

NGC2 Pressure Gauge Controller Interface Manual Issue 1.33

1. INTRODUCTION

The serial interface is RS232-compatible and only one instrument may be connected to a computer serial port.

Remote control is established and relinquished via the serial interface. An instrument may be switched to remote or local control by a single command.

At switch-on the NGC2 is reset into the local operation mode with the ion gauge switched off and the Pirani gauges switched on.

NGC2 does not check the viability or consistency of commands issued by a remote computer.

2. INTERFACE PROTOCOL.

9600 baud, 8 data bits, 1 stop bit, no parity, no handshaking

2.1 Timing and response time.

It is not necessary to poll the NGC2 more than 4 times per second, and we strongly recommend that a delay of at least 100ms is implemented before the next report request.

The response to commands is typically less than 1 second.

2.2 Local/remote control.

An NGC2 starts operation in local control, i.e. using the front panel. In local mode the NGC2 responds only to commands without parameters (<poll>, <control>, <status> and <reset error>). The <control> command puts the NGC2 into remote mode, and all the other commands can then be used. The front panel can still be used to change the display but not to start gauges or change setpoints. When a host takes control of the NGC2 emission is stopped, and any current Setup operation is cancelled. When the host returns the NGC2 to local control, emission is again stopped.

If any relay is permanently Energised or De-energised while in remote control the setpoint for that relay is changed to the limit so the status of the relay is no longer affected by pressure either in remote control or on return to local control.

2.3 Host Computer Commands.

The host computer sends commands to NGC2s in the following format:

- First byte:** '*' (ASCII 47)
- Second byte:** Command character. All commands are represented by a single character.
- Third byte:** Ignored on NGC2. (Character '0' to '8' or 'X' [ASCII 88]. This ensures compatibility with PGC1, which had a multi-drop capability where instruments were addressable. (All the examples below use '0'.)
- Optional parameter:** Additional command parameters, single ASCII characters.

2.4 Host Computer Command Format.

Command parameters are single printable ASCII characters.

Relays are addressed by uppercase letters 'A' to 'D'.

Command	Char.	Ignored	Para.	Description
<poll>	P	0		Poll instrument (returns state and error byte). (e.g. *P0)
<control>	C	0		Remotely control NGC2. (e.g. *C0)
<release>	R	0		Return NGC2 to local control. (e.g. *R0)
<reset error>	E	0		Reset all error flags. (e.g. *E0)
<status>	S	0		Request a report of operating status for all gauges. (e.g. *S0)
<Gauge on>	i	0	E	Switch on ion gauge emission. E = '0' 0.5mA E = '1' Not available on NGC2 (e.g. *i00)
<Gauge off>	o	0		Switch off ion gauge. (e.g.*o0)
<override>	O	0	R	Permanently energise relay R. R = 'A' to 'D' (e.g. *O0A)
<inhibit>	I	0	R	Permanently de-energise relay R R = 'A' to 'D' (e.g. *I0A)

2.5 <poll> State & Error byte coding:

State byte:

Bits 3-0 : Instrument type (0010₂ – NGC2)
 Bit 4 : 0 = local mode, 1 = remote mode
 Bit 5 : 1
 Bit 6 : 0
 Bit 7 : Ion gauge disconnected

Error byte:

Bit 0 : gauge - specific error
 Bit 1 : over temperature trip
 Bit 2 : 0
 Bit 3 : temperature warning
 Bit 4 : 0
 Bit 5 : 0
 Bit 6 : 1

The value in the error byte is maintained until reset by a <reset error> command.

2.6 <status> Status report.

The status report gives the operating status and pressure of each gauge in the NGC2.

State byte: As detailed above.

Error byte:

Relay status byte: The relay status byte is of the form 0100XXXX₂, where the least significant 4 bits indicate the state of relays A to D (1 = energised) with relay 'A' indicated by the least significant bit.

An unused byte: '0'

Gauge record: For each gauge in the NGC2:-

Byte	Name	Details
1	Header byte	'G'
2	Gauge type	'I' : Ion gauge 'P' : Pirani 'M' : capacitance manometer
3	Gauge number	'1' : Ion Gauge '2' : Pirani 1 '3' : Pirani 2 '4' : Capacitance manometer
4	Gauge status	All bits are set to 0 unless stated otherwise: Ion Gauge Status Bit 6: 1 Bit 5: filament 2 Bit 3: gauge in degas Bit 2: gauge controlling bakeout Bit 0: gauge in emission Pirani Gauge Status: Bit 0: gauge operating
5	Gauge error	Ion Gauge error: Bit 0: filament open-circuit Bit 1: overemission Bit 2: underemission Bit 3: overpressure Bit 4: Pirani interlock/autostart prevents starting Bit 6: 1 Bit 7: Filament/leads Pirani Gauge error: Bit 0: Pirani gauge open-circuit Bit 6:1 Bit 7:0
6-13	Pressure	Comma delimited string in scientific notation, e.g. "1.3E-07," If the gauge is not operating the string consists of spaces only, i.e. " ,"

Units Byte: 'T' = Torr.
'P' = Pascal.
'M' = mBar.

Unused Byte: '0'

CR-LF

The pressure measurement for each gauge in the NGC2 is updated 4 times a second. Pressures are displayed and reported without filtering.

All pressure values read from the NGC2 are in the NGC2's current display units.