The Gemini GV
Digital Servo Drive

The Gemini GV is a compact, low-cost, digital servo drive available in six power levels for producing up to 40 Amps continuous and 100 Amps peak current, or up to 29.4 kW of peak power. The Gemini GV is easily configurable via RS232/485 using Compumotor’s Motion Planner™ on a PC or Pocket Motion Planner™ on a Window’s CE™-based palm PC. With the available power levels, small package size, low cost, and numerous drive features, the Gemini GV will be the obvious choice for all of your low-to-mid power servo drive applications.

Simplified Tuning/Configuration
Tuning and configuration are easy. They are accomplished via RS232/485 with a PC or palm PC. Only the motor and some basic load information must be known by the drive to determine baseline-tuning gains. These are simple parameter entries the user can complete with the help of the front-end software tools. Users also have the ability to override these parameters for special application requirements.

Features
Performance
- Provides six power ranges for up to 11.8 kW of continuous power
- Torque, velocity, step & direction and CW/CCW modes
- Encoder tracking mode
- Digital notch filters provide the tools to eliminate mechanical resonance
- Sinusoidal commutation with encoder or resolver feedback
- Simplified tuning and configuration
- Variable resolution for encoder signal output as well as the command input
- Wide range of PWM frequencies for linear motor support

Protection
- Short-circuit protection – phase-to-phase and phase-to-ground
- Inrush current protection
- Drive over-voltage protection
- Drive under-voltage (brownout) protection
- Drive and motor over-temperature protection
- Current-foldback protection
- Regeneration protection

Physical
- A wide selection of brushless servo motors are available from Compumotor including the SM, BE, NeoMetric, J and M Series motors; a family of Linear Motors is also available
- Three input power ranges available: low – 120V, universal – 120/240V, and high – 240V
- Diagnostic LEDs for drive status, firmware download, and optional keep alive mode

Gemini Family Features
- 24V Keep Alive (not required) – keeps logic alive if AC power is removed
- Error Log – records 10 most recent errors with time stamp
- Approvals: UL Recognition, cUL, CE (LVD), and CE (EMC)
- Configurable via RS232/485 using Compumotor’s Motion Planner™ on a PC or Pocket Motion Planner™ on a Windows CE™-based Palm PC

See Stepper Drive section for the full line of Gemini stepper drives and drive/controllers.
The Gemini GV6
Digital Servo Drive with Basic Controller

Compumotor’s Gemini GV6 is a compact, low-cost, digital servo drive/controller. In addition to all of the drive features of the Gemini GV, the GV6 incorporates basic motion control and programming capabilities, allowing solutions for many distributed control applications. The Gemini GV6 is easily configured/programmed via RS232/485 using Compumotor’s Motion Planner™ on a PC or Pocket Motion Planner™ on a Windows CE™-based Palm PC. The Gemini GV6 also offers connectivity to several field buses including Profinet and DeviceNet.

**Features**

**Performance**
- Incorporates all of the powerful features of the Gemini GV digital servo drive
- Provides six power ranges for up to 11.8 kW of continuous power
- Stand-alone servo controller and drive in one small package
- Full ASCII communications capability
- Control features such as registration, motion profiles, S-curve velocity profiling and conditional statements
- Program storage: Up to 32 programs or 190 lines of program code
- Daisy chain up to 99 units
- Simplified configuration and tuning
- 8 programmable inputs and 6 programmable outputs
- Wide range of PWM frequencies for linear motor support

**Protection**
- Short-circuit protection – phase-to-phase and phase-to-ground
- Inrush current protection
- Drive over-voltage protection

**Protection, continued**
- Drive under-voltage (brownout) protection
- Drive and motor over-temperature protection
- Current-foldback protection
- Regeneration protection

**Physical**
- A wide selection of brushless servo motors are available from Compumotor including the SM Series, NeoMetric, J Series and M Series motors; a family of Linear Motors is also available
- Three input power ranges available: low – 120V, universal – 120/240V, and high – 240V
- Diagnostic LEDs for drive status, firmware download, and keep alive mode

**Connectivity**
- RS232/485 serial communications (ASCII)
- Profinet (optional)
- DeviceNet (optional)

**Gemini Family Features**
- 24V Keep Alive (not required) – keeps logic alive if AC power is removed
- Error Log—records 10 most recent errors with time stamp
- Approvals: UL Recognition, cUL, CE (LVD), and CE (EMC)
- Configurable/Programmable via RS232/485 using Compumotor’s Motion Planner™ on a PC or Pocket Motion Planner™ on a Windows CE™-based Palm PC

---

When can I take advantage of a low-cost stepper motor? Applications with . . .

- Predictable loads
- High stiffness at rest required
- High accuracy, resolution and reliability required

- Continuous power needs
- Speed less than 50 rps
The Gemini GV6K Digital Servo Drive with Full-Feature Controller

Compumotor's Gemini GV6K is the most powerful addition to the Gemini servo family lineup. This full-feature, standalone drive/controller offers a complete motion control solution in one economical, compact package. The GV6K comes complete with the same features, connectivity and front-end software tools as the Gemini GV and Gemini GV6. In addition to offering many of the drive features of the Gemini GV and control features of the Gemini GV6, the GV6K incorporates the flexibility and control functionality of Compumotor's 6K Controller to allow highly advanced motion control and sequencing capabilities for unrivaled flexibility in many distributed-control applications. The GV6K is easily configured/programmed via RS232/485 using Compumotor's Windows-based Motion Planner™ software package. The GV6K also offers connectivity to any ASCII-based serial device, including HMI panels and PLC ASCII modules. Products such as OPTO 22™ Snap I/O, DVT™ Vision Systems and AB™ SLC 5/05 PLC platforms can also be used for data chaining using the GV6K's Ethernet Client feature.

