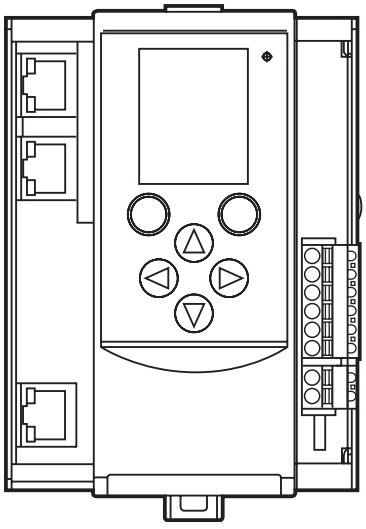
Operating instructions

UK

SmartPLC DataLine with EtherNet/IP device interface

AC1423 / AC1424



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1 Preliminary note

Technical data, approvals, accessories and further information at www.ifm.com.

1.1 Notes on this document

This document applies to devices of the type "SmartPLC DataLine with EtherNet/IP device interface" (art. no.: AC1423 /AC1424).
It is part of the device and contains information about the correct handling of the product.

1.2 Key to the symbols

▶ Instructions

> Reaction, result

[…] Designation of keys, buttons or indications

→ Cross-reference

Important note
Non-compliance may result in malfunction or interference.

Information
Supplementary note.

2 Safety instructions

- Read this document before setting up the product and keep it during the entire service life.
- The product must be suitable for the corresponding applications and environmental conditions without any restrictions.
- Only use the product for its intended purpose (→ Functions and features).
- If the operating instructions or the technical data are not adhered to, personal injury and/or damage to property may occur.
- The manufacturer assumes no liability or warranty for any consequences caused by tampering with the product or incorrect use by the operator.
- Installation, electrical connection, set-up, operation and maintenance of the unit must be carried out by qualified personnel authorised by the machine operator.
- Protect units and cables against damage.

2.1 Installation and connection

The device must only be installed, connected and put into operation by a qualified electrician as the safe function of the device and machinery is only guaranteed when installation is correctly carried out.
The installation and connection must comply with the applicable national and international standards. Responsibility lies with the person installing the unit.

This is a class A product. The unit may cause radio interference in domestic areas. In this case it can be necessary for the user to take appropriate measures.

2.2 Tampering with the device

Tampering with the device is not allowed and will lead to an exclusion of liability and warranty. Tampering with the device can affect the safety of operators and machinery.

- ▶ Do not open the device.
- ▶ Do not insert any objects into the device.
- ▶ Prevent metal foreign bodies from penetrating.

3 Functions and features

The SmartPLC DataLine with EtherNet/IP device interface integrates one (AC1423) or two (AC1424) AS-i masters, a web server and an EtherNet/IP device interface.

- It controls the exchange of data to the sensor / actuator level.
- It communicates with the higher-level control level via EtherNet/IP.
- It visualises sensor/actuator data on the integrated web server.
- It allows device configuration via the web server.

3.1 Configuration interfaces X3, X8

- RJ45, twisted pair (10 Mbps and 100 Mbps)
- TCP/IP - Transport Control Protocol / Internet Protocol
- UDP/IP - User Datagram Protocol
- EtherCAT (master)
- Modbus TCP (master / slave)
- 3S network-global variables

- HTTP server
- OPC-UA server
- CODESYS programming interface
- CODESYS web visualisation

3.2 Fieldbus interface X6 and X7

- EtherNet/IP device
- max.100 Mbps

3.3 Electrical supply

- the unit can be supplied either from 24 V (AUX) or from AS-i
- AS-i power 24 V compatible

4 Installation

▶ Fix the device onto a 35 mm raised rail.

The protection rating of the unit is IP 20, therefore it should be mounted in a protected location (e.g. control cabinet).

Ensure a condensation-free environment. Avoid excessive dust, vibration and shock. The air circulation through the vents must not be impeded.

Avoid installation in direct vicinity of frequency inverters or other interfering sources.

5 Electrical connection

The unit must be connected by a qualified electrician.

- ▶ Disconnect the plant from the mains supply before installation.
- ▶ Observe the national and international regulations for the installation of electrical equipment.
- ▶ Connect the device as indicated on the terminals.
- ▶ Ensure an electrical connection between device (terminal FE) and the ground of the installation.
- ▶ Do not disconnect or connect the AUX jumper when the unit is live, otherwise unit failures are possible.

5.1 Device supply

To operate an AS-i system, an AS-i power supply (e.g. AC1257) or the data decoupling module AC1250 (not supplied) with a DC power supply is required.

