# 7-163PIN160

## CHELTON

### Logic Converter Unit

High performance military aircraft need to maintain continuity for broadband, frequency hopping V/UHF secure communications. Radios need to integrate seamlessly with antennas to maximize the reliability and resilience of such communications.

In conjunction with Chelton's range of tuneable antennas, the **7-163PIN160 Logic Converter Unit (LCU)** takes frequency information from the radio and matches the performance of the antenna to that frequency.

The **7-163PIN160** can be configured to operate with one of up to seven radio types (such as the **ARC210** and **ARC231**) and with one of up to four antenna types (such as the **12-190-160**, **12-190-310** or **12-190-530LP**).

For the latest available radio and antenna support, please contact Chelton.

A selectively screened LCU, the **7-163PIN160HT**, is available for operation over an extended temperature range.

The **7-163PIN160** is powered from the 28 Volts dc aircraft supply.

The LCU terminates and validates the control signals from the radio, extracts the frequency information, translates it to a tuning command, and provides the required drive signals to tune the antenna via the parallel bus at the output connector.



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| DC Power<br>Input<br>Interface16 V to 32 VInterfaceNormal Working Voltage:22 to 29 Volts dcEmergency Working Voltage:16 to 29 Volts dcProtection: Reverse polarity and transient<br>protectionProtection in accordancePower interrupts:Protection in accordanceWith MIL-STD-704DMaximum current from aircraft supply:1.4 A at 18 V dcSerial Control<br>InterfaceRadio dependent:Differential Manchester Encoded serial bit<br>stream<br>Serial data and separate synchronous clockAntenna<br>Drive<br>InterfaceEach of the nine drive-lines gives either a high<br>voltage reverse bias or a constant current<br>source for the PIN diodes in the antenna.High Level<br>Low LevelAntenna segment, PIN diode reverse biased:<br>+100 V ± 25 VLow LevelAntenna segment, PIN diode forward biased:<br>-180 mA ± 25 mA constant current sourceConnectorsType MS3112E 14-19P |            |  |  |
|---|------------|--|--|
| InterfaceNormal Working Voltage:22 to 29 Volts dcEmergency Working Voltage:16 to 29 Volts dcProtection:Reverse polarity and transientprotectionPower interrupts:Power interrupts:Protection in accordancewith MIL-STD-704DMaximum current from aircraft supply:1.4 A at 18 V dcSerial ControlRadio dependent:InterfaceDifferential Manchester Encoded serial bit<br>streamSerial data and separate synchronous clockAntenna<br>DriveEach of the nine drive-lines gives either a high<br>voltage reverse bias or a constant current<br>source for the PIN diodes in the antenna.High LevelAntenna segment, PIN diode forward biased:<br>+100 V ± 25 VLow LevelAntenna segment, PIN diode forward biased:<br>-180 mA ± 25 mA constant current source  |            | 16 V to 32 V                                 |  |
| Protection: Reverse polarity and transient<br>protectionPower interrupts:Protection in accordance<br>with MIL-STD-704DMaximum current from aircraft supply:<br>1.4 A at 18 V dcSerial Control<br>InterfaceRadio dependent:<br>Differential Manchester Encoded serial bit<br>stream<br>Serial data and separate synchronous clockAntenna<br>Drive<br>InterfaceEach of the nine drive-lines gives either a high<br>voltage reverse bias or a constant current<br>source for the PIN diodes in the antenna.High LevelAntenna segment, PIN diode forward biased:<br>+100 V ± 25 VLow LevelAntenna segment, PIN diode forward biased:<br>-180 mA ± 25 mA constant current source   |            | Normal Working Voltage: 22 to 29 Volts dc    |  |
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| with MIL-STD-704DMaximum current from aircraft supply:1.4 A at 18 V dcSerial ControlRadio dependent:InterfaceDifferential Manchester Encoded serial bit<br>streamSerial data and separate synchronous clockAntennaEach of the nine drive-lines gives either a high<br>voltage reverse bias or a constant current<br>source for the PIN diodes in the antenna.High LevelAntenna segment, PIN diode reverse biased:<br>+100 V ± 25 VLow LevelAntenna segment, PIN diode forward biased:<br>-180 mA ± 25 mA constant current source  |            | 1 2  |  |
| 1.4 A at 18 V dc         Serial Control<br>Interface       Radio dependent:<br>Differential Manchester Encoded serial bit<br>stream         Serial data and separate synchronous clock         Antenna<br>Drive<br>Interface       Each of the nine drive-lines gives either a high<br>voltage reverse bias or a constant current<br>source for the PIN diodes in the antenna.         High Level       Antenna segment, PIN diode reverse biased:<br>+100 V ± 25 V         Low Level       Antenna segment, PIN diode forward biased:<br>-180 mA ± 25 mA constant current source   |            |  |  |
| Serial Control<br>Interface       Radio dependent:<br>Differential Manchester Encoded serial bit<br>stream         Serial data and separate synchronous clock         Antenna<br>Drive       Each of the nine drive-lines gives either a high<br>voltage reverse bias or a constant current<br>source for the PIN diodes in the antenna.         High Level       Antenna segment, PIN diode reverse biased:<br>+100 V ± 25 V         Low Level       Antenna segment, PIN diode forward biased:<br>-180 mA ± 25 mA constant current source   |            | Maximum current from aircraft supply:        |  |
| InterfaceDifferential Manchester Encoded serial bit<br>stream<br>Serial data and separate synchronous clockAntenna<br>DriveEach of the nine drive-lines gives either a high<br>voltage reverse bias or a constant current<br>source for the PIN diodes in the antenna.High LevelAntenna segment, PIN diode reverse biased:<br>+100 V ± 25 VLow LevelAntenna segment, PIN diode forward biased:<br>-180 mA ± 25 mA constant current source   |            | 1.4 A at 18 V dc                             |  |
| Antenna<br>Drive<br>InterfaceEach of the nine drive-lines gives either a high<br>voltage reverse bias or a constant current<br>source for the PIN diodes in the antenna.High LevelAntenna segment, PIN diode reverse biased:<br>+100 V ± 25 VLow LevelAntenna segment, PIN diode forward biased:<br>-180 mA ± 25 mA constant current source   |            | Radio dependent:                             |  |
| Antenna<br>Drive<br>InterfaceEach of the nine drive-lines gives either a high<br>voltage reverse bias or a constant current<br>source for the PIN diodes in the antenna.High LevelAntenna segment, PIN diode reverse biased:<br>$\pm 100 V \pm 25 V$ Low LevelAntenna segment, PIN diode forward biased:<br>$\pm 180 \text{ mA} \pm 25 \text{ mA constant current source}$  | Interface  |  |  |
| Drive<br>Interfacevoltage reverse bias or a constant current<br>source for the PIN diodes in the antenna.High LevelAntenna segment, PIN diode reverse biased:<br>+100 V ± 25 VLow LevelAntenna segment, PIN diode forward biased:<br>-180 mA ± 25 mA constant current source  |            | Serial data and separate synchronous clock   |  |
| +100 V ± 25 V<br>Low Level Antenna segment, PIN diode forward biased:<br>-180 mA ± 25 mA constant current source  | Drive      | voltage reverse bias or a constant current   |  |
| -180 mA ± 25 mA constant current source   | High Level |  |  |
| Connectors Type MS3112E 14-19P  | Low Level  |  |  |
|   | Connectors | Туре MS3112E 14-19Р                          |  |
| Type MS3112E 8-33P  |            | Type MS3112E 8-33P                           |  |
| Type MS3112E 12-10S   |            | T  |  |

