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Contents

1. General Information ..................................... 5
   1.1 About this Manual .................................... 5
   1.2 Explanation of Symbols Used .......................... 5
   1.3 Effigis Website. .................................... 5

2. Product Description .................................... 6

3. System Components ................................. 8
   3.1 ARD4 Module ....................................... 8
   3.2 DRV4 Module (optional) ............................. 13
   3.3 ITX2 Unit (optional) ................................. 17
   3.4 DRV3 Lite Unit (optional) ........................... 19
   3.5 DRV3 Unit (optional). ............................... 21

4. Physical Installation ................................ 22
   4.1 ARD4 Module Installation ............................ 22
   4.2 DRV4 Installation .................................. 27
   4.3 DRV3 Lite Installation ............................... 28
   4.4 DRV3 Installation .................................. 28
   4.5 ITX2 Installation .................................. 29

5. System Operation .................................... 30
   5.1 ARD4 Operation ..................................... 30
   5.2 DRV4 Operation ..................................... 30
   5.3 ITX2 Operation ..................................... 31
   5.4 DRV3 Lite Operation ................................. 31
   5.5 DRV3 Operation ..................................... 31

6. System Maintenance .................................. 32
   6.1 Cleaning of the Equipment ......................... 32
   6.2 Preventive Maintenance ............................. 32

7. Quick Trouble-Shooting Guide ....................... 33

8. Specifications ....................................... 36
   8.1 ARD4 Specifications ................................ 36
   8.2 DRV4 Specifications ................................ 38
   8.3 DRV3 Lite Specifications ............................ 39
   8.4 DRV3 Specifications ................................ 40
   8.5 ITX2 Specifications ................................. 42
1. General Information

1.1 About this Manual

This manual describes the components, installation and operation of the CPAT FLEX ARD4, DRV3, DRV3 Lite, DRV4, and ITX2 units.

You will find important safety information in this manual. We strongly recommend that all users read this manual. Use of this product other than for its intended application may compromise the unit's safety features.

1.2 Explanation of Symbols Used

The following symbols are used in this Manual:

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>✔️</td>
<td>Direct current. (DC)</td>
</tr>
<tr>
<td>⚠️</td>
<td>Caution. Indicates that operations or procedures, if carried out without caution, may cause personal injury or damage to the unit.</td>
</tr>
<tr>
<td>📝</td>
<td>Note. Indicates additional information about the product.</td>
</tr>
</tbody>
</table>

1.3 Effigis Web Site

2. Product Description

The CPAT FLEX is a modular monitoring platform that detects, records and dispatches signal leakage and ingress events in coaxial networks. The system is installed in a service vehicle and operates automatically. The CPAT platform provides web access to third party web-enabled devices or through cellular communication to upload data to a centralized CPAT web server site.

ARD4:
The ARD4 (Autonomous Recording Device) is the control module for the platform. It is installed in a service vehicle and is powered from the vehicle's electrical system. The ARD4 begins monitoring as soon as it is powered up and uploads data in real time back to the CPAT Web, or stores the data in memory. The ARD4 can be equipped with WiFi, CDMA, GPRS and HSDPA communication modules. The ARD4 accepts other CPAT FLEX add-on modules for increased monitoring capability.

ITX2: (optional)
The ITX2 (Ingress transmitter module) is a portable radio transmitter that continuously transmits a low-power test carrier signal in the cable upstream band (5-42 Mhz) to detect ingress faults. It can be used as a portable find-and-fix tool, or can be plugged into the ARD4 CPAT FLEX module to automatically locate ingress impairments while driving in the operator's territory as part of the technician's daily work routine.

DRV4: (optional)
The DRV4 is an optional module that can connect to the ARD4. The DRV1 is a dual-band leakage detection receiver that works with the ARD4 to automatically detect, measure and position leakage events. It operates from 118 to 140 MHz (Mid band tuner) and from 572 to 860 MHz (LTE band tuner).

DRV3 Lite: (optional)
The DRV3Lite is an optional module, is a portable signal leakage detection meter designed to operate in all-digital cable networks. It functions as a mid-band portable find-and-fix meter and as a monitoring probe when part of the CPAT FLEX system. It is frequency agile from 118 to 140 MHz.

DRV3: (optional)
The DRV3 is an optional module, is a portable signal leakage detection meter designed to operate in all-digital cable networks. It functions as a portable dual-band find-and-fix meter and as a monitoring probe when part of the CPAT FLEX system. It is frequency agile from 118 to 140 MHz (Mid band tuner) and from 572 to 960 MHz (LTE band tuner). The DRV3 can easily be set up via its intuitive user interface.
3. System Components

3.1 ARD4 Module

3.1.1 ARD4 Front View

ARD4 HSPA: P/N 150-00018-001
ARD4 WIFI: P/N 150-00020-001

3.1.2 ARD4 Rear View

3.1.2 DIN Rail Mounting Kit

Support rail

Rail Stoppers

P/N 006-00015-001

P/N 006-00014-100
3.1.3 Power Cable
P/N 036-00017-001

3.1.4 WiFi Antenna
P/N 111-00002-001

3.1.5 GPS Antenna
P/N 111-00016-001

Rail Screws
P/N 006-00011-001
3.1.6 HSPA Antenna  P/N 111-00017-001

3.1.7 GPRS Antenna  P/N 111-00001-001

3.2 DRV4 Module (optional)

3.2.1 DRV4 Front View  P/N 150-00035-100

3.2.2 Interface Cable (4 pins connectors)  P/N 036-00029-001
3.2.3 MID-BAND Monopole Antenna

- Base BNC + Whip: P/N 112-00004-100
- Base BNC: P/N 111-00010-001
- Whip: P/N 111-00028-001

