



60510002 CAN GATEWAY MESSAGING REFERENCE MANUAL

CANopen MESSAGING

Prerequisite Knowledge

It is assumed that the reader has some level of familiarity with CANopen networking and terminology, and the Akron Brass product. This information is not intended to be a tutorial on CANopen, nor Akron Brass product operation, but rather a resource for information concerning the requirements and techniques involved in implementing a CANopen control interface to the Akron Brass product line through the 6051 CAN Gateway.

CAN Physical Layer

The CANopen side of the 6051 Gateway physical layer characteristics are generally as follows:

- 11 bit CAN message headers
- User-configurable bit rate of 10K, 20K, 50K, 125K, 250K, 500K, 800K or 1M bits per second
- Proper bus wiring, terminations, etc.

General Message Characteristics

Communication via the 6051 CAN Gateway uses the CANopen 'Predefined Connection Set' as specified in CiA 301 CANopen Application Layer and Communication Profile. The messages are structured as follows:

```
Bit 11.9 8.....1
[.. ][.....]
[.. ]↑ 7 bits, Node-ID
↑ 4 bits, Function code
```

Data length - 1 to 8 bytes

Data bytes 1-8 = Data for message (1 to 8 bytes)

CAN Gateway Defaults

Gateway CANopen side data rate and node usage are configurable, supporting up to 6 monitors concurrently. Factory default configuration parameters are:

CANopen data rate of 125K bits per second
Gateway assigned CANopen node 70_{hex} (112_{dec})
One monitor active, assigned CANopen node 24_{hex} (36_{dec})

These defaults are used in the explanations and examples in the remainder of this document.

SDO 0x1000.00 – CiA DS 301 Device Type (Read Only)

The 6051 CAN Gateway device supports this standard SDO for itself and attached monitors, but note that all devices will return 00000000_{hex} for the device type, as none use a standard CANopen device profile. The Gateway device provides 0x5xxx.xx vendor-specific SDOs for access to certain information about itself and any attached monitors.

Request:

Header = 624_{hex} (monitor) | 670_{hex} (gateway)
Data length – 4 bytes
Data = 40 00 10 00_{hex}

Response:

Header = 5A4_{hex} (monitor) | 5F0_{hex} (gateway)
Data length – 8 bytes
Data = 43 00 10 00 00 00 00 00_{hex}

Example –

Request: [header] 624_{hex} [4 data bytes] 40 00 10 00_{hex}

Response: [header] 5A4_{hex} [8 data bytes] 43 00 10 00 00 00 00 00_{hex}

This exchange only verifies the presence of a device at CANopen node-ID 24_{hex}. SDO 0x5000.01 must be used to determine actual device characteristics.

SDO 0x5000.01 – Akron Brass Device Type (Read Only)

Request:

Header = 624_{hex} (monitor) | 670_{hex} (gateway)

Data length – 4 bytes

Data = 40 00 50 01_{hex}

Response:

Header = 5A4_{hex} (monitor) | 5F0_{hex} (gateway)

Data length – 8 bytes

Byte	1	2	3	4	5	6	7	8
Bit	8.....1	8.....1	8.....1	8.....1	8.....1	8.....1	8.....1	8.....1
	[.....]	[.....]	[.....]	[.....]	[.....]	[.....]	[.....]	[.....]
	[.....]	[.....]	[.....]	[.....]	[.....]	[.....]	[.....]	[.....]
	[.....]	[.....]	[.....]	[.....]	↑ 32 bits (low - high) unsigned, Device type			
	[.....]	[.....]	[.....]	↑ 1 byte, response data byte 4, 01 _{hex}				
	[.....]	[.....]	↑ 1 byte, response data byte 3, 50 _{hex}					
	[.....]	↑ 1 byte, response data byte 2, 00 _{hex}						
	↑ 1 byte, response data byte 1, 43 _{hex}							

Example –

Request: [header] 624_{hex} [4 data bytes] 40 00 50 01_{hex}

Response: [header] 5A4_{hex} [8 data bytes] 43 00 50 01 16 69 98 03_{hex}

This exchange determines that the unit at CANopen node-ID 24_{hex} is:

Akron Brass part 60320022 (style 3463 Firefox with Novotechnik sensors)

