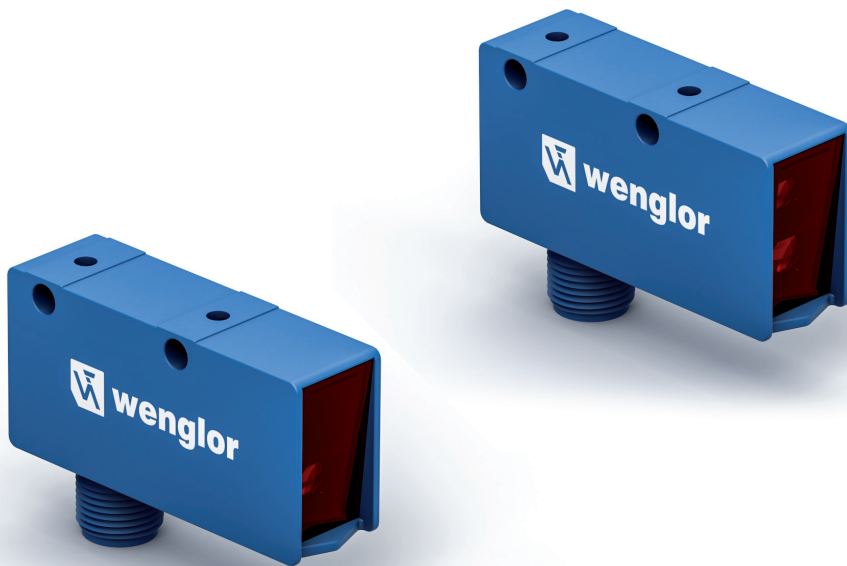


# P1MHxxx

Reflex Sensors with Background Suppression  
High-End with Teach-In



## Interface Description

# IO-Link P1MHxxx

## Vendor ID

| Product               | hex    | dec | hex (Bytes) | dec (Bytes) |
|-----------------------|--------|-----|-------------|-------------|
| wenglor sensoric GmbH | 0x0057 | 87  | 00 57       | 0 87        |

## Device ID

| Product | hex      | dec     | hex (Bytes) | dec (Bytes) |
|---------|----------|---------|-------------|-------------|
| P1MH102 | 0x290C02 | 2690050 | 29 0C 02    | 41 12 2     |
| P1MH104 | 0x290C08 | 2690056 | 29 0C 08    | 41 12 8     |
| P1MH203 | 0x290C05 | 2690053 | 29 0C 05    | 41 12 5     |
| P1MH206 | 0x290C0B | 2690059 | 29 0C 0B    | 41 12 11    |

|                                      |        |
|--------------------------------------|--------|
| IO-Link Version:                     | V1.1   |
| Parameter Server / Data Storage:     | Yes    |
| Blockparameter:                      | Yes    |
| MinCycletime:                        | 3,0 ms |
| SIO-Mode:                            | Yes    |
| COM-Mode:                            | COM2   |
| ISDU:                                | Yes    |
| Process data In (Device to Master):  | 16 Bit |
| Process data Out (Master to Device): | —      |

## Process data (Length: 16 Bit)

| Subindex | Name            | Bit Offset | Data Type | Valid for versions  | Range             |
|----------|-----------------|------------|-----------|---------------------|-------------------|
| 1        | A1 Output       | 0          | Bool      | all                 | 0 = off<br>1 = on |
| 2        | Signal Warning  | 1          | Bool      | all                 | 0 = off<br>1 = on |
| 3        | A2 Output       | 2          | Bool      | all                 | 0 = off<br>1 = on |
| 4        | No signal       | 3          | Bool      | all                 | 0 = off<br>1 = on |
| 5        | Short Circuit   | 4          | Bool      | all                 | 0 = off<br>1 = on |
| 6        | Laser Error     | 5          | Bool      | P1MH203,<br>P1MH206 | 0 = off<br>1 = on |
| 7        | Overtemperature | 6          | Bool      | all                 | 0 = off<br>1 = on |
| 8        | ---             | 7          | ---       | all                 | ---               |
| 9        | Signal          | 8          | Uint8     | all                 | 0...254           |

## Octet 0

| Subindex   | 9  |    |    |    |    |    |    |    |
|------------|----|----|----|----|----|----|----|----|
| Bit Offset | 23 | 22 | 21 | 20 | 19 | 18 | 17 | 16 |

## Octet 1

| Subindex   | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |
|------------|---|---|---|---|---|---|---|---|
| Bit Offset | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |

