



Findlay Irvine
Environmental Monitoring

Keith Hutchin
Senior Software Engineer



Company History

- Established in 1960
- Still family owned and run
- Engineering consultancy and manufacturing
 - Engineering Development
 - Manufacturing
 - Sales & Service



James Findlay and John Irvine



First Product

autoheat

FOR ACCURATE GREENHOUSE HEATING



FINDLAY IRVINE

Penicuik, Near Edinburgh
Telephone Penicuik 01968-672111
Fax 01968-672596

FINDLAY IRVINE



Markets



Rail

Remote condition monitoring & control



Road

Weather monitoring

Skid resistance testing



Air



Defence

Control systems



Design and Manufacture of Electronic Control Panels

- **Type 23 Frigate**
 - Helicopter handling system
 - Sonar towed array handling system
- **Astute submarine**
 - Mast control systems
 - Hydraulic power-pack control systems
 - Secondary propulsion system

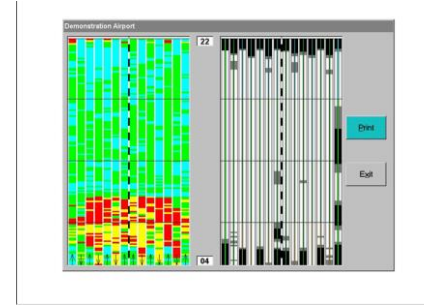




Skid Resistance Testing

GripTester

- Airports
- Roads
- Portable version to test surface resistance on Helidecks

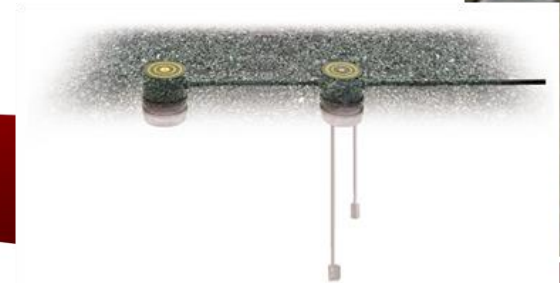




Road/Airport Weather Monitoring

Network of sensors measuring:

- Road/Runway temperatures
 - Road condition (wet/dry/ice/snow/salt)
 - Air temperature & dew point
 - Precipitation type, rate, accumulation
 - Wind speed & direction
 - Visibility
-
- Links to road weather forecasters
 - Displayed on website with management and audit information





Road/Airport Weather Monitoring

Information from sensors is displayed on website with management and audit information

Findlay Irvine - ICELERT.net - Microsoft Internet Explorer
Address: http://www.geckonewmedia.com/approval/fi/outstations/datatable.asp

Current and forecast data

Latest data table refresh 08 September 2003

Outstation	Date	Time	Status	Condition	Ground	Deep	Air	Dew	Humidity	Precipitation	Wind speed	Wind dir	Extra 1	Extra 2	Extra 3	Choose func
Tatting	15/08	15:35	Normal	Dry	17.8	4.4	5.6	4.6	92	No	9	W	-	-	-	- Choose -
Shardloe						4.4	5.6	4.6	92	No	9	W	-	-	-	- Choose -
Shardloe 1	15/08	15:35	Normal	Salt 1	4.6											- Choose -
Shardloe 2	15/08	15:35	Normal	Salt 1	4.5											- Choose -
Shardloe 3	15/08	15:35	Normal	Salt 1	4.6											- Choose -
Wing	15/08	15:35	Normal	Wet	6	5	2.6	4	92	No	7	N	-	-	-	- Choose -
Astwood	15/08	08:03	Normal	Wet	17.8	5.6	3.2	-15	0							- Choose -
Dayrell	15/08	15:35	Normal	Wet	4.6	3	3.5	5	95.9		8	N	-	-	-	- Choose -
Westcott	15/08	15:35	Normal	Wet	-25	0	4	4.4	92		9	W	-	-	-	- Choose -
Imer	15/08	15:35	Normal	Wet	4.3	4.4	4.1	5.6	94.9	No	0	NW	-	-	-	- Choose -
Winslow	15/08	15:35	Normal	Salt 1	4.6	5.2	2.6	14.4	95.8	No	0	SW	-	-	-	- Choose -
Milton Keynes	15/08	15:35	Normal	Wet	6	2.1	3.2		91.1		9	NE	-	-	-	- Choose -
Stokenchurch	14/08	10:32	Normal	Dry	17.8	1.6	3.5		95.8	No	8	E	-	-	-	- Choose -

