

# Racal Instruments™

# 1257A

## Scalable RF Interface Unit

The Racal Instruments™ 1257A is a sixth-generation RFIU design with four Commercial Off-The-Shelf (COTS) options from 1U to 4U. It comes with a new easy-to-use LXI Core 2011-compliant device and new enhanced features.

### Key Features

- User-selectable standard configurations
- 1U through 4U sizes, in rackmount or benchtop configuration
- Choice of Dow-Key, Agilent, and/or Radiall relays with 18, 20, 26.5, and 40 GHz frequency options in terminated or unterminated relays
- Choices of switch topology – SPDT, DPDT, 2xSPDT, 3xSPDT, SP3T, SP4T, SP6T
- LXI/Ethernet, USB, and GPIB control interface
- Scalable – Up to 96 switch channels
- Front-pluggable relays for easy expandability and replacement in the field
- Relay counter

### Product Information

The Racal Instruments™ 1257A is a Commercial-Off-The Shelf modular RF interface unit (RFIU) that can be flexibly configured in order to meet specific application requirements. This unique scalable design enables you to select from a 1U to 4U size and specify the number, frequency range and switch topology of the relays to be installed by at the factory. Front pluggable relays with connectors enable easy service and high density within a small footprint.

The 1257A RFIU offers an LXI interface based on Ethernet with a discovery and web-based interface. It incorporates many high-level software commands for easier programming and faster development. The design keeps track of all relay operations and sets alarms for end of life, so you will know when they need to be replaced. This ensures that they won't fail in service or halt the production line.

The 1257A COTS RFIU's offer flexible configuration, modular architecture, and scalability in order to preclude the need to design and fabricate a fully custom RFIU solution for many applications. The benefits of utilizing a COTS solution are lower costs, faster delivery, and easier replication.

In those rare cases where a standard 1257A is unable to meet specific application requirements, we also offer the 1257A-C, a fully-customized engineered and fabricated RFIU solution, and the 1257A-D, a complete modular developmental kit that enables you to configure and self-assemble your RFIU.

#### Applications for the 1257A

Common applications for the 1257A RFIU include the testing of communications equipment in production/installation/

commissioning and the operational monitoring of RF, Microwave, and radar signals. It can be used for base station, satellite antenna, or ATE test applications.

Relays with a frequency range of up to 40 GHz can be selected to accommodate a wide range of signal types. In many cases, the RFIU is utilized for routing and switching signals from one or more UUT's or antennae to different RF test and monitoring equipment such as spectrum analyzers, frequency counters, and/or power meters.

#### Easily configured to your application requirements

In order to cost effectively address the wide range of application needs, the 1257A offers a broad range of pre-qualified relays that can be mixed and matched within the instrument chassis to suit individual requirements. The relays are front pluggable with connectors, and are available in a variety of frequency ranges, and switch topologies. Terminated or non-terminated relays, and extended life options are available.

#### Easy to Service and Support

Relays may be conveniently installed or removed from the front of the RFIU, and a full selection of pre-qualified spare relays are available for order. Additionally, relay counters provide visibility when components reach the end of their useful service life, enabling preventative maintenance instead of system downtime.

#### Easy to Control and Program

The 1257A comes standard with LXI/Ethernet, USB, and GPIB control interfaces. A rich SCPI command set and IVI drivers provide easy integration and compatibility with almost all software environments. This new LXI interface is

## Product Information

continued

based on Ethernet and offers discovery and a web-based interface. Programming has been simplified with the incorporation of powerful and easy-to-use commands and features:

- Path Names – Makes paths intuitive
- Scan Lists – Set up a list the will run automatically
- Relay Counter – Counts relay closures and tracks relay end of life

### Fully Documented System Performance

Prior to shipping, every specific path within the 1257A is fully tested. VSWR and

insertion loss are typical measurements, with the validation plots for the applicable frequency range delivered on a CD with the product for customer viewing and future evaluation. This initial system characterization data often proves useful for quantifying the service life in electro-mechanical switches, troubleshooting, and for determining calibration factors.

