



## FX-SPIDER-40/10

Central control unit with 40 I/O's

- 40 integrated I/O-points through Modbus RTU RS-485
- 10.1" touch screen
- Integrated web server, history logging, user management, ...
- BACnet, Modbus and M-bus communication



## Fast, intelligent, clear and easy-to-use local control

The FX-SPIDER-40/10 central controlling unit for building automation and security applications is a special version of it's brother, the FX-3000-C. Dedicated for small processes, narrow spaces and all-in-one solutions, it features a 10.1" touch screen showing HTML-graphics, a powerful processor to run your programs, and 40 built-in I/O-points, thus being everything you need to get your project up and running.

The FX-SPIDER-40/10 uses the IEC-61131-3 standard for PLC programming.

Connect the standard European plug to a wall socket and get going in no time to discover the true meaning of plug and play!

## Technical features

Dimensions:	326 x 325 x 130mm
Operating voltage:	220-230 VAC
Power consumption:	max 200W
Operating temperature:	0 to +40°C
I/O ports:	8 DO, 16 UI, 8 DI, 8 AO
Outputs:	24 VDC for equipment, 0(2)-10 V for AO's



**Power supply:** The FX-SPIDER-40/10 controller comes with a standard European CEE 7/7 plug and is thus powered with 230 VAC. There is an adapter inside the encasing that powers all internal equipment, and also offers 24 VDC through connectors G1..G7 and H3..H8.

The controller has a backup capacitor. The capacitor is used -when the power is interrupted- to allow for a controlled shutdown of the controller. The controller will save all point data and close all running processes correctly, preventing possible data loss upon power interruptions.

**IMPORTANT!** As the power supply wire also serves as a power strip separator for the controller, **the lead power cable may ONLY be plugged into an easily accessible and GROUNDED socket.**

**Fuses:** The FX-SPIDER-40/10 has two fuses marked F3 and F4, protecting the 24VDC outputs. They are Fast Acting Fuses (Flink) of 2.0 Ampère. F3 is connected to outputs G1..G7, F4 is connected to outputs H3..H8.

The fuses should only be replaced with original fuses approved by IEC 60127-2. Use only fast 5x20 glass tube fuses. Always disconnect the main power supply plug before replacing fuses.

**Chip:** The FX-SPIDER-40/10 controller has an NVidia Tegra 2 dual core Cortex-A9, 1 GHz processor, 512 MB NAND Flash memory (8 bit), 256 MB DDR2 RAM memory (32 bit) and runs Microsoft Windows Embedded CE 6.

**USB:** The FX-SPIDER-40/10 has 2 USB ports. With the Update Tool software, the USB1 port can be used to update, consult or reset certain settings that require local intervention. The USB2 port is allocated to the internal router.

**Network:** The controller has three different networks, a wired WAN and LAN and a Wi-Fi to connect to -for instance- with a laptop in the technical room.

Use the Ethernet port marked 'WAN' to connect the controller to an external network. The other port, marked as 'LAN', can be used to connect a VISIO-10-C touchscreen display, extend the local network, connect multiLINK modules, or to connect field devices. Both ports operate at 10/100 Mbit/sec and have automatic speed negotiation (MDI / MDI-X). The built-in router operates fully independently and offers IEEE 802.1X support.

The wireless network is hosted by a chip with 1T1R at 2.4GHz and offers a 150 Mbps connection via 802.11b/g/n modes. By default, an antenna is connected to the motherboard. To get better reception, the antenna can be moved to the outside of the metal encasing.

There is a WPS button inside the encasing -next to the antenna-connector- to connect devices without the use of passwords. It can be reached with a thin object like a pen.

The default IP address of the controller are: on the WAN port: 10.100.1.198, on the LAN port: 192.168.11.1 and on the Wi-Fi network: 192.168.12.1.

**Network ports LEDs:** The orange LEDs indicate network activity for each port. The green LED of the LAN port is the controller's "heart beat"; slow blinking with 2 second intervals indicates normal CPU operation.

**Web server:** The FX-SPIDER-40/10 has an embedded FTP and web server. The user interface of the device is provided through the web server, which allows the device to be accessed from any browser. The VISIO-10-C operator panel also uses the same web interface, providing the same user experience locally and remotely.

**Reset:** Pressing the reset button inside the encasing will trigger a saving of the point data and restart the controller.

**µSD memory card:** The FX-SPIDER-40/10 has a µSD card-slot. This is used to store system backups. The controller automatically makes weekly backups to the µSD card. It is located underneath the metal cover that is protecting the circuit board.

**Battery:** The internal real time clock is powered by a replaceable CR2032 battery when the controller's power supply is not connected. It is located underneath the metal cover that is protecting the circuit board.

