# Product data sheet

## SMART CONTROLLER

**Smart Controller Expansions**

### 16 Digital inputs

### Features

- MODBUS RTU SLAVE
- 15 Configurable Address
- 24 V DC Power


### Ordering Information

Range of master controllers

| DEVICE P/N | GSM/LTE | WiFi | Antenna |
|---|---|---|---|
| SC-PL-I4-A4-Q8 | No | Yes | Internal |
| SC-PL-I4-A4-Q8-E | No | Yes | External WiFi |
| SC-PL-I4-A4-Q8-L | Yes | Yes | External GSM |

Range of expansion modules

| DEVICE P/N | I/O |
|---|---|
| SC-EX-M-D16 | 16 x Digital Input |
| SC-EX-M-Q16 | 16 x Transistor Output |
| SC-EX-M-V8 | 8 x Analog Input 0 - 10V |
| SC-EX-M-I8 | 8 x Analog Input 4 - 20mA |
| SC-EX-M-QV4 | 4 x Analog Output 0 - 10V |
| SC-EX-M-QM4 | 4 x Analog Output 4 - 20mA |
| SC-EX-M-TC4 | 4 x K type thermocouple |

## Main

| | |
|---|---|
| Range of product | Smart Controller |
| Product type | I/O Expansion |
| Rated supply voltage | 24 V DC 0.04A |
| Communication | MODBUS RTU over RS-485 |

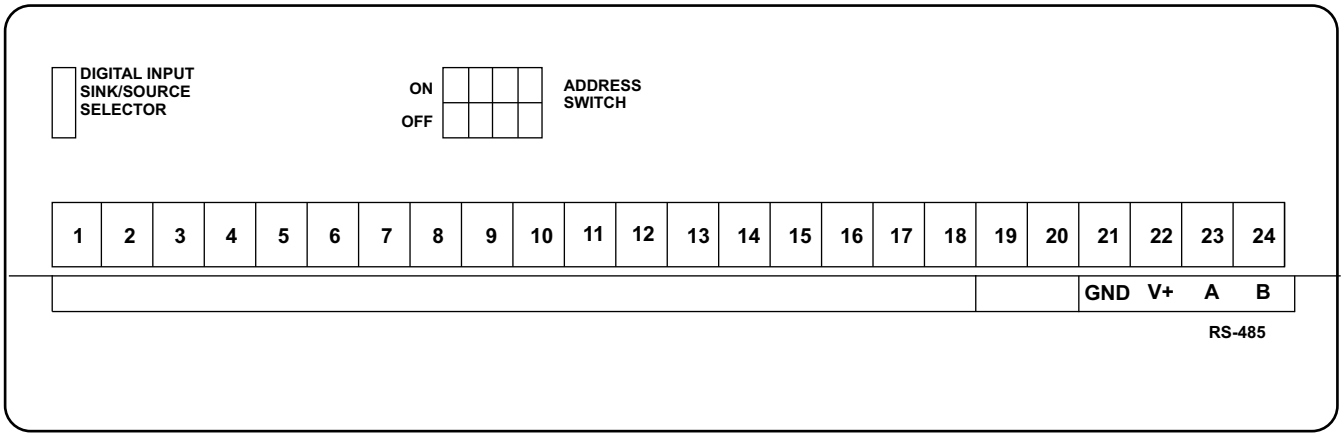
## Complementary

| | |
|---|---|
| Power consumption in W | 10.2W |
| Local signalling | 1 LED green for PWR<br>1 LED green for STATUS (Programmable) |
| Electrical connection | Screw terminal block for connections (pi ch 5.08 mm) |
| Mounting support | Wall mounting<br>Panel Mounting |
| Height | 130 mm |
| Depth | 27 mm |
| Width | 150 mm |
| Enclosure Material | ABS UL-94-HB |
| Product weight | 0.43 Kg |

## Environment

| | |
|---|---|
| Resistance to electrostatic discha ge | 4kV on contact 8kV on air |
| Resistance to electro magnetic fields | 10 V/m (80 MHz ..... 1GHz) 3 V/m (1.4 MHz ..... 2 GHz) 1 V/m (2 MHz ..... 3 GHz) |
| Immunity to microbreaks | 10 ms |
| Relati e humidity | 10....95% without condensation in ope aation |
| IP degree of protection | IP54 |
| Operating altitude | 0...2000m |
| Storage altitude | 0...3000m |
| Shock resistance | 15 gn for 11 ms |