[Device type = (low - high) 00010110 01101001 10011000 00000011 =

(unsigned 32 bit) 00000011 10011000 01101001 00010110 =

03986916_{hex} =

60320022_{dec}]

SDO 0x5001.01 – Akron Brass System Fault Status (Read Only)

Request:

Header = 624_{hex} (monitor) | 670_{hex} (gateway)

Data length – 4 bytes

Data = 40 01 50 01_{hex}

Response:

Header = 5A4_{hex} (monitor) | 5F0_{hex} (gateway) Data length – 8 bytes

Byte	1	2	3	4	5	6	7	8
Bit	8.....1	8.....1	8.....1	8.....1	8.....1	8.....1	8.....1	8.....1
	[.....]	[.....]	[.....]	[.....]	[...]	[...]	[...]	
	[.....]	[.....]	[.....]	[.....]	||| [...]	||| [...]	||| [...]	|||||↑ Internal EEPROM fault
	[.....]	[.....]	[.....]	[.....]	||| [...]	||| [...]	||| [...]	|||||↑ Motor Axis 1 fault
	[.....]	[.....]	[.....]	[.....]	||| [...]	||| [...]	||| [...]	|||||↑ Motor Axis 2 fault
	[.....]	[.....]	[.....]	[.....]	||| [...]	||| [...]	||| [...]	|||||↑ Motor Axis 3 fault
	[.....]	[.....]	[.....]	[.....]	||| [...]	||| [...]	||| [...]	|||||↑ Motor Axis 4 fault
	[.....]	[.....]	[.....]	[.....]	||| [...]	||| [...]	||| [...]	|||||↑ Motor Axis 5 fault
	[.....]	[.....]	[.....]	[.....]	||| [...]	||| [...]	||| [...]	|↑ Digital Output 1 fault
	[.....]	[.....]	[.....]	[.....]	||| [...]	||| [...]	||| [...]	↑ Digital Output 2 fault
	[.....]	[.....]	[.....]	[.....]	||| [...]	||| [...]	||| [...]	↑ Digital Output 3 fault
	[.....]	[.....]	[.....]	[.....]	||| [...]	||| [...]	||| [...]	|||↑ 4 bits (unused)
	[.....]	[.....]	[.....]	[.....]	||| [...]	||| [...]	||| [...]	|||↑ SCI input overrun
	[.....]	[.....]	[.....]	[.....]	||| [...]	||| [...]	|↑ CAN input overrun	
	[.....]	[.....]	[.....]	[.....]	||| [...]	||| [...]	↑ XGATE processor | code fault	
	[.....]	[.....]	[.....]	[.....]	||| [...]	||| [...]	↑ pCode syntax error	
	[.....]	[.....]	[.....]	[.....]	||| [...]	||| [...]	|||↑ 4 bits (unused)	
	[.....]	[.....]	[.....]	[.....]	||| [...]	||| [...]	|||↑ Internal fuse blown	
	[.....]	[.....]	[.....]	[.....]	||| [...]	|↑ 1 bit (unused)		
	[.....]	[.....]	[.....]	[.....]	||| [...]	↑ External EEPROM fault		
	[.....]	[.....]	[.....]	[.....]	|||↑ 5 bits (unused)			
	[.....]	[.....]	[.....]	[.....]	|||↑ SCI output overrun			
	[.....]	[.....]	[.....]	[.....]	|↑ CAN output overrun			
	[.....]	[.....]	[.....]	[.....]	↑ S12 processor | code fault			
	[.....]	[.....]	[.....]	↑ 1 byte, response data byte 4, 01 _{hex}				
	[.....]	[.....]	↑ 1 byte, response data byte 3, 50 _{hex}					
	[.....]	↑ 1 byte, response data byte 2, 01 _{hex}						
	↑ 1 byte, response data byte 1, 43 _{hex}							

Example –

Request: [header] 624_{hex} [4 data bytes] 40 01 50 01_{hex}

Response: [header] 5A4_{hex} [8 data bytes] 43 01 50 01 00 20 00 00_{hex}

This exchange determines that the system fault status of the unit at CANopen node-ID 24_{hex} is:

Internal fuse blown

[system error bit map = xxxxxxxx xx1xxxxx xxxxxxxx xxxxxxxx = Internal fuse blown]