## Parameter

| Name                                              | Index (hex) | Index (dec) | Sub-index | R/W | Data type      | Data Storage | Dynamic | Modify others | Default value                                                | Range                                                                                                                                             |
|---------------------------------------------------|-------------|-------------|-----------|-----|----------------|--------------|---------|---------------|--------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Identification</b>                             |             |             |           |     |                |              |         |               |                                                              |                                                                                                                                                   |
| Vendor Name                                       | 0x0010      | 16          | 0         | R   | String         |              |         |               | wenglor sensoric GmbH                                        |                                                                                                                                                   |
| Vendor Text                                       | 0x0011      | 17          | 0         | R   | String         |              |         |               | the innovative family                                        |                                                                                                                                                   |
| Product Name                                      | 0x0012      | 18          | 0         | R   | String         |              |         |               | P1MHxxx                                                      |                                                                                                                                                   |
| Product ID                                        | 0x0013      | 19          | 0         | R   | String         |              |         |               | P1MHxxx                                                      |                                                                                                                                                   |
| Product Text                                      | 0x0014      | 20          | 0         | R   | String         |              |         |               | Reflex Sensor with Background Suppression                    |                                                                                                                                                   |
| Serial Number                                     | 0x0015      | 21          | 0         | R   | String         |              |         |               | -                                                            |                                                                                                                                                   |
| Hardware Revision                                 | 0x0016      | 22          | 0         | R   | String         |              |         |               | -                                                            |                                                                                                                                                   |
| Firmware Revision                                 | 0x0017      | 23          | 0         | R   | String         |              |         |               | -                                                            |                                                                                                                                                   |
| Application Specific Tag                          | 0x0018      | 24          | 0         | R/W | String 32 Byte | X            |         |               | ***                                                          |                                                                                                                                                   |
| <b>Parameter</b>                                  |             |             |           |     |                |              |         |               |                                                              |                                                                                                                                                   |
| <b>Device Settings</b>                            |             |             |           |     |                |              |         |               |                                                              |                                                                                                                                                   |
| System Command                                    | 0x0002      | 2           | 0         | W   | UInt8          |              |         | X             | -                                                            | Factory Reset = 0x82 (130)                                                                                                                        |
| Device Access Locks.Parameter (write) Access Lock | 0x000C      | 12          | 1         | R/W | Bool           | X            |         |               | 0                                                            | 0 = unlocked<br>1 = Parameter Access locked                                                                                                       |
| Device Access Locks.Data Storage Lock             | 0x000C      | 12          | 2         | R/W | Bool           | X            |         |               | 0                                                            | 0 = unlocked<br>1 = Data Storage Locked                                                                                                           |
| Device Access Locks.Local Parameterization        | 0x000C      | 12          | 3         | R/W | Bool           | X            |         |               | 0                                                            | 0 = unlocked<br>1 = Local Parameterization locked                                                                                                 |
| NFC Disable                                       | 0x0305      | 773         | 0         | R/W | UInt8          | X            |         |               | 0                                                            | 0 = unlocked<br>1 = read only<br>2 = locked                                                                                                       |
| <b>Mesasured Value Settings</b>                   |             |             |           |     |                |              |         |               |                                                              |                                                                                                                                                   |
| Emitted Light                                     | 0x00E0      | 224         | 0         | R/W | UInt8          | X            |         |               | 0 = On                                                       | 0 = On<br>1 = Off                                                                                                                                 |
| Operating Mode                                    | 0x0110      | 272         | 0         | R/W | UInt8          | X            |         |               | 0 = Standard                                                 | 0 = Standard<br>1 = Interference free                                                                                                             |
| Hysteresis                                        | 0x0300      | 768         | 0         | R/W | UInt8          | X            |         |               | 0 = Small                                                    | 0 = Small<br>1 = Large                                                                                                                            |
| Distance measurement                              | 0x0301      | 769         | 0         | R/W | UInt8          | X            |         |               | 1 = Off                                                      | 0 = On<br>1 = Off                                                                                                                                 |
| <b>Pin Function</b>                               |             |             |           |     |                |              |         |               |                                                              |                                                                                                                                                   |
| E/A1 Pin Function                                 | 0x0040      | 64          | 0         | R/W | UInt8          | X            |         | X             | 0 = Switching Output                                         | 0 = Switching Output<br>1 = Error Output<br>2 = Contamination Output                                                                              |
| E/A2 Pin Function                                 | 0x0041      | 65          | 0         | R/W | UInt8          | X            |         | X             | 4 = Extern Teach A1                                          | 0 = Switching output<br>1 = Error output<br>2 = Contamination Output<br>4 = Extern Teach A1<br>5 = Deactivated<br>6 = Antivalent Switching Output |
| <b>A1 (Switching Output)</b>                      |             |             |           |     |                |              |         |               |                                                              |                                                                                                                                                   |
| A1 Teach-in                                       | 0x0200      | 512         | 0         | W   | UInt8          |              |         | X             | -                                                            | 1 = Teach-In                                                                                                                                      |
| A1 Teach Mode                                     | 0x0290      | 656         | 0         | R/W | UInt8          | X            |         |               | 0 = Foreground                                               | 0 = Foreground<br>1 = Background                                                                                                                  |
| A1 Switch Point                                   | 0x0270      | 624         | 0         | R/W | UInt8          | X            |         |               | 255                                                          | 0..255                                                                                                                                            |
| A1 ON Delay                                       | 0x0050      | 80          | 0         | R/W | UInt16         | X            |         |               | 0 ms                                                         | 0...10000 ms                                                                                                                                      |
| A1 OFF Delay                                      | 0x0060      | 96          | 0         | R/W | UInt16         | X            |         |               | 0 ms                                                         | 0...10000 ms                                                                                                                                      |
| A1 NO/NC                                          | 0x0210      | 528         | 0         | R/W | UInt8          | X            |         |               | 0 = NO                                                       | 0 = NO<br>1 = NC                                                                                                                                  |
| A1 Polarity                                       | 0x0220      | 544         | 0         | R/W | UInt8          | X            |         |               | 1 = PNP:<br>P1MH102, P1MH203<br>2 = NPN:<br>P1MH104, P1MH206 | 0 = PushPull<br>1 = PNP<br>2 = NPN                                                                                                                |

