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ORMEC Troubleshooting

MotionBASIC Ver 5.x & MotionDESK 3.x *Windows 95 or NT application*
Using the direct mode window.
By pressing **three key's < Shift + Alt + Letter >**, a command will be automatically typed.
Troubleshooting example key group are ... < Shift + Alt + F > ... for Fault status.

<Alt+Shift+F> Fault Status

For troubleshooting a system, the most useful <Alt+Shift+ letter> is ... F ... for Fault status. The following example shows the fault status after a machine has experienced a product jam problem.

```
?USING"& 1st of & faulted. FAULT@:& AFAULT@:###
❶  1st of 5 faulted

ALARM@:##";AXIS.FLT1@,AXIS.FAULT@,FAULT@,AFAULT@(AXIS.FLT1@),ALARM@(AXIS.FLT1@)
❷
```

The first line provides the ERROR code, error message, and the program line number where the error occurred. The second line prints the fault information.

System module ..... **FAULT@, ...{7}** .... Axis Fault
Axis that failed 1st ..... **AXIS.FLT1@ .....{2}** .... Axis # two caused the failure.
DSP module ..... **AFAULT@(AXIS.FLT1@) ..... 2** ..... See Servodrive ALARM@
Servodrive ..... **ALARM@(AXIS.FLT1@) ..... 17** .... Motor Overload for E-Series drive.

<Alt+Shift+C> Will attempt to clear faults. You must enter a MODE@ value #.

AFAULT@=0:FAULT@=0:WAIT 300:MODE@=
Available Modes: **0=Disabled**, *1=Pacer,* **2=Standby**, *3=Output, 4=Velocity , 5=Position*

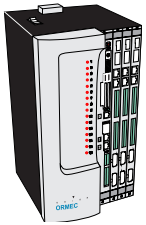
Alt+Shift+Key for MotionDESK 3.0

The "Alt keys" are provided to minimize typing at the command line. **MotionBASIC Ver 4.x -5.x** By pressing this group of keys, **< Alt + Shift + Key >**, a command will be automatically typed in the Direct Mode Window:

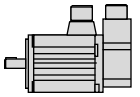
Key		
A REPEAT_	I MOVE FOR_ *(Index)*	R Repeat
B -	J MOVE AT_ *(Jog)*	S MODE@ Status
C Clear Faults	K Show Servo Gains	T Torque Status
D Dump Thread	L -	U UNTIL_
E Error Status	M MP.CONFIG	V Velocity Status
F Fault Status	N Normalize Axes	W WAIT_
G GEAR_	**O Clear Overtravel**	X AXIS.SET@={
H HALT_	P Position Status	Y
	Q Error Stop (Quit)	Z Axis Set Status

ORMEC ORION Fault Codes for MotionBASIC 5.x

FAULT@ ..... Unit Fault Code. Set of current fault(s) with a motion controller.



Code	Fault Condition	Code	Fault Condition
1	RAM Checksum Error	9	String Space Fault
2	Battery Failure (System Module)	10	MotionBASIC Extension Fault
3	Not used	11	Not used
4	Internal Error MBDUMP.BIN	12	Security Key Fault
5	Axis Module Failure	13	DSP not Pentium Compatible
6	E-Stop (or M-Stop) Input error	14	ServoWire Network Fault
7	Axis Fault occurred	15	Incompatible Project File
8	User Generated FAULT@ or, Machine Fault , MFAULT@		



AXIS.FLT1@ . First Servo in the System that Faulted.

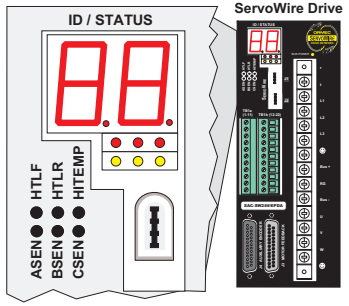
AFAULT@ ..... Axis Fault Code. Diagnostics determined at the SAM level.



ServoWire Axis Module

0	None	9	Hi Axis Loop Rate
1	Position Error > Max	10	Hi Pacer Loop Rate
2	See Servodrive ALARM@	11	No MotionDATA
3	Encoder Ch-A Open	12	Command Buffer Overflow
4	Encoder Ch-B Open	13	Lost Drive Communications
5	Command Overspeed	101	Motion Segment Overspeed
6	Pacer Overspeed	102	Missing Motion Table
7	Encoder Overspeed	901-999	... are Axis Module Software Faults
8	MotionDATA Error		

