Wabtec PROD1177 IVU PLUS Multi Purpose Telematics Computer User Manual

Contents

Wabtec PROD1177 IVU PLUS Multi Purpose Telematics Computer

The Digital Mining Technology PROD1177 IVU PLUS is a multi-purpose telematics computer that can be used in the context of a Collision Awareness System. The DEVICE acts as the central processor and data logging interface for a situational awareness drivers aid using GNSS proximity detection of vehicles/objects, vehicle-to-vehicle communications and other radio technology as required. This manual provides information on the DEVICE, its variants, specifications, operation, maintenance, decommission and disposal.

Safety Information

The safety section includes safety precautions that must be observed when working on items that appear throughout the manual. Examples of safety precautions and labels are outlined below:

- Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
- Indicates a potentially hazardous situation that, if not avoided, could result in minor or moderate injury.
- Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.
- Indicates a potential for equipment damage.

Disclaimer
The Digital Mining Technology PROD1177 IVU PLUS user manual comes with no implied warranty of any kind. Wabtec makes no ANY EXPRESS OR IMPLIED WARRANTY OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE OR ANY OTHER EXPRESS OR IMPLIED WARRANTY REGARDING ANY PRODUCTS DESCRIBED IN THESE MATERIALS.

To the maximum extent permitted by law, Wabtec disclaims any and all implied warranties that might otherwise arise or apply, including any implied warranty of merchantability or of fitness for a particular purpose. Wabtec further makes no representation or warranty of accuracy of these materials and neither Wabtec will have no responsibility or liability for any error or omission in these materials.

Company Details
The Digital Mining Technology PROD1177 IVU PLUS is manufactured by Industria Mining Technology Pty Ltd (trading as Digital Mining Technology) in Australia. It is a registered business subsidiary of Wabtec Corporation.

- **Manufacturer:** Industria Mining Technology Pty Ltd (trading as Digital Mining Technology)
- **Address:** 3 Co-Wyn Close Fountaindale, New South Wales, 2258 Australia
- **Telephone:** +61 2 8863 4730
- **Email:** GETProductionIMT@wabtec.com

- **Website:** www.wabteccorp.com

product Operation

The Digital Mining Technology PROD1177 IVU PLUS is a multi-purpose telematics computer that can typically be applied in the context of a Collision Awareness System. In this system, the DEVICE acts as the central processor and data logging interface for a situational awareness drivers aid using GNSS proximity detection of vehicles/objects, vehicle-to-vehicle communications and other radio technology as required.

Principle of Operation – Collision Awareness Context
The DEVICE uses GNSS proximity detection of vehicles/objects and vehicle-to-vehicle communications to provide a situational awareness drivers aid.

Concerning Radio Transmitters
The Digital Mining Technology PROD1177 IVU PLUS has detachable antennas and complies with regulations set by Industry Canada and Australian Radio Communications Equipment Radiation Exposure Statement. It also complies with RoHS and SVHC/REACH regulations. Please refer to pages 19-20 of the user manual for more information.

MANUFACTURER INFORMATION

INTRODUCTION
The product or product family described under scope of this document will be henceforth referred to as DEVICE. This manual provides the information on the DEVICE, its variants, specifications, operation, maintenance, decommission and disposal.

SAFETY INFORMATION
The safety section includes safety precautions which must be observed when working on items that appear throughout the manual. Examples of safety precautions and labels are outlined below:

- **DANGER** Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
- **WARNING** Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury.
- **CAUTION** Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.
- **CAUTION** Indicates a potential for equipment damage.

DISCLAIMER

These materials are provided for information purposes only, “as is” without express or implied warranty of any kind. Wabtec makes no ANY EXPRESS OR IMPLIED WARRANTY OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE OR ANY OTHER EXPRESS OR IMPLIED WARRANTY REGARDING ANY PRODUCTS DESCRIBED IN THESE MATERIALS. To the maximum extent permitted by law, Wabtec disclaims any and all implied warranties that might otherwise arise or apply, including any implied warranty of merchantability or of fitness for a particular purpose. Wabtec further makes no representation or warranty of accuracy of these materials and neither Wabtec will have any responsibility or liability for any error or omission in these materials. These specifications are subject to change without notice.

