### VideoboxV2 Hardware Features

| Main SoC (Processing Unit) | • **Renesas R-Car H3:**  
|                           |   ○ 4x Cortex A57, 4x Cortex A53  
|                           |   ○ ImgTech GPU GX6650  
|                           |   ○ Vision: IMP X5, IMR  
|                           | • (optional) R-Car M3W  
|                           | • (optional) R-Car V3H:  
|                           |   ○ 4x Cortex A53  
|                           |   ○ IMP X5+, IMR  
|                           |   ○ ISP  
| RAM                       | • **LPDDR4 4GB**  
| Video Input Interfaces    | • **Up to 8 FPDLinkIII (TI960 Deserializer Hub)**  
|                           | • **Up to 8 GMSL (MAX9286)**  
|                           | • (optional) custom video input adapters (e.g. HDMI to CSI)  
| PCIe Interfaces           | • **Two M.2 Key M PCIe Slots**  
| Ethernet                  | • **1x GigE**  
|                           | • (optional) Broad-R Switch add-on cards (Broadcom, NXP, Marvell): 4-5x Broad-R ports, 1x GigE  
| CANFD/CAN                 | • **2x CANFD/CAN**  
|                           | • **2x CAN**  
| Storage                   | • **1x SATA**  
|                           | • **1x uSD slot**  
|                           | • **1x Full-size SD card slot**  
|                           | • **2x PCIe(NVME or SATA) M.2 SSDs**  
|                           | • **On-board eMMC (32GB)**  
| Video Output              | • **2x HDMI Output**  
|                           | • **1x FPDLink3 Output**  
| USB                       | • **4x USB3.0**  
|                           | • **2x USB2.0 (1x OTG)**  

Cogent Embedded, Inc.  
[www.cogentembedded.com](http://www.cogentembedded.com)
VideoboxV2 Connectors Pinout

CAN PWR Connector (CN1)
Power, CAN, wakeup. TE Connectivity: 1-1355154-1

<table>
<thead>
<tr>
<th>Pin</th>
<th>Connection</th>
<th>Connection</th>
<th>Pin</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>12VDC in</td>
<td>12VDC in</td>
<td>10</td>
</tr>
<tr>
<td>2</td>
<td>GND</td>
<td>GND</td>
<td>11</td>
</tr>
<tr>
<td>3</td>
<td>CAN2_H</td>
<td>nc</td>
<td>12</td>
</tr>
<tr>
<td>4</td>
<td>CAN2_L</td>
<td>CAN3_H</td>
<td>13</td>
</tr>
<tr>
<td>5</td>
<td>CAN0_H</td>
<td>CAN3_L</td>
<td>14</td>
</tr>
<tr>
<td>6</td>
<td>CAN0_L</td>
<td>CAN1_H</td>
<td>15</td>
</tr>
<tr>
<td>7</td>
<td>WKUP1</td>
<td>CAN1_L</td>
<td>16</td>
</tr>
<tr>
<td>8</td>
<td>WKUP0</td>
<td>+5VDC out</td>
<td>17</td>
</tr>
<tr>
<td>9</td>
<td>nc</td>
<td>nc</td>
<td>18</td>
</tr>
</tbody>
</table>

FPDLink-III Display Output Connector

<table>
<thead>
<tr>
<th>Pin</th>
<th>Connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>A-</td>
</tr>
<tr>
<td>2</td>
<td>B-</td>
</tr>
<tr>
<td>3</td>
<td>A+</td>
</tr>
<tr>
<td>4</td>
<td>B+</td>
</tr>
</tbody>
</table>
VideoboxV2 Add-on Modules

Video Input Modules:

- TI960 and MAX9286 variants
- PoC and HSD connectors

<table>
<thead>
<tr>
<th>Pin</th>
<th>Connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>PoC GMSL (selectable 5, 9 or 11 V) or PoC FPD-Link III (selectable 5, 9 or 11V)</td>
</tr>
<tr>
<td>2</td>
<td>Ground/Shield</td>
</tr>
</tbody>
</table>

