VISHAY

VISHAY INTERTECHNOLOGY, INC.

VISHAY SYSTEMS
WEIGHING AND FORCE MEASUREMENT SOLUTIONS

G4

Vishay BLH • Vishay Nobel
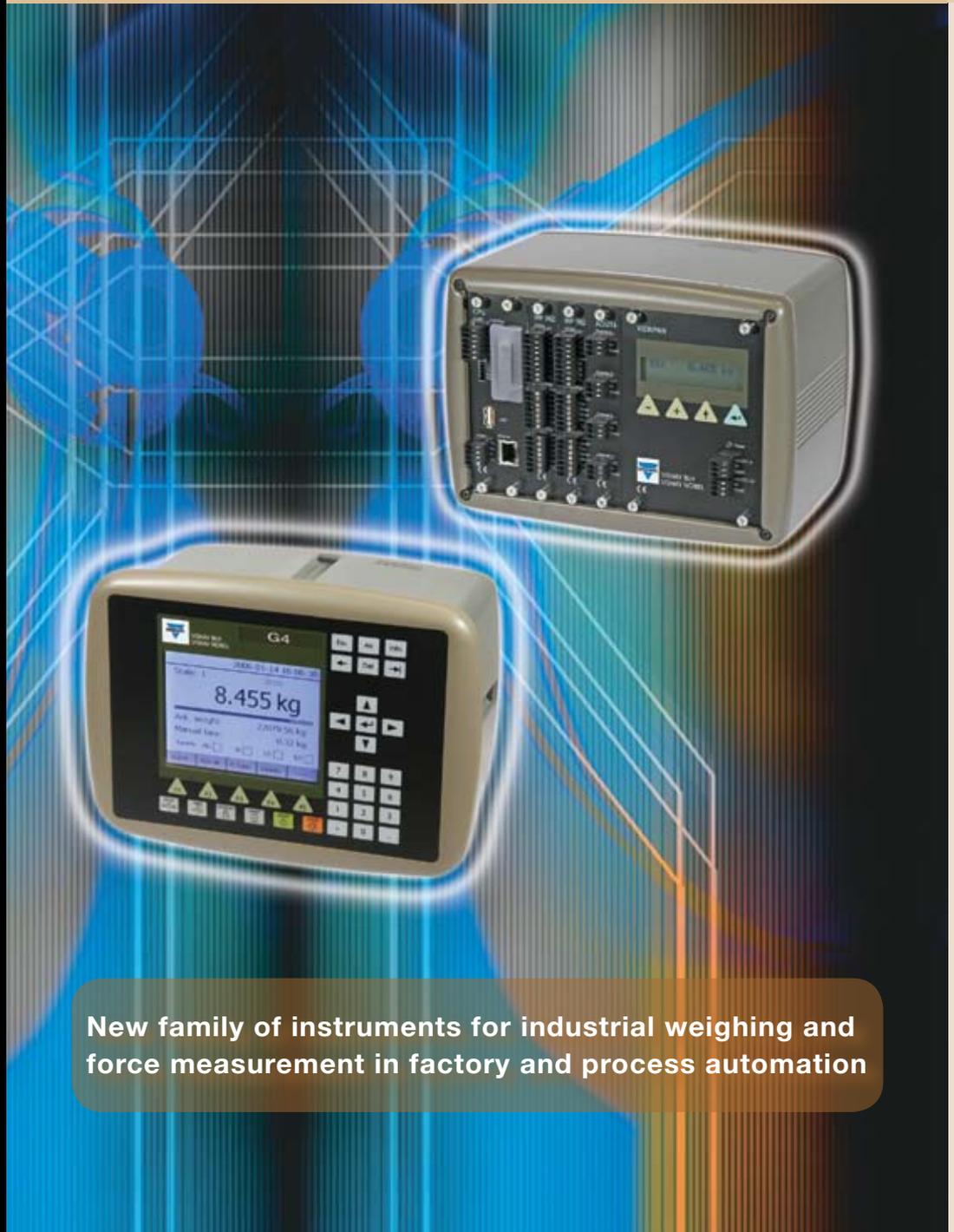
New family of instruments for industrial weighing and force measurement in factory and process automation

4th Generation of Process Instrumentation

Drawing upon 60 years of experience, Vishay Systems has used modern technology to develop a fast, easy-to-use, high-performance weighing/force measurement instrument, one which sets new industry standards.

