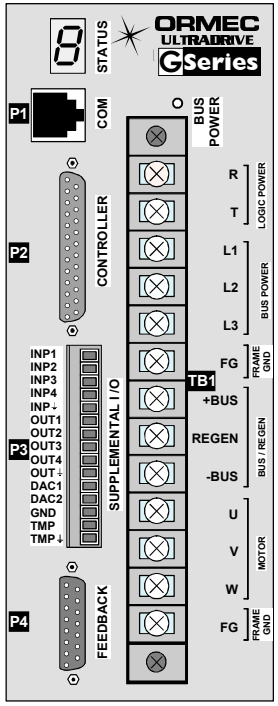
# ORMEC G-Series Digital Servodrive Reference

**WARNING: DO NOT SERVICE THE SERVODRIVE WHEN THE BUS POWER LED IS EVEN DIMLY ILLUMINATED. WAIT FOR THE BUS POWER LED TO BE COMPLETELY OFF. SERVODRIVE BUS MUST BE FULLY DISCHARGED BEFORE SERVICING. THIS CAN TAKE SEVERAL MINUTES. Check for zero DC volts across Bus+, Bus- before servicing.**

**G - Series Digital Servodrive Model Number:**
Example: ..... **G # # - AEB - 00**
# # = Continuous rated DC Bus current, Amps 03,05,10,17,20, 25, 35, 60.
Inputs: ..... **A** = Analog (always present)
Motor Feedback: .... **E** = Commutation encoder, **Y** = Multiplexing encoder
Communications: ... **B** = RS-232
**UltraTools Software** configuration allows the user to define motor and application-specific parameters to be stored in the drives flash RAM.
**00** = Shipped without UltraTools configuration, setup required.
Non Zero number = Custom hardware and/or software configuration.




## Terminal Block Connections:

**R,T** ..... **Logic Power** (G03 - G20) 115 or 230 VAC (+15 / -20%)
Single phase, 50/60 Hz. Absolute MAX is 265 VAC!
**r, t, fg** ... (G25 - G60 located on TB2 ), fg=Frame Ground for logic power.

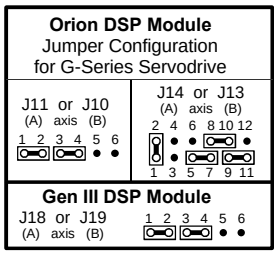
**L1, L2, L3 Main Power Input:** 115 or 230 VAC (+15 / -20%)
**Warning:** Use the servomotor's voltage rating to determine the maximum input voltage for the servodrive. Three phase connect power to (L1,L2,L3). G03 & G05 use single phase connect power to (L1,L2).
The input voltage should match the UltraTools software setting, to ensure proper operation of low bus voltage faults and inrush current limiting.
**FG** ..... Frame Ground for Logic Power and Bus Power Inputs.

**Bus Sharing supported on G25, G35, G60 only!**
**+BUS, -BUS** ... Drives should be connected so that the highest power drives are in the center of the bus-sharing chain. Bus wiring between drives should be less then 12 inches in length.
**Nominal Bus voltage: 163 VDC** for 115 VAC, **325 VDC** for 230 VAC.

**External Regenerative Resistor Option:**
**REGEN** Regenerative shunt circuitry, for use with external regen resistors, is provided on Servodrive models ( G10 through G60 only ).
When used, resistor is connected between +BUS and REGEN.

**Motor Cable:** ORMEC standard motor cable colors are:
**U,V,W** ..... **U** - RED, **V** - WHITE, **W** - BLACK
**FG** ..... Frame Ground - GREEN (Motor) & SILVER (Shield).
**SH** ..... Shield Ground - SILVER (Shield). SH on G25 - G60 only.

**Orion DSP Module**
Jumper Configuration
for G-Series Servodrive




## P3 - Supplementary Input / Output Port:

**The P3 I/O responce is determined by the internal software settings defined by UltraTools.**

**INP1- 4 ..... Digital Input.** (1 & 2 are shared on P2) _____ **INP⏚** ..... Digital Input Common.
Optionally configured for Hardware Travel Limits operation.
INP2 Clockwise rotation inhibit. INP3 Counterclockwise rotation inhibit.

