Digital Receiver Technology, Inc.

Approved for Public Release

DRT2183C

DESCRIPTION

Wideband N-Channel Transceiver System

The DRT2183C is a compact Wideband N-Channel Transceiver platform for the third generation of DRT hardware modules.

- Customizable transceiver module configurations with up to seven digital transceivers (eight analog transceivers) for up to 14 RF Channels (16 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.
- Gigabit Ethernet control interface (TCP/IP).
- 3U CompactPCI technology.
- Utilizes DRT's third generation reference module (REF3-40). The REF3-40 provides:
    - 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 that allows reference generator to be locked to GPS via an external antenna or a 1PPS signal fed by another GPS receiver. Can also generate a 1PPS signal for synchronization with other modules and systems.

- 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 simultaneously transmitting a maximum of 16 RF channels to external hardware. Future capability of fiber optic receive (RF transmit) to support a maximum of 4 RF channels from external hardware (Preliminary).
  - 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.

Supported Modules

The following third generation DRT hardware modules will be supported:

Module Name	Maximum Quantity Supported
RFT3A	7 (Digital), 8 (Analog)
RFT4	7 (Digital), 8 (Analog)
HFT1B (Future)	7 (Digital), 8 (Analog)
REF3	1
OFM2	1
System Controller	1

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 8 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 14 total with Digital or 16 total with Analog Only RFT3A-40
- Up to 14 Digital RF Inputs, 16 Analog RF Inputs (RFT3A-40 or RFT4)
- Up to 14 Digital RF Outputs, 16 Analog RF Outputs (RFT3A-40 or RFT4)
- Up to 16 IF Inputs/Outputs (RFT3A-40 or RFT4)
- Up to 14 Digital HF Inputs/Outputs (RFT3A-40 or RFT4)
- Up to 16 Fiber Optic Inputs and 16 Fiber Optic Outputs (OFM2)

Physical and Environmental Specifications

Physical	• Height: 4U (7 inches/17.78 cm); removable feet add 5/8 inch (1.59 cm). Remove feet with Phillips head screwdriver • Width: Basic body is 13 inches (33.1 cm) without slides. • Depth: Chassis is 11.5 inches (29.3 cm) from rear of mounting flange to folded handles. Mounting flange is 0.37 inches (0.94 cm) thick. Typical weight: 41.44 lbs. (18.9 kg) approximate weight. Weight varies with the number and type of modules installed. Chassis with System Controller and Reference Generator modules weighs 28 lbs (12.75 kg). See specific module data sheets for weights of additional modules.
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 Required	90-264 VAC, 47-400 Hz, or 22-36 VDC (User selectable)
Power Consumption	For fully populated system power with one System Controller, one REF3, 7 RFT3As, and 1 OFM2: 473 W Typical Independent Mode 397 W Two Groupings of 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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