# › Logic Controller
## Millenium Evo

› **Up to 44 I/Os - Base 16 DI (4 HighSpeed/8 AI) - 8 DO**

› **Wireless programming & control with bluetooth Interface and Crouzet Virtual Display**

› **Ethernet Modbus TCP/IP (Client/Server) and Modbus RTU Network via interface (Server)**

› **Event and Datalog Managment via mail/FTP server or Locally**

› **Up to 1000 programing blocks with intuitive Crouzet Soft to go from simple to complex applications**

XBP24
*Base 24 I/O*

XBP24-E
*Base 24 I/O Ethernet*

XDP24
*Base 24 I/O*

XDP24-E
*Base 24 I/O Ethernet*

## Product selection

| Type | LCD display | Ethernet network | Part number |
|------|-------------|------------------|-------------|
| XBP24 | No | No | **88 975 001** |
| XBP24-E | No | Yes | **88 975 011** |
| XDP24 | Yes | No | **88 975 101** |
| XDP24-E | Yes | Yes | **88 975 111** |

## Accessories

| Accesories Description | Part-number |
|------------------------|-------------|
| USB Interface | **88 980 110** |
| USB cable 3m B type | **88 980 170** |
| **Kit Description** | **Part-number** |
| MilleniumEVO STARTER KIT, Logic Controller + Bluetooth interface | **88 975 901** |
| MilleniumEVO STARTER KIT, Logic Controller with embedded Ethernet + Bluetooth interface | **88 975 911** |
| MilleniumEVO KIT XDP24-E + Crouzet Touch CTP104-E Performance, Ethernet, USB Key | **88 970 558** |
| MilleniumEVO KIT XDP24-E + Crouzet Touch CTP107-E Performance, Ethernet, USB Key | **88 970 568** |

| | XBP24 | XBP24-E | XDP24 | XDP24-E |
|---|-------|---------|-------|---------|
| **General features** | | | | |
| Ethernet Modbus TCP/IP (Client///Server) | - | Yes (16 IP range /// 16 words + 8bits) | - | Yes (16 IP range /// 16 words + 8bits) |
| Modbus RTU RS485 (Server) | Yes via interface (16 words + 8 bits) | | | |
| Datalog via mail or FTP | - | Yes (16 data channel; 32 000 recording) | - | Yes (16 data channel; 32 000 recording) |
| Datalog local | Yes (16 data channel; 6 000 recording) | - | Yes (16 data channel; 6 000 recording) | - |
| Event mangement via mail | - | Yes (12 events) | - | Yes (12 events) |
| Bluetooth | Yes via interface | | | |
| **General characteristics** | | | | |
| Products certification | CE, cULus Listed | | | |
| Conformity with the low voltage directive (in accordance with 2014/35/EU) | IEC/EN 61131-2 (Open equipment) | | | |
| Conformity with the EMC directive (in accordance with 2014/30/EU) | IEC/EN 61000-6-1 (Residential, commercial and light-industrial environments) IEC/EN 61000-6-2 (Industrial) IEC/EN 61000-6-3 (Residential, commercial and light-industrial environments) IEC/EN 61000-6-4 (Industrial) | | | |

