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Copyright Notice and Disclaimer

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Federal Communications Commission Statement

DECLARATION OF CONFORMITY WITH FCC RULES FOR ELECTROMAGNETIC COMPATIBILITY

We, Ingenitech (NZ) Limited, of 3A, 125 The Strand, Parnell, Auckland 1010, New Zealand, declare under our sole responsibility that the product, **TMU1000 (ibright® X-Series unit)**, to which this declaration relates, complies with Part 15 of the FCC Rules.

Operation is subject to the following two conditions:

- This device may not cause harmful interference, and
- This device must accept any interference received, including interference that may cause undesired operation.

Caution: Exposure to Radio Frequency Radiation

The radiated output power of the TMU1000 is well below the Federal Communications Commission (FCC) radio frequency exposure limits. Nevertheless, it is important that the TMU1000 is installed and used in such a manner that the potential for human contact during normal operation is minimized.

When connecting an external antenna to the TMU1000, the antenna shall be placed in such a manner to minimize the potential for human contact during normal operation. To avoid the possibility of exceeding the FCC Radio frequency exposure limits, human proximity to the antenna must not be less than 20 cm (8 inches) during normal operation.

Federal Communications Commission Notice

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 typical fleet asset installation.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, it may cause harmful interference to radio or television communications. There is no guarantee that interference will not occur at any particular installation. If the TMU1000 does cause harmful interference to radio or television communications, which can be determined by turning the equipment off and on, the user is encouraged to try and correct the interference by one or more of the following measures:

- Re-orient or relocate the radio or television device’s receiving antenna.
- Increase the distance between the TMU1000 and the radio or television device.
- Connect the TMU1000 to a power supply on a circuit different to the circuit to which the radio or television device is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Modifications

The FCC requires the user to be notified that any changes or modifications to this device that are not expressly approved by Ingenitech (NZ) Limited may void the user’s authority to operate the equipment.
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Getting Help
This topic covers how to use this help guide, the formatting and text conventions used in the guide, and where you can find more help outside this guide.
Please check that you are using the latest version by looking at the version tracking table and the version number on the title page.

Types of Help

PDF and HTML User Guides
Our guides are published in PDF format for printing, and in HTML format for online help accessible from the software.

Technical Guides
Technical Guides are published in PDF format only. They are for limited distribution among technical personnel, and usually cover installation related technical information in detail.

Web Resources
Please see our website (http://www.internationaltelematics.com) for corporate information, product descriptions and media releases.

Multimedia Resources
A number of multimedia resources such as animations, videos and presentations are available on request. Please contact us (see "Contact Information" on page 8) for more information.

Conventions

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<td><strong>Bold</strong></td>
<td>Items that can be clicked, emphasis.</td>
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<tr>
<td>KEY + KEY</td>
<td>A command key on the keyboard, such as CTRL, SHIFT, ALT, HOME, END or DELETE, used in combination with another key.</td>
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<tr>
<td>Step 1 &gt; Step 2 &gt; Step 3</td>
<td>This indicates a sequence that you should follow - for example a book &gt; chapter &gt; topic sequence, or a menu &gt; submenu &gt; submenu &gt; item sequence.</td>
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<tr>
<td>Procedure</td>
<td>This heading indicates a procedure and series of steps (usually numbered).</td>
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<td>[Variable]</td>
<td>Text enclosed in square brackets indicates a variable, to be replaced with the appropriate alternative according to the context.</td>
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<tr>
<td>Consolas</td>
<td>Source code.</td>
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Overview

This overview covers an introduction to the ibright® Solution and certification / compliance considerations for installation personnel.

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For Whom is this Guide?

This guide is for installers of the ibright® Solution hardware.
It covers hardware, part and tool checklists, installation planning, installation best practice, post-install checks including LED status conditions and troubleshooting.

The material in this guide falls into three overall sections.

• We first describe planning for the installation (see "Planning and Coordinating Installations" on page 13).
• Next, we describe the tools and equipment (on page 17), and hardware components (on page 18) required for the installation.
• We then describe the pre-installation checks (on page 34) and the installation (on page 42) in detail.

If you're using this guide as a reference and you have already completed some stages of the process, you may wish to use the links above, the Contents or the Index sections to go quickly to the section you require.

We also have Appendices that provide useful supplementary information.

International Telematics' Expectations

A quality installation is vital to ensure that the ibright® Solution performs in the expected manner.

An installation is only considered finished:

• When each unit is successfully connected and providing all the necessary data from the fleet asset to the end application, and
• Each unit is registered online with all the serial number details of the ibright® units and fleet asset details.

International Telematics requires all installers to have read all the information in this ibright® Installation and Operations guide prior to commencing any ibright® installations, and to follow all instructions in detail.

If there is any aspect of the installation that is not covered in this guide, or which you need further clarification on, please do not hesitate to contact us (see "Contact Information" on page 8).
Certification and Compliance Requirements for Installers - US

Installations of the ibright® Solution must be completed by a certified installer with the right (recognised) qualifications.

Installing hardware when you are not a certified installer will negate the product warranties for you or your customers. Incorrect installations are likely to result in the product not working, product damage, or poor performance from the technology.

Installation specifics will depend upon the type of ibright® hardware being installed, and the unique aspects of each fleet asset you are installing the unit/s into.

In ALL instances we recommend installers become familiar with fleet assets before an installation. If necessary read the Owner’s Manuals before installing equipment to qualify any power, connection locations or unique elements that may affect the technology working properly and safely.

Minimum Requirements for Installers
- 3 years’ installation experience.
- Customer references.
- Liability insurance.

Recommended Requirements for Installers
- MECP (Mobile Electronic Certified Professional) certification.
- Master Electrical Technician rating.
How Does the ibright® Solution Work?

The ibright® Solution has three parts:

- ibright® telematic unit.
- Server.
- ibright® Enterprise software application.

The ibright® unit is an advanced telematic computer incorporating GPS, GSM and Bluetooth communications technology.

It collects OBD-II, J1587 and J1939 data from the asset’s internal microcontrollers, combines the data with location information from GPS satellites, encrypts the data, and sends it over the Internet to the International Telematics servers.

The servers decrypt the information, send SMS and email alerts if required, and prepare the data for viewing in ibright® Enterprise within the ibright® middleware.

The information is then loaded into the ibright® Enterprise software for the customer to view.
Planning and Coordinating Installations

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Pilot Installations

The most important factor in a pilot installations of the ibright® Solution is to cover the **widest possible range** of makes and models of fleet assets.

Next, the pilot installation needs to be documented thoroughly, to ensure that **all the requirements and variables** applicable to any given installation context are captured.

This is not only useful in facilitating a smooth roll-out if the deal goes through, but also contributes to the knowledge and experience of the installation team.

In particular, these should be documented:

- Installation environment restrictions (outdoors, indoors, asset availability, authorization).
- Placement of the ibright® Solution hardware and components.
- Best connections for ground/GND (earth), constant power and ignition/IGN (NOT Accessory/ACC).
- Unusual 3rd party hardware specific to the fleet (for example, MDTs).
- Resources - for example, contact personnel, drivers, technicians.

Major Installations

For a major installation, your first step should be to produce a **roll-out plan**.