▶ Supply the device with one of the following versions.

5.1.1 Device supply via AUX, AS-i supply via AS-i power supply/supplies

▶ Pull out the AUX jumper.

▶ Connect the supply voltage inputs of the device to the power supplies intended for this purpose.

AS-i bus 1

▶ Connect the AS-i 1+ and AS-i 1- pins of terminal X1 to the AS-i power supply (e.g. AC1257) of the first AS-i bus.

AS-i bus 2 (only AC1424)

▶ Connect the AS-i 2+ and AS-i 2- pins of terminal X1 to the AS-i power supply (e.g. AC1257) of the second AS-i bus.

24 V device supply

▶ Connect the 24 V and 0 V pins of terminal X2 to a 24 V DC power supply (18...32 V SELV/PELV).

▶ Ensure a low-resistance connection of the symmetry point of the device (terminal X1, pin 5 FE) to the ground of the installation.

5.1.2 Device and AS-i supply via the AS-i power supply

▶ Connect AUX jumper with X2 connector

▶ Connect the AS-i power supply

AS-i bus 1

▶ Connect the AS-i 1+ and AS-i 1- pins of terminal X1 to the AS-i power supply (e.g. AC1257) of the first AS-i bus.

AS-i bus 2 (only AC1424)

▶ Connect the AS-i 2+ and AS-i 2- pins of terminal X1 to the AS-i power supply (e.g. AC1257) of the second AS-i bus.

▶ Ensure a low-resistance connection of the symmetry point of the device (terminal X1, pin 5 FE) to the ground of the installation.

If the AUX jumper is connected, the unit is internally supplied by AS-i line 1 (terminal X1, pins 3 and 4).

5.1.3 Device and AS-i supply via one common power supply

- ▶ Pull out the AUX jumper
- ▶ If necessary, remove inserted connectors from terminals X1 and X2.
- ▶ Plug the data decoupling module AC1250 (not supplied) in the terminals X1 and X2.
- ▶ Connect the first AS-i bus to the AS-i 1+ and AS-i 1- pins of the data decoupling module.
- ▶ Connect the second AS-i bus to the AS-i 2+ and AS-i 2- pins of the data decoupling module (only AC1424).
- ▶ Connect the DC power supply (21.5...31.6 V SELV/PELV) to the 24 V and 0 V pins of the data decoupling module.
- ▶ Ensure a low-resistance connection of the symmetry point of the device (terminal X1, pin 5 FE) to the ground of the installation.

Supply the device and both AS-i lines with the passive data decoupling module AC1250 and a DC power supply (SELV/PELV 21.5 V...31.6 V). The output voltage which is adjusted on the power supply then also corresponds to the voltage level of both generated AS-i bus voltages. The output voltage of the power supply used is therefore to be selected in accordance with the requirements of the application within the permitted limits from 21.5...31.6 V.

