



SeRFNet

Dynasys Sensor RF Network SeRFNet

RAMS- Reliability and Availability Management System

Lack of agility and flexibility in the Supply Chain system requires increased inventory volumes, transportation costs, and personnel. The ability to effectively measure the condition of systems through the use of technologies, such as RFID, and advanced analysis techniques can provide essential information for performing supply chain optimization and just-in-time re-supply. Item location is just part of the total solution. SeRFNet low-power radio frequency (RF) sensor network can monitor critical metrics such as power consumption, temperature, vibration, etc., and relay it, in almost real time via an existing secure infrastructure, to a global database.

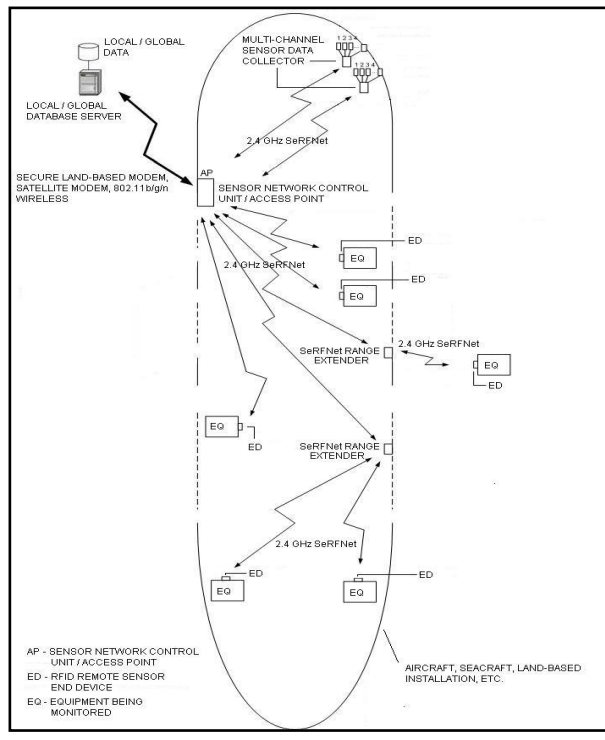
Operational:
FCC: 2394 - 2507 MHz ISM Band

Network Protocol:
Dynasys Modified SimpliCiTI

Communication Interface:
Standard: RS-232 serial
Optional: Ethernet LAN, WiFi 802.11 b/g wireless LAN

Components:

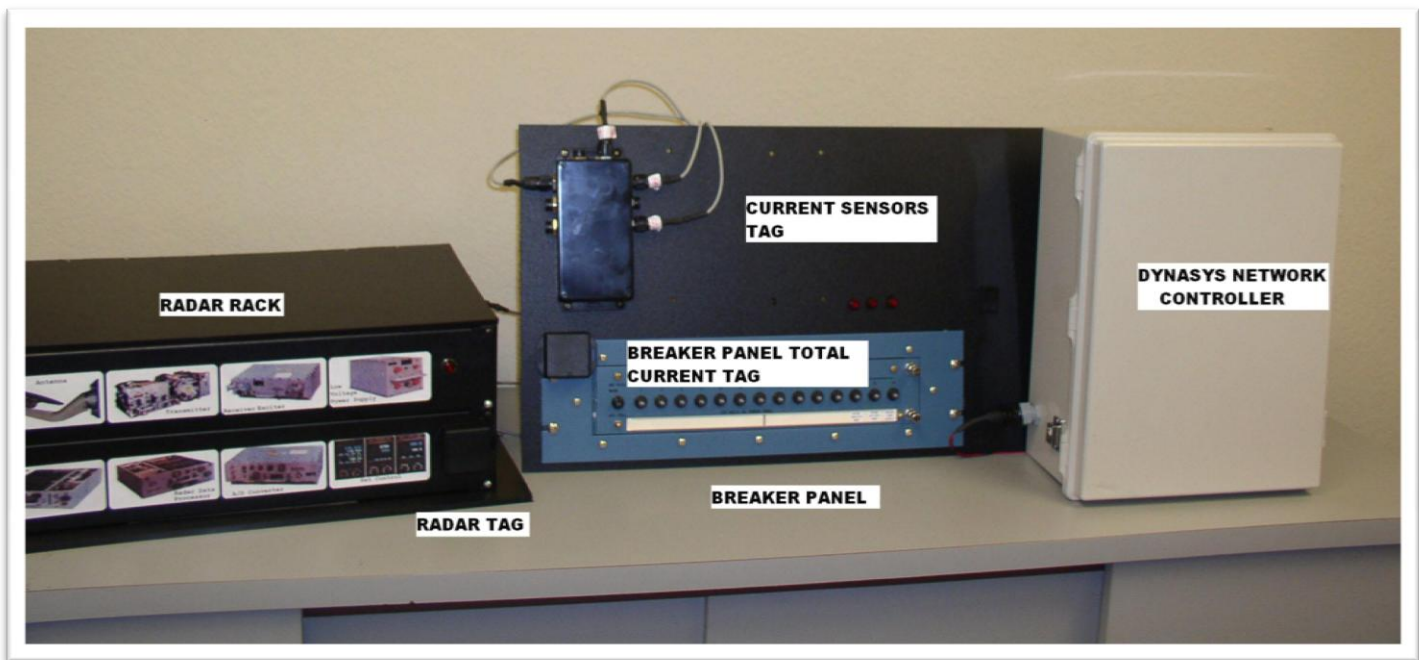
1. JRAMS Software-Information Management Database System by SwRI.
2. SeRFNet Controller- Controls Local communication and data uploads to Central Database
3. SeRFNet Collector- Collects sensor data and uploads to the Controller.
4. SeRFNet Current Sensor- Fast response sensor to monitor current and ON/OFF times.
5. SeRFNet RFID Tag- Identifies unique items, also collects data like temperature and RF signal strength. High Temperature rated.
6. SeRFNet Range Extender- Extends local network range and connectivity.