| Name                                      | Index (hex) | Index (dec) | Sub-index | R/W | Data type | Data Storage | Dynamic | Modify others | Default value                                                | Range                              |
|-------------------------------------------|-------------|-------------|-----------|-----|-----------|--------------|---------|---------------|--------------------------------------------------------------|------------------------------------|
| <b>A1 (Error or Contamination Output)</b> |             |             |           |     |           |              |         |               |                                                              |                                    |
| A1 ON Delay                               | 0x0050      | <b>80</b>   | 0         | R/W | Uint16    | X            |         |               | 0 ms                                                         | 0...10000 ms                       |
| A1 OFF Delay                              | 0x0060      | <b>96</b>   | 0         | R/W | Uint16    | X            |         |               | 0 ms                                                         | 0...10000 ms                       |
| A1 NO/NC                                  | 0x0210      | <b>528</b>  | 0         | R/W | Uint8     | X            |         |               | 0 = NO                                                       | 0 = NO<br>1 = NC                   |
| A1 Polarity                               | 0x0220      | <b>544</b>  | 0         | R/W | Uint8     | X            |         |               | 1 = PNP:<br>P1MH102, P1MH203<br>2 = NPN:<br>P1MH104, P1MH206 | 0 = PushPull<br>1 = PNP<br>2 = NPN |
| <b>A2 (Switching Output)</b>              |             |             |           |     |           |              |         |               |                                                              |                                    |
| A2 Teach-in                               | 0x0201      | <b>513</b>  | 0         | W   | Uint8     |              |         | X             | -                                                            | 1 = Teach-In                       |
| A2 Teach Mode                             | 0x0291      | <b>657</b>  | 0         | R/W | Uint8     | X            |         |               | 0 = Foreground                                               | 0 = Foreground<br>1 = Background   |
| A2 Switch Point                           | 0x0280      | <b>640</b>  | 0         | R/W | Uint8     | X            |         |               | 255                                                          | 0...255                            |
| A2 ON Delay                               | 0x0051      | <b>81</b>   | 0         | R/W | Uint16    | X            |         |               | 0 ms                                                         | 0...10000 ms                       |
| A2 OFF Delay                              | 0x0061      | <b>97</b>   | 0         | R/W | Uint16    | X            |         |               | 0 ms                                                         | 0...10000 ms                       |
| A2 NO/NC                                  | 0x0211      | <b>529</b>  | 0         | R/W | Uint8     | X            |         |               | 0 = NO                                                       | 0 = NO<br>1 = NC                   |
| A2 Polarity                               | 0x0221      | <b>545</b>  | 0         | R/W | Uint8     | X            |         |               | 1 = PNP:<br>P1MH102, P1MH203<br>2 = NPN:<br>P1MH104, P1MH206 | 0 = PushPull<br>1 = PNP<br>2 = NPN |
| <b>A2 (Error or Contamination Output)</b> |             |             |           |     |           |              |         |               |                                                              |                                    |
| A2 ON Delay                               | 0x0051      | <b>81</b>   | 0         | R/W | Uint16    | X            |         |               | 0 ms                                                         | 0...10000 ms                       |
| A2 OFF Delay                              | 0x0061      | <b>97</b>   | 0         | R/W | Uint16    | X            |         |               | 0 ms                                                         | 0...10000 ms                       |
| A2 NO/NC                                  | 0x0211      | <b>529</b>  | 0         | R/W | Uint8     | X            |         |               | 0 = NO                                                       | 0 = NO<br>1 = NC                   |
