UNIPULSE

REAL SIZE

This unit for a dramatically slimmed down production control system!

Now, latest PLCs are paramount weighing controllers.

Loadcell interface F159 is incorporable with state-of-the-art OMRON PLC "SYSMAC CJ1". F159 sweeps away waste of time and energy in the production system by curtailing time needed to develop a weighing system, maintenance, modifications and by improving serviceability. At the same time, it promises great cost reduction and high value-added.

F159 SPECIFICATIONS

■ Analog Section

Loadcell cabling	6-wire type (+EXC, +S, -S, -EXC, SHIELD, +SIG, -SIG) (Remote sensing)
Loadcell excitation	DC10V ±5%; Output current: within 120 mA (Up to 4 units of 350Ω load cells can be connected in parallel)
Zero adjustment range	0 ~ 2 mV/V Rough adjustment: Digitally controlled via rough adjustment circuit. Fine adjustment: Auto adjusting method via digital processing.
Span adjustment range	0.3 ~ 3.2 mV/V Rough adjustment: Digitally controlled via rough adjustment circuit. Fine adjustment: Auto adjusting method via digital processing.
Min. input sensitivity	0.3 μV/count
Accuracy	Non-linearity: within 0.01%/FS (Typ: 0.005%/FS at room temp.) Zero drift: within 0.2 μV/℃ RTI(Typ:0.15μV/℃) Gain drift: within 15 ppm/℃ (Typ: 5 ppm/℃)
Analog filter	Bessel low-pass filter (-12dB/oct.) Cut-off frequency: selectable at 2/ 4/ 6/ 8 Hz
A/D converter	⊿Σ method; Speed: 500 times/sec; Resolution: 24 bit (binary)
Display	1/10000 (1/4 scale division: ON) 1/40000 (1/4 scale division: OFF)

■ Display Section

Front panel	RUN: / ERC: / ERH: Turns on when an error in initial settings, CPU related error, and unit error is detected (compliant to CJ1 specification). WERR: Lighted when weight error status is ON. OUT1: Lighted when output 1 is ON. OUT2: Lighted when output 2 is ON.

Terminal configuration

+EXC	B1	SHILD	A1
+S	B2	+SIG	A2
-EXC	B3	-SIG	A3
-S	B4	RSV	A4
RSV	B5	RSV	A5
RSV	B6	RSV	A6
RSV	B7	RSV	A7
OUT1	B8	OUT2	A8
OUT1	B9	OUT2	A9

EMC Directive	EN61131-2 (CLASS A)

■ Settings

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M/C No. rotary switch	High performance I/O unit M/C No. setting: 0 ~ 95 M/C No.
Setting dip switch	Lock Function
Setting values	Setting based on CJ1 ・Saving setting values　Initial setting NOV RAM (non-volatile RAM) ・Protecting setting values　Setting operation can be prohibited (LOCK) to prevent unauthorized modifications of initial settings or calibrations. ・Setting items 　・Upper limit / Lower limit /Near zero / SP1/ SP2 / FF CPS. / Over / Under / Final / Tare 　・Comparison inhibit time/Compare time/ Complete output time/Auto jog timer/ Auto zero times / Judging times /FF CPS. regulation/ Weighing function 1 (Weighing mode, Over/Under comparison, Upper/Lower limit comparison, Near zero comparison) Weighing function 2 (Over/Under comparison mode, Upper/Lower limit comparison mode, Complete Signal Output mode, Sign convention for discharge control) / Weighing function 3 (FF CPS. coefficient, FF CPS., Average count of FF CPS., Digital tare subtraction)/ Output selection (Mode selection, Auto jog, At start NZ confirmation, At start weight value confirmation)/ Motion detection (period, range) / Zero tracking (period) / Zero tracking (range) / Filter (Analog filter, Digital filter) / Stable mode (Digital filter 2, Motion detection mode) / Function selection (Decimal place, 1/4 scale division) / Balance weight / Capacity / Minimum scale division / Net Over / Gross Over / DZ regulation / Gravitational acceleration (Area number) / Gravitational acceleration (Acceleration) 　・Zero calibration / Span calibration / Tare subtraction / Tare subtraction reset / Digital Zero / Digital Zero reset

