# PEMBROKE INSTRUMENTS, LLC

SWIR CAMERA DATA SHEET

## SenS 1920ML ST

Manufacturer: New Imaging Technologies (NIT)

Technical data reproduced from the original manufacturer datasheet.

**For a quote or more information email**

**sales@pembrokeinstruments.com**

# Ordering Informations

## Commercial Reference

| Commercial reference | Description | Ordering information |
|---|---|---|
| SenS 1920 M-ST | Cameralink Full-HD Camera<br>SDR26 & HR10-10R connector | 9SEC2101AE31MC0#<br># : **product revision** |
| SenS 1920 L-ST | Cameralink Full-HD Camera<br>LSHM130 Connector | 9SEC2101AE31LC0#<br># : **product revision** |

## Included Accessories

- Power and trigger Cable (Hirose HR10 connector)
- 12V power supply
- Heatsinks (M-ST version only)
- Cardboard shipping and storage box

## Optional Accessories

- Optical Filter mount
- Hardened protective case

## Custom variants (OEM)

Various options may be available depending on your camera model:

- Open frame housing
- Sensor without cover glass
- Flex configuration (sensor board split from camera electronics)
- …

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# FUNCTIONALITIES

## Camera

Main camera features (For full documentation contact ):

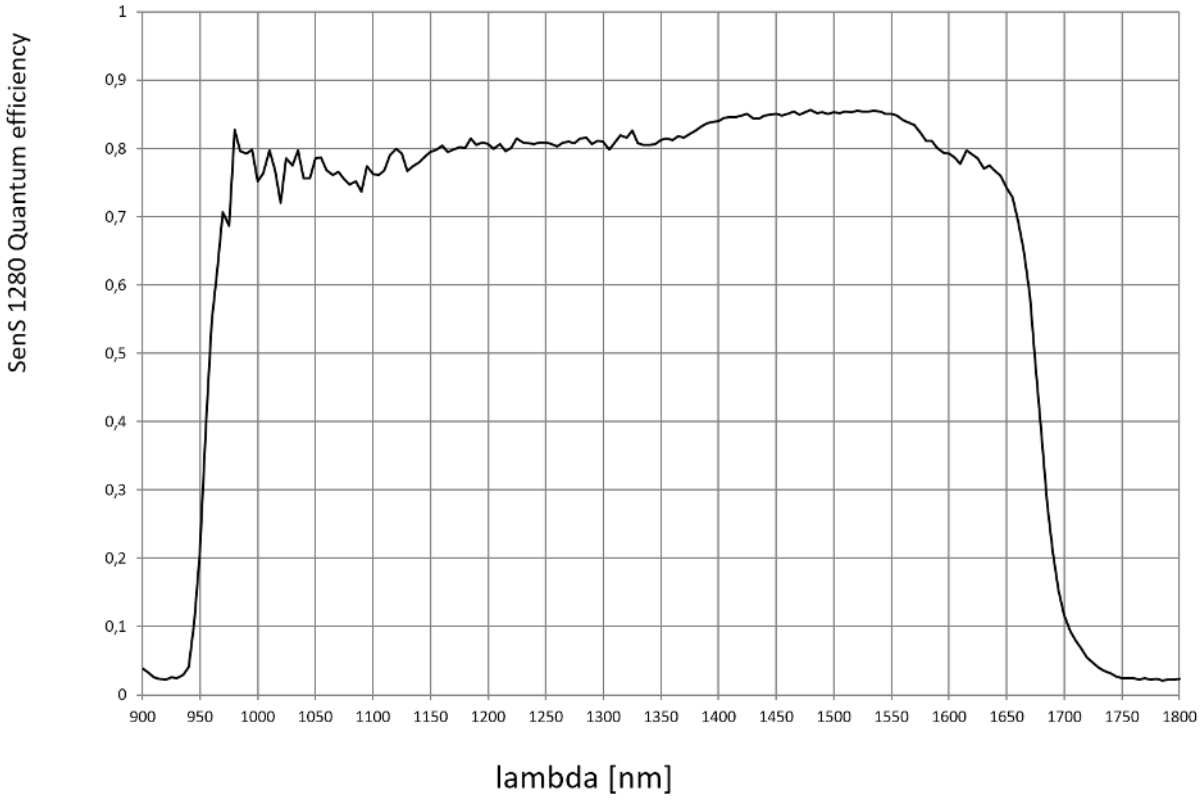
| | | |
|---|---|---|
| **Sensor characteristics** | Sensor type | InGaAs (0.9-1.7 spectral response, see QE curve) |
| | Pixel pitch | $8\mu m$ |
| | Resolution | 1920x1080 |
| | Sensor diagonal | 17.6mm |
| | Sensor noise | • High gain (CDS): $25e^-$ typical<br>• Low gain : $150e^-$ |
| | Dynamic range | • High gain (CDS): 54dB typical<br>• Low gain: 63dB typical |
| | Peak QE | >80% |
| **Camera features** | Frame rate | 60Hz (12 bit output mode), 37Hz (14 bit output mode) |
| | Sensor Readout | Global shutter<br>ITR (Integrate Then Read) |
| | Sensor modes | Low Gain / High gain (CDS) |