3.2.4 LTE Monopole Antenna

- Base SMA + Whip: P/N 112-00009-100
- Base SMA: P/N 111-00029-001
- Whip: P/N 111-00028-001

3.2.5 Interconnection Screws

P/N 006-00010-001
3.2.6 6.78 MHz Antenna

Base: P/N 111-00005-001
Whip: P/N 111-00006-001
Adapter: P/N 039-00026-001

3.3 ITX2 Unit (optional)

3.3.1 ITX2 Front View P/N 150-00026-100
3.3.2 ITX2 Antenna, coax cable and adapter UHF (female-female)

- Coax cable 48 in. UHF to BNC male RG58: P/N 037-00011-001
- Portable antenna 6.5 in. with BNC @ 27.12 MHz: P/N 111-00037-001
- Adapter UHF Female to UHF Female: P/N 039-00027-001

3.4 DRV3 Lite Unit (optional)

3.4.1 DRV3 Lite Front View P/N 150-00033-200
3.4.2 DRV3 Lite USB Cable  
P/N 036-00020-001

3.5 DRV3 Unit (optional)

3.5.1 DRV3 Front View  
P/N 150-00031-752

Mid band antenna 118-140 MHz (BNC connector): P/N 111-00022-001
Portable antenna 572-860 MHz (SMA connector): P/N 111-00035-001
110-220 VAC to 12 VDC adaptor: P/N 110-00005-001
+12 VDC power supply and battery pack: P/N 100-00010-001
ARD4/DRV3 USB interconnect ion cable: P/N 036-00020-001
DRV3 - Uni-flex mount and docking station: P/N 012-00020-001
4. Physical Installation

See «Modules Physical Installation» sheet for an overview of units assembly, on page 48

4.1 ARD4 Module Installation

The ARD4 box must be installed inside the vehicle, in a place not directly exposed to the sun. The support rail must be installed using the rail screws and should be installed in a horizontal position. The ARD4 will slide into the support rail and a rail stopper will be used on each side of the unit to keep it securely in place.

The GPS and wireless antennas location may affect the signal’s integrity and should be installed on the roof of the vehicle clear of any objects.

System connectors are located on both sides of the ARD4 unit. The position of each connector, LED and slot are clearly indicated. Here is a more detailed description of their usage:

// Front panel (From left to right)

1. DRK (Dead Reckoning)
2. CON (Reserved Port)
3. OBD (On-Board Diagnostic)
4. Status LEDs (Power, GPS, Diagnostics, Communication)
5. 2 USB Host ports (USB type A)
6. Ethernet (RJ45 connector)
4.1.1 Electrical Installation

The ARD4 uses two connections to the power, a fused connection to the car battery (12 VDC) and a connection to the accessory circuit (switched 12VDC). This dual power connection allows the ARD4 to complete its operations when the vehicle is shut down. After all recording and data transfer are completed, the ARD4 shuts itself off. When the switch is closed, the green LED flashes to indicate that the ARD4 is in the closing process.

**CAUTION!**

We recommend that the power cable be installed by qualified personnel.

---

**Power Connections**

- **Black (Ground)**
  - To vehicle ground (metal body).
- **Red (Unswitched 12 VDC)**
  - To 12 VDC electric terminal not controlled by ignition switch.
- **Green (Switched 12 VDC)**
  - To 12 VDC electric terminal controlled by ignition switch.

Do not use an intermittent accessory power like heating system.

---

**CAUTION!**

- The ARD4 must be installed on a 12V electric terminal with an inline fuse installed (5 Amp).

**CAUTION!**

- Do not disconnect or modify vehicle security systems as airbags or seatbelts. Security systems wires use only yellow sleeves and yellow connectors. Accidental triggering of these systems may cause severe injuries.
CAUTION!

- Never install this product in places where, or in a manner that it could injure the driver or passengers if the vehicle stops suddenly.
- Never install this product in places where, or in a manner that it may interfere with the driver’s operation of the vehicle, such as on the floor in front of the driver’s seat, or close to the steering wheel or shift lever.
- Make sure there is nothing behind the dashboard or paneling when drilling holes in them. Be careful not to damage fuel lines, brake lines, electronic components, communication wires or power cables.
- When using screws, do not allow them to come into contact with any electrical lead. Vibration may damage wires or insulation, leading to a short circuit or other damage to the vehicle.
- To ensure proper installation, use the supplied parts in the manner specified. If any parts other than the supplied ones are used, they may damage internal parts of this product or they may work loose and the product may become detached.
- It is extremely dangerous to allow the cables to become wound around the steering column or shift lever. Be sure to install this product, its cables, and wiring away in such a way that they will not obstruct or hinder driving.
- Make sure that leads cannot get caught in a door or the sliding mechanism of a seat, resulting in a short circuit.
- Please confirm the proper function of your vehicle’s other equipment following installation of the navigation system.
- Do not install this system where it may (i) obstruct the driver’s vision, (ii) impair the performance of any of the vehicle’s operating systems or safety features, including airbags, hazard lamp buttons or (iii) impair the driver’s ability to safely operate the vehicle.
- Never install the system in front of or next to the place in the dash, door, or pillar from which one of your vehicle’s airbags would deploy. Please refer to your vehicle’s owner’s manual for reference to the deployment area of the frontal airbags.
- Do not install the system in a place where it will impair the performance of any of the vehicle’s operating systems, including airbags and headrests.

