### Quick installation manual

**Date** | **Note**
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**SmartIC3**

[Image of SmartIC3 device]

SMART.IC3

ATON S.r.l. - Spilamberto (MO)  
Tel. +39 059 783939 - Fax +39 059 784323  
www.alfaprogetti.com

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Introduction

This manual is intended for technical personnel to install the SMART.IC3 system. It is necessary to observe the following indications:

- Read all of this document before starting installation work.
- Keep a copy of this document near the product.

READ THIS MANUAL BEFORE ANY OPERATION

Before starting any operation, it is mandatory to read this installation manual. The guarantee of good functioning and full performance compliance of the monitoring system are strictly dependent on the correct application of all the instructions contained in this manual.

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1 Smart.IC3 mounting on type-side battery connector tipe DINxxx

**ATTENTION:** the following activities must be performed on the **NOT POWERED DEVICE** and **WITHOUT TENSION** on battery **CABLES**.

Required material:
- N°1 Phillips screwdriver (type PH1)
- N°1 3mm Allen wrench
- N°1 5mm Allen wrench

1. **A**

   Locate the battery side and the connector side in the SMART.IC3 module.

   Pass the positive pole cable (red cable) inside the hole of the **SMART.IC3 S3** or **S3GPRS** Module.

   **N.B.:** In case the cable is so small that it does not allow the punches to pierce the insulating sheath, use the supports (B) supplied and place them in the appropriate seat, as shown in the sequence.

   A) **SMART.IC3 S3** or **S3GPRS** module
   B) Thickness P882C
1.B

Press on the cable clamp so that the punches completely puncture the cable sheath. Make sure the insulation has been pierced by the two tips on the bottom.

A) **Smart.IC3 S3** or **S3GPRS** module
B) DINxxx type connector
C) P882B cable clamp cover

Fix the SMART.IC3 (A) to the DINxxx (B) connector with the supplied screws.

D) N°4 M6x50 Allen screws *(code V8)*
E) Cylindrical 6MA nut *(code D2)*

Position the power supply wires inside the cable clamping compartment (P882A), so that they are not damaged by closing it.

(F) **POCKET** clamp P882A
Fix the cable clamp (F) with the supplied Allen screws (G) 4x20 mm (code V10).

G) 4x20 mm Allen screws (code V10)

Close the cable clamp with the cover (C), securing it with the supplied screw (H) 3.5x16 mm (code V4).

H) Screw 3.5x16 mm (code V4)

Wiring made and connector ready to use.

A) DIN type connector 160A o 320A
B) Smart.IC3 S3 or S3GPRS module
2 Mounting on USA battery type connector

ATTENTION: the following activities must be performed on the NOT POWERED DEVICE and WITHOUT TENSION on battery CABLES.

Required material:
N°1 Phillips screwdriver (type PH1)
N°1 3mm Allen wrench

2.A

Locate the battery side and the connector side in the SMART.IC3 module.

Pass the positive pole cable (red cable) inside the hole of the Smart.IC3 S3 or S3GPRS Module.

N.B.: In case the cable is so small that it does not allow the punches to pierce the insulating sheath, use the supports (B) supplied and place them in the appropriate seat, as shown in the sequence.

A) SMART.IC3 S3 or S3GPRS module
B) Thickness P882C
Wire the battery connector (B) by securing the + and - cables to the PINs. Fix the adapter block (D) (code P882EU) to the US type connector with the 4 screws (E) and their washers.

A) Smart.IC3 S3 or S3GPRS module
B) Connector type USA 160A or 320A
C) P882B cable clamp cover
D) Adapter (code P882EU)
E) N°4 screws 3.5x16 (code V4), 4 washers 4x12 (code R2)

Fasten the adapter block (D) (cod. P882EU) to the SMART.IC3 with the 4 screws (E) and their washers.
E) N°4 screws 3.5x16 (code V3), 4 washers 4x12 (code R2)
Fix the cable clamp (G) with the supplied Allen screws (H) 4x20 mm (code V10).

F) Cable block (code P882A)
G) 4x20 mm Allen screws (code V10)

Close the cable clamp with the cover (C), securing it with the supplied screw (I) 3.5x16 mm (code V4).

