R.F. Remote Control

Radio Frequency (RF) remote control utilizes radio frequency transmission to instantly pass data from one point to another without the restriction of physical wiring or cables. RF does not require line of sight and does not have to be aimed at a specific point in order to be detected. RF is emitted in all directions from the transmitter and can pass through physical structures making it an extremely useful communication method.

Tipping Point

All fuel tankers are required to shutdown their electrical systems in the event of a roll over. Accuracy and reliability is paramount in this circumstance as a faulty or poorly designed sensor can lead to all truck electricals being turned off mid corner with disastrous results.

iROS uses a 2-axis accelerometer along with sophisticated software to monitor both angle and g-forces to determine if a rollover has really occurred before sending out the signal to turn off the power. This same detection technology is also used in the iROS-T to help alert drivers to dangerous lean angles while raising their tipper bodies. A three staged warning gives the operator ample time to stop the body raising, potentially saving lives and equipment damage.

User Programmable

The Programmable Switch Panel is able to control up to 8 separate functions. Highly configurable, and featuring momentary or latching switch function, the user can select from multiple switch symbols stored in the memory of the unit to display on the integrated backlit LCD. The switch panel and receiver modules communicate using a dedicated CAN communication protocol and can be expanded by connecting multiple receivers to the CAN line.
Switching Systems

- Programmable Switch Panel
- Radio Remote Control
- Rollover
- Tipper
- Voltage Sensor
- Headlights On Units
- Hand Brake Alarm Module
- IONNIC Idle Timer
- Idle Timers
- Low Coolant Alarm
The ESM is an electronically monitored switch centre with inbuilt circuit monitoring and protection. The unit can be used in any application in which conventional circuit protection may have been used in the past. The ESM can be used for any application from connecting auxiliary lighting off original vehicle tail lights, eg Minebar hook up, to using it to monitor and protect a range of auxiliary equipment switched off the original vehicle inputs or after market toggle, rocker switches etc. If a short or over current condition presents on any of the outputs then the output will shut down. This will then cycle 3 times (on/off). If the over current situation is still present the output will then shut down permanently until the input is turned off.

Inductive loads must not be used on the input or output circuits without additional external protection. Failure to do so will result in damage to the unit and will void warranty.
## ESM

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Switching</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>ESM0013</td>
<td>Positive</td>
<td></td>
</tr>
<tr>
<td>ESM2013</td>
<td>Positive &amp; Negative</td>
<td>ESM2013 will switch on both positive or negative inputs, diodes may be required to prevent false triggering.</td>
</tr>
</tbody>
</table>

### Accessories & Related Products

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ESM9001</td>
<td>Connection Kit</td>
</tr>
<tr>
<td>DET-20</td>
<td>Crimp tool. Size 20</td>
</tr>
<tr>
<td>HDT-48-00</td>
<td>Crimp tool. Size 12, 16, 20 &amp; 22</td>
</tr>
<tr>
<td>DET-RT</td>
<td>Multi-use hook tool</td>
</tr>
<tr>
<td>CB187-XX</td>
<td>Circuit breaker: Surface mount series</td>
</tr>
<tr>
<td>CB255-XX</td>
<td>Circuit breaker: Panel mount series</td>
</tr>
<tr>
<td>AMI-XX</td>
<td>AMI Fuse Series</td>
</tr>
<tr>
<td>AMIFH</td>
<td>AMI Fuse holder: Surface mount</td>
</tr>
</tbody>
</table>

### ESM Mini

The ESM006 is a compact version of our original ESM with the following specifications:

- 6 Input.
- 6 Output.
- Max. Current Draw 25A @ 13.8V.

Due for release 2nd quarter of 2015.
Programmable Switch Panel System Integration

The Programmable Switch Panel can be installed into any vehicle system and can control up to 8 separate functions per switch panel. Each switch panel connects to multiple receivers via a single 3 core CAN data cable, the “backbone”. A Deutsch “Y” piece connector is used to branch out from the “backbone” to the receivers which in turn can control up to 4 outputs each.

Deutsch “Y” Piece Connection

• User programmable LCD switch panel.
• Switch panel can control up to 8 separate functions.
• User selectable switch function symbols.
• Clean contacts.
• Efficient system wiring via CAN communication.
• Fixed or momentary outputs.
• Dimmable backlight switch panel.
• Epoxy sealed receivers.
• On-board diagnostics.
• Audible user feedback.
• Multi-voltage.
• Ability to add multiple receivers.
• Lightweight panel design – ideal for various mounting options.