Features

Performance

- Combines the powerful features of the 6K Controller with the Gemini GV digital servo drive for a complete standalone servo solution in one small package
- Six power ranges for up to 11.8 kW of continuous power
- Full ASCII communication capability
- Control features such as following, registration, multitasking, PLC scan, electronic cam profiling, S-curve profiling, scaling, high-level math functionality and more
- Program storage: 300KB standard (battery backed)
- Daisy chaining of up to 99 units
- Simplified configuration and tuning

Protection

- Short-circuit protection - phase-to-phase and phase-to-ground
- Inrush current protection
- Drive over-voltage protection
- Drive under-voltage (brownout) protection
- Drive and motor over-temperature protection
- Current-foldback protection
- Regeneration protection

Physical

- Compatible with a wide selection of brushless servo motors, such as the Compumotor SM, BE, NeoMetric, J and M Series motors
- Supports linear servo motors, such as the Compumotor LXR and SL motor series
- Three input power ranges available: low – 120VAC, universal – 120/240VAC, and high – 240VAC

Gemini Family Features

- 24VDC Keep Alive Circuit (24VDC supply required) – powers the controller section independent of AC power and maintains vital position and controller information
- Error Log - records 10 most recent errors with time stamp
- Wide range of PWM frequencies for linear motor support
- Approvals: UL Recognition, cUL, CE (LVD), and CE (EMC)
- Diagnostic LEDs for drive status, firmware, download and 24VDC control power active
- Configurable/Programmable via RS232/485 or Ethernet using Compumotor's Motion Planner™

Gemini Offers Greater Flexibility and More Reliability Than Ever Before. Call 1-800-358-9070 Today.
Connectivity

- Two serial communication ports: one RS232 port (3 wire) and one RS232/RS485 port (4 wire)
- Ethernet communication port (10 Base-T, 10 Mbps twisted pair)
- Imbedded Ethernet Client – provides up to six client connections to the following devices: AB™ SLC 5/05 PLC, OPTO 22 SNAP™ I/O or DVT™ vision camera system
- Peer-to-peer data chain – allows direct Ethernet connectivity with up to 8 Gem6K or 6K devices for distributed control
- Master encoder port – allows for following from an external feedback signal
- Expandable I/O (up to 256 additional discrete I/O points, and/or 192 Ethernet I/O points)

Software and Standard Control Features

- Complete position-based following and electronic cam profiling
- Compiled motion functionality
- Multitasking (up to 10 individual programs simultaneously)
- PLC scan mode
- Floating point, integer and binary variables with high-level math functionality
- Full scaling functionality
- Comprehensive program monitoring, status and diagnostic features
- Full-feature 6K language command set
- Compatibility with platforms such as VisualBasic™, Visual C++™ and NI LabVIEW™

I/O Capabilities

- Onboard I/O: 8 digital inputs (3 programmable limits, 5 programmable), 6 digital outputs, 1 analog input, 2 D/A monitor outputs, 1 relay output
- Software selectable onboard input/output functionality
- Expandable serial I/O of up to 256 additional discrete digital I/O points, 64 analog I/O points or a combination of both digital and analog points
- Expandable Ethernet I/O of up to 192 additional digital or analog I/O points using Ethernet Client with OPTO 22 SNAP™ I/O modules
- Registration input capability
- Software selectable I/O high/low active level
- 5-24VDC selectable input reference voltage
- Inputs: selectable as sinking or sourcing; outputs: open collector (sinking)

---

**Gemini Family Summary**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Servo G7</th>
<th>Servo GV7K</th>
<th>Stepper GT6K</th>
</tr>
</thead>
<tbody>
<tr>
<td>CE, UL Recognition</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>RS232/485</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Encoderless Stall Detect</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Ethernet</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Profibus</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>DeviceNet</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>± 10V Command Input</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Step/Direction, CW/CCW Command Input</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Encoder Signal Input</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Onboard I/O</td>
<td></td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Expandable I/O</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Registration</td>
<td></td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>System Status &amp; Diagnostics</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Scaling</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Variables</td>
<td></td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Following</td>
<td></td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Multitasking</td>
<td></td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Compiled Motion</td>
<td></td>
<td>✔</td>
<td>✔</td>
</tr>
</tbody>
</table>

- ✔ Full Functionality
- ❌ Limited Functionality
### GV/GV6 Common Specifications

#### Specifications

<table>
<thead>
<tr>
<th>Voltage</th>
<th>GV (GV6)-L3</th>
<th>GV (GV6)-U3</th>
<th>GV (GV6)-U6</th>
<th>GV (GV6)-U12</th>
<th>GV (GV6)-H20</th>
<th>GV (GV6)-H40</th>
</tr>
</thead>
<tbody>
<tr>
<td>95-132VAC</td>
<td>95-265VAC</td>
<td>95-265 VAC</td>
<td>95-265 VAC</td>
<td>208-265 VAC</td>
<td>208-265 VAC</td>
<td></td>
</tr>
<tr>
<td>Phase</td>
<td>1Ø</td>
<td>1Ø</td>
<td>1Ø</td>
<td>1 or 3Ø</td>
<td>3Ø</td>
<td></td>
</tr>
<tr>
<td>Frequency</td>
<td>50/60 Hz</td>
<td>50/60 Hz</td>
<td>50/60 Hz</td>
<td>50/60 Hz</td>
<td>50/60 Hz</td>
<td></td>
</tr>
<tr>
<td>24V Keep Alive (Optional)</td>
<td>24 VDC +/- 20%</td>
<td>24 VDC +/- 20%</td>
<td>24 VDC +/- 20%</td>
<td>24 VDC +/- 20%</td>
<td>24 VDC +/- 20%</td>
<td></td>
</tr>
</tbody>
</table>