### 1257A COTS Relay Option Detail

Size	Relay Qty	Max # I/O Channels	Switch/Relay Options	Frequency/Connector Options	Term Options	Life & Indicator Options
1U	1 to 12	72	Dual SPDT, DPDT, SP3T, SP4T, SP6T mini relays	18 GHz; Coax	Open	2 M
2U	1 to 12	42	Top: 6x SPDT, SPDT Bottom: 6x SP4T, SP6T	20 GHz SMA 26.5 GHz SMA 40 GHz 2.9 mm	Open, 50 Ω	1 M/2 M/5 M Indicator
3U	1 to 16	96	SP3T, SP4T, SP6T	18 GHz SMA	Open	1 M
4U	1 to 12	96	SPDT, 2xSPDT, 3xSPDT, SP4T, SP6T, SP8T	18 GHz SMA 26.5 GHz SMA 40 GHz: 2.9 mm	Open, 50 Ω	2 M/2.5 M/10 M Indicator

Note: Block-off plates are provided for those openings not configured from the factory. Additional switching channels can be later added to the chassis by ordering and installing additional relays and their cables. Self-discovery of new components installed is facilitated by the software capabilities of the 1257A COTS.

## Specifications

Note: The Astronics Test Systems policy is one of continuous development and improvement. Consequently, the equipment may vary in detail from the description and specifications in this publication.

### Interface

#### Front Panel Indicators

- System Power Indicator
- LAN Status

#### Rear Panel Indicators

- Ethernet

#### Front Connections (1U and 2U)

- USB Type A

#### Rear Connections

- GPIB, USB Type B, Ethernet
- USB Type A (30, 40)

#### Front Panel Control

- System Reset

#### Rear Panel Control

- LAN Reset

#### Power Requirements

##### 1U Version

- Input voltage: 100 to 120/200 to 240 VAC
- Input frequency: 50/60 Hz
- Power Consumption: 420 VA max

##### 2U through 4U Version

- Input Voltage: 100 to 120/200 to 240 VAC
- Input Frequency: 50/60 Hz
- Power Consumption: 550 VA max

### Software

#### Native Language

- SCPI & SCPI scripting

#### Driver Support

- IVI(C and Com), LabView™ version 9.0\*

#### Web Page

- LXI Control v1.4 – LXI Core 2011 compliant device

### Environmental

#### Temperature

- Operating: 0° C to 50° C (Ethernet and USB)
- Storage: -40° C to 71° C

#### Relative Humidity

- 80% RH at 40° C

#### Emissions/Immunity

- EN61326:2006 Class B

#### Safety

- EN61010-1:2010-06

### Mechanical

#### 1U Version

##### Weight\*\*

- 10 lbs

##### Dimensions (base chassis)

- 1.73" H x 17.2" W x 16.00" D

#### 2U Version

##### Weight\*\*

- 13.5 lbs (6.1 kg)

##### Dimensions (base chassis)

- 3.47" H x 17.20" W x 16.00" D (with feet, 3.91")

#### 3U Version

##### Weight\*\*

- 14.1 lbs (6.4 kg)

##### Dimensions (base chassis)

- 5.22" H x 16.50" W x 16.59" D (19" W including rackmount front panel)

#### 4U Version

##### Weight\*\*

- 15.5 lbs (7.0 kg)

##### Dimensions (base chassis)

- 6.97" H x 16.50" W x 16.59" D (19" W including rackmount front panel)

\* Contact factory regarding other versions of LabView™

\*\* Actual weight is based on final configuration



# Ordering Information

continued

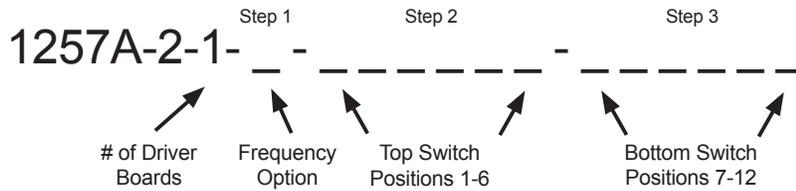
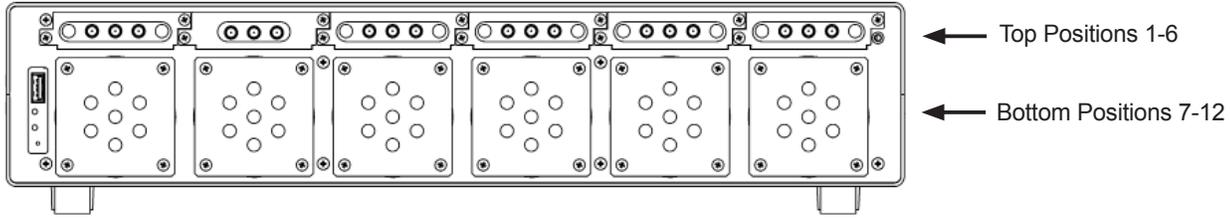
## 2U Version

1257A-2-1- - - - - : Racal Instruments™ 1257A-2

2U Scalable RF Interface Unit



1257A-2 (2U version)



### Instructions for creating the part number

**Step 1:** To create the first part of the part number, substitute the Frequency Code (single-digit letter) from the “Frequencies” table below for the “\_” in the part number as indicated above.

