

ETHERNET TECHNOLOGY

Intelligent Ethernet systems: For use in harsh environments

The intelligent Ethernet systems MSX-Exxxx are especially suited for industrial measurement, control and regulation tasks very close to the measuring point. In order to cope with daily stresses and strains such as current peaks, dirt or extreme temperatures, the systems are mounted in robust metal housings and comply with the degree of protection IP 65/IP 40. They can be used in the extended temperature range of - 40 °C / + 85 °C and are equipped with numerous protective circuitries. The systems can be freely cascaded and synchronised in the µs range.

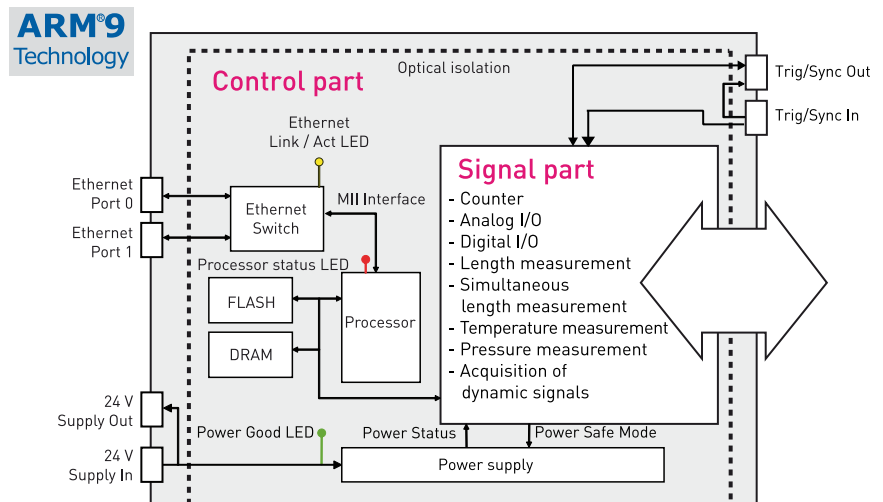
Ethernet, synchronisation and supply signals can be looped from one system to another. This allows distributed I/O signals to be acquired and processed directly at the measuring point. With these features, the MSX-E systems are suited both for simple distributed applications and for complex applications, in which multiple devices with physically widely separated signals have to operate together

Fast and easy PLC connection

The intelligent Ethernet I/O systems can be connected directly to a PLC such as the Siemens S7 through their integrated Ethernet switch. The PLC triggers the system measuring through a 24V digital output and receives the measured values again. This data is stored in a data block (DB) of the PLC.

IN BRIEF

- All system types can be cascaded and synchronised with one another.
- Degree of protection IP 65 or IP 40
- Optical isolation
- Compact systems for use close to the measuring point
- LED status display for quick error diagnostics
- Direct operation with MS Excel, no programming knowledge needed
- Easy to use, e. g. with .NET and LabVIEW™ via web services (WSDL files)



The systems are organized in two parts: the control part is common to all system types and allows a reliable and fast communication as well as signal processing when needed. The signal part features the specific function of each system type: counter, digital I/O, analog I/O, length measurement, ...

INTELLIGENT SYSTEMS

- ARM®9 technology: Intelligent systems
- Linux Embedded: For programming applications
- Website: Easy system configuration and monitoring as well as CSV file export (e.g. to MS Excel)
- SOAP command server (web services, WSDL): For easy use, e.g. with .NET and LabVIEW™
- Data server (TCP/IP or UDP socket): Standard communication modes
- Event server: For transferring events
- NTP client: For setting the system time

For PLC users:

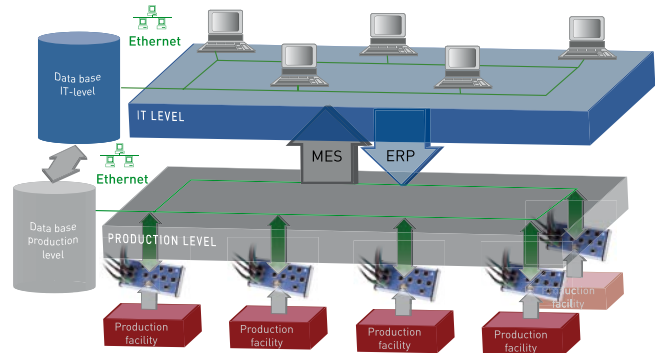
- Command server Modbus TCP as well as Modbus (UDP) for sending commands: For PLC connection

Measurement Control Regulation. Discover the wide range of applications of the intelligent Ethernet systems

Process optimisation and monitoring

The intelligent Ethernet systems MSX-E allow the direct connection to MES and ERP systems. The MSX-E systems acquire data directly at the measuring point, convert raw data into physical values and transfer them via the company network into the MES systems on the IT level.

Thanks to their integrated intelligence, the MSX-E systems can, in stand-alone operating mode, transfer measurement values, i.e. „meaningful“ data and not raw data, directly to the MES.

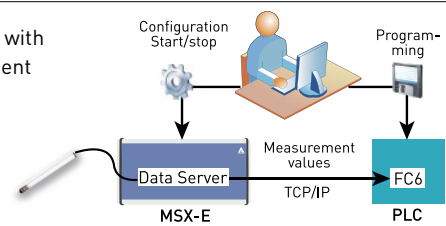


Extend the functionality range of PLCs with MSX-E systems

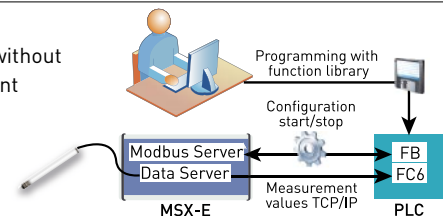
The MSX-E systems can be connected via Ethernet directly to a PLC and thus significantly extend its functionality. The actual measurement task is parameterised and stored on the systems via the website. With the autostart function, the systems load the measurement settings after booting and execute them independently, which makes additional programming unnecessary. The PLC accesses the data and stores it in a data block.

New! The Ethernet systems of the MSX-E series can now be managed directly from a PLC by means of a library. Frames enable the PLC to directly parameterise the MSX-E systems, to read system information and to start or stop measurements.

PLC connection with Modbus TCP Client Library

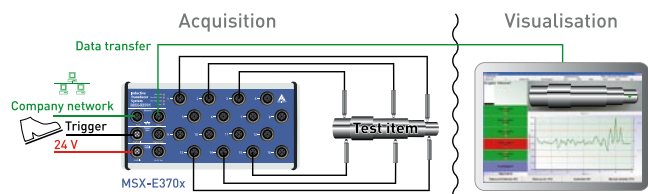


New! PLC connection without Modbus TCP Client Library (option)



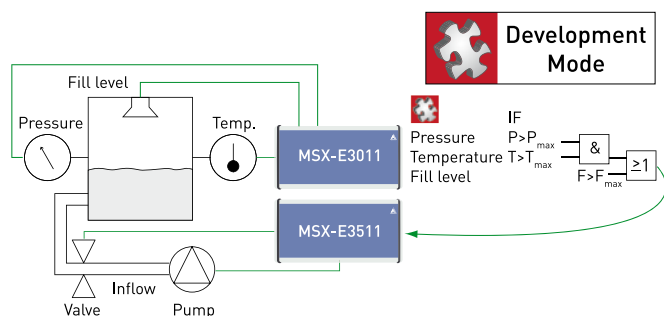
Data measurement and visualisation

For the visualisation of data acquired via the intelligent Ethernet systems MSX-E, ADDI-DATA offers two solutions: the software procella® by Q-DAS and SPC.kompakt by ProNES. There is no need for programming a connection to the hardware. The values acquired are directly recorded and displayed by procella® or SPC.kompakt. The graphical display allows the operator to distinguish fast and reliably between “good” and “incorrect” parts.

