MicroARM-A3

Programmable Logic Controller

sirea group

User Manual

Date	Version	Modification
04/02/11	1	Initial version
12/03/13	2	Error correction for the %QW100 output (instead of %Q100) The digital output with transistor is used as an output PWM (since 30/09/11)
23/03/18	3	Translated version, sections 5 to 9 added, new layout following SIREA's graphic chart

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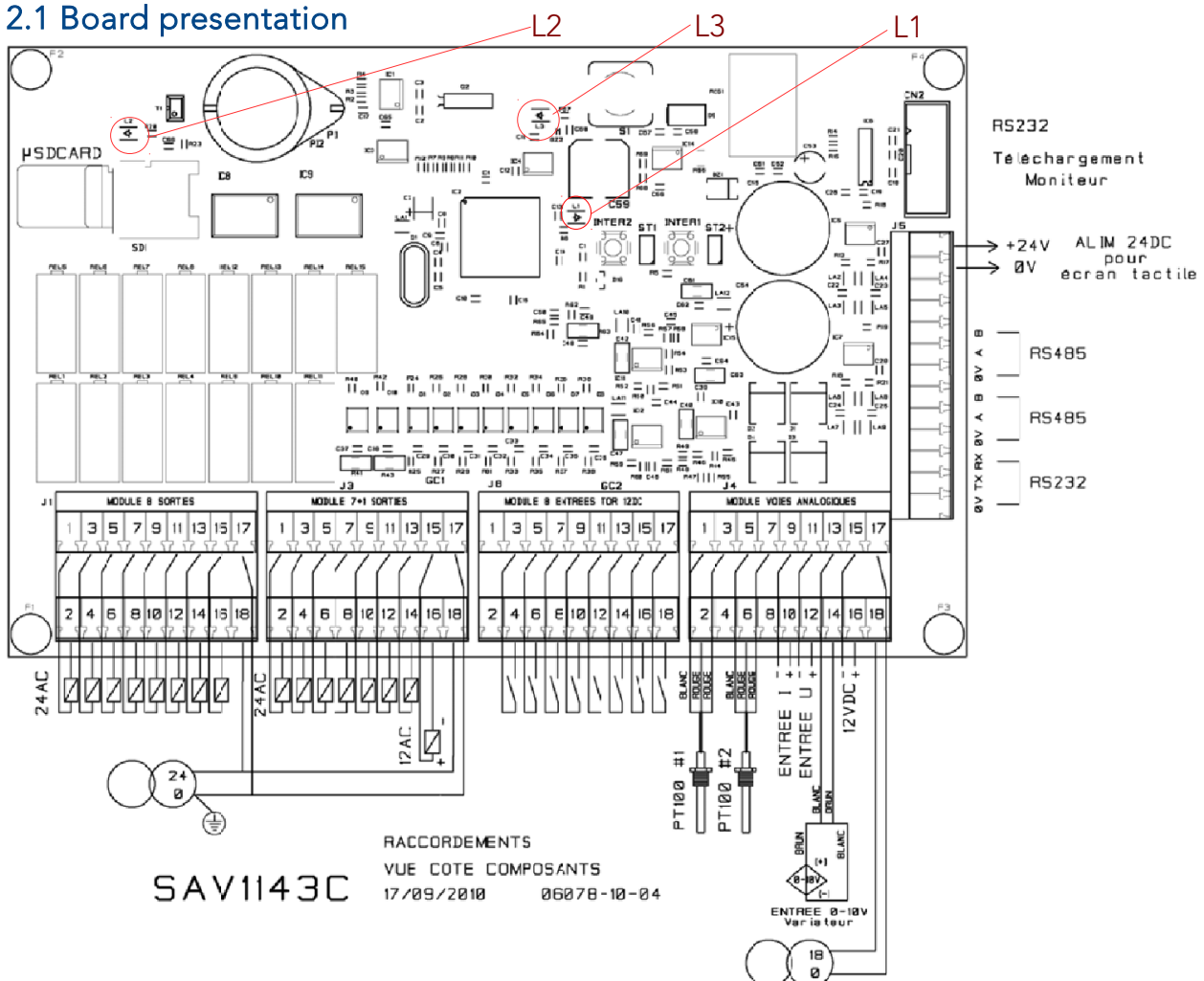## Programmable Logic Controller

1. Introduction

This manual describes the specifics of the MicroARM-A3.
For information common to programming, see the "MicroLADDER manual". To visualize better the corresponding addresses in MicroLADDER, they appear in color, on the sides of the diagrams.

