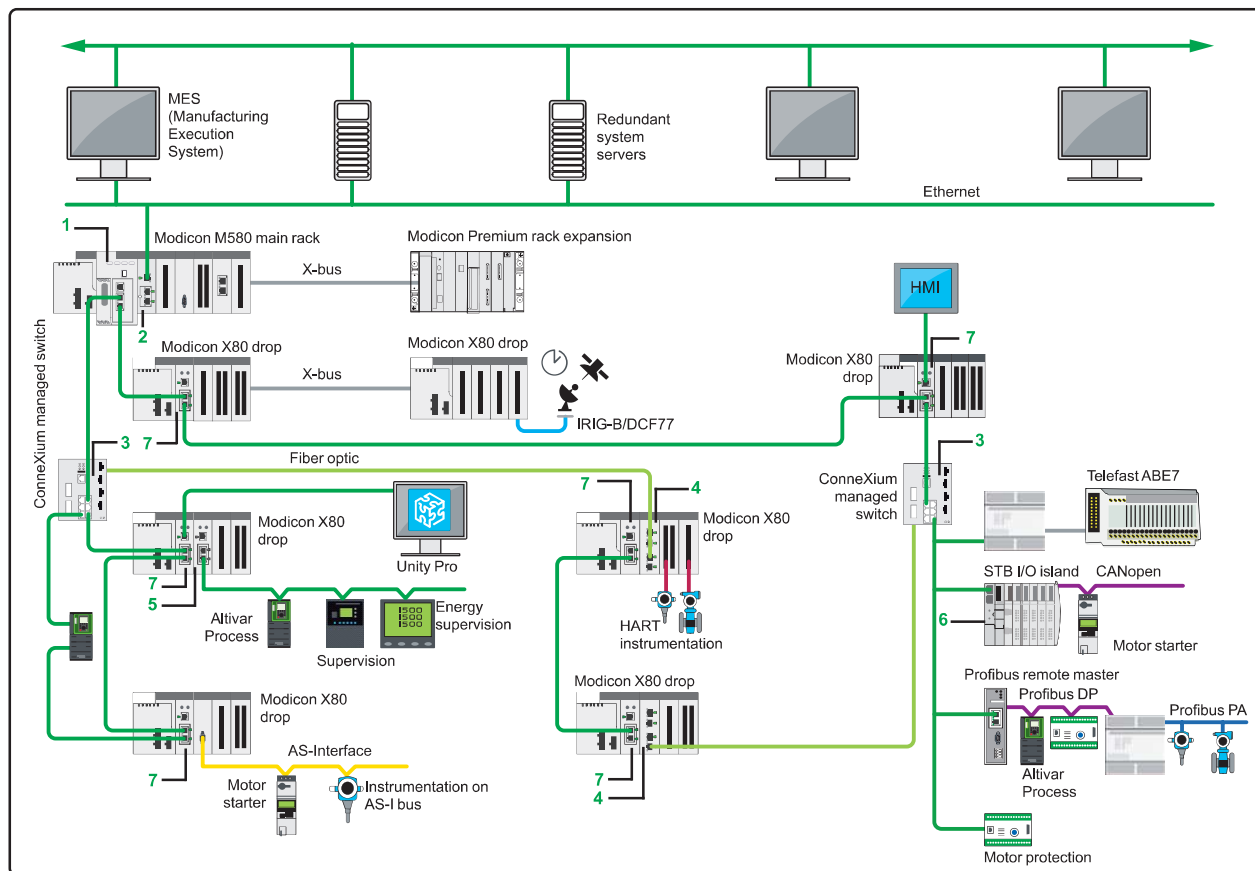


Example of a complex architecture

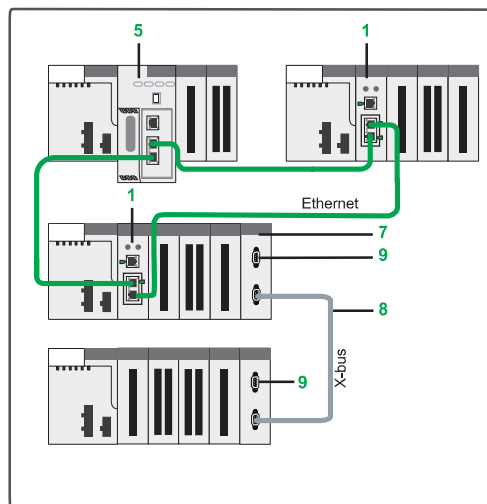
The complex architecture below illustrates the extensive possibilities of the Modicon M580 offer:

