

Easy Arc Integration to new BioControllers

Technical Note

Standard M12-Pole Connectors fits best for new BioControllers

The M12 has become the industry standard in various applications. The wide selection of designs enables a cost efficient plug and play connection for different devices and sensors.

Hamilton has chosen the M12-8 Pole as a standard.

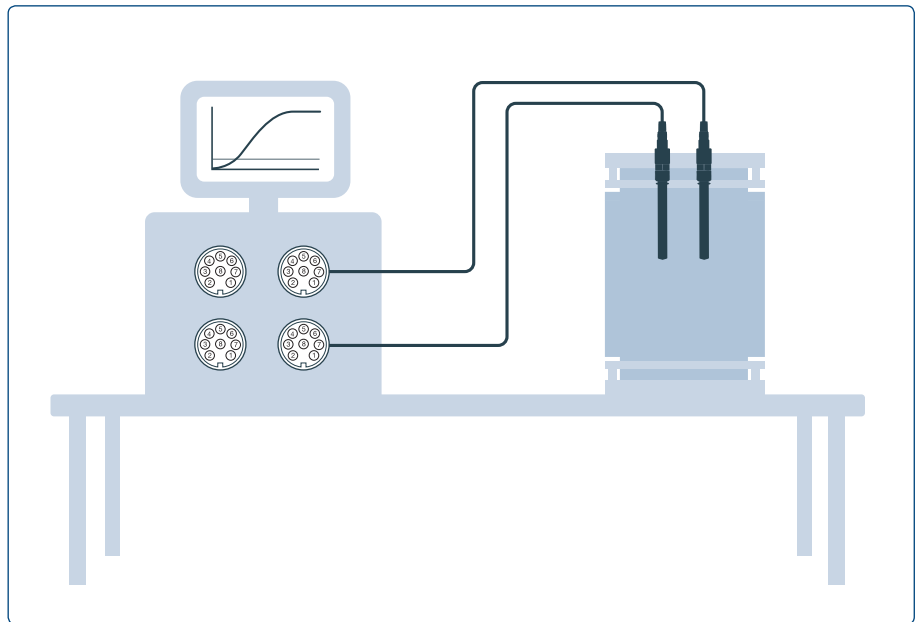


Figure 1: BioController scheme

A-Coded female connector

| Pin | Function |
|---------|-----------|
| 1 | + 4-20 mA |
| 2 | - 4-20 mA |
| 3 | + 4-20 mA |
| 4 | - 4-20 mA |
| 5 | RS485 (A) |
| 6 | RS485 (B) |
| 7 | GND |
| 8 | + 24 VDC |
| Housing | Shield |

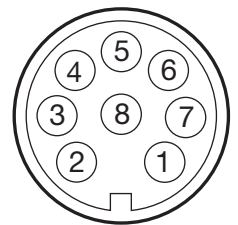


Figure 2: M12 8 Pole A Code female Connector

Arc Sensor cables for new BioControllers

| Ref | Description |
|----------|-------------------------------|
| 10067842 | 3 m Sensor Cable VP8 / M12-8 |
| 10067844 | 5 m Sensor Cable VP8 / M12-8 |
| 10067846 | 10 m Sensor Cable VP8 / M12-8 |

Arc Sensor Integration in to the BioController HMI System

We recommend to integrate these registers into the BioController HMI:

| Register | Description | Read/Write |
|--------------------------------------|--|------------|
| 2090 | Measured Value reading incl. sensor status (e.g. traffic light symbolic) (DO, pH, COND, ORP) | Read |
| 4736 (Warnings) 4800 (Errors) | Detailed Warning & Errors status | Read |
| 4872 | Quality indicator in % (DO, pH, COND, ORP) | Read |
| 5158 (CP1) 5190 (CP2) | Calibration data <ul style="list-style-type: none"> • Calibration Point 1 (DO, pH, COND, ORP) <ul style="list-style-type: none"> - Status - value: e.g. 4.01 pH • Calibration point 2 (DO, pH) <ul style="list-style-type: none"> - Status - Value: e.g. 20.95 %-vol | Read |
| 1280 (Ref) 1312 (SN) 1032 (FW) | Sensor ID <ul style="list-style-type: none"> • Sensor ref number (Ref) • Sensor serial number (SN) • Sensor firmware (FW) | Read |
| 4692 3146 3114 3530 | Possible user input: (manual counter no input from the sensor) <ul style="list-style-type: none"> - Autoclaving counter (All parameter) - Atmospheric Pressure (DO only) - Salinity (DO only) - Cap Type (only for optical sensors only) | Write |

These registers have to be set after each Arc-sensor has been powered up.

| Register | Description | Read/Write |
|----------|---|------------|
| 4096 | Device Address 1-32 (Default Address =1) | Write |
| 4102 | Baudrate (4800, 9600, 19200, 38400, 57600, 115200 bps) | Write |
| 4288 | Operator Level S | Write |
| 2090 | Measured Unit e.g. DO (define the specific parameter measured unit) | Write |
| 4108 | Parity | Write |
| 4108 | StopBits | Write |

Table 1: Registers to be integrated into the BioController

Arc Standard Calibration:

| Register | Description | Read/Write |
|--------------------------|---|------------|
| 4288 | Change Sensor to Operator Level S (Specialist) | Write |
| 5162 (auto) | Start CP1 (Place Sensor in calibration media (wait at least 3 minutes for stable measurement and temperature condition) | Write |
| 5194 (auto) | Start CP2 (Place Sensor in calibration media (wait at least 3 minutes for stable measurement and temperature condition) | Write |
| 5158 (CP1) 5190 (CP2) | Read calibration Status for calibration points (CP1 or CP2) | Read |