■ General Performance

Power Consumption	For 350Ω Loadcell; App. 300 mA for 1 loadcell connection ~ app. 700 mA for 4 loadcell connections
Application requirements	Temperature: Working temperature range 0~+40℃ Storage temperature range -20~+75℃ Humidity: 85% RH or less(non-condensing)
External dimensions / weight	31 (W) x 90 (H) x 65 (D) mm (protruding parts not included) App. 150 g

F159 DIMENSIONS　　　　　　　　　　Unit:mm

65
89
90
31

UNIPULSE F159
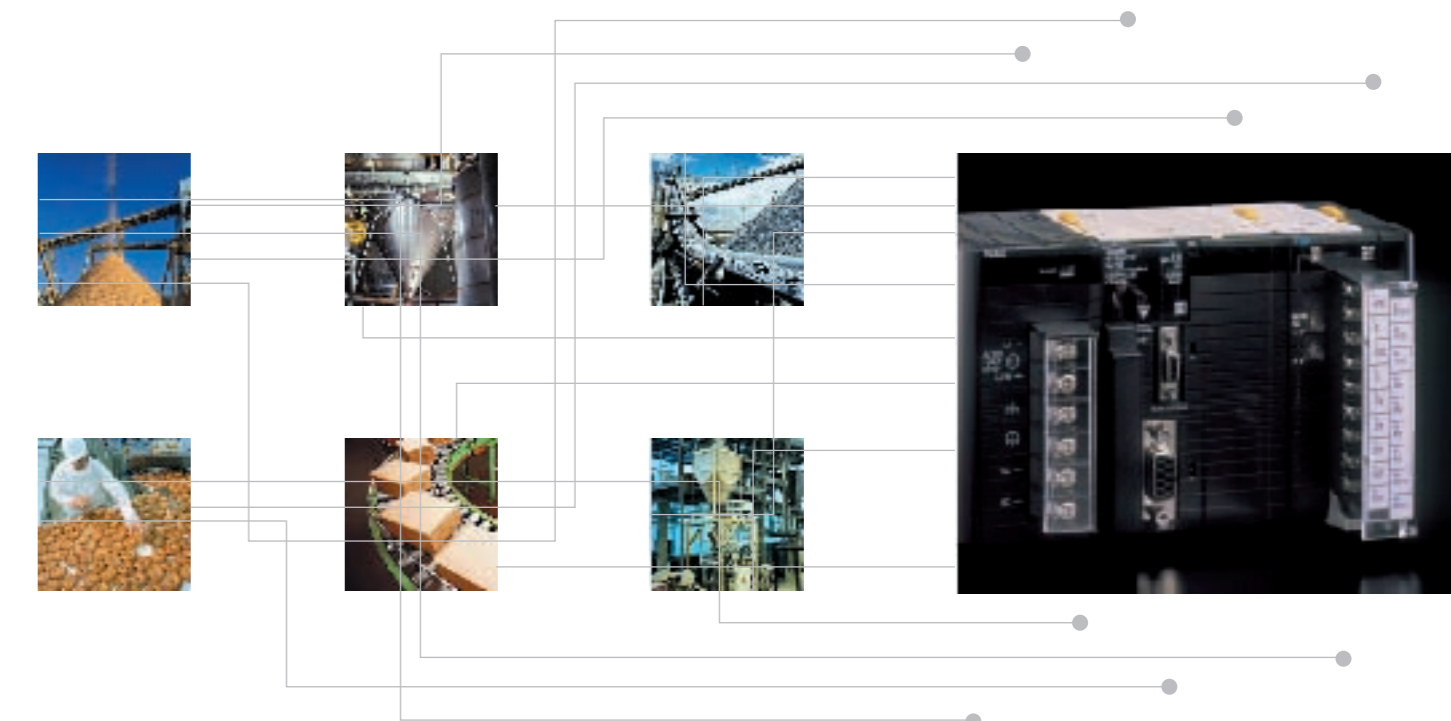LOADCELL INTERFACE
SERIAL No.
MADE IN JAPAN
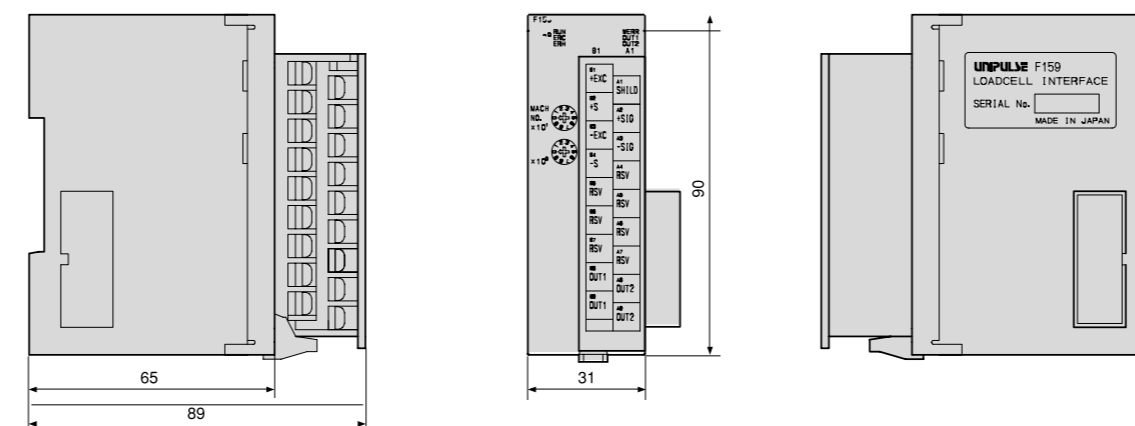
※ F159 is an electrical device that are incorporated in machines and manufacturing installations. F159 conforms to the related EMC standards so that the devices and machines into which F159 is built can more easily conform to EMC standards. The actual F159 has been checked for conformity to EMC standards. Whether these standards are satisfied for the actual system, however, must be checked by the customer.
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※ Please note that specifications or designs shown in this catalog may vary due to our continuous product improvement activities.

