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# **Digital Satellite Receiver MHA-1024A / HRIT / IS-VISSR Specifications**

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***ORIENTAL ELECTRONICS, INC.***

*We always pursue the future for human life with electronic technology*

# Digital Satellite Receiver M-1024A for HRIT / IS-VISSR

## 1. Introduction

The Meteorological Digital Satellite Receiver, Model M-1024A is designed for capturing HRIT or IS-VISSR broadcast signals from the Geostationary Meteorological satellites such as MTSAT (Japan) or FY-2 (China) series satellites.

HRIT (High Rate Information Transmission) is defined as a standard for dissemination of satellite observation data from MTSAT Geostationary satellite towards to the high resolution ground users directly. HRIT data transmission uses high rate communication links from the satellite to the ground stations, generally at 3.5Mbps (0.256 Mbps through 10 Mbps).

IS-VISSR (Improved Stretched Visible Infrared Spin Scan Radiometer) is defined as a standard for dissemination of satellite observation data from FY-2 series satellites operated by CMA.

## 2. Communication Link Parameters of the Satellites

There is only a down-link transmission service from the MTSAT/FY2 satellites to the ground station. The physical layer of transmission parameters of satellite communication link are specified as follows.

(1) Parameters of MTSAT/HRIT communication link (broadcasting from MTSAT-1R)

Items	Parameters
Center Frequency	1687.1MHz
EIRP	25.0 dBw
Polarization	Linear (Perpendicularity to orbital plane)
Band width	5.2 MHz (99% of total power)
Pulse shaping	Root Raised cosine, roll-off factor $\alpha = 0.5$
Total coded data rate	3.5 Msps
Modulation	PCM/NRZ-M/QPSK
Concatenated Coding	Reed-Solomon(255,223) + convolutional coding (1/2 rate, k=7)
Packetized data rate	3.5 Mbps (on CVCDU level)
Length of coded CVCDU	1020 octets

(2) Parameters of FY-2/IS-VISSR communication link

Items	Parameters
Center Frequency	1687.5 MHz
EIRP	57±1.5 dBm

Band width	Less than 2MHz (99% of total power)
Total coded data rate	660Kbps
Modulation	DPSK / PCM
Frame length	364848 bits (including SYNC code)
Coding scheme	Byte complementing and PN scrambling
Sequence of bits	Most Significant Bit (MSB) first

### 3. Major Specifications

MTSAT-2 and FY-2D/E satellites have one visible and four infrared imager sensors. The observation timetable of MTSAT-2 will consist of alternate full-disk and half-disk observations basically every 30 minutes. In case of FY-2D/E, it is every hour.

#### 3-1. Image Data Type

Processing Channels :	VIS, IR1, IR2, IR3, IR4
VIS (VNIR) :	0.55 - 0.90 $\mu$ m (cloud cover, solar reflective band)
IR1 (TIR1) :	10.3 - 11.3 $\mu$ m (SST and water vapor)
IR2 (TIR2) :	11.5 - 12.5 $\mu$ m (SST and water vapor)
IR3 (MWIR2) :	6.5 - 7.0 $\mu$ m (water vapor)
IR4 (MWIR1) :	3.5 - 4.0 $\mu$ m (nighttime cloud cover)

#### 3-2. Image Format

Image Resolutions :	1km (VIS) and 4km (IR) at a sub point
Brightness levels :	10 bits (1,024 levels) for all channels
Full Earth's Disk Image :	VIS 11,000 lines x 11,000 pixels IR 2,750 lines x 2,750 pixels
Half Earth's Disk Image :	VIS 5,500 lines x 11,000 pixels IR 1,375 lines x 2,750 pixels

#### 3-3. RF Specifications

Transmission Frequency :	1687.1 MHz for MTSAT or 1687.5 MHz for FY-2
Modulation Method :	2.3 Mbps PCM/NRZ-L/QPSK, Bandwidth : 2 MHz 660kbps for FY-2 ES-VISSR

#### 3-4. IF Specifications

Input IF frequency :	132.2MHz (MTSAT/HRIT) 134.6MHz(FY-2/ES-VISSR)
Reception method :	PLL digital synthesizer