H) Screws 3.5x16 mm (code V4)

Wiring made and connector ready to use.

A) Connector type USA 160A or 320A
B) Smart.IC3 S3 or S3GPRS module
3 Mounting outside the connector (battery side)

Materiale occorrente:
N°1 Phillips screwdriver (type PH1)
N°1 3mm Allen wrench
N°1 4mm Allen wrench

3.A

<table>
<thead>
<tr>
<th>Pass the positive pole cable (red cable) inside the hole of the Smart.IC3 Module.</th>
</tr>
</thead>
<tbody>
<tr>
<td>A) <strong>DINxxx type</strong> connector</td>
</tr>
<tr>
<td>B) <strong>USA type</strong> connector</td>
</tr>
<tr>
<td>C) <strong>Smart.IC3 S3</strong> or <strong>S3GPRS module</strong></td>
</tr>
<tr>
<td>D) Cable block (<strong>code P882A</strong>)</td>
</tr>
<tr>
<td>E) N°2 x 4x20 screws for cable clamp (<strong>code V10</strong>)</td>
</tr>
<tr>
<td>F) 3.5x16 screw for cable clamp cover (<strong>code V4</strong>)</td>
</tr>
<tr>
<td>G) Cable clamp for cable 25 mm. (<strong>code P882C25</strong>) or for 70 mm cable. (<strong>Cod.P882C70</strong>)</td>
</tr>
<tr>
<td>H) 2 screws 5x30 for cable clamp (<strong>code V5</strong>)</td>
</tr>
<tr>
<td>I) 2 nuts 5MA (<strong>code D1</strong>)</td>
</tr>
</tbody>
</table>

Fix the cable clamp collar (**D**) to the module (**C**) using the screws (**E, F**). Make sure the insulation has been pierced by the two tips on the bottom.
Also fix the battery cables to the Module (C) through the cable clamp collar (G) using the screws (H) and the fixing nuts (I).

Wiring made and connector ready to use.
A) **DINxxx type** connector
C) **SMART.IC3 S3** or **S3GPRS** module

Wiring made and connector ready to use.
B) **USA type** connector
C) **SMART.IC3 S3** or **S3GPRS** module
4 Antenna installation

4.A

Locate the connection for the corrugated sheath on the back of the Smart.IC3 plug.
Screw the antenna cable (B) onto the Smart.IC3 side connector (A).
Tighten the connector lightly with a spanner no. 8.
Insert the corrugated sheath (D) inside the fitting (C).

4.B

Place the antenna on the forklift, above a ferrous part, preferably in an area not shielded by metal parts such as the inside of the battery compartment.
The base of the antenna is composed of a magnet, thus favoring its positioning.

4.C

Spread the corrugated sheath along the battery cables.
Fix the corrugated sheath with clamps, avoiding pulling it.
N.B.: Check that the corrugated sheath of the antenna and the cable inside it, once positioned, will not be damaged by the closing of the box or any mechanical parts of the forklift.
## 5 Antenna unlocking

### 5.A

Locate in the fitting (A) the two holes (B) for the release of the sheath.

### 5.B

Insert an Allen key or a pin (C) inside the release holes (B) of the fitting (A).

### 5.C

Turn the Allen key (C) anticlockwise until a click is heard and slide off the sheath (D).
6 SMART.IC3 front plastic opening

6.A
Remove the rear closing cover by unscrewing the 6 fixing screws (A) (code V1).

6.B
Locate the connector with flat cable (B) and disconnect it from the hall sensor by sliding it downwards.

6.C
Remove the hall sensor (C) from the plastic housing.

6.D
Remove the electronic card (D) from the plastic casing until the green terminal blocks are accessible next to the Hall sensor.
7 Accessories connection

The following describes the operations for the installation of the following external accessories:
- immersion temperature probe, type PT1000 with two wires
- electrolyte level sensor.

The two operations are optional and independent of each other. For the sake of simplicity in the following images, only the assembly of the accessory treated in the corresponding paragraph will be shown.

If both accessories are installed, it will be necessary to make sure to use a cable gland of such dimensions as to contain all the cables to be used.

