

Programming Guide (1.2)

for PHB 1.21 based devices

This guide describes basic modes of operation of Microx TX3, Fibox 3, PDD 470 and OEM parts based on digital phase detection board PHB 1_03 from the PreSens GmbH. There are four modes of operation available with a number of options, therefore it is essential, that the programmer understands the purpose of each mode as well as general measurement and calibrations functions.

General measurement concept and parameters

PHB1.03 based instruments, are MPU controlled devices. The phase (oxygen, pH, temperature, etc.) measurement is performed automatically by the device's MPU according to internal procedures with parameters programmed by the user. Here some of the basic parameters (see PCP 1.087 communication protocol) are described.

Command	Parameter	Action	Status	Comment
* GENERAL *				
repo < r>	no	Status report	enabled	
data < r>	no	data request for mode 1 & 3	enabled	Mode 1 & 3 only
* CONFIGURATION *				
scur xxxx< r>	0..200	Changes the current of the signal LED	enabled	stored in EEPROM
mod xxxx< r>	0..4	Device operation mode	enabled	2 = MUX serial 3 = MUX parallel 4 = configure MUX stored in EEPROM
call xxxx< r>	0..23	When in mode 2 calls data from particular instrument When in mode 4 wakes up particular instrument for configuration	enabled	Mode 2 & 4 only
* SENSOR SETTING *				
tmpc xxxx< r>	0..60	Sets constant temperature for oxygen calculation	enabled	stored in EEPROM
* CALIBRATION *				
oxyu xxxx< r>	0..1	Oxygen unit 0 - % air saturation 1-mBar	enabled	stored in EEPROM
calz < r>	no	store currently measured values as the first calibration point	enabled	stored in EEPROM
calh < r>	no	store currently measured values as the second calibration point	enabled	stored in EEPROM
cald xxxx< r>	1..31	day of calibration	enabled	stored in EEPROM
calm xxxx< r>	1..12	month of calibration	enabled	stored in EEPROM
caly xxxx< r>	0..99	year of calibration	enabled	stored in EEPROM
calp xxxx< r>	500..2000	pressure of calibration [hPa]	enabled	stored in EEPROM
clzp xxxx< r>	0..90	calibration zero phase	enabled	stored in EEPROM
clzt xxxx< r>	0..50	calibration zero temperature	enabled	stored in EEPROM
clhp xxxx< r>	0..90	calibration hundred phase	enabled	stored in EEPROM
clht xxxx< r>	0..50	calibration hundred temperature	enabled	stored in EEPROM

RS-Port-Settings

Baud Rate: 38400
Databits: 8
Stopbits: 1
Parity: none
Protocoll: none

NOTE 1

The initialising procedure is started after switching the power on and lasts ~2,5 sec. During this time no data are accepted by the RS-port of the microcontroller.

NOTE 2

There is a character input buffer of 32 characters to store multiple commands (including 'carriage-returns' !). It should be stated, that an overflow of this buffer causes commands to be lost and not be interpreted.

NOTE 3

Hardware-dependent single characters may not be sent faster than 3ms.

NOTE 4

The hardware-dependent command lines finished with <cr> may not be sent faster than each 100 ms.

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Mode 3 (MUX parallel)

The Mode 3 is the optional multichannel mode. This mode is applicable only for multichannel (ODM-1) and the OEM modules (requires additional wiring). In mode 3 all channels are activated simultaneously and send data one-by-one sequentially. Measurement action is activated by command *data* (see PCP 1.087). Similar to mode 2 all channels listen to commands from RS232 port, so all can be reprogrammed simultaneously. This mode is useful wherever fast scanning of multiple channels is needed. Single channel can be reached in mode 4.

NOTE : All channels are triggered exactly at the same time. In the fast mode 3 (similar to fast mode 0) the scanning rate of 2 Hz for all 10 channels can be reached.

Mode 4 (MUX configuration)

This is the special mode used to configure multichannel systems. When in mode 4 the system (a single device as well) ignores all commands but *mode* and *call*. The idea of mode 4 is to be able to program or “talk” to the one, particular channel only even if the other are listening. Though other are listening, they do not interpret the commands sent to the active, selected channel.

Configuration procedure always start with selection of mode 4 command. Then the system is waiting for setting the active channel. It is done by use of *call-by-name* function. The channel called by *call* command is set to active state and changes it's mode to 0. This means, it starts to send data continuously to the serial port. Only the active channel reacts to the commands sent. This makes possible reprogramming/configuring single channel without changing entire system settings. To go out from mode 4, it is enough to set previous system's mode 2 or 3.

NOTE : The mode 4 is not stored in EEPROM, thus after power-on the system will be initialised with last set mode 2 or 3.