| | Output Type | 14 bits with 1X_1Y tap geometry (1 tap)<br>12 bit with 1X2_1Y tap geometry (2 tap) |
| | Exposure time | Minimum Integration time: 10us (Linear)<br>Controlled by camera register or Trigger width |
| | Trigger | Internal/External (LVTTL)<br>Software Trigger |
| | Trigger delay | User-Selectable |
| | Partial reading mode | Region of Interest (ROI). User-Selectable with a step of 8 pixels.<br>Maximum FPS increase with reduced ROI |
| **Environment and mechanical characteristics** | Power consumption (12V supply) | • Camera: <5.5W<br>• Cooling: User-Selectable TEC power limit<br>  ○ Off<br>  ○ Low : <1W<br>  ○ Medium : <2W<br>  ○ High : <4W (Default, user defined value) |
| | Supply voltage range | 6 to 15V (Overvoltage, reverse polarity protection). |
| | Storage temperature | -40 to +80°C |
| | Operating temperature | -40 to +71°C |
| | Size (WxHxL, mm) | 58x58x71.8 (M-ST)) / 52.8 (L-ST)<br>118x46x65.4 (M-ST) with heatsinks |
| | Weight | <350g without accessor heatsinks. |
| | Lens mount | C-Mount |
| **Software (Processing on host system)** | Control protocol | Serial NITCam protocol |
| | NIT Software | NITVision GUI (Windows/Linux, x64/aarch64 platforms) /!\ Compatible with Dalsa framegrabber only. Tested with XTium/XTium 2 series.<br>NITLibrary SDK (Windows/Linux, x64/aarch64 platform, C++/Python language) |
| | AGC (Histogram Stretching) | Automatic/Manual.<br>Automatic: continuous offset and gain adjustment based on current image histogram |
| | NUC correction | Correction 1-Point or 2-Point. 2 Point factory calibrated. (20°C sensor Temperature) |
| | Bad pixel correction | Factory calibrated Bad Pixel Map |
| | Temperature monitoring | Image Sensor |
| | Image Flip | Horizontal/Vertical |

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| | | |
|---|---|---|
| | Video recording | |

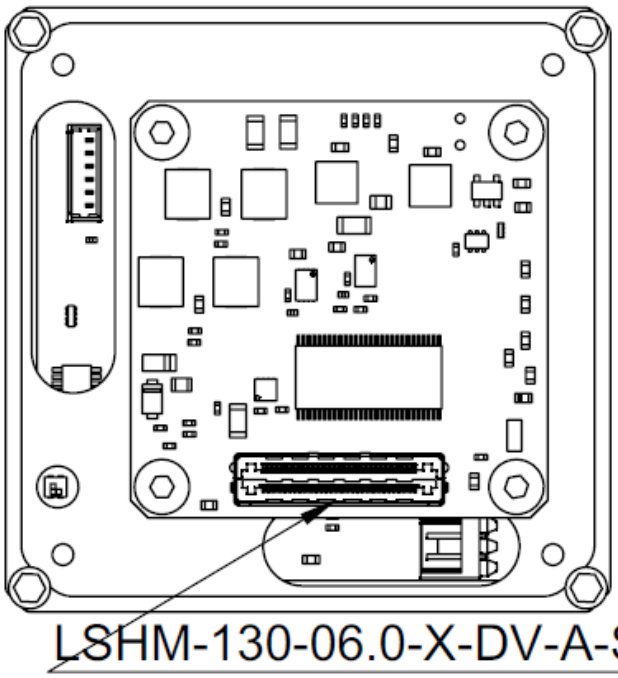
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QE Curve (typical)