4.1.2 Antennas Installation
The ARD4 comes with two modules, a wireless one chosen by the customer (WIFI or cellular) and a GPS one. Both the GPS and WIFI (or Cell) antennas must be connected to the ARD4 in order to maximize sky visibility and data transfer.

4.1.3 Dead Reckoning Installation
The DRK cable is used only with the dead reckoning option.
Green (Speed Signal)
To vehicle speed detection circuit lead coming out of the injection computer.
Brown (Reverse Signal)
To vehicle backup light lead.

4.1.4 On-Board Diagnostic Installation (optional module)
Not available yet.

4.2 DRV4 Installation
The DRV4 slides into the ARD4 and a screw is used on both sides to hold the two units in place.
The wire coming with the DRV4 connects to the DRV connector on the ARD4. (Showed are the way to slide a DRV4 into an ARD4 and the two units screwed together)

NOTE
The DRV4 unit can also be tied to the ARD4 unit by joining them side-to-side. The monopole antennas must be connected to the BNC/SMA connectors of the DRV4.
4.3 DRV3 Lite Installation

When used with an ARD4, the DRV3 Lite will connect to it using the USB connector. In this mode the user will view RF level of the fault found on the DRV3 Lite screen.

See user guide manual (Leakage Detector Operation Manual) for more information regarding the DRV3 Lite standalone installation.

4.4 DRV3 Installation

The DRV3 can be connect to ARD4 through a docking station providing power and data connections. In this mode the user will view RF levels of the faults founds in frequency agile from 118 to 140 MHz (Mid band tuner) and 572 to 960 MHz (LTE band tuner) on the DRV3 screen.

See user guide manual (Leakage Detector Operation Manual) for more information regarding the DRV3 standalone installation.

NOTE

- As soon as the DRV3 Lite is plugged and the ARD4 PWR LED indicator is green, the ARD4 will take full possession of the DRV3 Lite’s functionalities and DRV3 Lite menu should not be accessed.
- You can plug the DRV3 Lite to the ARD4 even if it is powered OFF.

4.5 ITX2 Installation

The ARD4 and the ITX2 will connect using a USB connector. When connected to the ARD4 via the USB cable, the ITX2’s buttons are automatically disabled, except for the Power button. In this mode the user will view RF level transmitted in the screen. The ITX2 module must be used in conjunction with the IRX1 ingress monitoring system installed in the headend.
5. System Operation

5.1 ARD4 Operation

5.1.1 Startup
When the vehicle starts, the ARD4 turns on automatically. The ARD4 PWR LED stays red until the system has completely finished its boot process. When the boot process has ended the PWR LED becomes green.

5.1.2 GPS
The ARD4 GPS LED stays OFF during the boot process. The LED is red when there is no valid information coming from the GPS (bad GPS antenna connection) and green when there is valid data.

5.1.3 Communication
The ARD4 tries to access the wireless network at startup in order to get its new configuration files, and upload remaining data files that have not yet been transferred. When this is done, it enters in transfer mode and simply tries to upload data files at configurable time interval. During each file transfer the COM LED becomes green. If any error occurs during a transfer this indicator becomes red for 1 second.

5.1.4 Shutdown
When the user turns off the vehicle, the ARD4 enters automatically into shutdown mode (Power LED flashing). It then tries to upload all remaining data files for 5 minutes and then shuts itself off. If the car is turned back ON, during this time the system stays ON and reopens a new data file.

5.1.5 Missing device
If there is a missing device (DRV or ITX), DIAG LED flashes red.

5.2 DRV4 Operation

5.2.1 Startup
When ARD4 starts, DRV4 turns on automatically. The DRV4 PWR LED flashes green when it is ready.

5.2.2 Communication
When DRV4 receives commands from ARD4, DRV4 COMM LED flashes green.

5.2.3 Leakage Detection
For any valid leakage detections the ARD4 DIAG LED and DRV4 MID/LTE (according to leak band) LED becomes green until the leakage become undetected.

5.3 ITX2 Operation

5.3.1 Booting
When the ITX2 is booting, the LCD display shows a splash screen with the Effigis logo for about 3 seconds. Then, the main interface appears, summarizing the unit’s operating parameters.

5.3.2 Normal Operation
The ITX2 is automatically turned On/Off by the ARD4 when they are linked via the USB cable and buttons are disabled, except for the Power button.

5.4 DRV3 Lite Operation

5.4.1 Antenna Selection
Since the ARD4 does not know which antenna is connected to the DRV3 Lite, you must configure this option in the DRV3 Lite’s menu while it is disconnected from the ARD4. See DRV3 Lite operating manual for antenna configuration.

5.4.2 USB Hotplug
All DRV3 Lite functional parameters are automatically applied by the ARD4 (operating frequency and operating mode) once plugged to it. ARD4 forces DRV3 Lite in Mid-band only.

5.5 DRV3 Operation

5.5.1 Reading the measurement
The DRV3 starts up in measurement mode by default, and immediately detects and displays levels for the last frequency selected. Unless the DRV3 has been set up for single band detection, it simultaneously monitors the selected frequencies in the Mid band and the LTE band.

