



## IP Long Range Data Links *On-the-move*

### Platforms

- UAV, RPAS, Drones
- Rotary & Fixed-Wing Platforms
- Control Stations
- Vehicles, Rovers, Handheld Units
- Ground Communications
- Launchers, Balloons
- Stratospheric Platforms

### Applications

- ISR Data Links
- Telemetry & Video Streaming
- Commanding & Control (C2)
- Radio Control Range Extender
- Wireless Mesh Networks

**S-6000** dual transceivers are miniaturised high-performance data links, designed to provide reliable wideband communications, under high-dynamics, for UAV, Drones, and other critical platforms.

The two full-duplex channels operate at any frequency between 70 MHz and 6 GHz, with data rates from 700 Kbps to 78 Mbps. FDMA and TDMA multiplexing allow point-to-point, point-to-multipoint, and mesh networks (MANET) with configurable time slots, regenerative data relay, and dynamic routing capabilities.

The data link has a rugged design for operating in harsh environments, featuring extended temperature range, conduction cooling, IP67 aluminium enclosure, and vibration/shock robustness. It enables on-the-move communications for any tactical system, commercial application, airborne platform, or ground vehicle.

The series includes a rack-mount unit for control stations, with flexible interfaces, AC power supply, higher power amplifiers, and a 5" LCD touchscreen.

With the unique capabilities of the S-6000 transceivers, it is possible to setup a synchronised wireless network between distant users moving at high-speed, without the need for external timing sources (GPS not needed).

## Specifications

	U6000	C6000	R6000
Signal	Ultra-Compact	Compact	Rack Mount
Frequency Bands	70 MHz to 6 GHz		
Waveform	Proprietary COFDM <i>Configurable Modulation &amp; Coding Rate</i>		
RF Bandwidth	1 MHz to 30 MHz		
Data Rate	700 Kbps to 78 Mbps per channel		
Max. RF Output Power	30 mW	2 W <i>UHF, L, S</i>	5 W <i>UHF, L, S</i> 8 W <i>C-band</i>
Power Amplifiers	-	1x HPA	1x or 2x HPA
Multiple Access	FDMA, TDMA		
Networking	Configurable Mesh, MANET, Data Relay		
MIMO Diversity	MRC <i>Option</i>		
Encryption	AES-128 <i>Option</i>		
<b>Interfaces</b>			
RF Connectors	4x SMA 50Ω	4x SMA 50Ω	4x N-type 50Ω
Ethernet	1000BASE-T, RJ-45 connector		
Circular Connector MIL-DTL D38999	6 contacts	13 contacts	-
Auxiliary Connectors	1x SMA 50Ω	1x D-sub 9	2x D-sub 9 6x BNC 75Ω 1x BNC 50Ω
Serial Interfaces	RS232, RS422/485, UART, SBUS		
Reference Clock Output	Up to 100 MHz <i>Option</i>		
Input Power Supply	+12 to +30 VDC <i>2x D38999 contacts</i>	+24 to +30 VDC <i>6x D38999 contacts</i> Maximum Rating: +35VDC	85 to 264 VAC 47 to 63 Hz
Current Consumption	≤ 0.5A @28VDC	≤ 0.7A @28VDC	≤ 0.6A @230VAC
<b>Mechanical</b>			
Dimensions	165x110x37 mm	165x110x50 mm	228.6x203.2x88 mm
Weight	750 g	1.05 Kg	~3.5 Kg
Material	Aluminium 6061		
LCD Display	-	-	5" Touchscreen 800x480
<b>Environmental</b>			
Operating Temperature	-40°C...+85°C	-40°C...+75°C	-25°C...+70°C
Storage Temperature	-55°C...+100°C	-55°C...+85°C	-30°C...+85°C
Ingress Protection Rating	IP67	IP67	-
Temperature, Vibration, Shock	MIL-STD-810		
EMI/EMC	MIL-STD-461		
Electrical Power	MIL-STD-704		
Voltage Transients	MIL-STD-1275, DO-160		
RoHS	Yes		
Export Classification	NLR, ITAR-free		
<b>Options &amp; Support</b>			
Included	12 months of Maintenance and Remote Support Configuration and Control Software Circular Connector Cable Assembly		
Options	MIMO, AES-128 Encryption, Custom Interfaces Ground and Airborne Antennas External Low Noise Amplifiers (LNA) On-site Integration Support and Training		

### One Hub for all your Links

Multiple devices can be connected simultaneously to the Ethernet and serial interfaces. Commanding & Control (C2), Telemetry, Audio, and Video streaming may be managed by a single transceiver.

### Flexibility

The two transmitter and receiver channels can be configured to setup two full duplex links, a multi-band modem, or a TDMA network. Any RF from 70 MHz to 6 GHz is possible, covering VHF, UHF, L, S, and C-bands.

### High-Dynamics

Advanced proprietary algorithms ensure stable data links under high-dynamic conditions (>2000 Km/h, >10g).

### Mesh Networking (MANET)

The transceivers implement a robust TDMA with configurable nodes (master or slave, with relay and mesh capabilities) to setup any network topology, without the need for external synchronisation (GPS not needed).

A caching system manages data peaks over the maximum bandwidth, ensuring stable communications of variable data flows (e.g. video streaming).

### Regenerative Data Relay

Any transceiver can be configured as a regenerative data relay, extending point-to-point range, and enabling dynamic routing between network nodes.

### Low SWaP-C

The units have been designed to minimise size, weight, power, and cost, while ensuring performance and robustness for critical platforms.

### Ruggedisation

S-6000 transceivers have a foolproof design for operating in harsh environments, including extended temperature range, vibration/shock and EMI/EMC robustness, IP67 waterproof, and power supply protections.

