



GW-400 Bus Series

Communication Gateway

DESCRIPTION

The GW-400 Communication Gateway is an onboard counting computer that works together with the DA-200/ DA-400 sensor series to create a highly accurate and precise automatic passenger counting (APC) system.

The ultra-compact GW-400 is fully autonomous or can be easily connected to other existing onboard computers. Its built-in power supply can adapt to a wide range of voltages.

These counting computers are installed inside the vehicles. At each stop or station, they receive the signals from the DA-200/DA-400s, transform them into counting data, which are then stored in the GW-400s' memory until they receive a download command.

The data is usually transferred, directly from the GW-400 via a wireless module to the ground data analysis server. This saves on:

- Cabling costs
- Installation time

The GW-400 is flexible and cost-effective. Up to four GW-400 can be installed inside a vehicle to reduce cabling complexity or the insolvable problematics encountered in older vehicles.

APPLICATION

The Communication Gateway is connected to the DA-200/DA-400 counting sensors. In brief, the GW-400 records the following data:

- "In" and "Out" counts per sensor, per door at each stop
- Time of arrival and departure at each stop
- Stop location and distance (with GPS option)
- Distance (if odometer signal available)
- Time of passage in front of stop or station without vehicle stop (virtual signpost)
- Speed of door opening and closing
- Detailed diagnostic information on sensors, GPS, door signals, system integrity, etc.

Detailed diagnostic information is coupled with our diagnostic software package to allow efficient fleet status analysis. Diagnostic information is recorded in the system and the GW-400 can send warning or error messages to onboard computers or to a central computer. The data formats and protocols are compatible with our data loggers DL-10, DL-10B and GW-200 series.

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The GW-400 powers the DA-400 sensors and gets in return, via a digital communication link, readings from the sensors. The GW-400 then processes the signals and interprets the optical signature of passengers and objects to accurately count people.

Available communication options include RF modem, GSM/GPRS cellular, serial RS-485 / RS-232, IBIS, J1708 and Ethernet LAN among others. A wireless LAN 802.11 b/g module can be interfaced using the Ethernet LAN option.

In stand-alone mode, data is usually transferred through a wireless link to a download computer. Software upgrades, parameter changes, and diagnostics can be completely performed remotely and automatically.

When interfaced with an onboard computer, the GW-400 normally receives commands from the computer to transfer the count data and reset the counts. The onboard computer can also control when to start and stop counting if it is aware of the door status. The data is exchanged using customised or industry standard protocols. Infodev also offers a simple Gateway ASCII protocol with free source code that demonstrates integration.

FEATURES

Design

- Accuracy between 97.5% to 99.5% has been proven many times without using any correction factors
- Very compact and lightweight
- Low power consumption: 5-7 W typically
- Data is safely stored permanently in flash memory that can record between 10 to 40 days of data
- Integrated power supply adaptable to any voltage source. Will not be perturbed by the electrical environment of a bus or train
- May be connected to up to 9 sensor elements and up to 4 other signal sources from the vehicle
- Installation requires minimal downtime: quick installation with bolt-in design
- Remote diagnostics and software upgrades

Connectivity

- Significantly reduced cabling
- External I/O can be used to connect to the door switch or signal, odometer or other inputs from other systems
- Interface to onboard computer using customised or industry standard protocols
- Automatic download capacity

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Maintenance

- Very light maintenance required during entire life of vehicle.
- ID chip technology provides automatic reconfiguration when a unit is replaced
- The GW-400's rugged design resists to harsh environmental conditions often found in public transit vehicles
- Diagnostic lights allows testing major functions

Options

- New generation of high sensitivity GPS
- Customized mounting plate for easy installation in restrictive space.

GENERAL SPECIFICATIONS

Parameter configuration	Software configurable Auto-reconfiguration ID Chip
Sensors	Up to 9 DA-200 / DA-400 sensor elements
External inputs/outputs (I/O)	4 I/O pins Input: <ul style="list-style-type: none"> • High impedance >100 kΩ • Programmable: normal, pull-up, and pull-down • 2 kV opto-insulation option Output: <ul style="list-style-type: none"> • TTL/CMOS compatible (optional)
Diagnostic LEDs	Power <ul style="list-style-type: none"> • In/Out count • System ready • RF/GPS communication
Memory	4 megabit flash (10-40 days worth of typical data) SD Card (optional for additional memory)
System watchdog	2 independent self-recovery
Protection	Surge, transient, ESD and reverse polarity protected Self-resettable fuse
Sensor communication	Digital RS-485, protected against short-circuits