COMPANY DETAILS

Manufacturer Industrea Mining Technology Pty Ltd (trading as Digital Mining Technology)

3 Co-Wyn Close Fountaindale, New South Wales, 2258 Australia

- **Telephone** +61 2 8863 4730
  - **GETProductionIMT@wabtec.com**
  - **www.wabteccorp.com**
- Industrea Mining Technology Pty Ltd is a registered business subsidiary of Wabtec Corporation

OPERATION

PRINCIPLE OF OPERATION COLLISION AWARENESS CONTEXT

The DEVICE is a multi-purpose telematics computer and can typically be applied in the context of a Collision Awareness System. In this system, the DEVICE acts as the central processor and data logging interface for a situational awareness drivers aid using GNSS proximity detection of vehicles/objects, vehicle-to-vehicle communications and other radio technology as required. Each vehicle broadcasts its current position and relevant parameters which are used to detect warnings of possible intersections with other vehicles that receive the broadcast. The position of other vehicles, together with any warnings is shown graphically on a display unit that connects to the DEVICE. The system helps the driver with a continuous view of other objects that are moving, stationary, over the horizon, just behind the vehicle or simply out of sight due to bad visibility and blind spots when operating their vehicle. The system provides the driver with an awareness tool to notify and visualize other objects surrounding the vehicle on take-off and during operation. The system continuously broadcasts its location and receives broadcasts of other vehicles in radio communications range using the in-built proprietary radio link. Vehicle interactions are projected based on the trajectories of the vehicles. The system notifies the driver with progressive audible and graphic alerts, and depending on the configuration, an acknowledgment by the driver may be required. Designed for off-road heavy machinery and automotive use. Please refer to the CAS-GPS user manual for user interface operation. The system provides the driver with an awareness tool to notify and visualize other objects surrounding the vehicle on take-off and during operation. The system continuously broadcasts its location and receives broadcasts of other vehicles in radio communications range using the in-built proprietary radio link. Vehicle interactions are projected based on the trajectories of the vehicles. The system notifies the driver with progressive audible and graphic alerts, and depending on the configuration, an acknowledgment by the driver may be required. Designed for off-road heavy machinery and automotive use. Please refer to the CAS-GPS user manual for user interface operation. The system provides the driver with an awareness tool to notify and visualize other objects surrounding the vehicle on take-off and during operation. The system continuously broadcasts its location and receives broadcasts of other vehicles in radio communications range using the in-built proprietary radio link. Vehicle interactions are projected based on the trajectories of the vehicles. The system notifies the driver with progressive audible and graphic alerts, and depending on the configuration, an acknowledgment by the driver may be required. Designed for off-road heavy machinery and automotive use. Please refer to the CAS-GPS user manual for user interface operation. The system continuously broadcasts its location and receives broadcasts of other vehicles in radio communications range using the in-built proprietary