- A choice between 9 **BMEP58000** CPUs **1**
- Easy integration of the I/O network with supervisors in the control network, due to the **BMENOC0301** Ethernet module **2**
- Optimized wiring with RIO and DIO control via a single medium: the DIO are controlled via the CPU
- High availability of secondary rings with ConneXium managed switches **3**
- Long distance optimized by the fiber optic converter **4** installed directly in the Modicon X80 rack
- Simplified integration of devices via a serial link **5** (for example, power meter, variable speed drive, motor starters, protection relays, etc.); FTD/DTM technology makes it possible to configure and debug devices transparently via the Ethernet network, from any supervisor
- Great flexibility due to integration of DIO devices **6** or other diagnostic/configuration tools on any drop SERVICE port or on the DIO port of a managed switch
- Easy integration of Modicon X80 I/O drops on Ethernet with **BMECRA31210** drop adapters **7**

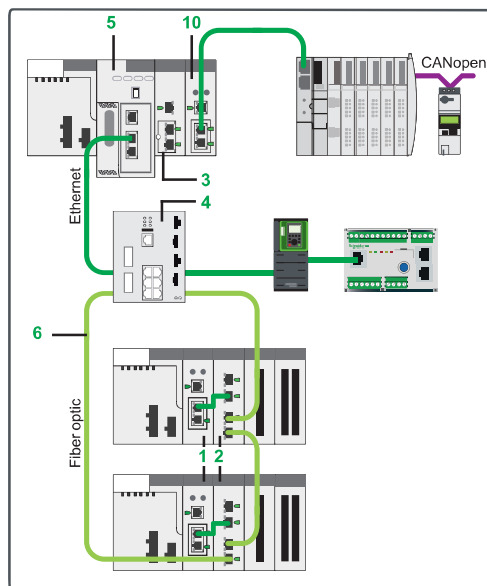
2



Example of a complex architecture



Local I/O architecture + Remote I/O architecture



Distributed I/O architecture + Remote I/O architecture

References (1)

Ethernet head and drop adapters (2)

Description	SERVICE port	Item (3)	Reference	Weight kg/lb
Modicon X80 EIO drop adapter Provide 1 module per Modicon X80 EIO drop	—	1	BMXCRA31200	0.200/ 0.441
	1	1	BMXCRA31210 (4)	0.234/ 0.516
	1	1	BMECRA31210 (4)	0.234/ 0.516

Modicon X80 Ethernet RIO drop fiber optic repeaters (2)

Description	Optical fiber	Item (3)	Reference	Weight kg/lb
Modicon X80 Ethernet RIO drop fiber optic repeaters	Multimode	2	BMXNRP0200	0.203/ 0.448
	Single-mode	2	BMXNRP0201	0.203/ 0.448

Ethernet Interlink cables Length 1 m/3.28 ft	Standard version	—	TCSECN3M3M1S4	—
	UL version	—	TCSECN3M3M1S4U	—

Ethernet communication modules and cordsets (2)

Description	Item (3)	Reference	Weight kg/lb
EtherNet/IP, Modbus/TCP network module	3	BMENOC0301	0.200/ 0.441
FactoryCast network module	3	BMENOC0311	0.200/ 0.441
Embedded router network module	3	BMENOC0321	0.200/ 0.441

Ethernet network option switch

Description	SERVICE port	Device network port (Ethernet)	Item	Reference	Weight kg/lb
Ethernet network option switch	1	2	10	BMENOS0300	—

