**Countum Group**

MECI
Metering Solutions

Flow computer for liquids and gases

CDN 16

CDN16 is a multi run panel-mounted flow computer designed for high accuracy custody transfer and fiscal metering applications. The CDN16 is designed for reliability in high-end gas- and liquid applications, and includes all relevant API, AGA, ISO, IP and many other standards.

It can be applied to a wide range of products including crude oil, refined products, bio-fuels and liquefied gas, natural and industrial gases.

Flow computers | **Measuring sytems**

Remote Terminal Unit | **Supervisory system**
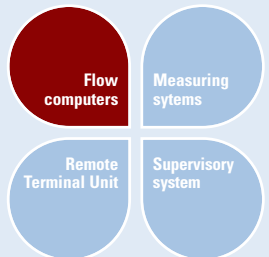
A versatile concept

Modular design

The CDN16 is based on powerful single stream modules which are combined in a number of different casings, for different application types. A CDN16 stream module comprises an impressive number of inputs, outputs, communication interfaces and other hardware for real-time digital and analog signal processing for one metering stream, with cycle times up to 250ms.

Flexibility with various Enclosures

CDN16 stream modules are used in a specific enclosure, ranging from a single stream DIN-rail mountable device with screw terminals for field connections, to a convenient multi-stream panel mounted flow computer with a 7 inch large color touch-screen for more demanding applications. The 19 inch rack enclosure for up to 8 stream modules allows compact cabinet design, ideal for off-shore platforms or other space limited systems.

Supported products

The CDN16 supports but is not limited to crude oils, natural gas, NGLs, LPGs, refined products, special gases, and steam. Either liquid or gas may be combined in multi-stream applications.

Connectivity

Free-configurable digital communication interfacing is implemented for ultrasonic flow meters, gas chromatographs, HART transmitters and other metering equipment utilizing various communication protocols for flexible usage – no "firmware" programming is required.

A next generation technology

A state of-the art flow computer

Prover support with uni-directional, bi-directional, compact prover, master meter, with dual chronometry and pulse interpolation with a resolution of 50ns.

PID & valve control, prove control, batch control, and sampler control.

Built-in redundancy for dual power supply, dual Ethernet and software.

On-board storage (1 GB) for audit-trail, event- and primary data logging in each module.

High precision calculations utilizing a math coprocessor using 64-bit double precision floating point data.

High accuracy of 0.008% FS or better even at high ambient temperatures of electronics.

No totalizer rollovers through high resolution 64-bit counters.

True Level A pulse integrity verification utilizing the on-board programmable hardware (FPGA).

No DIP-switches, no jumpers.

Design, Production & Assembly

Modern, fully automated production & assembly lines and automated calibration procedures are used to ensure top quality of the electronic boards.

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Technical data - CDN 16 Flow computer

Model	CDN16		
Specification per stream module — Liquid applications	Pipeline metering, loading/unloading of tank trucks, wagons or tankers		
	Management of calibration system/prover and calculation of calibration factor		
Gas applications	Upstream metering, international cross-border metering stations, large interconnection pipelines, underground storages, methane terminals		
Functions	Data acquisition, calculation of corrected volume and mass, management of safety devices		
	Control valves operation, prover control, secured back-up of transactions data		
	Communication with PLC and supervisory system		
Metrology — Meter	Volumetric meter, mass flow meter, ultrasonic flow meter, turbine meter, differential pressure system		
Prover	Ball prover with 2 or 4 detector inputs, piston prover, master meter		
Temperature	4-20 mA transmitter or Pt100 4-wire		
Pressure and differential pressure	4-20 mA transmitter		
Density	Frequency or 4-20 mA transmitter		
Gas quality	RS232 serial link with chromatograph		
Calculation of corrected volume & mass (liquid applications)	Crude oil — ISO 91-1 Tables 53A and 54A, ISO 9770 API MPMS 11.1 Refined products — ISO 91-1 Tables 53B and 54B, NF M 08-017; ISO 9770, API MPMS 11.2.2 LPG — API MPMS 11.2.2.M, NF M 08-017, NF M 08-009 or polynomial equation Ethanol and hydro-alcoholic blend: OIML R22 Lubrication oils — ISO 91-1 Table 54D Other products — Polynomial temperature conversion		
Calculation of the base volume, mass and energy (gas applications)	Differential pressure system according ISO5167 or AGA3, Ultrasonic meters according AGA9		
	Volume flow meters or turbine meters according ISO9951, AGA7		
	Calculation of density according table Z, AGA NX19, AGANX19+BRKORR3H, AGA8 complete, (PC and MV methods), GERG88		
	Heating value according ISO6976		
Metrological	Compliant with OIML R117-1 and API Manual of Petroleum Measurement Standards		
Inputs / Outputs — Frequency input	4[1] for densitometer, 5 kHz max., max. input voltage 24V, galvanically isolated		
Metering inputs	1 High speed single or dual pulse input, Trigger level 1.25, 3.6 or 12V, max level 30V		
	5 kHz max (dual pulse), 10 kHz max. (single pulse)		
Analog inputs	6[1] 0 / 4 - 20mA or 0 / 1 – 5V on 24 bits A/D converter, galvanically isolated		
Digital inputs	16[2] inputs for switch/valve status, sphere detectors, 0.5 ms detect update rate		
Pt100 inputs	2 for RTD 4-wire, resolution 0.02°C for PT100 Ω input		
Digital outputs	16[2] open collectors, Rating 100 mA@24V, update rate 250 ms for alarms, status, prover		
Pulse outputs	4[1] open collectors max. 100 Hz		
Current outputs	4[1] : 4-20mA (max. load 650Ω) galvanically isolated, resolution 12 bits		
	For measurements duplication, control valve monitoring, flow control, pressure control		
Serial databus	2 RS485 /RS232 input/output for ultrasonic meter, printer or generic, 110 to 256kbps		
	Modbus protocol or printer		
Ethernet	2 RJ45 Ethernet interface, TCP/IP Modbus protocol and printer		
Mémoire	1024MB on-board memory for time stamped data, report archive and audit trial		
Equipment	Single module (max. 1 run)	Panel (max. 4 runs)	Rack (max. 8 runs)
	Per stream: 4 lines display, 4 navigation buttons, front screen alarms, vol. resolution: 1011 points		
User interface		7" multi-lingual color touch-screen	7" multi-lingual color touch-screen other upon request
Connections	screw terminals, RJ45	screw terminals, RJ45, SUB-D 37	screw terminals, RJ45, SUB-D 37
Size	142x250x164mm	150x235x335mm	482x355x135mm
Weight	2.4 kg	6.8 kg	10.8 kg max.
Data storage	Capacity: 1GB on flash memory card, approximately 16 000 reports		
Operating conditions — Temperature	Ambient : +5°C to + 55°C Storage : -20°C to +70°C		
Relative humidity	Max. 90% without condensation		
Installation — Power supply	20 – 32Vdc, nominal 24Vdc, with redundant connections		
Custody transfer approval	MID-CE Evaluation Certificate		

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Representantes / Distribuidores Exclusivos
Buenos Aires, Argentina
Tel.: (54 - 11) 5352-2500
Email: info@dastecsrl.com.ar
Web: www.dastecsrl.com.ar