The integration of General Use PLC - OMRON CJ1 and F159 weighing controller is

The new proposition to customers who envisage "Weighing" of weight and "Controlling" of weight.

Diverse merits from its direct plug-in feature:

- A completely seamless integration of CJ1 and F159 communication.
- With its function blocks and other features, shorter preparation for standard application of sequence controlled programs with high reliability are achieved.
- System development time is shortened and maintenance, modifications and servicing are easy.
- Inter-equipments wiring is greatly simplified.
- Cost effective.

Specifications that can be offered only by the well-versed Unipulse-all mobilized into a small body, is the new weighing solution.

High Speed A/D conversion with high resolution
A 500 times/sec high-speed conversion to counter fluctuations in weight value. Also, when it is set to the 1/4 scale division compliance to the Weight and Measurement Law, it guarantees 1/10000 display resolution at all input range (1/40000 when not set at 1/4 scale division). Its accuracy is most desired by demanding weighing requirements.

Weighing Sequence Function
By only entering the setting instruction, feeding and discharging gate can be directly controlled. All weighing control is performed by F159 to lighten CJ1 load so that a high-speed weighing and control line can be set-up without it being affected by CJ1 command timing.

Auto free fall compensation
It automatically compensates fluctuations in actual free fall, which is one of the biggest factors that cause weighing error.

Gravitational acceleration compensation
Even when the calibration site and installation site are at different locations, calibration can be completed by just setting the gravitational acceleration of the installation site. There is no further need to perform re-calibration at the installation site.