In particular, these factors should be considered:

- Location of installations. We recommend that installations be performed in the open, as this allows GPS to connect easier.
- Installation environment restrictions (outdoors, indoors, asset availability, authorization).
- Coordination of asset installations so that identical assets are installed together.
- Placement of the ibright® Solution hardware and components.
- Best connections for ground/GND (earth), constant power and ignition/IGN (NOT Accessory/ACC).
- Unusual 3rd party hardware specific to the fleet (for example, MDTs).
- Resources - for example, contact personnel, drivers, technicians.
General Installation Considerations

The ibright® hardware SHOULD be installed:
1. In a secure area of the fleet asset, where it will be protected by the asset’s security system.
2. So that tampering by unauthorized personnel is avoided.
3. Where accidental damage is least likely to occur.
4. So that cables are concealed from view, secure and cannot be loosened or stepped on.
5. So that components cannot easily be removed.
6. With screws or bolts, using lock-nuts or nuts with shake-proof washers, or rivets.
7. Firmly and securely, away from moving parts.
8. Soldered and insulated with heat-shrink insulation for crucial connections like POWER.
9. With all spliced wires taped and/or silicon sealed.
10. Away from sources of heat.
11. Away from sources of moisture. Test that all wiring points and installation points are dry.
12. With an anti static wrist band whilst handling SIM Cards.

The ibright® hardware should NOT be installed:
1. On harnesses, hoses, pipes or heater ducts.
2. Where it can create interference on audio head units.
3. Where it may protrude or obstruct in any way.
4. In a way that may constitute a hazard or contravene any applicable Health and Safety Standards.
5. In a way that ibright® components, cords or attachments vibrate or rattle.
6. Where it may chafe cables, pipes or the fleet asset’s body during operation.
7. With ‘quick tap’ screws, as they are prone to corrosion and wiring failures.

Asset Warranty Conditions

The first responsibility of the installer is to thoroughly check all fleet asset warranty conditions, and whether any or all of the ibright® hardware installation steps may void any of the asset warranties.

The customer has the discretion to halt the installation if there is a danger of voiding a warranty.

If this is the case, International Telematics must be promptly informed.

If the customer decides to proceed with the installation and void any warranties, confirmation must be gained in writing.

Health and Safety Precautions

To safeguard the health and safety of all installers and take proper care of the customer’s property, please observe the following when doing an installation.

- Remove all ties and loose or unsecured items of clothing, to avoid these being caught on moving fleet asset parts or hinder movement.
- Remove all accessories or sharp objects like jewellery or belt buckles that may scratch the body of the asset or hinder movement.
- Wear protective eyewear, gloves and protective clothing as appropriate.
• Wearing a high visibility (hi-vis) vest is recommended at all times, and is mandatory for work on open roads or open areas.
• Adequate, independently powered lighting is recommended for night installations.

Drilling and Cutting Precautions

Warning: Do not drill or cut anything for pilot installations.

1. Always read the asset's owners manual for any special instructions before commencing.
2. Before drilling ensure there are no obstructions, pipes or cables on either side of the panel to be drilled.
3. Check that any equipment or wiring or equipment has not been damaged once drilling or cutting is complete.
4. Remove any rough edges and filings dropped from holes drilled.
5. Protect any drilled holes or cut edges using a recognized anti-corrosion treatment.
6. Fit suitable grommets where wiring is to be routed through body panels and ensure grommets through engine bulk-heads are water and gas tight.
7. Ensure the structural integrity of the asset will not be reduced.
8. Ensure the technicians are aware of any manufacturers instructions regarding corrosion, particularly on aluminium assets.
Installation Documentation

Documenting the environment before an installation, during the installation and after the installation is crucial. Doing so will not only capture essential reference information, but will also safeguard you in the event of a problem with the installation.

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Installation and Work Repair Form (IWRF)

Camera

Installation Documentation

Installation and Work Repair Form (IWRF)

An Installation and Work Repair Form (IWRF) is provided to each installer to document all steps of the installation. This form is designed to capture ALL relevant asset and installation environment information. It is also helpful as a checklist of the installation steps.

It is printed and filled in during the installation. A PDF copy of the form can be downloaded from the International Telematics Support website (http://support.itelematic.com). You can also contact us (see "Contact Information" on page 8).

Note: Completing the IWRF is essential - the unit will not be provisioned unless a completed form is received at International Telematics.

Camera

A camera or some sort of image capture device is essential for the installation. This is to record anything important or unusual before beginning the installation, while doing the installation and after it also. This is not only for reference, but as a safeguard against being held responsible for faults that existed before the installation began.
Tools and Equipment
This section covers the tools and equipment you will require for International Telematics installations.

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Access Tools and Equipment
- Socket set (minimum 40 Piece recommended, torque bits are required).
- Screwdriver set (various size flat and Phillips drivers).
- Flashlight.
- Electrostatic Wristband.

Wiring Tools and Accessories
- Wire Stripping tool/ knife.
- Crimping Tool.
- Multimeter.
- Soldering iron.
- Rosin Core Solder.
- Spare Automotive grade wire (16 – 18 AWG).
- Automotive wire.
- Connectors.
- Electrical Insulation Tape.
- Spare 3 amp fuses.
- Terminal Brush.
- Cleaning Alcohol wipes.
- Heat Shrink.

ibright® Mounting Tools
- Industrial Velcro.
- Industrial double sided tape.
- Silicone Sealant.
- Various screws (self tappers).
- Spare nuts & bolts.
- Spare washers (as required for installation).
- Cable ties (various lengths).
Hardware Components

This section describes the standard and optional components that may be used for a typical installation.

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Basic Kit Box

The white basic kit box supplied to all International Telematics installers has a number of standard components included with it. Only the ibright® unit itself has a part code, as the included components are considered part of the basic kit.

The topics below describe the components individually.

ibright® X-Series Unit

- Description: ibright® X-Series Unit with built-in accelerometer, GPS, Bluetooth and GPRS connectivity.
- Code: TDV-XSER-1.2a.
Power Loom with Inline Fuse
- Description: 2m power loom with in-line 3amp fuse and wiring for ignition and Dallas ID connections included.

Note: The power loom is not required when using J-Bus cables (see "6/9 Pin J-Bus Y Cable" on page 22) for the installation.

Blade Fuse, 5 Amp Plugin ATQ
- Description: 5 amp blade fuse. Most often included with the power loom (above) but sometimes supplied individually with a blue fuse block for installations requiring non-standard ignition wiring (below).
- Code: ACCFUSE5AMP-000.

Blade Fuse Holder
- Description: Blade fuse crimper / holder for installations requiring non-standard ignition wiring.
- NZ:
• US (Code: ACC-FUSEHOLDER-000):

ibright® X-Series Mounting Bracket
• Description: Mounting bracket for ibright® X-Series Unit.

Mounting Screws
• Description: 4x mounting screws to be used with ibright® X-Series Mounting Bracket.

Rubber Port Protection Grommet
• Description: Rubber ingress protection IP55 grommet to protect the ibright® X-Series Unit ports from liquid and dust contamination.
Cable Tie
- Description: Cable Tie to secure loom.

Security Stickers
- Description: Security stickers for ibright® X-Series unit. The VOID sticker is placed over the join between the top and bottom halves of the ibright® X-Series unit, and the silver sticker is placed over the edge of the SIM card port.
Optional Components

A number of optional components are also available for specific installation needs. These components have a part code for your convenience.

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6/9 Pin J-Bus Y Cable

- Description: 6 and/or 9 pin J-Bus Y-cable serving the triple purpose of supplying power to the ibright® unit, supplying power to the Autotap and transmitting/receiving data. This example shows the 6 pin Y-cable.
- Codes: LOO-YCABL6P-000 (6 pin Y-cable), LOO-YCABL9P-000 (9 pin Y-cable).