Features and Benefits

- Modular configuration: enables future growth and upgrades
- High reading rate: enables accurate control of dynamic processes
- Synchronized sampling of all channels: enables true measurement that is not affected by severe vibration and shock
- Advanced digital filtering
- Modern user interface: color graphics enable intuitive operation
- Extensive communication support: fieldbus, Ethernet, serial, analog
- Extensive I/O support

User Interface

The instrument is equipped with a 5.7-inch color touch screen and graphic display. This makes it easy to operate. The color screen can show four weighing/force channels simultaneously. This will allow you to have full control of your processes. With the large touch screen display, you will have good visibility of the process being measured. In addition, you will be able to move around easily in the menus in order to view settings or make changes if required.

Base Configurations

The G4 has four mountings options and enclosure types: DIN rail-mount enclosure (IP20), panel-mount enclosure (IP65 from front panel), stand-alone enclosure (IP65), and stainless steel stand-alone enclosure (IP65). The base configurations come with the following standard components:

- Power: 24 VDC or 115/230 VAC
- USB interface: For external peripherals, keyboard, printer and Disk-On-Key (program update, backup and restore, measurement data)
- Ethernet: for process data with Modbus TCP
- Serial communication: RS485 with Modbus RTU and RS232 with Modbus RTU
- One weighing/force channel with digital I/O support
- Microsoft® Windows CE® operating system
- Application software for weighing or force measurement

Optional Modules

The G4 modular system has seven different cards/modules that can easily be added or replaced according to the system specification, number of channels, application, or maintenance. You can easily implement system upgrades by adding modules, replacing existing modules with higher performance ones, or downloading new application software into the unit. This results in a highly flexible instrument that can be upgraded from one up to a maximum of eight weighing channels, has many digital inputs and outputs, and has a variety of different communication channels and power supply options.

Communication

The G4 instrument is designed to use a wide variety of communication interfaces for industrial applications. Typical fieldbus options include Profibus, DeviceNet, Modbus, TCP, etc.

Software

Software can easily be downloaded to the instrument via the USB interface. Customized software for special applications or customer demands is available upon request from the Vishay Systems Applications Engineering department. Please contact us with specific requirements.

Single- or Multi-Vessel Process Weighing

G4 synchronous monitoring of multiple scales, high update rate, advanced digital filtering, and flexible I/O capabilities provides the state-of-the-art solution for process weighing applications, such as:

• Quality-critical reactor vessels
• High-value ingredient accountability
• Ingredient storage bins
• Batch / blend / mix systems
• Loss-in-weight systems
• Conveyer scales

Multi-Zone Web Tension Measurement and Control

G4 synchronous high sample rate (up to 20,000 Hz) of multiple load cells provides advanced, modern, multi-zone force measurement and web-tension control. The unit supports any combination of eight single-zone machines, up to eight zones on a single machine, and provides measurement of left, right and total tension for each zone. Dual-axis resultant force calculation is also possible using Vishay HTU transducers. Typical applications are:

• Strip steel mills
• Paper machines
• Converting equipment
• Roofing machines
• Felts, calenders, coaters, winders, rewinders, laminators, dryers, breakers, wire sections