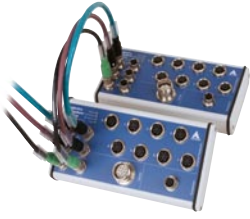


Stand-alone applications

The MSX-E systems feature a Development Mode which allows to realise and execute applications directly on the MSX-E systems. The MSX-E systems can access other MSX-E systems or any other Ethernet hardware through the Ethernet switch. The connection via standard Ethernet allows to realise complex distributed measurement and control tasks on site, close to the test item. Such stand-alone applications would be suitable for fill level monitoring and regulation tasks.



Overview of the Ethernet systems



New!

New!


	Digital I/O, 24 V	Multifunction counter			Analog input		Analog output	Temperature measurement	Pressure measurement
	MSX-E1516	MSX-E1711	MSX-E1721	MSX-E1701	MSX-E3011	MSX-E3021	MSX-E3511	MSX-E3211	MSX-E3311
Intelligent through Arm®9 technology	✓	✓	✓	✓	✓	✓	✓	✓	✓
Ethernet	✓	✓	✓	✓	✓	✓	✓	✓	✓
Optical isolation 1000 V	✓	✓	✓	✓	✓	✓	✓	✓	✓
1 x trigger input / 1 x synchro input / time synchronisation	✓	✓	✓	✓	✓	✓	✓	✓	✓
Compare logic generates synchro trigger signal		✓	✓		on request			on request	on request
Timer function generates synchro trigger signal	✓	✓	✓						
Cascading	✓	✓	✓	✓	✓	✓	✓	✓	✓
Degree of protection	IP 65	IP 65	IP 65	IP 65	IP 65	IP 65	IP 65	IP 65	IP 65
Temperature range from – 40°C to + 85°C	✓	✓	✓	✓	✓	✓	✓	✓	✓
Dimensions (mm)	215 x 110 x 50	215 x 110 x 54	215 x 110 x 54	215 x 110 x 50	154 x 110 x 54	215 x 138 x 50	215 x 138 x 50	215 x 138 x 50	215 x 138 x 50
Digital I/O, 24 V, status LEDs	16	16	16						
Event logic	✓								
Input filter configuration through software	✓								
M12 female connector, 5-pin (for 2 inputs or outputs)	8	8	8						
Multifunction counter		✓	✓						
Incremental counter inputs (A, B, C, D signals)				4					
Sin/Cos counter inputs (A, B, C signals) 1 V _{pp} (MSX-E1711) or 11µA _{pp} (MSX-E1721)		4							
M23 female connector, 12-pin for incremental counter and Sin/Cos counter 1 V _{pp} (MSX-E1711), or 9-pin for Sin/Cos counter 11µA _{pp} (MSX-E1721)		4	4						
5 V inputs, RS422, 24 V inputs optional			✓						
Max. input frequency		250 kHz (depending on the resolution)		5 MHz					
Analog input					4x4 channels, diff.		16/8 diff. channels	16/8 diff. channels	
Resolution					16-bit		24-bit	24-bit	
Type					V / A		Thermocouples/ RTD	Strain gauges	
Connector					16 x M12 5-pin female connector		8 x M12 8-pin female connector	8 x M12 8-pin female connector	
Simultaneous acquisition					up to 4 channels		8 channels	8 channels	
Throughput					up to 100 kHz		up to 1 kHz	up to 1 kHz	
Input ranges					± 5 V, ± 10 V				
Current inputs (PC-Diff option)					0(4)-20 mA				
Analog output, 16-bit							8		
M12 female connector, 5-pin							8		
Output ranges							0-10 V, ± 10 V		
Current outputs							0-20 mA		
Lengths measurement									
Number of transducers (half-bridge, LVDT, Mahr)									
5-pin M18 female connector									
Simultaneous acquisition									
Temperature input for Pt100									
Page	38	40	40		42 / 44		46	48	50
Software	Current driver list on the web: www.addi-data.com								

New!