Voltage: 10-24V
Current Rating: 10A max. per circuit
Panel Material: ABS

Programmable Switch Panel

<table>
<thead>
<tr>
<th>PCS-01</th>
<th>PCS-02</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage</td>
<td>Current</td>
</tr>
<tr>
<td>10-24V</td>
<td>10A max. per circuit</td>
</tr>
</tbody>
</table>

The Programmable Switch Panel can be installed into any vehicle system and can control up to 8 separate functions per switch panel. Each switch panel connects to multiple receivers via a single 3 core CAN data cable, the “backbone”. A Deutsch “Y” piece connector is used to branch out from the “backbone” to the receivers which in turn can control up to 4 outputs each.
Programmable Switch Panel

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCS-01</td>
<td>Switch Panel</td>
</tr>
<tr>
<td>PCS-02</td>
<td>Receiver</td>
</tr>
</tbody>
</table>

Accessories & Related Products

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>103349</td>
<td>CAN data cable - metre</td>
</tr>
<tr>
<td>DTO4-3P-P007</td>
<td>Deutsch DT Series - Receptacle &quot;Y&quot; Piece. Includes wedgelocks &amp; contacts</td>
</tr>
<tr>
<td>DTO4-3P</td>
<td>Deutsch DT Series - Receptacle - 3 circuit</td>
</tr>
<tr>
<td>W3P</td>
<td>Deutsch DT Series - Wedgelock - Receptacle - Green. Suits DTO4-3P</td>
</tr>
<tr>
<td>W3P-1939</td>
<td>Deutsch DT Series - Wedgelock - Receptacle - Blue. Suits DTO4-3P</td>
</tr>
<tr>
<td>DTO6-3S</td>
<td>Deutsch DT Series - Plug - 3 circuit</td>
</tr>
<tr>
<td>W3S</td>
<td>Deutsch DT Series - Wedgelock - Plug - Orange. Suits DTO6-3S</td>
</tr>
<tr>
<td>W3S-1939</td>
<td>Deutsch DT Series - Wedgelock - Plug - Blue. Suits DTO6-3S</td>
</tr>
<tr>
<td>0460-202-1631</td>
<td>Contact - Pin - Solid - Gold Plated - Size 16</td>
</tr>
<tr>
<td>0462-201-1631</td>
<td>Contact - Socket - Solid - Gold Plated - Size 16</td>
</tr>
<tr>
<td>DET16</td>
<td>Crimp tool - Size 16</td>
</tr>
<tr>
<td>HDT-48-00</td>
<td>Crimp tool - Size 12, 16, 20 &amp; 22</td>
</tr>
<tr>
<td>DET-RT</td>
<td>Multi-use hook tool</td>
</tr>
<tr>
<td>BMM-013</td>
<td>Mount for PCS-01. Adhesive/bolt-down</td>
</tr>
</tbody>
</table>
Switching Systems

DIP Switches

DIP switches found inside receiver enclosure can be set to achieve either latching or momentary for each output respectively.

Input 1 Interlock Override
Input 2 Interlock Override
Output 1
Output 2
Output 3
Output 4

The Interlock Override inputs can be used to manually override outputs 1 and 2 only.

Kits

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Voltage</th>
<th>Transmitter Style</th>
<th>Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>R15-R12-F</td>
<td>12</td>
<td>Fob</td>
<td>1 x R1500-R12, 1 x R1000-TR4</td>
</tr>
<tr>
<td>R15-R24-F</td>
<td>24</td>
<td>Fob</td>
<td>1 x R1500-R24, 1 x R1000-TR4</td>
</tr>
<tr>
<td>R15-R12-P</td>
<td>12</td>
<td>Pendant</td>
<td>1 x R1500-R12, 1 x R1000-TR4</td>
</tr>
<tr>
<td>R15-R24-P</td>
<td>24</td>
<td>Pendant</td>
<td>1 x R1500-R24, 1 x R1000-TR4</td>
</tr>
</tbody>
</table>

Typical Range: 90m
Frequency: 433 MHz
Current Rating: 5A max. per output
Battery: Pendant 2 x AA, Fob 1 x CR2032
Transmitter Battery Life: 100,000 activations
Receiver Cable Length: 300mm
Encryption: Rolling Codes

- 4 output, user programmable remote switching system.
- 2 transmitter styles available:
  - Palm-sized fob
  - Heavy duty pendant
- Up to 90 metre range.
- Rolling codes, secure encryption.
- Multiple transmitters able to be paired with single receiver.
- All 4 outputs can be momentary or latching.
- Hard-wired interlock feature on 2 outputs.