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# Electrical ICD (L-ST – LSHM130 output)



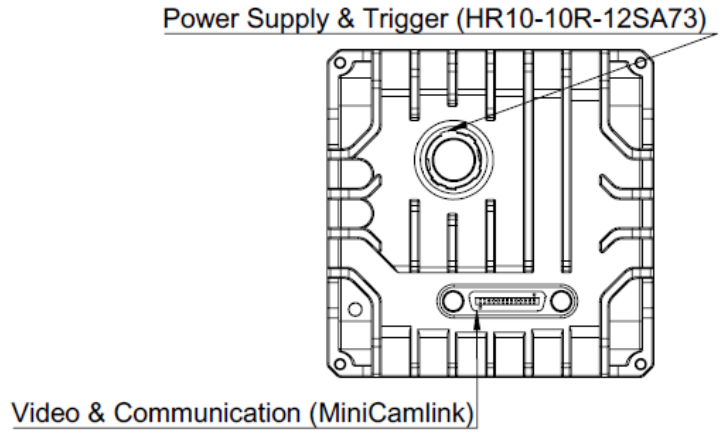

- LSHM-130-06.0-X-DV-A-S Pinout

| Pin Number | Name | Type | Comment | Pin Number | Name | Type | Comment |
|---|---|---|---|---|---|---|---|
| 1 | GND | Power | Supply voltage ground | 31 | NC | | |
| 2 | GND | Power | Supply voltage ground | 32 | NC | | |
| 3 | CamLinkPair4+ | Clock | | 33 | NC | | |
| 4 | CamLinkPair5+ | Data3 | | 34 | Trigger Out | TTL | Programmable |
| 5 | CamLinkPair4- | Clock | | 35 | NC | | |
| 6 | CamLinkPair5- | Data3 | | 36 | Trigger Out | TTL | Programmable |
| 7 | GND | | | 37 | NC | | |
| 8 | GND | | | 38 | Trigger In/Ou | TTL | Programmable |
| 9 | CamLinkPair3+ | Data2 | | 39 | GND | | |
| 10 | CamLinkPair2+ | Data1 | | 40 | GND | | |
| 11 | CamLinkPair3- | Data2 | | 41 | NC | | |
| 12 | CamLinkPair2- | Data1 | | 42 | NC | | |
| 13 | GND | | | 43 | NC | | |
| 14 | GND | | | 44 | NC | | |
| 15 | CamLinkPair1+ | Data0 | | 45 | Cable detect | | 100 Ohm to GND |
| 16 | NC | | | 46 | NC | | |
| 17 | CamLinkPair1- | Data0 | | 47 | Enable | | On : 1.6 to 3.3V or floating<br>Off: Connect to GND to turn off |
| 18 | NC | | | 48 | NC | | |
| 19 | GND | | | 49 | GND | | |
| 20 | GND | | | 50 | GND | | |
| 21 | CamLinkPair7+ | SerTG | | 51 | GND | | |
| 22 | CamLinkPair8+ | CC1 | | 52 | GND | | |
| 23 | CamLinkPair7- | SerTG | | 53 | GND | | |
| 24 | CamLinkPair8- | CC1 | | 54 | GND | | |
| 25 | CamLinkPair6+ | SerTC | | 55 | Power Input | Power | 9 to 35V |
| 26 | CamLinkPair9+ | CC2 | | 56 | Power Input | Power | 9 to 35V |
| 27 | CamLinkPair6- | SerTC | | 57 | Power Input | Power | 9 to 35V |
| 28 | CamLinkPair9- | CC2 | | 58 | Power Input | Power | 9 to 35V |
| 29 | GND | | | 59 | Power Input | Power | 9 to 35V |
| 30 | GND | | | 60 | Power Input | Power | 9 to 35V |

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# Electrical ICD (M-ST – SDR26 video output)

| Reference | Designation | Manufacturer |
|---|---|---|
| HR10-10R-12SA | Connector Female 12 positions | Hirose |

