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|-----------------------------------------------------------------------------------|-----------------------|------------------|-------|----------|------------------|----|
|  | Doc or ECO #:         | PN4-001-ASSM-002 | Date: | 11/1/17  | Author:          | CH |
|                                                                                   | Rev. #:               | A                |       |          |                  |    |
| ECO for PRO4 panel BNC connector isolation                                        | Engineering Approval: | AEG              | Date: | 11/13/17 | Quality Approval | DO |

|               |                                    |                        |                   |
|---------------|------------------------------------|------------------------|-------------------|
| <b>P/N #:</b> | PN4-001-ASSM                       | <b>Effective Date:</b> | November 13, 2017 |
| <b>Title:</b> | Pro4 Panel BNC Connector Isolation |                        |                   |

## 1.0 Purpose / Summary

The BNC connector can form an electric connection to the ICB panel. This can cause video noise due to ground loops. The BNC connector on the back of the Pro4 panel interface will be isolated to improve video quality from the ROV. This will eliminate a potential ground loop on the video signal.

## 2.0 Parts Affected

| Part Number | Notes                                                          | Removed                  | Added                               | New                                 | Modified                            |
|-------------|----------------------------------------------------------------|--------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| 51001       | Pro4 ICB, Standard (PPI)                                       | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 51010       | Pro4 ICB, BlueView with M100 Modem Ready                       | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 51011       | Pro4 ICB, BlueView with M100 Modem Ready, Integrated Lynn Hawk | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 52394       | Hard Fiber Washer for 1/4" Screw Size,                         | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| 52395       | Plastic Washer for 1/4" Screw Size                             | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| 52396       | Sleeve Washer Rolled- Collar, 1/4" Screw Size                  | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |

## 3.0 Disposition of Material

All systems in stock and moving forward should be modified to conform to this ECO.

## 4.0 Detail

The BNC connector on the back of the Pro4 panel interface will be isolated to improve video quality from the ROV. This connector provides the user with analog video directly from the ROV. In some cases, video noise can be induced through this connector due to contact with the chassis ground on the panel.

Electrically isolating this connector from the panel with spacers will remove any contact with chassis ground, therefore avoiding any noise from the chassis to be introduced into the video feed.

This change will only require the addition of 3 spacers to the assembly and no modifications to the panel.

|                                                                                   |                       |                  |       |          |                  |    |
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## 5.0 Action Items

| Action                                                                                                                                                                                                                                                                                       | Department | Acknowledgement Initials |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|--------------------------|
| <ul style="list-style-type: none"> <li>Provide Purchasing all documentation related to the BNC connector isolation</li> <li>Approve First Article for Pro4 panel with isolated BNC</li> </ul>                                                                                                | PE         | CH                       |
| <ul style="list-style-type: none"> <li>Notify Pro4 panel assemblers of the changes stated above</li> <li>Provide applicable documentation to Pro4 panel assemblers including work instructions</li> <li>Get a Pro4 panel with isolated BNC First Article for Engineering approval</li> </ul> | Purchasing | NS                       |
| <ul style="list-style-type: none"> <li>Modify all Pro4 panels in stock with changes stated above</li> </ul>                                                                                                                                                                                  | Production | KK                       |
| <ul style="list-style-type: none"> <li>Implement changes stated above on all incoming Pro4 panels</li> </ul>                                                                                                                                                                                 | Repairs    | JK                       |
| <ul style="list-style-type: none"> <li>Inspect Incoming Pro4 panels for the implementation of the isolated BNC connector</li> </ul>                                                                                                                                                          | QA         | DO                       |

## 6.0 Modified / Referenced Documents:

| Document                                 | Current Revision |
|------------------------------------------|------------------|
| Pro4 Panel BNC Connector Isolation.doc   | A                |
| Pro4 BNC Connector Isolation Diagram.pdf | A                |

## 7.0 Revision History

| Date Revised (mm-dd-yyyy) | Location of Change (section, paragraph no., step no., etc.) | Description of Change Made | Name of Person making the Change |
|---------------------------|-------------------------------------------------------------|----------------------------|----------------------------------|
|                           |                                                             |                            |                                  |
|                           |                                                             |                            |                                  |
|                           |                                                             |                            |                                  |