5.5.2 USB Hotplug
All DRV3 functional parameters are automatically applied by the ARD4 (operating frequency and operating mode) once plugged to it.
6. System Maintenance

6.1 Cleaning of the Equipment
Your CPAT FLEX unit can be wiped clean with a damp cloth. Do not immerse the unit in water. Avoid solvents and commercial cleaners.

6.2 Preventative Maintenance
The technician shall do periodic visual inspections on the RF connections and antennas to make sure that there is nothing loose and that there is no rust. Both can affect the performance of the system. Periodic inspection on the power cable shall be done to ensure that the insulation is intact.

In case that a replacement is required, please contact Effigis for more information.

7. Quick Trouble-Shooting Guide

<table>
<thead>
<tr>
<th>PROBLEM OR CONDITION</th>
<th>PROBABLE CAUSES</th>
<th>CORRECTIVE ACTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>No leakage events detected</td>
<td>Connection problem to vehicle mounted whip antenna</td>
<td>✗ Verify for continuity between the center pin of the antenna connector and the whip antenna.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>✗ Check for humidity between the whip and the base of the antenna.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>✗ Verify for continuity between the center pin of the antenna connector and center pin on the whip base.</td>
</tr>
<tr>
<td>Is DRV2 (3) connected to ARD4?</td>
<td>Check connection of USB cable between ARD4 and DRV2 (3).</td>
<td>✗ Check connection of USB cable between ARD4 and DRV2 (3).</td>
</tr>
<tr>
<td>In-vehicle antenna</td>
<td>Check to ensure the monopole antenna is connected to the DRV2 (3) while inside the truck.</td>
<td>✗ Ensure the monopole setting is selected on the DRV2 menu while inside the vehicle.</td>
</tr>
<tr>
<td>Detection frequency problem</td>
<td>Verify frequency at the head end is not more than 4 kHz offset from the DRV2 (3)'s detection frequency.</td>
<td>✗ Check connection of USB cable between ARD4 and DRV2 (3).</td>
</tr>
<tr>
<td></td>
<td>Verify your location and validate frequency area information is correct (frequency, mode, calibration factor).</td>
<td>✗ Install a test point and confirm DRV2 (3) detects correctly the simulated leak in mobile mode and then confirm the leak is still detected when DRV2 (3) is connected through vehicle antenna.</td>
</tr>
<tr>
<td>System noise</td>
<td>Verify noise level at detection frequency to note presence of high noise levels.</td>
<td>✗ Verify frequency at the head end is not more than 4 kHz offset from the DRV2 (3)'s detection frequency.</td>
</tr>
<tr>
<td></td>
<td>For DRV3, it is possible to check interference with the spectrum view (available through its menu).</td>
<td>✗ Verify your location and validate frequency area information is correct (frequency, mode, calibration factor).</td>
</tr>
<tr>
<td>Analog video carrier</td>
<td>Sync level may be too low when video tag used.</td>
<td>✗ Install a test point and confirm DRV2 (3) detects correctly the simulated leak in mobile mode and then confirm the leak is still detected when DRV2 (3) is connected through vehicle antenna.</td>
</tr>
<tr>
<td></td>
<td>Should be between -12 to -23 dBC, ideally -18 dBC. The use of a color bar generator with 87% modulation is ideal.</td>
<td>✗ Install a test point and confirm DRV2 (3) detects correctly the simulated leak in mobile mode and then confirm the leak is still detected when DRV2 (3) is connected through vehicle antenna.</td>
</tr>
<tr>
<td>PROBLEM OR CONDITION</td>
<td>PROBABLE CAUSES</td>
<td>CORRECTIVE ACTIONS</td>
</tr>
<tr>
<td>----------------------------</td>
<td>--------------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| Unable to upload to CPAT Web | No cellular communications                                                      | ▪ Verify if COM LED comes on (A retry is initiated to communicate every 5 minutes if there is sufficient cellular coverage).  
▪ Check if there is a proper connection with the cellular (3 inch) antenna.  
▪ Validate SIM card account is active with cellular service provider.  
▪ Confirm with CPAT Support APN information in ARD4 configurations.  
▪ Verify if COM LED comes on (A retry is initiated to communicate every 5 minutes if there is sufficient WiFi range).  
▪ Check if there is proper connection with WiFi (3 inch) antenna.  
▪ Check if wireless router has a valid IP address.  
▪ Check if cable modem/router are connected and working properly.  
▪ Test Wi-Fi communication with another devices (laptop, mobile, etc.).  
▪ Do a restart of the modem and router.  
▪ Check power connector.  
▪ Check voltage presence:  
  ▪ RED wire: 12VDC vehicle battery.  
  ▪ GREEN wire: Switched (ignition) 12 VDC.  
  ▪ BLACK wire: Ground.  
▪ Check Power connector.  
▪ Check Voltage presence:  
  ▪ RED wire: 12 VDC vehicle battery.  
  ▪ WHITE wire: Switched (ignition) 12 VDC.  
  ▪ BLACK wire: Ground.  

