Ethernet counter system
3 sin/cos counter inputs 1 V_{pp} , 1 analog input, 24-bit

New!*

MSX-E1741-1VPP

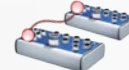| 3 sin/cos counter inputs 1 V_{pp} |
| 1 analog input |
| 24 V digital trigger input |
| M12 and M23 connectors |

Integrated Ethernet switch

+ 85 °C*
- 40 °C

IP 65

ARM®9 Technology
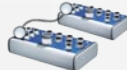
Cascadable, can be synchronised in the µs range

Timer function or compare logic for synchro trigger signal

*Operating temperature

RoHS 2002/95/EC

on request

DatabaseConnect
see page 72

More information on
www.addi-data.com

Features

- 24 V digital trigger input
- ARM®9 32-bit processor
- 64 MB onboard SDRAM for storing data
- Robust standardized metal housing
- Power Save Mode: Reduced power consumption when no acquisition runs

Safety features

- Status LEDs for fast error diagnostics
- Optical isolation 1000 V
- Input filters

Counter

- 3 x 32 bit sin/cos counter inputs 1 V_{pp}, 250 kHz
- Voltage supply of the sensors via M23 female connectors (5 V)
- Compare logic
- Status LED for counter inputs

Analog input

- 1 diff./SE inputs, 24-bit, 4-pin M12 female connector
- Sampling frequency 100 kHz/channel max.

Interfaces

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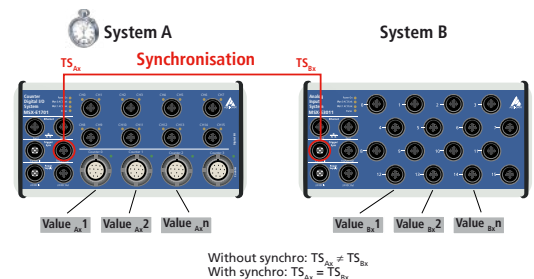- Line in for 24 V supply and cascading

Communication interfaces

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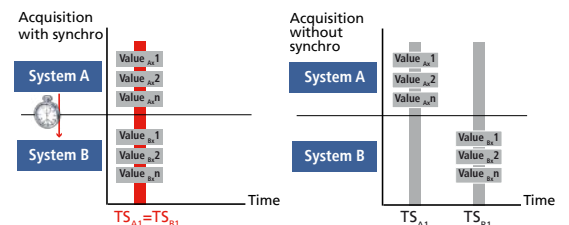- Command server Modbus TCP and Modbus (UDP) for sending commands

Synchronisation/time stamp

Time stamp

Several MSX-E systems can be synchronised with one another in the µs range through a synchro connection. This allows to start a synchronous data acquisition, to generate trigger events and to synchronise the time on several MSX-E systems. Furthermore, the systems have a time stamp that logs the point in time at which the data was acquired by the system.

System A   Synchronisation   System B

TS_{Ax} TS_{Bx}

Value$_{Ax}$1   Value$_{Ax}$2   Value$_{Ax}$n   Value$_{Bx}$1   Value$_{Bx}$2   Value$_{Bx}$n

Without synchro: $TS_{Ax} \neq TS_{Bx}$
With synchro: $TS_{Ax} = TS_{Bx}$

The combination of synchronisation and time stamp (TS) allows the clear allocation of signals that were captured by several systems.

Acquisition with synchro

System A
Value$_{Ax}$1
Value$_{Ax}$2
Value$_{Ax}$n

System B
Value$_{Bx}$1
Value$_{Bx}$2
Value$_{Bx}$n

$TS_{A1}=TS_{B1}$ Time

Acquisition without synchro

System A
Value$_{Ax}$1
Value$_{Ax}$2
Value$_{Ax}$n

System B
Value$_{Bx}$1
Value$_{Bx}$2
Value$_{Bx}$n

TS_{A1} TS_{B1} Time

Acquisition modes

Acquisition modes – There are 2 different possibilities for reading the counter inputs.
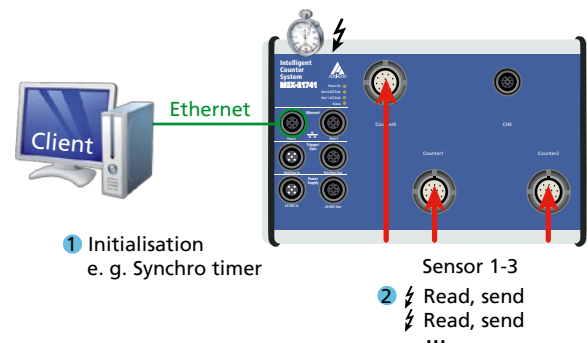
1. Asynchronous acquisition

With the asynchronous acquisition, the counter inputs can be read out via SOAP or Modbus function. For each function call, the values of one channel are transmitted.