Frequencies		
Frequency Code	Range	Connector
B	20 GHz	SMA
C	26.5 GHz	SMA
D	40 GHz	2.9 mm

Steps 2 and 3 are on the next page.

# Ordering Information

continued

**Step 2:** To create the second part of the part #, substitute the Switch Code (single-digit letter) from the “Top Switches” table below for the “\_” in the part number as indicated above. Use a “0” for non-selected options. Note: Top switches must be in pairs (1,2; 3,4; 5,6)

**Step 3:** To create the third part, substitute the Switch Code (single-digit letter) from the “Bottom Switches” table below for the “\_” in the part number as indicated above. Use a “0” for non-selected options.

2U 20 GHz Switch Kit* Spares Part Numbers			
Top Switches			
Switch Code	Description	Life Option	Spares P/N
0	Rectangular Blanking Plate		408465-001**
A	SPDT (Agilent 8765B-024)	LC (Normal)	408474-001
B	SPDT w/Term (Agilent 8762B-024)	LC (Normal)	408473-001
C	SPDT w/Indicator (Agilent N1810UL-020-124-201-402)	EL	408480-001
D	SPDT w/Term and Indicator (Agilent N1810TL-020-124-201-402)	EL	408479-001
Bottom Switches			
0	Square Blanking Plate		408465-011**
G	SP4T (Agilent L7204B)	LC (Normal)	408477-001
H	SP4T w/Term (Agilent L7104B)	LC (Normal)	408475-001
I	SP4T w/Term (Agilent 87104B-024)	EL	408471-001
J	SP6T (Agilent L7206B)	LC (Normal)	408478-001
K	SP6T w/Term (Agilent L7106B)	LC (Normal)	408476-001
L	SP6T w/Term (Agilent 87106B-024)	EL	408472-001

\* Switch kits contain switch, mounting bracket, mounting screws, and cables

\*\* Includes mounting screws

Note: EL Life Option = 5 million cycles

# Ordering Information

continued

2U 26.5 GHz Switch Kit* Spares Part Numbers			
Top Switches			
Switch Code	Description	Life Option	Spares P/N
0	Rectangular Blanking Plate		408465-001**
A	SPDT (Agilent 8765C-024)	LC (Normal)	408474-002
B	SPDT w/Term (Agilent 8762C-024)	LC (Normal)	408473-002
C	SPDT (Agilent N1810UL-026-124-201-402)	EL	408480-002
D	SPDT w/Term (Agilent N1810TL-026-124-201-402)	EL	408479-002
Bottom Switches			
0	Square Blanking Plate		408465-011**
G	SP4T (Agilent L7204C)	LC (Normal)	408477-002
H	SP4T w/Term (Agilent L7104C)	LC (Normal)	408475-002
I	SP4T w/Term (Agilent 87104C-024)	EL	408471-002
J	SP6T (Agilent L7206C)	LC (Normal)	408478-002
K	SP6T w/Term (Agilent L7106C)	LC (Normal)	408476-002
L	SP6T w/Term (Agilent 87106C-024)	EL	408472-002

\* Switch kits contain switch, mounting bracket, mounting screws, and cables

\*\* Includes mounting screws

2U 40 GHz Switch Kit* Spares Part Numbers			
Top Switches			
Switch Code	Description	Life Option	Spares P/N
0	Rectangular Blanking Plate		408465-001**
C	SPDT (Agilent N1810UL-040-124-201-402)	EL	408480-003
D	SPDT w/Term (Agilent N1810TL-040-124-201-402)	EL	408479-003
Bottom Switches			
I	SP4T w/Term (Agilent 87104D-024)	EL	408471-003
L	SP6T w/Term (Agilent 87106D-024)	EL	408472-003

\* Switch kits contain switch, mounting bracket, mounting screws, and cables

\*\* Includes mounting screws

## 2U Part Number Ordering Example:

### 1257A-2-C-BBA000-GGHJ00

1257A 2U RFIU at a frequency of 26.5 GHz (Option C) with two SPDT Terminated switches with normal life option (Option B) and one SPDT switch with normal life option (Option A) on the top row, and two SP4T switches with normal life option (Option G), one SP4T Terminated switch with normal life option (Option H), and one SP6T switch with normal life option (Option J) on the bottom row.