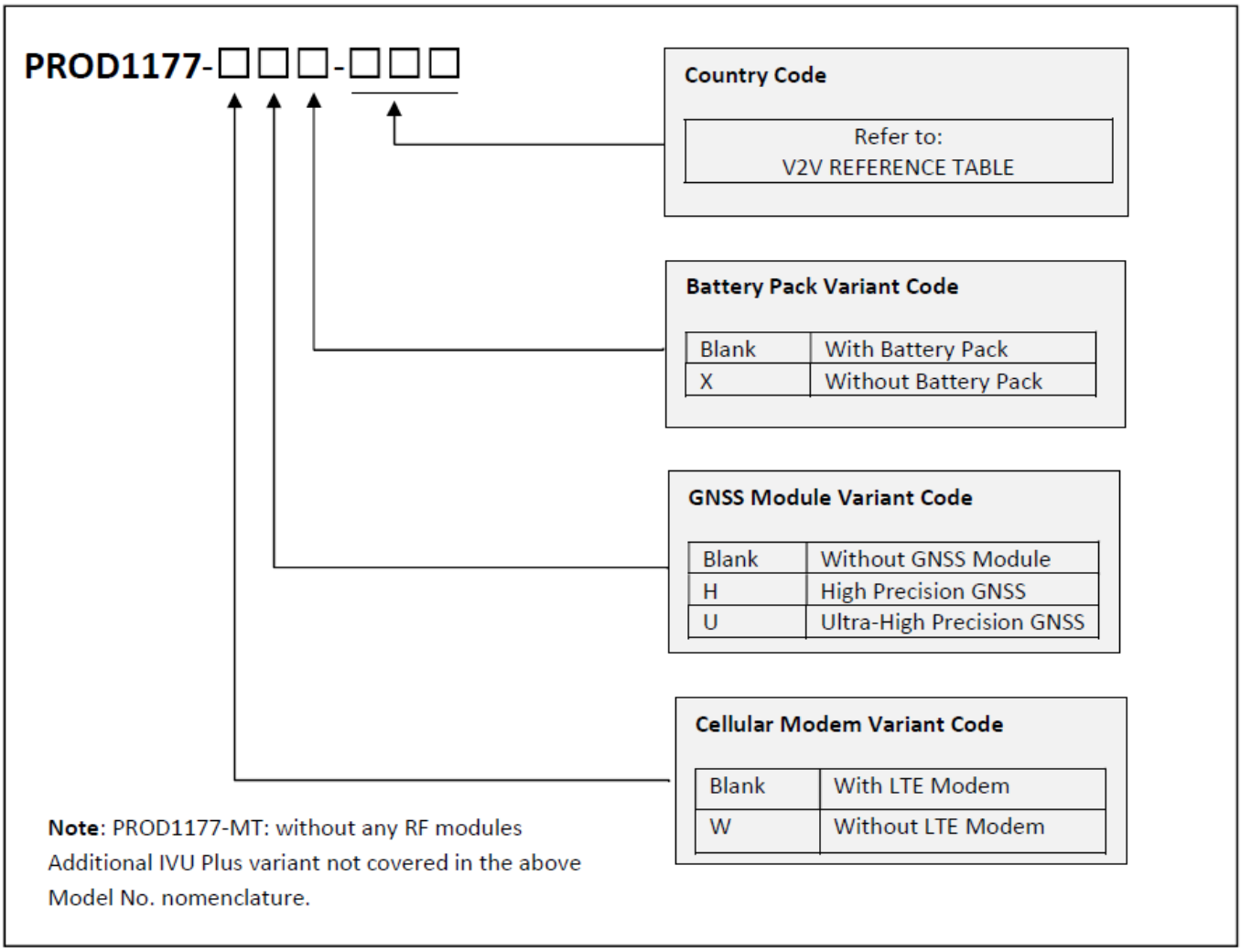
radio link. Vehicle interactions are projected based on the trajectories of the vehicles. The system notifies the driver with progressive audible and graphic alerts, and depending on the configuration, an acknowledgment by the driver may be required. Designed for off-road heavy machinery and automotive use. Please refer to the CAS-GPS user manual for user interface operation. The system continuously broadcasts its location and receives broadcasts of other vehicles in radio communications range using the in-built proprietary radio link. Vehicle interactions are projected based on the trajectories of the vehicles. The system notifies the driver with progressive audible and graphic alerts, and depending on the configuration, an acknowledgment by the driver may be required. Designed for off-road heavy machinery and automotive use. Please refer to the CAS-GPS user manual for user interface operation. an acknowledgment by the driver may be required. Designed for off-road heavy machinery and automotive use. Please refer to the CAS-GPS user manual for user interface operation. an acknowledgment by the driver may be required. Designed for off-road heavy machinery and automotive use. Please refer to the CAS-GPS user manual for user interface operation.

ABBREVIATIONS

ABBREVIATIONS	**DESCRIPTION**
IVU	In Vehicle Unit
GPS	Global Positioning System
CAS	Collision Awareness System
LAN	Local Area Network
WIFI	Wireless Communication Medium
GSM	Global System for Mobile Communications
OEM	Original Equipment Manufacturer
GNSS	Global Navigation Satellite System