① Read command
③ Position values
Sensor 1-3
② Read
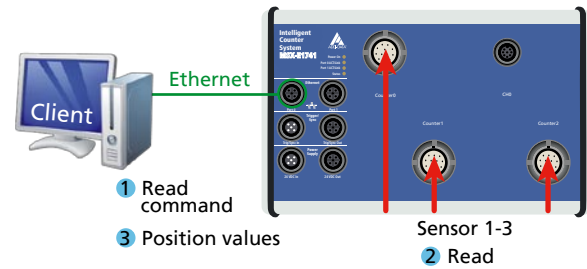
2. Synchronous acquisition

With the synchronous acquisition, the inputs are first initialised and then the acquisition is parameterised. The acquisition runs automatically depending from a trigger source.
Either the 24V trigger input or a synchro trigger can be used as trigger source.

① Initialisation e. g. Synchro timer
Sensor 1-3
② Read, send
Read, send
…

Synchro latch

A periodic acquisition of the counter inputs is possible using the synchro timer (synchro latch). Several MSX-E systems (of same or different types) can be combined through synchro trigger. With the synchronous acquisition, as soon as there are measurement values available, they are sent to the clients via socket connection.

Compare logic

With the compare logic, a synchro-trigger signal can be generated in order to latch the counter value as soon as the counter value is equal to the compare value.
With the additional „Modulo-Mode" (Modulo Compare), a trigger can also be generated at the n value of the compare value.
Thus it is possible, e. g. when using an encoder with 3,600 steps / revolution to obtain each degree of a measurement value (Modulo Compare = 10).
The thus generated synchro-trigger can also be used for data acquisition on further MSX-E systems.

② Counter
0
1 2 3 4 5 6 7 8 9 10
11 12 … 20
21 22 … 30
…
① Modulo Compare = 10
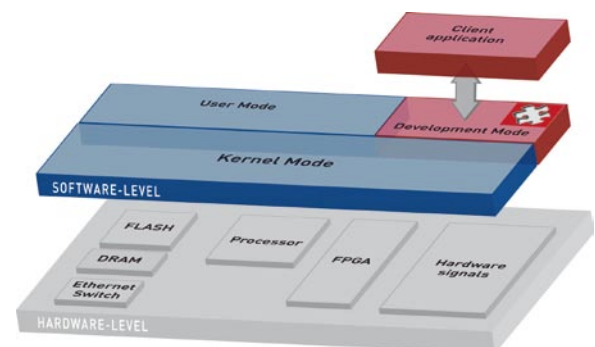**③** Send data
③ Send data
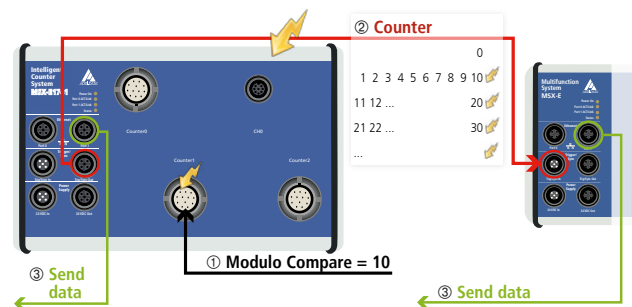
Index logic

The Index track of the encoder can also be used as trigger source. Either the selected edge of the index signal can directly start the acquisition or a synchro-trigger can be generated and then used on further MSX-E systems. Furthermore, the index signal can be used to delete the counter channel.

Onboard programming / stand-alone operation

Development mode

With the Development mode of the MSX-E systems you can customise your measurement, control and regulation applications to fit your requirements. The programs run directly on the MSX-E systems, which has two advantages: external PCs are relieved and you can process data freely according to your requirements. This helps you to improve the efficiency of your processes and to secure your investments.