## Modbus Address Setup




| SWITCH CONFIGURATION | ADDRESS |
|---|---|
| ON / OFF | 1 |
| ON / OFF | 2 |
| ON / OFF | 3 |
| ON / OFF | 4 |
| ON / OFF | 5 |
| ON / OFF | 6 |
| ON / OFF | 7 |
| ON / OFF | 8 |

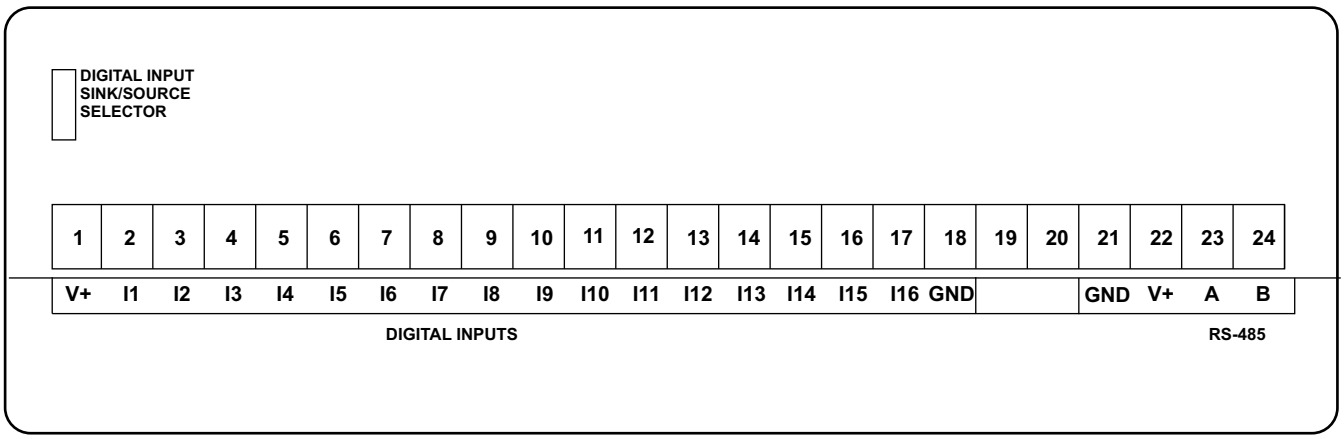
| SWITCH CONFIGURATION | ADDRESS |
|---|---|
| ON / OFF | 9 |
| ON / OFF | 10 |
| ON / OFF | 11 |
| ON / OFF | 12 |
| ON / OFF | 13 |
| ON / OFF | 14 |
| ON / OFF | 15 |
| | |

# Product data sheet

Connections & Schematics

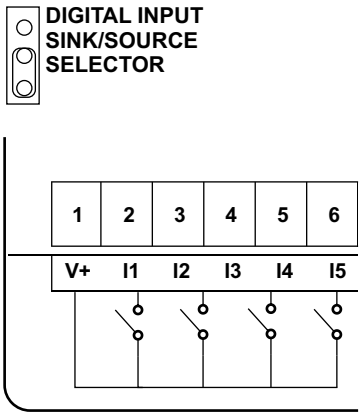
## SMART CONTROLLER

**SC-EX-M-QV4**

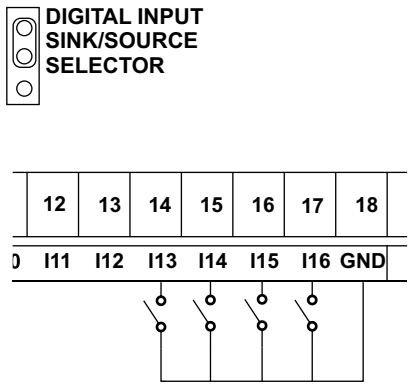



| PIN | NAME | DESCRIPTION |
|---|---|---|
| 1 | V+ | 12V + OUTPUT Max.10mA |
| 2 | I1 | Digital Input 1 |
| 3 | I2 | Digital Input 2 |
| 4 | I3 | Digital Input 3 |
| 5 | I4 | Digital Input 4 |
| 6 | I5 | Digital Input 5 |
| 7 | I6 | Digital Input 6 |
| 8 | I7 | Digital Input 7 |
| 9 | I8 | Digital Input 8 |
| 10 | I9 | Digital Input 9 |
| 11 | I10 | Digital Input 10 |
| 12 | I11 | Digital Input 11 |
| 13 | I12 | Digital Input 12 |
| 14 | I13 | Digital Input 13 |
| 15 | I14 | Digital Input 14 |
| 16 | I15 | Digital Input 15 |
| 17 | I16 | Digital Input 16 |
| 18 | GND | GROUND |
| 19 | -- | Not Connected |
| 20 | -- | Not Connected |
| 21 | GND | GROUND |
| 22 | V+ | 24V+ for Digital Input |
| 23 | A | RS-485 A |
| 24 | B | RS-485 B |