Dedicated ConneXium managed switches (5)

Copper port	Multimode fiber optic port	Single-mode fiber optic port	Item (3)	Reference (4)	Weight kg/lb
RJ45 shielded connectors	Duplex SC connectors				
8 x 10/100 BASE-TX ports	—	—	—	TCSESM083F23F1	1.000/ 2.205
6 x 10/100 BASE-TX ports	2 x 10/100 BASE-FX ports	—	4	TCSESM063F2CU1	1.000/ 2.205
—	—	2 x 10/100 BASE-FX ports	4	TCSESM063F2CS1	1.000/ 2.205

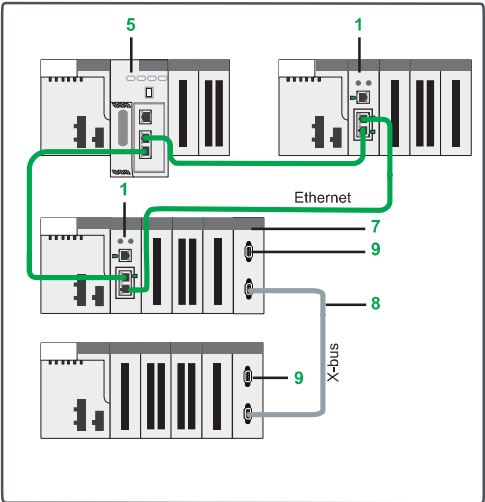
(1) For additional characteristics, see our website www.schneider-electric.com.

(2) Requires Unity Pro Extra Large software ≥ V8.0 (see page 2/19).

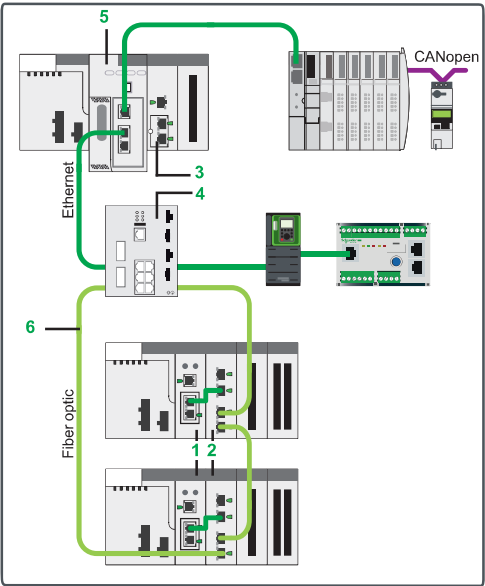
(3) For items 5 to 9, see pages 2/18 and 2/19.

(4) Conformal coating version for harsh environments. In this case, add the letter "C" to the end of the reference.

(5) ConneXium managed switches validated for Modicon M580 architectures.



Local I/O architecture + Remote I/O architecture



Distributed I/O architecture + Remote I/O architecture

References (continued) (1)

Modicon M580 processors

I/O capacity	Maximum number of networks	Device ports	SERVICE port	Item (2)	Reference	Weight kg/lb
1,024 discrete I/O 256 analog I/O 24 application-specific channels 4 MB integrated (memory program)	2 Ethernet networks	2 DIO	1	5	BMEP581020	–
2,048 discrete I/O 512 analog I/O 32 application-specific channels 8 MB integrated (memory program)	2 Ethernet networks	2 DIO	1	5	BMEP582020	–
		2 RIO/DIO	1	5	BMEP582040	–
3,072 discrete I/O 768 analog I/O 64 application-specific channels 12 MB integrated (memory program)	3 Ethernet networks	2 DIO	1	5	BMEP583020	–
		2 RIO/DIO	1	5	BMEP583040	–
4,096 discrete I/O 1,024 analog I/O 64 application-specific channels 16 MB integrated (memory program)	4 Ethernet networks	2 DIO	1	5	BMEP584020	–
		2 RIO/DIO	1	5	BMEP584040	–