Roll Force Systems
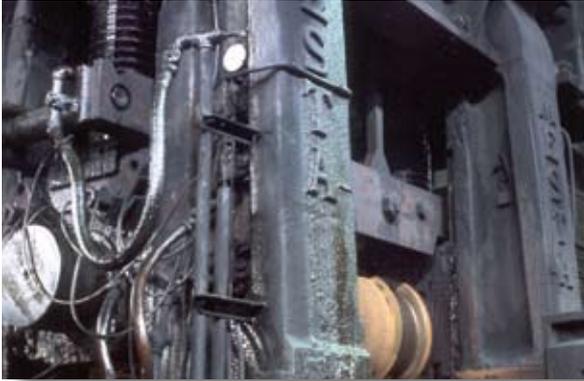
G4 can measure work/drive side stress, status indications (like metal-in-mill status), and overload alarm indications. This enables increased roll life, prevents mill overloads, improves product quality, and reduces mill down time as required for applications such as:

- Rolling mills operation optimization
- Overload safety systems

Offshore Drilling & Exploration

When combined with Vishay Systems standard and customized load cells, G4 instruments provide a wide range of coverage in the offshore drilling industry, where they are used to sense and control:

- Deck-mating forces
- Mooring loads
- Grout pressure and automated drilling fluids formulation
- Well-head pressure, stimulation pressure and mud pressure
- Tension in drum winches, towing winches and tension legs

Card/Module Specifications

Front View	Description

	CPU Module
	• Embedded PC architecture with Microsoft® Windows CE® operating system
	• Non-volatile memory for alibi memory and critical parameters storage
	• Multiple communication channels:
	   - Serial communication: Modbus RTU via RS232 and RS485, USB
	   - Ethernet: Modbus TCP (standard)
	   - Fieldbus optional: Profibus, DeviceNet, and others
	• Peripheral device support via USB
	   - Keyboard, printer, USB memory stick, etc.
	• Remote maintenance, setup, backup, and restore via Ethernet
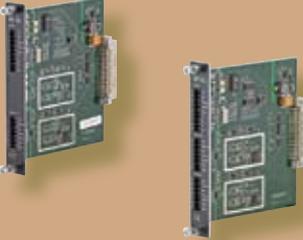
	WF Module: Weighing and Force Measurement Channels • Single-channel or dual-channel weighing module • Sample rate: Up to 3840 samples per second • Update rate: Up to 300 updates per second • Resolution: 16,000,000 counts • Excitation: 5 VDC, up to 16 load cells per channel, no barriers • Accuracy static: 0.002% • Input range: ±7.5 mV/V • Offset drift: <10 nV/V/K • Gain drift: <2 ppm/K • Digital I/O: 4 inputs and 2 outputs, 24 V, 50 mA
	HSWF Module: High-Speed Weighing and Force Measurement • Single-channel or dual-channel weighing module • Sample rate: 20,000 samples per second • Updates rate: Up to 800 updates per second • Resolution: 16,000,000 counts • Excitation: 10 VDC, up to 4 load cells per channel, barriers OK • Accuracy: 0.002% • Input range: ±7.5 mV/V • Offset drift: 10 nV/V • Gain drift: 2 ppm/K • Digital I/O: 4 inputs and 2 outputs, each 24 V, 50 mA
	DIO Module: Digital outputs and inputs • 8 Isolated digital inputs , 24 V, 7 mA • 8 Isolated outputs, 24 V, 100 mA

	AOUT Module: Analog Outputs
	• Single output module or quad-output (4) module
	• Voltage or current outputs:
	   - 4-mA to 20-mA isolated analog output at RLoad <500 ohms, or
	   - –20-mA to +20-mA analog output at RLoad <500 ohms, or
	   - –10-V to +10-V analog output at RLoad >1 kilohm
	• Resolution: 16-bit
	• Update rate: 300/800 updates per second, same as measurement rate

Front View	Description
	Viewpan Module: User Interface panel for DIN Rail Unit • 2 x 16 character LCD display with backlight • 4-functional-keys keypad • 24-VDC power supply
	DC PS Module: 24-VDC Power Supply • Power in: 24 VDC • Power regulation and filtering • Power indication LED
	AC PS Module: 115/230-VAC Power Supply • Power in: 115/230 VAC • Power regulation and filtering • Power indication LED • Mains AC power connector

Exciting Application Possibilities

The new Vishay Systems G4 instrument offers a wide variety of application possibilities. The G4 sets new standards for a broad spectrum of applications, ranging from standard weighing to complex multi-vector force measuring. You can use modules to build the G4 to fit your specific needs and applications.