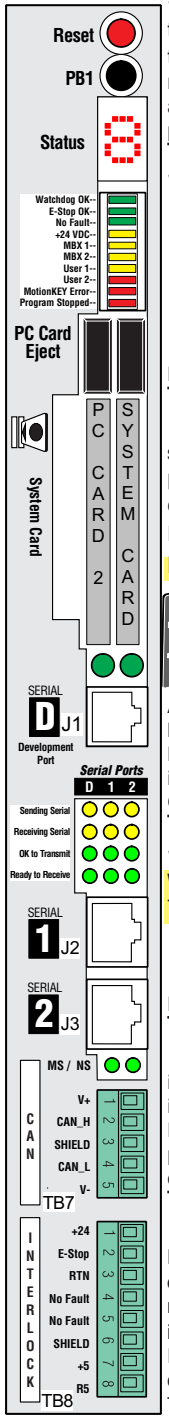
ALARM@ . ServoWire Drive alarm codes



(Decimal)		(Hex)
144-153	Internal Drive Error	90 - 99
154-159	Internal Drive Error	9A - 9F
160	Drive RMS Over Current	A0
161	Peak Over Current	A1
162	Power Module Fault	A2
163	Low Bus Voltage	A3
164	High Bus Voltage	A4
165	Drive/Project Mismatch	A5
166	Drive Not Configured	A6
167	Invalid while drive enabled	A7
168	Invalid commutation position	A8
224	ServoWire Protocol Incompatibility	E0
225	ServoWire Time-out	E1
226	ServoWire Cycle Time Exceeded	E2
240	Motor RMS Over Current	F0
241	Motor Encoder Open Wire	F1
242	Auxiliary Encoder Open Wire	F2
243	Invalid Hall State	F3
244	Motor Over Temperature	F4

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ORMEC ORION ... System Module



5x7 Status Display

After initialization, the ORION Status display will print the MotionBASIC® Version and installed MBX's. Once a user program starts execution, the display will be blank. When a user program terminates normally, the display will revert back to the Direct Mode starburst. If a user program terminates due to an error and enters direct mode, the program stopped led will be ON and the display shows the pertinent error code. Example: "E", "1" , "8" , "0" , "5" ... for ERROR 1805 Program aborted.

Status LEDs when lit indicates the following:

Watchdog OK	Green	Motherboard Processor is alive, flashes 1/sec.
E-Stop OK	Green	12 - 24 Volts is present at Terminal Block TB8 E-Stop.
No-Fault	Green	The controller has no faults. FAULT@=0
+24 VDC	Yellow	Power is present at TB8, +24 and referenced to RTN.
MBX1 & MBX2	Yellow / Yellow	MotionBASIC® Extensions, Under program control.
User 1 / User 2	Yellow / Red	User LED's indication, Under program control.
MotionKEY Error	Red	MotionKEY is missing or insufficient credits.
Program Stopped	Red	MotionBASIC® program not running. In Direct Mode.

PC Card™ ATA

The required system card (right slot) can contain all the system executable programs, MotionBASIC® Extensions (MBX), user MotionBASIC® program, and data files. An optional PC Card™ (left slot) can be added for Ethernet communications or a Memory card for data storage. When the Green LED is ON or Flashing, it indicates that the controller is accessing the PC Card™.

DO NOT REMOVE A PC CARD WHEN THE LED IS ON OR FLASHING.

FILES ... Display names of files currently stored on the booted SYSTEM Card™.

MB Ver 4.x-5.x	MB Ver 3.2	
FILES "D:*.*"	FILES "1:*.*"	... Display files stored in root dir on RIGHT PC Card™.
FILES "E:*.*"	FILES "2:*.*"	... Display files stored in root dir on LEFT PC Card™.
.MTP	.BAS	... Filename extension (*.ext*) for below function.

AUTOLOAD.*ext* ..... File name which is designated to automatically load into the controller from the left PC Card™ on power up. Filename allowed in the left PC Card™ slot ONLY.

PB1LOAD.*ext* ..... File loaded into the controller from the PC Card™ if the PB1 button is held pressed during power up. PB1LOAD.*ext* in the left PC Card™ will always OVERWRITE an existing PB1LOAD.*ext* on the System Card located in the right slot.

Serial Ports

D=MotionDesk™ Development, **1**= SRL1, **2**= SRL2

WARNING: DO NOT connect the communications cable to J2 or J3 serial ports. This can cause damage to the ORION serial port or your computer port.

Sending Serial ...	Yellow	Transmitting a character on serial port.
Receiving Serial ...	Yellow	Receiving a character on serial port.
OK to Transmit	Green	Handshake from other devices has been established.
Ready to Receive ...	Green	Handshake from ORION.

E-Stop

- (TB8 E-Stop) ORION controllers include an E-Stop monitor input, which is indicated by a green "E-Stop OK" LED above. For normal operation, Emergency Stop input power (+12 to +24VDC or 12 to 24VAC, referenced to TB8-RTN) is applied to TB8 E-Stop input. It is recommended that the input be interlocked with the servodrive main power auxiliary contact. Should that current be interrupted, the "E-Stop OK" LED will go off, causing a controller fault error. Error #1910: "E-Stop OK" Input Open.