### Easy Configuration

A Commanding & Control protocol allows local and remote configuration and status monitoring of the transceivers through the Ethernet interface.

**Data Link**

S-6000 dual transceivers are designed to establish reliable long-range communications under high velocity, acceleration, jerk, and shock conditions.

The flexible data link allows the selection of the RF band, data rate, and transmitted power; meeting any range, platform, and regulatory requirements.

U6000/C6000 are rugged, miniaturised transceivers for aerial and ground platforms, while R6000 is a rackmount equipment for control stations. The two transceivers per unit and the IP capabilities enable:

- Any TDMA network with configurable nodes.
- Up to two full duplex communication channels.
- A multi-band modem with configurable RF bands.
- The use of terminals as regenerative data relays.
- Controlling several air vehicles simultaneously from a ground station using TDMA and IP multicast.
- Simultaneous reception of telemetry data streams from several air vehicles in a single ground station.

**Interfaces**

**Data Ports**

The units are connected directly to the Gigabit Ethernet interface to transfer IP data packets through the wireless link (telemetry, video, audio, commands), working as a network bridge transparent to the user.

RS232/422/485, SBUS, or UART data interfaces are also available using D-sub or circular connectors.

**Power Supply**

For airborne units, input DC power supply is provided through the circular connector (default) or using the auxiliary D-sub interface. It includes EMI filtering, overcurrent, and reverse voltage protections. The transceiver withstands voltage transients (spikes, surge) according to MIL-STD-1275 and DO-160.

R6000 VAC input power supply features overcurrent and short circuit protections.

**Outputs**

The transceivers may provide the following configurable outputs through the D-sub, BNC, and RF interfaces:

- +5VDC output to supply external devices.
- Reference clock signals up to 100MHz.
- AGC/AM outputs for Antenna Control Units.
- Custom CMOS/TTL/LVDS and analogue signals.



R6000 Dual Transceiver – Rear Panel

**Environment**

S-6000 are qualified communication systems for Drones, UAVs, helicopters, fixed-wing aircrafts, ground vehicles, control stations, and launchers; delivering superior performance in harsh environments with optimised size, weight, and power consumption.

They are a robust solution for aerial platforms with limited payload capabilities and cost budget, but demanding range, environmental, and reliability requirements.

The extended operating temperature range is based on a conduction-cooled design and IP67 waterproofing as per IEC 60529 specification. The units are compliant with MIL-STD-704 (Electrical), MIL-STD-461 (EMI/EMC) and MIL-STD-810 (Temperature, Vibration, Shock).

**Configuration & Status Monitoring**

A proprietary IP protocol allows configuration and status monitoring of the transceivers, both locally through the Ethernet interface, and remotely via the wireless link.

The protocol is used to configure network, waveform, interfaces, encryption, and TDMA parameters. Periodic monitoring includes signal (EVM, Eb/N0, BER, RSSI) and system status indicators (BIT). Configuration and control software, and ANSI C drivers for integration in customer application, are available.

R6000 units include a 5” sunlight readable touchscreen for configuration and status monitoring, including real-time plots of the received constellations. Touchscreen is synchronised with local and remote commands, ensuring parameters integrity within the wireless network.

**Integration Support**

BERTEN provides dedicated on-site service for a fast deployment of the data link in your platform. It may include integration support, antennas procurement, and RF components selection, interfacing and cabling.

Qualified airborne and ground station antennas (Omnidirectional, Hemispherical, Sector, or Directional) are available to deliver a complete long-range communication solution.

Integration support also includes the definition and adaptation of the interfaces with other payload elements, including autopilots, radio controls, IP cameras, gimbals, and on-board computers. A wide range of airborne and ground equipment can be PnP connected to S-6000 Transceivers.



S-6000 Dual Transceivers & Antennas

**Ordering Information**

Part Numbering <sup>(1)</sup> X 6000 - TX1 XX - RX1 XX - TX2 XX - RX2 XX - B1 XX - B2 XX - P X - XX - X - X

Model	
U	Ultra-Compact
C	Compact
R	Rack Mount

RF Band, MHz <sup>(2)</sup>	
N0	Disabled
U1	300-500
U2	800-1000
L1	1150-1350
L2	1350-1550
L3	1550-1750
L4	1750-1950
S1	2000-2200
S2	2200-2400
S3	2400-2600
S4	2700-2900
C1	4400-4600
C2	4700-4900
C3	5050-5250
C4	5250-5450
C5	5500-5700
C6	5700-5900

Bandwidth	Data Rate
01	1 MHz 0.7 to 2.5 Mbps
02	2 MHz 1.4 to 5.0 Mbps
05	5 MHz 3.7 to 13 Mbps
07	7.5 MHz 5.6 to 19 Mbps
15	15 MHz 11 to 39 Mbps
20	20 MHz 15 to 52 Mbps
30	30 MHz 22 to 78 Mbps

Power Amplifiers <sup>(3)</sup>	
0	No PA
1	TX1
2	TX2
3	TX1&TX2

Serial Interfaces	
R0	Disabled
R2	2x RS232
R4	1x RS422/485
B2	2x SBUS
U2	2x UART
RB	1x RS232, 1x SBUS
RU	1x RS232, 1x UART

MIMO <sup>(4)</sup>	
N	No
R	MRC

Encryption	
N	No
E	AES-128

(1) Contact us for non-listed RF band, bandwidth, serial interfaces, and auxiliary input/outputs.  
 (2) Any frequency can be set by IP commands within the selected RF Band.  
 (3) P1 and P2 options are available for C6000 and R6000. P3 is only available for R6000.  
 (4) MIMO MRC requires RX1=RX2 and B1=B2.