SCOPE

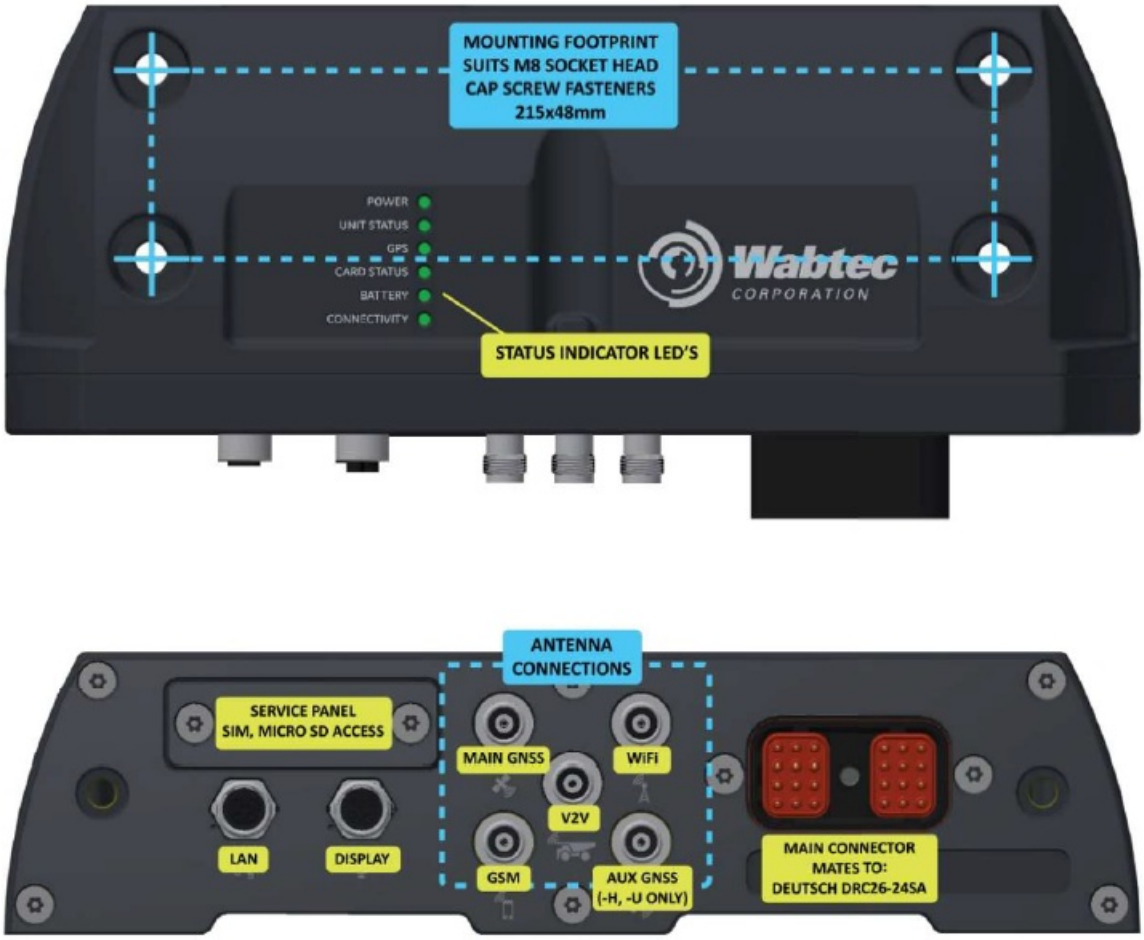
This user manual covers the following variants of the PROD1177 IVU PLUS product family, with part number nomenclature of the following form:



IVU Plus Variant Model Numbers

	Modem Code	**GNSS Code**	**Battery Pack Code**	**Country Code**
PROD1177	W	H		USA
PROD1177	W	U		USA
PROD1177	W			USA
PROD1177	W	H	X	USA
PROD1177	W	U	X	USA
PROD1177	W		X	USA
PROD1177		H		USA
PROD1177		U		USA
PROD1177		H	X	USA
PROD1177		U	X	USA
PROD1177			X	USA
PROD1177-MT				

PART IDENTIFICATION



CONNECTIVITY

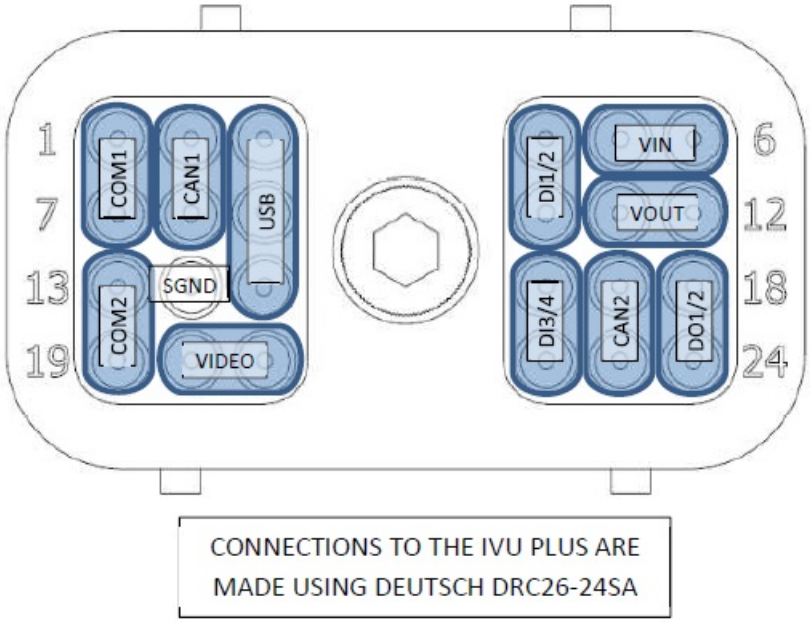
The DEVICE has the ability to upload and download data to and from a remote server. The upload function is used to send data retrieved from the internal database in real-time or from a selected date range. The download function is used to send new software updates to the device. Bidirectional data can be transmitted between the central server's database and the DEVICE via the following connections.