20 Way Loom

- Description: 20-way loom with serial connectors for attaching the Autotap and/or MDT to the ibright® X-Series unit.
• Code: LOO-20WAY-000.

18 Way Loom
• Description: 18-way loom for connections to the ibright® X-Series unit.
• Code: LOO-18WAY-000.

AutoTap
• Description: Microprocessor unit used for engine diagnostics.
• Code: ACC-AUTO-000.

External GPS Antenna
• Description: External GPS antenna to extend the range of the GPS unit built in to the ibright® X-Series.
• Code: ANT-EXGPS-000.

Note: An external GPS antenna must have adequate 'sky view' to be able to acquire a GPS fix.

External GSM Antenna (US Only)
• Description: Glass mounted high gain external GSM antenna to extend the range of the GSM unit built in to the ibright® X-Series. For US installations only.
• Code: ANT-EXGSMHG-001.

Note: Must be mounted on the windscrean.

External GSM Stub Antenna (NZ Only)
• Description: External GSM stub antenna to extend the range of the GSM unit built in to the ibright® X-Series. This component is for NZ installations only.
- Code: ANT-EXGSM-000.

**External Combo Antenna (US Only)**
- Description: External combination GSM / GPS antenna to extend the range of the GSM and GPS modules built in to the ibright® X-Series. This component is for US installations only. 2 types are available.

**Note:** Mount on the roof of the asset, and run wires through light housings or the door jamb.
- Code: ANT-ARCGT-000 (ARC Titan).
- Code: ANT-ARCPM-000 (ARC PM).

**Thermoking iBox Sensor**
- Description: Thermoking iBox Sensor for refrigerated unit assets.
• Code: SENS-IBOX-000.

MDT (Mobile Data Terminal)
• Description: Multi-purpose MDT (Mobile Data Terminal) for messaging, alerts and diagnostic information. Shown below is the Motia MDT.
• Code: DAT-MDT-000.

• A Mio MDT is also available.

RAM Mounting Bracket for MDT
• Description: RAM truck cab mounting bracket for MDT.
• Code: DATA-VCD-000.
Ports and Connections

In This Section

ibright® X-Series Ports - Overview 28
ibright® X-Series 18 Pin Port 28
ibright® X-Series 20 Pin Port 29
6-Pin J-Bus Connector 30
9-Pin J-Bus Connector 31

ibright® X-Series Ports - Overview

Peripheral devices are connected directly to the ports shown above. The option existing to connect devices via Bluetooth if hard-wired connections are not possible. The ibright® X-Series can accept both digital and analog connections.

- Digital Inputs enable sensors with on/off states to be connected - for example, door, brake and seat belt sensors. Digital Outputs provide events to be measured - for example, alarms, immobilizers.
- Analog inputs enable sensor readings to be constantly measured - for example, weight and temperature sensors can use the four RS232/ RS485 ports to measure temperature for refrigeration units ('reefers'). Another example: the Dallas input pin allows connection of Driver ID sensing devices.

ibright® X-Series 18 Pin Port

The pin configuration and channel descriptions for the dedicated 18 pin port are detailed below.

<table>
<thead>
<tr>
<th>Pin</th>
<th>Signal</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5.25v Supply Out</td>
<td>Current Output (100mA max)</td>
</tr>
<tr>
<td>2</td>
<td>Analog In 1.1</td>
<td>0-5v</td>
</tr>
<tr>
<td>3</td>
<td>Analog In 1.3</td>
<td>0-5v</td>
</tr>
<tr>
<td>4</td>
<td>Analog In 1.5</td>
<td>0-5v</td>
</tr>
<tr>
<td>5</td>
<td>Analog In 1.7</td>
<td>0-5v</td>
</tr>
</tbody>
</table>
ibright® X-Series 20 Pin Port

The pin configuration and channel descriptions for the dedicated 20 pin port are detailed below.

<table>
<thead>
<tr>
<th>Pin</th>
<th>Signal</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5.25v Supply Out</td>
<td>Current Output (100mA max)</td>
</tr>
<tr>
<td>2</td>
<td>Analog In 0.1</td>
<td>0-5v</td>
</tr>
<tr>
<td>3</td>
<td>Analog In 0.3</td>
<td>0-5v</td>
</tr>
<tr>
<td>4</td>
<td>Analog In 0.5</td>
<td>0-5v</td>
</tr>
<tr>
<td>5</td>
<td>Analog In 0.7</td>
<td>0-5v</td>
</tr>
<tr>
<td>6</td>
<td>Digital In 1</td>
<td>0-12v w/ 2v threshold</td>
</tr>
<tr>
<td>7</td>
<td>Digital In 3</td>
<td>0-12v w/ 2v threshold</td>
</tr>
<tr>
<td>8</td>
<td>Digital Out 0</td>
<td>Current sink 300mA max</td>
</tr>
<tr>
<td>9</td>
<td>Serial Receive 0</td>
<td>RS232 In (Equipment Tx) / RS485 - RxD In</td>
</tr>
<tr>
<td>10</td>
<td>Serial Receive 1</td>
<td>RS232 In (Equipment Tx) RS485 + In</td>
</tr>
<tr>
<td>11</td>
<td>Analog GND (Earth)*</td>
<td>GND (Earth) for analog sensors</td>
</tr>
<tr>
<td>12</td>
<td>Analog In 0.2</td>
<td>0-5v</td>
</tr>
<tr>
<td>13</td>
<td>Analog In 0.4</td>
<td>0-5v</td>
</tr>
<tr>
<td>Pin</td>
<td>Description</td>
<td>Wire Color in Loom</td>
</tr>
<tr>
<td>-----</td>
<td>-------------------------------------------------</td>
<td>--------------------</td>
</tr>
<tr>
<td>A</td>
<td>J1587 + (Data +)</td>
<td>Green</td>
</tr>
<tr>
<td>B</td>
<td>J1587 - (Data -)</td>
<td>Blue</td>
</tr>
<tr>
<td>C</td>
<td>12v Power Supply*</td>
<td>Red</td>
</tr>
<tr>
<td>D</td>
<td>Not used</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>0v (Ground / Earth)</td>
<td>Black</td>
</tr>
<tr>
<td>F</td>
<td>Not used</td>
<td></td>
</tr>
</tbody>
</table>

*Check for constant power even when the asset ignition is off.*
9-Pin J-Bus Connector

Modern assets use a 9-pin J-Bus connector that can handle both SAE J1587 and J1939 protocols.

The pins and cable descriptions are as follows.

<table>
<thead>
<tr>
<th>Pin</th>
<th>Description</th>
<th>Wire Color in Loom</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Ground (Earth)</td>
<td>Black</td>
</tr>
<tr>
<td>B</td>
<td>12v Power Supply*</td>
<td>Red</td>
</tr>
<tr>
<td>C</td>
<td>J1939 + (Data +)</td>
<td>Yellow</td>
</tr>
<tr>
<td>D</td>
<td>J1939 - (Data -)</td>
<td>Brown</td>
</tr>
<tr>
<td>E</td>
<td>J1939 Shield</td>
<td>White</td>
</tr>
<tr>
<td>F</td>
<td>J1587 + (Data +)</td>
<td>Green</td>
</tr>
<tr>
<td>G</td>
<td>J1587 - (Data -)</td>
<td>Blue</td>
</tr>
<tr>
<td>H</td>
<td>Not used</td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>Not used</td>
<td></td>
</tr>
<tr>
<td>J</td>
<td>Not used</td>
<td></td>
</tr>
</tbody>
</table>

*Check for constant power even when the asset ignition is off.
Connectivity Options

The ibright® X-Series and D-Series units offer a number of connectivity options, both wireless and wired.