Fiber optic cable

Description	Length m/ft	Item (2)	Reference	Weight kg/lb
62.5/125 µm multimode fiber optic cables equipped with MT-RJ connectors	3/9.84	6	490NOR00003	–
For interconnection of the Ethernet port on the CPU or BMECRA adapter 1	5/16.40	6	490NOR00005	–

Rack expansion for Modicon X80 drop

Description	Item (2)	Reference	Weight kg/lb
Modicon X80 rack expansion module Standard module for mounting in each rack (XBE slot) and allowing the interconnection of 2 racks max.	7	BMXXBE1000	0.178/ 0.392
Modicon X80 rack expansion kit Complete kit for 2-rack configuration comprising: - 2 BMXXBE1000 rack expansion modules - 1 BMXXBC008K extension cordset, length 0.8 m/2.63 ft - 1 TSXTLYEX line terminator (pack of 2)	7 8 9	BMXXBE2005	0.700/ 1.543

(1) For additional characteristics, see our website www.schneider-electric.com.

(2) For items 1 to 4, see page 2/16.

References (continued) (1)

Description	Type of connector	Length m/ft	Item (2)	Reference	Weight kg/lb
X-bus preformed extension cordsets with two 9-pin SUB-D connectors	Elbowed	0.8/2.63	8	BMXXBC008K	0.165/ 0.364
		1.5/4.92	8	BMXXBC015K	0.250/ 0.551
		3/9.84	8	BMXXBC030K	0.420/ 0.926
		5/16.40	8	BMXXBC050K	0.650/ 1.433
		12/39.37	8	BMXXBC120K	1.440/ 3.175
	Straight	1/3.28	8	TSXCBY010K	0.160/ 0.353
		3/9.84	8	TSXCBY030K	0.260/ 0.573
		5/16.40	8	TSXCBY050K	0.360/ 0.794
		12/39.37	8	TSXCBY120K	1.260/ 2.778
		18/59.06	8	TSXCBY180K	1.860/ 4.101
		28/91.86	8	TSXCBY280KT (3)	2.860/ 6.305

Description	Use	Length m/ft	Item (2)	Reference	Weight kg/lb
Cable on reel Cable with free ends, 2 line testers	To be equipped with 2 TSXCBYK9 connectors	100/328	—	TSXCBY1000	12.320/ 27.161

Description	Use	Sold in lots of	Item (2)	Reference	Weight kg/lb
Line terminator 2 x 9-way SUB-D connectors marked A/ and /B	Required on the 2 BM●XBP●●●0 modules located at either end of the daisy chain	2	9	TSXTLYEX	0.050/ 0.110
X-bus straight connectors 2 x 9-way SUB-D connectors	For TSXCBY1000 cable ends	2	—	TSXCBYK9	0.080/ 0.176

Connector installation kit 2 crimping pliers, 1 pen (4)	For fixing TSXCBYK9 connectors	—	—	TSXCBYACC10	—
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(1) For additional characteristics, see our website www.schneider-electric.com.

(2) For items 1 to 4, see page 2/16; for items 5 to 7, see page 2/17.

(3) Cable supplied with a set of 2 TSXTVSY100 electrical transient suppressors.

(4) Installation of connectors on the cable also requires a wire stripper, a pair of scissors, and a digital ohmmeter.

Requirements for a Modicon M580 Ethernet I/O architecture ⁽¹⁾

The table below gives the minimum hardware and software requirements for setting up a Modicon M580 I/O architecture.