#### Drive Output Power

<table>
<thead>
<tr>
<th>Bus Voltage</th>
<th>GV (GV6)-L3</th>
<th>GV (GV6)-U3</th>
<th>GV (GV6)-U6</th>
<th>GV (GV6)-U12</th>
<th>GV (GV6)-H20</th>
<th>GV (GV6)-H40</th>
</tr>
</thead>
<tbody>
<tr>
<td>PWM**</td>
<td>40 kHz</td>
<td>8 kHz</td>
<td>8 kHz</td>
<td>8 kHz</td>
<td>8 kHz</td>
<td></td>
</tr>
<tr>
<td>Continuous Current *</td>
<td>3 Amps</td>
<td>3 Amps</td>
<td>6 Amps</td>
<td>12 Amps</td>
<td>20 Amps</td>
<td></td>
</tr>
<tr>
<td>Continuous Power</td>
<td>0.44 kW</td>
<td>0.88 kW</td>
<td>1.75 kW</td>
<td>3.5 kW</td>
<td>5.9 kW</td>
<td></td>
</tr>
<tr>
<td>Peak Current*</td>
<td>7.5 Amps</td>
<td>7.5 Amps</td>
<td>15 Amps</td>
<td>30 Amps</td>
<td>50 Amps</td>
<td></td>
</tr>
<tr>
<td>Peak Power</td>
<td>1.1 kW</td>
<td>2.2 kW</td>
<td>4.4 kW</td>
<td>8.75 kW</td>
<td>14.7 kW</td>
<td></td>
</tr>
<tr>
<td>Commutation</td>
<td>Sinusoidal</td>
<td>Sinusoidal</td>
<td>Sinusoidal</td>
<td>Sinusoidal</td>
<td>Sinusoidal</td>
<td></td>
</tr>
</tbody>
</table>

#### Performance

**Servo Update**
- 50 micro seconds

**Accuracy**
- Solid lines represent 240VAC operation, continuous and peak. Dashed lines represent performance using 120VAC input. Speed/torque curves may vary +/- 10%. +/- 0.5 arc min (0.0833°), encoder dependent.

**Command Inputs – GV**
- Velocity and Torque Mode
- Position Mode

**Inputs – GV**
- Enable, Reset
- Neg/Pos Limits
- User Fault
- Encoder

**Inputs – GV6**
- 8 Programmable
- Enable, Reset
- Encoder
- Analog Input

**Outputs – GV**
- Fault, At Limit
- Position Error
- Analog Monitors
- Encoder
- Relay

**Outputs – GV6**
- 6 Programmable
- Analog Monitors
- Encoder
- Relay

**Communications**
- Type: RS232/RS485 (4-wire), ASCII or 8 bit binary protocol
- Baud Rate: Fixed at 9600
- Up to 99
- Profibus (optional), DeviceNet (optional)

**Environmental**
- Temperature: Still air: 113°F (45°C), moving air: 122°F (50°C)
- Humidity: 0-95%, non-condensing
- Shock/Vibration: Shock:15G half-sine @ 11 msec/vibration: 2G, 10-2000 Hz

**Protection**
- Short Circuit: Phase-to-phase, phase-to-ground
- Brownout: AC drops below 85 VAC
- Over Temperature: Shutdown fault at 131°F (55°C)

**Standards**
- UL, cUL, CE (LVD), CE (EMC)
- SM Series, BE Series, NeoMetric Series, J Series, M Series, and Linear Motors
- Please refer to the GV and GV6 Hardware Installation Guide

**Physical**
- Compumotor Motors
- Non-Compumotor Motors
- Connectors: 9-pin D-shell (male)
- Motor and Power: Barrier screw terminal
- Command and I/O: 50-pin High density Amp Champ - 0.050 Series II (with screw attachment)
- Feedback: 26-pin High density Amp Champ - 0.050 Series II (with screw attachment)
- +24VDC/Relay: 4-pin removable terminal block

* Peak of sine wave

**Motor ripple frequency is rated at twice the PWM value for a given drive**
## G6V Common Specifications

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Drive Input Power</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Voltage</td>
<td>95-132VAC</td>
<td>95-265VAC</td>
<td>95-265VAC</td>
<td>95-265VAC</td>
<td>208-265VAC</td>
<td>208-265VAC</td>
</tr>
<tr>
<td>Phase</td>
<td>1Ø</td>
<td>1Ø</td>
<td>1Ø</td>
<td>1Ø</td>
<td>1Ø or 3Ø</td>
<td>3Ø</td>
</tr>
<tr>
<td>Frequency</td>
<td>50/60 Hz</td>
<td>50/60 Hz</td>
<td>50/60 Hz</td>
<td>50/60 Hz</td>
<td>50/60 Hz</td>
<td>50/60 Hz</td>
</tr>
<tr>
<td>24V Keep Alive (Required)</td>
<td>24 VDC +/- 20%</td>
<td>24 VDC +/- 20%</td>
<td>24 VDC +/- 20%</td>
<td>24 VDC +/- 20%</td>
<td>24 VDC +/- 20%</td>
<td>24 VDC +/- 20%</td>
</tr>
<tr>
<td>Drive Output Power</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PWM**</td>
<td>40 kHz</td>
<td>8 kHz</td>
<td>8 kHz</td>
<td>8 kHz</td>
<td>8 kHz</td>
<td>8 kHz</td>
</tr>
<tr>
<td>Continuous Current *</td>
<td>3 Amps</td>
<td>3 Amps</td>
<td>6 Amps</td>
<td>12 Amps</td>
<td>20 Amps</td>
<td>40 Amps</td>
</tr>
<tr>
<td>Continuous Power</td>
<td>0.44 kW</td>
<td>0.88 kW</td>
<td>1.75 kW</td>
<td>3.5 kW</td>
<td>5.9 kW</td>
<td>11.8 kW</td>
</tr>
<tr>
<td>Peak Current*</td>
<td>7.5 Amps</td>
<td>7.5 Amps</td>
<td>15 Amps</td>
<td>30 Amps</td>
<td>50 Amps</td>
<td>100 Amps</td>
</tr>
<tr>
<td>Peak Power</td>
<td>1.1 kW</td>
<td>2.2 kW</td>
<td>4.4 kW</td>
<td>8.75 kW</td>
<td>14.7 kW</td>
<td>29.4 kW</td>
</tr>
<tr>
<td>Commutation</td>
<td>Sinusoidal</td>
<td>Sinusoidal</td>
<td>Sinusoidal</td>
<td>Sinusoidal</td>
<td>Sinusoidal</td>
<td>Sinusoidal</td>
</tr>
</tbody>
</table>