Wireless Connectivity
- Bluetooth Class 1 for up to 4 peripheral devices.
- GPRS/GSM mobile network connectivity.

Wired Connectivity Using Ports
- 9 x Digital inputs.
- 4 x Digital outputs.
- 4 x RS232/RS485 ports.
- 14 x analog inputs.
- 1 x Dallas input wire.
- Mini USB Host.
- SD (Secure Digital) card host.

Internal Antennas

The ibright® X-Series has internal GPS and GPRS antennas.
Where connectivity or acquiring a satellite lock is difficult with the internal antennas, external antennas should be connected as shown in the illustration below.

See Antenna Positions (see “Scope External Antenna Locations” on page 39) for more information on installing external antennas.

Bluetooth Coverage Area

The ibright® X-Series unit incorporates Class 1 Bluetooth connectivity for up
to four peripheral devices.

Class 1 Bluetooth will provide a secure connectivity and coverage area of up to 60m around an asset.
Pre-Installation Checks

This section describes the scoping and pre-installation checks to be done before performing an ibright® hardware installation.

We also expect that you have already covered the procedures involved in Planning and Coordinating Installations (on page 13) above.

Use this section in conjunction with the Installation and Work Repair Form (IWRF) (on page 16) and document all of the following, both on the form and with photographs or digital images (see "Camera" on page 16) for the record.

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| Pre-Installation Electrical Checks | 34 |
| Assemble Tools and Components | 34 |
| Scope Protocols | 35 |
| Scope Fusebox Location | 35 |
| Scope and Test Power Supply to ibright® Unit / Autotap | 35 |
| Scope Ground (Earth) Point | 35 |
| Scope True Ignition, Cable Path | 35 |
| Scope J-Bus Plug Location | 36 |
| Scope ibright® Unit Location and Position | 36 |
| Scope External Antenna Locations | 39 |
| Scope MDT Location | 40 |
| Scope PLC Reader / PLC ID Positions and Wiring | 40 |
| Scope Dallas ID Tag / Reader Location | 41 |

Step 1

Pre-Installation Electrical Checks

A pre-installation electrical check is absolutely crucial to check and document the condition of the lights, indicators, accessories and any other electrical equipment already installed in each fleet asset.

International Telematics requires that all installation companies and installers perform pre- and post-installation electronic checks to ensure that the installation has not affected the working condition of the asset.

The pre-installation electrical checklist and steps are on the Installation and Work Repair Form (IWRF) (on page 16).

A summary of the checks are below.

- External Lights.
- Electronics and Ignition.
- Internal Lights.

Any additional accessories or electronic equipment should be photographed, tested and described in the Equipment Comments field of the Other Equipment section of the IWRF.

Step 2

Assemble Tools and Components

Assemble all required tools (see "Tools and Equipment" on page 17) and hardware components (on page 18).
Step 3

**Scope Protocols**

Find out what sort of asset is being installed, and whether it will require J-Bus (US and European manufacturers) or Linetap (Japanese manufacturers).

Step 4

**Scope Fusebox Location**

Find the location of the fusebox. This may be needed for the power supply.

Step 5

**Scope and Test Power Supply to ibright® Unit / Autotap**

The power supply to the ibright® unit and the Autotap is important. The ibright® X-Series requires a constant (not switched) power supply. This will either be 12v (US / European asset) or 24v (Japanese).

When using the J-Bus Y Cable (see "6/9 Pin J-Bus Y Cable" on page 22), tapping constant power and ground is not required - this is handled by the cable, so you need to source just the ignition tap. If you’re not using a J-Bus cable (for example, for cars and smaller trucks), source tap points for all three - power, ground and ignition.

Look for all tap points behind the steering column.

Test the power source with a multimeter to ensure that there is a consistent voltage of between 10 to 28 volts. If the positive voltage drops or exceeds this range, find an alternative power source within the asset. The power supply voltage should not drop more than 0.5 volts between the mounting point and the battery.

Step 6

**Scope Ground (Earth) Point**

A good, secure ground point is essential.

You may need a ring terminal, crimped and connected with a bolt directly to the body of the asset.

Step 7

**Scope True Ignition, Cable Path**

The ignition wire will need to be fused, and other connections from the ibright® X-Series will be soldered directly to it, so you must be absolutely certain of the location of the ignition wire.

Find and record the true ignition wire.

Also consult the customer on a cable path. The customer may have specific preferences on where the cables are to be laid.
Note: It’s important to distinguish between accessory (ACC) and ignition (IGN) wires. ibright® hardware should NOT be connected to the ACC cable as it is generally switched (controlled by the driver’s key).

The inline 5 amp fuse (see "Blade Fuse, 5 Amp Plugin ATQ" on page 19) and fuse holder (see "Blade Fuse Holder" on page 19) should be waterproofed.

Step 8

Scope J-Bus Plug Location

Locate the J-Bus Plug so that you can position the ibright® X-Series unit near it.

More information is available in the section above on Ports and Connections:

- 6-Pin J-Bus Connector (on page 30).
- 9-Pin J-Bus Connector (on page 31).

Step 9

Scope ibright® Unit Location and Position

It is absolutely crucial that the ibright® unit (and the bracket that holds it) be positioned properly so that the 3 axis accelerometer that the ibright® unit incorporates can function.

This is because each ibright® unit has a 3-axis accelerometer that measures G-forces. Its purpose is to measure sudden acceleration or braking, swerving and more. For example, the accelerometer will generate alerts if a driver has been in an accident.

To ensure that the accelerometer is properly calibrated, the ibright® unit must be installed only in the manner described below, and its placement must be documented on the IWRF form (see "Installation and Work Repair Form (IWRF)" on page 16).
Scope possible positions for the ibright® unit as described below, and document any vehicle panels that may need to be removed. A location as close as possible to the power supply and the J-Bus plug is recommended.

Overall Location Considerations

- The placement of ibright® unit, sensors or power cord should not hinder the driver or the passenger's movements. This especially relates to the ibright® unit not obstructing movement around the pedals, gear lever, handbrake, steering wheel, or the driver's seating position and view for driving.
- The ibright® unit must not be placed as to obstruct air-bag deployment, or any mechanical function of the asset it is being installed into.
Horizontal, Vertical and Lateral Position

The ibright® unit may be positioned either vertically, horizontally or lateral to the asset’s X or Y axis, but never at an angle.

Communication ports facing down to avoid any moisture descending into the unit if possible.

The length of the ibright™ X Series must be level and facing in one of the above directions.

The communication ports should face downwards for extra protection from moisture descending into the unit.
Incorrect Installations

Below are some examples of how NOT to install the ibright® X-Series unit.

Step 10

Scope External Antenna Locations

2 internal antennas for GPS and GPRS are built in to the ibright® X-Series unit, but external antennas for either GPS or GPRS may be required depending on network signal strength and operating environment (for example, whether the asset will mainly be operating in a built-up environment, or mainly on highways / freeways).

Scope the position of the antennas as below.

Note: Any antenna externally connected to the ibright® unit is defined as an external antenna. This includes external antennas installed both inside and outside the asset.

The external GPS antenna must always be installed in a position that will have sky view.