2. Characteristics

2.1 Board presentation

- ➔ ARM7 LPC2368 Processor
- ➔ 512Ko Flash (to save the monitor and the application) and 32Ko RAM
- ➔ 1 RS232 port (COM 0) with HE10 connector for loading or free of use
- ➔ 1 RS232 12V port (COM1) for loading or free of use
- ➔ 2 RS485 ports (COM2 and COM3) for loading or free of use
- ➔ 1 RTC (Real Time clock) on bus I2C with backup battery

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- 1 EEPROM 16 Ko on bus I2C (to backup variables) (depending of the manufacturing choice)
- 1 FRAM 32Ko (to backup variables) (depending of the manufacturing choice)
- 1 connector for the SD card (the card must be formated in FAT32)
- 8 digital inputs whithout LED display
- 15 digital outputs with relay and without LED display
- 2 analog inputs PT100
- 1 analog input 0-10V
- 1 analog input 0-20mA
- 1 analog output 0-10V
- 1 digital output PWM with transistor and without LED display
- 1 reset push-button (inter 2) (located next to the processor) picked up by the jumper ST1
- 1 push-button to change the program (inter 1) (located next to 2 big capacitors) picked up by the jumper ST2
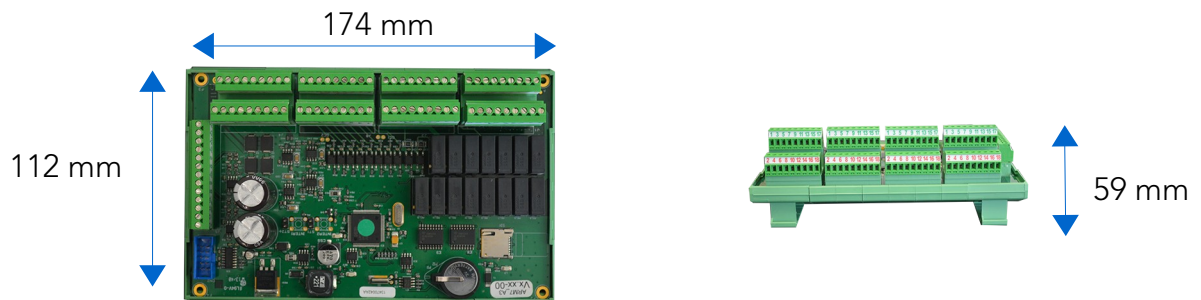
2.2 LED meanings

L1 : State order of the Programmable Logic Controller (PLC)
L2 : Presence of a SD card
L3 : Presence 3,3 volts tension
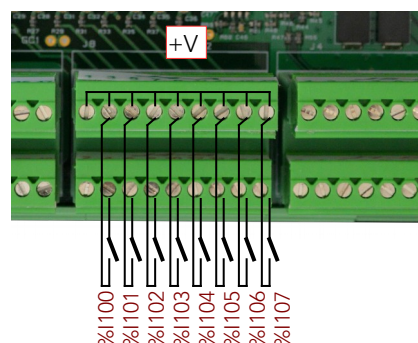See red circles on drawing chapter 2.1.

2.3 Mechanical dimension

174 mm

112 mm

59 mm

3. Connections

3.1 Digital

3.1.1 Digital input
Value range from 0 to 1.

+V

%I100 %I101 %I102 %I103 %I104 %I105 %I106 %I107
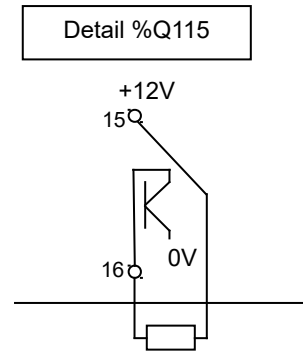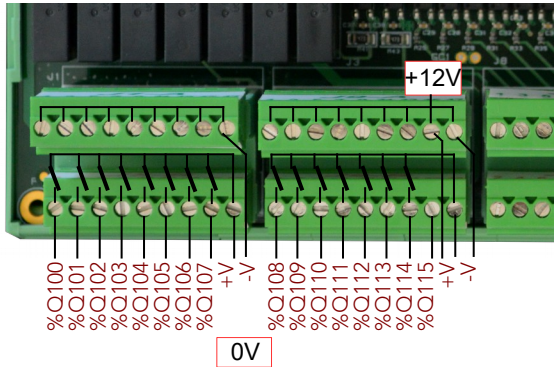
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3.1.2 Digital output

Detail %Q115

Value range from 0 to 1.
+V and -V voltage must be supplied by the outside.
+12V voltage from terminal 15 is supplied by the board.
The %Q115 output is used as a PWM output and is controlled by %QW101.
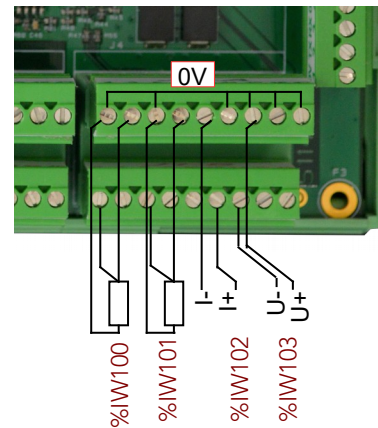
3.2 Analog