CROUZET

| | XBP24 | XBP24-E | XDP24 | XDP24-E |
|---|---|---|---|---|
| Power supply earthing | None | | | |
| Overvoltage category | 3 in accordance with IEC/EN 60664-1 | | | |
| Pollution | Degree: 2 in accordance with IEC/EN 61131-2 | | | |
| Maximum utilization altitude | Operation: 2000 m<br>Transport: 3000 m | | | |
| Mechanical resistance | Immunity to vibrations IEC/EN 60068-2-6, Fc test<br>Immunity to shock IEC/EN 60068-2-27, Ea test | | | |
| Resistance to electrostatic discharge | Immunity to ESD IEC/EN 61000-4-2, level 3 | | | |
| Resistance to HF interference<br>(Immunity) | Immunity to radiated electrostatic fields IEC/EN 61000-4-3, level 3<br>Immunity to fast transients (burst immunity) IEC/EN 61000-4-4, level 3<br>Immunity to shock waves IEC/EN 61000-4-5<br>Radio frequency in common mode IEC/EN 61000-4-6, level 3 | | | |
| Conducted and radiated emissions<br>(in accordance with EN 55022/11 group 1) | Class B | | | |
| Operation temperature | -20 °C (-4 °F) → +60 °C (140 °F) (+40 °C (104 °F) in a non-ventilated enclosure)<br>UL: maximum surrounding air: +50 °C (122 °F) | | | |
| Storage temperature | -40 °C (-40 °F) → +80 °C (176 °F) | | | |
| Relative humidity | 95% max. (no condensation or dripping water) | | | |
| Screw terminals connection capacity | Flexible wire with ferrule: 1 conductor: 0.2 to 2.5 mm2 (AWG 24-14)<br>Flexible wire with ferrule: 2 conductors: 0.2 to 0.75 mm2 (AWG 24-18)<br>Rigid wire: 1 conductor: 0.2 to 2.5 mm2 (AWG 24-14)<br>Rigid wire: 2 conductors: 0.2 to 0.75 mm2 (AWG 24-18)<br>Tightening torque: 0.5 N.m (4.5 lb-in) (tighten using screwdriver diam. 3.5 mm)<br>Stripping length: 6 mm | | | |
| Material | Lexan, UL94V0 | | | |
| Environnement | Reach, RoHS, Halogen free 1272/2008/CE | | | |
| On front panel color | Grey RAL 7035 | | | |
| On sole color | Black RAL 9011 | | | |
| Protection rating<br>(in accordance with IEC/EN 60529) | IP 40 on front panel<br>IP 20 on terminal block | | | |
| Weight | Without packing: 270 g<br>With packing: 320 g | Without packing: 300 g<br>With packing: 350 g | | Without packing: 330 g<br>With packing: 380 g |
| Dimensions | Without packing: 124.6 x 90 x 61.1 mm / 4.91 x 3.54 x 2.4 inch<br>With packing: 148 x 103 x 65 mm / 5.83 x 4.06 x 2.56 inch | | Without packing: 124.6 x 90 x 62 mm / 4.91 x 3.54 x 2.44 inch<br>With packing: 148 x 103 x 65 mm / 5.83 x 4.06 x 2.56 inch | |
| **Processing characteristics** | | | | |
| LCD display | Without | | Display with 4 lines of 18 characters, yellow/green | |
| Programming method | FBD (Function Block Diagram), including SFC (Sequential Function Chart) (Grafcet) | | | |
| Program size | Function blocks: typically 512 blocks<br>Macro blocks: 127 max. (255 blocks per macro) | | | |
| Program memory | Flash | | | |
| Removable memory | N.A | | | |
| Data memory | 2 k octets | | | |
| Back-up time<br>(in the event of power failure) | Program and settings in the controller: 10 years<br>Data memory: 10 years | | | |
| Data back-up | Data backup in the flash memory is guaranteed if the product is powered on more than 10 seconds | | | |
| Cycle time | From 2 ms* to 90 ms, default value: 10 ms<br>*: Depending on configuration | | | |
| Clock data retention | 10 years (lithium battery) at 25 °C (77 °F) | | | |
| Clock drift | Drift < 12 min/year (at 25 °C (77 °F))<br>6 s / month (at 25 °C (77 °F) with user-definable correction of drift).<br>Synchronizable by network | | | |