US Installations:

All installations, including pilots, should have external antennas. We recommend that the antennas be installed on top of the roof of the asset.
NZ Installations:

Use your judgement as to whether the external antenna should be located on the roof or inside the cab. Given below are some typical in-cab locations that have been found to be adequate.

Step 11

Scope MDT Location

Note: For customers who have opted to install an MDT (Mobile Data Terminal). If this step is not required, feel free to proceed to the next scoping step (see "Scope PLC Reader / PLC ID Positions and Wiring" on page 40), or go directly to Installation (on page 42).

The MDT (Mobile Data Terminal) unit must be installed securely, close enough to the driver to enable operation while travelling, but protected as well as possible from the sun.

The installer should discuss location of the MDT with the driver and installer. The MDT cannot block the drivers view, but if it includes built-in GPS, will require sky view.

Secure the bracket with bolts and screws, to insure that the MDT is securely mounted.

Step 12

Scope PLC Reader / PLC ID Positions and Wiring

Note: For customers who have opted to install PLC Trailer linking. If this step is not required, feel free to proceed to the next scoping step (see "Scope Dallas ID Tag / Reader Location" on page 41), or go directly to Installation (on page 42).

If the customer’s enterprise requires PLC trailer linking, you need to scope locations for the 2 units and the cable path.

PLC Reader

This is installed close to the ibright® unit, so there should be a reasonable amount of room for mounting and wiring.

PLC ID

This unit is installed on the trailer, and must be within close proximity to the PLC connector (see below). It should be protected from exposure to weather and dust.
PLC cable path
The diagram below shows a typical cable path for a Volvo vehicle.

Tip: When cab is tipped forward, be careful about heavy objects at the back of the cab falling forward as well.

The cable from the cab follows the main wiring loom, through the chassis grommet near the arrow, along (and inside) the chassis member until it emerges at the black connector.

Step 13
Scope Dallas ID Tag / Reader Location

Note: For customers who have opted to install an Dallas driver identification system. If this step is not required, feel free to go directly to Installation (on page 42).

This is installed closer to the driver than the ibright® unit.

As the engine will not start unless the properly coded tag for an authorized driver is placed on the reader, the Dallas reader should be within easy reach.

Most modern vehicle dashboards include blanks for accessory switches - we recommend using one of these.
# Installation

This section covers installation procedures. We assume that you have already worked through the pre-installation checks (on page 34).

Please keep General Installation Considerations (on page 14) in mind at all times.

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Things to Remember when Installing

Warning: Always connect cables before connecting POWER.

MDT / Autotap: connect the male DB9 connector to the Autotap and the female end to the MDT - use a gender bender connector.

DO NOT use the BLUE wire - this is reserved for Driver ID.

Check the J-Bus connector for CONSTANT POWER. The ibright® X-Series should get power even when the vehicle is OFF.

COMPLETE the IWRF (Installation and Work Repair Form).
Step 14

SIM Card Installation

Please keep General Installation Considerations (on page 14) in mind at all times.

Note: The following steps are required only if the ibright® X-Series is delivered without the SIM card installed. Generally we supply ibright® units with SIM cards, so this situation should be extremely rare.

SIM cards need to be inserted into the ibright® X-Series prior to installation. If a SIM card has not been installed and supplied separately please follow these instructions.

For your own convenience, remember to record the SIM number before installing the SIM card so that you won’t need to remove the ibright® unit to get it later.

Warning: To avoid electrostatic discharge when handling SIM cards, please wear a electrostatic discharge wrist strap. SIM cards must not be installed or removed when power is on. Check that all power to the unit is off before inserting or removing a SIM card.

1. Carefully turn the SIM holder cover clockwise.

2. Slide down the SIM holder and lift to open.

3. Slide the SIM card in with the metal contacts correctly positioned to make contact with the SIM holder contacts. The positioning cut on the edge of the SIM card will guide you.
4. Push down and slide in the direction of the arrow to close.

5. Replace cover and lock into place by turning anti-clockwise.
Step 15

External Antenna Installation

Warning: Do not connect or remove external antennas when the power is on.

This installation step assumes that you have scoped external antenna locations (see "Scope External Antenna Locations" on page 39).

Please keep General Installation Considerations (on page 14) in mind at all times.

- We recommend that the antennas be installed on top of the roof of the asset.
- By removing the plastic siding of 'A' pillar on the side of the windscreen and part of roof lining, the antennas may be installed within the roof lining.
- Each antenna must be a minimum of 10 cm away from the other.
- The ibright® antennas emit magnetic radio waves, similar to mobile phones. The technology complies with the international radio emission limits. To ensure the safety of the driver and passengers we recommend that the ibright® X-Series unit and the antennas are installed a minimum distance of 35 cm from any passenger.
**Ground (Earth) Wiring**

This step assumes that you have scoped and decided on an adequate ground/earth point (see "Scope Ground (Earth) Point" on page 35).

Please keep General Installation Considerations (on page 14) in mind at all times.

The ground (earth) wire is the **BLACK** wire.

- Always connect to a dedicated ground point on the asset. This is to avoid contact resistance from other electrical systems. Specifically avoid earth points that serve the engine management system (ECU), Air bags, ABS or other vital electrical systems.
- If you use a connector or junction to connect wires, please insert wires fully and don’t leave any exposed wires.
- If you combine wires, ensure the connectors can handle the combined voltage.
- Use toothed washers when bolting connectors to the asset if possible.

The diagram below shows a typical ground (earth) connection.

- Connect the ground wire before the power wire.
- Always connect to a dedicated chassis ground.
- The power loom with inline fuse (on page 19) should be connected as close to the chassis ground as possible.
- After connection, using a multimeter, test for continuity between the ground point and the main ground connection on the asset battery. The resistance should be less than 0.1ohms.
Step 17

J-Bus Connection

This step assumes that you have already scoped and tested points and locations for the J-Bus Y-cable (see "Scope J-Bus Plug Location" on page 36).

Note: Some vehicles do not have a J-Bus connector and will need to be wired manually - if this is the case, go straight on to ibright® X-Series Unit Wiring (on page 51).

Please keep General Installation Considerations (on page 14) in mind at all times.

- Connect J-Bus

1. Unlock the vehicle's existing J-Bus can.


3. Test that the can has constant power.

4. Secure the cable and the connector with zip ties.
Step 18

AutoTap Installation

This step assumes that you have already scoped and tested points and locations for the J-Bus Y-cable (see "Scope J-Bus Plug Location" on page 36) and space for an Autotap unit.

Note: Some vehicles do not have a J-Bus connector and will need to be wired manually - if this is the case, go straight on to ibright® X-Series Unit Wiring (on page 51).

Please keep General Installation Considerations (on page 14) in mind at all times.

- **Connect Autotap**

1. Connect the J-Bus Y-cable to the AutoTap unit, and the AutoTap unit to the ibright® unit’s 20-pin port as shown in the diagram below.

2. Test that the can and the AutoTap have constant power.

3. Secure the AutoTap unit and the cables with zip ties.

**Important Notes**

- Some assets have the voltage supply switched OFF and ON with the key. This is not suitable, and requires the power supply to be sourced elsewhere. For more information, see the J-Bus Plug Location Reference (on page 66).

- To identify which protocol is running on a J-Bus plug that is wired for both, measure the voltage between pins F and G with a multimeter. When the key is switched on, you should see a rapidly changing voltage if J1587 is active.