Findlay Irvine - ICELERT.net - Microsoft Internet Explorer
Address: http://www.geckonewmedia.com/approval/fi/outstations/current_graph.asp

Current graph for <<outstation>>

Currently viewing 24 hour graph for <<outstation>>.

Outstation Navigator
Use the menus below to view a different outstation or display.
- Choose outstation -
- Choose function -

Summary for <<outstation>>
Min Ground Temp 0.6
Min Air Temp -1.2
Min Dew Point 0.8
Min Deep Temp 1.6
Max Wind Speed 22

Change temperature range
Lowest Highest Go

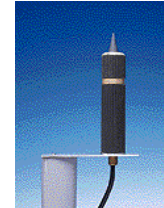
Sensor 13 14 15 16 17 18 19 20 21 22 23 00 1 2 3 4 5 6 7 8 9 10 11 12

W 40
I 30
T 20
N 10
D 0
WD



Rail Condition Monitoring & Control

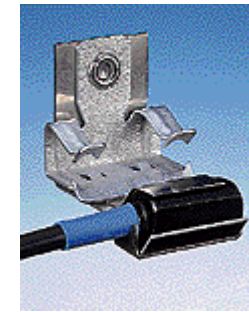
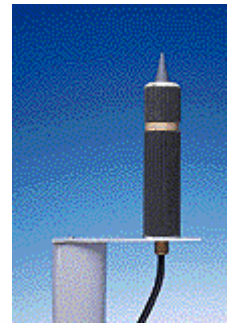
- 30 Years experience in Rail industry
- Switch point heating
- Remote Condition Monitoring Equipment & systems





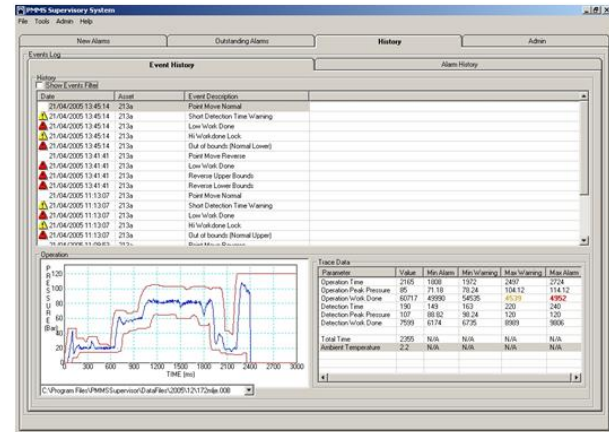
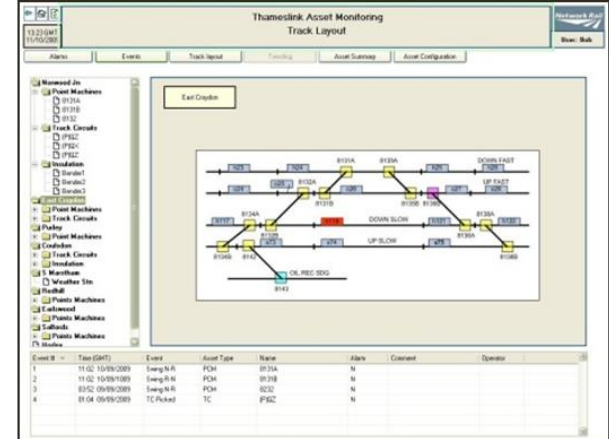
Rail Condition Monitoring & Control