### Performance

#### Servo Update Accuracy

- 50 micro seconds
- Solid lines represent 240VAC operation, continuous and peak. Dashed lines represent performance using 120VAC input. Speed/torque curves may vary +/- 10%. +/- 0.5 arc min (0.0833°), encoder dependent.

- 5-24VDC Selectable, 1/3 1/3 1/3 voltage switching threshold
- 12-bit, +/- 10 VDC input voltage (2 ms update)

#### Inputs - Onboard

- 8 Programmable
- 1 Analog
- Enable, Reset
- Encoder

#### Inputs - Expansion (Optional)

- Up to 256 additional digital inputs (2ms update)
- Up to 64 additional 12-bit analog inputs (+/- 10 VDC)
- Up to 192 analog or digital Ethernet inputs via Ethernet Client and OPTO22™ SNAP I/O Module

#### Outputs - Onboard

- 6 Programmable
- 2 Analog Monitors
- Encoder / Resolver
- Relay

#### Outputs - Expansion (Optional)

- Up to 256 additional digital outputs (2ms update)
- Up to 64 additional 12-bit analog outputs (+/- 10 VDC)
- Up to 192 analog or digital Ethernet outputs via Ethernet Client and OPTO22™ SNAP I/O Module

#### Communications

- Type: Serial: RS232/ RS485 (4-wire), ASCII
- Baud Rate: Selectable up to 115200
- Daisy Chain: Up to 99
- Ethernet: 10 Base-T (10 Mbps twisted pair)
- Protocols supported: TCP/IP and UDP, ModBus/TCP, AB Ethernet and ASCII over Ethernet

#### Environmental

- Temperature: Still air: 113°F (45°C), moving air: 122°F (50°C)
- Humidity: 0-95%, non-condensing
- Shock/Vibration: Shock: ±15G half-sine @ 11 msec/ vibration: 2G, 10-2000 Hz

### Protection

- Short Circuit: Phase-to-phase, phase-to-ground
- Brownout: AC drops below 85 VAC
- Over Temperature: Shutdown fault at 131°F (55°C)

### Standards

- UL, cUL, CE (LVD), CE (EMC)
- SM Series, BE Series, NeoMetric Series, J Series, M Series, and Linear Motors

### Physical

- Compumotor Motors
- Non-Compumotor Motors
- Connectors
- Serial (Com1 & Com2)
- Ethernet (Gigabit)
- Motor and Power Command, Onboard I/O
- Feedback
- Master Encoder
- Expandable I/O
- +24VDC/Relay

---

* Peak of sine wave
** Motor ripple frequency is rated at twice the PWM value for a given drive

---

Parker Hannifin Corporation
Compumotor Division
compumotor.com
Gemini GV/GV6 Connections and LEDs

RS232/485
- 9 pin D-connector

24VDC/Relay (Optional)
- +24VDC - provides logic keep alive to the drive
- Relay – 5A at 24 VDC or 120 VAC
- Relay opens when drive is disabled/faulted

AC Input Connections
- Terminals: #8 (M4)
- Mating Terminals: spade fork, 0.325” max width

Fuses
- GV6K-H20n at 208/240VAC 1-phase
- GV6K-H20n/H40n at 208/240VAC 3-phase

Motor Output Connections
- Terminals: #8 (M4)
- Mating Terminals: spade fork, 0.325” max width

Motor Feedback Connector
- 26-pin .050 Series II AMP CHAMP

PV Topology

LEDs

Green/Red - Yellow/Green
- LED Color: LTR
- Indicated Status: Maintenance

Green (Flash) - Yellow (Flash)
- Keep alive mode

Green (Flash) - Yellow (Flash)
- Drive not enabled

Green (Flash) - Yellow (Flash)
- Programming flash memory

Red (Flash) - Off
- Awaiting flash download

Green (Flash) - Yellow (Flash)
- Initialization

Left Right Indicated State*

*Please Consult the User Guide for Proper Fuse Selection

See Stepper Drive section for the full line of Gemini stepper drives and drive/controllers.
Gemini GV6 with Profibus Option

