Digital Receiver Technology, Inc.

Approved for Public Release

DRT2311C and DRT2312C

DESCRIPTION

Wideband N-Channel Transceiver System

The DRT2311C is a compact Wideband N-Channel Transceiver platform for third generation DRT hardware modules. The DRT2311C provides the same functionality as the DRT2301C, but the DRT2311C I/O connectors are located on the rear of the chassis adding 1U of height. In addition, the modules are recessed behind a removable panel which contains an air filter.

DRT2312C – DC powered-version of the DRT2311C. Same features and accessories, but DC power input replaces AC power input. AC/DC adapter included.

- Customizable transceiver module configurations with up to sixteen digital transceivers (eighteen analog transceivers) for up to 32 RF Channels (36 Analog RF Channels).
- Flexible tuner configuration provides frequency coverage of all bands of interest.
  - RFT3A-40: Dual channel transceiver VHF/UHF coverage from 20-3000 MHz; HF coverage from 0.5 – 32 MHz usable (1.7 MHz – 30 MHz full spec coverage)
  - RFT4: Dual channel transceiver VHF/UHF coverage from 20-6500 MHz; HF coverage from 0.5 – 32 MHz usable (1.7 MHz – 30 MHz full spec coverage)
  - HFT1B: High performance HF receiver from 0.2 - 32 MHz (usable) (Future)
- System architecture allows blocks of simultaneous groupings of coherent and independent RF channels, all software-reconfigurable. Channel groupings are restricted to blocks within a given module and by adjoining slots.
- Fast-scan step control via rear panel sync connector, front panel sync connectors and/or time of day.
- Utilizes DRT's third generation reference module (REF3-40). The REF3-40 provides:
  - 10 MHz I/O and 1PPS I/O.
  - Improved system phase noise relative to previous generation of DRT reference modules.
  - BIT/CAL source, 0.5 to 3000 MHz, with programmable modulation.
  - Built-in ovenized precision low-noise time base.
  - Commercial GPS receiver allows reference generator to be locked to GPS via external antenna or 1PPS signal fed by another GPS receiver. Can also generate a 1PPS signal for synchronization with other modules and systems.

- Two slots (18 and 19) available for DRT's second generation of Output Formatter Modules (OFM2):
  - Allows for various transport mechanisms based on implementation requirements.
  - First offering is DRT's fiber optic OFM2.
- DRT's fiber optic OFM2 provides half-duplex transmission/reception of a single RF channel over a single fiber optic link.
  - Provides fiber optic transceivers for interfacing a maximum of 32 RF channels (16 RF channels per OFM2) to external hardware.
  - Non-blocking switch backplane architecture allows for routing of any RF channel to any external fiber optic output and any external fiber optic input to any RF channel.
  - The OFM2 optical transceiver transmits and receives data using the VITA 49 transport layer protocol, and VITA 17.2 link layer protocol (SFPDP) at a rate of 3.125 Gbps. Transport protocol allows the embedding signal related information with data (e.g., gain, frequency, time of day).
  - The physical transport devices use a four-channel, 850 nm Vertical Cavity Surface Emitting Laser (VCSEL) transceiver conforming to the POP4 MSA (Four Channel Pluggable Optical Transceiver Multi-Source Agreement). The optical interface accepts industry standard MTP™(MPO) optical connectors. Example mating optical interface mating connector: Molex 86081-3030 MTP multimode connector, 50/125uM ferrule hole size.
  - Fiber run lengths up to 400 ft. will be supported with 500 MHz.km fiber.
- Gigabit Ethernet control interface (TCP/IP).
- 3U CompactPCI technology.