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SERIAL COMMUNICATION

Speed	<ul style="list-style-type: none"> • 600 – 230 400 bps • 8 data bits • 1 stop • No parity
RS-232	<ul style="list-style-type: none"> • Maximum distance: 3-10 m (10-33 ft) depending on bps
RS-485 Opto-isolated IBIS	<ul style="list-style-type: none"> • Maximum insulation voltage: 1500 V RMS • Maximum voltage: 36 V DC • Maximum current (protected): 300 mA
J1708 APC	<ul style="list-style-type: none"> • Standard and customised APC messages • 9 600 bits/sec • Collision detection
RS-485	<ul style="list-style-type: none"> • Maximum of devices: 32 multidrop • Maximum distance: 1 000 m (3 280 ft) • Protection: Surge, ESD and short-circuit protected
MODBUS	<ul style="list-style-type: none"> • RTU / ASCII Transmission modes • Communication : 7 or 8 bits • Parity: none, even or odd



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ETHERNET / RF / WiFi

Ethernet TCP/IP (With POE Option)	Interface <ul style="list-style-type: none"> • Ethernet 10Base-T or 100Base-TX full/half duplex • MIZOR RJ45 connector • Auto-Sensing Protocols <ul style="list-style-type: none"> • TCP/IP, UDP, ARP, FTP/TFTP, Telnet, DHCP, HTTP (internal web server) • MODBUS TCP Indicators (LED) <ul style="list-style-type: none"> • 10Base-T and 100Base-TX connection • Link & activity indicator – full/half duplex Security <ul style="list-style-type: none"> • Password protection
WiFi	Interface <ul style="list-style-type: none"> • WIFI IEEE 802.11b/g • Telnet configuration by WiFi, up to dated by FTP Protocols <ul style="list-style-type: none"> • DHCP, UDP, DNS, ARP, ICMP, TCP, socket Security <ul style="list-style-type: none"> • Wi-Fi Alliance certificated WPA2-PSK • WEP-128, WPA-PSK(TKIP), WPA2-PSK (AES) • FCC / CE / ICS certified
Long-range RF	Format <ul style="list-style-type: none"> • True peer-to-peer, point-to-point, and point-to-multipoint • Hopping channels • 65 000 available network addresses • Auto-correction data transfer Maximum distance <ul style="list-style-type: none"> • Indoor: up to 180 m (up to 600 ft) • Outdoor: 300 m – 1000 m (1 000 ft – 3 300 ft) typical • Line-of-sight: up to 10 km with directional antenna Connector <ul style="list-style-type: none"> • SMA reverse-polarity RF Power <ul style="list-style-type: none"> • 10 – 50 milliwatts License <ul style="list-style-type: none"> • Not required. Worldwide acceptance Technology <p>DSSS (Direct Sequence Spread Spectrum)</p>

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LOCATION

GPS Option	<p>Accuracy</p> <ul style="list-style-type: none"> • 5 m or better typically <p>Connector</p> <ul style="list-style-type: none"> • RG 178 SMA <p>Battery</p> <ul style="list-style-type: none"> • Integrated rechargeable Li-ion battery for fast power-on availability (2-4 s) <p>Sensitivity</p> <ul style="list-style-type: none"> • Acquisition sensitivity: -139 dBm • Tracking sensitivity: -152 dBm • 12 channels <p>Time to first fix (TTFF)</p> <ul style="list-style-type: none"> • Cold start: 50 seconds • Warm start: 35 seconds • Hot start: 2-4 seconds <p>Automatic antenna disconnect detection</p>
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Environment

Storage temperature	-40 to 85°C (-40 to 185 °F)
Operational temperature	-40 to 75°C (-40 to 167 °F)
Humidity	10 to 95 % not condensing internally

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ELECTRICAL PROPERTIES

Power	
Operation <ul style="list-style-type: none"> 24 to 36 V DC input range Surge (1.8 kV), transient (2 kV), reverse polarity and ESD protected	CONSUMPTION <p>Stand-alone:</p> <ul style="list-style-type: none"> 0.5-1 W standby 1-3 W average <p>With 6 elements sensor total:</p> <ul style="list-style-type: none"> 7 W typical 10 W maximum
Connectors	
Power <ul style="list-style-type: none"> A & B: ID Chip C: Negative PWR D: N/U E: Positive PWR (8 - 39 V DC) F: Positive PWR (40 – 130 V DC) 	Input/output <ul style="list-style-type: none"> B-D-F-H: Grounds G:I/O 1 E: I/O 2 C: I/O 3 A: I/O 4 A: I/O 5 C: I/O 6 E: I/O 7 G: External GPS
Sensor group 1 <ul style="list-style-type: none"> A: Negative PWR B: Comm A- C: Comm B+ D: Positive PWR E & F: N/C 	Sensor group 2 <ul style="list-style-type: none"> A: Negative PWR B: Comm A- C: Comm B+ D: Positive PWR

