Digital Receiver Technology, Inc.

**Approved for Public Release**

# DRT2301C and DRT2302C

## DESCRIPTION

### Wideband N-Channel Transceiver System

The DRT2301C is a compact Wideband N-Channel Transceiver platform for third generation DRT hardware modules.

**DRT2302C** – DC powered-version of the DRT2301C. 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 simultaneously transmitting a maximum of 32 RF channels (16 RF channels per OFM2) to external hardware. Future capability of fiber optic receive (RF transmit) to support a maximum of 8 RF channels (4 RF channels per OFM2) 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.
- 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. (48.26 cm) rack mountable x 4U High<br>Height: 4U - 7.0 in. (17.78 cm) without feet (feet are 5/8 in. (1.59 cm) tall and can be removed for rack mounting)<br>Width of Basic Body without Slides: 17.34 in. (44.04 cm)<br>Minimum overall depth with front handles detached and rear handles folded: 18.90 in. (48 cm)<br>Front handles add 1.75 in. (4.45 cm); unfolding rear handles adds 0.94 in. (0.24 cm)<br><br>71.32 lbs. (32.5 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** | 2301C: 100 – 240 VAC, 50 – 60 Hz; 110 – 130 VAC, 400 Hz<br>2302C: 22-36 VDC |
| **Power Consumption** | For fully populated system power with one System Controller, one REF3, 16 RFT3As, and 2 OFM2s:<br>850 W Typical Independent Mode<br>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.



***12409 Milestone Center Drive, Germantown, MD 20876-7114***
***Phone: 855-401-4185 ~ Fax: 301-916-5787 ~ www.drti.com ~ international@drti.com***

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