System Interfaces

- Gigabit Ethernet Control Interface (System Controller)
- VGA (System Controller)
- USB (System Controller)
- Multi-pin Fast Scan Sync Connector on the chassis rear provides total of 18 individual Fast Scan sync inputs, one to each tuner

The following interfaces are supplied via the REF3-40:

- 10 MHz In
- 10 MHz Out
- GPS In
- Fixed LO Out
- BIT Out
- RF CAL Out
- HF CAL Out
- IF CAL In
- MPIO
    - RS-232 (Time Code)
    - CAL Sync Out
    - 1PPS In
    - 1PPS Out
    - 1 Fast Scan In
    - 1 GPIO Out
    - 1 Antenna Control Analog Out
    - 5 Antenna Control Outputs
    - Audio Output
- 1PPS In
- 1PPS Out

Remaining interfaces are dependent on the number and type of modules installed in the system:

- Front Panel Fast Scan Sync – 2 Fast Scan sync inputs per RFT3A-40, up to 32 total with Digital or 36 with Analog Only RFT3A-40
- Up to 32 Digital RF Inputs or 36 Analog RF Inputs (RFT3A-40 or RFT4)
- Up to 32 Digital RF Outputs or 36 Analog RF Outputs (RFT3A-40 or RFT4)
- Up to 36 IF Inputs/Outputs (RFT3A-40 or RFT4)
- Up to 32 Digital HF Inputs/Outputs (RFT3A-40 or RFT4)
- Up to 32 Fiber Optic Inputs and 32 Fiber Optic Outputs (OFM2)

Supported Modules

The following third generation DRT hardware modules will be supported:

Module Name	Maximum Quantity Supported
RFT3A-40	16 (Digital), 18 (Analog)
RFT4	16 (Digital), 18 (Analog)
HFT1B (Future)	16 (Digital), 18 (Analog)
REF3-40	1
OFM2	2
System Controller	1

Physical and Environmental Specifications

Physical	19 in. rack mountable W x 8.75 in. H (5U) (48.26 cm W x 22.23 cm H) 18.44 in. (46.84 cm) depth from rear surface of front panel (mounting surface) to rear panel of unit. 19.50 in. (49.53 cm) depth from rear surface of front panel (mounting surface) to folded rear handles 79 lbs. (36 kg.) approximate weight, fully populated system weight with System Controller, REF3, 16 RFT3As, and 2 OFM2s
Operating Temp	-20°C to +60°C (-4°F to +140°F), system inlet air temperature, de-rated above sea level 1°C/1000 feet. (The optical transceivers on the OFM2 will not operate below 0°C. A warm-up period will be required for cold start temperatures below 0°C in order to raise system internal temperature above 0°C for OFM2 optical transceiver use.)
Storage Temp	-40°C to +75°C (-40°F to +167°F)
Operating Altitude[(1)]	0 to 3048 m (0 to 10,000 ft.)
Vibration[(2)]	
Operational:	The system will operate while exposed to RTCA DO-160E, Figure 8.1, Curve C, 1 Hr/Axis. The system will also meet MIL-STD-810F, Test Method 514.5, Procedure 1, Category 20, Per Figure 514.5C-3, 40 Min/Axis. RF performance may be degraded and will require vibration isolation to improve performance.
Non-operational:	The system will survive exposure to MIL-STD-810F, Test Method 514.5, Procedure 1, Category 24, Per Figure 514.5C-17, 1 Hr/Axis.
Shock, Operational and Non-operational	The system will remain continuously operational and meet all specifications while operating when subjected to MIL-STD-810F, Method 516.5, Procedure I, Per Figure 516.5-8, Functional Test for Ground Equipment, 3 shocks in each direction for each of 3 axes.
Acceleration	Forward/upward/backward/downward 5g
Humidity	95% non condensing
Power	2311C: 100 – 240 VAC, 50 – 60 Hz; 110 – 130 VAC, 400 Hz 2312C: 22-36 VDC
Power Consumption	For fully populated system power with one System Controller, one REF3, 16 RFT3As, and 2 OFM2s: 850 W Typical Independent Mode 650 W Two Groupings of 8 Tuners Coherent Mode

(1) Contact DRT regarding the possibility of operating beyond these altitude specifications.
(2) When mounting in a high-vibration platform such as an aircraft, we recommend using a vibration isolator to achieve optimum fidelity. Contact DRT for more information and latest testing results.

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