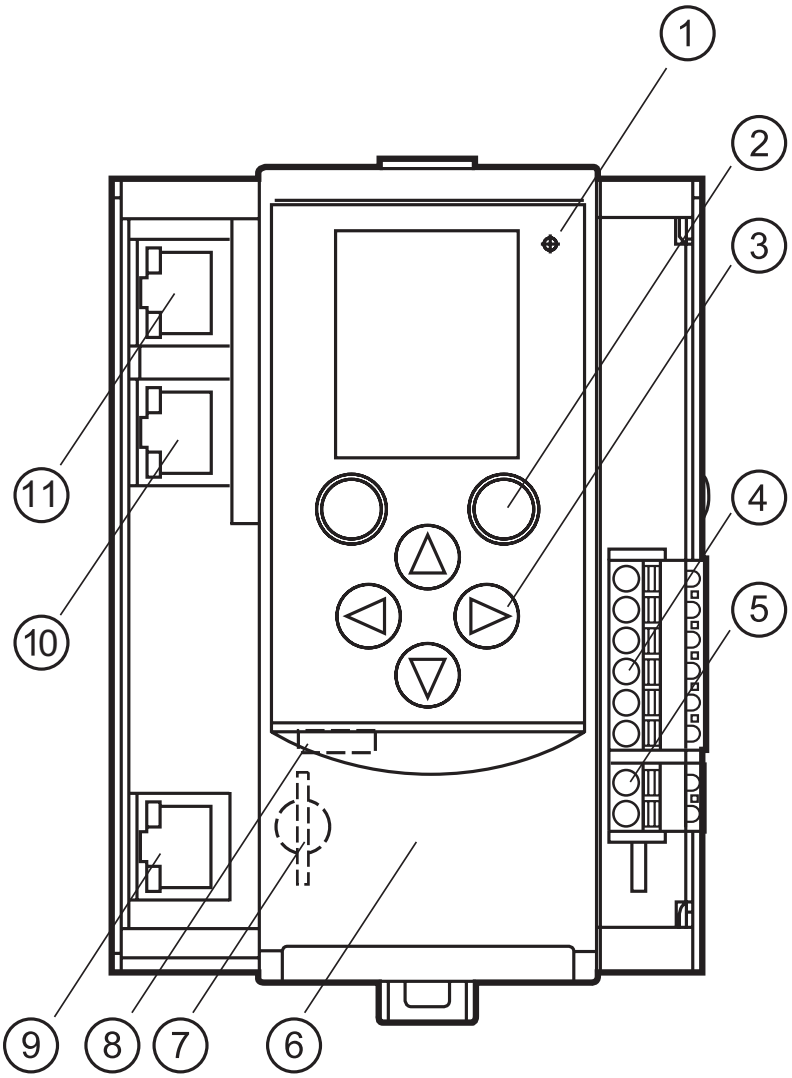
5.2 Wiring

Terminal X1	Pin	Description
AS-i 2 +	1	AS-i + for AS-i line 2 (only AC1424)
AS-i 2 -	2	AS-i - for AS-i line 2 (only AC1424)
AS-i 1 +	3	AS-i + for AS-i line 1
AS-i 1 -	4	AS-i + for AS-i line 1
FE	5	functional earth
	6	not used

Terminal X2	Pin	Description
24 V	1	+24 V device supply
GND	2	GND device supply

Terminal X3	Configuration interface X3
Terminal X6	EtherNet/IP device interface 2
Terminal X7	EtherNet/IP device interface 1
Terminal X8	Configuration interface X8

6 Operating and display elements



1: Device LED H1 green / yellow / red
2: Softkeys
3: Navigation buttons
4: AS-i bus and FE connection X1
5: 24 V device voltage supply X2 or AUX jumper
6: Front flap
7: Slot for SD card
8: Configuration interface X3
9: Configuration interface X8
10: EtherNet/IP device interface 1 X7
11: EtherNet/IP device interface 2 X6

6.1 LED indicators

6.1.1 Device LED H1

The LED on the front panel signals the state of the device and the connected systems.

LED status	Description
Green LED on:	▶ Device has been started. ▶ There is no warning message. ▶ There is no error message.
Yellow LED flashes slowly (0.5 Hz):	▶ There is a warning message. ▶ There is no error message.
Red LED flashes quickly (2 Hz):	▶ There is an error message.

6.1.2 Interface LEDs on X6, X7

LED status	Description
Yellow LED flashing:	Reception of data
Green LED on:	Physical connection ok

6.1.3 Interface LED on X8

LED status	Description
Yellow LED on:	Physical connection ok
LED green flashes:	Reception of data

7 Operation

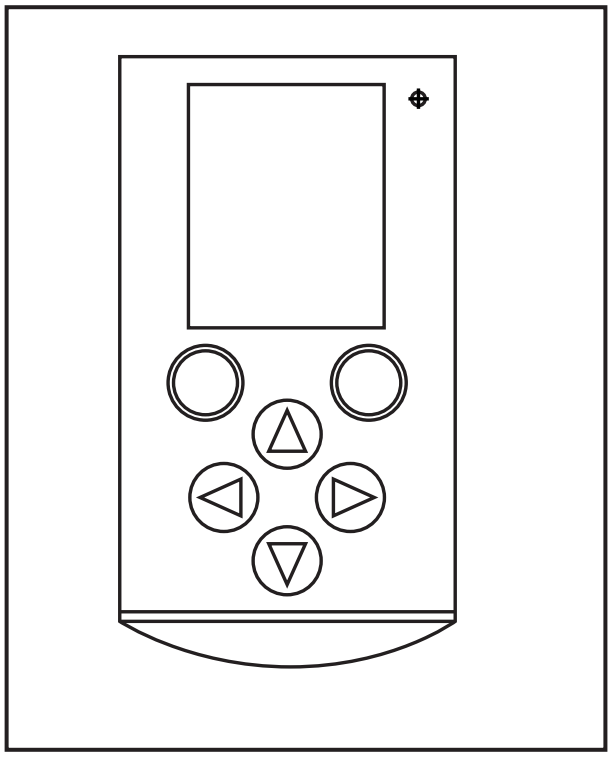
7.1 Settings

During operation the display is switched off after 10 minutes without operation.