| | XBP24 | XBP24-E | XDP24 | XDP24-E |
|---|---|---|---|---|
| Timer block accuracy | 0.5 % ± 2 cycle time | | | |
| Start up time on power up | < 8 s base alone, < 5 s base + 2 expansions + 1 accessory (RS485) | < 10 s base alone, < 5 s base + 2 expansions + 1 accessory (RS485) | < 8 s base alone, < 5 s base + 2 expansions + 1 accessory (RS485) | < 10 s base alone, < 5 s base + 2 expansions + 1 accessory (RS485) |
| Self test | Test firmware integrity (checksum memory) | | | |
| | Stability of the internal power supply | | | |
| | Check the conformity of the em4 device configuration with the configuration in the application program. | | | |
| **Supply** | | | | |
| Nominal voltage | 24 V⎓ (-15% / +20%) | | | |
| Operating limits | 20.4 - 28.8 V⎓ | | | |
| Immunity from micro power cuts | ≤ 1 ms (repetition 20 times) | | | |
| Max. absorbed power | 3.8 W @ 24 V⎓, 5 W @ 28.8 V⎓, 1.5 W @ 24 V⎓ I/O OFF | 4.8W @ 24 V⎓, 6.2 W @ 28.8 V⎓, 1.5W @ 24 V⎓ I/O OFF | 4W @ 24 V⎓, 5.3 W @ 28.8 V⎓, - 0.3 W backlight OFF 1.5W @ 24 V⎓ (I/O + backlight) OFF | 5W @ 24 V⎓, 6.5 W @ 28.8 V⎓, - 0.3 W backlight OFF 1.5W @ 24 V⎓ (I/O + backlight) OFF |
| Protection against polarity inversions | Yes | | | |
| Power monitoring | Yes and value available through the application "FB Status", 1/10V, 5%. | | | |
| **Inputs** | | | | |
| **Digital and high speed digital inputs 24 V⎓ - 4 inputs from I1 to I4** | | | | |
| **Input used as digital input** | | | | |
| Input voltage | 24 V⎓ (-15% / +20%) | | | |
| Input current | 1.8 mA @ 20.4 V | | | |
| | 2.1 mA @ 24 V | | | |
| | 2.5 mA @ 28.8 V | | | |
| Input impedance | 11.6 kΩ | | | |
| Logic 1 voltage threshold | ≥ 15 V⎓ | | | |
| Making current at logic state 1 | ≥ 1.3 mA | | | |
| Logic 0 voltage threshold | ≤ 10 V⎓ | | | |
| Release current at logic state 0 | ≤ 0.8 mA | | | |
| Response time | 1 to 2 cycle times | | | |
| Sensor type | Contact or 3-wire PNP | | | |
| Conforming to IEC/EN 61131-2 | Type 1 | | | |
| Input type | Resistive | | | |
| Isolation between power supply and inputs | None | | | |
| Isolation between inputs | None | | | |
| Protection against polarity inversions | Yes | | | |
| Status indicator | No | | On LCD screen | On LCD screen |
| Cable length | ≤ 30 m | ≤ 30 m | | |
| **Input used as high speed digital input** | | | | |
| Maximum counting frequency | 3 channels encoder (I1, I2, I3): 5 kHz* | | | |
| | 2 independent counters (I1, I2) (I3, I4) (Cumul, IND, DIR): 2 channels: 10 kHz*, 4 channels: 5 kHz*, | | | |
| | 2 independent counters (I1, I2) (I3, I4) (PH, PH2): 2/4 channels: 5 kHz* | | | |
| | 4 independent counters (I1, I2, I3, I4) (Up/Down): 1 channel: 15 kHz*, 2 channels: 10 kHz*, > 2 channels: 5 kHz* | | | |
| | * with a time cycle ≤ 10 ms and a ton / toff = 50% ± 5%, level 0 < 2V and level 1 > 20.4V | | | |
| Other functions | 4 tachometers (I1, I2, I3, I4 ) | | | |
| Cable length | ≤ 3 m with shielded twisted cable | | | |

