

Fast Electric Energy Transducer

- ▶ **Highest performance**
- ▶ **Highest versatility**
- ▶ **Highest reliability**



The Fast is a microprocessor based electric energy transducer with outstanding flexibility and accuracy designed to meet the most demanding applications of electrical parameters analyses and energy supply monitoring in the industrial environment. All the readings are “true-RMS” and they are obtained with a continuous sampling of the voltage and current waveforms in order to ensure the maximum metering accuracy of rapidly varying loads (e.g. spot welding). A patented digital measurement system, an automatic scale change on current and voltage inputs and a compensation system of the internal amplifiers’ offsets ensure the maximum metering accuracy and stability irrespective of the signal level and the environmental working conditions. Two expansion ports make it possible to select the data transmission mode by means of a simple connection of optional modules (RS232, RS485, Analog).

Readings

The following readings are available on serial communication (MODBUS protocol). They are read as numerical registers in 32 bit floating point format according to IEEE754 standards.

Parameter	Type	L1	L2	L3	Σ
Voltage	V L-N	•	•	•	•
	V L-L	•	•	•	•
Current	I-phase	•	•	•	
	I-neutral				•
Power Factor	PF	•	•	•	•
Frequency	Hz				•
Harmonic distort.	THD-V	•	•	•	•
	THD-I	•	•	•	•
Life time	h (1/100 h)				•
Active power	Instantaneous P	•	•	•	•
	Rolling avg. Pm				•
	Max. Demand Pmd				•
Reactive power	Instantaneous Q	•	•	•	•
	Rolling avg. Qm-ind				•
	Rolling avg. Qm-cap				•
	Max. Demand Qmd-ind				•
	Max. Demand Qmd-cap				•
Apparent power	Instantaneous S	•	•	•	•
	Rolling avg. Sm				•
	Max. Demand Smd				•
Active energy	KWh				•
Reactive energy	Kvarh-ind				•
	Kvarh-cap				•
Apparent energy	KVAh				•

Serial communication

The Fast supports an RS485 or RS232 serial communication by means of optional add-on modules. The protocol is the MODBUS RTU or ASCII, suitable for communication with PLCs and with SCADA programs. The Fast protocol provides as well “full compliance” with the Modbus and with its defaults configurations. A transmission speed of up to 38400 bps., with maximum 124 registers (equivalent to 62 parameters) per query with no waiting time between queries, ensure an unrivalled communication speed and dialogue efficiency.

Versatile in application

The Fast is suitable for virtually all type of electrical grid, 3- and 4-wire, symmetrical and asymmetrical, balanced or unbalanced, single- and bi-phase, Low Tension and High Tension, with 1, 2 or 3 CTs as well as for 2 and 4 quadrant (import/export) measurement.

Basic set up is by dip-switch setting on the front panel and more extensive instrument configuration is made by serial port.

A Led indicator, pulsing with a frequency proportional to the active import power, is also provided for field calibration verification by means of external optical devices.

Digital outputs

The Fast is equipped, as standard feature, with two optically isolated transistor outputs rated 27 Vdc 27 mA per DIN 43864 standards.

The two outputs are factory set to the transmission of pulses proportional to the Active energy and the Reactive energy; the pulse number and rate are programmable.

The outputs may be alternatively configured as outputs of the internal alarm functions or as remote output devices controlled via serial line and Modbus commands.

Alarms

The Fast is equipped with 2 programmable alarms giving the widest configuration flexibility. Each alarm can be selected to link to any one of the parameters available, either as a minimum or as a maximum alarm. Linking of both alarms to the same parameter is also possible for operating as dual threshold alarm. Special alarms are also available such as min. or max. voltage and max. current applicable to the 3 phases and current unbalance on the 3 phases.

The alarms configuration includes the option of precise setting of a delay time (1-99 sec), a hysteresis cycle (in %) and the activation of the output contacts. The alarms state information is always available on serial communication as Modbus “coils”. The alarms are entirely programmable via serial port by means of Modbus *Holding registers*.

SET UP

Transducer configuration is by two methods:

- a LOCAL set-up, carried out by means of a dip-switch selector located underneath the removable front plate
- a REMOTE set up carried out via serial line.

Local set-up via Dipswitch selectors

The number of combinations supported by the dip switch selector (12 switches) restricts the options to an essential number and type of settings such as:

- Serial port setting (parity, speed)
- Instrument address (1...31)
- Wiring configuration (4-wire STAR or 3-wire Delta)
- 2 or 4 quadrant operating mode
- Set up mode selection (Local or Remote)



The dip switch settings can be inspected at any time, with no need to access the transducer, by means of the transparent windows provided on the front panel.

The configuration of the transducer via Modbus can be operated by using a commercial program certified for Modbus protocol and able to write Holding Registers. Specialised technical literature on Modbus mapping and commands is available separately. Alternatively the Energy Brain software (configurator version) represents an easy all-users tool.

HARDWARE EXPANSIONS (optional modules)

The Fast is fitted with 2 expansion sockets for the connection of external expansion modules supporting specific communication functions (serial, analogue, digital).



The optional modules connect by means of plug-in connectors and they are self-supplied. The relevant set-up functions are automatically enabled upon connection of the option(s).



Remote set-up via MODBUS

It allows extending of the configuration to all the numerous possibilities offered by the transducer.

- **Metering:**
Sets Network type (2, 3, 4 wires), LT/HT, CT and VT value, import or import/export mode, power integration interval and Counters hold time.
- **Digital outputs:**
Sets their working mode as Pulse transmission, Alarms or remote Modbus-controlled Output devices.
- **Pulse transmission**
Sets the pulse rate and duration.
- **Alarms:**
Sets alarm Parameter(s), Threshold(s), Hysteresis, Min or Max mode and alarm delay time. It is enabled when the digital outputs are set to operate as ALARMS.
- **Analogue outputs:**
Sets output Parameter(s), 4-20 or 0-20 mA mode, full scale value(s), offset value(s). Distinct settings for the two output channels can be made. It is automatically enabled upon connection of the dual 4-20mA analogue option.
- **Instrument address**
Sets the instrument address in the 1-247 range
- **Serial transmission:**
Sets extra functions like Words/Bytes swap flags (swaps Big Endian to Little Endian format). TX delay time

RS485 option

Opto isolated RS485 port with 2400 bps to 38400 bps. programmable speed. It supports instrument networking with other units up to a distance of 1000 meters and up to max 128 meters connected on the same communication pair with no need of additional line amplifiers.

RS232 option

Opto isolated RS232 port with programmable speed, 2400 bps to 38400 bps.

2 x 4-20 mA option

2 galvanically isolated analogue outputs; 4-20 mA or 0-20 mA transmission. Extremely high accuracy and signal stability thanks to a 10 bit digital to analogue conversion that maintains the accuracy of the original parameter. It ensures a response time of max. 50 ms. with max. 200 ms. update interval. Each of the two outputs may be linked to any one of the parameters available with the additional possibility of setting the zero output (4 or 0 mA) and/or the 20 mA output to match any desired positive or negative measurement value.



Technical specification

- Add-on modules
- Compact and lightweight
- No power supply required
- Connection: Input: plug-in cable + connector
Output(s): plug-in terminal board
- Weight: max. 45 gr.
- Size: 2 DIN modules
- Suiting other Electrex panel meters



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