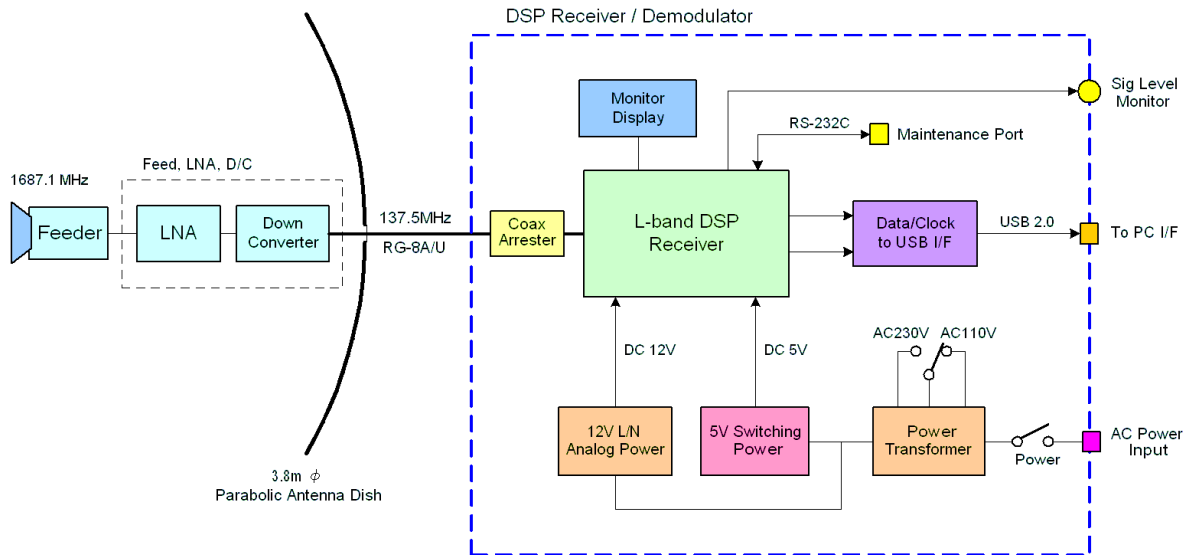
#### 3-5. Interface Specifications

Host Interface	USB 2.0 exclusive base-band connection
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#### 3-6. General Specifications

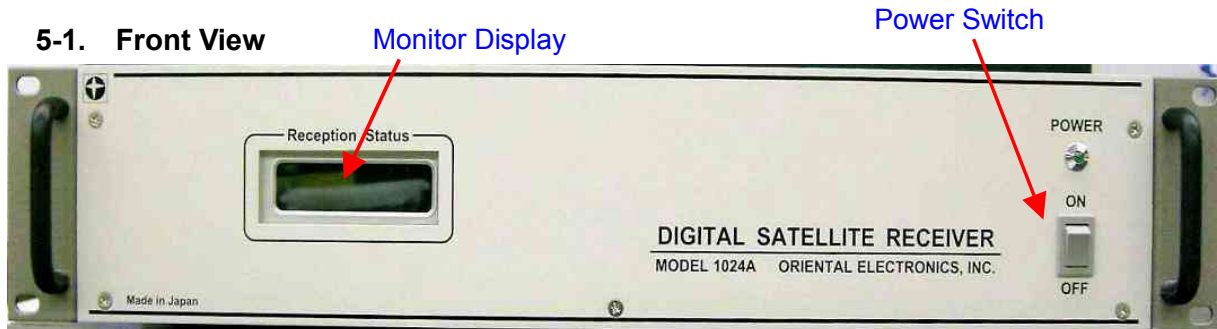
Input Power Source	AC220 – 240V 50Hz, Max 1A
Physical Dimensions	430/480(W), 350(D), 88(H) mm, 4 kg
Operational Environment	0 to +40 C-deg, 20 to 95%RH with no condensation

## 4. Schematic Diagram



## 5. External View

### 5-1. Front View



### 5-2. Rear View

