

## TECH TALK: Google Glass

Google Glass is a wearable device designed to provide hands free information on a semi-transparent screen in the field of view and is targeted at working professionals and manufacturing. The table below is a technology selection decision support tool and not a substitute for business procurement processes. Information is correct at time of publication

What's in the box	Technical specifications	Set up investment and required skills
<div> </div> <p><i>Image source:</i> <a href="#">Google Glass</a></p> <p><b>Hardware</b></p> <p> <b>Manufacturer:</b> Google  <b>Model and release date:</b> Glass Enterprise Edition 2  <b>Price (est):</b> AU\$2,200 (base model)  <b>Weight:</b> 46g (without frame - several frame options available)  <b>Size:</b> 212 x 57 x 29 mm unfolded            182 x 55 x 29 mm folded  <b>Battery:</b> 800 mAh  <b>Display:</b> 640 x 360 RGB  <b>Audio:</b> Mono, USB and BT  <b>Camera:</b> 8 Megapixel colour sensor            83° diagonal field of view            60 cm focal length  <b>Microphone:</b> 3 beam forming mics  <b>Environment resistance:</b> IP53            0-35 °C         </p>	<p><b>Computer and Connectivity</b></p> <p> <b>Security Operation Centre (SOC):</b> Qualcomm Snapdragon XR1  <b>Memory:</b> 3GB LPDDR4  <b>Connection:</b> WIFI - 802.11a/g/b/n/ac, dual-band            Bluetooth 5.0            USB C            32GB eMMC Flash  <b>Storage:</b>  <b>Operating System:</b> Android Open-Source Project 8.1 (Oreo)  <b>Access:</b> Data accessed using an Empatica Connect account         </p> <p><b>Recommended PC Specification</b></p> <p> <b>USB:</b> USB PD 2.0 compliant (for fast charge (1.5 A @ 5V)            USB 2.0 data transfer            USB Type A port         </p> <p><b>Applications</b></p> <p> <b>Workflow and work orders:</b> Digitise work orders with variable level of instruction  <b>Inspection and Validation:</b> Document work orders or completed work with video or photographs  <b>Training:</b> Bring new meaning to on job training. Instruct people on tasks with options for supervisors to call in to help         </p>	<p><b>Key Compatible Software</b></p> <ul style="list-style-type: none"> <li>• Android OS (on Google Glass)</li> <li>• Relevant software for custom App development</li> </ul> <p><b>Key Knowledge</b></p> <p>(depending on application)</p> <ul style="list-style-type: none"> <li>• Using Google Glass is similar to using a smart phone; Glass can be used to interact with certain Apps and workflows</li> <li>• Generating workflows using Skylight requires some programming experience.</li> <li>• Custom App design requires more advanced skills but can unlock more capability</li> </ul> <p><b>Practical Task Setup</b></p> <p>(as experienced by engineers)</p> <ul style="list-style-type: none"> <li>• Basic features require a familiarisation period to get used to the environment</li> <li>• Relatively quick to do story boarding and task setup (authoring) of workflows. Online examples can be altered quite quickly</li> <li>• Features such as video conferencing and sharing work quickly and easily</li> <li>• Authoring is time consuming and may not be appropriate for bespoke tasks and workflows and the time saving/benefit should be considered</li> </ul>

## PEOPLE PERSPECTIVE: Google Glass

Task/Environment Suitability	Usability Features	Task/Environment Considerations	Usability Considerations	Key Opportunities & Applications	Guidance for Implementation
<p><b>Portable</b> Small &amp; lightweight, can be used in confined spaces and easy to travel with between sites</p> <p><b>Tasks</b> Well suited for repetitive workflows, validation, inspection and documentation. Images and checklists are saved easily and are attached to tasks</p> <p><b>Environment</b> Beneficial where hard copy documents may get lost, damaged or are awkward to manage</p> <p>Outdoor environments may not be appropriate (e.g. extremes of temperature, humidity and high lighting)</p>	<p><b>Performance</b> The features of Google Glass can be quickly learnt with little training and an instructional workflow</p> <p>Meetings, taking photos and voice recordings are immediately available features that are accessed using either voice command or touch controls</p> <p><b>Customisation</b> Google Glass can be fitted with lenses for users with glasses and is adaptable for PPE and other headwear. The screen is displayed on a prism and can be moved to accommodate different users</p> <p><b>Comfort</b> Being lightweight, Google Glass may be worn for long periods before discomfort occurs</p>	<p><b>Accuracy/performance will be reduced by:</b> Unreliable or weak internet connectivity. (e.g. such as when surrounded by lots of metal/steel)</p> <p>The screen has low contrast in bright environments and information perception may be reduced</p> <p>Voice control may be inhibited in noisy environments</p> <p>Voice control doesn't discriminate between voices and other voice commands can be interpreted accidentally. Multiple users may have problems in close proximity</p> <p>Sweat, dirt/dust and PPE may inhibit the effectiveness of gesture controls</p>	<p><b>Performance</b> Beyond the basic functionality, workflows (stepped instructions) require authoring, and which can be time consuming and may not be suitable for one-off jobs</p> <p><b>Safety</b> The screen can distract or obstruct part of vision and care should be taken in busy environments</p> <p>Photos and video require looking at the object. This could result in uncomfortable/awkward positions and strain</p> <p><b>Privacy</b> Safeguards should be put in place so that photography, video and calls are controlled by the user (e.g. video calls may not be appropriate in some situations)</p> <p><b>Comfort</b> Frame is unbalanced (weighted to the righthand side where CPU is stored) which may cause discomfort or frustration with extended use. Left-handers may also need longer to adjust to using their right hand to interact with the device</p>	<p><b>Workflow and work orders</b> Instructions for how to complete tasks can be delivered hands free with varying levels of detail tailored to different individuals</p> <p><b>Inspection and validation</b> The photo, voice record and video functionality are ideal for documenting, process and checks can be built into workflows as tasks are completed</p> <p><b>Training</b> Powerful tool to enable teams to learn new tasks with confidence. Video call functionality can bring the supervisor to the team member, preventing bottlenecks</p>	<p>The immediate features are simple to use, much like a phone. Workflows and file systems require proper organisation and integration or more time may be spent organising data collected</p> <p>Authoring workflows (designing instructions) requires input from experienced individuals and consideration of different audiences and skill sets. This is a great opportunity to involve the broader team with the technology and may help with acceptance</p> <p>The activities Google Glass is used for should be carefully planned. The tasks most likely to benefit from authored workflows are common tasks completed frequently by new team members and complex unique tasks that require constant reference and hands-free access to detailed information</p>

*These suggestions are formulated from a human factors research trial examining use of the technology in a brief visual inspection task working in harsh conditions. Selection and implementation of a technology should consider the abilities of the person doing the task, the task requirements, and the environment in which the work is to be undertaken.*