MECHANICAL PROPERTIES

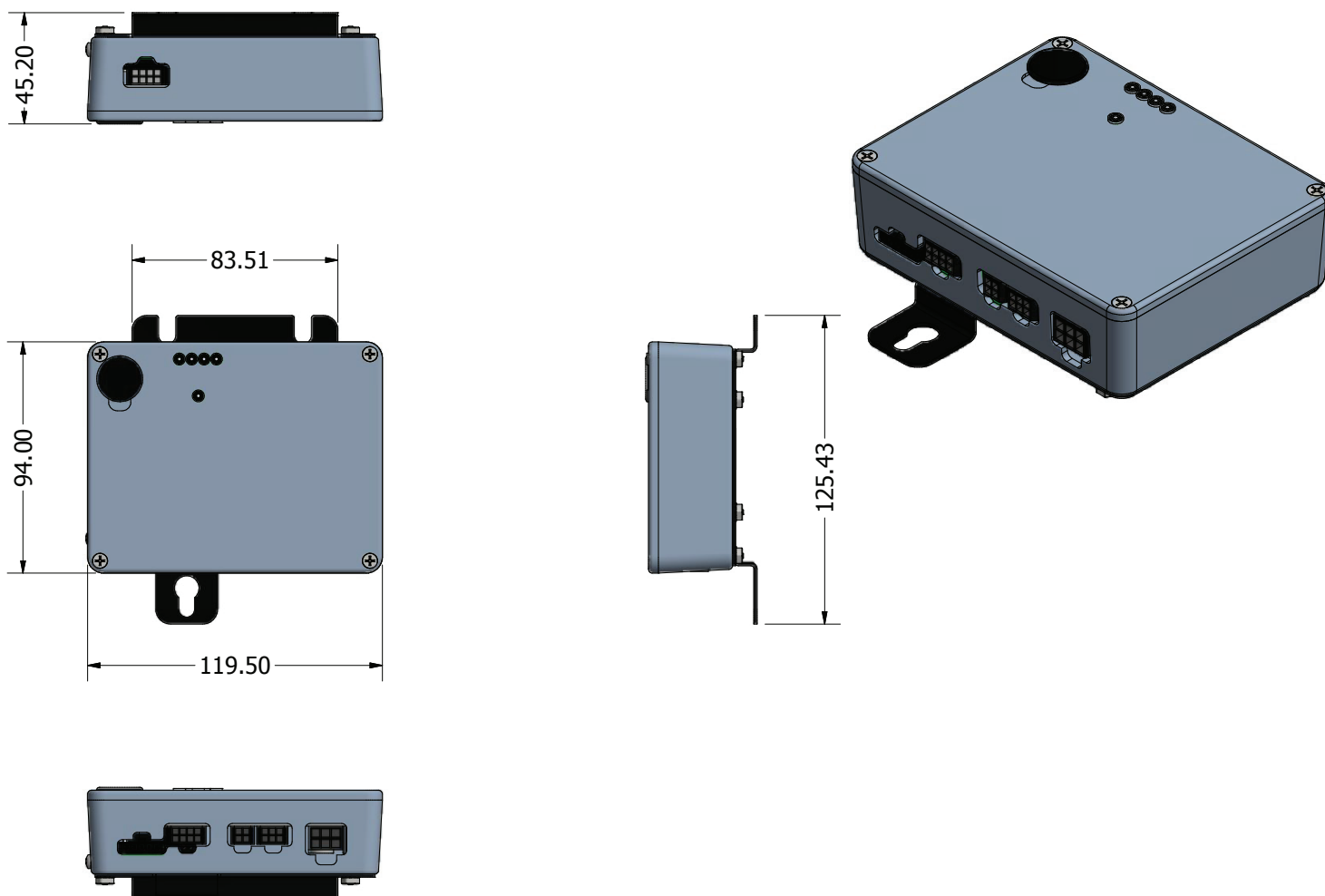
Type	Diecast aluminium
Dimensions	12.0 x 9.0 x 3.5 cm (4.7 x 3.7 x 1.2 in.)
Weight	500 g (17 oz)
Color	Natural aluminum (silver) Black
IP Standard	IP64: With GW-400 Extra Protective Enclosure IP32: Without enclosure

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DIMENSIONED DRAWING

GW-400 unit (all measurements are in mm)



For more information regarding our technology and our most recent achievements, please **contact us**.

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