Ethernet Broad-R Switch Modules:

- Broadcom, NXP and Marvell variants
- 4-5 Broad-R Ports, 1x GigE

Broad-R Connector (CN3)

<table>
<thead>
<tr>
<th>Pin</th>
<th>Connection</th>
<th>Connection</th>
<th>Pin</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Pwr3+</td>
<td>Br3+</td>
<td>10</td>
</tr>
<tr>
<td>2</td>
<td>Pwr3-</td>
<td>Br3-</td>
<td>11</td>
</tr>
<tr>
<td>3</td>
<td>Br2-</td>
<td>Pwr2-</td>
<td>12</td>
</tr>
<tr>
<td>4</td>
<td>Br2+</td>
<td>Pwr2+</td>
<td>13</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td>14</td>
</tr>
<tr>
<td>6</td>
<td>Br1+</td>
<td>Pwr1+</td>
<td>15</td>
</tr>
<tr>
<td>7</td>
<td>Br1-</td>
<td>Pwr1-</td>
<td>16</td>
</tr>
<tr>
<td>8</td>
<td>Pwr0+</td>
<td>Br0+</td>
<td>17</td>
</tr>
<tr>
<td>9</td>
<td>Pwr0-</td>
<td>Br0-</td>
<td>18</td>
</tr>
</tbody>
</table>
VideoboxV2 Dimensions

Dimensions:
- Width: 255 mm
- Height: 123 mm
- Depth: 113 ± 0.2 mm
- 4 holes
- Width: 243 ± 0.2 mm
- Height: 156 mm
- Width: 143.5 mm

COGENT EMBEDDED
# VideoboxV2 Software

| Base OS | • Linux/Yocto:  
|         |   o 4.9, 4.14 Linux LTS  
|         |   o GLES3.1, OpenCL1.2  
|         |   o Wayland/Weston, Qt  
|         |   o GStreamer  
|         |   o OpenCV  
|         |   o Caffe  
| Recording Software Suite | • Camera and Sensors recording:  
|                         |   o Up to 4x 2MP 30fps Camera streams (raw), vehicle data (CANFD/CAN, Ethernet), sensors (Ethernet, CANFD/CAN)  
|                         |   o H.264 and raw formats  
|                         |   o Time synchronization  
|                         |   o Recording and Playback modes  
|                         |   o Cloud synchronization/upload  
| Camera Calibration Software | • Cogent Intrinsic Calibration Suite  
|                          | • Cogent Extrinsic Calibration Suite  
| Surround View Software | • Cogent 3D Surround View SDK:  
|                         |   o 2D/3D projections, fixed and free viewpoints  
|                         |   o UI overlays (vehicle 3D model, projected path/guidelines, obstacles, objects)  
|                         |   o Color correction  
|                         |   o Historical view  
|                         |   o Dynamic/adaptive mesh and blend zones  
|                         |   o Factory calibration  
|                         |   o Online calibration (autocalibration)  
| Vision Functions | • Cross Traffic Alert  
|                  | • Moving Objects Detection  
|                  | • Pedestrian Detection  
|                  | • Lane Detection  
|                  | • Trailer Angle Detection  
|                  | • Dirt & Blockage Detection  
|                  | • Parking Slot Detection  
| Ethernet AVB | • Cogent Ethernet AVB Stack  
|               |   o AVDECC (IEEE1722.1)  
|               |   o MSRP/MVRP (IEEE802.1Q)  
|               |   o gPTP (AS master capable)  
|               |   o AV payload (IEEE1722, IEEE1733)  
|               |   o Traffic shaping  

Cogent Embedded, Inc.  
[www.cogentembedded.com](http://www.cogentembedded.com)
Contact info@cogentembedded.com for availability and pricing