Original instructions

Smile 11 AS-i
Emergency stop with safe AS-i input node
Read and understand this document

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The following are some examples of applications for which particular attention must be given. This is not intended to be an exhaustive list of all possible uses of the products, nor is it intended to imply that the uses listed may be suitable for the products:

Outdoor use, uses involving potential chemical contamination or electrical interference, or conditions or uses not described in this document.

Nuclear energy control systems, combustion systems, railroad systems, aviation systems, medical equipment, amusement machines, vehicles, and installations subject to separate industry or government regulations.

Systems, machines, and equipment that could present a risk to life or property.

Please know and observe all prohibitions of use applicable to the products.

NEVER USE THE PRODUCTS FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE ABB JOKAB SAFETY PRODUCT IS PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.

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1 Introduction

Scope
The purpose of these instructions is to describe the emergency stop Smile 11EA AS-i, Smile 11EAR AS-i and the safety stop Smile 11SA AS-i, and to provide the necessary information required for installation and operation.

Audience
This document is intended for authorized installation personnel.

Prerequisites
It is assumed that the reader of this document has knowledge of the following:

- Basic knowledge of ABB Jokab Safety products.
- Knowledge of the AS-i system.
- Knowledge of machine safety.

Special notes
Pay attention to the following special notes in the document:

⚠️ Warning! An instruction or procedure which, if not carried out correctly, may result in injury to the technician or other personnel.

⚠️ Caution! Danger of damage to the equipment! An instruction or procedure which, if not carried out correctly, may damage the equipment.

NB: Notes are used to provide important or explanatory information.

Safety regulations

⚠️ Warning!
Carefully read through this entire manual before using the device.

The devices shall be installed by a trained electrician following the Safety regulations, standards and the Machine directive.

Failure to comply with instructions, operation that is not in accordance with the use prescribed in these instructions, improper installation or handling of the device can affect the safety of people and the plant.

For installation and prescribed use of the product, the special notes in the instructions must be carefully observed and the technical standards relevant to the application must be considered.

In case of failure to comply with the instructions or standards, especially when tampering with and/or modifying the product, any liability is excluded.
2 Overview

General description

Smile 11EA AS-i is an emergency stop with a built-in dual channel safe AS-i input node. Smile 11SA AS-i has a similar dual channel safe AS-i input node, but is intended for use as a safety stop and therefore has a black pushbutton. Smile 11EAR AS-i works the same way as Smile 11EA AS-I but is designed to be mounted on the inside of a control cabinet, with the emergency stop button through the cabinet wall.

The AS-i bus and the safety around it is specified by the two organisations “AS-International Association” and “AS-Interface Safety at Work”, and is described in the publication “AS-Interface The Automatic Solution”.

⚠️ Warning! Smile normally needs to be complemented with other safety functions such as interlocking guards etc. Refer to risk analysis.

NB: The emergency stop should not be used as normal stop of the machine, only in case of emergency.
# 3 Connections

Smile 11EA/SA AS-i connections

## 5-pole M12-connector:

1) AS-i +
2) Not used
3) AS-i –
4) Not used
5) Not used

### Accessories for connection to the AS-i bus

<table>
<thead>
<tr>
<th>Type</th>
<th>Article number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AS-i T-connector with M12</td>
<td>2TLA020073R0000</td>
<td>Flat cable connector to M12</td>
</tr>
<tr>
<td>M12-C112</td>
<td>2TLA020056R2000</td>
<td>1 m cable, 5-pole, 0.34 mm², M12 female + M12 male connectors</td>
</tr>
<tr>
<td>M12-C312</td>
<td>2TLA020056R2100</td>
<td>3 m cable, 5-pole, 0.34 mm², M12 female + M12 male connectors</td>
</tr>
</tbody>
</table>

5 x 0.34 mm² cable, screen with straight female and male M12 connectors. Screen connected to pin 3 (0 VDC) on male connector.