### Digital Input Wiring Diagram | Source Inputs

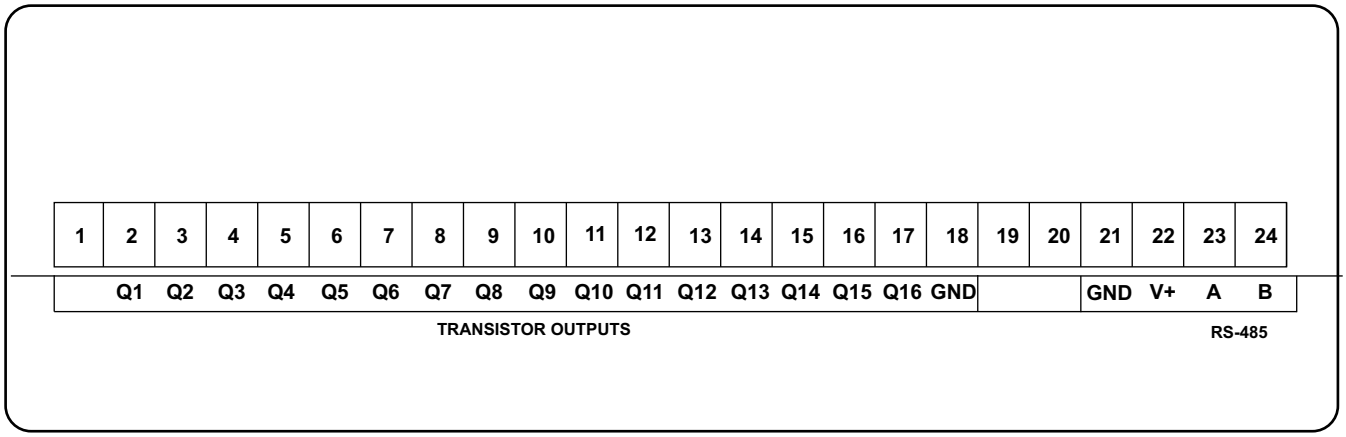



### Digital Input Wiring Diagram | Sink Inputs

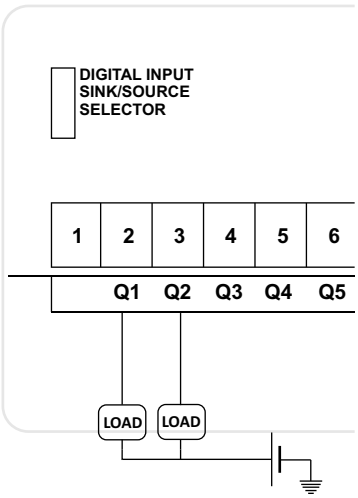



| | |
|---|---|
| Discrete input number | 16 Digital Inputs |
| Discrete logic input | Sink or source |
| Discrete input voltage | 24 V |
| Discrete input voltage type | DC |
| Voltage state 1 guaranteed | >=18V for input |
| Voltage state 0 guaranteed | <=6 V for input |
| Discrete input current | 5 mA for input |
| Input impedance | 4.7k Ohm for input |

***Refer product user guide for MODBUS Address information**




| PIN | NAME | DESCRIPTION |
|---|---|---|
| 1 | -- | -- |
| 2 | Q1 | Transistor Output 1 |
| 3 | Q2 | Transistor Output 2 |
| 4 | Q3 | Transistor Output 3 |
| 5 | Q4 | Transistor Output 4 |
| 6 | Q5 | Transistor Output 5 |
| 7 | Q6 | Transistor Output 6 |
| 8 | Q7 | Transistor Output 7 |
| 9 | Q8 | Transistor Output 8 |
| 10 | Q9 | Transistor Output 9 |
| 11 | Q10 | Transistor Output 10 |
| 12 | Q11 | Transistor Output 11 |
| 13 | Q12 | Transistor Output 12 |
| 14 | Q13 | Transistor Output 13 |
| 15 | Q14 | Transistor Output 14 |
| 16 | Q15 | Transistor Output 15 |
| 17 | Q16 | Transistor Output 16 |
| 18 | GND | GROUND |
| 19 | -- | Not Connected |
| 20 | -- | Not Connected |
| 21 | GND | GROUND |
| 22 | V+ | 24V+ for Digital Input |
| 23 | A | RS-485 A |
| 24 | B | RS-485 B |




| | |
|---|---|
| Type | Open Collector NPN |
| Maximum Voltage | 24V DC |
| Max. current drive | 25 mA @ 12V DC |
| Max. Power dissipation | 310mW |

