## 2.6 Tune-up procedure not to exceed maximum TX power

A CSV file (configuration file) per transmitter are created by the NOC engineer based on the installation parameters such as line lengths, antenna type etc. **The TX output power level setting is contained in the CSV file**.

The output power is adjusted by the 'PA gain" setting. This value in the CSV file is calculated by a formula to set the output power (not to exceed 30W ERP). The variables used in the calculation include PA Gain (Gpa), TX Antenna Gain (Gant), TX filter insertion loss (ILflt), internal cable loss (ILint), external cable loss (ILext), and transceiver output power (PTCVR).

$ERP\ (W) = 10^{((P_{TCVR} - IL_{int} + G_{pa} - IL_{flt} - IL_{ext} + G_{ant}) / 10)} / 1000$

The PA gain setting should be set to a proper value so that total sum of net antenna gain and cable loss coupled with PA output does not exceed 30 Watts EIRP, PEP (Peak Envelope Power) . Table 2 is a list of all possible antennas and RF cable combinations with corresponding RF power settings required to comply with the FCC requirement of 30 Watts EIRP Peal Envelope Power (PEP).

| Tx Band | PA Gain (dB) | PA out (dBm) | Antenna Type | Antenna Gain (dBd) | Cable Loss (dB) | ERP (dBm) | ERP (W) (PEP) |
|---|---|---|---|---|---|---|---|
| 2 MHz | 60.3 max | +41.53 | DB586-Y | 6.0 | 2.8 min | +44.73 | 29.7 |
| | 61.0 max | +42.23 | SC433-HF6LDF | 2.5 | 0.0 min | +44.73 | 29.7 |
| | 60.3 max | +41.53 | BCD-8707 | 6.5 | 3.3 min | +44.73 | 29.7 |
| | 60.6 max | +41.83 | OD9-5 | 2.9 | 0.0 min | +44.73 | 29.7 |
| IDB Mode A or B 2 MHz channel | 59.0 max | +41.56 | DB586-Y | 6.0 | 2.8 min | +44.76 | 29.9 |
| | | | SC433-HF6LDF | 2.5 | 0.0 min | +44.06 | 25.5 |
| | | | BCD-8707 | 6.5 | 3.3 min | +44.76 | 29.9 |
| | | | OD9-5 | 2.9 | 0.0 min | +44.46 | 27.9 |
| IDB Mode A or B 5 MHz channel | 59.0 max | +41.33 | DB586-Y | 6.0 | 2.8 min | +44.53 | 28.4 |
| | | | SC433-HF6LDF | 2.5 | 0.0 min | +43.83 | 24.2 |
| | | | BCD-8707 | 6.5 | 3.3 min | +44.53 | 27.9 |
| | | | OD9-5 | 2.9 | 0.0 min | +44.23 | 26.5 |

Table 2 Maximum allowable RF power settings with various antenna/cable

Note 1: PA module provides means of RF Gain control in steps of 0.1 dB from 0 to 65 dB. Maximum PA Gain values listed in the table2 are required to ensure that conducted and radiated spurious emission standards of Part 90 are met . The difference of PA output

levels between 2 MHz and IDB mode is compensated using internal RF attenuation that can be set remotely by NOSS engineers to ensure that 30 Watts ERP is met in both cases.

# 3 Technical Specifications

| Parameter | Value/Description |
|---|---|
| Modulation | BPSK modulation with CDMA spreading |
| Maximum ON time | 200ms/1second |
| Duration of a single burst | 100ms |
| Center Frequencies | 926.227MHz for single 2 MHz band and in IDB band Type B<br>920.773 MHz for 2 MHz IDB band Type A<br>924.692 MHz for 5MHz in IDB band Type A and B |
| Necessary Signal Bandwidth | 2.046MHz for single band,<br>5.115MHz for IDB band Type A & B |
| Frequency Stability | <10ppb |
| EIRP | 30W ERP ` |
| Data Rate | 99 bits in a 100ms slot |
| Power Supply | Nominal: 110 VAC (primary means)<br>48 VDC (secondary means – battery backup) |
| Power Consumption | 330 W max, 140 W average, 7.5A |
| Operating Conditions | -40°C to +50°C, plus solar radiation<br>0 to 95% humidity, non-condensing |
| Remote Monitoring | Via SNMP protocol |
| Environmental Standard | IP66 |