|  | XBP24 | XBP24-E | XDP24 | XDP24-E |
|---|---|---|---|---|
| **Digital 24 V⎓ and analog inputs 12 bits / 28.8 V - potentiometer - 8 inputs from I5 to IC** | | | | |
| *Input used as digital input* | | | | |
| Input voltage | 24 V⎓ (-15% / +20%) | | | |
| Input current | 1.8 mA @ 20.4 V<br>2.1 mA @ 24 V<br>2.5 mA @ 28.8 V | | | |
| Input impedance | 11.6 kΩ | | | |
| Logic 1 voltage threshold | ≥ 11 V⎓ | | | |
| Making current at logic state 1 | ≥ 1 mA | | | |
| Logic 0 voltage threshold | ≤ 9 V⎓ | | | |
| Release current at logic state 0 | ≤ 0.7 mA | | | |
| Response time | 1 to 2 cycle times | | | |
| Sensor type | Contact or 3-wire PNP | | | |
| Conforming to IEC/EN 61131-2 | Type 1 | | | |
| Input type | Resistive | | | |
| Isolation between power supply and inputs | None | | | |
| Isolation between inputs | None | | | |
| Protection against polarity inversions | Yes | | | |
| Status indicator | No | | On LCD screen | On LCD screen |
| Cable length | ≤ 30 m | | | |
| *Input used as analog input* | | | | |
| Measuring range | 0 → 10 V, 0 → V power supply or Voltmeter | | | |
| Input impedance | 11.6 kΩ | | | |
| Maximum value without destruction | 28.8 V⎓ max | | | |
| Input type | Common mode | | | |
| Resolution | 12 bit at maximum input voltage (10 bit at 10V) | | | |
| Value of LSB | 7.03 mV | | | |
| Conversion time | Controller cycle time | | | |
| Maximum error in 0-10V mode | ± 3.5 % of full scale at 25 °C (77 °F)<br>± 5 % of full scale at 55 °C (131 °F) | | | |
| Maximum error in 0-V power supply mode | ± 5 % of full scale at 25 °C (77 °F)<br>± 6.2 % of full scale at 55 °C (131 °F) | | | |
| Repeat accuracy at 55 °C (131 °F) | ± 2 % | | | |
| Voltmeter | From 0 to 30.5 V, 5% | | | |
| Isolation between analogue channel and power supply | None | | | |
| Protection against polarity inversions | Yes | | | |
| Potentiometer control | 2.2 kΩ / 0.5 W (recommended), 10 KΩ max. | | | |
| Cable length | ≤ 10 m with shielded twisted cable (sensor not isolated) | | | |
| **Digital 24 V⎓ - 4 inputs from ID to IG** | | | | |
| Input voltage | 24 V⎓ (-15% / +20%) | | | |
| Input current | 1.5 mA @ 20.4 V<br>1.7 mA @ 24 V<br>2.1 mA @ 28.8 V | | | |
| Input impedance | 13.9 kΩ | | | |
| Logic 1 voltage threshold | ≥ 11 V⎓ | | | |
| Making current at logic state 1 | ≥ 0.8 mA | | | |
| Logic 0 voltage threshold | ≤ 8 V⎓ | | | |
| Release current at logic state 0 | ≤ 0.5 mA | | | |
| Response time | 1 to 2 cycle times | | | |
| Sensor type | Contact or 3-wire PNP | | | |

| | XBP24 | XBP24-E | XDP24 | XDP24-E |
|---|---|---|---|---|
| Conforming to IEC/EN 61131-2 | Type 1 | | | |
| Input type | Resistive | | | |
| Isolation between power supply and inputs | None | | | |
| Isolation between inputs | None | | | |
| Protection against polarity inversions | No | | | |
| Status indicator | No | | On LCD screen | On LCD screen |
| Cable length | ≤ 30 m | | | |

### Outputs

#### 6 A relay output - 2 outputs from O1 to O2

| | XBP24 | XBP24-E | XDP24 | XDP24-E |
|---|---|---|---|---|
| Breaking voltage | 250 V∿ max | | | |
| Breaking current | 6 A<br>Derating: UL: ≥ 45 °C (113 °F): 4A max | | | |
| Maximum breaking current in the common | IEC @ 25 °C (77 °F): 12 A<br>IEC @ 60 °C (140 °F) or UL: 10 A | | | |
| Mechanical life | 5 000 000 operations (cycles) | | | |
| Electrical durability for 50 000 operating cycles | 24 V⎓ tau = 0 ms: 6 A, tau = 7 ms: 3 A, tau = 15 ms: 1.8 A<br>Usage category DC-12: 24 V, 6 A<br>Usage category DC-14: 24 V, 1.8 A<br>250 V∿ cos phi = 1: 6 A, cos phi = 0.7: 5 A, cos phi = 0.4: 2.5 A<br>Usage category AC-12: 250 V, 6 A<br>Usage category AC-13: 250 V, 5 A<br>Usage category AC-15: 250 V, 2 A | | | |
| Minimum switching capacity | 100 mA (at minimum voltage of 12V) | | | |
| Maximum operating rate | Off load: 10 Hz<br>At operating current: 0.1 Hz | | | |
| Voltage for withstanding shocks | In accordance with IEC/EN 60947-1 and IEC/EN 60664-1: 4 kV | | | |
| Response time | Make = 1 cycle time + 8 ms typical<br>Release = 1 cycle time + 4 ms typical | | | |
| Built-in protections | Against short-circuits: None<br>Against over voltages and overload: None | | | |
| Status indicator | No | | On LCD screen | On LCD screen |
| Cable length | ≤ 30 m | | | |