- When fitting a truck with an ibright® unit and an AutoTap for engine management purposes, the ibright® unit must be powered up or power cycled **AFTER** the AutoTap unit has been connected. If the AutoTap is unplugged from either the ibright® unit or the asset, the ibright® unit should be restarted. Failure to do so may result in no data being received.
Step 19

Power Wiring

This step assumes that you have already scoped and tested points and locations for power supply (see "Scope and Test Power Supply to ibright® Unit / Autotap" on page 35).

Please keep General Installation Considerations (on page 14) in mind at all times.

Note: Always refer to the Owner’s Manual before installing the ibright® hardware and thoroughly investigate any power supply related issues before installing the ibright® hardware.

The power wire is the RED wire.

It must be connected to a clean power source direct from the battery. This is also to assist monitoring the asset’s battery voltage.

- Ensure power and earth mounting surfaces are clean.
- The power must be fused to protect the ibright® unit from any power surges. ibright® hardware power cords are provided with a tamper-proof 3amp in-line fuse. This fuse box comes complete with the supplied power cord to save installation time.
- Power should be taken from the non-fused terminal in the fuse box if possible.
- Do not use any loom or wiring other than the supplied Power Loom with Inline Fuse (on page 19).
- The ground (earth) point must be close to the power source.
- Using a multi meter test all power supplies before connecting ibright® equipment.
- Check that the power wire can connect directly to a power bar or common terminal connection point if possible. The ibright® unit has an internal battery voltage meter, therefore a connection to a source that feeds directly from the battery is required.
- Don’t connect ibright® to other electrical devices. In many cases these points can exhibit voltage drops.
- Connect only to a continuous +12 to +24 volt DC battery supply. This should be taken from a secondary side of the main distribution fuse from the asset battery, and should not share a fuse supply from any other equipment. To avoid power operation issues, test that the power supply isn’t interrupted (see below).

Testing the power source voltage

Always use a multimeter to test the source of voltage to see if it offers consistent voltage within the +12 to +24 volt range. Should the positive voltage be outside this range, find an alternative power source within the asset. Power supply voltage should not drop more than 0.5 volts between the mounting point and the battery.
Step 20

ibright® X-Series Unit Wiring

Note: This step assumes that you have already scoped and finalized the ibright® unit location and position within the asset (see "Scope ibright® Unit Location and Position" on page 36). The location and positioning of the ibright® unit is crucial for its operation. Do not proceed with the installation unless this has been done exactly as described in the scoping topic above.

Please keep General Installation Considerations (on page 14) in mind at all times.

Take care when removing and re-fitting panels and trims. Some panels may have ‘click’ connections, others screws or bolts. Please use the appropriate tool to avoid any shredded threads etc. Keep all panels, screws, bolts etc in a safe place whilst working on the installation to avoid damage or loss of parts.

Warning: Ensure that power is OFF while soldering or connecting wires.

- **Installing the ibright® X-Series Unit**

1. Solder the connections securely.

2. Connect all devices to their respective ports (18 pin and/or 20 pin connector).
Step 21

Bracket Preparation

Note: This step assumes that you have already scoped and finalized the ibright® unit location and position within the asset (see "Scope ibright® Unit Location and Position" on page 36). The location and positioning of the ibright® unit is crucial for its operation. Do not proceed with the installation unless this has been done exactly as described in the scoping topic above.

Please keep General Installation Considerations (on page 14) in mind at all times.

Secure the bracket level to the body of the asset, and ensure that it is perfectly level, either vertically or horizontally.

It's sometimes useful to add a few drops of silicon glue to hold the bracket in place while drilling holes - this is particularly important if all four retaining screws cannot be installed for the bracket.

The diagram below shows the location of the mounting screws.

The bracket should be installed in a way that avoids the incorrect ibright® unit positions below.
Incorrect Installations

Below are some examples of how NOT to install the ibright® X-Series unit - the bracket and mounting needs to take these needs into account.

Note: Do not mount the ibright® unit on the bracket at this point. It is better to connect all cables, run status tests and satisfy yourself that the unit is working as expected before doing the final mounting of the unit on to the bracket, as you will not be able to see the indicators if the ibright® unit is mounted.
MDT Installation

Note: Applicable only to MDT installations. If this is not relevant, feel free to go forward to Making Connections, Port Protection (on page 56). Please keep General Installation Considerations (on page 14) in mind at all times.

You should have already discussed the placement and the location of the MDT with the customer, and scoped power and bracket placement in the asset cab (see "Scope MDT Location" on page 40).

Securely mount the MDT to its retaining bracket, and tap the red MDT power cable to the white ignition wire from the ignition line tap. Connect the MDT ground to any good ground.
Dallas ID

Note: Applicable only to Dallas ID Reader and Tag installations. If this is not relevant, feel free to go forward to Making Connections, Port Protection (on page 56). Please keep General Installation Considerations (on page 14) in mind at all times.

Assuming that you have scoped installation positions for the reader and the tag (see "Scope Dallas ID Tag / Reader Location" on page 41), connect the blue Dallas wire from the standard power loom to the Dallas Reader.

Connect ground from the Dallas Reader to the ibright® X-Series ground.

Next, you need to connect the warning buzzer. This will sound if the expected Dallas ID Tag is not placed on the reader.

Connect the buzzer ground to pin 8 of the 18 way connector, and the positive (red) wire to pin 1 of the 18 way connector (see "18 Way Loom" on page 23).
Step 24

Making Connections, Port Protection

Please keep General Installation Considerations (on page 14) in mind at all times.

You can now connect the cables to run status tests before doing the final mounting.

- **Port protection, connecting cables**

1. First, trim the rubber port protection grommet (on page 20) so that only the ports you require are exposed. This ensures that the ports you will not be using are protected from covers from dust and damp. Remember also that the unit should be installed in as dry, dust free an area as is possible.

![Diagram of port protection](image)

2. Connect the cables.

3. Power - to avoid any power surges into the unit, connect the power only after making all other connections. Press the power cord connector onto the 4 port connector as shown in the illustration:

![Diagram of power connection](image)

Confirm the power cord connector lever has ‘clicked’ firmly into place.

4. You’re now ready to test the unit functions before mounting the unit on the installed bracket.
Step 25

Status Indicators and Status Testing

The ibright® X-Series unit has a number of LEDs to indicate connectivity and power status conditions. Only the LEDs that relate to the components / peripheral devices connected to your ibright® unit will indicate.

Use the table below to test whether the ibright® X-Series is properly connected to the GPRS network, has acquired a GPS lock, and (if connected) is properly communicating with paired Bluetooth devices.

The chart below is a guide to the various conditions.

<table>
<thead>
<tr>
<th>LED:</th>
<th>LED Color</th>
<th>Steady</th>
<th>Single blink</th>
<th>Double fast blink every second</th>
<th>Single blink every 3 seconds</th>
<th>Off</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power</td>
<td>GREEN</td>
<td>Power On</td>
<td>Engine on, Bluetooth connected</td>
<td>Incorrect or missing config file</td>
<td>Standby mode</td>
<td>Off</td>
</tr>
<tr>
<td>GSM/GPRS Connection</td>
<td>RED</td>
<td>GPRS Locked</td>
<td>Acquiring GPRS,lock, or engine is off (no GPRS)</td>
<td>-</td>
<td>-</td>
<td>Off</td>
</tr>
<tr>
<td>GPS Connection</td>
<td>ORANGE</td>
<td>Locked to satellite</td>
<td>Acquiring GPS lock, or engine is off (no GPS)</td>
<td>-</td>
<td>-</td>
<td>Off</td>
</tr>
<tr>
<td>Bluetooth Connection</td>
<td>BLUE</td>
<td>Locked to Bluetooth Device</td>
<td>Pairing with Bluetooth device</td>
<td>-</td>
<td>-</td>
<td>Off</td>
</tr>
</tbody>
</table>

Note: If all the lights are on together and do not change, this is a malfunction and you will need to reset the unit. Disconnect the power cable for 2 minutes, and then reconnect - the ibright® unit will reboot.
Step 26

Final Unit Mounting

Note: This step assumes that you have already scoped and finalized the ibright® unit location and position within the asset (see "Scope ibright® Unit Location and Position" on page 36). The location and positioning of the ibright® unit is crucial for its operation. Do not proceed with the installation unless this has been done exactly as described in the scoping topic above.