SDO 0x5001.02 – Akron Brass Operational Error Code (Read Only)

Request:

Header = 624_{hex}
Data length – 4 bytes
Data = 40 01 50 02_{hex}

Response:

Header = 5A4_{hex}
Data length – 6 bytes

Byte	1	2	3	4	5	6
Bit	8.....1	8.....1	8.....1	8.....1	8.....1	8.....1
	[.....]	[.....]	[.....]	[.....]	[.....]	[.....]
	[.....]	[.....]	[.....]	[.....]	↑ word, Operational Error Code	
	[.....]	[.....]	[.....]	↑ 1 byte, response data byte 4, 02 _{hex}		
	[.....]	[.....]	↑ 1 byte, response data byte 3, 50 _{hex}			
	[.....]	↑ 1 byte, response data byte 2, 01 _{hex}				
	↑ 1 byte, response data byte 1, 4B _{hex}					

Example –

Request: [header] 624_{hex} [4 data bytes] 40 01 50 02_{hex}

Response: [header] 5A4_{hex} [6 data bytes] 4B 01 50 02 0B 00_{hex}

This exchange determines that the operational error code of the unit at CANopen node-ID 24_{hex} is:

11 (Rotation Sensor error)

[Operational Error Code = (low - high) 00001011 00000000 =
(unsigned 16 bit) 00000000 00001011 =
000B_{hex}
=11_{dec}]

Values in Operational Error code correspond to Error Flash Codes in the reference manual for the specific device.

SDO 0x5002.01 – Akron Brass Zero Axis Positions request (Write Only)

Request:

Header = 624_{hex}

Data length – 5 bytes

Data = 2F 02 50 01 41_{hex}

Response:

Header = 5A4_{hex}

Data length – 4 bytes

Data = 60 02 50 01_{hex}

Example –

Request: [header] 624_{hex} [5 data bytes] 2F 02 50 01 41_{hex}

Response: [header] 5A4_{hex} [4 data bytes] 60 02 50 01_{hex}

This exchange with the unit at CANopen node-ID 24_{hex} causes the device to set its zero positions for rotation and elevation to their current positions.

This SDO write is only accepted and acknowledged by controllers supporting monitors with analog position feedback, allowing the integrator to set zero axis positions via CANopen.

SDO 0x5002.02 – Akron Brass Reset Controller request (Write Only)

Request:

Header = 624_{hex}

Data length – 5 bytes

Data = 2F 02 50 02 45_{hex}

Response:

Header = 5A4_{hex}

Data length – 4 bytes

Data = 60 02 50 02_{hex}

Example –

Request: [header] 624_{hex} [5 data bytes] 2F 02 50 02 45_{hex}

Response: [header] 5A4_{hex} [4 data bytes] 60 02 50 02_{hex}

This exchange with the unit at CANopen node-ID 24_{hex} causes the device to perform a power on reset.

This SDO write results in an immediate reset of the target unit. The response is provided by the CAN Gateway to maintain compatibility with the CANopen protocol.

SDO 0x5002.03 – Akron Brass Enter Setup Mode request (Write Only)

Request:

Header = 624_{hex}

Data length – 5 bytes

Data = 2F 02 50 03 46_{hex}

Response:

Header = 5A4_{hex}

Data length – 4 bytes

Data = 60 02 50 03_{hex}

Example –

Request: [header] 624_{hex} [5 data bytes] 2F 02 50 03 46_{hex}

Response: [header] 5A4_{hex} [4 data bytes] 60 02 50 03_{hex}

This exchange with the unit at CANopen node-ID 24hex causes the device to enter setup mode.

This SDO write has the same effect as powering up the target control with the Stream command input active.

CiA DS 301 Network Management

The 6051 CAN Gateway provides support for the following standard NMT commands for itself and attached monitors:

Header = 000_{hex}

Data length – 2 bytes

Data = cc nn

cc:

01_{hex} = Start / Run

81_{hex} = Reset Node

nn:

node-ID, 00_{hex} = all nodes

Example: [header] 000_{hex} [2 data bytes] 01 00_{hex}

This request places the gateway and all attached monitors into the Operational state.

CiA DS 301 Heartbeat

The 6051 CAN Gateway provides support for this message for itself and attached monitors. It is enabled and set to 1000ms (1 second) interval for all devices by default.