Flat cable connector to M12
4 Installation and maintenance

All Smile 11 are supplied with 30 VDC from the AS-i bus.

Recommended connection to the AS-i bus is through a flat cable connector to M12 (see figure to the left), making it possible to quickly and easily connect the unit to the yellow AS-i cable.

Both Smile models can also be connected directly to the AS-i bus using only two cables (pin-1 and 3 of the M12-connector on the unit) according to “Connections” above.

Installation precautions

Mount Smile 11 using two M5 bolts, before attaching the M12-connector.

⚠️ **Warning!** All the safety functions must be tested before starting up the system.

Maintenance

⚠️ **Warning!** The safety functions and the mechanics shall be tested regularly, at least once every year to confirm that all the safety functions are working properly.

⚠️ **Warning!** In case of breakdown or damage to the product, contact the nearest ABB Jokab Safety Service Office or reseller. Do not try to repair the product yourself since it may accidentally cause permanent damage to the product, impairing the safety of the device which in turn could lead to serious injury to personnel.

⚠️ **Caution!** ABB Jokab Safety will not accept responsibility for failure of the switch functions if the installation and maintenance requirements shown in this sheet are not implemented. These requirements form part of the product warranty.
5 Operation

Stop button:
Push the button.
An actuating force of 22 ± 4 N is required and the actuator travel is approximately 4 mm to latch. Turn the button clockwise to unlatch the button.

LED indication
The LED indication is identical on all models.

LED in pushbutton:
The LED indication is programmed individually in the PLC-program according to the table below.

<table>
<thead>
<tr>
<th>LED</th>
<th>Indication</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red</td>
<td>ON</td>
<td>Out bit 1 ON</td>
</tr>
<tr>
<td></td>
<td>OFF</td>
<td>Out bit 1 OFF or Out bit 1&amp;2 ON.</td>
</tr>
<tr>
<td>Green</td>
<td>ON</td>
<td>Out bit 2 ON</td>
</tr>
<tr>
<td></td>
<td>OFF</td>
<td>Out bit 2 OFF or Out bit 1&amp;2 ON.</td>
</tr>
</tbody>
</table>

AS-i LED and Fault LED in combination:
LED pair by the M12-connector.

<table>
<thead>
<tr>
<th>AS-i (Green)</th>
<th>Fault (Red)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>OFF</td>
<td>OFF</td>
<td>AS-i power missing</td>
</tr>
<tr>
<td>ON</td>
<td>OFF</td>
<td>Normal operation</td>
</tr>
<tr>
<td>OFF</td>
<td>ON</td>
<td>No data exchange with master</td>
</tr>
<tr>
<td>FLASH</td>
<td>ON</td>
<td>No data exchange because address = 0</td>
</tr>
</tbody>
</table>
### 6 Model overview

<table>
<thead>
<tr>
<th>Type</th>
<th>Article number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smile 11EA AS-i</td>
<td>2TLA030052R0000</td>
<td>Emergency stop</td>
</tr>
<tr>
<td>Smile 11SA AS-i</td>
<td>2TLA030052R0100</td>
<td>Safety stop</td>
</tr>
<tr>
<td>Smile 11EAR AS-i</td>
<td>2TLA030052R0200</td>
<td>Emergency stop button, inverted mounting</td>
</tr>
</tbody>
</table>

The Jokab Safety branded product with article number beginning with 2TLJ is fully compatible with the ABB branded product with article number beginning with 2TLA.