Standard Weighing	G4's base features include an Ethernet connection, color touch screen, and easy setup. You can save settings and record data on a memory stick via the G4's USB connection. The G4 enables you to have visual control of your tank, silo, or bucket through the graphic color screen. You also have the option of integrating the instrument in your network.
Multi-Channel Batching	With up to eight weighing channels and expanded I/O possibilities, you can control several batching processes with the G4. Simultaneous measuring and high-speed capabilities lets you to increase the accuracy of your batching process. And with the G4's multi-optional interfaces, you can monitor different processes from a control room or your office.
Multi-Channel Force Vector Calculation	Simultaneous, synchronous measurement of all eight channels and high-speed communication capabilities allow you to measure different forces and make complex calculations with your G4 instrument. You can control forces and monitor your processes through the graphic color screen or at your computer.
High Dynamic Force Measurement	Simultaneous, synchronous measurement of up to eight high-sample-rate channels, combined with high-speed communication capabilities, enables true measurement of forces in systems with high speed events, such as machine automation, press machine real-time control, and quality assurance monitoring.

Base Unit Configurations

Front View	Description	Side and Rear Views
	DIN Rail Mount • Modular configuration of weighing, communication, and I/O modules • Up to 3 modules per unit • Maximum of 6 weighing/force channels • LCD operator display, 2 x 16 character, with backlight • Functional keypad with 4 keys • Fieldbus support: Modbus TCP, Profibus, DeviceNet, and others • Additional I/O channels available through external modules • Power supply: Isolated 24 VDC power for unit and I/Os • IP20 enclosure • Size (W x H x D) 229 x 168 x 145 mm	
	Panel Mount • Modular configuration of weighing, communication, and I/O modules • Up to 6 modules per unit • Maximum of 8 weighing/force channels • 5.7-inch LCD color graphic touch screen with backlight • Numeric and functional keypad with 34 keys and soft keys • Fieldbus support: Modbus TCP, Profibus, DeviceNet, and others • Additional I/O channels available through external modules • Power: 230/110 VAC or 24 VDC • IP65 enclosure (front panel) • Size (W x H x D) 294 x 227 x 152 mm	
	Stand-Alone Unit • Modular configuration of weighing, communication, and I/O modules • Up to 6 modules per unit • Maximum of 8 weighing/force channels • 5.7-inch LCD color graphic touch screen with backlight • Numeric and functional keypad with 34 keys and soft keys • Fieldbus support: Modbus TCP, Profibus, DeviceNet and others • Additional I/O channels available through external modules • Power: 230/110 VAC or 24 VDC • IP65 enclosure with tilt stand • Size (W x H x D) 355 x 274 x 214 mm	
	Stainless Steel Unit for Harsh Environments • Modular configuration of weighing, communication, and I/O modules • Up to 6 modules per unit • Maximum of 8 weighing/force channels • 5.7-inch LCD color graphic touch screen with backlight • Numeric and functional keypad with 34 keys and soft keys • Fieldbus support: Modbus TCP, Profibus, DeviceNet, and others • Additional I/O channels available through external modules • Power: 230/110 VAC or 24 VDC • IP65 enclosure with tilt stand and wash-down capabilities • Size (W x H x D) 343 x 274 x 235 mm	

The **World's Largest**
Manufacturer
of Weighing and Force Measurement Transducers

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VTR-PL0039-0606