Header = 724_{hex} (monitor) | 770_{hex} (gateway)

Data length – 1 byte

Data:

00_{hex} – Node just powered on (initial transmission only)

7F_{hex} – Node is in Pre-Operational state

05_{hex} – Node is in Operational state

Example: [header] 724_{hex} [1 data byte] 05_{hex}

This message indicates the device at CANopen node-ID 24_{hex} is in the Operational state.

Monitor RPDO1 – Joystick Command Message

COB id = 00000224_{hex}
 Header = 0x200 + Node-ID
 Data length – 8 bytes

Byte	1	2	3	4	5	6	7	8
Bit	8.....1	8.....1	8.....1	8.....1	8.....1	8.....1	8.....1	8.....1
	[] [] [] []	[.....]	[] [] [] []	[.....]	[] [] [..]	[] [] [] []	[] [] [] []	[] [] [] []
	[] [] [] []	[.....]	[] [] [] []	[.....]	[] [] [..]	[] [] [] []	[] [] [] []	[] [] [] [] ↑ Switch 12 status
	[] [] [] []	[.....]	[] [] [] []	[.....]	[] [] [..]	[] [] [] []	[] [] [] []	[] [] [] [] ↑ Switch 11 status
	[] [] [] []	[.....]	[] [] [] []	[.....]	[] [] [..]	[] [] [] []	[] [] [] []	[] [] [] [] ↑ Switch 10 status
	[] [] [] []	[.....]	[] [] [] []	[.....]	[] [] [..]	[] [] [] []	[] [] [] []	[] [] [] [] ↑ Switch 9 status
	[] [] [] []	[.....]	[] [] [] []	[.....]	[] [] [..]	[] [] [] []	[] [] [] []	[] [] [] [] ↑ Switch 8 status
	[] [] [] []	[.....]	[] [] [] []	[.....]	[] [] [..]	[] [] [] []	[] [] [] []	[] [] [] [] ↑ Switch 7 status
	[] [] [] []	[.....]	[] [] [] []	[.....]	[] [] [..]	[] [] [] []	[] [] [] []	[] [] [] [] ↑ Switch 6 status
	[] [] [] []	[.....]	[] [] [] []	[.....]	[] [] [..]	[] [] [] []	[] [] [] []	[] [] [] [] ↑ Switch 5 status
	[] [] [] []	[.....]	[] [] [] []	[.....]	[] [] [..]	[] [] [] []	[] [] [] []	[] [] [] [] ↑ Switch 4 status
	[] [] [] []	[.....]	[] [] [] []	[.....]	[] [] [..]	[] [] [] []	[] [] [] []	[] [] [] [] ↑ Switch 3 status
	[] [] [] []	[.....]	[] [] [] []	[.....]	[] [] [..]	[] [] [] []	[] [] [] []	[] [] [] [] ↑ Switch 2 status
	[] [] [] []	[.....]	[] [] [] []	[.....]	[] [] [..]	[] [] [] []	[] [] [] []	[] [] [] [] ↑ Switch 1 status
	[] [] [] []	[.....]	[] [] [] []	[.....]	[] [] [..]	[] [] [] []	[] [] [] []	[] [] [] [] ↑ 4 bits (unused)
	[] [] [] []	[.....]	[] [] [] []	[.....]	[] [] [..]	[] [] [] []	[] [] [] []	[] [] [] [] ↑ Y detent status (ignored by Akron Brass devices)
	[] [] [] []	[.....]	[] [] [] []	[.....]	[] [] [..]	[] [] [] []	[] [] [] []	[] [] [] [] ↑ X detent status (ignored by Akron Brass devices)
	[] [] [] []	[.....]	[] [] [] []	[.....]	[] [] [..]	[] [] [] []	[] [] [] []	[] [] [] [] ↑ 8 bits, Y deflection (high) unsigned, 0.1%
	[] [] [] []	[.....]	[] [] [] []	[.....]	[] [] [..]	[] [] [] []	[] [] [] []	[] [] [] [] ↑ Y neutral status
	[] [] [] []	[.....]	[] [] [] []	[.....]	[] [] [..]	[] [] [] []	[] [] [] []	[] [] [] [] ↑ Y back (-) status
	[] [] [] []	[.....]	[] [] [] []	[.....]	[] [] [..]	[] [] [] []	[] [] [] []	[] [] [] [] ↑ Y forward (+) status
	[] [] [] []	[.....]	[] [] [] []	[.....]	[] [] [..]	[] [] [] []	[] [] [] []	[] [] [] [] ↑ 2 bits, Y deflection (low) unsigned, 0.1%
	[] [] [] []	[.....]	[] [] [] []	[.....]	[] [] [..]	[] [] [] []	[] [] [] []	[] [] [] [] ↑ 8 bits, X deflection (high) unsigned, 0.1%
	[] [] [] []	[.....]	[] [] [] []	[.....]	[] [] [..]	[] [] [] []	[] [] [] []	[] [] [] [] ↑ X neutral status
	[] [] [] []	[.....]	[] [] [] []	[.....]	[] [] [..]	[] [] [] []	[] [] [] []	[] [] [] [] ↑ X left (-) status
	[] [] [] []	[.....]	[] [] [] []	[.....]	[] [] [..]	[] [] [] []	[] [] [] []	[] [] [] [] ↑ X right (+) status
	[] [] [] []	[.....]	[] [] [] []	[.....]	[] [] [..]	[] [] [] []	[] [] [] []	[] [] [] [] ↑ 2 bits, X deflection (low) unsigned, 0.1%