▶ Activate the display by pressing any desired button.

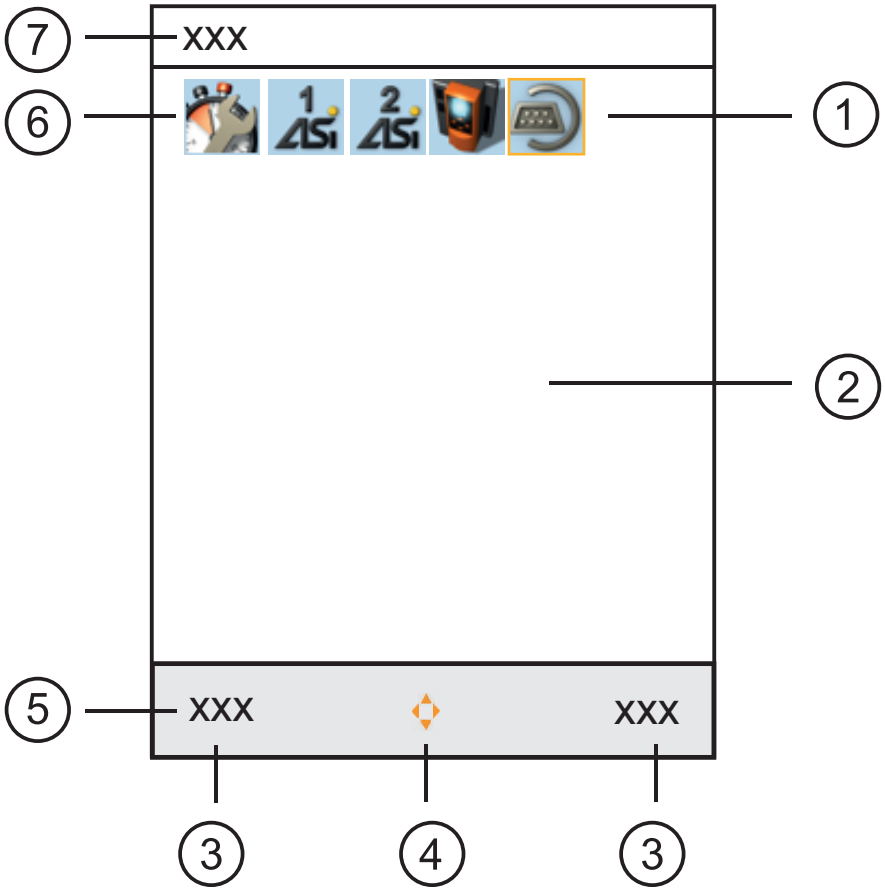
7.1.1 Language selection

▶ Change the user language of the device by pressing the ▶ button and the ▲ button or ▼ button simultaneously.



7.2 Navigation

7.2.1 Navigation elements



1: Focus
2: Operating area
3: Softkey labelling
4: Navigation compass
5: Navigation status bar
6: Main navigation bar
7: Info bar

7.2.2 Pictograms and main navigation

Quick set-up (summary of the menu points required for a basic configuration)

- Config all
  Projection adaptation for AS-i master 1 and AS-i master 2 (only AC1424)
- Operating mode
  Selection of the operating modes for
  - AS-i master 1,
  - AS-i master 2 (only AC1424),
  - System (gateway, manual)
- QR code
- Fieldbus
  - Display / modify the parameters of the EtherNet/IP interface
  - IP address
  - Subnet mask
  - Gateway address
- Configuration interface X3
  - Display / modify the parameters of the Ethernet configuration interface
  - DHCP
  - IP address
  - Subnet mask
  - Gateway address
- Configuration interface X8
  - Display / modify the parameters of the Ethernet configuration interface
  - DHCP
  - IP address
  - Subnet mask
  - Gateway address
- Addressing 1
  - Slave overview AS-i line 1 (with the option to change AS-i addresses)
- Addressing 2 (only AC1424)
  - Slave overview AS-i line 2 (with the option to change AS-i addresses)

AS-i 1

- AS-i master settings
- AS-i diagnostics
- AS-i slaves

AS-i 2 (only AC1404)

- AS-i master 2 settings
- AS-i diagnostics
- AS-i slaves

System

- Information
- Settings
- Diagnostics

Interfaces

- Settings and information of the configuration interfaces
- Settings and information of the PROFINET interface