Switch Points heating and monitoring





Rail Condition Monitoring & Control





Rail Condition Monitoring & Control

Range of Track Condition Sensors

- Wireless Rail Temperature Sensor to manage rail buckling



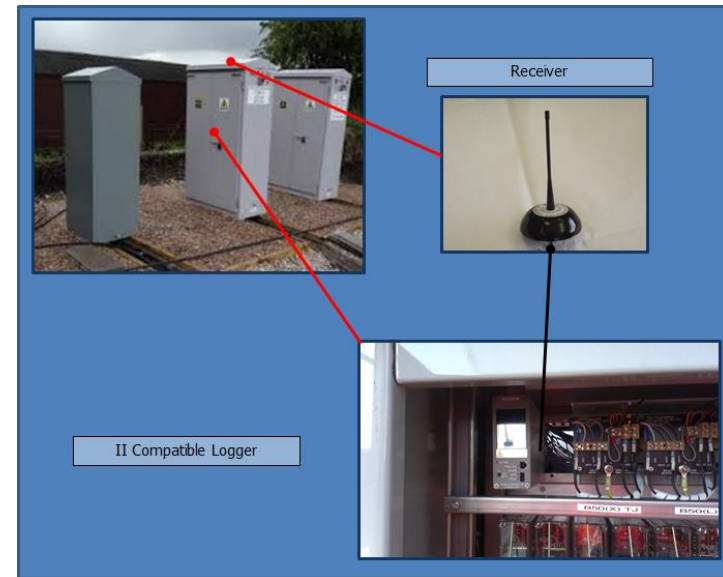
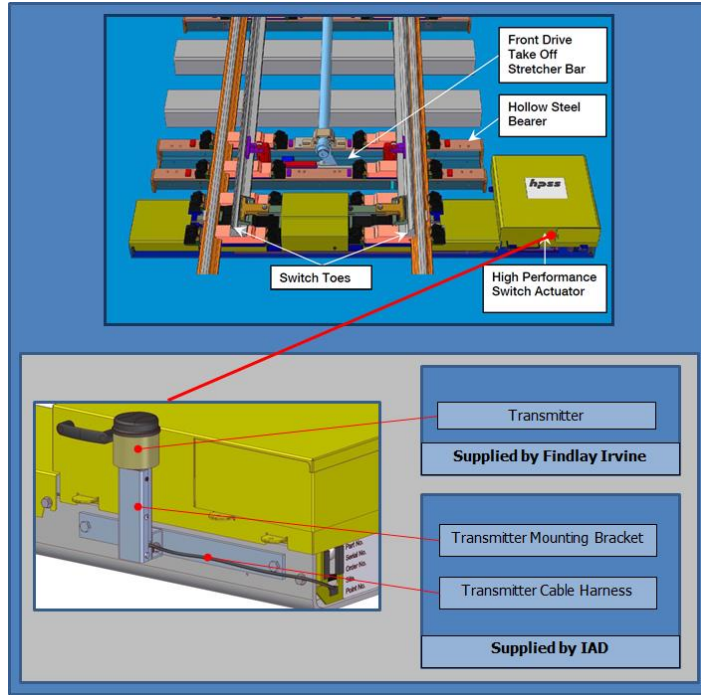
- Flood Sensor (trial)