(2 bit status field values: 00 = Off, 01 = On, 10 = Error, 11 = N/A)

Example – [header] 224_{hex} [8 data bytes] 10 7D 04 64 00 10 00 00_{hex}

This Joystick Command message to the Akron Brass monitor at CANopen Node-ID 24_{hex} indicates:

Rotate Right is commanded at 50% speed

[X deflection = (low – high) 00..... 01111101 =
 (unsigned 10 bit)01 11110100 =

1F4_{hex} =

500_{dec} =

50.0%]

[X right (+) status = ..01.... = On]

Elevate Up is commanded at 40% speed

[Y deflection = (low – high) 00..... 01100100 =
 (unsigned 10 bit)01 10010000 =

190_{hex} =

400_{dec} =

40.0%]

[Y back (-) status =01.. = On]

Pattern Fog is commanded

[Switch 2 status = ..01.... = On]

Refer to Appendix A for detailed switch input mapping, message timing requirements, and information on how Joystick Command input is handled by Akron Brass devices.

Monitor TPDO1 – Monitor Position / Limit Status

This message is issued periodically (default 100ms) by 6032 Universal II, 6040 Forestry, 6042 Global Platform and 6052 StreamMaster II units to indicate axis positions (units with analog feedback), travel limit status, et.al.

COB id = 400001A4_{hex}, transmission type = FE_{hex} (event driven, manufacturer specific)

Header = 1A4

Data length – 8 bytes

Byte	1	2	3	4	5	6	7	8
Bit	8.....1	8.....1	8.....1	8.....1	8.....1	8.....1	8.....1	8.....1
	[.....]	[.....]	[.....]	[.....]	[.....]	[.....]	[.....]	[.....]
	[.....]	[.....]	[.....]	[.....]	[.....]	[.....]	[.....]	[.....]↑ Calibration status
	[.....]	[.....]	[.....]	[.....]	[.....]	[.....]	[.....]	[.....]↑ Operational Error Code set
	[.....]	[.....]	[.....]	[.....]	[.....]	[.....]	[.....]	[.....]↑ Axis 5(-) hard stop status
	[.....]	[.....]	[.....]	[.....]	[.....]	[.....]	[.....]	[.....]↑ Axis 5(+) hard stop status
	[.....]	[.....]	[.....]	[.....]	[.....]	[.....]	[.....]	[.....]↑ Axis 4(-) hard stop status
	[.....]	[.....]	[.....]	[.....]	[.....]	[.....]	[.....]	[.....]↑ Axis 4(+) hard stop status
	[.....]	[.....]	[.....]	[.....]	[.....]	[.....]	[.....]	[.....]↑ Axis 3(-) hard stop status
	[.....]	[.....]	[.....]	[.....]	[.....]	[.....]	[.....]	[.....]↑ Axis 3(+) hard stop status
	[.....]	[.....]	[.....]	[.....]	[.....]	[.....]	[.....]	[.....]↑ Axis 2(-) hard stop status
	[.....]	[.....]	[.....]	[.....]	[.....]	[.....]	[.....]	[.....]↑ Axis 2(+) hard stop status
	[.....]	[.....]	[.....]	[.....]	[.....]	[.....]	[.....]	[.....]↑ Axis 1(-) hard stop status
	[.....]	[.....]	[.....]	[.....]	[.....]	[.....]	[.....]	[.....]↑ Axis 1(+) hard stop status
	[.....]	[.....]	[.....]	[.....]	[.....]	[.....]	[.....]	[.....]↑ Elevation Down(-) position status
	[.....]	[.....]	[.....]	[.....]	[.....]	[.....]	[.....]	[.....]↑ Elevation Up(+) position status
	[.....]	[.....]	[.....]	[.....]	[.....]	[.....]	[.....]	[.....]↑ 12 bits (high - low) unsigned, Elevation position, 0.1°
	[.....]	[.....]	[.....]	[.....]	[.....]	[.....]	[.....]	[.....]↑ Rotation Left(-) position status
	[.....]	[.....]	[.....]	[.....]	[.....]	[.....]	[.....]	[.....]↑ Rotation Right(+) position status
	[.....]	[.....]	[.....]	[.....]	[.....]	[.....]	[.....]	[.....]↑ 12 bits (high - low) unsigned, Rotation position, 0.1°
	[.....]	[.....]	[.....]	[.....]	[.....]	[.....]	[.....]	[.....]↑ 8 bits, message type, 00000001 = 01 _{hex}