Radio Remote Control

R1500-R12
R1000-TR4
R1000-TF4

R.F. Processor

Output 4
Output 3
Output 2
Output 1

Input 2 Interlock Override
Input 1 Interlock Override

Kxa. R15-R12-F, R15-R24-F
Kxa. R15-R12-P, R15-R24-P
## Components

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Voltage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>R1500-R12</td>
<td>12</td>
<td>Receiver</td>
</tr>
<tr>
<td>R1500-R24</td>
<td>24</td>
<td>Receiver</td>
</tr>
<tr>
<td>R1000-TF4</td>
<td>12-24</td>
<td>Transmitter - Fob style</td>
</tr>
<tr>
<td>R1000-TR4</td>
<td>12-24</td>
<td>Transmitter - Pendant style</td>
</tr>
</tbody>
</table>
Switching Systems

Rollover

AS2809 compliant rollover switch.
- Solid state electronics.
- Microprocessor controlled.
- Multi-voltage.
- Senses vertical & horizontal axis through an accelerometer (angle and G-force sensing device).
- Conducts system self-tests without shutdown.
- EMF spike suppression.

Voltage: 10-30V
Housing: Die-cast
Compliance: AS2809

Intelligent Rollover Switch
The iROS uses a 2 axis accelerometer to determine angle and G-force. The output will only be switched if all of the criteria for angle and motion are met and held for a set period.
The iROS has an input for a 'System Test' button that when pushed and held will activate the sensor to the rollover point, making testing a simple task.
Compliant to AS2809, the iROS will activate any of the remotely switched battery isolation switches commonly used on the Australian market.

Rollover

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>IROS</td>
<td>AS2809 compliant rollover switch</td>
</tr>
</tbody>
</table>
Tipper Safety

The iROS-T (intelligent roll over switch - tipper) warns the driver of a potentially unsafe lean on a tipper body as it is being raised. The supplied dash mounted display indicates system status and angle warnings with the 3rd (and highest) level activating an output for an external alarm or control. Each iROS-T requires the three warning angles to be programmed into the unit once installed. This requires the iROS-T cable and PC compatible software (supplied).

This software also allows access to the data logs of the last 15 activations.

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Switching Systems

- Determines when there’s an unsafe lean on a raised tipper body.
- Solid state electronics.
- Microprocessor controlled.
- Multi-voltage.
- Data logs the last 15 activations.
- Conducts system self-tests.

### Tipper

**Part No.**

- **iROS-T**: Kit includes sensor unit & connector, display and 1.8m harness
- **iROS-T-USB**: Proprietary cable required to program iROS-T. Includes software disc

### Specifications

- **Voltage**: 10-30V
- **Housing**: Die-cast
- **Connector Ingress Protection**: IP65
Switching Systems

Voltage Sensor

- Internal change-over relay activates when the voltage falls below or rises above the preset level.
- Adjustable sensing range.
- Example uses:
  - Helps prevent the over-discharging of a battery.
  - Triggering an alert when a battery discharges to a preset level.
  - Automatic activation of a battery charger.
- Made in Australia.
- 2 years warranty.

**Voltage Sensor**

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Voltage</th>
<th>Current Rating (A)</th>
<th>Adjustable Sensing Range (V)</th>
<th>Factory Trigger Setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>VS12</td>
<td>12</td>
<td>10</td>
<td>9.0 - 16.0</td>
<td>Minimum Voltage 12.0 ± 0.2, Maximum Voltage 12.7</td>
</tr>
<tr>
<td>VS24</td>
<td>24</td>
<td>10</td>
<td>18.0 - 35.0</td>
<td>Minimum Voltage 24.0 ± 0.2, Maximum Voltage 25.2</td>
</tr>
</tbody>
</table>

**5 Terminal - Change Over (C/O)**

- COM
- +
- NO
- NC
- -

Used to switch a circuit relative to system voltage. The user only sets the minimum voltage level (User Set Point). The VS12 maximum voltage level is approximately +0.7 volts higher than the User Set Point. The VS24 maximum voltage level is approximately +1.5 volts higher than the User Set Point.