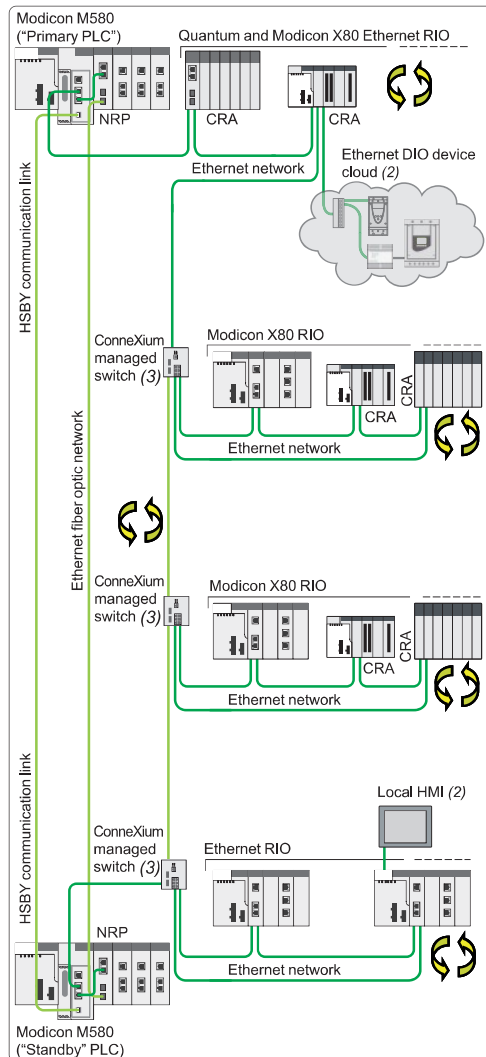
Description of the hardware or software required	Reference	Version	Item (2)
Unity Pro Extra Large software	UNISPUEF●CD80	≥ 8.0	—
Modicon X80 RIO drop adapter	BMECRA31210	≥ 2.0	1
	BMXCRA31200	≥ 2.0	1
	BMXCRA31210	≥ 2.0	1
Modicon X80 NRP EIO drop fiber optic repeaters	BMXNRP0200	—	2
	BMXNRP0201	—	2
ConneXium managed switches	TCSESM083F23F1	Firmware ≥ 6.0	4
	TCSESM063F2CU1	Firmware ≥ 6.0	4
	TCSESM063F2CS1	Firmware ≥ 6.0	4
M580 CPUs	BMEP581020	Firmware ≥ 1.0	5
	BMEP582020	Firmware ≥ 1.0	5
	BMEP582040	Firmware ≥ 1.0	5
	BMEP583020	Firmware ≥ 1.0	5
	BMEP583040	Firmware ≥ 1.0	5
	BMEP584020	Firmware ≥ 1.0	5
	BMEP584040	Firmware ≥ 1.0	5
	BMEP585040	Firmware ≥ 1.0	5
	BMEP586040	Firmware ≥ 1.0	5

(1) For additional characteristics, see our website www.schneider-electric.com.

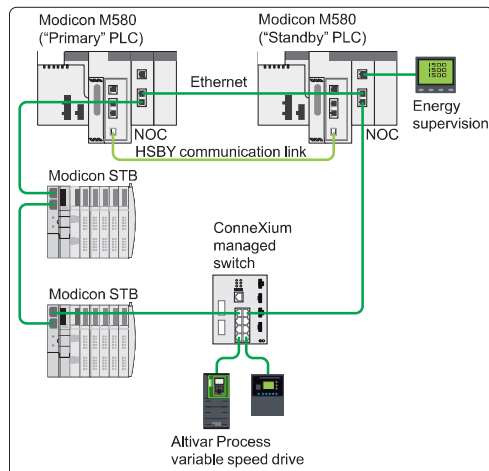
Modicon M580 automation platform

High-availability architectures

2



Modicon M580 Hot Standby Ethernet I/O architecture, long distance



Modicon M580 Hot Standby Ethernet I/O architecture with Ethernet DIO devices, without CRA Ethernet drop adapter

Types of M580 high-availability architecture (1)

High-availability system

The Unity high-availability system is used for more demanding applications, in terms of the availability of their control/command system, as no interruption of the process can be tolerated. This system helps to ensure global availability of the redundant CPU and Ethernet I/O devices.

At the heart of this architecture are 2 PLC racks ("Primary" and "Standby") with identical hardware configurations, based on **BMEH58●●40** Unity redundant CPUs, connected via a high-speed (1Gbps) link (copper or fiber optic). The volume of data exchanged between the "Primary" and "Standby" PLCs can reach 4 MB depending on the CPU.