2 bit status field values: 00 = Off, 01 = On, 10 = Error, 11 = N/A

axis (+) position status = 01, axis (-) position status = 00 and axis position = 0xFF

indicates axis sensor error

axis (+) position status = 11, axis (-) position status = 11 and axis position = 0xFFF

indicates analog feedback option not present on axis

Example – [header] 1A_{hex} [8 data bytes] 01 1D 94 03 71 00 00 01_{hex}

This message from the Akron Brass monitor at CANopen node-ID 24_{hex} indicates:

Rotation position is $+47.3^\circ$ [Axis 0 position = (high – low) 00011101 1001.... =
(unsigned 12 bit)0001 11011001 =

$$\begin{aligned} 1D9_{\text{hex}} &= \\ 473_{\text{dec}} &= \\ 47.3^\circ \end{aligned}$$

[Axis 0 (+) position status =01.. = On]

Elevation position is -5.5° [Axis 1 position = (high – low) 00000011 0111.... =
(unsigned 12 bit)0000 00110111 =

037_{hex} =
55_{dec} =
5.5°]

[Axis 1 (-) position status =01 = On]

Unit has been calibrated [Calibration status =01 = On]

Refer to Appendix B for default axis usage for Akron Brass monitors.

Note that 'Operational Error Code set' status of 01 (On) indicates that an Operational Error has been encountered and the unit is operating in a reduced functionality mode. SDO 0x5001.02 should be used to retrieve the error code and determine required action.

Monitor TPDO2 – Digital Output Status

This message is issued periodically (default 100ms) by the 6032 Universal II, 6040 Forestry, 6042 Global Platform and 6052 StreamMaster II units to indicate status of various digital outputs.

COB id = 400002A4_{hex}, transmission type = FE_{hex} (event driven, manufacturer specific)

Header = 2A4_{hex}

Data length – 3 bytes

Byte	1	2	3
Bit	8.....1	8.....1	8.....1
	[.....]
	[.....]	.....	.....↑ Status (panel) LED
	[.....]	.....	.....↑ Status (point-aim) LED
	[.....]	.....	.....↑ Monitor not in exclusion zone (ladder avoidance)
	[.....]	.....	.....↑ Remote mode (portable battery powered monitor)
	[.....]	.....	.....↑ Status (wireless hand-held) LED
	[.....]	.....	.....↑ Monitor high-flow status
	[.....]	.....	.....↑ Discharge valve status
	[.....]	.....	.....↑ Dry chemical dispense status
	[.....]	.....	.....↑↑ Electric riser command bits
	[.....]	.....	.....↑ reserved
	[.....]	.....	.....↑ reserved
	[.....]	.....	.....↑ reserved
	[.....]	.....	.....↑ reserved
	[.....]	.....	.....↑ Monitor Active status
	[.....]	.....	.....↑ Enable input status
	↑ 8 bits, message type, 10000011 = 83hex		