When the system voltage reaches the maximum voltage level the internal change-over relay energises switching the COM from NC to NO. When the system voltage falls below the minimum voltage level the internal relay de-energises switching the COM back to NC.

Example uses:
- Helps prevent the over-discharging of a battery.
- Triggering an alert when a battery discharges to a preset level.
- Automatic activation of a battery charger.
- Made in Australia.
- 2 years warranty.
Switching Systems

Headlights On Units

- Designed to operate park & low beam lights any time vehicle ignition is on.
- Can be wired to disable control unit eg. hand brake switch, door switch.
- 10 seconds start up delay.
- Compact easy installation.
- Diagnostic LEDs.
- Available in positively and negatively switching models.
- Epoxy filled for enhanced moisture and vibration protection.
- 2 year warranty.

Body: ABS
Wire Length: 200mm
Operating Temperature: -40°C to 70°C

---

### Headlights On Units

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MS-LOR-12V</td>
<td>Suits any negatively switched headlight</td>
</tr>
<tr>
<td>MS-LOP-12V</td>
<td>Suits any positively switched headlight</td>
</tr>
<tr>
<td>MS-LOR-12V-KIT</td>
<td>Suits Toyota Hi-Lux up to 2011 model. Supplied complete with plug-in harness</td>
</tr>
</tbody>
</table>

Installation on late model multiplexed vehicles must be performed by a qualified technician.
Switching Systems

Hand Brake Alarm Module

- Can be adapted to any vehicle.
- Can be used as a general 2 stage alarm module.
- Designed to signal when hand brake is not engaged and vehicle door opens.
- Satisfies mine site requirements.
- 2 stage outputs.
- Compact easy installation.
- Suitable for positive and negatively switched vehicles/applications.
- Epoxy filled for enhanced moisture and vibration protection.
- Clean contacts.
- 2 year warranty.

Voltage: 12-24V
Current Rating: 2 x 10A @ 12V
Body: ABS
Wire Length: 150mm
Operating Temperature: -40°C to 70°C

Hand Brake Alarm Operation

The MS-HB01 Hand Brake Alarm Module is designed to satisfy the mine site requirement where all stationary vehicles must have the hand brake engaged. The MS-HB01 does this by triggering alarms when a vehicle operator attempts to leave the vehicle by opening one or more of the doors without applying the hand brake.

The MS-HB01 unit is a 2 stage device.

Stationary vehicle

Hand brake not engaged

Door opens

Stage 1 output ON.

5 seconds delay

Stage 1 & Stage 2 output ON.

Device deactivation will only occur when the hand brake is applied. Closing the door alone will not deactivate the unit.

Hand Brake Alarm Module

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MS-HB01</td>
<td>Suits any positive or negatively switched vehicle</td>
</tr>
</tbody>
</table>
• Selectable idle time cycle.
• LED indicators for visual warning.
• Multi-voltage.
• Environmentally sealed - IP65.
• Push & toggle switch kits available.
• Suitable for Energised To Run (ETR) systems. Energised To Stop (ETS) model available on request.

Voltage: 12-24V
Weight: Controller Unit 255g
Enclosure: ABS
Ignition Output: 10A
Auxiliary Output: 0.7A
Ingress Protection: IP65
Approvals: CE, C-Tick
Operating Temperature: -40°C to 85°C

IONNIC Idle Timer

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Description</th>
<th>Kit contains</th>
</tr>
</thead>
<tbody>
<tr>
<td>IT10452</td>
<td>Idle Timer kit - push button switch</td>
<td>1 x IT11450, 1 x IT10451</td>
</tr>
<tr>
<td>IT11452</td>
<td>Idle Timer kit - toggle switch</td>
<td>1 x IT11450, 1 x IT11451</td>
</tr>
<tr>
<td>IT11450</td>
<td>Idle Timer controller unit</td>
<td></td>
</tr>
</tbody>
</table>
Switching Systems

Voltage: 12-24V
Current Rating: 10A max.

- Multiple mounting options.
- Energise to run or stop models.
- Models with remote face.
- 5 Minute Fixed models feature 30A switching capacity via serviceable external relay.
- Multi-voltage.
- Vehicle specific pre-terminated models available on request, lead times apply.