Arc Product Calibration:

| Register | Description | Read/Write |
|---------------|--|------------|
| 5322 (assign) | Assign offline a reference value | Write |
| 5340 (init.) | Start Product Calibration with following values: <ul style="list-style-type: none"> • 0x01 Perform initial measurement • 0x02 Cancel an active product calibration | Write |



Sensor and Bio Controller Management

Controller mode:

1. Select Operator Level «S» (Exclusive access to the BioController)
2. Read and write rights via BioController (see table 1)
3. Write register after each sensor connection (see table 1)
4. Read out via wireless: everything that is read only («U»)
5. Sensor Calibration via BioController only
6. Product Calibration re-calibration via BioController only

Maintenance mode:

1. Select Operator Level «U» (unlock sensor for mobile or PC)
 - User has to select a button on the BioController HMI
 - Show user on HMI that read out via BioController is interrupted
2. New status:
 - Read/Write out via BioController: not possible
 - Read and write rights via ArcAir: everything
3. Switch to controller mode:
 - User has to select button on BioController HMI
 - When operator level is switched from level U to level «S» the following registers must be overwritten by BioController:
 - Baud rate
 - Device address
 - Stop bits
 - Parity
 - Measurement unit

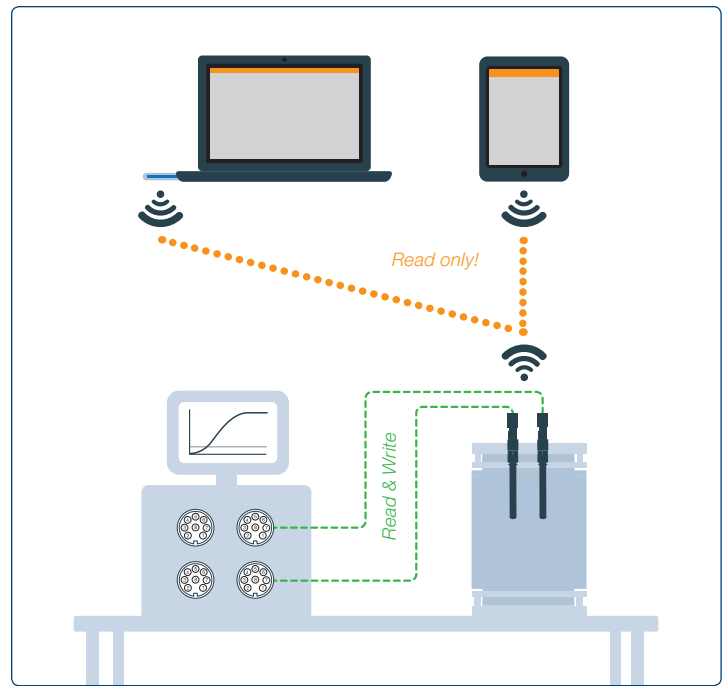


Figure 3: Controller mode

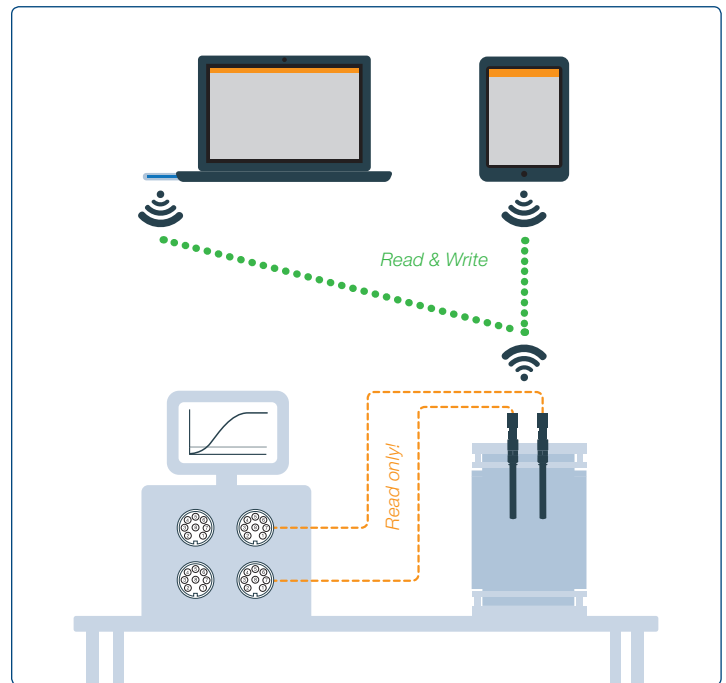


Figure 4: Maintenance mode

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HAMILTON®

Web: www.hamiltoncompany.com

USA: 800-648-5950

Europe: +41-58-610-10-10

Hamilton Americas & Pacific Rim

4970 Energy Way
Reno, Nevada 89502 USA
Tel: +1-775-858-3000
Fax: +1-775-856-7259
sales@hamiltoncompany.com

Hamilton Europe, Asia & Africa

Via Crusch 8
CH-7402 Bonaduz, Switzerland
Tel: +41-58-610-10-10
Fax: +41-58-610-00-10
contact.pa.ch@hamilton.ch

To find a representative in your area, please visit hamiltoncompany.com.