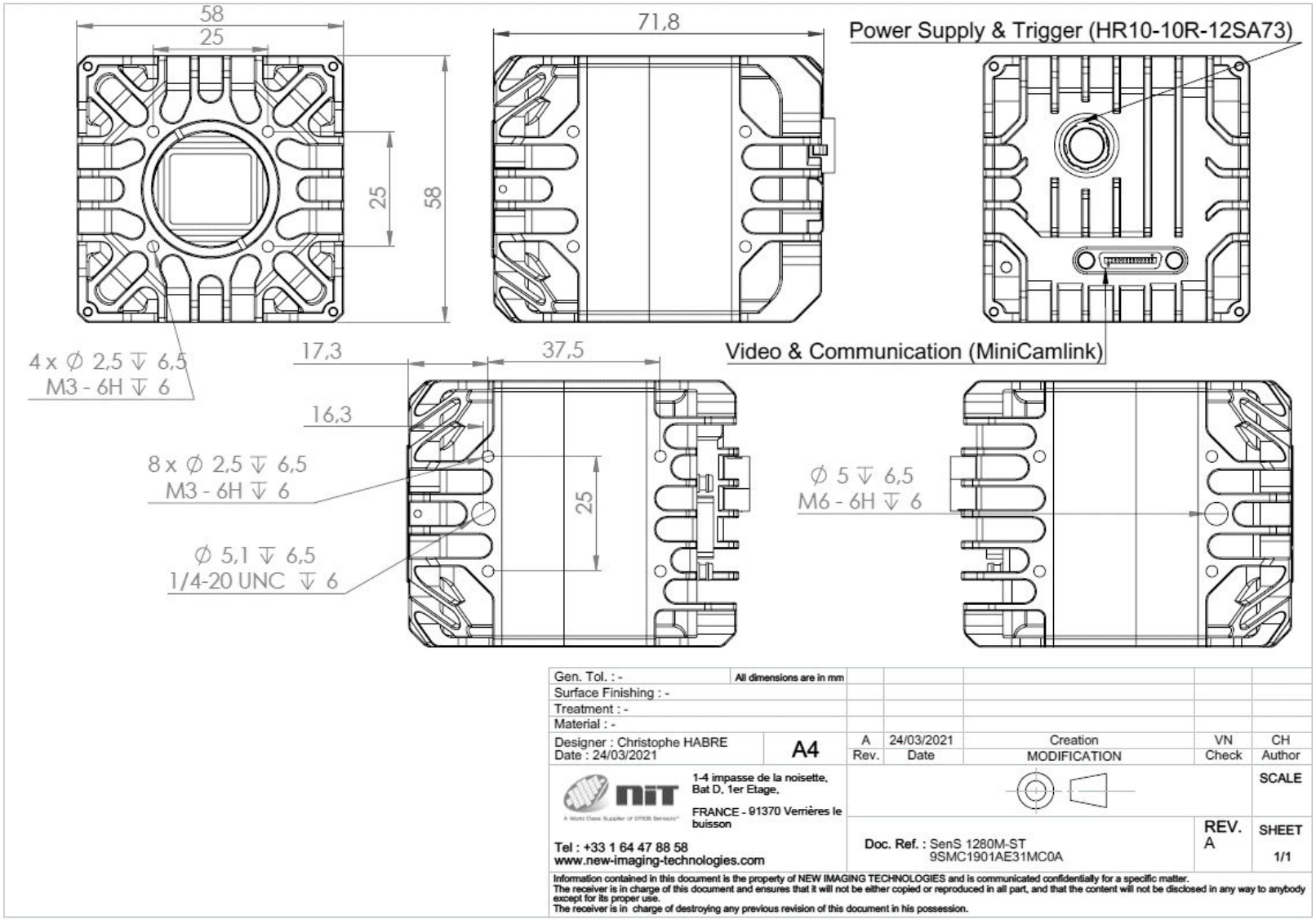



| Reference | Designation | Manufacturer |
|---|---|---|
| 12226-1150-00FR | SDR26 connector | 3M |

| Hirose Connector Pinout | | |
|---|---|---|
| Pin | Signal Name | Cable color |
| 1 | Power (6-24V) | Red/Purple/(Orange) |
| 2 | Power GND | Blue/Brown |
| 3 | Trigger OUT2 | White |
| 4 | Trigger OUT1 | Yellow |
| 5 | NC | |
| 6 | NC | |
| 7 | Reserved | |
| 8 | Power GND | Blue/Brown |
| 9 | Power (6-24V) | Red/Purple/(Orange) |
| 10 | Trigger IN/OUT (LVTTL) | Green |
| 11 | Not connected | |
| 12 | Trigger GND | Black |

