Ethernet analog input module
16 analog inputs, differential, 16-bit

New!*

ARM®9 Technology

MSX-E3011

16 analog inputs, differential, 16-bit

Trigger / Synchro

Degree of protection IP 65

Cascadable

Extended temperature range

- 40° C to + 85° C

RoHS 2002/95/EC

More information on www.addi-data.com

The intelligent Ethernet analog input module MSX-E3011 is designed for demanding measuring tasks. 16 differential analog inputs (Throughput: 25 kHz/channel) are available. The modules can be cascaded, which allows to synchronouslyise numerous channels in a phase-accurate manner.
The distributed platform is based on ARM®9 technology. The cascading of the modules via the 2-port Ethernet switch avoid the separate connection of each module to the computer. The external trigger signal (hardware trigger) can also be synchronised from one module to the next. Furthermore, the I/O modules can be synchronised. Thanks to the combination of trigger signal synchronisation and cascading, data from several modules can be acquired simultaneously.

Features

- Extended temperature range - 40° C to + 85° C
- Fast distributed data acquisition
- Dynamic measurement via 24 V digital trigger input
- Synchronisation of several modules
- 64 MB onboard SDRAM for storing data
- Onboard ARM®9 32-bit processor
- Integrated Ethernet switch
- Cascading of all MSX-E module types
- Cascading of the 24 V supply
- Complies with the degree of protection IP 65
- Robust metal housing
- Power Save Mode: Reduced power consumption when no acquisition runs
- LED status display for fast error diagnostics

Analog inputs

- M12 female connector
- 16 differential inputs
- 16-bit resolution
- Throughput max. 100 kHz, up to 4 simultaneous sampling channels
- Input voltage: ± 5 V, ± 10 V (16-bit)
  0-5 V, 0-10 V (15-bit)
- Current inputs optional

Acquisition modes:

- Auto Refresh mode: Automatic update of the acquired data in the background
- Sequence mode: Data acquisition in „packages"
- Acquisition triggered through trigger input

Safety features

- Optical isolation
- Input filters
- Overvoltage protection ± 40 V
- Internal temperature monitoring

Applications

- Industrial process control, measurement
- Industrial measurement and monitoring
- Multichannel data acquisition
- Control of chemical processes
- Factory automation

Interfaces

- Fast 24 V trigger input
- Ethernet switch with 2 ports
- Synchronisation/trigger In/Out
- 24 V supply and cascading

Communication interface

- Web server (configuration and monitoring)
- Access via TCP/IP socket
- Command server (SOAP) for sending commands
- Data server (TCP/IP or UDP socket) for sending acquisition data
- Event server (TCP/IP socket) for sending module events (Diagnostics such as temperature, short-circuits...)
- Access via UDP
- Command server (MODBUS) for sending commands

Software:

- Software drivers for Windows Vista™ (32-bit)/XP/2000
- ADDIPACK (not all functions are supported)
- Direct access via SOAP (TCP/IP)
- Direct access via MODBUS (UDP)
- Programming examples .net2003, VC++ 6.0
- LABVIEW from 8.20 on request

*Preliminary product information

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Ethernet analog input module
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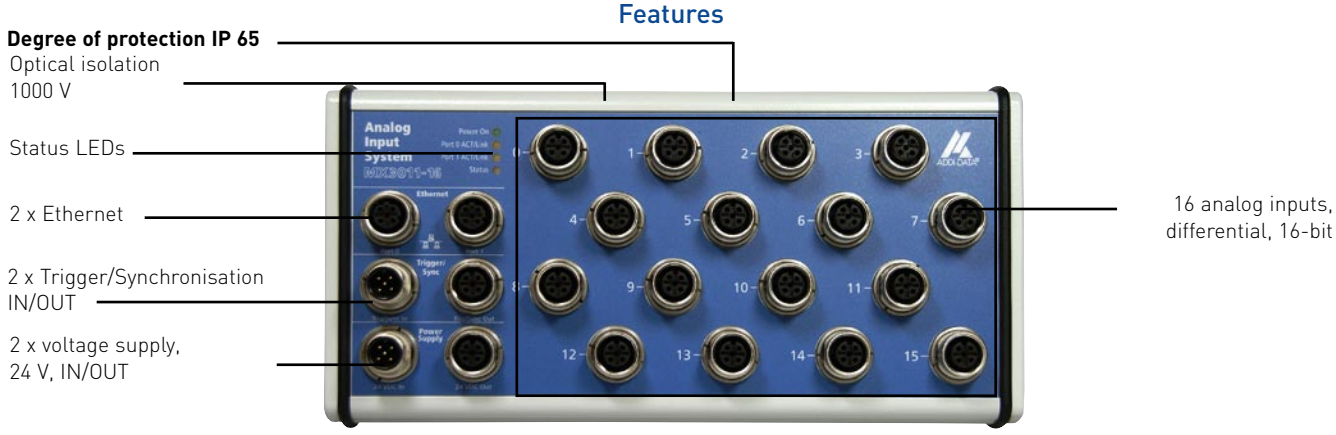
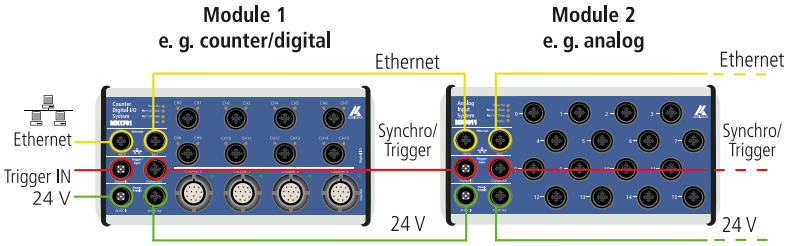
Features