3.2.1 Analog input

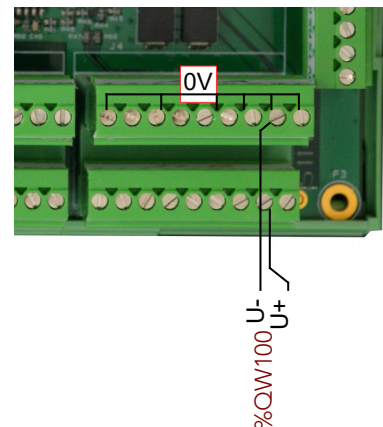%IW100 and %IW101 : PT100 input. Temperature in tenth of a degree (200pt = 20°C).
%IW102 : voltage input in µA. Range from 0 to 20mA = 0 to 20000pt.
%IW103 : voltage input in mV. Range from 0 to 10V = 0 to 10000pt.

3.2.2 Analog output

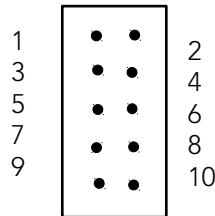%QW100 : voltage input in mV. Range from 0 to 10V = 0 to 10000pt

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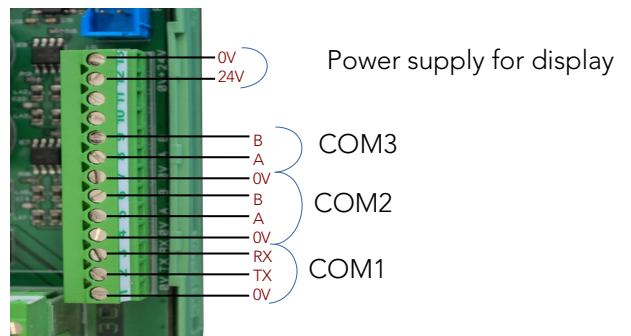## Programmable Logic Controller

3.3 Communication port

3.3.1 COM0 and RS232

1	NC	2	NC
3	RX0	4	NC
5	TX0	6	NC
7	NC	8	NC
9	0V	10	NC

3.3.2 COM2 and COM3 RS485

3.3.3 COM1 RS232

3.4 Power supply

4. Saved variables

There is no saved RAM.

The EEPROM address is KC_EEPROM_UC_ADR. The number of bytes reserved by the system at the beginning of EEPROM is 80 bytes. The size of the character buffer (VcEepromBuf []) is 216. The pages are 64 bytes. The size of the EEPROM is 16384 bytes = 16kb.

On this PLC, it is possible to have a FRAM or not and to have an EEPROM or not according to the choice of manufacture.

It is possible to test the CSaveParamType variable. It is worth KC_SAVE_TYPE_INCONNU if there are no components. It is worth KC_SAVE_TYPE_EEPROM if there is an EEPROM. It is worth KC_SAVE_TYPE_FRAM if there is a FRAM. As the presence test of the EEPROM is

done after the presence test of the FRAM, this variable is KC_SAVE_TYPE_EEPROM if the two components are present.

The address of the FRAM is KC_FRAM_UC_ADR. The number of bytes reserved by the system at the beginning of EEPROM is 80 bytes. The size of the character buffer (VcFramBuf []) is 64. The pages are 64 bytes. The size of the the FRAM is 32768 bytes = 32kb.

There is no history management (events, alarms and traces).

5. Safety and warnings

⚠️ If the device is not used as per these instructions, the safety of people and equipment can be compromised. We disclaim any liability for any material damage or due to improper handling or failure to comply with the safety instructions.

The interventions on the devices must be made by staff who are competent to work on electric installations.

Before all interventions, all power supplies must be switched off. The cutting devices on the installation must be dimensioned and placed according to the standard UTE C 15-100.

For all interventions on a device installed on an electric installation, the Personal Protective Equipment (PPE) as defined by the safety regulations on the electric installations must be carried by the worker.

In the event of a failure or malfunction, the device must not be opened and must be returned to the factory.

Observe the following pictograms:

Symbol	Description
⚠️	Attention. On the product label this symbol means that the notice must be consulted. In this manual, this symbol indicates important information.
∿	Alternate current.
▬ ▬ ▬	Direct current.
CE	This device is CE approved and complies with the national and European guidelines.

Sirea, a company specialized in the field of industrial automation and electrical energy.

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6. Protection device

Quick fuse protections must be positioned on the 24 volt continuous start feeding the PLC. These fuses will be sized according to the number of devices set in series behind the start.

7. Elimination

Old electronic devices are recyclables goods that should not be thrown into the trash can. If the device reaches the end of its life, it should be eliminated in accordance with the legal regulations in force to the recovery centres in your municipality. Elimination in the household trashes is prohibited.

8. Cleaning

For cleaning, use a clean, dry, antistatic, lint-free cloth without corrosive products.

9. Technical features

Power supply	18 to 28 V ⎓ or 14 to 19 V ∿
Maximum operating Altitude	2000 m
Maximum operating Temperature	45 °celsius
Maximum Operating Humidity	70 %