#### 8 A relay output - 6 outputs from O3 to O8

| | XBP24 | XBP24-E | XDP24 | XDP24-E |
|---|---|---|---|---|
| Breaking voltage | 250 V∿ max | | | |
| Breaking current | 8 A<br>Derating: CEI ≥ 55 °C (131 °F) or UL: ≥ 45 °C (113 °F): 6A max | | | |
| Maximum breaking current in the common | IEC @ 25 °C (77 °F): C3, C6: 8A; C4, C5: 16 A<br>IEC @ 60 °C (140 °F) or UL: C3, C6: 8 A; C4, C5: 10 A | | | |
| Mechanical life | 20 000 000 operations (cycles) | | | |
| Electrical durability for 50 000 operating cycles | 24 V⎓ tau = 0 ms: 8 A, tau = 7 ms: 3 A, tau = 15 ms: 1.5 A<br>Usage category DC-12: 24 V, 8 A<br>Usage category DC-14: 24 V, 1.5 A<br>250 V∿ cos phi = 1: 8 A, cos phi = 0.7: 4.75 A, cos phi = 0.4: 3 A<br>Usage category AC-12: 250 V, 8 A<br>Usage category AC-13: 250 V, 4.3 A<br>Usage category AC-15: 250 V, 1.5 A | | | |
| Minimum switching capacity | 100 mA (at minimum voltage of 12V) | | | |
| Maximum operating rate | Off load: 10 Hz<br>At operating current: 0.1 Hz | | | |
| Voltage for withstanding shocks | In accordance with IEC/EN 60947-1 and IEC/EN 60664-1: 4 kV | | | |
| Response time | Make = 1 cycle time + 10 ms typical<br>Release = 1 cycle time + 5 ms typical | | | |
| Built-in protections | Against short-circuits: None<br>Against over voltages and overload: None | | | |

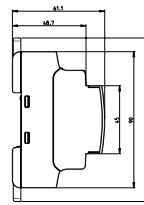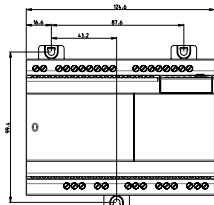|  | XBP24 | XBP24-E | XDP24 | XDP24-E |
|---|---|---|---|---|
| Status indicator | No | | On LCD screen | On LCD screen |
| Cable length | ≤ 30 m | | | |
| **Ethernet network** | | | | |
| Programming / exploitation | - | USB & Ethernet port / Ethernet port | - | USB & Ethernet port / Ethernet port |
| Ethernet connection | - | Type RJ45, 10/100 Mbit/s, MDI/ MDIX | - | Type RJ45, 10/100 Mbit/s, MDI/ MDIX |
| Adressage | - | Static or dynamic (DHCP server / Auto IP) | - | Static or dynamic (DHCP server / Auto IP) |
| Protocols | - | Modbus TCP (client / server), Discovery, UDP, TCP, SMTP, SSL (workshop communication via Ethernet) | - | Modbus TCP (client / server), Discovery, UDP, TCP, SMTP, SSL (workshop communication via Ethernet) |
| Cable length | - | Maximun length between 2 devices: 100 m / 3937 inch | - | Maximun length between 2 devices: 100 m / 3937 inch |
| Ethernet earthing | - | Yes, refer to the quick reference guide supplied with the product | - | Yes, refer to the quick reference guide supplied with the product |

