Bit 7 = 1 Zone 8 Load Shed Enabled Bit 8 = 1 Zone 9 Load Shed Enabled Bit 9 = 1 Zone 10 Load Shed Enabled Bit 10 = 1 Zone 11 Load Shed Enabled Bit 11 = 1 Zone 12 Load Shed Enabled Bit 12 = 1 Zone 13 Load Shed Enabled Bit 13 = 1 Zone 14 Load Shed Enabled Bit 14 = 1 Zone 15 Load Shed Enabled Bit 15 = 1 Zone 16 Load Shed Enabled
1081	RTD 1 Mode	0 = Monitor, 1 = Control, 2 = Continuity (PLI-SES Only)
1082	RTD 2 Mode	0 = Monitor, 1 = Control, 2 = Continuity (PLI-SES Only)
1083	RTD 3 Mode	0 = Monitor, 1 = Control, 2 = Continuity (PLI-SES Only)
1084	RTD 4 Mode	0 = Monitor, 1 = Control, 2 = Continuity (PLI-SES Only)
1085	PLI Update Interval	1 – 255 minutes (default 10)
....	Spare	
....	Spare	
1118	Spare	
1119	Limiter Parameter	[NGC-20 European Only] Bit 0 = 1, Reset Tripped Limiter (0 has no effect) Bit 1 = 1, Force Limiter Trip, (0 has no effect) Bit 2 = 1, spare (always 0) Bit 3 = 1, Reset Limiter Min/Max Temps (0 has no effect)
1120	Limiter Cutout Temp	[NGC-20 European Only] 0.1°C Range -60°C to 599°C (-600 – 5990)
1121	Circuit 2 Data (see Registers 1001 – 1120 above)	
1241	Circuit 3 Data (see Registers 1001 – 1120 above)	

1361	Circuit 4 Data (see Registers 1001 – 1120 above)
1481	Circuit 5 Data (see Registers 1001 – 1120 above)
...	
60881	Circuit 500 Data (see Registers 1001 – 1120 above)
61000	Circuit 500 Data end



WWW.PENTAIRTHERMAL.COM

NORTH AMERICA

Tel: +1.800.545.6258
Fax: +1.800.527.5703
Tel: +1.650.216.1526
Fax: +1.650.474.7711
thermal.info@pentair.com

EUROPE, MIDDLE EAST, AFRICA

Tel: +32.16.213.511
Fax: +32.16.213.603
thermal.info@pentair.com

ASIA PACIFIC

Tel: +86.21.2412.1688
Fax: +86.21.5426.2937
cn.thermal.info@pentair.com

LATIN AMERICA

Tel: +1.713.868.4800
Fax: +1.713.868.2333
thermal.info@pentair.com

Pentair and NGC are owned by Pentair or its global affiliates. All other trademarks are the property of their respective owners. Pentair reserves the right to change specifications without prior notice.

© 2006–2015 Pentair.