Profibus LED Indicators

<table>
<thead>
<tr>
<th>LED</th>
<th>Steady Flash</th>
<th>Function</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>FB1</td>
<td>--</td>
<td>Not used</td>
<td>--</td>
</tr>
<tr>
<td>FB2</td>
<td>Off</td>
<td>Module is not online</td>
<td>FBS bit #4 = 0</td>
</tr>
<tr>
<td>FB3</td>
<td>Off</td>
<td>Module is not offline</td>
<td>FBS bit #4 = 1</td>
</tr>
<tr>
<td>FB4</td>
<td>Off</td>
<td>Module is offline</td>
<td>FBS bit #4 = 0</td>
</tr>
</tbody>
</table>

| FB2 | Off          | Module is not powered/not online | FBS bit #4 = 0 |
| FB3 | Off          | Module is not online | FBS bit #4 = 1 |
| FB4 | Off          | Module is offline | FBS bit #4 = 0 |

- Red 1 flash/second - FBSIZE setting does not match network configuration
- Red 4 flashes/second - hardware failure

Profibus Connector Pin Out

<table>
<thead>
<tr>
<th>Pin</th>
<th>Name</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>V-</td>
<td>DC Return</td>
</tr>
<tr>
<td>2</td>
<td>CAN_L</td>
<td>CANBUS LOW</td>
</tr>
<tr>
<td>3</td>
<td>SHIELD</td>
<td>Protective earth</td>
</tr>
<tr>
<td>4</td>
<td>CAN_H</td>
<td>CANBUS HIGH</td>
</tr>
<tr>
<td>5</td>
<td>V+</td>
<td>+5V Power</td>
</tr>
</tbody>
</table>

Profibus Baud Rate

The GV6 will automatically detect the baud rate of the Profibus network. For a complete list of supported baud rates, see the CMTRØ90E.GSD file, which accompanies the Gemini product.

Gemini GV6 with DeviceNet Option

DeviceNet LED Indicators

<table>
<thead>
<tr>
<th>LED</th>
<th>Steady Flash</th>
<th>Function</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>FB1</td>
<td>--</td>
<td>Not used</td>
<td>--</td>
</tr>
<tr>
<td>FB2</td>
<td>Off</td>
<td>Not powered/not online</td>
<td>FBS bit #4 = 0</td>
</tr>
<tr>
<td>FB3</td>
<td>Off</td>
<td>Module is not online</td>
<td>FBS bit #4 = 1</td>
</tr>
<tr>
<td>FB4</td>
<td>Off</td>
<td>Module is offline</td>
<td>FBS bit #4 = 0</td>
</tr>
</tbody>
</table>

| FB2 | Off          | Module is not powered/not online | FBS bit #4 = 0 |
| FB3 | Off          | Module is not online | FBS bit #4 = 1 |
| FB4 | Off          | Module is offline | FBS bit #4 = 0 |

- Red 1 flash/second - network connection timeout
- Red 4 flashes/second - hardware failure

DeviceNet Connector Pin Out

<table>
<thead>
<tr>
<th>Pin</th>
<th>Name</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>V-</td>
<td>DC Return</td>
</tr>
<tr>
<td>2</td>
<td>CAN_L</td>
<td>CANBUS LOW</td>
</tr>
<tr>
<td>3</td>
<td>SHIELD</td>
<td>Protective earth</td>
</tr>
<tr>
<td>4</td>
<td>CAN_H</td>
<td>CANBUS HIGH</td>
</tr>
<tr>
<td>5</td>
<td>V+</td>
<td>+5V Power</td>
</tr>
</tbody>
</table>

DeviceNet Connector Pin Out

<table>
<thead>
<tr>
<th>Pin</th>
<th>Name</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>+</td>
<td>CANBUS LOW</td>
</tr>
<tr>
<td>2</td>
<td>CAN_L</td>
<td>Protective earth</td>
</tr>
<tr>
<td>3</td>
<td>SHIELD</td>
<td>CANBUS HIGH</td>
</tr>
<tr>
<td>4</td>
<td>V+</td>
<td>+5V Power</td>
</tr>
</tbody>
</table>

DeviceNet Baud Rate

To configure baud rate via hardware, dip switches are provided to set a baud rate of 125, 250 or 500kb. Setting the dip switches to 0xFF (all ON) enables software configuration of baud rate.

<table>
<thead>
<tr>
<th>Baud rate (Bit/sec)</th>
<th>BD1</th>
<th>BD2</th>
</tr>
</thead>
<tbody>
<tr>
<td>125k</td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td>250k</td>
<td>OFF</td>
<td>ON</td>
</tr>
<tr>
<td>500k</td>
<td>ON</td>
<td>OFF</td>
</tr>
<tr>
<td>Reserved</td>
<td>ON</td>
<td>ON</td>
</tr>
</tbody>
</table>

See Also:
The Profibus or DeviceNet User Guide for complete specifications
**Catalog 8000-4/USA**

**GV6K Specifications**

**GV6K Digital Controller/Drive**

**Protective Circuits**
- Short Circuit Protection
- Inrush Current Protection
- Drive Overtemperature Protection
- Motor Overtemperature Protection
- Undervoltage Protection
- Overvoltage Protection
- Current Foldback
- Regeneration Protection

**Enviromental Specifications**

- **Operating Temperature**
  - Still Air: 45°C (113°F)
  - Moving Air: 50°C (122°F)
- **Storage Temperature:**
  - -40°C to 85°C (-40°F to 185°F)
  - 0 – 95%, non-condensing
- **Humidity:** 50% non-condensing

**Specifications**

- **Manual Trips**
  - 30 mA at 24VDC
- **Diodes**
  - 1N4148 or equivalent

**Expansion I/O Connector**

- **RS-232 Connector – COM1 – Port 1**
  - Connect an RP240, or use this port for RS-232. Download OS through this port only.
  - Ethernet and COM2 can both be active at the same time.

