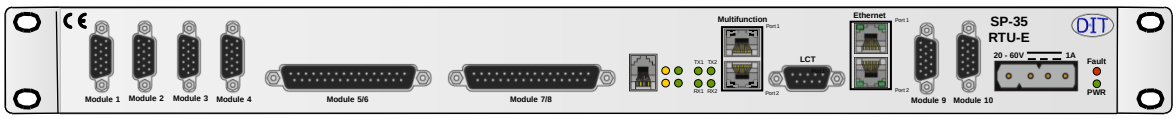
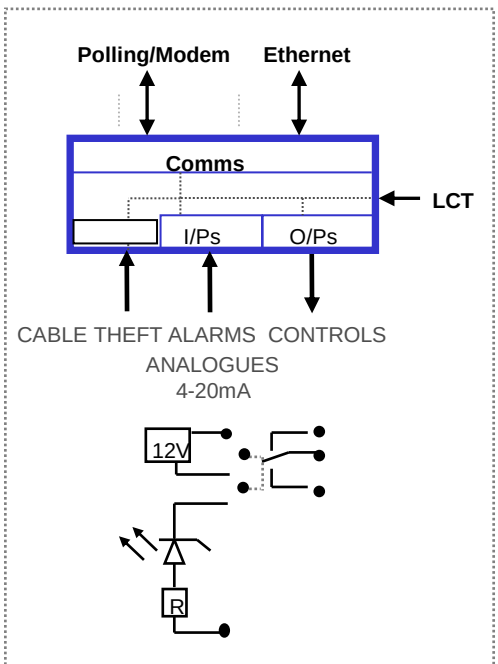
Environmental Monitoring PIM for RTUs



- **N/W Access via Ethernet, Modem or Serial Ports**
- **Supports 4 x plug in modules (PIMs) incl alarm inputs, control outputs, analogue, 4-20 mA, Cable Theft and serial interfaces**
- **Each 4-20 mA PIM supports 2 x Analogue channels**
- **Each Analogue channel supports 4 configurable alarms (2 above and 2 below the nominal Temp/RH level)**
- **Supports Logging and Export of selected Analogue channels (for suspected problem sites)**
- **Local or Remotely Manageable**
- **Managed by D&ITs NMS PC-Gx**



Data and Information Technology's range of Remote Terminal Units (RTUs) provide network monitoring and control capabilities quickly and efficiently without the need for custom programming.

An example RTU is the SP-35 RTU-E as shown above which supports up to 24 x Alarm Inputs and 4 x control outputs in its base configuration. A further 4 x additional Plug In Modules (PIMs) on the LHS can be fitted to support a range of features including Digital Inputs, Relay Output controls, Cable Theft and Environmental Monitoring (e.g. Temperature and RH).

Note that the PIMs described here are also supported on the SP-15 RTU that is already widely used in railway networks.

Please refer to separate Plug in Modules for RTUs datasheet for summary details of these PIMs. This datasheet focuses on the Environmental Monitoring PIM features.

Environmental Monitoring Plug-In Module

Temperature & RH Monitoring

Environmental Monitoring is achieved through the use of a standards based 4-20 mA PIM Interface. This interface can be used to capture analogue values generated by 3rd party devices such as Temperature and Relative Humidity Sensors used for Environmental Monitoring as well as simple applications to monitor the level of fuel or water tanks, battery Voltage etc.

The 4-20mA PIM was developed in conjunction with customers as part of a strategy to reduce the data transport and CPU loading on the PC-G8 NMS systems used to monitor the railway infrastructure. By processing alarm data at source on board the PIM/RTU, the need for PC-G8 to process and store raw analogue data is minimised.

The 4-20mA PIM has enhanced onboard firmware that enables the unit to display values in units measured rather than raw data. It can also identify threshold values relating to the input current and report as a standard digital value for easy operational recognition of the monitored values.