| A2 Polarity                               | 0x0221      | <b>545</b>  | 0         | R/W | Uint8     | X            |         |               | 1 = PNP:<br>P1MH102, P1MH203<br>2 = NPN:<br>P1MH104, P1MH206 | 0 = PushPull<br>1 = PNP<br>2 = NPN |
| <b>A2 (Antivalent)</b>                    |             |             |           |     |           |              |         |               |                                                              |                                    |
| A2 Polarity                               | 0x0221      | <b>545</b>  | 0         | R/W | Uint8     | X            |         |               | 1 = PNP:<br>P1MH102, P1MH203<br>2 = NPN:<br>P1MH104, P1MH206 | 0 = PushPull<br>1 = PNP<br>2 = NPN |
| <b>E2 (Teach Input)</b>                   |             |             |           |     |           |              |         |               |                                                              |                                    |
| Input Ub active/inactive                  | 0x0260      | <b>608</b>  | 0         | R/W | Uint8     | X            |         |               | 0 = Ub active                                                | 0 = Ub active<br>1 = Ub inactive   |
| <b>Device Test</b>                        |             |             |           |     |           |              |         |               |                                                              |                                    |
| Test Mode                                 | 0x0310      | <b>784</b>  | 0         | R/W | Uint8     |              | X       |               | 0 = OFF                                                      | 0 = OFF<br>1 = ON                  |
| Test Output A1                            | 0x0317      | <b>791</b>  | 0         | R/W | Uint8     |              | X       |               | 0 = OFF                                                      | 0 = OFF<br>1 = ON                  |
| Test Output A2                            | 0x0311      | <b>785</b>  | 0         | R/W | Uint8     |              | X       |               | 0 = OFF                                                      | 0 = OFF<br>1 = ON                  |
| Test Input E2                             | 0x0313      | <b>787</b>  | 0         | R   | Uint8     |              | X       |               | 0 = OFF                                                      | 0 = OFF<br>1 = ON                  |
| Test Error                                | 0x0314      | <b>788</b>  | 0         | R/W | Uint8     |              | X       |               | 0 = OFF                                                      | 0 = OFF<br>1 = ON                  |
| Test Contamination                        | 0x0315      | <b>789</b>  | 0         | R/W | Uint8     |              | X       |               | 0 = OFF                                                      | 0 = OFF<br>1 = ON                  |
| Test Signal                               | 0x0316      | <b>790</b>  | 0         | R/W | Uint8     |              | X       |               | 0                                                            | 0...254                            |

## Notes for the use of the IODD

### RAM-memory

The changed parameters are stored in the volatile memory of the sensor. This could be used for testing and if the configuration of the sensor changes often (e. g. for different production batches).

### Changes have the following effects

- Sensor behavior is adjusted immediately without a restart according to the changed parameter.
- In case of a sensor restart (e. g. by turning power off and on) the settings are lost.
- Changes have no effects on the OTP-memory of the sensor.

### OTP-memory

By writing the parameters, they are stored in the non-volatile memory. At every start-up the OTP parameters are loaded to the RAM of the sensor. The OTP-memory has limited write cycles. The wenglor sensoric GmbH can guarantee at least 240 writes to the OTP-memory at delivery.

The current number of writes is readable from the parameter "Counter OTP memory".

### Procedure to save parameters in the OTP-memory of the sensor:

1. Test the sensor settings within the application until the desired configuration is clear.
2. Set the parameter "Write parameters to OTP-memory" to "write parameters" and send it to the sensor.
3. The configuration is applied directly, and after a restart it is loaded from the OTP-memory.
4. New configuration is stored in the sensors RAM and OTP-memory.