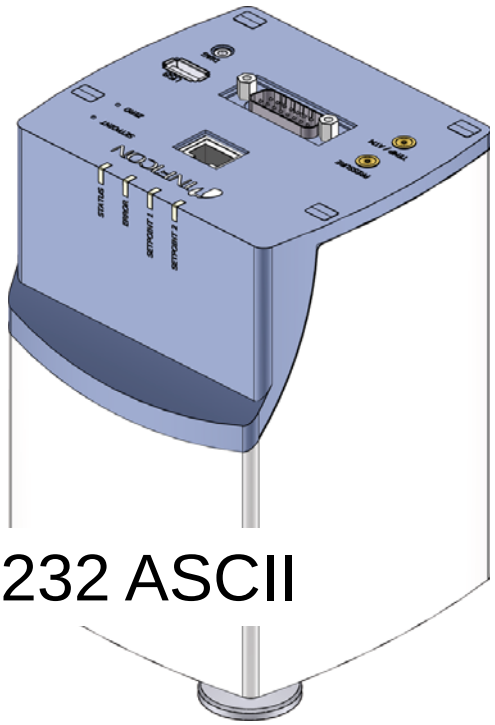
RS232 ASCII

Serial Interface

Cube CDGsci



General Information

The RS232 ASCII Serial Interface for Cube CDGsci permits the communication between this digital INFICON Capacitance Diaphragm Gauge and

- a computer or
- a general device that understands RS232 ASCII.

The protocol is easy to implement and best suited to try out certain parameters of the Cube gauge before programming an interface because it can be directly accessed by a terminal program such as

- Windows XP terminal program
- Any other terminal program that can communicate on a RS232 interface.

The RS232 ASCII Serial Interface integrated in the Capacitance Diaphragm Gauge allows to digitally transmit measurement values and information on the gauge status as well as to make parameter settings.

Caution

Caution: data transmission errors

Any attempt to simultaneously operate the gauge via the RS232 ASCII Serial Interface and a fieldbus interface (DeviceNet or Profibus) or the diagnostic port may result in incorrect data and data transmission errors.

Therefore, it is inadmissible to simultaneously operate the gauge via the RS232 ASCII Serial Interface and DeviceNet, Profibus, or the diagnostic port.

Validity

This document applies to products with part numbers

3 C S 1 - 3 1 1 - 2 3 0 0

Flange

1	DN 16 ISO-KF
3	DN 16 CF-R
E	8VCR female

Measurement range (F.S.)

3	0.1
6	1
9	10
C	100
F	1000

The part number (PN) can be taken from the product nameplate.

If not indicated otherwise in the legends, the illustrations in this document correspond to CDGsci gauges with the DN 16 ISO-KF vacuum connection.

We reserve the right to make technical changes without prior notice.

Functional Principle

The RS232 ASCII Serial Interface is used in duplex operation.

Data format

- ASCII
- 8 data bits
- 1 stop bit
- no parity bit
- no handshake

Transmission rate

- 9600 Baud

Pin assignment

- TxD Pin 13
- RxD Pin 14
- GND Pin 5
  (sensor cable connector)

1 Interface Protocol

1.1 Send and Receive

Commands are send to the Cube gauge as an ASCII string. Each command is terminated with an CR/LF.

The input of only the command results in Cube sending the actual value of the parameter corresponding to the command (read access). The value is transmitted as an ASCII string terminated with a CR/LF.

The input of the command with a trailing parameter value will result is a writing attempt of the value into the corresponding parameter on the Cube. If successful, the string "o.k." is transmitted back, otherwise an error message will result.

The data type in the parameter table 1.2 indicates how the string can be interpreted. The column "Access Rights" denotes if the command is read only ("R") or has a write and read access ("RW").

Response time

100 ms for pressure values

200 … 1000 ms for other information or write commands

Example 1

Command: `AUN` (displays / sets the currently set pressure unit)

Possible parameter values: mbar, Pa, Torr

Entry of command without parameters displays the current unit:

```
Cube> AUN
Torr
Cube>
```

Entry of command with parameter sets Cube to the specified unit:

```
Cube> AUN mbar
o.k.
Cube>
```

Entry of command with not recognized / allowed parameter results in an error:

```
Cube> AUN psi
Value does not fall within the expected range
Cube>
```

If unsure about the parameters, the help function will display them:

```
Cube> HLP aun
Device unit, 0=mbar, 1=torr, 2=pa
Cube>
```

Example 2

Write commands that do not have a parameter list need a trailing zero.
Command: `ZAD` (performs zero adjust at base pressure)

```
Cube> ZAD 0
O.k.
Cube>
```