Temperature & RH Monitoring Continued

This simplifies the processes on the NMS PC-G8, the graphics generation of alarm being compatible with standard digital alarm input format, greatly reducing processing and configuration time for NMS.

The 4-20 mA PIM allows the user to configure up to four alarm points (e.g. two above and two below the nominal temperature level, if the PIM is being used for temperature and RH monitoring) that can be forwarded to the Network Management System (PC-G8) for presentation to the network operations personnel. It is possible to configure these alarm settings remotely using Remote Terminal Window (RTW) facilities from the existing PC-G8 clients at the management centres. These digital alarms are synonymous with the existing digital input reporting supported by PC-G8 on all networks.

Whenever one (or more) alarm threshold is crossed, the RTU-E/RTU transmits a message containing the status of all alarms. Additionally, a report of the status of all alarms is transmitted on a regular basis if there has been no change in the alarm status (Auto Verify)

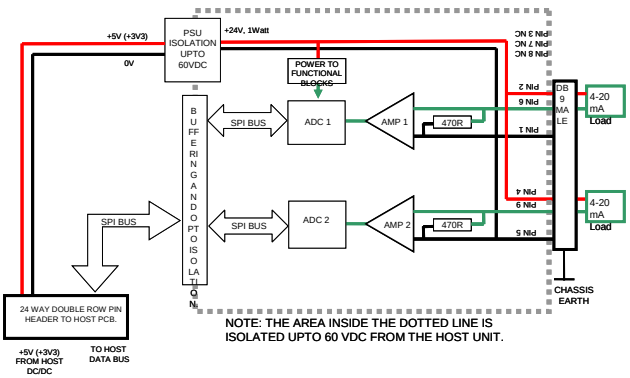
Based on the above, temperature readings consistent with the required operation will be received by the Network Management System (Server Application PC-G8) and can be displayed on the graphics as required.

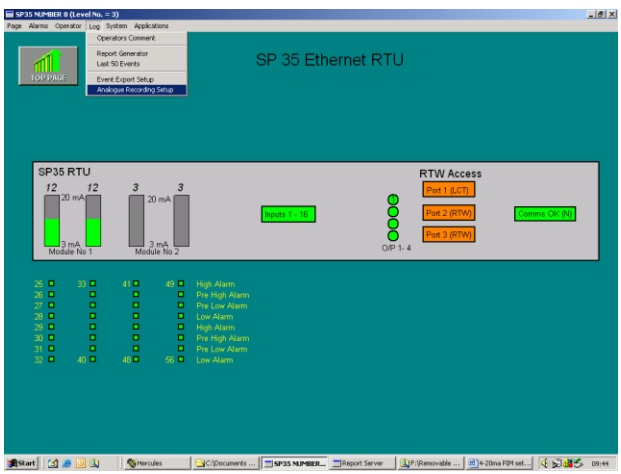
If the user wishes to maintain a historical record of the information it is possible to export the analogue log file in .csv format from PC-G8 to an Excel spreadsheet where the information can be presented/viewed/processed as required in an office environment.

This .csv export facility is normally expected to be used to monitor the environmental conditions over a period of time at a site (or sites) where a problem is considered to exist. For example, to maintain a check of the Temperature at a site where the Air Conditioning may not be operating correctly and assurance is required that the co-located Battery System is running within the specified temperature range.

2 Channel 4-20 mA Module (9050-0541A)

Typical Apps	Temperature & RH Monitoring, Fuel level
Connector	9-way 'D' connector (male)
Interlocking	None
Number of Chans	2
Resolution	12-bit
Accuracy	See Data Sheet of Sensor utilised (But nominally better than 3% for device referenced)
Range	4-20mA standard
Alarm Outputs	4 digital alarm outputs per channel (High, Pre High, Low & Pre Low – individual threshold values set to customers requirements)
Power consmptn	0.1W (typical)





Example PC-G8 graphics for Temperature and RH Monitoring