Zero tracking
The slow zero drift, which is caused by temperature fluctuation, and the zero point shift are automatically compensated.

Powerful filters to eliminate mechanical vibrations
Installed with Bessel low-pass filter, which has powerful damping characteristics, and moving average-type digital filter.
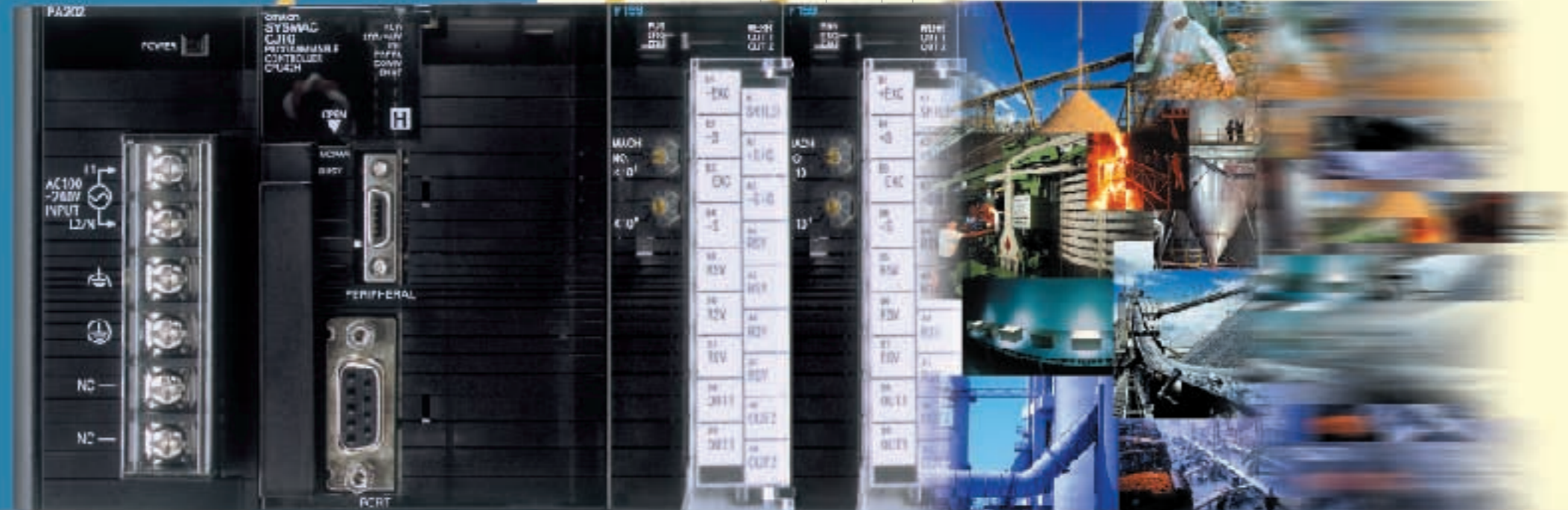
SYSMAC CJ1 is an OMRON network system that solves problems in the production area and promises "total cost down" and "high value-added".
- Its size is extremely small that it does not take up much space when built-in into equipments.
- It is base-less structured and its necessary functions are mini-sized.
- Its tact time is short thanks to its high-speed processing.
- It can be seamlessly linked to Ethernet, Controller link or its like.

Examples of Applications

Platform Scale Weighing

Formula Batch Weighing

Barcode handy terminal
Prevents miss-feed by scanning barcode label.

Material feeding weight check
To check if feeding is done according to instruction.

Batching mistake prevention
By entering only batching instruction, feeding and discharging gates can be directly controlled and its results recorded.

Raw Material A
Raw Material B
Raw Material C
Raw material tank
Weighing hopper
Loadcell

Indicator
Raw Material
Platform scale
Barcode handy terminal

Batch Weighing

Mixer
Loadcell

Weight Checker (Belt-type)

Base platform
Loadcell

Powder Weighing

Loadcell