1.2 Parameter Table

Parameter name	ASCII command	Data type	Access right	Comment
Reset	RST	unit8	W	Power On Reset [RST 0] or [q RST]
FilterSettings	FIL	unit8	RW	Filter Settings: 0 = dynamic 1 = fast 2 = slow 3 = Bypass
SP1LevelLow	S1L	real32	RW	Setpoint 1 switch on, pressure units
SP2LevelLow	S1L	real32	RW	Setpoint 2 switch on, pressure units
SP1LevelHigh	S1H	real32	RW	Setpoint 1 switch off, pressure units
SP2LevelHigh	S2H	real32	RW	Setpoint 2 switch off, pressure units
PerOfAtmSP1	S1P	uint8	RW	Setpoint 1, percentage of atmosphere (only for 1000Torr gauges). Not interchangeable with S1[L/H]. Reset S1P to 0 before using S1[L/H].
PerOfAtmSP2	S2P	uint8	RW	Setpoint 2, percentage of atmosphere (for 1000 Torr gauges only). Not interchangeable with S1[L/H]. Reset S1P to 0 before using S1[L/H].
ZeroAdjust	ZAD	uint8	W	Zero adjust gauge
ZeroAdjValue	ZAV	sint16	RW	Value after Zero Adjust, unit counts [-2^15…2^15]
DcOutputOffset	DOO	sint16	RW	Customer DC-Output Offset, unit counts [-2^15…2^15]
RemainingZero	RZE	sint16	R	Remaining Zero value, unit counts [-2^16…2^15]
FirmwareRevisionCPU2	SSV	string	R	Software version EtherCAT
ImageRevisionCPU2	AIM	string	R	Software version Cube
FirmwareRevisionCPU1	SWV	unit8	R	Software version CPU1
SwDateYear	SWY	string	R	Year of software version in readable format (string)
SwDateMonthDay	SWD	string	R	Month and day of software version [MMDD]
CalibDate	CDA	string	R	Calibration date (xY'MM'DD'HH'MM)
PartNo	PAN	string	R	Part number on custom label (max. 20 byte incl. null terminator)
SerialNumber	SNU	unit32	R	Serial number (unique)
RunHours	RHO	unit16	R	Running hours: 1 = 1h
ExtendedError	EXE	uint16	R	Extended Errors, coded as 16bit uint. High byte: Bit 0 PT1000 fault Bit 1 Heater block overtemperature Bit 2 Electronic overtemperature Bit 3 Zero adjust error Low byte: Bit 0 Atm. pressure out of range Bit 1 Temperature out of range Bit 4 Cal. mode wrong Bit 5 Pressure underflow Bit 6 Pressure overflow Bit 7 Zero adjust warning
SensPressRange	SPR	unit8	R	Exponent: 0 = E-3 4 = E+1 1 = E-2 5 = E+2 2 = E-1 6 = E+3 3 = E0
SensFSR	SFS	unit8	R	Mantissa: 0 = 1.0 3 = 2.5 1 = 1.1 4 = 5.0 2 = 2.0 5 = 1.4
Help	HLP	string	R	Returns all the available commands
SystemDateTime	SDT	string	RW	Set date and time. Format: DD/MM/CCYY hh:mm:ss
ComportCPU2	COA	string	RW	RS baudrate for CPU2 processor board. Selectable values are 9600, 19200, 38400, 57600
Ethernet LAN	CLA	string	R	Ethernet LAN on/off

(continued)

(concluded)

Parameter name	ASCII command	Data type	Access right	Comment
WLAN	WLA	unit8	RW	WLAN on/off
FindAccessPoints	FAP	string	R	Find Wifi access points
ConnectAccessPoint	CAP	string	RW	Connect to access point [index | password]
WLANSettings	IPW	string	R	TCP-IP address of current Wifi connection
LANSettings	IPL	string	RW	TCP-IP address. Gauge resets after successful command.
AnalogOutPLow	APL	real32	RW	Zoom: low pressure which will force an output of 0 V of the DAC
AnalogOutPHigh	APH	real32	RW	Zoom: high pressure which will force an output of 10 V of the DAC
CustomAnalogOut	CAO	unit8	RW	Zoom function for analogue out
CPU2Unit	AUN	unit8	RW	Device unit: 0 = mbar 1 = Torr 2 = Pa
Pressure	PRE	real32	R	Actual pressure
ATMValue	ATM	unit16	R	ATM value of the CPU1, unit counts [0…2^16]
MACAddress	MAC	string	R	Mac address of the Ethernet adapter
ResetFactory	RSF	unit8	W	Factory reset device
StoreFlash	SFL	unit8	W	Write new values to EEPROM
ComPortCPU2	COA	string	RW	Baudrate: selectable values are 9600, 19200, 38400, 57600
CubeMode	DOS	uint8	R	1 = CUBE (24Bit TempOut) 2 = CUBE(24Bit AtmOut)
SecondSTageFilter *)	SSF	uint8	RW	0 = moving exponential average filter 1 = Salvitzky-Golay filter 2 = LOESS filter 3 = off (default)

*) The filter only operates on the digital data stream.

Data type

Abbr.	Meaning
REAL32	32 bit floating point
SINT16	16 bit signed integer
SINT32	32 bit signed integer
UINT8	8 bit unsigned integer
UINT16	16 bit unsigned integer
UINT32	32 bit unsigned integer

Access right

Abbr.	Meaning
R	Read only
RW	Read and write
W	Write only

Notes

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