| No Wi-Fi communication      | ▪ Verify if COM LED comes on (A retry is initiated to communicate every 5 minutes if there is sufficient WiFi range).  
▪ Check if there is proper connection with WiFi (3 inch) antenna.  
▪ Check if wireless router has a valid IP address.  
▪ Check if cable modem/router are connected and working properly.  
▪ Test Wi-Fi communication with another devices (laptop, mobile, etc.).  
▪ Do a restart of the modem and router.  
▪ Check power connector.  
▪ Check voltage presence:  
  ▪ RED wire: 12VDC vehicle battery.  
  ▪ GREEN wire: Switched (ignition) 12 VDC.  
  ▪ BLACK wire: Ground.  
▪ Check Power connector.  
▪ Check Voltage presence:  
  ▪ RED wire: 12 VDC vehicle battery.  
  ▪ WHITE wire: Switched (ignition) 12 VDC.  
  ▪ BLACK wire: Ground.  

| GPS                        | No Path Displayed on CPAT Website                                                | ▪ Check GPS antenna connection is good (use GPS LED).  
▪ Is the GPS light blinking green or red?  
▪ Check power connector.  
▪ Check voltage presence:  
  ▪ RED wire: 12VDC vehicle battery.  
  ▪ GREEN wire: Switched (ignition) 12 VDC.  
  ▪ BLACK wire: Ground.  
▪ Check Power connector.  
▪ Check Voltage presence:  
  ▪ RED wire: 12 VDC vehicle battery.  
  ▪ WHITE wire: Switched (ignition) 12 VDC.  
  ▪ BLACK wire: Ground.  

| Power                      | ARD4 Unit off                                                                  | ▪ Check power connector.  
▪ Check voltage presence:  
  ▪ RED wire: 12VDC vehicle battery.  
  ▪ GREEN wire: Switched (ignition) 12 VDC.  
  ▪ BLACK wire: Ground.  
▪ Check Power connector.  
▪ Check Voltage presence:  
  ▪ RED wire: 12 VDC vehicle battery.  
  ▪ WHITE wire: Switched (ignition) 12 VDC.  
  ▪ BLACK wire: Ground.  

| AFDD Unit off              | ▪ Check Power connector.  
▪ Check Voltage presence:  
  ▪ RED wire: 12 VDC vehicle battery.  
  ▪ WHITE wire: Switched (ignition) 12 VDC.  
  ▪ BLACK wire: Ground.  

### ARD4 LED STATUS

<table>
<thead>
<tr>
<th>LED</th>
<th>Indication</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>POWER LED</td>
<td><img src="image" alt="Start-up and error" /> <img src="image" alt="Normal operation" /> <img src="image" alt="Flashing green indicates shutdown in progress" /></td>
<td><img src="image" alt="Start-up and error" /> <img src="image" alt="Normal operation" /> <img src="image" alt="Flashing green indicates shutdown in progress" /></td>
</tr>
<tr>
<td>GPS LED</td>
<td><img src="image" alt="Bad or weak GPS signal" /> <img src="image" alt="Valid GPS signal detected" /></td>
<td><img src="image" alt="Bad or weak GPS signal" /> <img src="image" alt="Valid GPS signal detected" /></td>
</tr>
<tr>
<td>COM LED</td>
<td><img src="image" alt="Flashing red indicates transfer error" /> <img src="image" alt="Normal data transfer" /></td>
<td><img src="image" alt="Flashing red indicates transfer error" /> <img src="image" alt="Normal data transfer" /></td>
</tr>
<tr>
<td>DIAG LED</td>
<td><img src="image" alt="Flashes during leakage detection" /> <img src="image" alt="Non detection of DRV2/3/ITX2" /></td>
<td><img src="image" alt="Flashes during leakage detection" /> <img src="image" alt="Non detection of DRV2/3/ITX2" /></td>
</tr>
</tbody>
</table>

### AFDD LED STATUS (Discontinued Product)

<table>
<thead>
<tr>
<th>LED</th>
<th>Indication</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amber</td>
<td><img src="image" alt="On approximately 10 sec at startup" /> <img src="image" alt="Blinking during modem communication" /></td>
<td><img src="image" alt="On approximately 10 sec at startup" /> <img src="image" alt="Blinking during modem communication" /></td>
</tr>
</tbody>
</table>
| Red          | Continuous blinking no GPS signal or GPS antenna failure  
▪ Slow blink 3X at shutdown sequence  
▪ Continuous sequence of 2 blinks indicates radio failure | Continuous blinking no GPS signal or GPS antenna failure  
▪ Slow blink 3X at shutdown sequence  
▪ Continuous sequence of 2 blinks indicates radio failure |
| Green        | ![On for normal operation](image) ![Blink 2X indicates leakage detected or file transmission complete](image) ![Blink 3X for file reception completed](image) | ![On for normal operation](image) ![Blink 2X indicates leakage detected or file transmission complete](image) ![Blink 3X for file reception completed](image) |
| Red          | Continuous blinks between red and green during firmware update. | Continuous blinks between red and green during firmware update. |
| Green        | ![Continuous blinks between red and green during firmware update.](image) | ![Continuous blinks between red and green during firmware update.](image) |
8. Specifications