The "Primary" PLC executes the application program and controls the I/O, while the "Standby" PLC remains in the background.

In the event of a detected error affecting the "Primary" PLC, the "Standby" system switches over automatically, changing over execution of the application program and control of the I/O to the "Standby" PLC with an up-to-date data context. Once the changeover is complete, the "Standby" PLC becomes the "Primary" PLC. Once the detected error has been cleared on the other PLC and it has been reconnected to the standby system, it acts as the "Standby" PLC.

The changeover is performed smoothly at the outputs and is completely transparent to the process.

The high-availability system with Unity Pro software thus increases productivity by minimizing process downtime.

High-availability system based on remote I/O architecture

The high-availability system based on the remote I/O (RIO) architecture is used for sensitive processes that require an I/O control takeover time within the region of the PLC scan time.

As the Ethernet RIO drops are synchronized with the PLC CPU scan time, the CPU changeover is carried out smoothly at the outputs, i.e. it is bumpless.

Due to the Ethernet build-in technology of the Modicon M580 controllers, the remote I/O architecture is simple to realize. There is no need to insert an Ethernet head adapter module twice in the "Primary" PLC and the "Standby" PLC. The capacity of Modicon X80 I/O drops depends on the CRA Ethernet drop adapter used.

A maximum of 31 RIO drops can be supported in a Hot Standby remote I/O architecture. Automatic switching of the IP address of these modules helps to ensure transparent addressing to SCADA, even in the event of a CPU changeover.

High-availability system based on Ethernet DIO device architecture

In this type of high-availability architecture without Ethernet RIO drops, the CRA Ethernet drop adapter is not required.

Only one M580 Ethernet module **BMENOC0301/BMENOC0311/BMENOC0321** or **BMENOS0300** (if less than 61 DIO) is required in each "Primary" and "Standby" PLC using distributed devices. The changeover from "Primary" to "Standby" processor might not be bumpless according to the type of DIO used. Please contact our Customer Care Center for more information.

(1) Requires Unity Pro Extra Large software ≥ V11.0.

(2) Please refer to the relevant product catalogs on our website www.schneider-electric.com.

(3) As well as the secondary ring, an Ethernet DIO device cloud can be connected to each managed switch.