### 2U Accessories:

408415-001 : Rackmount ear kit

# Ordering Information

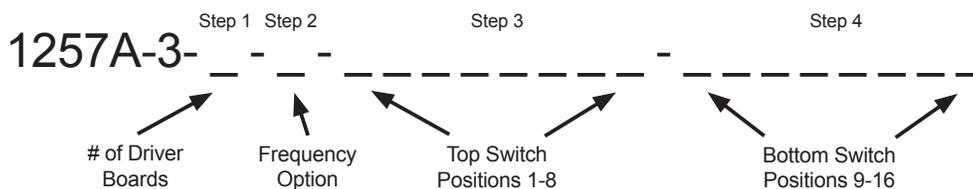
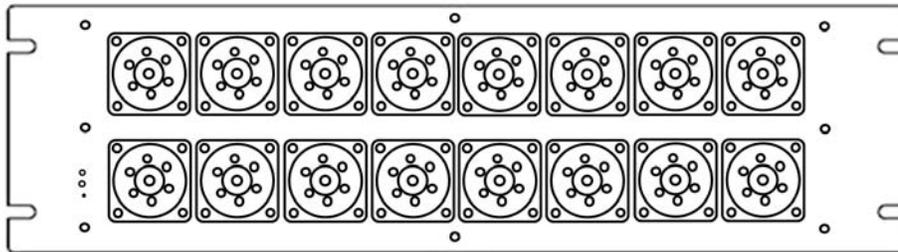
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## 3U Version

1257A-3- - - - - : Racal Instruments™ 1257A-3  
3U Scalable RF Interface Unit



1257A-3 (3U version)



## Instructions for creating the part number

**Step 1:** To create the first part of the part #, select the number of driver boards needed and add that number to the part number where indicated.

# of Driver Boards	Description	Spares Part Number
1	For switch positions 1 through 6	N/A
2	For switch positions 1 through 12 (required for 7 to 12 switches)	N/A
3	For switch positions 1 through 16 (required for 13 to 16 switches)	N/A

**Step 2:** To create the second part, substitute the Frequency Code (single-digit letter) from the "Frequencies" table below for the "\_" in the part number as indicated above.

Frequencies		
Frequency Code	Range	Connector
B	18 GHz	SMA

**Step 3:** To create the third part, substitute the Switch Code (single-digit letter) from the "Switches" table below for the "\_" in the part number as indicated above for the top switches. Use a "0" for non-selected options.

**Step 4:** To create the fourth part, substitute the Switch Code (single-digit letter) from the "Switches" table below for the "\_" in the part number as indicated above for the bottom switches. Use a "0" for non-selected options.

Top and Bottom Switches		
Switch Code	Description	Spares Part Number
0	Blanking Plate	408467-001*
D	SP3T (Dowkey 535J-5808)	408467-002*
E	SP4T (Dowkey 545J-5808)	408467-003*
F	SP6T (Dowkey 565J-5808)	408467-004*

Consult factory for additional switch options

Note on Future Expansion:

If a unit was initially ordered with one Driver Board, the unit can be expanded later to up to three Driver Boards by ordering optional accessories. The second Driver Board requires an additional three Adapter Boards. The third Driver Board requires two more Adapter Boards, for a total of five, in order to complete the system.

## Part Number Ordering Example:

### 1257A-3-3-B-DDFF0000-DEEFF00

1257A 3U RFIU with three driver boards at a frequency of 18 GHz (Option B), two SP3T switches (Option D) and two SP4T switches (Option F) in the top row; and one SP3T switch (Option D), two SP4T switches (Option E), and three SP6T switches (Option F) in the bottom row.

### 3U Accessories:

408429-001 : Driver Board kit  
408523-001 : Adapter Board kit

\* Switch kits contain switch, mounting bracket, mounting screws, and cables

# Ordering Information

continued

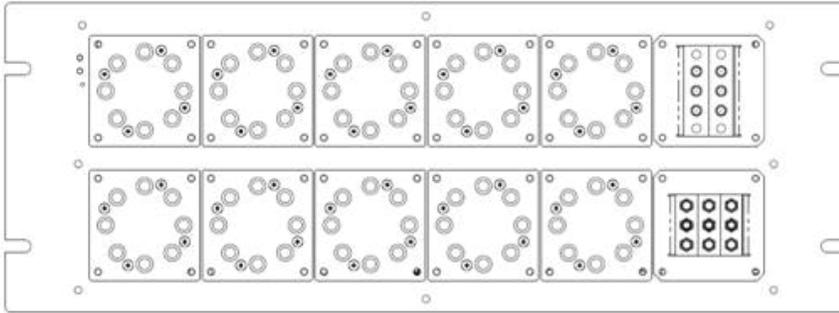
## 4U Version (Mature)