- Wi-Fi
- Ethernet
- GPRS GSM, 3G, LTE HSDPA network.

In the absence of a reliable wireless connection to the DEVICE, data can be retrieved manually from the removable flash card. This data can then be transferred into the central server's database for reporting and analysis.

DANGER
Removing the flash card from the DEVICE is a potential hazard as it will disable the operation of the DEVICE.

CONNECTOR PINOUTS



CONNECTIONS TO THE IVU PLUS ARE MADE USING DEUTSCH DRC26-24SA

		Connections
Pin	**Signal**	**Functions**
1	COM1	RS232 Tx / RS485A
7	COM1	RS232 Rx / RS485B
2	CAN1-P	CAN1 High
8	CAN1-N	CAN1 Low
3	USB5V	USB supply out
9	USBD-N	USBD-N
15	USBD-P	USBD-P
4	DIN1	Digital Input 1+

10	DIN2	Digital Input 2+
5	GND Vin	Input Power -ve
6	PWR Vin	Input Power +ve
11	GND Vo	Vout Ground
12	12 Vo	Output +12V
13	COM2	RS232 Tx / RS485A
19	COM2	RS232 Rx / RS485B
14	SGND	Signal Ground
16	DIN3	Digital Input 3+
22	DIN4	Digital Input 4+
17	CAN2-P	CAN2 High
23	CAN2-N	CAN2 Low
18	DOUT1	Digital Output 1+
24	DOUT2	Digital output 2+
20	VID	Video-
21	VID	Video+

SPECIFICATIONS

Main CPU	**ARM® Cortex®-A9 Quad core 32bit processor, 800MHz**
Standby CPU	ARM 32-bit Cortex™ M3
Memory Card	Micro SD
RAM	1GB DDR3
Flash	16GB NAND
Sensors	3-axis gyroscope, accelerometer
	Altimeter -500m to 9000m
Main interface	Deutsch DRC series 24-pin connector – refer connection table
Digital Output	2 x Open Drain Solid state relays, 60V Max / 250mA Max
12V DC Output	1 x 12VDC @ 1.2A Max
Digital Inputs	4 x single ended inputs (referenced to common power ground), 60Vdc Tolerant/@30mA max, 3Vdc logic threshold
CAN interface	Dual 1Mbps CAN channels
USB interface	1 x USB2.OTG port
Other	2 x RS232/485 S/W configurable
Video input	1 x differential composite video (PAL or NTSC)
LAN interface	1 x 100BASE-T on M12 (code D)
RF connectors	Multiple TNC connectors
Optional V2V SRD Radio	Upto 100 mW option, 902-928 MHz, 864.5 MHz, 866 MHz, 869.525 MHz, Refer to V2V Radio Reference table (Depends on Regulatory Authority & Installation country)
GNSS	The product is offered in two variants: High (H) and Ultra-High (U) Precision

Product variants	**High Precision** **PROD1177-H** **PROD1177-HX** **PROD1177-WH** **PROD1177-WHX**	**Ultra-High Precision** **PROD1177-U** **PROD1177-UX** **PROD1177-WU** **PROD1177-WUX**
Rx Channels	184	448
GPS	L1, L2	L1, L2
GLONASS	L1, L2	L1, L2
Galileo1	E1, E5	E1, E5
BeiDou1	B1, B2	B1, B2
QZSS	L1, L2	L1, L2
SBAS	Not applicable	L1
Accuracy (CEP_{50})	**Horizontal** **Standalone** 1.5m - - **RTK** 1.0cm	**Horizontal** **Standalone** 1.0m **SBAS** 0.5m **DGNSS** 0.3m **RTK** 0.5cm
PVT Update rate	20Hz (2 concurrent constellations)	100Hz/ 50Hz with heading (all constellations)
Heading (1σ)	Better than 1˚, 1m separation (requires secondary receiver, using moving-baseline RTK, 8Hz)	0.15˚, 1m separation (dual antennas, standalone)
Enhanced robustness		anti-jamming and monitoring against narrow and wideband interference advanced scintillation mitigation a posteriori multipath estimator for code and phase multipath mitigation superior tracking robustness under heavy mechanical shocks or vibrations

Optional WAN	Multi Band LTE Cat 1 with 2G / 3G Fallback for Seamless Global Connectivity LTE Bands: 1, 2, 3, 4, 5, 7, 8, 12(17), 18, 19, 20, 28 3G Bands: 1, 2, 4, 5, 8, 9, 19 2G Bands: Quad Band
Optional WLAN	IEEE 802.11b/g/n Wi-Fi 1W b/g/n: 2.412 ~ 2.462 GHz
Size	290 wide x 72 high x 130 mm deep (basic), Mounting Footprint 215x48mm (suits 4 x M8 SHCS)
Weight	2kg
IP Rating	IP66
Operating Temp.	15°C to +60°C -40°C to +70°C for No Battery variant
Typical Battery Backup.	$LiFePO_4$, 3.3V, 8.25Wh, UN38.3 Certification 14hrs standby operation (with V2V active), 3hrs charge time.