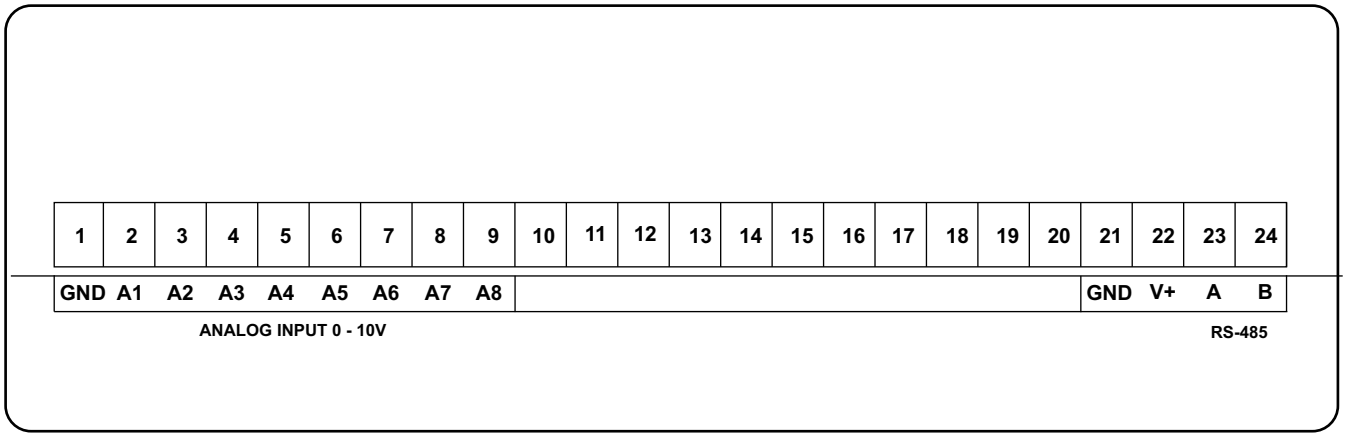
***Refer product user guide for MODBUS Address information**

# Product data sheet

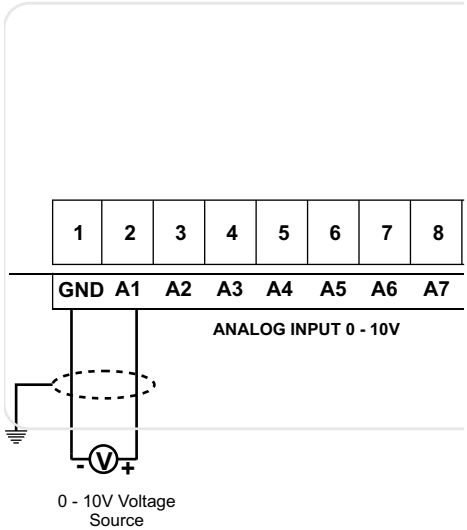
Connections & Schematics

SMART CONTROLLER

**SC-EX-M-QV4**




| PIN | NAME | DESCRIPTION |
|---|---|---|
| 1 | GND | GROUND |
| 2 | A1 | Analog Input 1 |
| 3 | A2 | Analog Input 2 |
| 4 | A3 | Analog Input 3 |
| 5 | A4 | Analog Input 4 |
| 6 | A5 | Analog Input 5 |
| 7 | A6 | Analog Input 6 |
| 8 | A7 | Analog Input 7 |
| 9 | A8 | Analog Input 8 |
| 10 | – | – |
| 11 | – | – |
| 12 | – | – |
| 13 | – | – |
| 14 | – | – |
| 15 | – | – |
| 16 | – | – |
| 17 | – | – |
| 18 | – | GROUND |
| 19 | – | Not Connected |
| 20 | – | Not Connected |
| 21 | GND | GROUND |
| 22 | V+ | 24V+ for Digital Input |
| 23 | A | RS-485 A |
| 24 | B | RS-485 B |




| | |
|---|---|
| Type | 0 - 10 V DC |
| Resolution | 16 bit |
| Input Impedance | 3.3 kOhm |

