

Communication Protocol

Introduction

This document provides the information needed to communicate with the OEM Sensor Hub board through direct UART communication.

Document status & Revision history

Version	Author	Release date	Comments
V1.0.0	Camille		Launch version

Serial connection settings

Baud rate: 230400

Data bits: 8

Stop bit: 1

Parity: none

Termination character: '\n'

Syntax

Command syntax

char 0: '<' to start the query

char 1 to 5: command name

char 6: '?' to read, '!' to write

then ':' to start a value. Can iterate over many arguments

Error handling

In an answer, after the read/write character, '[xx]' with xx 2 hexadecimal numbers are also sent and indicating the error code associated with the request. '00' means non error. The following error codes are:

Error code	Meaning
00	No error
C0	Channel error: wrong channel requested
L0	Locking error: you do not have writing access to this parameter
I0	Impossible command: this query can not be processed
P0	Pause error: this command can not be processed while pause is set to 1
NS	No sensor connected to this channel
B0	Argument value out of bound

Quickstart

An Sensor Hub module features four sensing communication heads (M8 connection ports) for connecting sensors. This module can be connected to a Hub or Control Center within a complex system. The sensor values from the Sensor Hub can then be utilized by other modules of the system for a deported feedback loop.

Sensing

A Pressure Controller sensing unit has a hybrid module enabling direct analog reading of analog sensors, and it also features an I2C head for communication with digital sensors..

Sensor control

Elveflow digital sensors are automatically detected and read by the device. It's possible to apply offset, slope and quadratic coefficients to the values measured by the sensor using SENCA command to set these coefficients.

Elveflow analog sensors can also be utilized with the device. First, set the appropriate sensor type using the SENSO command, following the correspondence table that matches analog sensors with their corresponding integer types for use in the SENSO command.

Type id	unit in output	Sensor type
0		No sensor connected
1	uL/min	MFS1 digital
2	uL/min	MFS2 digital
3	uL/min	MFS3 digital
4	uL/min	MFS4 digital
5	uL/min	MFS5 digital
6-20		reserved
21	uL/min	MFS1 analogic
22	uL/min	MFS2 analogic
23	uL/min	MFS analogic
24	uL/min	MFS3 analogic

25	uL/min	MFS4 analogic
26	uL/min	MFS5 analogic
27-29		reserved
30	mbar	MPS0 analogic
31	mbar	MPS1 analogic
32	mbar	MPS2 analogic
33	mbar	MPS3 analogic
34	mbar	MPS4 analogic
35	mbar	MFP
36-39		reserved
40	mV	bubble detector
44	mV	Custom

List of commands

Parameter	Mandatory arguments	Arguments	W	R	Number of characters returned	Example query	Typical answer	Note
PINGA		float: sensor value of channel 0 int: sensor type of channel 0 float: sensor value of channel 1 int: sensor type of channel 1 float: sensor value of channel 2 int: sensor type of channel 2 float: sensor value of channel 3 int: sensor type of channel 3		X	35	<PINGA?	>PINGA? 00 00000.00:00:0000.00:00:0000.00:00:0039.99:04	
PING_	int : channel (1 to 4)	float: sensor value int: sensor type		X	26	<PING_?:2	>PING_? 00 02:00000.00:00	
IDN		str: device name		X	22	<_IDN_?	>_IDN_? 00 OEMREGSEN	
DEVSN		str: SN		X	27	<DEVSN?	>DEVSN? 00 48V111	
FIRMV		str: firmware version	X *	X	21	<FIRMV?	>FIRMV? 00 v01.03.01	
RESET						<RESET		reset firmware

SENSO	int : channel (1 to 4)	int : sensor type	X	X	14	<SENSO?:0 <SENSO!:0:21	>SENSO? 00 00:04 >SENSO! 00 00:21	Sensor types: 00: no sensor 01: MFSD1 02: MFSD2 03: MFSD3 04: MFSD4 05: MFSD5 10: Universal 21 to 50: analog sensors (W only compatible with analog sensors)
SENCA	int : channel (1 to 4)	float : sensor slope float : sensor offset	X	X	32	<SENCA?:2 <SENCA!:2:2.3 1:0.04	>SENCA? 00 02:00001.00:0 0000.00 >SENCA! 00 02:00002.31:0 0000.04	
SENRE	int : channel (only 1)	int : sensor resolution	X	X	17	<SENRE?:1 <SENRE!:1:8	>SENRE? 00 01:04 >SENRE! 00 01:8	Sensor resolution corresponds to the number of bits used to code the sensor value. (see Acquisition time table for sensor resolution for details) compatible only with digital sensors type 1 to 5
SENLT	int : channel (1	int : liquid type	X	X	17	<SENLT?:0	>SENLT? 00 00:00	saved in sensor's

	to 4)					<SENLT!:0:3	>SENLT! 00 00:03	memory compatible with sensor type 1 to 5 only
SMOOT	int : channel (1 to 4)	float : smoothrate	X	X	23	<SMOOT?:2 <SMOOT!:1:0. 45	>SMOOT? 00 02:00000.10 >SMOOT! 00 01:00000.45	
SENRA	int : channel (1 to 4)	int : sensor measured rate		X	17	<SENRA?:3	>SENRA? 00 03:119	