### Dimensions

**Smile 11 AS-i**

![Diagram of Smile 11 AS-i]

**Smile 11 EAR AS-i**

![Diagram of Smile 11 EAR AS-i]

NB: All measurements in millimetres.
## 7 Technical data

### Manufacturer

<table>
<thead>
<tr>
<th>Address</th>
<th>ABB JOKAB SAFETY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Varlabergsvägen 11</td>
</tr>
<tr>
<td></td>
<td>SE-434 39 Kungsbacka</td>
</tr>
<tr>
<td></td>
<td>Sweden</td>
</tr>
</tbody>
</table>

### AS-i data

<table>
<thead>
<tr>
<th>AS-i profile</th>
<th>S-7.B.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Addressing</td>
<td>M12-connector</td>
</tr>
<tr>
<td>Node address at delivery</td>
<td>0</td>
</tr>
<tr>
<td>Response time over AS-i bus</td>
<td>5 ms (+ response time of safety monitor)</td>
</tr>
</tbody>
</table>

### Power supply

<table>
<thead>
<tr>
<th>Operating voltage</th>
<th>30 VDC, AS-i bus. Tolerance 26.5 – 31.6 V DC.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total current consumption</td>
<td>&lt; 60 mA</td>
</tr>
</tbody>
</table>

### General

<table>
<thead>
<tr>
<th>Degree of protection</th>
<th>IP65</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient temperature</td>
<td>-25…+50°C</td>
</tr>
<tr>
<td>Size (H x W x L)</td>
<td>52 x 40 x 84 mm (+12.5 mm M12 contact)</td>
</tr>
<tr>
<td>Colour</td>
<td>Base: Yellow</td>
</tr>
<tr>
<td></td>
<td>Emergency stop pushbutton: Red</td>
</tr>
<tr>
<td></td>
<td>Safety stop pushbutton: Black</td>
</tr>
<tr>
<td>Actuating force</td>
<td>22 ± 4 N</td>
</tr>
<tr>
<td>Actuator travel</td>
<td>Approx. 4 mm to latch</td>
</tr>
<tr>
<td>Mechanical life</td>
<td>&gt; 50 000 operations</td>
</tr>
</tbody>
</table>

### Safety-related characteristic data and Conformity

<table>
<thead>
<tr>
<th>Conformity</th>
<th>European Machinery Directive 2006/42/EC</th>
</tr>
</thead>
<tbody>
<tr>
<td>IEC/EN 61508-1…7</td>
<td>SIL3, PFDavr: 2.95<em>10^-5, PFHd: 6.95</em>10^-9</td>
</tr>
<tr>
<td>EN 62061</td>
<td>SIL3</td>
</tr>
<tr>
<td>EN ISO 13849-1</td>
<td>Performance level: PL e, category 4</td>
</tr>
<tr>
<td></td>
<td>MTTFd: High</td>
</tr>
<tr>
<td>EN 60947-5-1 &amp; -5</td>
<td>For E-stop button / Safety stop button</td>
</tr>
<tr>
<td>EN ISO 13850:2008</td>
<td>For E-stop button / Safety stop button</td>
</tr>
<tr>
<td>Certificates</td>
<td>TÜV Nord (AS-i), Inspecta (Emergency stop)</td>
</tr>
</tbody>
</table>
8 EC Declaration of conformity

EC Declaration of conformity
(according to 2006/42/EC, Annex II A)

We, ABB AB
JOKAB SAFETY
Varlabergsgatan 11
SE-434 39 Kungsbacka
Sweden

declare that the safety components of ABB AB make with type designations and safety functions as listed below, is in conformity with the Directives

2006/42/EC
2006/95/EC

Authorised to compile the technical file
ABB AB
JOKAB Safety
Varlabergsgatan 11
SE-434 39 Kungsbacka
Sweden

Product
Emergency stop device Smile
11EA AS-i
11EAR AS-i

Certificates
11-SKM-CM-0103
44 798 10 555632 000

(for emergency stop device)
(for AS-i part)

Notified Body
Inspecta Sweden AB
Box 30100
SE-104 25 Stockholm
Sweden

TÜV NORD CERT GmbH
Langemarckstrasse 20
45141 Essen
Deutschland

Notified Body No. 0409
Notified Body No. 0044

Used harmonized standards
IEC 60947-5-5:2005

Jesper Kristensson
PRU Manager
Kungsbacka 2014-02-17

www.abb.com/jokabsafety

Original