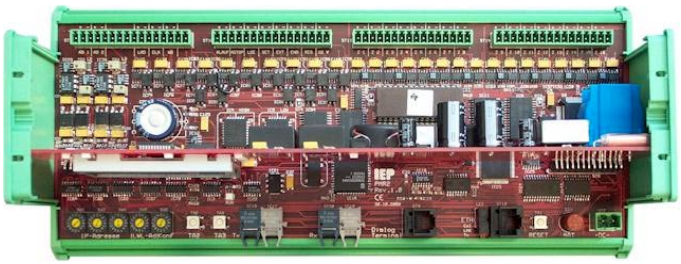
Ingenieurbüro für Echtzeitprogrammierung

IKON

Impuls-**K**ontroller

IEG

Impuls-**E**rfassungs-**G**erät



Pulse counting systems

Digital and Analog
Acquisition – Processing – Evaluation

The controllers **IKON** and **IEG** together with the signal conditioning modules **IVV, MIU** and **SIUx** are making up a complete system for the acqisition, transmission and processing of process signals in digitized form. Standard interfaces serve for their integration into open control concepts, free programmability gives flexibility and assures a long time usability.

Concept

Inputs

The flexibility of the 16 pulse inputs is common to both basic devices. The inputs can be used independently from each other in the following modes of operation:

- Input – reading the actual signal state
- Counters – cascadable 16-Bit-Counter for leading and/or trailing edges, fmax= 750 kHz
- Pulse width measurement – the time between signal slopes can be measured with a resolution of 250 ns.
- Position/angle measurement – two channels in combination can be configured to resolve quadrature signals as presented e.g. by incremental encoders. The resolved position is readable through a 16-bit-register.

Sensor supply

The pulse inputs are galvanically isolated from the controller core and implemented as active circuits in order to provide sensor power supply. The frequency of the input pulses (upto 70 kHz) is measured to determine the physical values.

Each input channel of the **IKON** can supply 18 V / 70 mA to an external sensor and counts pulses due to interruptions in the current flow (I < 4 mA, t >= 2 µs). The available power (> 1 W for each channel) allows to supply the external sensors. The sensors convert analog process signals to digitital pulse trains. Using the current for pulse recognition assures trouble free signal transmission even over long distances without susceptibility to interferences.

Standard-conforming

The inputs of the **IEG** are frequency limited to 3 kHz and follow the S0-Standard of the conventional power meter technology. A current source (I_{nom} = 15 mA, U_{max} = 27 V), whose supply can be connected either internally or externally allows the acquisition of energy import or export signals.

Active WT signals can be used directly to supply the power source.

Outputs

The **IEG** is conceived only as signal acquisition device.

The **IKON** offers additinal in- and outputs and is designed as complete controller.

Digital

The **IKON** provides additional digital signals:

- 7 outputs, 18 V, 70 mA
- 2 active inputs, 18 V, 70 mA
- 2 of the outputs are safeguarded by a watchdog; the watchdog signal is available externally
- 5 of the outputs can also be used as inputs

Analog

Two voltage outputs (0...10V, 16 bits resolution), electrically isolated, can be used as analog setpoint outputs. Using its inputs for incremental encoder acquisition, the **IKON** e.g. can be used as 2 axis control.

Interfaces

IKON and **IEG** integrate themselves into superordinate system by the means of standard communications interfaces.

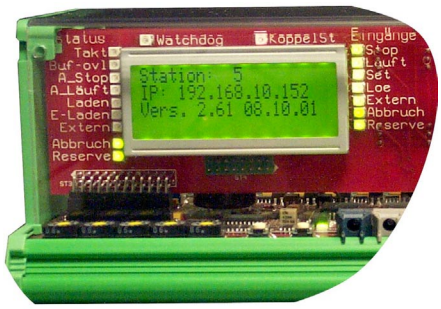
IKON

The **IKON** provides:

- 1 programming and data interface RS-232, 5-wire
- 1 partyline, optical fibre, upto 38400 Baud
- Ethernet 10 Mbit, RJ 45.

ASCII drivers for RS-232 and LWL as well as a TCP/IP stack for Ethernet are in the standard scope of supply. For Ethernet basic services like FTP, Telnet and http are available.

A LCD display 4x20 with background light, two operating keys and 5 application defined configuration switches gives simple operating.



IEG

The **IEG** provides:

- 1 programming und data interface RS-232, 3-wire
- 2 multiprotocol data interfaces RS-232 / RS-485. The physical interface configuration is determined by a link in the external connector.

ASCII drivers are in the standard scope of supply.

Processing core

IKON and **IEG** are based on the same processor core:

- Processor Motorola MC68332.
- Memory: upto 1 MB EPROM for firmware, upto 1 MB Flash for application software, on board programmable, upto 2 MB SRAM, optionally backed up by battery.
- Real-time clock provides date and time
- Battery back-up for SRAM and RTC, either by a lithium battery or by a Goldcap capacitor.

Power supply

IKON and **IEG** are using a power supply of 24 V_{DC}. The **IEG** is also available for voltage ratings of 48 V and 60 V.

Both systems are housed in a plastic strand profile casing with a transparent cover and can be mounted on DIN rails. Pluggable srew-clamp terminals are used for signal connections.

Programming

The realtime multitasking operating system RTOS-UH is in the standard scope of supply. Available programming languages are:

- the IEC 61131-3 programming environment CoDeSys
- the high level programming languages ANSI-C or PEARL90
- 68k-Assembler as low level language

Application software can be stored in the on-board programmable Flash memory, in order to allow a software update without physical access to the equipment.

Sensor technology

Different signal conditioning modules for the acquisition of commonly used signals are available. Special developments are economically viable even for smaller lots.

IVV – Pulse multiplier

The **IVV** has one S0 input and provides multiple S0 outputs. It is used to distribute power meter pulses between different recipients.

- Input: active, either S0 or WT, with integrated current source U_{max} = 27 V, I_{nom} = 15 mA
- Outputs: 1x WT, 2x S0, simultaneously active
- Frequency range 0...1 kHz
- Power supply alternatively 24 V_{DC} / 48 V_{DC} / 60 V_{DC}
- DIN-rail mountable

MIU Milliampere to pulse converter

The **MIU** accepts a bipolar current signal ±20 mA from the conventional measuring technique and converts it to a frequency-proportional pulse trail.

- Input: analog, ±20 mA
- Outputs: 2x S0 for positive current, 2x S0 for negative current, simultaneously active
- Output frequency range: 0...1 kHz, accuracy better than 0.1%
- Power supply alternatively 24 V_{DC} / 48 V_{DC} / 60 V_{DC}
- DIN-rail mountable

SIU Signal to pulse converter

Our range of **SIU** modules converts analog process signals from standard measuring ranges to frequency-proportional pulse trails. They are in particular designed for the use with the **IKON**.

- **SIU-Up10**: Voltage input 0... 10 V
- **SIU-Ub10**: Voltage input –10 V... + 10 V
- **SIU-Ip20**: Current input 0... 20 mA
- Output frequency range 0... 65 kHz
- Accuracy 15 bits with 1 s sampe interval
- remotely powered by the pulse inputs of the **IKON**, 2-wire connection with arbitrary polarity
- DIN-rail mountable

Additional modules with signal conditioning for special kinds of sensors (thermocouples, PT100, DMS) are available on request.