**GSM-modem:** The RJ9-port is an RS232 interface to the COM1 port of the controller. Using the FX-SP-D9F cable, a serial GSM-modem can be used to send out alarms as SMS messages or receive SMS controls. The port offers both operating voltage and communication to the modem.

**Serial communication:** The internal I/O's on the FX-SPIDER-40/10 are connected internally to serial port COM3 on a Modbus RTU loop over RS485. The I/O's occupy fixed addresses 1..6, but the loop can continue from connectors H1/H2.

Optionally, an additional RS485 card can be attached to the COM4 port. This allows for the controller to operate two separate serial ports on different speeds or with different communication protocols.

**Connecting the I/O's:** The connectors are marked with a combination of a letter and a number. Each connector has its own letter code and the connector points are coded with numbers. The connectors are all of the springback type. The two connector points on top of each other are all internally connected so that two wires can be connected to the same physical and logical point - one to each connector. Wires can be released from the connectors by pressing the gap between the connector points with a screwdriver.

On connectors A1..B8 (relay output connectors), cables with a diameter of 0.2mm<sup>2</sup> - 2.5 mm<sup>2</sup> can be used. On the other connectors (C1..J8), cables with a diameter of 0.2mm<sup>2</sup> - 1.5 mm<sup>2</sup> can be used.

**Relays:** The FX-SPIDER-40/10 has 8 relay outputs on connectors A1..B8. The relays are of the Normal Open type. The maximum load per relay is 6A at 230 VAC or 5A at 30 VDC. In the firmware, the relays are recognised as a DO-module at Modbus address 2 and points are configured as DO-points.

**Attention!** If 230VAC and low voltage connections are both used on the relays of the FX-SPIDER-40/10, the different voltages must be separated by leaving at least one empty connector point between them to ensure sufficient clearance.

**Universal Inputs:** In the firmware of the FX-SPIDER-40/10 the inputs provided by connectors C1..D8 are recognised as two AI-modules at Modbus addresses 3 and 4. These universal inputs can be programmed as voltage signal measurements (0..10V), resistive measurements, indications or alarms. The type of measurement is defined in the conversion table selected in the point-programming. Indication and alarm points are always resistive measurements.

Connect resistive sensors between connectors C1..D8 (reference) and I1..J8 (ground). Active sensors need only be connected to connectors C1..D8. Make sure to keep the ground level of sensor and controller at the same level. When using the internal 24VDC outputs (G1..G7 and H3..H8), this is already the case.

**Attention!** Universal inputs are not suitable for fast changing signals. With all measuring points in use, each point is measured approximately every 3 seconds. Use the safety loop inputs to measure rapidly changing signals.

**Safety loop inputs:** The FX-SPIDER-40/10 has 8 safety loop inputs on terminals E1..E8. The reference level for the inputs is terminals I1..J8. These inputs are recognised as an SI-module at Modbus address 5. Security inputs can be defined as safety alarms (with or without termination resistor), indications or pulse counter points in the point-programming.

Safety loop inputs are fast and also suitable for pulse measurements. When programming pulse measurements, connectors E1..E8 are assigned to points 31..38 of the SPIDER-module at Modbus address 1.

**0..10 V Analogue Outputs:** Analogue Outputs F1..F8 send out 0-10V signals with an impedance of 1kΩ, at a maximum load of 10 mA.

In the firmware of the FX-SPIDER-40/10 the outputs are recognised as an AO-module at Modbus address 6.

**24 VDC out:** The FX-SPIDER-40/10 has 13 connectors (G1..G7 and H3..H8) at which it offers 24 VDC out to power field equipment. Aside the VISIO-10-C touchscreen display (12 Watt or 500 mA reserved), the maximum total load of all devices connected to these outputs is 36 Watt or 1.50 A.