V2V RADIO REFERENCE

country abbreviation Operation Band (MHz)

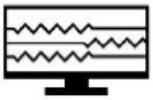
EUROPE	– EUR	869.40	869.65
GABON	– GAB	869.40	869.65
GHANA	-GHA	869.40	869.65
MOZAMBIQUE	– MOZ	869.40	869.65
NEW CALEDONIA	-NCL	869.40	869.65
SENEGAL	– Sen	869.40	869.65
SOUTH AFRICA	-ZAF	869.40	869.65
CANADA	-CAN	902.00	928.00
MEXICO	– MEX	902.00	928.00
PERU	-PER	902.00	928.00
AMERICA	– USA	902.00	928.00
ARGENTINA	-ARG	915.00	928.00
AUSTRALIA	-AUS	915.00	928.00
BRAZIL	– BRA	915.00	928.00
CHILE	-CHL	915.00	928.00
COLUMBIA	-COL	915.00	928.00
PAPUA NEW GUINEA	-PNG	915.00	928.00
INDIA	-IND	865.00	867.00

RUSSIA	-RUS	864.00	865.00
MONGOLIA	-MNG	920.00	925.00
INDONESIA	-IDN	920.00	923.00

APPROVED ACCESSORIES LIST
The table below outlines the accessories that are approved for operation with the DEVICE:

Product Number	**Description**
PROD0839A	Display
PROD1052-STx	Node
PROD1116-Sx	Node
PROD1039(D)	Emitter
PROD0799	Dual TOF/RF unit
PROD0810	TOF unit
PROD0118	Camera
PROD0161-xx	Expansion unit
PROD0163	Camera converter
MISC0467/PROD1222	GNSS antenna
PROD0833	TOF/Wi-Fi antenna
PROD0852/MISC0394	V2V antenna
PROD0854	Multiband antenna
PROD0851	Ethernet cable
PROD0850	Display cable

WARNINGS

caution	The unit contains a lithium-ion battery and should be disposed of in accordance with local regulations.
danger	Disposal of electronics should be done in accordance with local regulations.
	Medical equipment may be very sensitive to RF energy. The operation of cardiac pacema kers, other implanted medical equipment and hearing aids can be affected by interference from cellular terminals placed close to the device. If in doubt about potential danger, conta ct the physician or the manufacturer of the device to verify that the equipment is properly shielded.
	The operation of wireless appliances in an aircraft is forbidden to prevent interference wit h communications systems. Failure to observe these instructions may lead to the suspens ion or denial of cellular services to the offender, legal action, or both. All equipment shippe d by Industrea Mining Technology are placed into transit mode disabling all device function s before being dispatched. All functions are enabled during the commissioning of the equi pment.
	Do not operate the cellular terminal in the presence of flammable gases or fumes. Switch off the cellular terminal when you are near petrol stations, fuel depots, chemical plants or where blasting operations are in progress. Operation of any electrical equipment in potent ially explosive atmospheres can constitute a safety hazard.
	Your cellular terminal receives and transmits radio frequency energy while switched on. R emember that interference can occur if it is used close to TV sets, radios, computers or in adequately shielded equipment. Follow any special regulations and always switch off the cellular terminal wherever forbidden, or when you suspect that it may cause interference or danger.
	Road safety comes first! Do not use cellular terminal when driving a vehicle. Faulty installa tion or operation can constitute a safety hazard.

SOS	**IMPORTANT!** Cellular terminals operate using radio signals and cellular networks. Becau se of this, connection cannot be guaranteed at all times under all conditions. Therefore, y ou should never rely solely on any wireless device for essential communications, for exam ple emergency broadcasts. The CAS system uses the telecommunication and wireless ne tworks for data transfers of vehicle telemetry only and is not capable of making or receivin g phone calls or SMS messages under any condition.