Example – [header] 2A4_{hex} [3 data bytes] 83 00 01_{hex}

This message from the Akron Brass monitor at CANopen node-ID 24_{hex} indicates:

Panel LED is on

[Panel LED status = 1 = On]

Monitor is active

[Monitor Active status = .1..... = On]

Enable input is active

[Enable input status = 1..... = On]

Note that if an Operational Error has been encountered and the unit is operating in a reduced functionality mode, 'Panel LED status' will be blinking out the error code. Refer to TPDO1 for more information.

Note that Monitor Active status is not set if the monitor is stowed, and is set if the monitor is in any other state.

Note that if the Enable input is not active, CAN communication will continue, but no motor movement requests will be honored. Motor movement will be allowed to resume when the Enable input returns to active status.

Appendix A – Handling of Joystick Command messages

Joystick inputs are mapped to 6032 Universal II, 6040 Forestry, 6042 Global Platform and 6052 StreamMaster II inputs as follows:

- X axis right - Rotate Right with proportional speed control
- X axis left - Rotate Left with proportional speed control
- Y axis back - Elevate Up with proportional speed control
- Y axis forward - Elevate Down with proportional speed control
- Switch 1 - Pattern Stream
- Switch 2 - Pattern Fog
- Switch 3 - Discharge On
- Switch 4 - Oscillate On | Set
- Switch 5 - Flow High
- Switch 6 - Flow Low
- Switch 7 - Oscillate Pause | Resume
- Switch 8 - Deploy
- Switch 9 - Stow
- Switch 10 - Discharge Off
- Switch 11 - CAFS dry mode
- Switch 12 - CAFS wet mode

On the Akron Brass CAN bus, the units will accept input requests from multiple sources and will try to honor any and all non-conflicting requests. Conflicting requests will be handled according to the following default priority scheme (meaning input requests from a particular source will override conflicting requests from all lower priority sources):

Highest priority

- Physical input switches (only available on 6032 Universal II)

- CAN device at node address 33_{hex}

- CAN device at node address 34_{hex}

- CAN device at node address 35_{hex}

- CAN device at node address 36_{hex}

- CAN device at node address 37_{hex}

- CAN device at node address 38_{hex}

Lowest priority

By default, all control devices [6035 Joystick, 6037 Wireless Interface, 6041 Switchbox, 6051 CAN Gateway, and any integrator device(s)] appear to Akron Brass controllers as a J1939 joystick at one of the above addresses broadcasting Joystick Command messages.

Joystick Command messages are expected to be broadcast on a periodic basis, every 100ms or less (Akron Brass control devices default to every 20ms). As a safety precaution against control device failure or CAN bus interruption, the controller monitors message timing and if it does not receive any message from an input device (CAN node address) for 200ms, the input buffer for that CAN node is cleared, stopping any manual motion that was being requested by that device.

Appendix B – Default Axis Usage for Akron Brass Monitors

6032 Universal II controller

Axis 1: Rotation, (+) = right, (-) = left

Axis 2: Elevation, (+) = up, (-) = down

Axis 3: Pattern, (+) = stream, (-) = fog

Axis 4: Monitor specific

Trident Dual Gallonage: Flow control, (+) = high flow, (-) = low flow

DeckMaster: Swing arm, (+) = deploy, (-) = stow

Others: N/A

Axis 5: Discharge valve, (+) = open, (-) = close

6040 Forestry controller

Axis 1: Rotation, (+) = right, (-) = left

Axis 2: Elevation, (+) = up, (-) = down

Axis 3: Pattern, (+) = stream, (-) = fog

Axis 4: Discharge valve, (+) = open, (-) = close

6042 Global Platform controller

Axis 1: Rotation, (+) = right, (-) = left

Axis 2: Elevation, (+) = up, (-) = down

Axis 3: Pattern, (+) = stream, (-) = fog

6052 StreamMaster II controller

Axis 1: Rotation, (+) = right, (-) = left

Axis 2: Elevation, (+) = up, (-) = down

Axis 3: Pattern, (+) = stream, (-) = fog



Tested... Proven... Trusted.

ISO 9001 REGISTERED COMPANY

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