Rail Condition Monitoring & Control

Monitoring of Points Control system





Rail Condition Monitoring & Control



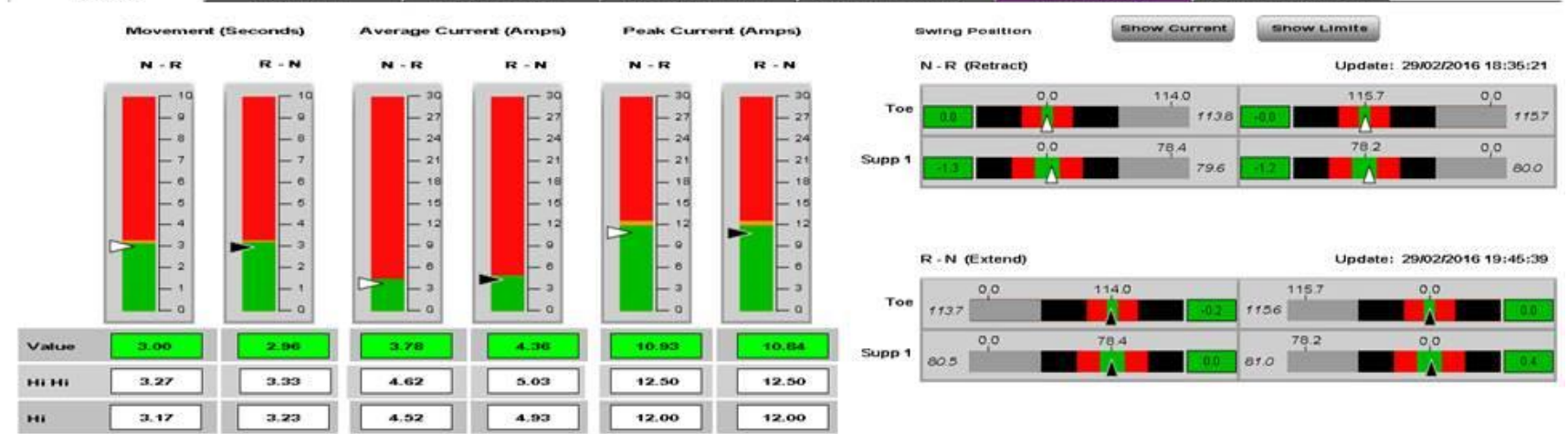


Rail Condition Monitoring & Control

Network Rail - Intelligent Infrastructure Monitoring System
 29/02/2016 21:19:07 LARBTJCN SCM3 P9HPSS - Points Monitoring User: ARichar6
 Edinburgh section: Edinburgh_West_SM_SIGNALS

You are in: UK > Scotland > Edinburgh > Edinburgh_West_SM_SIGNALS > LARBTJCN_SCM3_P9HPSS

Details Attributes Logger Offsets Asset Trending Alarm Summary Maintenance Current Waveform



Point Operational Data

HPSS Data

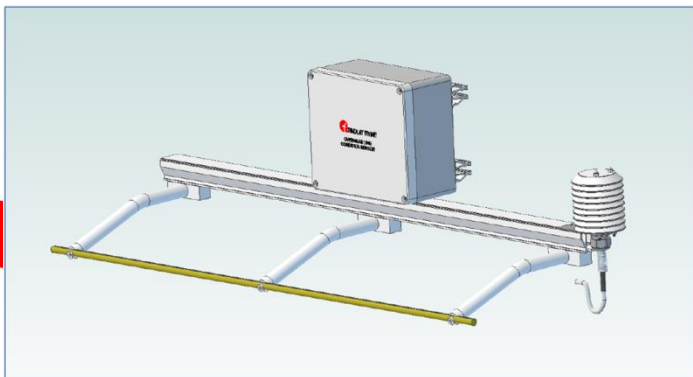
	Last Swing	No. of Ops	Invalid Ops	Ops Reset	Last Alarm	Latest CT Data	Last ECU Swing Data	Datum Reset (In Maint. Period)	Power Status	ECU Comma	Data Link Comma
N - R	29/02/2016 21:00:52	4579	500	21/10/2015 12:00:11	29/02/2016 21:05:22	29/02/2016 21:00:52	29/02/2016 21:10:35	COUNT: 3	Powered	PASS	PASS
R - N	29/02/2016 20:45:01	4545						28/02/2016 10:17:45	28/02/2016 10:22:09	28/02/2016 10:20:41	28/02/2016 10:22:09