**Motor Output Connections**

- **CompuMotor Servo Cable Color Code:**
  - Black #1
  - Black #2
  - Black #3
  - Grn/Yel (Mot. out)

**AC Input Connections**

- **GV6K-4n at 120VAC**
- **GV6K-U2n/6n/12n at 120/240VAC**

**RS-232 Connector – COM2 – Port 2**

- **RS-232 Connections**
  - Rx, Tx, Gnd (RD A)

**Expansion I/O Connector**

- **50 Pin DRIVE I/O Connector**
- **Expansion I/O Connector**
- **Master Encoder Connector**

**See Stepper Drive section for the full line of Gemini stepper drives and drive/controllers.**
Gemini Dimensional Drawings

**GV/GV6 Dimensions in inches (mm)**

![Diagram of GV/GV6 Dimensions]

<table>
<thead>
<tr>
<th>Power Level</th>
<th>W Width IN (mm)</th>
<th>FH FIN Height IN (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>L3</td>
<td>3.13 (79.4)</td>
<td>0.38 (9.5)</td>
</tr>
<tr>
<td>U3</td>
<td>3.13 (79.4)</td>
<td>0.38 (9.5)</td>
</tr>
<tr>
<td>U6</td>
<td>3.75 (95.3)</td>
<td>1.00 (25.4)</td>
</tr>
<tr>
<td>U12</td>
<td>3.75 (95.3)</td>
<td>1.00 (25.4)</td>
</tr>
<tr>
<td>H20</td>
<td>5.00 (127)</td>
<td>2.25 (57.2)</td>
</tr>
<tr>
<td>H40</td>
<td>5.00 (127)</td>
<td>2.25 (57.2)</td>
</tr>
<tr>
<td>GPDM</td>
<td>2.75 (70.0)</td>
<td>0.00 (0.0)</td>
</tr>
</tbody>
</table>

**GVK/GV6-PB/GV6-DN Dimensions in inches (mm)**

![Diagram of GVK/GV6-PB/GV6-DN Dimensions]

<table>
<thead>
<tr>
<th>Power Level</th>
<th>OW Overall Width IN (mm)</th>
<th>FH Fin Height IN (mm)</th>
<th>OL Overall Length IN (mm)</th>
<th>OH Overall Height IN (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>L3</td>
<td>3.88 (98.6)</td>
<td>0.38 (9.5)</td>
<td>8.0 (203.2)</td>
<td>6.0 (153.0)</td>
</tr>
<tr>
<td>U3</td>
<td>3.88 (98.6)</td>
<td>0.38 (9.5)</td>
<td>8.0 (203.2)</td>
<td>6.0 (153.0)</td>
</tr>
<tr>
<td>U6</td>
<td>4.50 (114.3)</td>
<td>1.00 (25.4)</td>
<td>8.0 (203.2)</td>
<td>6.0 (153.0)</td>
</tr>
<tr>
<td>U12</td>
<td>4.50 (114.3)</td>
<td>1.00 (25.4)</td>
<td>8.0 (203.2)</td>
<td>6.0 (153.0)</td>
</tr>
<tr>
<td>H20</td>
<td>5.75 (146.1)</td>
<td>2.25 (57.2)</td>
<td>9.9 (251.5)</td>
<td>6.0 (153.0)</td>
</tr>
<tr>
<td>H40</td>
<td>5.69 (144.6)</td>
<td>N/A</td>
<td>12.5 (317.5)</td>
<td>8.49 (215.7)</td>
</tr>
</tbody>
</table>
Gemini Ordering Nomenclature

GV [-] [-] [-] (Example: GV6K-U6E)

Control Level:
Blank - drive only
6 - basic drive/controller
6K - full-feature drive/controller

Option:
PB (Profibus - GV6 only)
DN (DeviceNet - GV6 only)
(blank) no fieldbus

Feedback:
E - Encoder
R - Resolver

Compatible Servo Motors
- SM Series (in 16 and 23 frame sizes)
- BE Series (in 16, 23 and 34 frame sizes)
- NeoMetric Series (in 34, 70mm and 92 frame sizes)
- J Series (in 34, 70mm and 92 frame sizes)
- M Series (in 105mm - 205mm frame sizes)

Motor Cabling Options
- CE(LVD & EMC) compliant MS connector option
- Flying lead option (with GFB-Kit)
- 10’ cable option (with GFB-Kit)
- C1 quick connection option (Coming Soon)

Servo Power Levels

<table>
<thead>
<tr>
<th>Servo</th>
<th>Input Voltage (VAC)</th>
<th>Bus Voltage (VDC)</th>
<th>Continuous Current (Apk)</th>
<th>Maximum Current (Apk)</th>
</tr>
</thead>
<tbody>
<tr>
<td>L3</td>
<td>120</td>
<td>170</td>
<td>3</td>
<td>7.5</td>
</tr>
<tr>
<td>U3</td>
<td>120/240 1 ø</td>
<td>170/340</td>
<td>3</td>
<td>7.5</td>
</tr>
<tr>
<td>U6</td>
<td>120/240 1 ø</td>
<td>170/340</td>
<td>6</td>
<td>15</td>
</tr>
<tr>
<td>U12</td>
<td>120/240 1 ø</td>
<td>170/340</td>
<td>12</td>
<td>30</td>
</tr>
<tr>
<td>H20</td>
<td>208/240 1 or 3 ø</td>
<td>295/340</td>
<td>20</td>
<td>50</td>
</tr>
<tr>
<td>H40</td>
<td>208/240 3 ø</td>
<td>295/340</td>
<td>40</td>
<td>100</td>
</tr>
</tbody>
</table>

See also:
The Gemini Family of Digital Stepper Drive Products in the Stepper Section