An example of such a system is the USAF Joint Reliability Availability Management System (JRAMS). The JRAMS is an integrated information management system that provides a suite of analysis tools to aid personnel with decision support and equipment management. The system uses a variety of external system interfaces to obtain data for further processing and analysis. The data obtained, in conjunction with the internal processing of the system, enable system applications to provide users with the means to assess key metrics required like availability, reliability, maintainability, and operational performance for planning, decision support, and monitoring mission critical activities.

Item Name	WUC	NSLN	PSL PNE	Core CD	00101 Freq	Tag Hours	M108	MTBF	Tag Range	Average Range	Amp Threshold
APQ-180 Transmitter LRU	72WC1	002791357	3263843	01456	41100001	159	182	87%	196.3	1.2	1.5
AQP-180 Receiver/Extender LRU	72WB0	014891000	3173035-117	40884	41100002	309	247	84%	246.3	1.2	1.5
AQP-180 Antenna LRU	72WC0	014878407	3173032-105	82577	41100003	379	263	91%	296.3	1.3	1.5
APQ-180 Radar Data Processor LRU	72WCC	010350744	253957-1	82577	41100004	309	332	93%	346.3	1.2	1.5
APQ-180 Signal Data Processor LRU	72WCD	010350744	253957-1	82577	41100005	359	397	90%	396.3	1.2	1.5
APQ-180 Analog to Digital Converter LRU	72WPF	013100180	3173037-100	82577	41100006	159	182	87%	196.3	1.2	1.5
APQ-180 Power Supply LRU	72WGW	013100180	3173037-100	82577	41100007	209	232	90%	216.3	1.2	1.5
AQP-180 Sec Control LRU	72WH0	011928112	3173912-100	82577	4110000A	209	437	87%	216.3	1.2	1.5
AIQ-172 PB Receiver LRU	76KAD	013252225	26247010003	28527	42100001	346	247	96%	390.5	1.3	1.5
AIQ-172 PB Transmitter LRU	76KCD	011521792	26247021003	28527	42100002	346	332	104%	390.5	1.3	1.5
AIQ-172 Signal Controller LRU	76LL0	013864412	121A812-1	03610	43100004	326	332	98%	356.8	1.2	1.5
					44100001	346	1422	39%	891.8	3.8	100.2

JRAMS RFID demo screen showing a given aircraft along with its location, inventory of critical items, unique ID, and on-time since commission based on a true measured MTBF. The system also has the ability to generate other alarms such as current overload and equipment overheating.



PICTURED JRAMS RFID DEMO EQUIPMENT INCLUDES A NETWORK CONTROLLER, A MULTIPLE CURRENT SENSOR CHANNEL TAG, A RADAR RACK AND TWO RFID TAGS.

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    <LRU Type="72W006" Radio="41100006" Minutes="1199" Amps="1468.8" />
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    <LRU Type="72W008" Radio="41100008" Minutes="1160" Amps="1456.4" />
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Example XML batch file transferred from the controller to the JRAMS system.

-Each LRU part is uniquely identified by an RFID tag that also keeps the ON time and its current consumption data.

-Shown are 2 collector units with 8 channels each, supporting 23 LRU's.