Ethernet multifunction counter module
4 counter inputs and 16 digital I/O, 24 V

New!*

MSX-E1701

4 incremental counter inputs, each with A, B, C (index) and D (ref.) signals, status LEDs

16 digital I/O, 24 V, status LEDs

Trigger / synchro

Degree of protection IP 65,

M12 and M23 connector

Cascadable

Extended temperature range

- 40° C to + 85° C

RoHS 2002/95/EC

More information on www.addi-data.com

The intelligent Ethernet I/O module MSX-E1701 combines two functionalities: Four incremental counter inputs for encoder acquisition and 16 digital inputs/outputs, 24 V. Several modules can be cascaded via the two-port Ethernet switch to avoid the separate connection of each module to the computer. The externel trigger signal (hardware trigger) can also be synchronised from one module to the next one. 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
- Dynamic measurement via 24 V digital trigger input
- Synchronisation of several modules
- ARM®9 32-bit processor
- 64 MB onboard SDRAM for storing data
- 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

Counter

- M23 female connector
- 4 x 32-bit incremental counter for the acquisition of incremental encoders
- Counting frequency 5 MHz (direct mode)
- Inputs in RS422 or 24 V available
- A, B (incremental signal inputs), C (Index signal input) and D (ref.) signals
- Compare logic
- Single, double, quadruple edge analysis, direct mode up/down counter
- Supply voltage of the incremental measurement transducers: 24 V or 5 V, protective filter
- Status LEDs for incremental counter input A/B

Digital

- M12 female connector
- 8 x 2 digital lines, 24 V, which can be parameterized as inputs or outputs
- 2 lines on each M12 connector
- Optical isolation 1000 V
- All inputs are filtered
- High-side outputs
- Output current per channel 500 mA (with current limit at 1.85 A at 20°C per 8-channel group)
- Shutdown logic
- Watchdog for resetting the outputs to „0“
- At Power-On the outputs are set to „0“
- Electronic fuse
- Dual LED for all 24 V digital I/O with direction indication

Safety features

- Optical isolation 1000 V
- Overtemperature and voltage reversal protection
- Internal temperature monitoring
- Input filter
- Short-circuit protection
- Overvoltage protection 30 V

Applications

- Event counting
- Position acquisition
- Industrial I/O control
- PLC-coupling
- Signal switching

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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4 counter inputs and 16 digital I/O, 24 V

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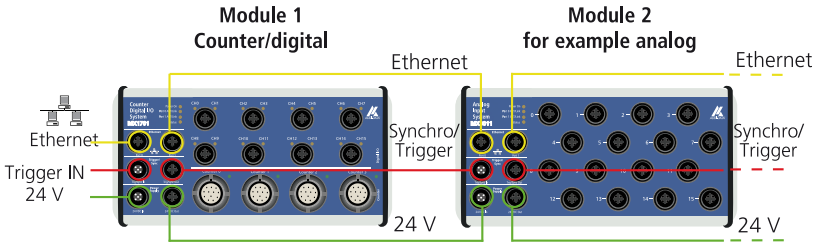
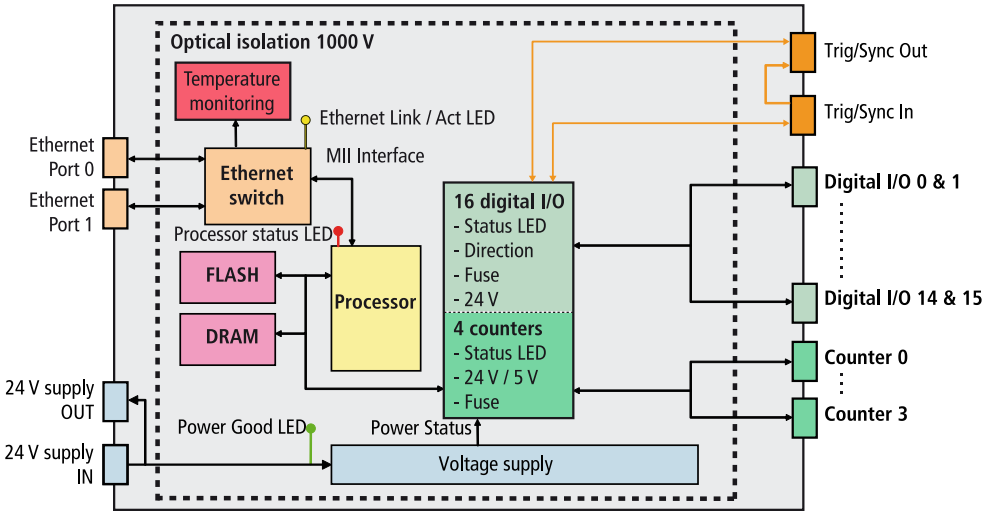
Features

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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Counter