8.1 ARD4 Specifications

<table>
<thead>
<tr>
<th>SYSTEM</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating system</td>
<td>Linux</td>
</tr>
<tr>
<td>Data storage</td>
<td>Up to 1000 hours of data ≥ 25 weeks @ 40 hours</td>
</tr>
<tr>
<td>Power</td>
<td>12 VDC, 200 mA</td>
</tr>
<tr>
<td>Wireless link</td>
<td>WiFi or cellular (HSDPA)</td>
</tr>
<tr>
<td>GPS module</td>
<td>Accuracy 2.5 m (cold start 30 s)</td>
</tr>
<tr>
<td>Communication port</td>
<td>2 USB serial ports (host)</td>
</tr>
<tr>
<td>Network connector</td>
<td>Proprietary use</td>
</tr>
<tr>
<td>Proprietary connectors</td>
<td>1 connector for each of the following: ITX2, DRV4, expansion ports</td>
</tr>
<tr>
<td></td>
<td>1 connector for each of the following: GPS and wireless communication module antennas</td>
</tr>
<tr>
<td>GPS sattus LED</td>
<td>'Blanked' during GPS initialization, 'red' when invalid GPS position and 'green' when valid GPS position</td>
</tr>
<tr>
<td>Wireless communication LED</td>
<td>'Green' when uploading/downloading to a wireless infrastructure, blinks 'red' if error during transmission and 'off' when module is idle</td>
</tr>
<tr>
<td>Power LED</td>
<td>'Red' when booting, 'green' when on, 'red' on error and 'off' when power off, flashing 'green' when shutting down</td>
</tr>
<tr>
<td>Diag LED</td>
<td>Flashing 'green' when leakage is detected, 'red' if missing device</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PHYSICAL</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions [H x W x D]</td>
<td>3.3 cm x 11.2 cm x 22.3 cm / 1.3” x 4.4” x 8.8”</td>
</tr>
<tr>
<td>Weight</td>
<td>652 g / 23 ounces</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>-20˚ to +60˚ C / -4˚ to +140˚ F</td>
</tr>
</tbody>
</table>

* Specifications subject to change without prior notice.
### 8.2 DRV4 Specifications

<table>
<thead>
<tr>
<th>ELECTRICAL</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Detector type</td>
<td>Dual-band digital receiver / demodulator</td>
</tr>
</tbody>
</table>
| Frequency range | Agile 118 to 140 MHz (mid-band)  
Agile 600 to 860 MHz (LTE-band) |
| Tuning resolution | 100 Hz |
| Level range | 2 to 4,000 μV/m @ 3 meters (mid-band)  
5 to 4,000 μV/m @ 3 meters (LTE-band) |
| Level accuracy | ±1.5 dB mid-band  
±2.5 dB LTE-band |
| System tag | AM [10 to 110 Hz]  
DSB-SC modulation 3,500 to 7,000 Hz  
Video NTSC (mid-band only) |
| Measurement units | μV/m and dBμV/m |
| Power | Via the ARD4 port (+ 5 VDC 0.8 A) |
| Communication port | ARD4 port (proprietary) and USB serial port |
| Storage temperature | -20°C to +40°C / -4°F to +104°F |
| Operating temperature | 0°C to +60°C / -32°F to +140°F |
| Maximum relative humidity | 80% for temperatures up to 31°C (88°F) decreasing linearly to 50%  
relative humidity at 40°C (104°F) |

### 8.3 DRV3 Lite Specifications

<table>
<thead>
<tr>
<th>ELECTRICAL</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Detector type</td>
<td>Dual-band digital receiver/demodulator</td>
</tr>
<tr>
<td>Channel tuning</td>
<td>Configurable via USB port and/or Bluetooth</td>
</tr>
</tbody>
</table>
| Frequency range | Agile from 118 to 140 MHz (mid-band)  
Agile from 600 to 860 MHz (LTE-band) |
| Frequency range | Agile from 118 to 140 MHz (mid-band)  
Agile from 600 to 860 MHz (LTE-band) |
| Tuning resolution | 100 Hz |
| Level range | 2 to 4,000 μV/m @ 3 meters (mid-band)  
5 to 4,000 μV/m @ 3 meters (LTE-band) |
| Measurement units | μV/m and dBμV/m |
| Level accuracy | ±1.5 dB (mid-band) ±2.5 dB (LTE-band) |
| System tag | AM modulation 20-110 Hz  
DSB-SC modulation 3480-7000 Hz  
Video NTSC (mid-band only) |
| Adjust Audible Tone | Yes, varies with leak intensity. Can be muted |
| Communication port | USB serial port and Bluetooth |
| RF level scale display | Single scale from 0 to 4,000 μV/m |
| Operation time | 6 hrs. continuous on battery power |
| Operating temperature* | -20°C to +40°C (-4°F to +104°F) |
| Charging temperature* | 0°C to 45°C (32°F to 110°C) |
| Battery Charge Time | 2.25 hrs. for full charge |
| Storage temperature | -20°C to +45°C (-4°F to +113°F) |
| Maximum relative humidity | 80% for temperatures up to 31°C (88°F) decreasing linearly to 50%  
relative humidity at 40°C (104°F) |

* Specifications subject to change without prior notice.
### 8.4 DRV3 Specifications