#### MECHANICAL

| Dimensions<br>(deployed) | 67.7 x 159.7 x 77.8 max   |
|--------------------------|---------------------------|
| Weight                   | 1.0 kg maximum            |
| Mounting                 | Four holes fixed location |
|                          |                           |

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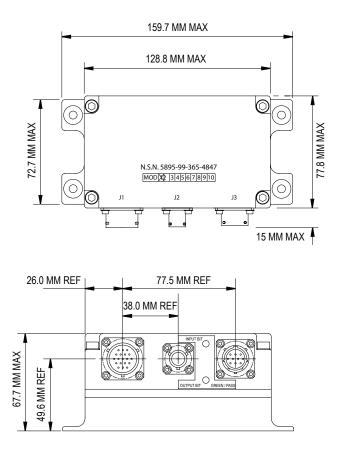
# 7-163PIN160

## CHELTON

### Logic Converter Unit

The **7-163PIN160** contains extensive built in diagnostic facilities (BIT) which monitor the input data, PSU status, internal health monitor, in addition to monitoring each of the output drive lines. The BIT status of the unit is fed back to the radio using an 'open-collector' switched ground output. In addition, two LED lamps on the front face of the unit will notify the maintenance crew of operational faults in the antenna system.

The LCU housing is constructed from aluminium alloy with internal filter plates to maximise EMC performance. The base of the unit is flanged with mounting holes for mounting to the airframe.