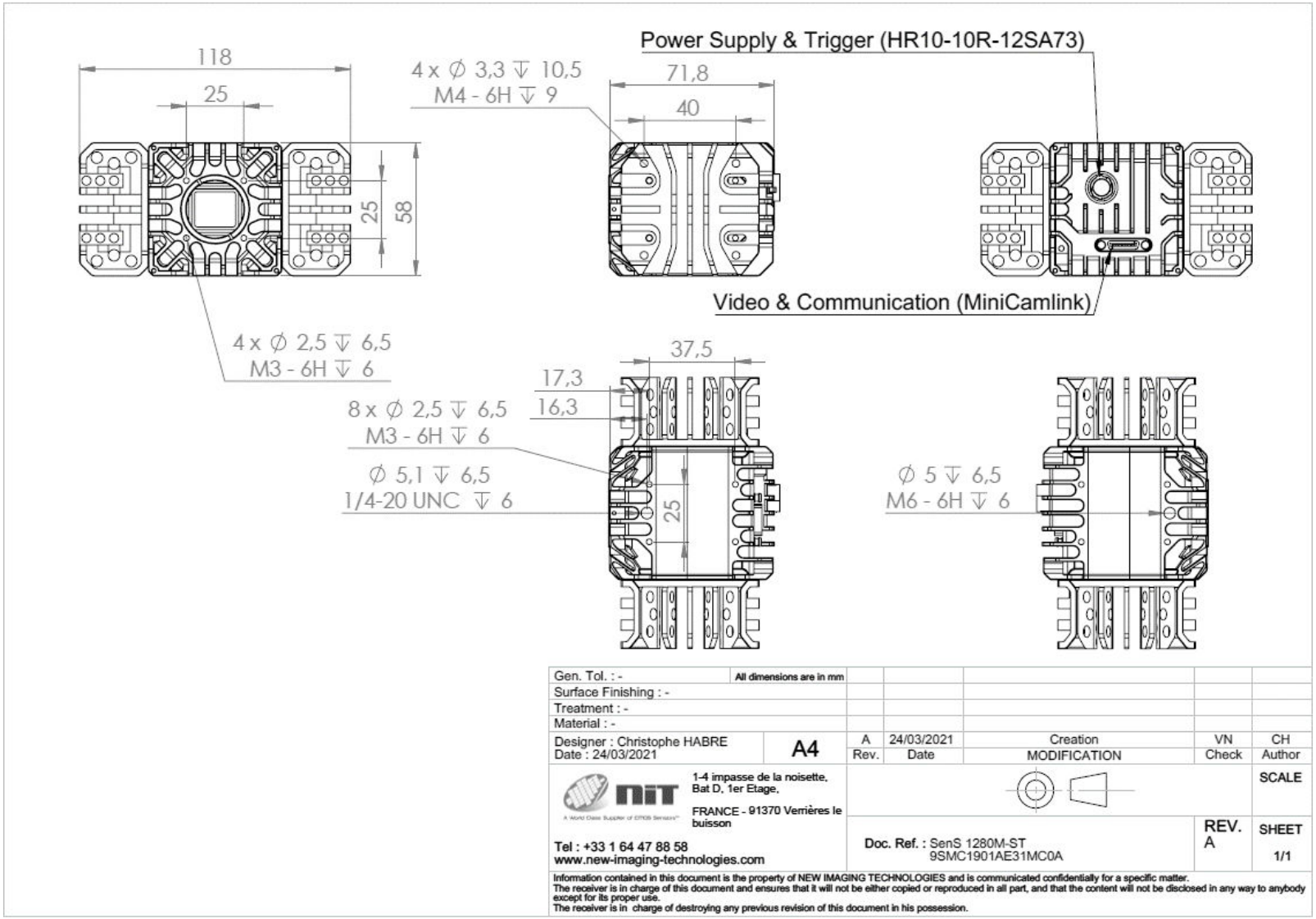
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# Mechanical ICD (SenS 1920 M-ST)