<table>
<thead>
<tr>
<th><strong>ELECTRICAL</strong></th>
<th><strong>Details</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Detector type</td>
<td>Dual-band digital receiver/demodulator</td>
</tr>
<tr>
<td>Frequency range</td>
<td>Agile from 118 to 140 MHz (mid-band)</td>
</tr>
<tr>
<td></td>
<td>Agile from 572 to 960 MHz (LTE-band)</td>
</tr>
<tr>
<td>Chanel tuning</td>
<td>Configurable via USB port and by front panel buttons</td>
</tr>
<tr>
<td>Tuning resolution</td>
<td>100 Hz</td>
</tr>
<tr>
<td>Level range</td>
<td>2 to 4,000 µV/m @ 3 meters (mid-band), 5 µV/m to 4,000 µV/m @ 3 meters (LTE-band)</td>
</tr>
<tr>
<td>Level accuracy</td>
<td>± 1.5 dB mid-band</td>
</tr>
<tr>
<td></td>
<td>± 2.5 dB LTE-band</td>
</tr>
<tr>
<td>System tag</td>
<td>AM modulation 10-110 Hz</td>
</tr>
<tr>
<td></td>
<td>DSB-SC modulation 3,500-7,000 Hz</td>
</tr>
<tr>
<td></td>
<td>Video NTSC (mid-band only)</td>
</tr>
<tr>
<td>Audible tone</td>
<td>Yes, varies with leak intensity</td>
</tr>
<tr>
<td>Adjustable audio volume</td>
<td>Yes, variable</td>
</tr>
<tr>
<td>RF level scale display</td>
<td>Single scale from 0 to 4,000 µV/m</td>
</tr>
<tr>
<td>Measurements units</td>
<td>µV/m and dBuV/m</td>
</tr>
<tr>
<td>Power</td>
<td>Pack of 2 rechargeable Li-ion cells, 3,100 mAh</td>
</tr>
<tr>
<td>Operating time</td>
<td>2.5 hours nominal (both tuners activated) or 4.0 hours nominal (one tuner activated)</td>
</tr>
<tr>
<td>Charging temperature</td>
<td>0°C to 45°C / 32°F to 113°F</td>
</tr>
<tr>
<td>Communication port</td>
<td>USB serial port</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>0° to +40° C / 32° to +104° F</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>PHYSICAL</strong></th>
<th><strong>Details</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions [H x W x D]</td>
<td>21 cm x 11 cm x 4 cm / 8.3” x 4.3” x 1.6”</td>
</tr>
<tr>
<td>Weight</td>
<td>850 g / 30 oz</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>DOCK STATION</strong></th>
<th><strong>Details</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions [H x W x D]</td>
<td>24 cm x 12.5 cm x 8 cm / 9.4” x 4.9” x 3.2”</td>
</tr>
<tr>
<td>Weight</td>
<td>240 g / 9 oz</td>
</tr>
</tbody>
</table>

* Specifications subject to change without prior notice.*
8.5 ITX2 Specifications

<table>
<thead>
<tr>
<th>TECHNICAL</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transmitter type</td>
<td>DBPSK</td>
</tr>
<tr>
<td>Frequency range</td>
<td>6.78 MHz or 27.12 MHz, set at factory</td>
</tr>
<tr>
<td>Bandwidth</td>
<td>30 KHz</td>
</tr>
<tr>
<td>Radiated power</td>
<td>Maximum: -8 dBm</td>
</tr>
<tr>
<td>Antenna connector</td>
<td>BNC 50 Ω</td>
</tr>
<tr>
<td>Transmitted data</td>
<td>68 bits</td>
</tr>
<tr>
<td>Transmission duration</td>
<td>8 ms</td>
</tr>
<tr>
<td>Transmission interval</td>
<td>100 ms</td>
</tr>
<tr>
<td>Communication port</td>
<td>USB type A</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ELECTRICAL</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power</td>
<td>Inputs: +12 VDC 1.2 A max</td>
</tr>
<tr>
<td></td>
<td>+7.2 VDC lithium ion battery pack of 2000 mAh – 0.3 A</td>
</tr>
<tr>
<td>AC battery charger</td>
<td>Input: 100-240 V – 50-60 Hz 0.7 A</td>
</tr>
<tr>
<td></td>
<td>Output: +12 VDC 1.66 A</td>
</tr>
<tr>
<td></td>
<td>Transient overvoltage II</td>
</tr>
<tr>
<td></td>
<td>Rated pollution degree 2</td>
</tr>
<tr>
<td>Mains supply voltage fluctuations</td>
<td>Up to ±10% of the nominal voltage</td>
</tr>
<tr>
<td>Operation time</td>
<td>6 hours nominal on battery power</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>-20° to +40° C / -4° to +104° F</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>-20° to +45° C / -4° to +113° F</td>
</tr>
<tr>
<td>Recommended use</td>
<td>Indoor use or outdoor use without exposing to direct sunshine or wet location</td>
</tr>
</tbody>
</table>

| Altitude                   | Up to 2,000 m (6,560 ft)         |
| Maximum relative humidity  | 80% for temperatures up to 31° C (88° F) decreasing linearly to 50% relative humidity at 40° C (104° F) |

<table>
<thead>
<tr>
<th>PHYSICAL</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions [H x W x D]</td>
<td>19.5 cm x 8.6 cm x 4.5 cm / 7.7” x 3.4” x 1.8”</td>
</tr>
<tr>
<td>Weight</td>
<td>550 g / 19 oz</td>
</tr>
</tbody>
</table>

* Specifications subject to change without prior notice.
9. Our Services

Effigis offers a portfolio of services to deploy and support purchased equipment through its Customer Support organization. Customer Support is standard with every product sale and consists of a phone technical support during business hours, repair and calibration center.