Common specifications for all MSX-E systems

Acquisition of dynamic signals	Length measurement			Serial interfaces
	MSX-E3711	MSX-E3701	MSX-E3700	
MSX-E3601	MSX-E3711	MSX-E3701	MSX-E3700	MSX-E7511
✓	✓	✓	✓	✓
✓	✓	✓	✓	✓
✓	✓	✓	✓	✓
✓	✓	✓	✓	✓
	✓			on request
	✓	✓	✓	
✓	✓	✓	✓	✓
IP 65	IP 65	IP 65	IP 40	IP 65
✓	✓	0°C to +60°C (-40°C to +85°C) on request	0°C to +60°C	✓
215 x 110 x 50	215 x 110 x 54	215 x 110 x 50	215 x 110 x 39	215 x 138 x 50
				Serial interfaces RS232, RS422, RS485, 20mA CL
	1			
	1			
	✓			
	5 MHz			
8 SE, diff., ICP				
24-bit				
V / A / ICP				
8 x BNC				
up to 8 channels				
up to 128 kHz				
± 5 V, ± 10 V				
0(4)-20 mA				
	24-bit	24-bit	24-bit	
	8	4 / 8 / 16	4 / 8 / 16	
	8	4 / 8 / 16	4 / 8 / 16	
	✓			
	✓			
52	56	60	60	64

Voltage supply

Nominal voltage :	24 V 
Supply voltage:	18-30 V
Optical isolation:	1000 V
Reverse voltage protection:	1 A max. (except MSX-E3711)

Connectors

24 VDC input	1 x 5-pin flange connector M12
24 VDC output	1 x 5-pin flange-type socket M12

Ethernet

Interface	Ethernet acc. to IEEE802.3 specification	
Number of ports:	2	
Cable length:	150 m	max. at CAT5E UTP
Bandwidth:	10 Mbps	auto-negotiation
	100 Mbps	auto-negotiation
Protocol:	10Base-T	IEEE802.3 compliant
	100Base-TX	IEEE802.3 compliant
Optical isolation:	1000 V	
MAC address:	00:0F:6C:##:##:##, unique for each device	
Connectors		
Ethernet:	2 x 4-pin flange-type socket, D-coded M12 for Port 0 and Port1	

Trigger

Number of inputs:	1 trigger input
Number of outputs:	1 trigger output
Filters/protective circuit:	Low-pass/transorb diode
Optical isolation:	1000 V
Nominal voltage:	24 V external
Input voltage:	0 to 30 V
Input current:	11 mA at 24 VDC, typical
Input frequency (max.):	2 MHz at 24 V

Connectors, common with synchro

Trigger input :	1 x 5-pin flange connector M12
Trigger output:	1 x 5-pin flange-type socket M12

Synchro

Number of inputs:	1
Number of outputs:	1
Max. cable length:	20 m
Optical isolation:	1000 V
Signal type:	RS485
Connectors, common with trigger	
Synchro input:	1 x 5-pin flange connector M12
Synchro output:	1 x 5-pin flange-type socket M12

EMC – Electromagnetic compatibility

The product complies with the European EMC directive. The tests were carried out by a certified EMC laboratory in accordance with the norm from the EN 61326 series (IEC 61326). The limit values as set out by the European EMC directive for an industrial environment are complied with. The respective EMC test report is available on request.













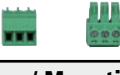
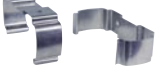






DatabaseConnect

Database connection

DatabaseConnect is an easy-to-use database interface software which does not require any programming skills.