CAUTION	The availability of some specific channels and/or operational frequency bands are country dependent and are firmware programmed at the factory to match the intended destination . The firmware setting is not accessible by the end user.
WARNING	RISK OF EXPLOSION IF BATTERY IS REPLACED BY AN INCORRECT TYPE. DISPOSE OF USED BATTERIES ACCORDING TO THE INSTRUCTIONS provided in section 1.11 (Decommission and Disposal) of this document.
WARNING	Fire, explosion and server burn hazard. DO NOT cut, disassemble, short circuit, crush penetrate, incinerate, overheat or expose c ontents to water.
WARNING	**Handling:** Do not expose battery or cell to extreme temperatures or fire. Do not disassem ble, crush or puncture battery. **Storage:** Insulate positive and negative terminals to avoid short circuit. Store in a cool an d well ventilated area and avoid direct sunlight. Elevated temperatures can result in reduc ed battery life.
WARNING	**Stability:** Stable **Conditions to Avoid:** Avoid exposing battery to high temperatures. Do not incinerate, def orm, mutilate, crush, pierce, short circuit or disassemble. **Materials to Avoid:** Not Applicable Hazardous Decomposition Products: Combustible vapors may be released if exposed to f ire. **Possibility of Hazardous Reactions:** Not available.

	Only use with approved accessories.

GENERAL INFORMATION

TRANSPORT OF EQUIPMENT

All possible precautions should be taken to protect the equipment against damage or losses during shipment, however before accepting delivery, check all items against the packing list or Bill of Lading. If there are shortages or evidence of physical damage, notify Digital Mining Technology immediately. This action will help ensure a speedy resolution to any perceived problems. Keep a record of all claims and correspondence. Photographs are recommended.
Do not remove protective covers prior to installation unless there are indications of damage. Boxes opened for inspection and inventory should be carefully repacked to ensure protection of the contents or else the parts should be packaged and stored in a safe place. Examine all packing boxes, wrappings and covers for items attached to them, especially if the wrappings are to be discarded.

STORAGE OF EQUIPMENT

When the equipment is not installed immediately, proper storage is important to ensure protection of equipment and validity of warranty. Equipment should be stored indoors in a cool dry place to protect against environmental elements like weather, moisture and heat. Do not store the equipment on the ground.

UNPACKING OF EQUIPMENT

CAUTION

- Do not use damaged equipment.

INSTALLATION

Installation should be in accordance with the procedures defined by Digital Mining Technology and only performed by authorized and qualified installers. Installation should adhere to all local regulations appropriate for automotive Installations in the end-user geographic region. For example: standard AS/NZS 4346 as specified under AS/NZS 2772 in Australia. Contact your local authorized representative for installation guide.

TESTING AND COMMISSIONING

After installation of the DEVICE, it should be thoroughly tested. Testing should include connectivity and functionality tests to confirm the DEVICE is working according to the operational requirements prior to deployment and field use. Functionality will be verified at the time of commissioning and an on-going maintenance schedule will be carried out under an approved SLA between the authorized representative and customer for the life of the product.

MAINTENANCE

This equipment is not intended to be maintained by the end user. Opening the enclosure should not be attempted, will void any warranty and could compromise the safe operation of the unit. No user-serviceable parts. Contact your local authorized representative for service arrangements.

DECOMMISSION AND DISPOSAL

- The unit contains a lithium battery and should be disposed of in accordance with local regulations.
- Disposal of electronics should be done in accordance with local regulations.

- Power should be disconnected before decommissioning.
- The unit must not be treated as general waste. By ensuring that this product is disposed of correctly, you will be helping to prevent potentially negative consequences for the environment and human health which could otherwise be caused by incorrect handling of this product.
- **Waste Disposal Method:** Recycling is encouraged. Dispose of in accordance with local, state and federal laws and regulations.
- **USA:** Dispose of in accordance with local, state and federal laws and regulations.
- **Canada:** Dispose of in accordance with local, state and federal laws and regulations.
- **EC:** Dispose of in accordance with relevant EC Directives.

WARRANTY TERMS

Equipment and Parts: 15 months from delivery or 12 months from when the system is placed in service (whichever occurs first). Modifications to this product without written consent from the manufacturer or its designated authorized representatives will void all warranty obligations.

AUTHORIZED REPRESENTATIVES

Australia
Industrea Mining Technology Pty Ltd, Trading as Digital Mining Technology 3 Co-Wyn Close Fountaindale, NSW, 2258 Australia

- **Telephone** +61 (2) 8863 4730
- **GETProductionIMT@wabtec.com**
- **www.wabteccorp.com**

North America

Digital Mining
2901 East Lake Road Erie, Pennsylvania, 16531 USA

- **Telephone** +1 (480) 264 2063
- **Fax** +1 (480) 264 6402
- **www.wabteccorp.com**

Canada

Wabtec Transportation Canada Inc 84 Terracon Pl. Winnipeg Manitoba, R2J 4G7 Canada

- **Telephone** +1 (905) 251 0074
- **www.wabteccorp.com**

PRODUCT APPROVALS AND REGULATORY INFORMATION

CAUTION
Modifications to this product without written consent from the manufacturer or its designated authorized representatives could void the user's authority to operate the equipment.