*Preliminay product information

Phone: +49 7229 1847-0   info@addi-data.com
Fax: +49 7229 1847-222   www.addi-data.com

ConfigTools

The **ConfigTools** program allows an easy administration of the MSX-E systems. These are automatically detected in the network. **ConfigTools** consists of common and specific functions.
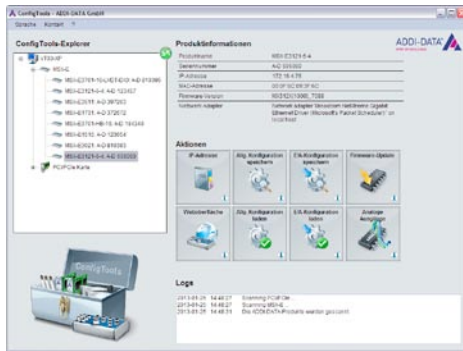
In addition, with **ConfigTools**, the complete configuration of a MSX-E system can be saved and transferred to another system of the same type (clone function).

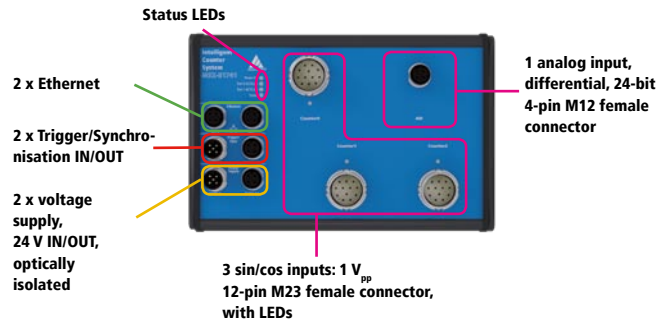**ConfigTools** is included in the delivery.

ConfigTools functions for MSX-E1741-1VPP:
- Change of IP address
- Display of web interface
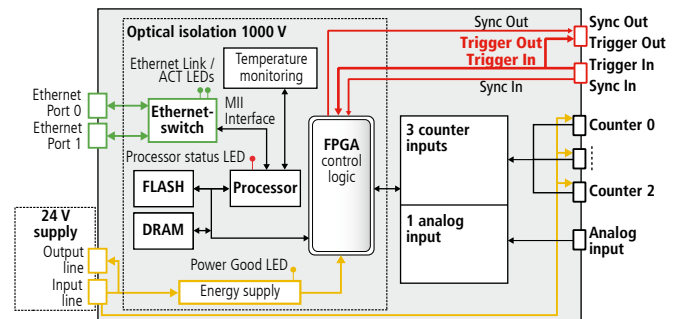- Firmware update
- Save/load system configuration

Very easy use through the „ConfigTools" program; The MSX-E system is automatically detected in the network.
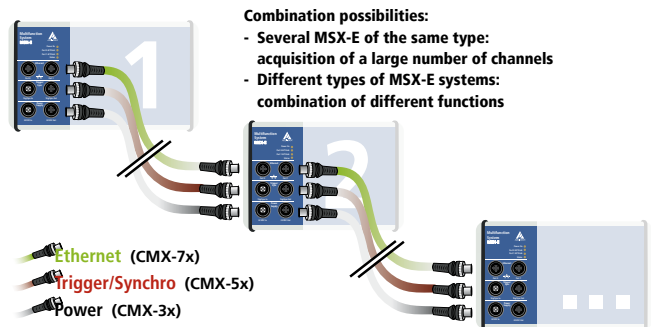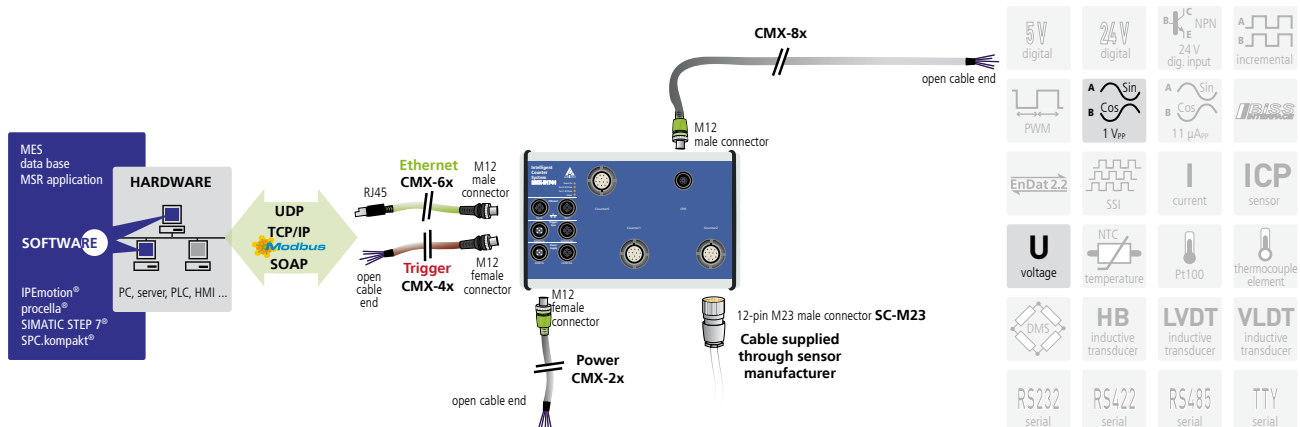