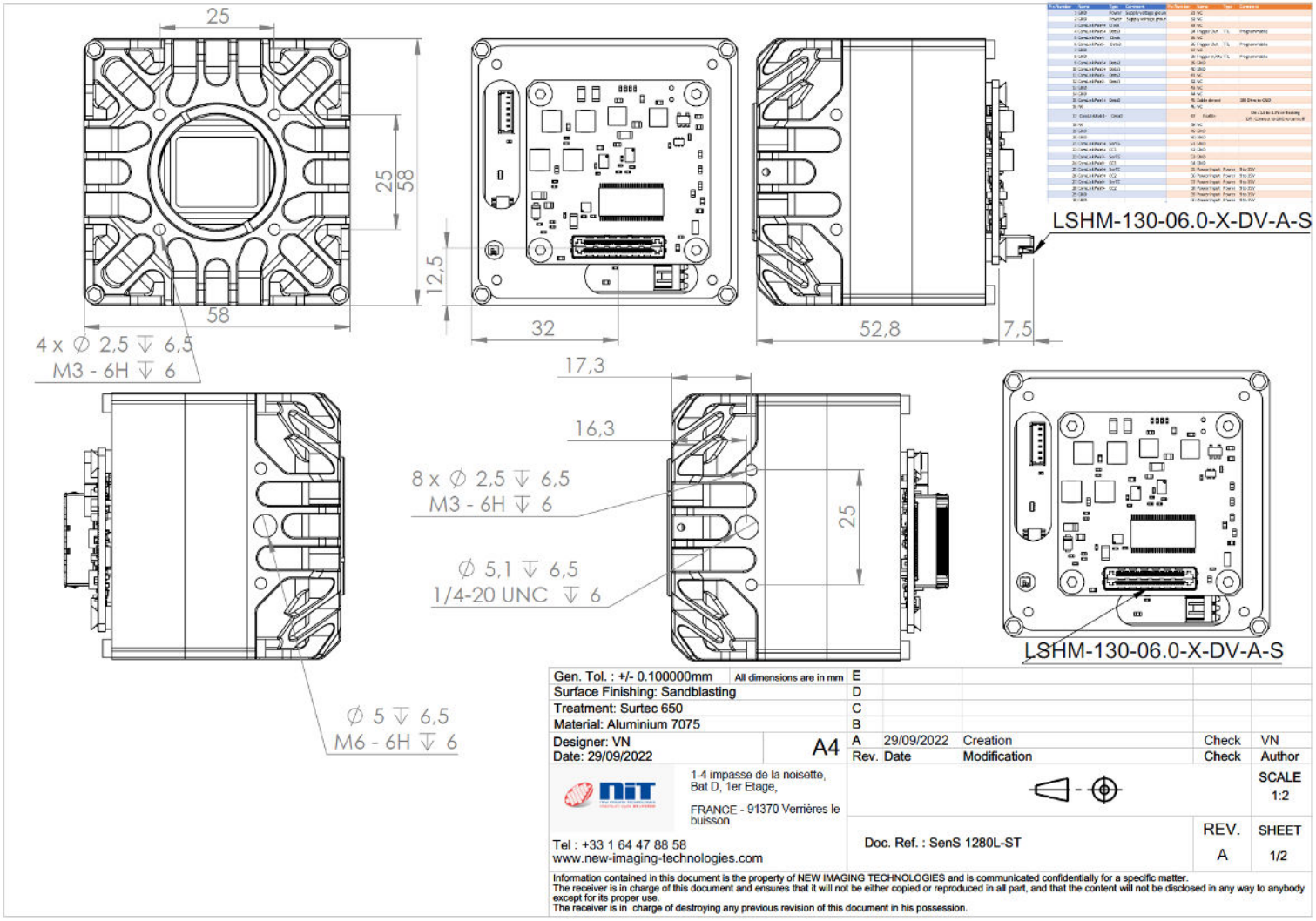

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# Mechanical ICD - With Heatsinks (SenS 1920 M-ST)




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# Mechanical ICD (SenS 1920 L-ST)




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