Please keep General Installation Considerations (on page 14) in mind at all times.

The ibright® unit connects to its mounting bracket with a slide and click action. The click locks the unit in place.

We recommend also securing the unit to the bracket with a cable tie through the channel provided on the base of the bracket.
Post Installation

This section covers post-installation testing and verification procedures. We assume that you have already worked through the pre-installation checks (on page 34) and the installation (on page 42).

In This Section

Post-install Testing

Post-install Testing

After completing the installation, a post-installation electrical checklist must be completed on the Installation and Work Repair Form (IWRF) (on page 16) to ensure that the asset’s electrical system has not been adversely affected in any way.

A summary of the checks are below.

- Connections.
- Antennas.
- Voltage.
- External lights.
- Electronics and ignition.
- Internal lights.

Any additional accessories or electronic equipment should be photographed, tested and described in the Equipment Comments field of the Other Equipment section of the IWRF.

Isolator

Some assets have an isolator switch. As it is the convention to leave the asset in exactly the same condition as it was before the install, the switch may be need to be OFF after install - this depends on the customer. This also means that the installed ibright® unit will show in ibright® Enterprise and the management interfaces as inactive.

Make a note of the isolator switch on the IWRF form so that all installation personnel are aware of it.
MDT Test

Once the MDT and ibright® unit are powered up, and connected by the 20-way loom to the Com 5 port on the MDT, the lower left hand corner of the MDT should show two orange gears as in the image below.

This means that the ibright® unit and MDT are connected, and you can now send test messages and receive alerts (examples shown above).

If that corner of the screen shows an ibright® unit with a small red cross over it, however, this means that the unit and the MDT are not connected properly.

Check all connections and the power supply.
## Appendices

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Appendix 1

Troubleshooting

This alphabetically arranged troubleshooting section is intended to address frequently asked questions and recurring issues related to ibright® Solution installations, and will be updated frequently.

Asset appears offline in ibright® Enterprise

If an asset shows as offline in ibright® Enterprise (asset status indicator shows a grey dot) and you are certain that it is not, this may be due to a loss of the GPRS network connection or GPS fix.

First, check the following:

1. Check that the asset is not actually offline. If it is parked and the engine is off, it is offline and will be shown as such in ibright® Enterprise. If the engine is running, move the asset outdoors, or obtaining a GPS lock will not be possible.

2. Check the ibright® unit and ensure that all connections are secure, including GPS and GPRS antennas.

3. Check that the ibright® unit’s power LED light is on (green).

If the above checks are passed:

1. Reboot the ibright® unit by unplugging the power cable and then plugging it in again.

2. You should see the power light (green) come on, and stay steady.

3. After about 60 seconds, the GPRS light (red) and the GPS light (orange) should start flashing.

4. In approximately 5 minutes, all 3 lights (green, red and orange) should be on continuously. This means that the ibright® unit is connected to the network and its GPS locked.

Green (power) and red (GPRS) LEDs are on but orange (GPS) is flashing

This is because the ibright® unit has not been able to acquire a GPS lock. A GPS lock is possible only if the asset is outdoors.

1. Plug a spare GPS antenna into the ibright® unit.

2. Check the GPS wire and any connections between the GPS antenna and the ibright® unit. If there is damage, swap the GPS antenna for another.

3. Run the GPS antenna outside the asset to where it will be in clear line-of-sight of a satellite (open sky).

4. Wait for the GPS light (orange) light to remain steady.

5. If the connections are good, there is no damage to the wire, and there is still no GPS lock, it may be necessary to relocate the GPS antenna to a different position. Bad placement can also result in drift and inaccurate speed readings.

Note: The GPS antenna needs to have a direct and unobstructed view of the sky to achieve a satellite lock or report asset position accurately.

Green (power) LED is on and red (GPS) is flashing

This may be a symptom of a damaged or bad connection between the GPRS antenna and the ibright® unit.

1. First check for physical damage. If you don’t see any damage, connect a spare antenna GPRS antenna to the ibright® unit.

2. Position the antenna outside the asset to allow the clearest possible signal, and wait to see if the new antenna acquires the GPRS network (steady red light).

3. Swap the antennas, and ensure that GPRS remains connected (steady red).
**LEDs are all off on ibright® unit**

This is a power supply issue.

1. The power supply cable to the ibright® unit must be traced back to where it is tapped into the power supply.
2. Test it with a multimeter to ensure that it receives at least 12V of power. The red wire is the constant 12V. The white requires at least 6V, and needs to be tapped into the trucks true ignition. The black wire is the ground.
3. After checking the power supply, power up the AutoTap first, and then the ibright® unit. The green power light should be steady on the Autotap. If the green light blinks every 2 seconds on the ibright® unit, the ignition is on. If the green light blinks rapidly, please contact us (see "Contact Information" on page 8), as this means that there is a configuration issue with the unit.

**Odometer reading not present in ibright® Enterprise**

The reason for this is a faulty connection with the engine diagnostic system.

1. Power down the Autotap.
2. Power down the ibright® unit.
3. Check the wiring/plug into the J-BUS for damage, and make sure that the plug has not popped out.
4. Make sure that the pins are not disconnected from the junction plugs.
5. After checking all the above connections to satisfaction, power up the Autotap.
6. Power up the ibright® unit.

You should now see odometer readings coming through in ibright® Enterprise.
Appendix 2

Wire Loom Parts and Ordering Codes

A typical installation will not usually require these parts as they are supplied with the pre-wired looms. The table below is for the purpose of ordering individual parts to make up or repair looms as required. Use the appropriate code to order the parts.

- New Zealand supplier: Tyco Electronics.
- United States supplier: Digikey Inc.

### AMP Mini-Universal MATE-N-LOK

<table>
<thead>
<tr>
<th>Description</th>
<th>Units</th>
<th>Type</th>
<th>TYCO p/n</th>
<th>DIGIKEY p/n</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 Circuit Plug</td>
<td>1</td>
<td>White Natural</td>
<td>172167-1</td>
<td>A25571-ND</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>172338-1</td>
<td></td>
</tr>
<tr>
<td>Socket Contact, Gold, 22-18 AWG</td>
<td>4</td>
<td>Loose, Strip, 30µAu</td>
<td>1-770988-0</td>
<td>A32016-ND</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1-770904-0</td>
<td></td>
</tr>
<tr>
<td>Hand Crimping Tool</td>
<td>-</td>
<td></td>
<td>91522-1</td>
<td>A9916-ND</td>
</tr>
<tr>
<td>Contact Extraction Tool</td>
<td>-</td>
<td></td>
<td>189727-1</td>
<td>A25695-ND</td>
</tr>
</tbody>
</table>

### AMP Micro MATE-N-LOK

<table>
<thead>
<tr>
<th>Description</th>
<th>Units</th>
<th>Type</th>
<th>TYCO p/n</th>
<th>DIGIKEY p/n</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 Circuit Receptacle Housing</td>
<td>1</td>
<td>Black</td>
<td>2-794617-0</td>
<td>A30302-ND</td>
</tr>
<tr>
<td>18 Circuit Receptacle Housing</td>
<td>1</td>
<td>Black</td>
<td>1-794617-8</td>
<td>A30301-ND</td>
</tr>
<tr>
<td>Receptacle Contacts, Gold, 20-24 AWG</td>
<td>38</td>
<td>Loose, Strip, 15µAu</td>
<td>1-794610-1</td>
<td>A32523-ND</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1-794610-2</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1-794606-1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1-794606-2</td>
<td></td>
</tr>
<tr>
<td>Hand Crimping Tool</td>
<td>-</td>
<td></td>
<td>91501-1</td>
<td>A30498-ND</td>
</tr>
<tr>
<td>Contact Extraction Tool</td>
<td>-</td>
<td></td>
<td>843996-6</td>
<td></td>
</tr>
</tbody>
</table>
Appendix 3

Resources

A number of additional resources are available for installers.