See Stepper Drive section for the full line of Gemini stepper drives and drive/controllers.
# Cables and Accessories

## Gemini to 6K Controller (GV only)

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Product Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>71-016966-10</td>
<td>Gemini to 6K Step &amp; Direction command cable, 10', CE(LVD&amp;EMC) (position mode)</td>
</tr>
<tr>
<td>71-016987-10</td>
<td>Gemini to 6K Analog command cable, 10', CE(LVD&amp;EMC) (torque or velocity mode)</td>
</tr>
<tr>
<td>71-018183-10</td>
<td>Gemini to 6K Step &amp; Dir or Analog command cable, 10', CE(LVD&amp;EMC) (all modes)</td>
</tr>
<tr>
<td>71-019862-04</td>
<td>Gemini to 6K Step &amp; Direction command cable, 4', (non CE) (position mode)</td>
</tr>
<tr>
<td>71-019863-04</td>
<td>Gemini to 6K Step &amp; Dir or Analog command cable, 4', (non-CE) (all modes)</td>
</tr>
</tbody>
</table>

## 50-Pin High Density (Entire Family)

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Product Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEM-VM50</td>
<td>Gemini 50-pin screw terminal breakout board with 3' cable</td>
</tr>
<tr>
<td>71-016943-10</td>
<td>10' cable, 50-pin high density to flying leads, CE(LVD&amp;EMC)</td>
</tr>
<tr>
<td>71-019861-04</td>
<td>4' cable, Gemini 50-pin high density to flying leads (non-CE)</td>
</tr>
<tr>
<td>71-019861-10</td>
<td>10' cable, Gemini 50-pin high density to flying leads (non-CE)</td>
</tr>
<tr>
<td>GC-50</td>
<td>50-pin Gemini connector with terminal strips</td>
</tr>
<tr>
<td>GC-SDA</td>
<td>Gemini connector with 11-pin terminal strips (drive commands only)</td>
</tr>
</tbody>
</table>

## 26-Pin High Density (Entire Family)

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Product Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>GC-26</td>
<td>Gemini connector with 26-pin terminal strips</td>
</tr>
<tr>
<td>GFB-KIT</td>
<td>26-pin Gemini connector kit</td>
</tr>
</tbody>
</table>

## Additional Accessories (Entire Family)

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Product Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>71-016939-10</td>
<td>10' cable, RS232/485 null modem, CE(LVD&amp;EMC)</td>
</tr>
<tr>
<td>GPDM</td>
<td>Gemini Power Dissipation Module</td>
</tr>
</tbody>
</table>
## Selecting a Servo Motor and Cables

The following cable sets are recommended when combining the shown Gemini GV, GV6 and GV6K power levels with the following Compumotor servo motors.

### Power Level | Motor | Cable Sets
--- | --- | ---
L3R | SM231AR-NMSN, SM232AR-NMSN, SM233AR-NMSN | 23GR CABLE-nn
U3R | BE230DR-NMSN, BE231DR-NMSN, BE232DR-NMSN | BE-GR CABLE-nn
U6E | BE232FJ-NMSN, BE233FJ-NMSN, BE341FJ-NMSN, BE342FJ-NMSN, N/J0701EF-NMSN, N/J0702EF-NMSN, N/J0703EF-NMSN, N/J0704EF-NMSN | BE-GS CABLE-nn
U6R | BE232FR-NMSN, BE233FR-NMSN, BE341FR-NMSN, BE342FR-NMSN, N/J0701DR-NMSN, N/J0702ER-NMSN, N/J0703FR-NMSN, N/J0704FR-NMSN, N/J0921EF-NMSN | BE-GR CABLE-nn

### Power Level | Motor | Cable Sets
--- | --- | ---
H20E | BE342KJ-NMSN, BE343KJ-NMSN, BE344KJ-NMSN, BE230KJ-NMSN, BE231DJ-NMSN, BE232DJ-NMSN, BE233DJ-NMSN | BE-GS CABLE-nn
H40R | M1053KJ-NMSN, M1054KJ-NMSN, M1453KJ-NMSN, M1454KJ-NMSN, M1455KJ-NMSN, M2053KJ-NMSN, M2054KJ-NMSN | BE-GR CABLE-nn

### ADDITIONAL CABLE INFORMATION

- Each cable set comes with 1 motor cable and 1 feedback cable.
- All cables have MS connectors and are CE(LVD&EMC) compliant.
- Motors may also be purchased with either flying leads or non-removable cables if GC-26 or GFB KIT are purchased.
- Motor and/or feedback cables may also be purchased individually.
- Cable sets: nn denotes cable lengths. Cables available in selected lengths. Call for details.
- For motors with brake option, refer to the motor/cable table for appropriate cable part numbers.
Motor Speed-Torque Performance Curves
Gemini with SM motors, 16 and 23 frame, encoder feedback, 120 VAC*

NOTES:
- Speed-torque curves limited to 7,500 rpm (motor mechanical limit).
- Curves represent 120VAC (nominal) operation.
- Actual speed-torque curves may vary ±10%.
- Speed-torque curves are based on motor current values listed in Motor Parameter Table, available on the Motion Planner CD and on the Compumotor Web site, www.compumotor.com.
- For speed-torque curves of motors that may have been released after this catalog was published, see the Gemini Motor Reference section of the Compumotor Web site.

*Encoder feedback performance shown. Resolver-based systems provide up to an 8% increase of continuous and peak torque at all speeds over encoder-based systems. Refer to the Servo Motors section for more information on resolver motors.
Motor Speed-Torque Performance Curves
Gemini with BE motors, 16 and 23 frame, encoder feedback, 120/240 VAC*

*Encoder feedback performance shown. Resolver-based systems provide up to an 8% increase of continuous and peak torque at all speeds over encoder-based systems. Refer to the Servo Motors section for more information on resolver motors.