9.1 Customer Support

Customer Support is available with the sale of every Effigis product. Customer Support services includes:

- Product and Service Literature
- Technical Assistance (business hours)
- Equipment Repair (under Warranty Repair and Calibration Services)
- Equipment Return Authorizations

Contact a Customer Support representative through your local distributor or by accessing the http://effigis.com/cpat-flex-support/ for information on calibration and warranty policies.

B.1.1 Equipment Return Instructions

Please contact your local Customer Support location via telephone for Return Authorization to accompany your equipment. For each piece of equipment returned for repair, attach a tag that includes the following information:

- Owner’s name, address and telephone number
- Serial number, product type and model
- Warranty status (if you are unsure of the warranty status of your instrument, contact Effigis’s Customer Support)
- A detailed description of the problem or service requested
- The name and telephone number of the person to contact regarding questions about the repair
- The return authorization (RA) number

If possible, return the equipment using the original shipping container and materials. If the original container is not available, the unit should be carefully packed so that it will not be damaged in transit; when needed, appropriate packing materials can be obtained by contacting Effigis’s Customer Support. Effigis is not liable for any damage that may occur during shipping. The customer should clearly mark the Effigis’s issued RA or reference number on the outside of the package and ship it prepaid and insured to Effigis.

Equipment repaired or replaced under warranty will be returned at Effigis’s expense to Customer (Canada/USA) or Effigis’s representative (all other countries).

All other non-warranty repairs will be returned at Customer’s expense to Customer (Canada/USA) or Effigis’s representative (all other countries).

9.2 Limited Product Warranty

9.2.1 Hardware

Effigis warrants to the original end user (Customer) that the new Effigis branded products will be free from defects in workmanship and materials, under normal use, for one (1) year from the date of original shipment.

Effigis warrants repaired products for ninety (90) days from the date of shipment. Any Product repaired or replaced under warranty is only warranted for the period of time remaining in the original warranty for the Product.

Any third party products, including software, included with Effigis products are not covered by this Effigis warranty, and Effigis makes no representations or warranties on behalf of such third parties. Any warranty on such products is from the supplier or licensor of the Product.

9.2.2 Software

Effigis warrants to the Customer that new Effigis branded software and firmware will perform in substantial conformance to program specifications for a period of ninety (90) days from the date of original shipment. Effigis warrants the media containing software against failure during the warranty period.

Effigis makes no warranty or representation that the operation of the software products will be uninterrupted or error free, or that all defects in the software products will be corrected.

9.2.3 Exclusions

This warranty excludes:

- Damage to the physical surface of the Product, including cracks or scratches to any part.
- Damage caused by misuse, neglect, improper installation or testing, unauthorized attempts to open, repair, or modify the Product, or any other cause beyond the range of the intended use.
- Use of the Product with any non-recommended device or service if such device or service causes the problem.
- Installation or maintenance of Product by someone other than Effigis or persons certified by Effigis.
• Changes to the Customer environment in which Product was installed.
• Damage caused by accident, fire, power changes, other hazards, or acts of nature.
• Consumable Product or parts thereof (e.g., parts with an expected useful life of less
than ninety (90) days, such as certain batteries).
• Product not returned in accordance with Effigis’ RA procedure.

9.2.4 Refurbished Parts and Prior Testing

The Product may incorporate reconditioned or refurbished parts or subassemblies and may
have been used in testing prior to sale.

9.2.5 Exclusive Remedies

If any Product materially fails to conform to the limited warranty set forth in this Section
(Limited Warranty), and actually fails during the applicable warranty period and under normal
use, Effigis shall, at its sole discretion, (i) repair or replace the non-conforming Product
to remedy the nonconformity identified by the Customer in accordance with this Section
(Limited Product Warranty); or (ii) issue a credit to the Customer for the amounts paid for the
Product in exchange for return of the non-conforming Product, in which case Customer’s
licences to any firmware shall be automatically revoked. The Customer hereby transfers to
Effigis title and ownership of any parts that Effigis replaces.

9.2.6 Disclaimer

THE REMEDIES EXPRESSLY PROVIDED IN THIS SECTION WILL BE THE CUSTOMER’S SOLE
AND EXCLUSIVE REMEDIES AND SHALL BE IN LIEU OF ANY OTHER RIGHTS OR REMEDIES
THE CUSTOMER MAY HAVE AGAINST EFFIGIS WITH RESPECT TO ANY NON-CONFORMANCE
OF PRODUCTS. EXCEPT AS SPECIFIED IN THIS LIMITED PRODUCT WARRANTY, EFFIGIS
MAKES NO EXPRESS REPRESENTATIONS OR WARRANTIES WITH REGARD TO ANY PRODUCT.
EFFIGIS DISCLAIMS ALL IMPLIED WARRANTIES, CONDITIONS, AND REPRESENTATIONS
INCLUDING, BUT NOT LIMITED TO, ANY WARRANTIES OR CONDITIONS OF MERCHANTABILITY,
SATISFACTORY QUALITY, FITNESS FOR A PARTICULAR PURPOSE, AND NON-INFRINGEMENT,
REGARDLESS OF THE LEGAL THEORY ON WHICH SUCH IMPLIED WARRANTY MAY BE
BASED, INCLUDING, BUT WITHOUT LIMITATION, CONTRACT, COURSE OF DEALING, USAGE,
OR TRADE PRACTICE.
Modules Physical Installation

1. Insert the module into the槽.
2. Secure with screws.
3. Connect the cables.
4. Attach the connectors.
5. Final setup ready.