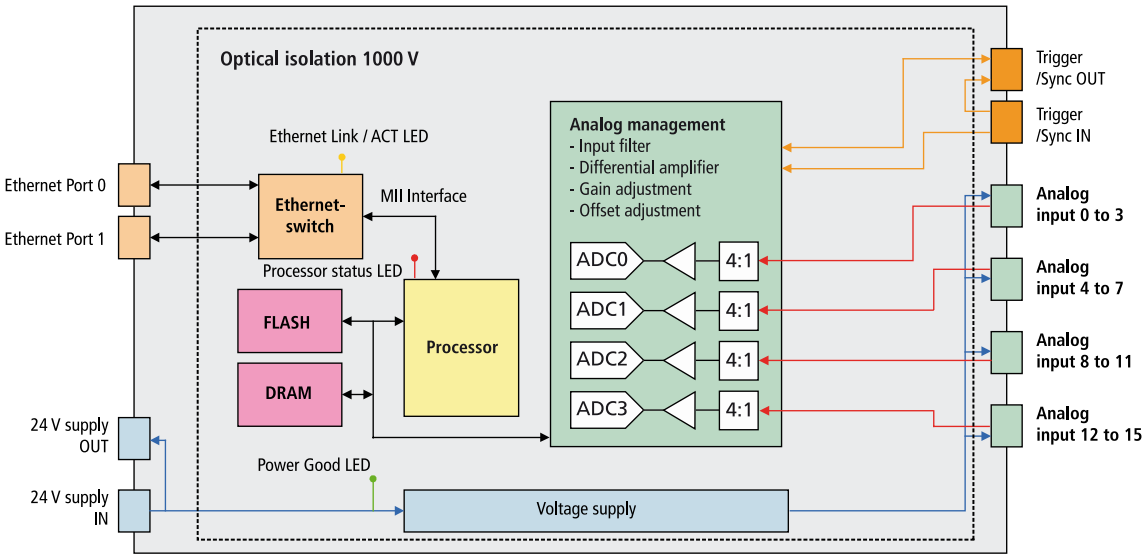


Synchronisation

Ethernet, synchronisation and supply signals can be put through from one module to the next. In this way, you can acquire and process distributed I/O signals directly at production machines. These features allow the I/O modules to be used for simple, distributed applications and for complex applications, in which numerous devices have to interact with signals that are far away from each other.



Simplified block diagram



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Analog inputs

Number/type	16 differential inputs
Architecture	4 groups of 4 channels 4-port simultaneous converter with one 4-channel multiplexer per converter
Resolution	16-bit, SAR ADC
Accuracy	On request
Relative precision (INL)	± 3 LSB max. (ADC)
Optical isolation	1000 V
Input ranges	± 5 V, ± 10 V software-programmable
Throughput	100 kHz max. error < 0.01 % FSR
Gain	x1, x2, software-programmable
Common mode rejection	80 dB min. DC up to 60 Hz
Input impedance (PGA)	10^9 Ω // 10nF against GND
Bandwidth (-3dB)	160 kHz limited through TP filters 16 Hz version with differential filter
Trigger	Digital input, synchro, software-programmable
Offset error	On request
Gain error	On request
On request	
Temperature drift V_{in}: input voltage in Volt (-10 V ≤ V_{in} ≤ +10 V) In the temperature range: from -40°C to +85°C	2.3 x V_{in} + 22.5 (µ V/ °C) typ. 4.5 ppm/°C FSR

Supply voltage

Nominal voltage	24 V ⎓
Supply voltage	18-30 V
Optical isolation	1000 V
Current consumption at 24 V	160 mA
Voltage reversal protection	1 A max.