Features

- Status LEDs
- 2 x Ethernet
- 2 x Trigger/Synchro-nisation IN/OUT
- 2 x voltage supply, 24 V IN/OUT, optically isolated
- 1 analog input, differential, 24-bit 4-pin M12 female connector
- 3 sin/cos inputs: 1 V$_{PP}$ 12-pin M23 female connector, with LEDs

Simplified block diagram

Cascading

Combination possibilities:
- Several MSX-E of the same type: acquisition of a large number of channels
- Different types of MSX-E systems: combination of different functions

Ethernet **(CMX-7x)**
Trigger/Synchro **(CMX-5x)**
Power **(CMX-3x)**

ADDI-DATA connection technology

* Preliminay product information

Phone: +49 7229 1847-0   info@addi-data.com
Fax: +49 7229 1847-222   www.addi-data.com

ADDI-DATA
SPIRIT OF EXCELLENCE

Specifications*

Sin/cos counter inputs

Number of inputs:	3 x sin/cos counter inputs, each with A, B, C signals
Resolution:	32-bit
Differential inputs:	1 V_{pp}
Interpolation factor:	up to 8192
Max. input frequency:	max. 250 kHz (at min. interpolation)
ESD protection:	2 kV

Analog input

Number/type:	1 differential / single-ended input (software-selectable)
Resolution:	24-bit
Optical isolation:	1000 V
Input ranges:	± 10 V, ± 1 V, ± 100 mV, ± 10 mV (24-bit), 0-10 V, 0-1 V, 0-100 mV, 0-10 mV (23-bit), software-programmable, current input 0(4) – 20 mA optional
Sampling frequency:	100 kHz
Gain:	x1, x10, x100, software-programmable
Trigger:	digital input, synchro, software-programmable

Voltage supply, Ethernet, Trigger, Synchro

The specifications for the voltage supply, Ethernet, Trigger, Synchronisation and Electromagnetic Compatibility apply to all MSX-E systems. See page 27.

System features

Interface:	Ethernet acc. to specification IEEE802.3
Dimensions (mm):	215 x 110 x 54
Weight:	in preparation
Degree of protection:	IP 65
Current consumption at 24 V:	in preparation
Operation temperature:	-40 °C to +85 °C
Connectors for sensors	
Sin/cos counter input 1 V_{pp}:	3 x 12-pin M23 female connector
Analog input:	1 x 4-pin M12 female connector

Ordering information

MSX-E1741-1VPP

Ethernet counter system, 3 sin/cos counter inputs 1 V_{pp}, 1 analog input, 24-bit. Incl. technical description, software drivers and ConfigTools.

Connection cables
Voltage supply
CMX-2x: Shielded cable, M12 5-pin female connector/open end, IP 65
CMX-3x: For cascading, shielded cable, M12 5-pin female connector/male connector IP 65

Trigger/Synchro
CMX-4x: Shielded cable, M12 5-pin female connector/open end, IP 65
CMX-5x: For cascading, shielded cable, M12 5-pin female connector/male connector IP 65

Ethernet
CMX-6x: CAT5E cable, M12 D-coded male connector/RJ45 connector
CMX-7x: For cascading: CAT5E cable, 2 x M12 D-coded male connector

Connection to peripherals
CMX-8x: For the analog input, shielded cable, M12 5-pin male connector/open end, IP 65

Options
S7 Modbus TCP Client Library for S7: Easy use of the Ethernet systems MSX-E with PLCs
MSX-E 5V-Trigger: Level change of the trigger inputs and outputs to 5 V
MX-Clip, MX-Rail (Please specify when ordering!), **MX-Screw, PCMX-1x**

* Preliminay product information