Priority	Time	State	Type	Name	Description	Value	User	Comment	Control Centre	Fms Id	Ellipse Id	Area
501	29/02/2016 21:05	AckAlm	DSC	LARBTJCN_SCM3_P9HPSS	Brakes Not Released	true	ivocaca	Maintenance Mode Alarm Automatically Acknowledged	Scotland Incident East			Edinburgh_West_SM_SIGNALS
501	29/02/2016 21:05	AckAlm	DSC	LARBTJCN_SCM3_P9HPSS	LVD1 3 Exceed Fault	true	ivocaca	Maintenance Mode Alarm Automatically Acknowledged	Scotland Incident East			Edinburgh_West_SM_SIGNALS
501	29/02/2016 21:05	AckAlm	DSC	LARBTJCN_SCM3_P9HPSS	LVD1 4 Exceed Fault	true	ivocaca	Maintenance Mode Alarm Automatically Acknowledged	Scotland Incident East			Edinburgh_West_SM_SIGNALS



Rail Condition Monitoring & Control

Contact Wire Frost Management



System measures potential for Frost on Overhead Catenary wires and on Rails for Wheel Slip Conditions



Rail Condition Monitoring & Control

Earth Works Monitoring System





Rail Condition Monitoring & Control

Earth Works Monitoring System





Rail Condition Monitoring & Control

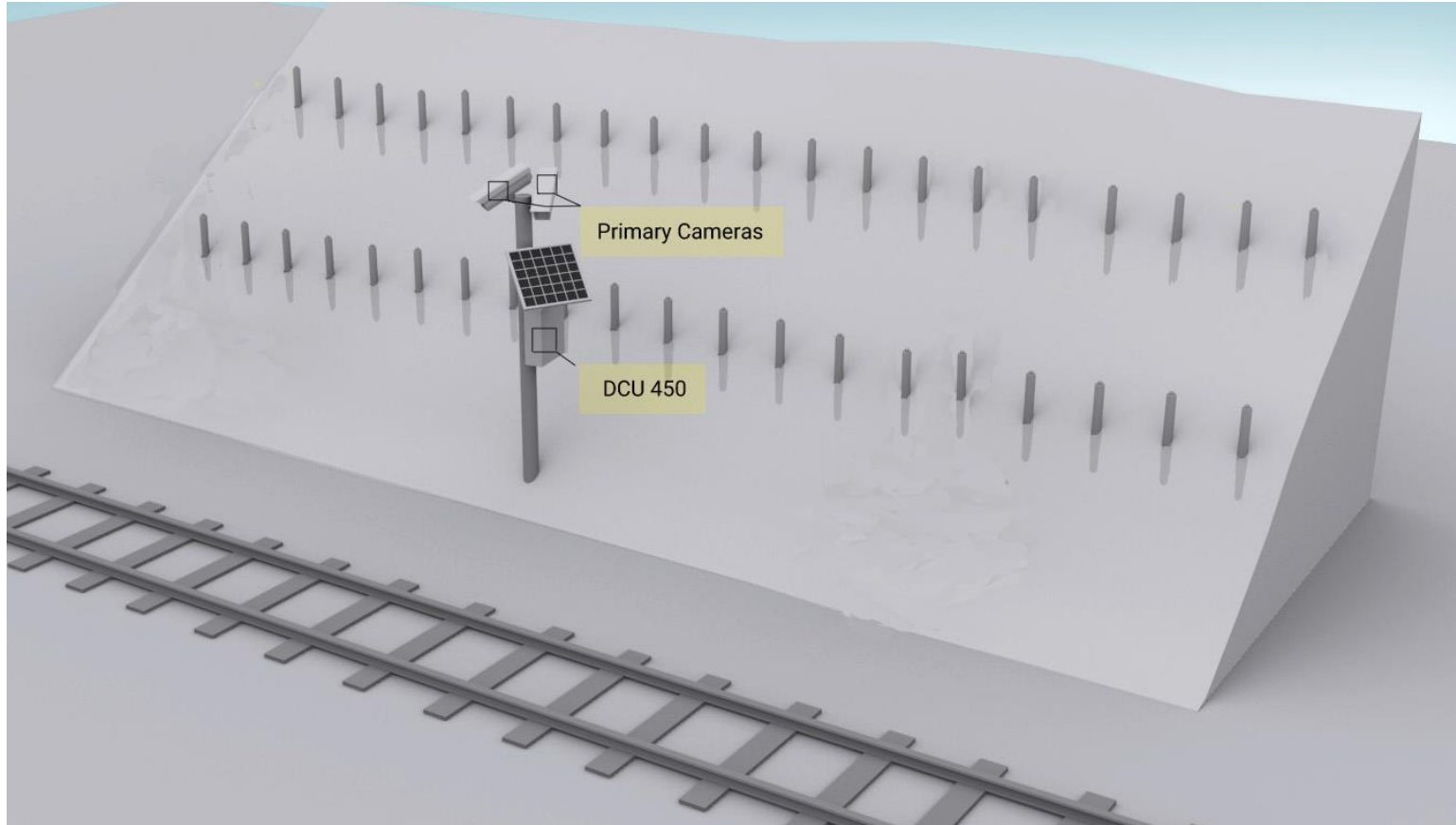
Earth Works Monitoring System





Rail Condition Monitoring & Control

Earth Works Monitoring System





Rail Condition Monitoring & Control

Earth Works Monitoring System

Tilt sensor originally based on iQRF DCTR-56DA module.

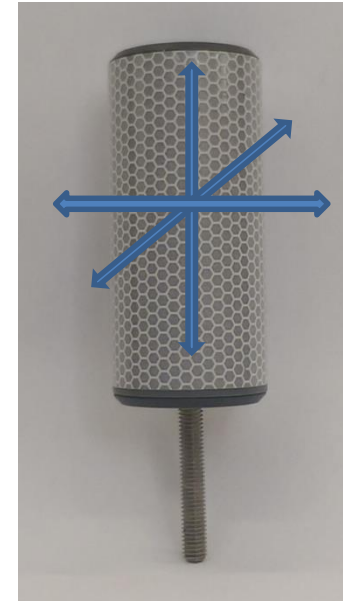
MicroRisc provided training on modules at Jicin HQ.

Uses Accelerometer to measure tilt angle in 3 axis.

Battery powered for 5 years.

Sealed to IP68.