#### **ENVIRONMENTAL**

| Temperature/<br>Altitude   | MIL-STD-810C, Metho<br>Category 6, modified (   | d 501.4, Procedure l,<br>Step 5 omitted)   |
|--|---|--|
|  | 7-163PIN160   | 7-163PIN160HT  |
| Normal<br>Operational:   | -40°C to +71°C  | -54°C to +71°C   |
| Occasional<br>Operational:   | -40°C to +85°C  | -54°C to +85°C   |
| Survival:<br>Altitude  | -55°C to +95°C<br>70,000 feet   | -55°C to +95°C   |
|  |   |  |
| Temperature/<br>Altitude/<br>Humidity  | MIL-STD-810F, Method  | d 520.2, Procedure I   |
| Temperature  | Operational:  | -54°C to +71°C   |
| Altitude   | Survival:<br>25,000 feet  | -55°C  |
| Humidity   | MIL-STD-810D, Metho   | d 507.2. Procedure III   |
| Acceleration   |   |  |
| Acceleration   | MIL-STD-810E, Methoo<br>13.5 g  |  |
| Shock  | MIL-STD-810C, Metho<br>III and V  | d 516.2, Procedures I,   |
|  | 20 g 11 ms terminal sa  | awtooth basic design   |
|  | 40 g 11 ms terminal sa  | awtooth crash safety   |
|  | 40 g 11 ms terminal sa  | awtooth crash hazard   |
| Sine on<br>Random<br>Vibration   | MIL-STD-810F, Method 514.5 Procedure I,<br>Category 14, Functional Endurance  |  |
|  | Frequency   | Displacement   |
|  | (Hz)  | Amplitude (g peak)   |
|  |   |  |
|  | (Hz)  | Amplitude (g peak)   |
|  | (Hz)<br>4.3   | Amplitude (g peak)<br>0.11   |
|  | (Hz)<br>4.3<br>17.2   | <b>Amplitude (g peak)</b><br>0.11<br>1.72  |
|  | (Hz)<br>4.3<br>17.2<br>34.4   | Amplitude (g peak)<br>0.11<br>1.72<br>2.50<br>0.11<br>Acceleration Power<br>Density (g <sup>2</sup> /Hz)   |
|  | (Hz)<br>4.3<br>17.2<br>34.4<br>51.6<br>Frequency  | Amplitude (g peak)           0.11           1.72           2.50           0.11           Acceleration Power  |
|  | (Hz)<br>4.3<br>17.2<br>34.4<br>51.6<br>Frequency<br>(Hz)  | Amplitude (g peak)<br>0.11<br>1.72<br>2.50<br>0.11<br>Acceleration Power<br>Density (g <sup>2</sup> /Hz)   |
|  | <pre>(Hz) 4.3 17.2 34.4 51.6 Frequency (Hz) 10</pre>  | Amplitude (g peak)<br>0.11<br>1.72<br>2.50<br>0.11<br>Acceleration Power<br>Density (g <sup>2</sup> /Hz)<br>@ 0.001<br>@ 0.01<br>@ 0.01  |
|  | <pre>(Hz) 4.3 17.2 34.4 51.6 Frequency (Hz) 10 100</pre>  | Amplitude (g peak)         0.11         1.72         2.50         0.11         Acceleration Power<br>Density (g²/Hz)         @ 0.001         @0.01   |
| Explosive<br>Atmosphere  | <pre>(Hz) 4.3 17.2 34.4 51.6 Frequency (Hz) 10 100 300</pre>  | Amplitude (g peak)           0.11           1.72           2.50           0.11           Acceleration Power<br>Density (g²/Hz)           @ 0.001           @ 0.01           @ 0.012  |
|  | <pre>(Hz) 4.3 17.2 34.4 51.6 Frequency (Hz) 10 100 300 500</pre>  | Amplitude (g peak)         0.11         1.72         2.50         0.11         Acceleration Power Density (g²/Hz)         @ 0.001         @ 0.01         @ 0.012         d 511.4, Procedure I  |
| Atmosphere<br>Temperature  | (Hz)<br>4.3<br>17.2<br>34.4<br>51.6<br>Frequency<br>(Hz)<br>10<br>100<br>300<br>500<br>MIL-STD-810F, Method   | Amplitude (g peak)         0.11         1.72         2.50         0.11         Acceleration Power Density (g²/Hz)         @ 0.001         @ 0.01         @ 0.012         d 511.4, Procedure I         d 503.2, Procedure I   |
| Atmosphere<br>Temperature<br>Shock   | (Hz)<br>4.3<br>17.2<br>34.4<br>51.6<br>Frequency<br>(Hz)<br>10<br>100<br>300<br>500<br>MIL-STD-810F, Method<br>MIL-STD-810D, Method   | Amplitude (g peak)         0.11         1.72         2.50         0.11         Acceleration Power<br>Density (g²/Hz)         @ 0.001         @ 0.012         d 501.2, Procedure I         d 509.2, Procedure I   |
