# BILL OF MATERIAL AND EQUIPMENT LOCATIONS

## EQUIPMENT:

<table>
<thead>
<tr>
<th>EQUIPMENT</th>
<th>LOCATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>RUM WIRELESS TRANSPONDER</td>
<td>(1) PER PEDESTAL</td>
</tr>
<tr>
<td>CELLULAR BASE STATION</td>
<td>(1) PER FACILITY- INSTALLED CENTRALLY ON BUILDING</td>
</tr>
<tr>
<td>* 6DBI LAN OMNI-DIRECTIONAL ANTENNA</td>
<td></td>
</tr>
<tr>
<td>* 20' LMR-400 COAX CABLE</td>
<td></td>
</tr>
<tr>
<td>* MOUNTING BRACKET</td>
<td></td>
</tr>
<tr>
<td>NETWORK REPEATERS (IF REQUIRED)</td>
<td>(1-4) PER FACILITY- INSTALLED PER COVERAGE PLAN/AERIAL SURVEY</td>
</tr>
<tr>
<td>SOFTWARE AS A SERVICE AND SUPPORT (SAASAS)</td>
<td>ANNUAL SERVICE CONTRACT INCLUDES SYSTEM COMMISSIONING, DATA PLAN, ONLINE REPORTING AND TECHNICAL SUPPORT. FIRST YEAR SAASAS INCLUDED WITH PURCHASE</td>
</tr>
</tbody>
</table>

## NETWORK DIAGRAM

- **RUM** Remote Utility Monitoring & Control
- **BASE STATION**
- **RF** Radio Frequency
- **Cellular**
- **Internet (Cloud Based)**
- **Data is stored in MarineSync’s Cloud**
- **Access usage reports, billing info and control features from any Web-Enabled Device**

Wireless transmission from Pedestal to base station to Internet/database (cloud) reporting tools/software, accessible from any internet enabled computer or device.
REMOTE METER READING SYSTEM
PRODUCT INFORMATION
DATE: 05/04/14

PART: WIRELESS RUM TRANSPONDER
P/N RM0100.000

MANUFACTURER:
MARINESYNC CORP.

LOCATION:
ONE PER PEDESTAL

INSTALLED BY:
PEDESTAL MANUFACTURER
A WIRELESS TRANSPONDER WILL BE LOCATED INSIDE THE TOP OF EACH PEDESTAL. EACH TRANS PonDER HAS THE CAPABILITY TO WIRELESSLY TRANSMIT UP TO FOUR (4) OUTPUTS. THE UNIT WILL BE PREWired BY THE PEDESTAL MANUFACTURER.
A WIRELESS TRANSPONDER WILL BE LOCATED INSIDE THE TOP OF EACH PEDESTAL. EACH TRANSPONDER HAS THE CAPABILITY TO WIRELESSLY TRANSMIT UP TO FOUR (4) OUTPUTS. THE UNIT WILL BE PREWIRED BY THE PEDESTAL MANUFACTURER.
**WIRELESS TRANSPONDER – TECHNICAL SPECIFICATION**

**Size:** 5" x 4.2" x 1.9" (127mm x 106mm x 48mm)

**PCB:** Conformal Coated, Lead-Free & RoHS Compliant

**Enclosure:** Polycarbonate 3-Piece

**Ingress Protection:** IP64 / Outdoor Rated

**Input Voltage:** 12-24 VDC

**Power Consumption:** 500mW typical, 1900mW peak

**Operating Temperature:** -22°F - +158°F (-30°C - +70°C)

**Radio:** 915 MHz ISM Band Direct Sequence Spread Spectrum

Compliant to IEEE 805.15.4

FCC and Industry Canada Certified

**Protocol:** 802.15.4 (WPAN) - Mesh

**Inputs**

- **Meter:** (4) dry-contact / open collector compatible for interfacing pulse output meters
- **Ground Fault:** (1) analog input for measuring ground fault currents. Measurement range 0mA to 1000mA with 1mA resolution. Integral CT burden resistor and scaling circuits.
- **Digital:** (2) dry contact / open collector inputs for interfacing tamper or external sensor / switch

**Outputs**

- **Load Disconnect:** (2) Channels driving @ 12VDC
- **Relay:** (2) 1-FORM-C, 5A, 30VDC/125VAC contact rating
- **LED:** (3) Open-drain PWM Outputs driven using supply voltage
- **Ground Fault LED:** Open-collector or open-drain output for driving LED. 100mA sink current max.

**Expansion**

- **I2C (3.3 VDC) 2mm JST**

**Wiring**

- (1) 4-Position, 3.5mm Removable Screw Terminal Connector
- (2) 12-Position, 3.5mm Removable Screw Terminal Connector

**Warranty**

- 2-Years
PART: LAN ANTENNA
P/N CA2002.000

MANUFACTURER: L.COM FOR MARINESYNC CORP.