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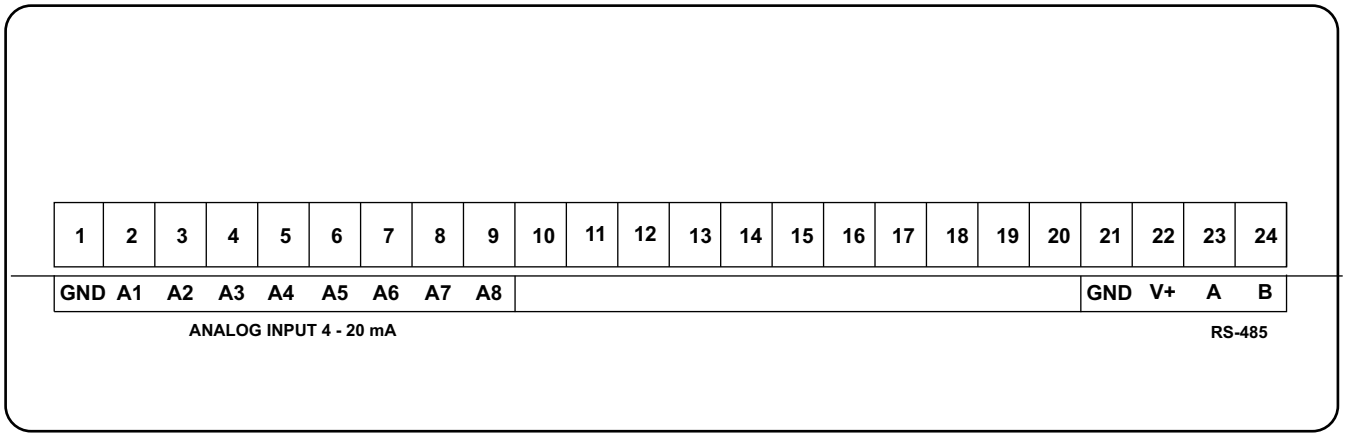
# Product data sheet

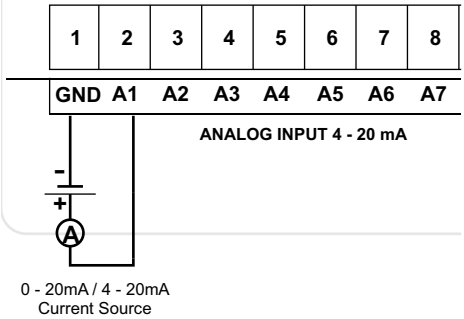
Connections & Schematics

SMART CONTROLLER

**SC-EX-M-QV4**




| PIN | NAME | DESCRIPTION |
|---|---|---|
| 1 | GND | GROUND |
| 2 | A1 | Analog Input 1 |
| 3 | A2 | Analog Input 2 |
| 4 | A3 | Analog Input 3 |
| 5 | A4 | Analog Input 4 |
| 6 | A5 | Analog Input 5 |
| 7 | A6 | Analog Input 6 |
| 8 | A7 | Analog Input 7 |
| 9 | A8 | Analog Input 8 |
| 10 | – | – |
| 11 | – | – |
| 12 | – | – |
| 13 | – | – |
| 14 | – | – |
| 15 | – | – |
| 16 | – | – |
| 17 | – | – |
| 18 | – | GROUND |
| 19 | – | Not Connected |
| 20 | – | Not Connected |
| 21 | GND | GROUND |
| 22 | V+ | 24V+ for Digital Input |
| 23 | A | RS-485 A |
| 24 | B | RS-485 B |




| | |
|---|---|
| Type | 0 - 10 V DC |
| Resolution | 16 bit |
| Input Impedance | 10 Ohm |