DECLARATION OF CONFORMITY 47 CFR § 2.1077 COMPLIANCE INFORMATION

We, Industrea Mining Technology Pty, Ltd, T/A Digital Mining Technology, of 3 Co-Wyn Close, Fountaindale, NSW, 2258, Australia declare under our sole responsibility the products:

Make:	IVU PLUS
FCC ID:	YIY-PROD1177
Model	PROD1177-WHX-USA
Numbers:	PROD1177-WUX-USA
	PROD1177-WH-USA
	PROD1177-WU-USA
	PROD1177-W-USA
	PROD1177-WX-USA
	PROD1177-HX-USA
	PROD1177-UX-USA
	PROD1177-H-USA
	PROD1177-U-USA
	PROD1177-X-USA
	PROD1177-MT
Responsible Party:	Digital Mining 2901 East Lake Road Erie, PA, 16531 (814) 875-2234

Which contains the following optional FCC approved modules:

Model No: NM-DB-2M (Wi-Fi Module) FCC ID: 2AG87NM-DB-3
Model No: PLS63-W (Cellular Modem) FCC ID: QIPPLS63-W

FCC STATEMENT

Complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause unwanted operation.

FCC INTERFERENCE STATEMENT FOR CLASS B DEVICES

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

A shielded type Ethernet cord is required to meet FCC Class B emission limits and prevent interference to the nearby radio and television reception.
This device and its antenna(s) must not be co-located or operate in conjunction with any other antenna or transmitter. The antenna is considered an integral system component. Use of any antenna other than those specified in the installation manual or supplied with the product may void the product compliance.

FCC RADIATION EXPOSURE STATEMENT
To comply with FCC RF exposure limits for general population / uncontrolled exposure, the antennas used for this transmitter must be installed to provide a separation distance of at least 50 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

INDUSTRY CANADA COMPLIANT

This Class B digital apparatus complies with Canadian ICES-003. Changes or modifications not expressly approved by the party responsible for compliance could void the user’s authority to operate the equipment.

CONCERNING RADIO TRANSMITTERS

This device complies with Industry Canada’s license-exempt RSSs. Operation is subject to the following two conditions:

1. This device may not cause interference; and
2. This device must accept any interference, including that which may cause unwanted operation of the device.

Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (eirp) is not more than that necessary for successful communication.

DETA CHEABLE ANTENNAS

This radio transmitter has been approved by Industry Canada to operate with the antenna types listed in the installation manual with the maximum permissible gain and required antenna impedance for each antenna type indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

INDUSTRY CANADA – RADIATION EXPOSURE STATEMENT

To comply with Industry Canada RF exposure limits for general population / uncontrolled exposure, the antennas used for this transmitter must be installed to provide a separation distance of at least 50 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

DOCUMENT REVISION

DOCUMENT NO	REVISION
PROD1177-USER-EN-A	Document release
PROD1177-USER-EN-B	Revised WiFi Module FCC ID in Sec. 4.1, updates to Sec. 3.9 & 2.7
PROD1177-USER-EN-C	Removed 5 GHz WiFi ratings in Sec. 2.7

DOCUMENT SIGN OFF

DOCUMENT REVISION NO.	
POSITION	Certification Engineer
DATE	CREATED: By P C Shivalingam at 8:08 am, Apr 27, 2023
POSITION	Engineering Lead
DATE	REVIEWED: By Peter O'Donnell at 12:46 pm, Apr 27, 2023
POSITION	Engineering Manager
DATE	APPROVED: By Steve Clifton at 1:14 pm, Apr 27, 2023

Documents / Resources

	Wabtec PROD1177 IVU PLUS Multi Purpose Telematics Computer [pdf] User Manual YIY-PROD1177, YIYPROD1177, prod1177, PROD1177 IVU PLUS, PROD1177 IVU PLUS Multi Purpose Telematics Computer, Multi Purpose Telematics Computer, Telematics Computer

References

- Inicio – Cominsa
- Home - Intecs Teknikatama Industri
- Renewable Energy - Inverters & Batteries | Probe Group
- Homepage | Wabtec Corporation