LOCATION: ON SHORE NEAR OR ON DOCKMASTER BUILDING

INSTALLED BY: INSTALLING CONTRACTOR
LAN ANTENNA –/ MOUNTING

MOUNTING

THE ANTENNA SHOULD BE MOUNTED ON OR NEAR THE DOCKMASTER BUILDING WHERE THE BASE STATION IS LOCATED. THE DIAGRAM TO THE LEFT SHOWS A TYPICAL MOUNTING SET-UP FOR THE ANTENNA. THE METAL MOUNTING BRACKET IS INCLUDED.

MOUNTING INSTRUCTIONS

1. Attach mounting bracket to mast as shown using (2) U-bolts and supplied hardware.

2. Remove antenna mounting bolt and washer from antenna base.

3. Insert antenna into mounting bracket and secure with washer and antenna mounting nut. Do not over tighten.
LAN ANTENNA SPECIFICATIONS

ELECTRICAL SPECIFICATIONS

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>P/N</td>
<td>CA2002.000</td>
</tr>
<tr>
<td>Frequency</td>
<td>824 - 960 MHz</td>
</tr>
<tr>
<td>Gain</td>
<td>6 dBi</td>
</tr>
<tr>
<td>Vertical Beam Width</td>
<td>30 Degrees</td>
</tr>
<tr>
<td>Horizontal Beam Width</td>
<td>360 Degrees</td>
</tr>
<tr>
<td>Polarization</td>
<td>Vertical</td>
</tr>
<tr>
<td>Impedance</td>
<td>50 Ohm</td>
</tr>
<tr>
<td>Max. Input Power</td>
<td>100 Watts</td>
</tr>
<tr>
<td>VSWR</td>
<td>&lt; 1.5:1 avg.</td>
</tr>
</tbody>
</table>

MECHANICAL SPECIFICATIONS

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connector</td>
<td>Integral N-Female</td>
</tr>
<tr>
<td>Weight</td>
<td>2.4 lbs. (1.1 Kg)</td>
</tr>
<tr>
<td>Length</td>
<td>23.6 in. (600 mm)</td>
</tr>
<tr>
<td>Diameter</td>
<td>1.3 in. (33 mm)</td>
</tr>
<tr>
<td>Radome Material</td>
<td>White Fiberglass</td>
</tr>
<tr>
<td>Mounting Mast Size</td>
<td>1.2 to 2 in. Dia. (31.7 to 50.8 mm dia.)</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>-40°C to 85°C (-40°F to 185°F)</td>
</tr>
<tr>
<td>Rated Wind Velocity</td>
<td>108 MPH (173km/h)</td>
</tr>
<tr>
<td>RoHS Compliant</td>
<td>Yes</td>
</tr>
</tbody>
</table>

RF ANTENNA PATTERNS

![RF Antenna Patterns]
REMOTE METER READING SYSTEM
PRODUCT INFORMATION
DATE: 05/04/14

PART: CELLULAR BASE STATION
P/N: MS0202.000

MANUFACTURER:
MARINESYNC CORP.

LOCATION:
DOCKMASTER BUILDING

INSTALLED BY:
INSTALLING CONTRACTOR
Base Station Technical Specs.

**Size:** 10.26” x 12.14” x 6.13” (261mm x 306mm x 156mm)

**Enclosure:** NEMA 4X, Non Metallic

**Ingress Protection:** IP66/ Indoor/Outdoor Rated

**Input Voltage:** 120/240 VAC, 50/60Hz

**Battery Backup:** Internal Lead-Acid, ±6 Hours of backup

**Operating Temperature:** -4°F − +149°F (-20°C − +65°C)

**GSM / GPRS:** Quad Band EGSM 850/900/1800/1900 MHz
   - Class 4 (2W) @ 850/900 MHz
   - Class 1 (1W) @ 1800/1900 MHz

   FCC, PTCRB and Industry Canada Certified

**Warranty:** 2 Years
REMOTE METER READING SYSTEM
PRODUCT INFORMATION
DATE: 05/04/14

PART: WIRELESS REPEATER
P/N: MS0203.000

MANUFACTURER: MARINESYNC CORP.
LOCATION: PER SPECIFIED PLAN
INSTALLED BY: INSTALLING CONTRACTOR
Repeater Technical Specs.

**Size:** 8.44” x 6.44” x 4.71” (214mm x 163mm x 119mm)

**Enclosure:** NEMA 4X, Non Metallic

**Ingress Protection:** IP68/ Indoor/Outdoor Rated

**Input Voltage:** 120/240 VAC, 50/60Hz

**Battery Backup:** Internal Lead-Acid, ±6 Hours of backup

**Operating Temperature:** -4°F – +149°F (-20°C – +65°C)