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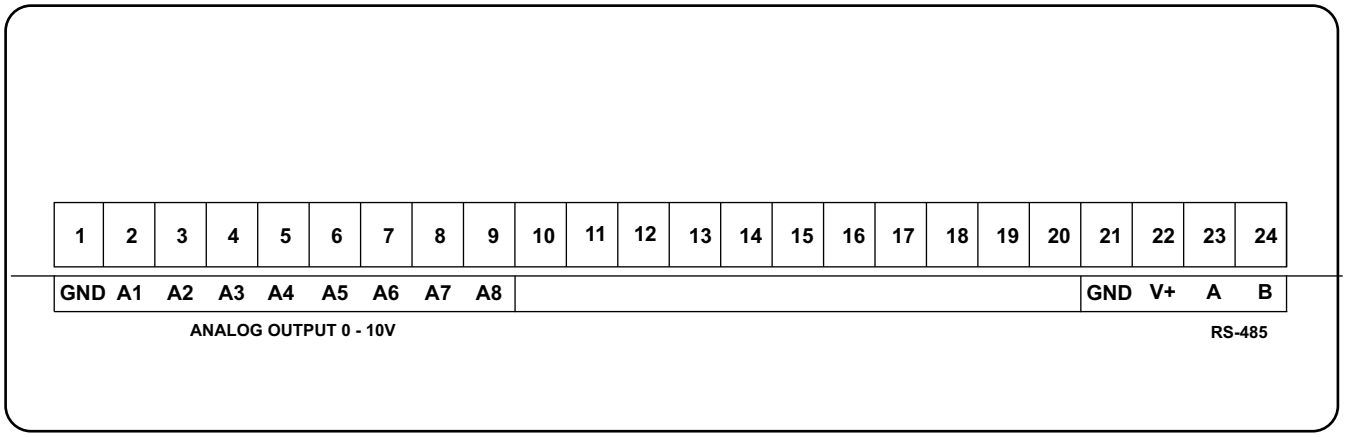
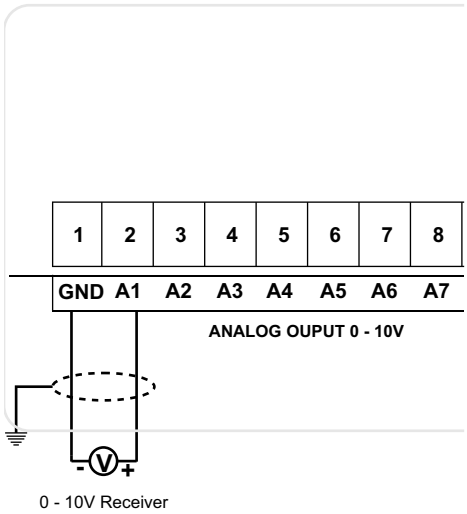
Connections & Schematics

SMART CONTROLLER

**SC-EX-M-QV4**




| PIN | NAME | DESCRIPTION |
|---|---|---|
| 1 | GND | GROUND |
| 2 | A1 | Analog Output 1 |
| 3 | A2 | Analog Output 2 |
| 4 | A3 | Analog Output 3 |
| 5 | A4 | Analog Output 4 |
| 6 | – | – |
| 7 | – | – |
| 8 | – | – |
| 9 | – | – |
| 10 | – | – |
| 11 | – | – |
| 12 | – | – |
| 13 | – | – |
| 14 | – | – |
| 15 | – | – |
| 16 | – | – |
| 17 | – | – |
| 18 | – | – |
| 19 | – | – |
| 20 | – | – |
| 21 | GND | GROUND |
| 22 | V+ | 24V+ for Digital Input |
| 23 | A | RS-485 A |
| 24 | B | RS-485 B |




| | |
|---|---|
| Type | 0 - 10 V DC |
| Resolution | 10 bit |
| Input Impedance | 3.3 kOhm |

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# Product data sheet

Connections & Schematics

SMART CONTROLLER

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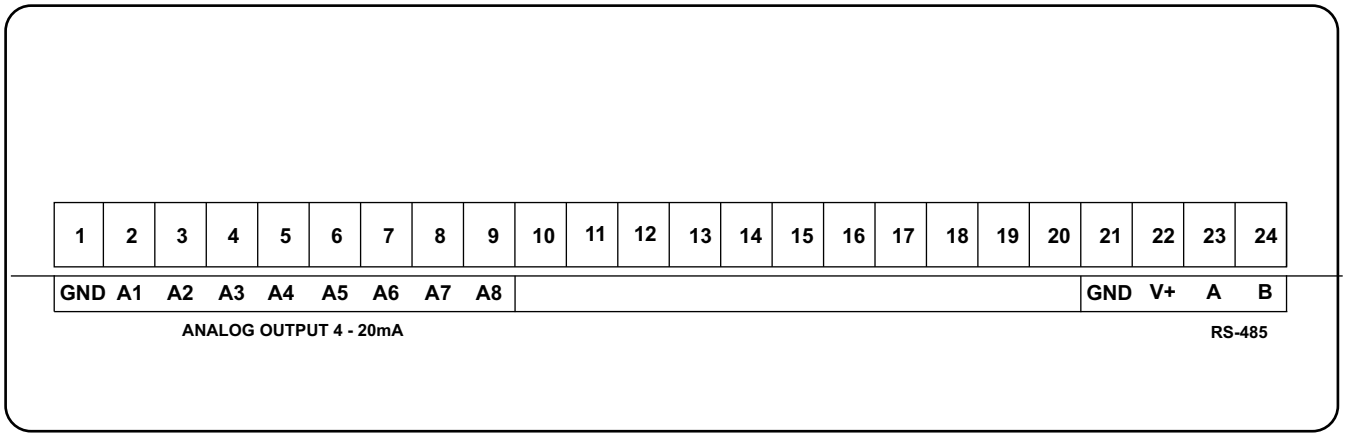
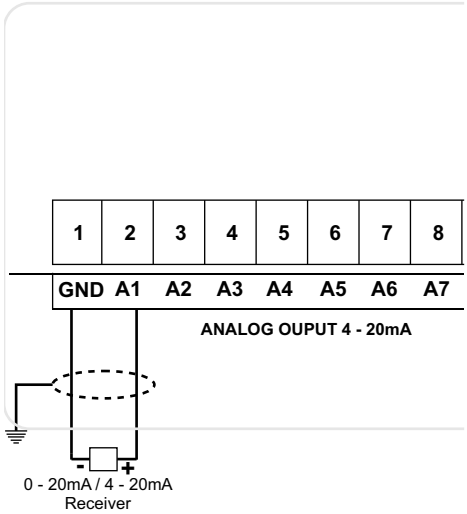