No Fault

- INTERLOCK (TB8 - No Fault, pins 4&5) ORION controllers have a "No Fault relay", located on the system module. This relay is an isolated "normally-open" output contact. As long as there are No Fault conditions in the controller (LED is ON), the relay will be energized, holding the output contact closed. The power to the No Fault relay is also hardware interlocked with both the E-Stop monitor input and Watchdog circuitry. It is recommended that the No Fault relay be interlocked in series with the main contactor coil. To reenergize this relay after a fault, "E-Stop OK" and "No Fault" LED's must be ON. The "No Fault" LED is only an indicator and tells you the contact SHOULD be closed.

ORMEC ORION Quick Reference

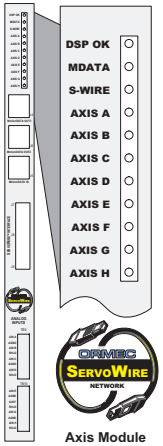
Reset located on the system module is a reboot, like a PC key combination <Ctrl> <Alt> <Del>. Used to restart the system instead of flipping the power switch. Avoid turning the power on and off frequently.

PB1 - Push Button one can be used at power up (boot-up) in two ways:

Inhibits a MotionBASIC® program from running at boot-up.

Load a MotionBASIC® program. At power up, if PB1 is held in, the controller checks for one of the following program files in this order: PB1LOAD.*ext* on left slot PC Card first, System Card, right slot second. Filename extension (*.ext*) for MotionBASIC Ver 4.x or 5.x is (**.MTP**), MotionBASIC Ver 3.2 is (**.BAS**). PB1LOAD.*ext* on left PC Card will always OVERWRITE an existing PB1LOAD.*ext* on the System Card.

ServoWire Axis Module (ORN-SW-AM) LED's when lit, indicates the following:



Axis Module

LED Name	*color*	*Action*
DSP OK	Green	**Axis Module is operating properly.** No internal faults.
MDATA	Green	Receiving MotionDATA communications.
S-WIRE	Red	ServoWire Network configuration error.

Examples: LED ON when two ServoWire Axis Module's are cabled together. Network connected in a ring. Too many drives on network.

Axis A - H LED's are status indicators. Dual color, Green and Red.

The AXIS LED's, labeled A through H, are assigned in ascending order based on the drives ID's that are attached to the Axis Module ServoWire network. The lowest drive ID will be assigned to AXIS A LED. The next higher drive ID will be assigned to AXIS B and so on. Pacer and Virtual axes are also assigned a ServoWire AXIS Status LED.

color(s)	*Action*
Green	**Axis OK,** AFAULT@=0
Red	Axis fault, see AFAULT@
Red / Green	Alternating (flashing) both Green and Red indicates mis-match in project vs Drive ID's setup.

ORION ... Discrete Input / Output board Connecting External Field Power Supply at TB2

The ORION model number indicates if it has an internal field power supply or not. The letter "F" = Internal Field supply, The letter "X" = NONE

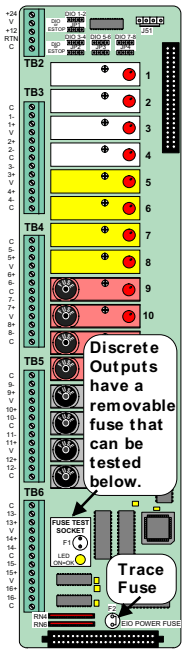
WARNING: If ORION has an internal 24VDC power supply, DO NOT connect another 24VDC supply to pins (+24, RTN) on TB2 or TB8

Discrete I/O Point

- DIO@(*number*) ... number of the I/O point.

Read Input	**PRINT DIO@(*number*)**	Zero=OFF, minus one (-1)=ON
Clear a Latched Input	**DIO@(*number*)=OFF**	
Write Output	**DIO@(*number*)=ON**	or OFF or Set time in milliseconds.
Configure I/O point	**IO.MODE@(*number*)="*letter*"**	

letters are: **I** = Input, **O** = Output, (for any point)
R = Rising, **F** = Falling (Only the first 16 points)



Trace Fuses

On the Discrete I/O board is a Fuse Test socket "F1" and spare holder. The below list of fuses are PRE-FUSED by the circuit board trace.

DO NOT USE A REPLACEMENT FUSE UNLESS THE TRACE IS OPENED!

Discrete I/O board: ....."F2".... Extended Input /Output , +5VDC power.

System module trace fuses are located on the solder side (back) of board.

System module: "F1"..... +5 VDC test at Interlock TB8 pin 7(+5) and pin 8 (R5)

System module: "F2"..... E-Stop (12 to 24VAC)or(+12 to +24VDC) monitor voltage.

System module: "F3"..... +24 VDC test at Interlock TB8 pin 1(+24) and pin 3 (RTN)

The replacement fuse is Wickman 250V, 4Amps. Part # 19370-062K

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