Modicon M580 automation platform

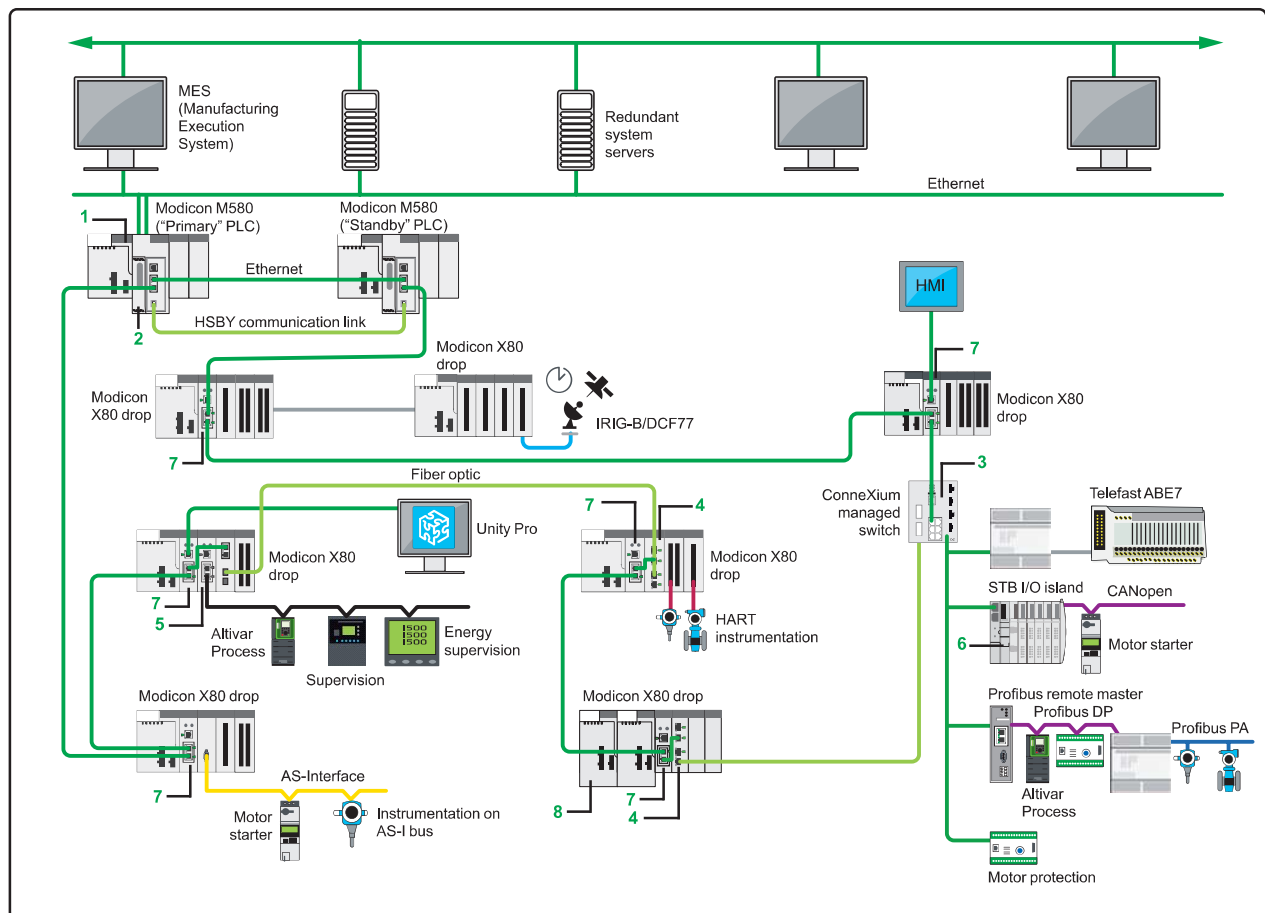
High-availability architectures
Example of a complex architecture

Example of a complex architecture

The complex architecture below illustrates the extensive possibilities of the Modicon M580 offer:

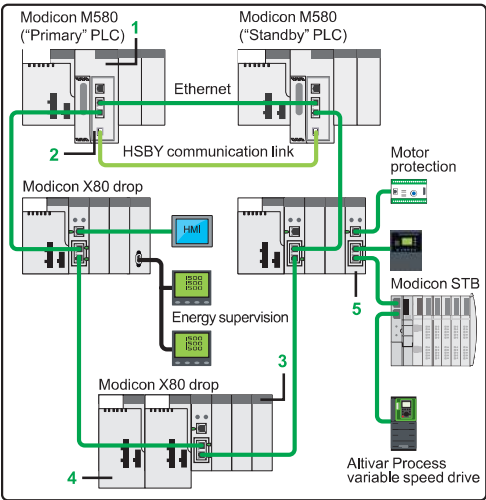
- A choice between 3 **BMEH58•040** M580 redundant CPUs **1**
- Easy integration of the I/O network with supervisors in the control network, due to the **BMENOC03•1** Ethernet module **2**
- Optimized wiring with RIO and DIO control via a single medium: the DIO are controlled via the CPU
- High availability of secondary rings with ConneXium managed switches **3**
- Long distance optimized by the fiber optic converter **4** installed directly in the Modicon X80 rack
- Simplified integration of devices via a serial link **5** (for example, power meter, variable speed drive, motor starters, protection relays, etc.); FTD/DTM technology makes it possible to configure and debug devices transparently via the Ethernet network, from any supervisor
- Great flexibility due to integration of DIO devices **6** or other diagnostic/configuration tools on any drop SERVICE port or on the DIO port of a managed switch
- Easy integration of Modicon X80 I/O drops on Ethernet with **BMECRA31210** drop adapters **7**
- The redundant power supplies are compatible with both single power supply racks for standard applications, and the dual power supply racks are compatible with high-availability applications **8**