| PIN | NAME | DESCRIPTION |
|---|---|---|
| 1 | GND | GROUND |
| 2 | A1 | Analog Output 1 |
| 3 | A2 | Analog Output 2 |
| 4 | A3 | Analog Output 3 |
| 5 | A4 | Analog Output 4 |
| 6 | – | – |
| 7 | – | – |
| 8 | – | – |
| 9 | – | – |
| 10 | – | – |
| 11 | – | – |
| 12 | – | – |
| 13 | – | – |
| 14 | – | – |
| 15 | – | – |
| 16 | – | – |
| 17 | – | – |
| 18 | – | – |
| 19 | – | – |
| 20 | – | – |
| 21 | GND | GROUND |
| 22 | V+ | 24V+ for Digital Input |
| 23 | A | RS-485 A |
| 24 | B | RS-485 B |




| | |
|---|---|
| Type | 4 - 20 mA |
| Resolution | 10 bit |
| Input Impedance | 3.3 kOhm |

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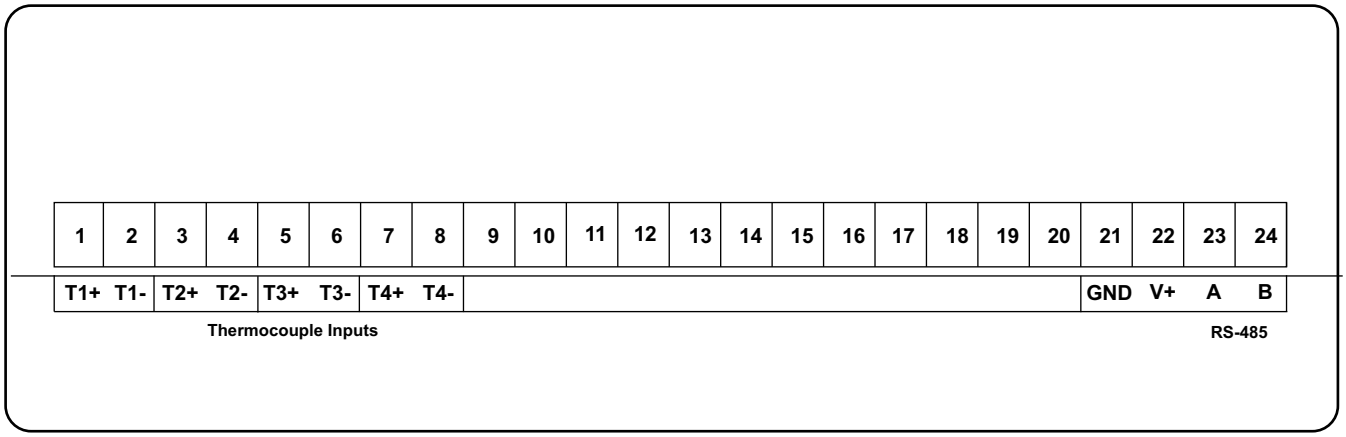
Connections & Schematics