- If you experience problems not covered in this guide, feel free to contact us (see "Contact Information" on page 8).
- If you have been set up with an installer login to Support Suite, you can use an online form (http://support.itelematic.com) to raise a ticket for installation issues.
- Additional Wiring Diagrams are available in Support Suite.
**J-Bus Plug Location Reference**

This topic shows the location of the J-Bus connector in a number of assets.

<table>
<thead>
<tr>
<th>Asset</th>
<th>Plug Location</th>
<th>Protocol</th>
<th>Wiring Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freightliner, Newer</td>
<td>Beside door and left seat</td>
<td>J1587</td>
<td>Yellow = Power and Ground</td>
</tr>
<tr>
<td>Models</td>
<td></td>
<td></td>
<td>Orange = J1587 -</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Green = J1587 +</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Wires are usually labelled</td>
</tr>
<tr>
<td>Freightliner, Older</td>
<td>Passenger side dashboard/fusebox</td>
<td>J1587</td>
<td>Yellow - all wires</td>
</tr>
<tr>
<td>Models</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sterling, 2000</td>
<td>Left hand side wall, behind door</td>
<td>J1587</td>
<td>Pink/Black = J1587 +</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Pink/Green = J1587 -</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Red/Black = Power</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Black/orange = GND</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Power to plug is switched, don’t use</td>
</tr>
<tr>
<td>Sterling, 2003</td>
<td>Above clutch pedal</td>
<td>J1587</td>
<td>Green = J1587 +</td>
</tr>
<tr>
<td>onwards</td>
<td></td>
<td></td>
<td>Orange = J1587 -</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Red/Black = Power</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Black/orange = GND</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Power to plug is switched, don’t use</td>
</tr>
<tr>
<td>International</td>
<td>Relay box on passenger side of dash</td>
<td>J1587</td>
<td>Red/Pink = J1587 +</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Blue = J1587 -</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Purple/Grey = Power</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>White = GND</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Power is switched, don’t use</td>
</tr>
<tr>
<td>Mack, pre-2007</td>
<td>Behind left hand seat</td>
<td>J1587</td>
<td>White = all wires, except:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Black = GND</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Has switched power as well, don’t use</td>
</tr>
<tr>
<td>Mack, late model</td>
<td>Relay box on passenger side</td>
<td>J1587</td>
<td>White = all wires, except:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Power is switched, don’t use</td>
</tr>
<tr>
<td>Mack Vision</td>
<td>Above brake pedal</td>
<td>J1939</td>
<td>White = all wires, except:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>There is another connector above the clutch pedal. Don’t use.</td>
</tr>
<tr>
<td>Volvo</td>
<td>Driver’s side, under dash</td>
<td>J1587</td>
<td>4-pin Plug</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>May be different in US models</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Grey = J1587 +</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Orange = J1587 -</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Black = Power</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>White = GND</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Power is switched, don’t use</td>
</tr>
</tbody>
</table>
Appendix 5

Wiring Overview Diagram
Glossary

G

Geofence

Geofences are ‘virtual areas’ defined within the ibright® Solution that serve as checkpoints for asset movements. By comparing the data from an asset before, during and after an asset passes through a Geofence, a comprehensive picture of an asset’s visit to a certain location or area can be obtained.

H

Hubo / Virtual Hubo

The popular abbreviation of the term hubodometer, a mechanical device that measures distance travelled in kilometers or miles (depending on the country of use). It is attached to the wheel of an asset, and is used mainly to estimate RUC charges.

International Telematics has developed proprietary ‘virtual hubo’ technology that estimates hubodometer readings from odometer data, and is a good reference check against the actual hubodometer reading.

I

ibright® D-Series Unit

This compact communications unit is sometimes required for specific asset installation situations, in addition to the ibright® X-Series unit (see below). The use of a D-series unit is extremely rare, and is not covered in this guide.

ibright® Enterprise Software

The user interface and software application in which you can work with the telematic information generated by assets using the ibright® Solution.

ibright® X-Series Unit

The compact telematic computing and communications unit that is the heart of the ibright® Solution. It is installed in every asset, and transmits OBD-II, SAE J1587 and SAE J1939 diagnostic data and GPS location information to the International Telematics Servers when the asset is active.

IFTA

International Fuel Tax Agreement. An agreement between the lower 48 states of the United States and the Canadian provinces to simplify the reporting of fuel use by freight carriers that operate in multiple jurisdictions.

J

J1587

SAE J1587 is a diagnostic data standard used on older assets (for example, older trucks and heavy vehicles).

J1939

SAE J1939 is a diagnostic data standard. Most modern assets (for example, trucks and heavy vehicles) use this standard.

J-Bus

The generic term for diagnostic bus connector plugs or sockets using any SAE J standard protocol (see J1587, J1939 below).

M

MDT

Mobile Data Terminal, a compact computer that may either be plugged into the ibright® unit to view and analyze stored telematic information, or installed in an asset to show that information or enable communications between an office base and an asset operator.

MECP

Mobile Electronic Certified Professional, a certification for mobile electronics installation technicians.

N

NZTA

New Zealand Transport Agency. In the context of land transport policy initiatives, directives and documents, NZTA is now synonymous with Land Transport New Zealand (LTNZ) and Land Transport Safety Authority (LTSA). It is responsible, among other things, for administering road infrastructure maintenance and revenue from road users like RUC (see below).
O

OBD, OBD-II

On-Board Diagnostics, a protocol developed by General Motors in the mid 1980s used in the capture of diagnostic information from assets. OBD-II is the latest version of the protocol, and is equivalent to SAE J1979. This standard is mainly used in cars.

P

PLC

Power Line Communication, the technology that allows data to be exchanged over power lines. In fleet asset management, PLC technology allows drivers to monitor the status of trailers. For the ibright® Solution a PLC Reader is linked to the ibright® unit, and communicates with a PLC ID unit in the trailer.

PTO

Power Take-Off, a mechanical link provided on tractor assets to allow farm equipment, for example, to be driven by the tractor.

R

Reefer

The popular term for a refrigerated unit.

RUC

Road User Charges, a New Zealand specific levy on heavy vehicles and specialized vehicles that are not taxed at the source, to allow them to operate on public roads. RUC is administered by NZTA (see above).

S

Smart Beaconing

An ibright® Solution technology that reports GPS position data only when an asset changes direction of travel, not at specified time intervals, ensuring that the data is meaningful and accurate.
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