2

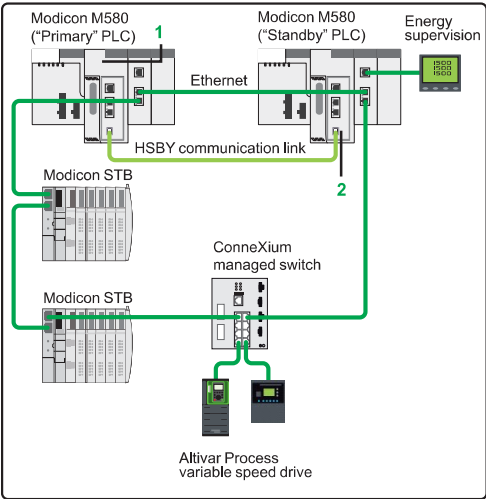


Example of a complex architecture

2



Remote I/O architecture



Distributed I/O architecture

References (1)

Modicon M580 redundant processors

Memory capacity	Maximum number of networks	Device ports	SERVICE port	Item (2)	Reference	Weight kg/lb
8 MB integrated (memory program)	2 Ethernet networks	2 RIO/DIO	1	1	BMEH582040	0.849/1.872
16 MB integrated (memory program)	4 Ethernet networks	2 RIO/DIO	1	1	BMEH584040	0.849/1.872
64 MB integrated (memory program)	6 Ethernet networks	2 RIO/DIO	1	1	BMEH586040	0.849/1.872

Accessories

Description	Use	Cable medium	Item	Reference	Weight kg/lb
HSBY link SFP socket (one reference for one socket)	To be inserted in pair in 2 BMEH58●●40 redundant processors for short distance	RJ45 copper	2	490NAC0100	–
	To be inserted in pair in 2 BMEH58●●40 redundant processors for long distance	Single-mode fiber	2	490NAC0201	–

Ethernet + X-bus dual power supply racks

Description	Type of module to be inserted	Ethernet connectors	X-bus connectors	Power consumption	Item (2)	Reference	Weight kg/lb
6-slot Ethernet + X-bus dual power supply backplane	BMXCPS4002● processor, BMEP58/BMEH58	4	6	3.9 W	3	BMEXP0602	1.377/3.036
10-slot Ethernet + X-bus dual power supply backplane	I/O modules, communication modules, and application-specific modules (counter, motion control, and serial)	8	10	3.9 W	3	BMEXP1002	1.377/3.036

Redundancy power supply modules

Line supply	Available power 3.3 V ⎓ (2)	24 V ⎓ (2)	Total	Nominal current 24 V ⎓ rack	Item (2)	Reference	Weight kg/lb
100...240 V ~	18 W	40 W	40 W	1.67 A	4	BMXCPS4002	0.360/0.794
100...240 V ~	18 W	40 W	40 W	1.67 A	4	BMXCPS4002H	0.360/0.794

Ethernet network option switch

Description	SERVICE port	Device network port (Ethernet)	Item	Reference	Weight kg/lb
Ethernet network option switch	1	2	5	BMENOS0300	–

(1) For additional characteristics, see our website www.schneider-electric.com.
(2) 3.3 V ⎓ and 24 V ⎓ rack voltages for powering modules in the Modicon X80 I/O rack.
(3) 24 V ⎓ sensor voltage for powering the input sensors (voltage available via the 2-way removable connector on the front panel).



BMEH580040K Hot Standby kits

References (continued) (1)			
Hot Standby kits			
Description	Composition	Reference	Weight kg/lb
M580 Hot Standby kit	- 2 Modicon M580 BMEH582020 redundant processors - 2 RJ45 SFP sockets 490NAC0100	BMEH582040K	—
	- 2 Modicon M580 BMEH584020 redundant processors - 2 RJ45 SFP sockets 490NAC0100	BMEH584040K	—

(1) For additional characteristics, see our website www.schneider-electric.com.