Latest version uses new iQRF DCTR-76DA module with PIC to provide averaging and sensor control





Rail Condition Monitoring & Control

Earth Works Monitoring System





Rail Condition Monitoring & Control

Earth Works Monitoring System

Findlay Irvine Asset Monitoring

SITES HISTORIC CONTACT CONFIGURATION FIADMIN LOG OFF

Assets Overview / Sites Overview / Apperley Junc. 202.1265D Site Details

Apperley Junc. 202.1265D Site Details

Site has returned to normal after an alarm without being acknowledged. Comm Status: Online Site Status: Unack Return Main Battery: 11.38 Volts

Sensors 04/02/2016 15:21:13

2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40
1.13	0.8	1.3	0.2	1.4	1.4	2.0	2.2	1.6	2.3	1.3	0.0	0.7	0.2	2.1	0.9	0.8	0.8	1.8	1.2
1	3	5	7	9	11	13	15	17	19	21	23	25	27	29	31	33	35	37	39
0.0	0.7	0.8	1.2	0.8	1.0	1.4	1.4	1.2	1.3	1.4	0.0	0.8	1.4	1.6	0.0	0.7	0.7	0.0	0.0

ILK1 202miles 1210yards

Tilt Values: Reading Frequency: 1 hour Save

Camera Images

1:Low Mileage 29/01/2016 15:57:00

DAY NIGHT

2:High Mileage 29/01/2016 16:00:00

DAY NIGHT

Request Image 1 Request Image 2

Image Upload Frequency: 1 hour 2 hours 3 hours 6 hours 12 hours



Rail Condition Monitoring & Control

The Future

New ranges of Environmental sensors based on the iQRF DCTR-76DA modules.

More Rail Condition Monitoring systems using iQRF modules to replace existing hard-wired connections.

Several new Rail Monitoring systems already in prototype stages.



Thanks For Listening