**OUT 1- 4 .... Digital Output.** (1,2 & 3 are shared on P2) ___ **OUT⏚** ..... Digital Output Common.
Optionally configured for application-specific fault information.

**DAC 1-2 ..... Digital to Analog Output.** _____ **GND** ..... DAC Signal Common.
DAC output may include current, velocity, or signal error monitoring.
UltraTools default: DAC1 = Velocity Monitor +/- 9.5VDC = Maximum velocity.
DAC2 = Current Monitor +/- 10 VDC = Peak Torque.

**TMP ..... Motor Temperature Input.** _____ **TMP⏚** ..... Motor Temp Signal Common.
TMP input can protect against motor damage by using normally closed motor thermal switch.



# ORMEC G-Series Fault Code Quick Reference

The G-Series servodrive contains a seven segment alphanumeric display that provides status information. If this status LED is rapidly rotating in a figure eight pattern, the servodrive is operating normally with no fault condition and the output IGBT transistors enabled.
If a fault condition exists a two-character status code will be displayed:

| 7 Seg. LED ( Hex ) | UltraTools Fault Codes (Decimal) | Status | Description |
|---|---|---|---|
| C1 | 193 | Hardware Disable | Drive disabled by the hardware enable input. Drive input (P2 pin-23) not active. See INPFN98 |
| C2 | 194 | Software Disable | Drive disabled by the software enable command DRVENA=0. |
| **Alarms** | | | |
| A0 | 160 | Over Current (RMS) | The maximum rating for the continuous current output of the drive has been exceeded. |
| A1 | 161 | Over Current (Peak) | The maximum rating for the peak current output of the drive or the motor has been exceeded. |
| A3 | 163 | Low Bus Voltage | The DC bus voltage is too low. The trip point depends on the nominal AC input voltage. (usually due to disabled main power) 115 VAC nominal input: trip point = 90 VDC 230 VAC nominal input: trip point = 205 VDC |
| A6 | 166 | Drive Not Configured | An attempt was made to enable torque before the drive's setup parameters have been configured using UltraTools. |
| A8 | 168 | Invalid Commutation Position | Invalid commutation position detected, while drive enabled and in sixstep mode. Possibly due to encoder failure. Check hall input. |
| A9 | 169 | Phase Loss | Loss of a main power phase was detected. |
| AA | 170 | No Bus Voltage | No bus voltage was detected. The SCR has not been commanded ON when trying to enable the drive. |
| AC | 172 | Soft Start Error | An overtemperature condition was detected in the drive powerblock, or a failure of the inrush current resistor. |
| **Faults** | | | |
| F1 | 241 | Motor Over Current (RMS) | The motor's rating for continuous current has been exceeded by the actual RMS current for longer than allowed by the thermal time constant of the motor. (UltraTools software setting) |
| F2 | 242 | Power Module Fault | The Power Module's self-protection has detected a short circuit, over current, over temperature or control supply under voltage. |
| F3 | 243 | High Bus Voltage | The bus voltage is excessive. The trip point depends on the rated voltage of the motor, a UltraTools software setting: |
| F4 | 244 | Motor Over Temperature | When Software Enabled - Open contact at P3-TMP input. When Software Disabled - Closed contact at P3-TMP input. |
| F7 | 247 | Motor Encoder Open Wire | At least one motor encoder feedback channel (ENCA, ENCA', ENCB, ENCB') is not connected properly. |
| F8 | 248 | Watchdog Timeout | DSP Watchdog timeout error. |
| 90-99 9A-9F | 144 - 159 | Internal Drive Error | An unexpected failure in the Servodrive software or hardware. Internal error 98 indicates that the manufacturing calibration of the drive has not been done. Should be reported to Ormec Customer Service. (716) 385 - 3520 |

Recommendations with respect to wiring, grounding and line filters are described in the "Shielding & Grounding Electrical Panels" Application Note, which is available in the ORION Installation & Operation Manual, as well as ORMEC's Web Site (**www.ormec.com**).

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