Number of inputs	4 incremental counter inputs each with A, B, C and D signals
5 V inputs (Version MSX-E1701)	
Differential inputs	Complies with the EIA-Standards RS422A
Input type	Differential inputs or TTL
Common mode range	+12 / -7 V
Input sensitivity	± 200 mV
Input hysteresis	50 mV typ.
Input impedance	12 kΩ min.
Max. input frequency	5 MHz (direct mode)
„Open Circuit Fail Safe Receiver Design"	„1" = inputs open
ESD protection	Up to ±15 kV
24 V inputs (Version MSX-E1701-24)	With this version, you can connect 24 V encoders Only 24 V signals can be connected to the inputs.
Nominal voltage	24 VDC
Max. input frequency	1 MHz at nominal voltage
Input impedance	> 1 MΩ
Logic input levels:	
UH (max.)	30 V typ.
UH (min)	18 V typ.
UL (max.)	16 V typ.
UL (min)	0 V typ.
Voltage supply	of the incremental encoder selectable, 5 V or 24 V, max. 500 mA

Digital inputs

Number of inputs	16, 2 per female connector Common ground acc. to IEC 1131-2
Overvoltage protection	30 V
Optical isolation	1000 V through opto-couplers
Nominal voltage	24 VDC
Input voltage	0 to 30 V
Input impedance	> 1 MΩ
Logic input levels:	
UH (max.)	30 V typ.
UH (min)	18 V typ.
UL (max.)	16 V typ.
UL (min)	0 V typ.

Digital outputs

Number of outputs	16, 2 per female connector	
Optical isolation	1000 V through opto-couplers	
Output type	High Side, load against mass acc. to IEC 1131-2	
Nominal voltage	24 V	
Supply voltage	18 V-30 V	
Current (max.)	1.85 A typical for 8 channels through PTC	
Output current per output	500 mA max.	
Short-circuit current per output	1.7 A max.	Shut-down logic at 24V, R_{load}=10mΩ
RDS ON resistance	280 mΩ	max.
Switching-on time	100 µs	max. RL=48 Ω from 80 % V_{out}
Switching-off time	150 µs	max. RL=48 Ω from 10 % V_{out}
Overtemperature (shutdown)	135°C max. (output driver)	
Temperature hysteresis	15°C typ. (output driver)	
Diagnostics	Common diagnostics bit for all 16 channels at overtemperature of one channel	

Voltage supply

Nominal voltage	24 V ⎓
Supply voltage	18-30 V
Optical isolation	1000 V
Current consumption at 24 V	160 mA without load
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

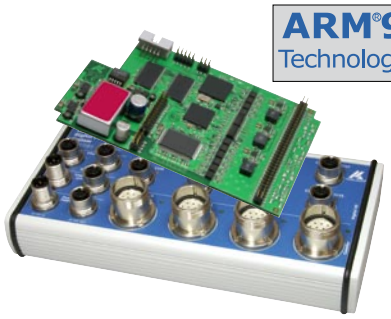
Synchro

Number of inputs	1
Number of 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 mm x 110 mm x 54 mm
Weight	900 g
Degree of protection	IP 65
Function connectors	
Ethernet	2x 4-pin flange type socket, D-coded M12 for Port 0 and Port1
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 the digital I/O	8 x 5-pin flange type socket M12
For the counter	4 x 12-pin. flange type socket M23

ARM®9 Technology



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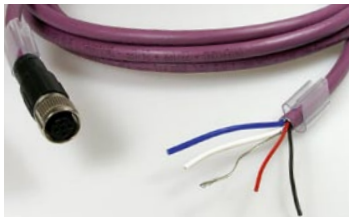
Cables

Power Supply

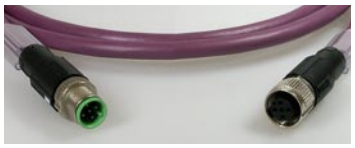
Shielded cable,
M12 5-pin cable box/open end,
IP 65
CMX-20: 1.5 m
CMX-21: 3 m
CMX-22: 5 m
CMX-23: 10 m
CMX-29: On request

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
connector
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 illustr.)

PCMX-12:
Protection cap
for M23 connector
(without illustr.)

PCMX-13:
Protection cap
for M12
connector

Ordering information

MSX-E1701

Ethernet multifunction counter module, 4 counter inputs and 16 digital I/O, 24 V. Incl. technical description and software drivers.

Versions

MSX-E1701: For 5 V RS422 counter inputs
MSX-E1701-24: For 24 V counter inputs

Connection cables

Voltage supply

Shielded cables, 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 cables, 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 cables, 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 cables, 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 cables, 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 cables, 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 cables, 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 or machines
PCMX-10: 5 protection caps for M12 connector (4 x female, 1 x male) for Ethernet, trigger/synchro, power
PCMX-12: 1 protection cap for M23 connector (counter)
PCMX-13: 10 protection caps for M12 connector (digital)

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