See Stepper Drive section for the full line of Gemini stepper drives and drive/controllers.
Motor Speed-Torque Performance Curves
Gemini with BE motors, 34 frame, encoder feedback, 120/240 VAC*

*Encoder feedback performance shown. Resolver-based systems provide up to an 8% increase of continuous and peak torque at all speeds over encoder-based systems. Refer to the Servo Motors section for more information on resolver motors.
Motor Speed-Torque Performance Curves
Gemini with NeoMetric and J series motors, 70mm and 34 frame, encoder feedback, 120/240 VAC*

<table>
<thead>
<tr>
<th>Motor Model</th>
<th>Speed (RPM)</th>
<th>Torque (Nm)</th>
<th>Torque (oz-in)</th>
</tr>
</thead>
<tbody>
<tr>
<td>N0701D/J0701D with GV/6/6K-U6E</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>17</td>
<td>1.76</td>
<td>39.74</td>
</tr>
<tr>
<td></td>
<td>33</td>
<td>1.41</td>
<td>31.21</td>
</tr>
<tr>
<td></td>
<td>50</td>
<td>1.06</td>
<td>23.76</td>
</tr>
<tr>
<td></td>
<td>67</td>
<td>0.71</td>
<td>16.41</td>
</tr>
<tr>
<td></td>
<td>83</td>
<td>0.35</td>
<td>7.71</td>
</tr>
<tr>
<td>N0701F/J0701F with GV/6/6K-U6E</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>17</td>
<td>1.76</td>
<td>39.74</td>
</tr>
<tr>
<td></td>
<td>33</td>
<td>1.41</td>
<td>31.21</td>
</tr>
<tr>
<td></td>
<td>50</td>
<td>1.06</td>
<td>23.76</td>
</tr>
<tr>
<td></td>
<td>67</td>
<td>0.71</td>
<td>16.41</td>
</tr>
<tr>
<td></td>
<td>83</td>
<td>0.35</td>
<td>7.71</td>
</tr>
<tr>
<td>N0702E/J0702E with GV/6/6K-U6E</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>17</td>
<td>2.82</td>
<td>64.71</td>
</tr>
<tr>
<td></td>
<td>33</td>
<td>2.12</td>
<td>46.41</td>
</tr>
<tr>
<td></td>
<td>50</td>
<td>1.41</td>
<td>31.21</td>
</tr>
<tr>
<td></td>
<td>67</td>
<td>0.71</td>
<td>16.41</td>
</tr>
<tr>
<td>N0703G/J0703G with G/6/6K-U12E</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>17</td>
<td>4.24</td>
<td>93.66</td>
</tr>
<tr>
<td></td>
<td>33</td>
<td>2.82</td>
<td>62.24</td>
</tr>
<tr>
<td></td>
<td>50</td>
<td>1.41</td>
<td>31.21</td>
</tr>
<tr>
<td></td>
<td>67</td>
<td>0.71</td>
<td>16.41</td>
</tr>
<tr>
<td>N0704G with G/6/6K-U12E</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>17</td>
<td>4.24</td>
<td>93.66</td>
</tr>
<tr>
<td></td>
<td>33</td>
<td>2.82</td>
<td>62.24</td>
</tr>
<tr>
<td></td>
<td>50</td>
<td>1.41</td>
<td>31.21</td>
</tr>
<tr>
<td></td>
<td>67</td>
<td>0.71</td>
<td>16.41</td>
</tr>
</tbody>
</table>

NOTES:
- Speed-torque curves limited to 7,500 rpm (motor mechanical limit).
- Curves represent 120VAC (nominal) and 240VAC (nominal) operation.
- Actual speed-torque curves may vary ±10%.
- Speed-torque curves are based on motor current values listed in Motor Parameter Table, available on the Motion Planner CD and on the Compumotor Web site, www.compumotor.com.
- For speed-torque curves of motors that may have been released after this catalog was published, see the Gemini Motor Reference section of the Compumotor Web site.

*Encoder feedback performance shown. Resolver-based systems provide up to an 8% increase of continuous and peak torque at all speeds over encoder-based systems. Refer to the Servo Motors section for more information on resolver motors.

See Stepper Drive section for the full line of Gemini stepper drives and drive/controllers.
Motor Speed-Torque Performance Curves
Gemini with NeoMetric and J series motors, 92mm frame, encoder feedback, 120/240 VAC*

NOTES:
• Speed-torque curves limited to 7,500 rpm (motor mechanical limit).
• Curves represent 120VAC (nominal) and 240VAC (nominal) operation.
• Actual speed-torque curves may vary ±10%.
• Speed-torque curves are based on motor current values listed in Motor Parameter Table, available on the Motion Planner CD and on the Compumotor Web site, www.compumotor.com.
• For speed-torque curves of motors that may have been released after this catalog was published, see the Gemini Motor Reference section of the Compumotor Web site.

*Encoder feedback performance shown. Resolver-based systems provide up to an 8% increase of continuous and peak torque at all speeds over encoder-based systems. Refer to the Servo Motors section for more information on resolver motors.
Motor Speed-Torque Performance Curves

Gemini with M series motors, 105, 145 and 205mm frame, encoder feedback, 240 VAC*

*Encoder feedback performance shown. Resolver-based systems provide up to an 8% increase of continuous and peak torque at all speeds over encoder-based systems. Refer to the Servo Motors section for more information on resolver motors.

See Stepper Drive section for the full line of Gemini stepper drives and drive/controllers.