Ethernet

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	

Trigger input

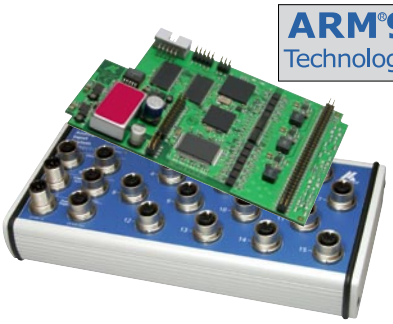
Number of inputs	1 trigger input
Filters/Protective circuitry	Low-pass/transorb diode
Optical isolation	1000 V
Nominal voltage	24 V external
Input voltage	0 to 30 V
Input current	11 mA at 24 VDC, typical
Input frequency (max.)	2 MHz at 24 V

Synchro

Number of inputs	1
Number outputs	1
Max. Cable length	20 m
Optical isolation	1000 V
Signal type	RS485

System requirements

Interface	Ethernet acc. to specification IEEE802.3
Dimensions	215 x 110 mm x 51 mm
Weight	850 g
Degree of protection	IP 65
Function connectors	
Ethernet	2x 4-pin flange type socket, D-coded M12 for Port 0 and 1Port1
Trigger/Synchro input	1 x 5-pin flange connector M12
Trigger/Synchro output	1 x 5-pin flange type socket M12
24 VDC input	1 x 5-pin flange connector M12
24 VDC output	1 x 5-pin flange type socket M12
Connectors for sensors	
For analog inputs	8 x 5-pin flange type socket M12



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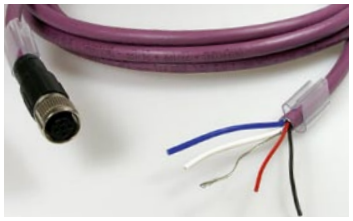
cable

Power Supply

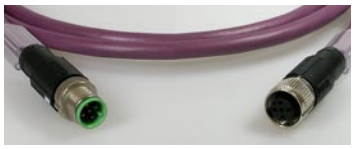
Shielded cable,
M12 5-pin cable box/open end,
IP 65
CMX-20: 1.5 m
CMX-21: 3 m
CMX-22: 5 m
CMX-23: 10 m
CMX-29: On request

For cascading
Shielded cable,
M12 5-pin cable box/connector
IP 65
CMX-38: 0.6 m
CMX-30: 1.5 m
CMX-31: 3 m
CMX-32: 5 m
CMX-39: On request

Trigger/Synchro



Shielded cable,
M12 5-pin cable box/open end,
IP 65
CMX-40: 1.5 m
CMX-41: 3 m
CMX-42: 5 m
CMX-43: 10 m
CMX-49: On request



For cascading
Shielded cable,
M12 5-pin cable box/connector
IP 65
CMX-58: 0.6 m
CMX-50: 1.5 m
CMX-51: 3 m
CMX-52: 5 m
CMX-59: On request

Ethernet

CAT5E cable,
M12 D-coded cable connector/
RJ45 connector
CMX-60: 2 m
CMX-61: 5 m
CMX-62: 10 m
CMX-69: On request

For cascading
CAT5E cable,
2 x M12 D-coded cable con-
nector
CMX-78: 1 m
CMX-70: 2 m
CMX-71: 5 m
CMX-72: 10 m
CMX-79: On request

Connection to peripherals

Shielded cable,
M12 5-pin cable box/open end,
IP 65
CMX-81: 3 m

Options

MX-Rail: for DIN-rail mounting

MX-Screw: for wall mounting

PCMX-10: Protection cap
for M12 connector
(without illustration)

PCMX-13:
Protection cap
for M12 connector

Ordering information

MSX-E3011

Ethernet analog input module, 16 analog inputs, differential, 16-bit. Incl. technical description and software drivers.

Option

Please indicate the number of channels
PC-Diff: Current input 0(4)-20 mA for 1 input, diff.

Connection cables

Voltage supply
Shielded cable, M12 5-pin cable box/open end, IP 65
CMX-20: 1.5 m **CMX-21:** 3 m
CMX-22: 5 m **CMX-23:** 10 m
CMX-29: Cable length on request

For cascading:
Shielded cable, M12 5-pin cable box/connector IP 65
CMX-38: 0.6 m **CMX-30:** 1.5 m
CMX-31: 3 m **CMX-32:** 5 m
CMX-39: Cable length on request

Trigger/Synchro
Shielded cable, M12 5-pin cable box/open end, IP 65
CMX-40: 1.5 m **CMX-41:** 3 m
CMX-42: 5 m **CMX-43:** 10 m
CMX-49: Cable length on request
For cascading:
Shielded cable, M12 5-pin cable box/connector IP 65
CMX-58: 0.6 m **CMX-50:** 1.5 m
CMX-51: 3 m **CMX-52:** 5 m
CMX-59: Cable length on request

Ethernet
CAT5E cable, M12 D-coded cable connector/RJ45 connector
CMX-60: 2 m **CMX-61:** 5 m
CMX-62: 10 m **CMX-69:** Cable length on request

For cascading: CAT5E cable, 2 x M12 D-coded cable connector
CMX-78: 0.6 m **CMX-70:** 2 m
CMX-71: 5 m **CMX-72:** 10 m
CMX-79: Cable length on request

Connection to peripherals
Shielded cable, M12 5-pin cable box/open end, IP 65
CMX-81: 3 m

Options

MX-Rail: Mounting set for DIN-rail mounting
MX-Screw: Mounting set for direct mounting on devices and machines
PCMX-10: 5 protection caps for M12 connector (4 x female, 1 x male) for Ethernet, trigger/synchro, power
PCMX-13: 10 protection caps for M12 box (analog)

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