DatabaseConnect stores measurement data which has been acquired through MSX-E Ethernet systems directly into databases via standard Ethernet. System requirements and other important product information see the datasheet on page 66

Accessories for the Ethernet systems

		Digital I/O, 24 V	Multifunction counter
		MSX-E1516	MSX-E1711 MSX-E1721 MSX-E1701
Cable			
	Power Supply Shielded cable, M12 5-pin female connector/open end, IP65 CMX-20 (1.5 m), CMX-21 (3 m), CMX-22 (5 m), CMX-23 (10 m), CMX-29 (Length on request)	✓	✓
	Voltage Supply – Cascading Shielded cable, M12 5-pin female connector/male connector, IP65 CMX-38 (0.6 m), CMX-30 (1.5 m), CMX-31 (3 m), CMX-32 (5 m), CMX-39 (Length on request)	✓	✓
	Trigger / Synchro Shielded cable, M12 5-pin female connector/open end, IP65 CMX-40 (1.5 m), CMX-41 (3 m), CMX-42 (5 m), CMX-43 (10 m), CMX-49 (Length on request)	✓	✓
	Trigger / Synchro – Cascading Shielded cable, M12 5-pin female connector/male connector, IP65 CMX-58 (0.6 m), CMX-50 (1.5 m), CMX-51 (3 m), CMX-52 (5 m), CMX-59 (Length on request)	✓	✓
	Ethernet CAT5E cable, M12 D-coded male connector/RJ45 connector CMX-60 (2 m), CMX-61 (5 m), CMX-62 (10 m), CMX-69 (Length on request)	✓	✓
	Ethernet – Cascading CAT5E cable, 2 x M12 D-coded male connector CMX-78 (1 m), CMX-70 (2 m), CMX-71 (5 m), CMX-72 (10 m), CMX-79 (Length on request)	✓	✓
	Connecting peripheral equipment Shielded cable, M12 5-pin male connector/open end, IP65 CMX-81 (3 m), CMX-89 (Length on request)	✓	✓
Screw connector binders for voltage supply			
	SMX-10 Standard 3-pin binder, 5.08 mm grid, 1-row screw connector, included in the delivery content	-	-
	SMX-11 3-pin binder, 5.08 mm grid, 2-row screw connector	-	-
	SMX-12 3-pin binder, 5.08 mm grid 2-row, spring-cage connector	-	-
Screw connector binders for Trigger / Synchro			
	SMX-20 Standard 3-pin binder, 5.08 mm grid included in the delivery content	-	-
Options / Mounting			
	MX-Clip 2 clips for DIN-rail mounting or for direct mounting on units.	✓	✓
	MX-Rail Assembly equipment for DIN-rail mounting. Please specify when ordering!	✓	✓
	MX-Screw Assembly equipment for direct mounting on machines	✓	✓
Options / Protection caps			
	PCMX-10 5 pc. protection caps for M12 connectors (4 x female, 1 x pin)	✓	✓
	PCMX-11 10 pc. protection caps for M18 connectors	-	-
	PCMX-12 1 pc. protection cap for M23 connector	-	✓
	PCMX-13 10 pc. protection caps for M12 connectors	✓	✓

Analog input	Analog output	Temperature measurement	Pressure measurement	Acquisition of dynamic signals	Length measurement			Serial interfaces
MSX-E3011 New! MSX-E3021	MSX-E3511	MSX-E3211	New! MSX-E3311	MSX-E3601	MSX-E3711	MSX-E3701	MSX-E3700	New! MSX-E7511
✓	✓	✓	✓	✓	✓	✓	-	✓
✓	✓	✓	✓	✓	✓	✓	-	✓
✓	✓	✓	✓	✓	✓	✓	-	✓
✓	✓	✓	✓	✓	✓	✓	-	✓
✓	✓	✓	✓	✓	✓	✓	-	✓
✓	✓	-	-	-	-	-	-	-
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-	-	-	-	-	-	-	✓	-
-	-	-	-	-	-	-	✓	-
✓	✓	-	-	✓	✓	✓	✓	-
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