8 Diagnostics

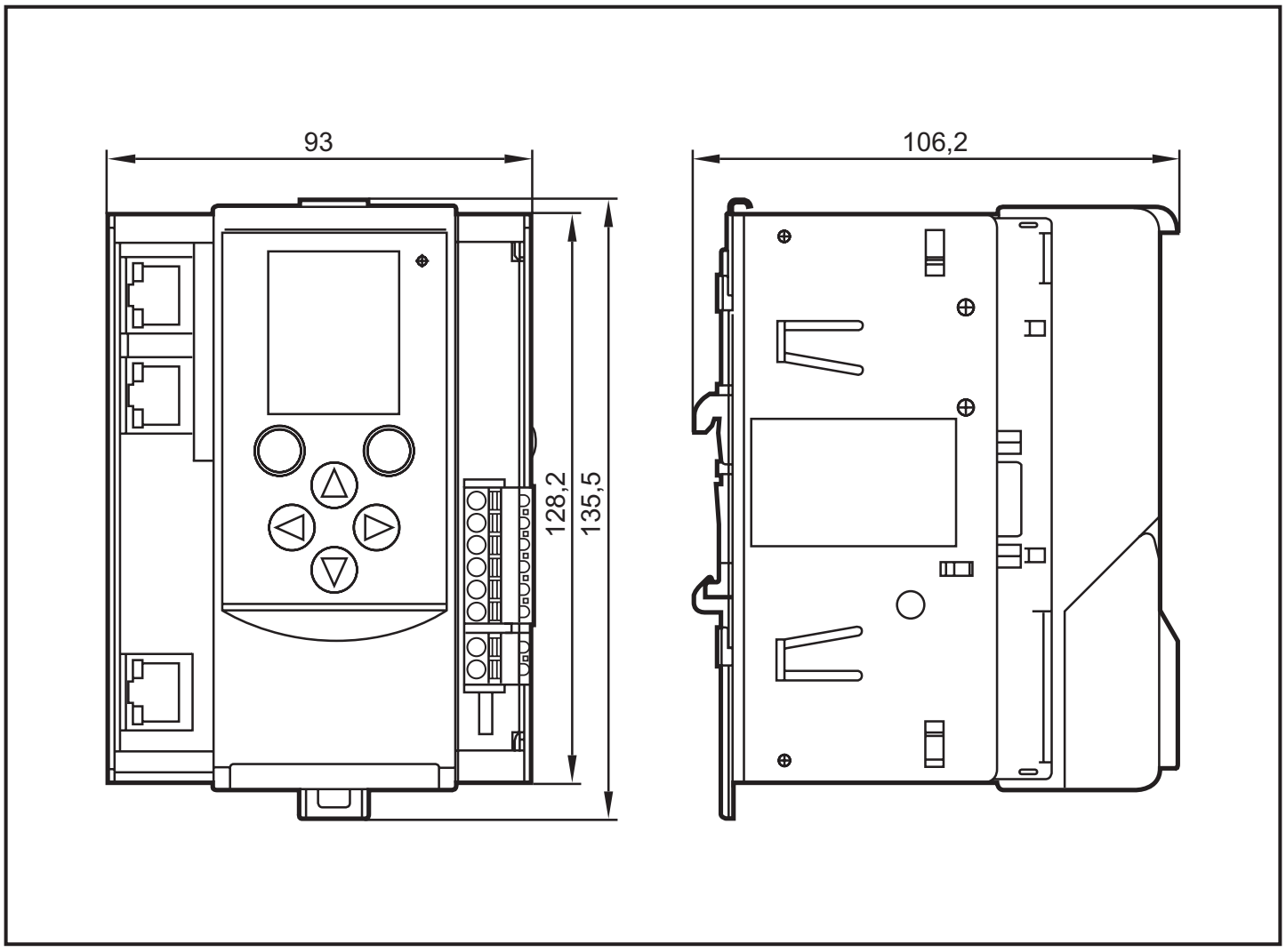
Any warning or error message is indicated in the display of the device. The pictogram of the function unit concerned is superposed by a warning or error symbol. If for one function unit a warning and an error message exist at the same time, only the error symbol is displayed.

Warning message

Information messages

Error message

9 Maintenance, repair and disposal

- ▶ Replace the buffer battery of the real-time clock as required, type CR2032.
- ▶ Dispose of the device in accordance with the national environmental regulations.

10 Scale drawing