Idle Timers

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Outputs</th>
<th>Energise to</th>
<th>Time Intervals (min)</th>
<th>Park Brake Override</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BES-925/ST-1</td>
<td>1</td>
<td>Run</td>
<td>0.5, 1, 2, 3, 4, 5</td>
<td>Yes</td>
<td>Non-electronic engine management</td>
</tr>
<tr>
<td>BES-925/ST-3</td>
<td>2*</td>
<td>Run</td>
<td>0.5, 1, 2, 3, 4, 5</td>
<td>Yes</td>
<td>Non-electronic engine management</td>
</tr>
<tr>
<td>BES-925/ST-4</td>
<td>1</td>
<td>Run</td>
<td>0.5, 1, 2, 3, 4, 5</td>
<td>Yes</td>
<td>Electronic engine management</td>
</tr>
<tr>
<td>BES-925/ST-5</td>
<td>2</td>
<td>Run</td>
<td>0.5, 1, 2, 3, 4, 5</td>
<td>Yes</td>
<td>Electronic engine management</td>
</tr>
<tr>
<td>CTR-M</td>
<td>1</td>
<td>Stop</td>
<td>0.5, 1, 2, 3, 4, 5</td>
<td>No</td>
<td>Electronic engine management</td>
</tr>
</tbody>
</table>

* Second output used to isolate power to EDIC (shutdown) motor during idle period.
## Adjustable - X-Series

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Outputs</th>
<th>Energise to</th>
<th>Time Intervals (min)</th>
<th>Park Brake Override</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BES-X104</td>
<td>1</td>
<td>Run</td>
<td>30 sec to 30 min</td>
<td>Yes</td>
<td>Suitable for both electronic &amp; non-electronic engine management</td>
</tr>
<tr>
<td>BES-X105</td>
<td>2</td>
<td>Run</td>
<td>30 sec to 30 min</td>
<td>Yes</td>
<td></td>
</tr>
</tbody>
</table>

## Adjustable

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Outputs</th>
<th>Energise to</th>
<th>Time Intervals (min)</th>
<th>Park Brake Override</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BES-124/ST-1</td>
<td>1</td>
<td>Run</td>
<td>1, 3, 5</td>
<td>No</td>
<td>Non-electronic engine management</td>
</tr>
<tr>
<td>BES-124/ST-2</td>
<td>2</td>
<td>Run</td>
<td>1, 3, 5</td>
<td>No</td>
<td>Non-electronic engine management</td>
</tr>
<tr>
<td>BES-124/ST-4</td>
<td>1</td>
<td>Run</td>
<td>1, 3, 5</td>
<td>No</td>
<td>Electronic engine management</td>
</tr>
</tbody>
</table>

## Fixed - Gauge Mount

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Outputs</th>
<th>Energise to</th>
<th>Time Intervals (min)</th>
<th>Park Brake Override</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CST500D</td>
<td>1</td>
<td>Run</td>
<td>Fixed @ 5</td>
<td>No</td>
<td>Relay driven output</td>
</tr>
<tr>
<td>CST515</td>
<td>1</td>
<td>Stop</td>
<td>Fixed @ 5</td>
<td>No</td>
<td>Relay driven output</td>
</tr>
</tbody>
</table>
Low Coolant Alarm

• Visual & audible warning device for water/coolant level monitoring.
• LED indicator on modules.
• 7 second “slosh” delay preventing false triggering.
• Epoxy encapsulated modules.
• Brass sleeve or rubber multi-fit style probes available.

Voltage: 12-24V
Sensing Depth:
WL601PS1 25mm
WL601P 35mm
Current Rating:
WL601LP 3A @ 12V
8015002 10A

Kits

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Description</th>
<th>Part No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>WL-1</td>
<td>10A Module with Threaded Probe</td>
<td>WL601PS1</td>
<td>BA16DS-RED</td>
</tr>
<tr>
<td>WL-2</td>
<td>10A Module with Multi-fit Probe</td>
<td>WL601P</td>
<td>BA16DS-RED</td>
</tr>
<tr>
<td>WL-3</td>
<td>3A Module with Threaded Probe</td>
<td>WL601PS1</td>
<td>8015002</td>
</tr>
<tr>
<td>WL-4</td>
<td>3A Module with Multi-fit Probe</td>
<td>WL601P</td>
<td>8015002</td>
</tr>
</tbody>
</table>

All components available separately.