| Atmosphere<br>Temperature<br>Shock<br>Salt Fog   | (Hz)<br>4.3<br>17.2<br>34.4<br>51.6<br>Frequency<br>(Hz)<br>10<br>100<br>300<br>500<br>MIL-STD-810F, Method<br>MIL-STD-810D, Method   | Amplitude (g peak)         0.11         1.72         2.50         0.11         Acceleration Power<br>Density (g²/Hz)         @ 0.001         @ 0.01         @ 0.012         d 511.4, Procedure I         d 503.2, Procedure I         d 509.2, Procedure I         tion 3:3.3  |
| Atmosphere<br>Temperature<br>Shock<br>Salt Fog<br>Fungus   | (Hz)<br>4.3<br>17.2<br>34.4<br>51.6<br>Frequency<br>(Hz)<br>10<br>100<br>300<br>500<br>MIL-STD-810F, Method<br>MIL-STD-810D, Metho<br>BS 3G 100, Part 2, Sec<br>MIL-STD-810D, Metho   | Amplitude (g peak)         0.11         1.72         2.50         0.11         Acceleration Power<br>Density (g²/Hz)         @ 0.001         @ 0.012         d 501.2, Procedure I         d 509.2, Procedure I         tion 3:3.3         d 506.2, Procedure II  |
| Atmosphere<br>Temperature<br>Shock<br>Salt Fog<br>Fungus<br>Rain<br>Sand and Dust<br>Fluid                               | (Hz)<br>4.3<br>17.2<br>34.4<br>51.6<br>Frequency<br>(Hz)<br>10<br>100<br>300<br>500<br>MIL-STD-810F, Method<br>MIL-STD-810D, Metho<br>BS 3G 100, Part 2, Sec<br>MIL-STD-810D, Metho<br>MIL-STD-810D, Metho<br>and II<br>EUROCAE ED-14C/RTC  | Amplitude (g peak)         0.11         1.72         2.50         0.11         Acceleration Power<br>Density (g²/Hz)         @ 0.001         @ 0.012         d 501.2, Procedure I         d 509.2, Procedure I         tion 3:3.3         d 506.2, Procedure II  |
| Atmosphere<br>Temperature<br>Shock<br>Salt Fog<br>Fungus<br>Rain<br>Sand and Dust<br>Fluid<br>Susceptibility<br>Magnetic | (Hz)<br>4.3<br>17.2<br>34.4<br>51.6<br>Frequency<br>(Hz)<br>10<br>100<br>300<br>500<br>MIL-STD-810F, Method<br>MIL-STD-810D, Method<br>BS 3G 100, Part 2, Sec<br>MIL-STD-810D, Method<br>MIL-STD-810D, MEHOD<br>MIL-STD-810D, MEHOD<br>MIL-STD-810D, MEHOD<br>MIL-STD-810D, MEHOD<br>MIL-STD-810D, MEHOD<br>MIL-STD-810D, MEHOD<br>MIL-STD-810D, MEHOD<br>MIL-STD-8100 MEHOD<br>MIL-STD-810 MEHOD<br>MIL-STD-810 MEHOD<br>MIL-STD-810 MEH | Amplitude (g peak)         0.11         1.72         2.50         0.11         Acceleration Power<br>Density (g²/Hz)         @ 0.001         @ 0.01         @ 0.012         d 511.4, Procedure I         d 509.2, Procedure I         tion 3:3.3         d 506.2, Procedure II         d 510.2, Procedure I  |
| Atmosphere<br>Temperature<br>Shock<br>Salt Fog<br>Fungus<br>Rain<br>Sand and Dust<br>Fluid<br>Susceptibility             | (Hz)<br>4.3<br>17.2<br>34.4<br>51.6<br>Frequency<br>(Hz)<br>10<br>100<br>300<br>500<br>MIL-STD-810F, Method<br>MIL-STD-810D, Method<br>BS 3G 100, Part 2, Sect<br>MIL-STD-810D, Method<br>MIL-STD-810D, MEHOD<br>MIL-STD-810D, MEHOD<br>MIL-STD-810D, MEHOD<br>MIL-STD-810D, MEHOD<br>MIL-STD-810D, MEHOD<br>MIL-STD-810D, MEHOD<br>MIL-STD-810D, MEHOD<br>MIL-STD-810D, MEHOD<br>MIL-STD-8100 MEHOD<br>MIL-STD-810 MEHOD<br>MIL-STD-810 MEHOD<br>MIL-STD-810 MEH | Amplitude (g peak)         0.11         1.72         2.50         0.11         Acceleration Power<br>Density (g²/Hz)         @ 0.001         @ 0.01         @ 0.012         d 511.4, Procedure I         d 509.2, Procedure I         d 509.2, Procedure I         d 500.2, Procedure I         d 510.2, Procedure I         d 510.2, Procedure I         d 510.2, Procedure I         d 510.2, Procedure I         d 500.2, Procedure I |

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