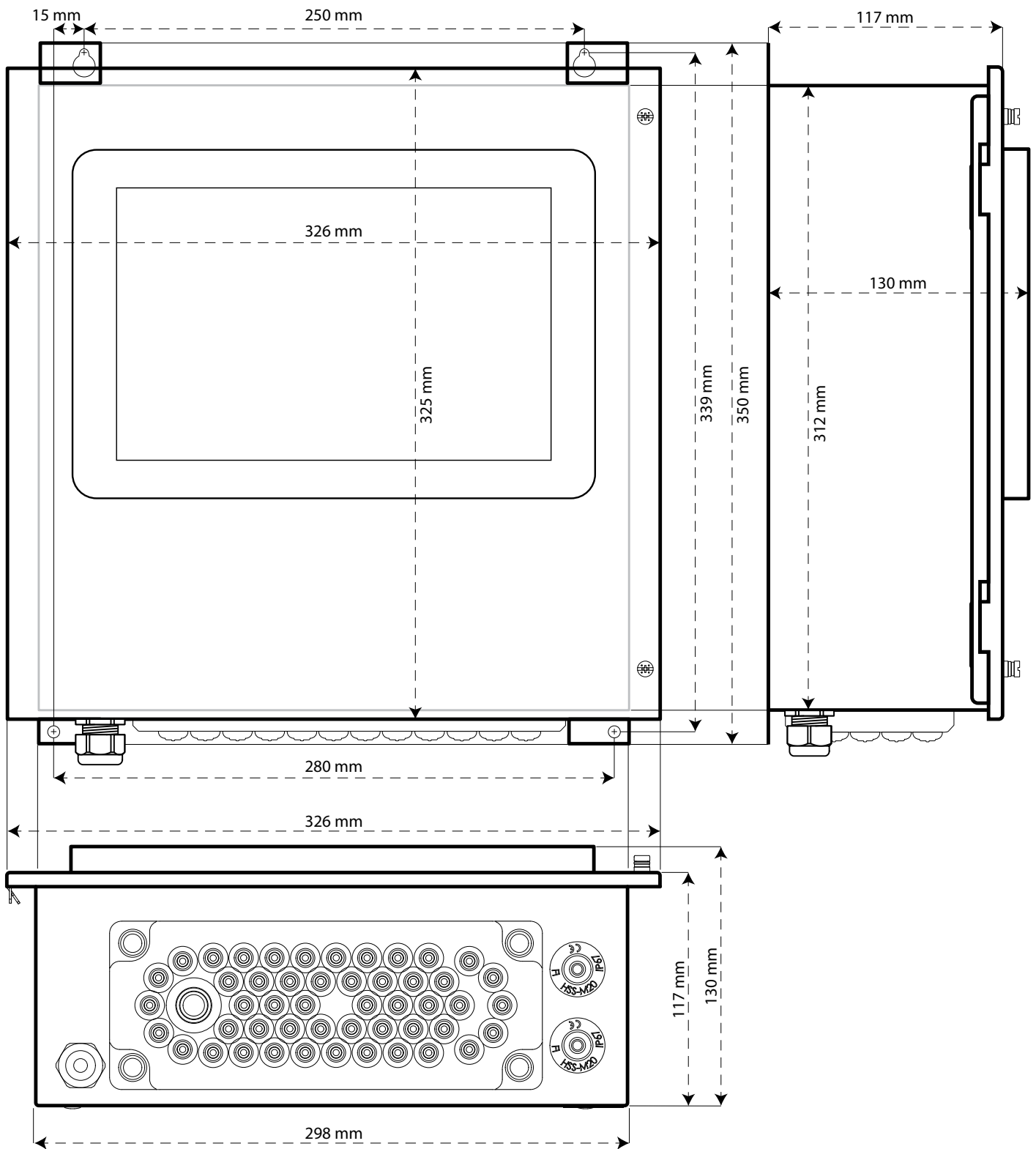
**24 VAC out:** To power actuators or more power-demanding sensors, an optional 24 VAC transformer in its own metal enclosure can be installed inside the metal box of the FX-SPIDER-40/10. It is separately powered (connected in parallel) through the same 230 VAC plug the controller itself is powered with. The maximum load on the transformer is 20VA or 1.0A continuous, with allowed momentary peak-loads up to 60VA.

**G7-G8:** The G7+G8 connectors (24 VDC and GND) provide power to the 10.1" VISIO-10-C touchscreen display. This means G8 is the only point on the G-connector where no 24 VDC out is provided.

**Touchscreen display:** The FX-SPIDER-40/10 is equipped with a 10.1" VISIO-10-C touch screen display mounted on the door. Consult the VISIO-10-C (or VISIO-15-C) datasheet and manual for more details. The VISIO-10-C display is pre-connected to the Wi-Fi of the FX-SPIDER-40/10. Optionally the display can be left out and then the door will be a full metal plate.

**Programming:** Use our software suite FX-Editor, offering a clear and efficient project overview, to program the controller. It makes programming not only an easy, but also a speedy process and seamlessly combines the creation of web pages (HTML), point programming and PLC code (IEC-61131-3 compliant) into one easy-to-manage package.

# Dimensions



# Installation

The FX-SPIDER-40/10 controller is best installed directly onto a concrete wall. For this purpose, there are two metal ribbons attached to the backside of the controller, with holes in them for easy hanging; the top two holes can fit over screws with heads up to 1 cm in diameter, so you can easily hang the FX-SPIDER-40/10 from the top two holes with screws already in the wall at 25cm distance, and only then add the bottom two screws to fix the controller onto the wall.

This way the FX-SPIDER-40/10 cannot be accidentally removed without proper tools.

For more detailed instructions on how to install the FX-Spider-40/10 controller, consult the mounting instructions.