## SMART CONTROLLER

**SC-EX-M-QV4**

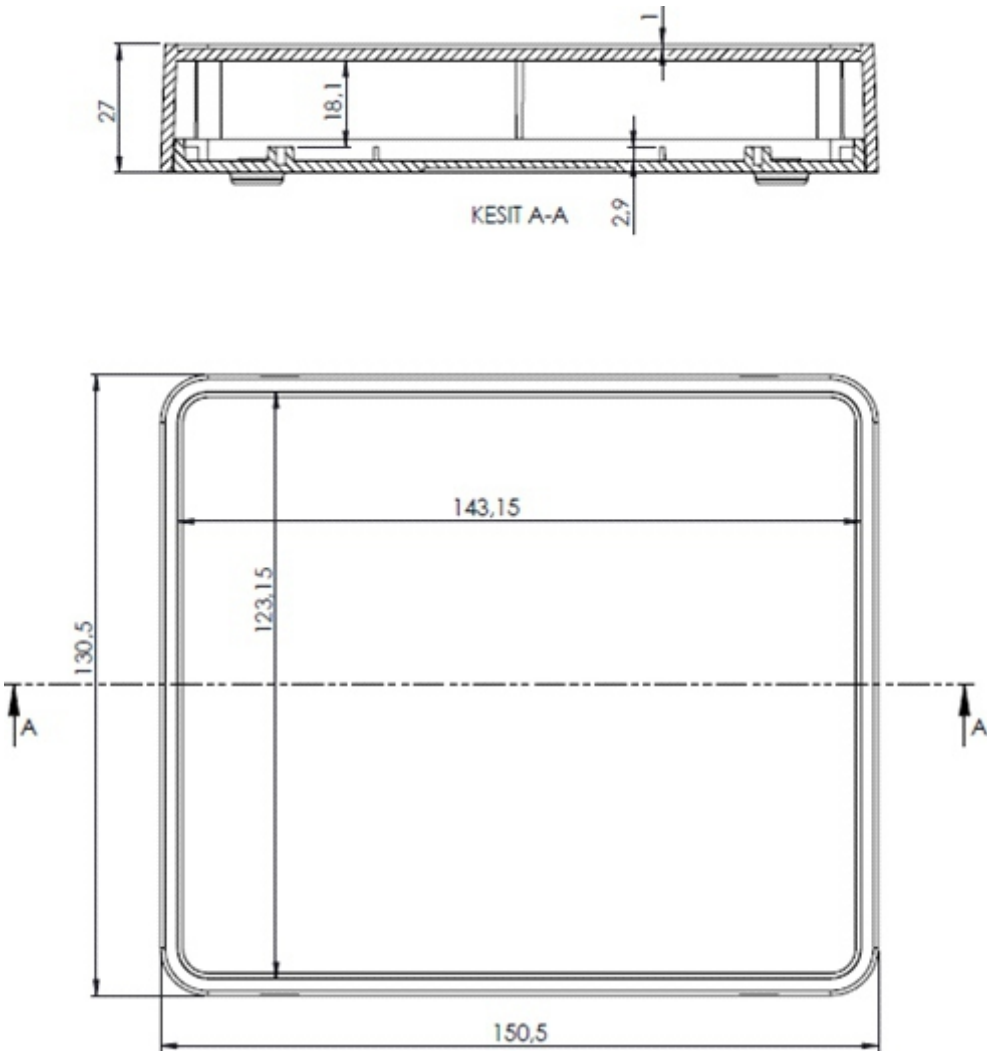



| PIN | NAME | DESCRIPTION |
|---|---|---|
| 1 | T1+ | Thermocouple 1 + |
| 2 | T1- | Thermocouple 1 - |
| 3 | T2+ | Thermocouple 2 + |
| 4 | T2- | Thermocouple 2 - |
| 5 | T3+ | Thermocouple3 + |
| 6 | T3- | Thermocouple 3 - |
| 7 | T4+ | Thermocouple 4 + |
| 8 | T4- | Thermocouple 4 - |
| 9 | – | – |
| 10 | – | – |
| 11 | – | – |
| 12 | – | – |
| 13 | – | – |
| 14 | – | – |
| 15 | – | – |
| 16 | – | – |
| 17 | – | – |
| 18 | – | |
| 19 | – | – |
| 20 | – | – |
| 21 | GND | GROUND |
| 22 | V+ | 24V+ for Digital Input |
| 23 | A | RS-485 A |
| 24 | B | RS-485 B |

| | |
|---|---|
| Type | K - type Thermocouple |
| Resolution | 14 bit |
| Cold Junction Compens ation | YES |

***Refer product user guide for MODBUS Address information**

## Dimensions

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# Document Revisions

| Version | Changes | Date |
|---|---|---|
| 1.0 | Initial elease | 15/08/2021 |