**Technical sketches**

**Dimensions (mm)**

|  | XBP24 | XBP24-E | XDP24 | XDP24-E |
|---|---|---|---|---|

**Connections**

**INPUTS**

I1 ... IG  0/1

I5 ... IC  U

**I1 ... I4** `2604` — + 24 VDC / Hz / 3 m Max / 9.84 feet Max



**I1 ... I4** `2604` — + 24 VDC / Hz / 3 m Max / 9.84 feet Max



**I1 ... I4** `2604` — + 24 VDC / Hz, Rpm / 3 m Max / 9.84 feet Max
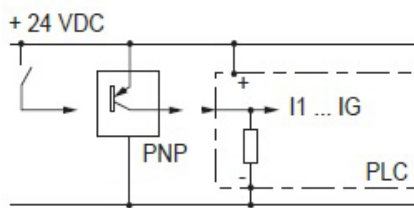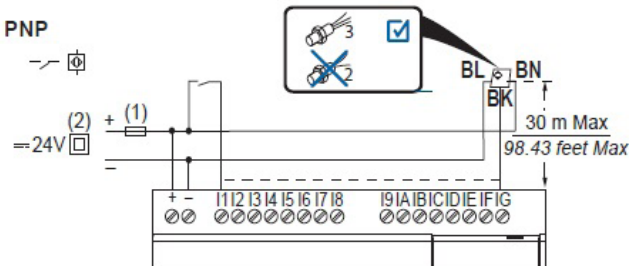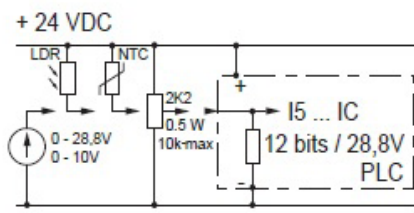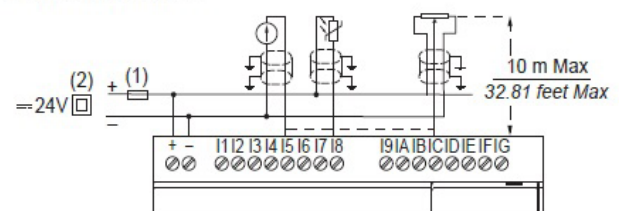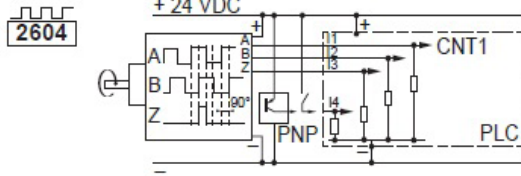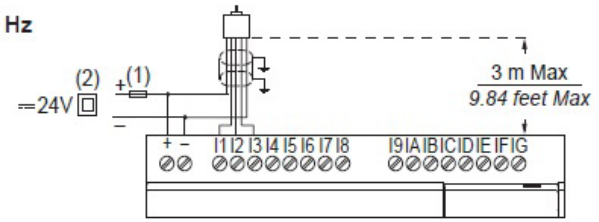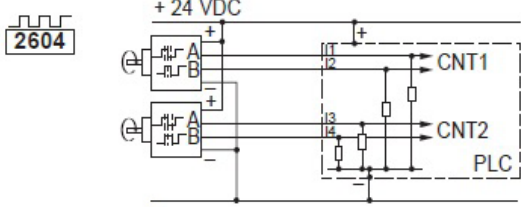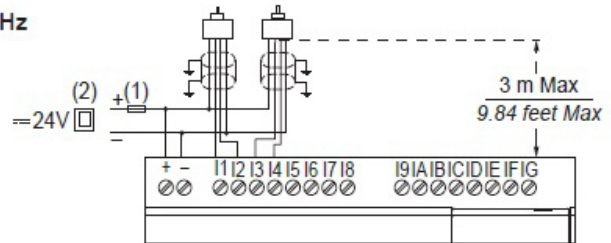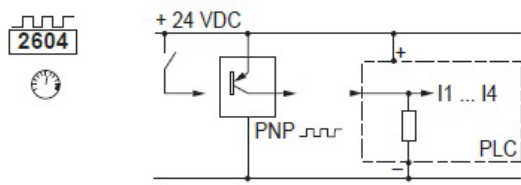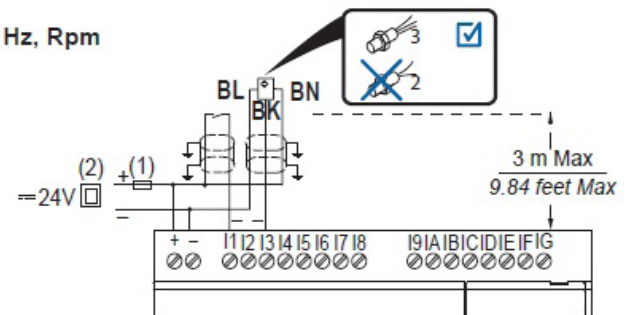
## OUTPUTS



**O1 ... O8** ≃ 12...240V 50/60Hz  =12...24V / 6 A, 8 A / 30 m Max / 98.43 feet Max