7.1 External temperature probe

7.1.A

Remove the closing cover (A), remove the electronic card from the plastic casing until the terminal board is accessible. Insert the wires (B) through the cable gland (C) and connect the wires to the terminal board (D) according to the following diagram (see screen-printed numbering next to the terminals; colors referring to the temperature probe supplied by ATON SRL).

<table>
<thead>
<tr>
<th>Collegamenti</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>PIN 11</td>
<td>Red cable</td>
</tr>
<tr>
<td>PIN 12</td>
<td>White cable</td>
</tr>
</tbody>
</table>

A) Closing cover (cod. P882CU)
B) Wires temperature probe (PT1000)
C) Cable stoper
D) Connection terminal for external temperature probe

7.1.B

Reposition the closing cover and tighten with screws. Tighten the cable gland.
7.2 Electrolyte level sensor
The SmartIC3 system supports wand electrolyte level sensors which indicate that the threshold to be topped up is reached.

### 7.2.A

Remove the closing cover (A), remove the electronic card from the plastic casing until the terminal board is accessible. Insert the wires (B) through the cable gland (C) and connect the wires to the terminal board (D) according to the following diagram (see screen-printed numbering next to the terminals, colors referring to the level probe supplied by ATON SRL).

<table>
<thead>
<tr>
<th>Collegamenti</th>
<th>PIN 14</th>
<th>Red cable</th>
</tr>
</thead>
<tbody>
<tr>
<td>PIN 15</td>
<td></td>
<td>Black cable</td>
</tr>
</tbody>
</table>

### 7.2.B

Reposition the closing cover and tighten with screws.
Tighten the cable gland.
7.2.C

Install the level sensor on the battery according to the diagram below, supplying the sensor with a voltage of 8V, which can be taken at the ends of 4 elements connected in series.

**CAUTION:** Always position the sensor wand on the element where the BLUE positive power cable is connected.

7.2.D

Place the level sensor inside a battery element (in the figure the automatic top-up cap is used, or a hole can be made on the element cover).

7.3 Flowmeter

The SmartIC3 system supports flow sensors to measure the amount of electrolyte replenished and calculate the remaining autonomy before the next refueling.

7.3.A

Remove the closing cover (A), remove the electronic card from the plastic casing until the terminal board is accessible. Insert the wires (B) through the cable gland (C) and connect the wires to the interface board ATN889FL (D) according to the following diagram (see screen-printed numbering next to the terminals, colors referring to the flow meter supplied by ATON SRL).

<table>
<thead>
<tr>
<th>Collegamenti</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>PIN 1</td>
<td>Cable red</td>
</tr>
<tr>
<td>PIN 2</td>
<td>Cable brown</td>
</tr>
<tr>
<td>PIN 3</td>
<td>Cable black</td>
</tr>
</tbody>
</table>
7.3.B
Repaint the closing cover and tighten with screws. Tighten the cable gland.

7.3.C
Install the level sensor on the battery according to the diagram shown by applying the sensor on the main delivery pipe for topping up observing the direction indicated on the sensor with the arrow pointing towards the battery.
8 Communication with other devices

Smart.IC3 has the following serial interfaces to communicate with external devices:
- Galvanically isolated RS485
- Galvanically isolated CAN bus

NOTE:
- RS485 and CAN bus are on the same galvanic region
- CAN line and the RS485 line are terminated within SMART.IC3 with a resistance of 120Ω

The signals are available on the terminal board inside Smart.IC3.

The table shows the signals and the relative terminals.

| Altri dispositivi          | PIN 1 | PIN 2 | PIN 3 | PIN 4 | PIN 5 | PIN 6 | PIN 7 | PIN 8 | PIN 9 | PIN 10 | PIN 11 | PIN 12 | PIN 13 | PIN 14 | PIN 15 | PIN 16 | PIN 17 | PIN 18 | PIN 19 |
|---------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
|                           | RL1-C | RL1-NA| RL2-C | RL2-NA| GND-CAN| CAN+  | CAN-  | RS485_A (+) | RS485_B (-) | ID1    | ID2    | ID3    | ID-    | Electrolyte + | Electrolyte - | External temperature probe | External temperature probe | IA-AUX+ | IA-AUX- |