1257A-4- - - - - : Racal Instruments™ 1257A-4

4U Scalable RF Interface Unit

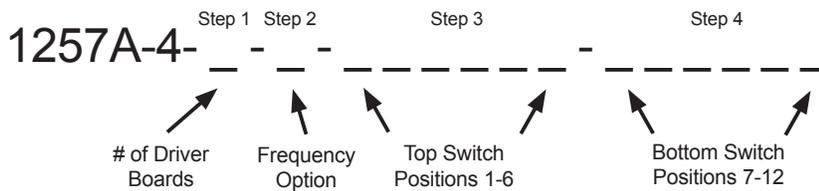


1257A-4 (4U version)



← Top Positions 1-6

← Bottom Positions 7-12



### Instructions for creating the part number

**Step 1:** To create the first part of the part #, select the number of driver boards needed and add that number to the part number where indicated.

# of Driver Boards	Description	Spares Part Number
1	For switch positions 1 through 6	N/A
2	For switch positions 1 through 12 (required for 7 to 12 switches)	N/A

**Step 2:** To create the second part, substitute the Frequency Code (single-digit letter) from the “Frequencies” table below for the “\_” in the part number as indicated above.

Frequencies		
Frequency Code	Range	Connector
B	18 GHz	SMA
C	26.5 GHz	SMA
D	40 GHz	2.9 mm

## Ordering Information

continued

**Step 3:** To create the second part, based on the frequency you selected, substitute the Switch Code (single-digit letter) from the “Switches” table below for the “\_” in the part number as indicated above for the top switches. Use a “0” for non-selected options.

**Step 4:** To create the third part, substitute the Switch Code (single-digit letter) from the “Switches” table below for the “\_” in the part number as indicated above for the bottom switches. Use a “0” for non-selected options.

4U 18 GHz Switch Kits* with Spares Part Numbers for both Top and Bottom Switches				
Switch Code	Description	Spares P/N	# of Switches per Adapter Board	Adapter Board Kit
A	SPDT (Radiall R570433010)	408481-001	Up to 8 x SPDT	408442-001
B	SPDT w/Term (Radiall R585433210)	408482-001	Up to 8 x SPDT	408422-001
C	2xSPDT (Radiall R570433010)	408481-002	4x2xSPDT	408422-001
D	2xSPDT w/Term (Radiall R585433210)	408482-002	4x2xSPDT	408422-001
E	3xSPDT (Radiall R570433010)	408481-003	2x3xSPDT	408422-001
H	SP4T (Radiall R573433415)	408483-001	Up to 4	408431-001
I	SP4T w/Term (Radiall R574433415)	408484-001	Up to 4	408431-001
J	SP6T (Radiall R573433615)	408485-001	Up to 2	408431-001
K	SP6T w/Term (Radiall R574433615)	408486-001	Up to 2	408431-001
L	SP8T (Radiall R573433815)	408487-001	Up to 2	408464-001
M	SP8T w/Term (Radiall R574433815)	408488-001	Up to 2	408464-001

Consult factory for additional switch options

4U 26.5 GHz Switch Kits* with Spares Part Numbers for both Top and Bottom Switches				
Switch Code	Description	Spares P/N	# of Switches per Adapter Board	Adapter Board Kit
A	SPDT (Radiall R570F33010)	408481-004	Up to 8 x SPDT	408442-001
B	SPDT w/Term (Radiall R585F33210)	408482-003	Up to 8 x SPDT	408442-001
C	2xSPDT (Radiall R570F33010)	408481-005	4x2xSPDT	408442-001
D	2xSPDT w/Term (Radiall R585F33210)	408482-004	4x2xSPDT	408442-001
E	3xSPDT (Radiall R570F33010)	408481-006	2x3xSPDT	408442-001
H	SP4T (Radiall R570433010)	408483-002	Up to 4	408431-001
I	SP4T w/Term (Radiall R573F33415)	408484-002	Up to 4	408431-001
J	SP6T (Radiall R573F33615)	408485-002	Up to 2	408431-001
K	SP6T w/Term (Radiall R574F33615)	408486-002	Up to 2	408431-001
L	SP8T (Radiall R573F33815)	408487-002	Up to 2	408464-001
M	SP8T w/Term (Radiall R574F33815)	408488-002	Up to 2	408464-001

Consult factory for additional switch options

# Ordering Information

continued

4U 40 GHz Switch Kits* with Spares Part Numbers for both Top and Bottom Switches				
Switch Code	Description	Spares P/N	# of Switches per Adapter Board	Adapter Board Kit
A	SPDT (Radiall R570833010)	408481-007	Up to 8 x SPDT	408442-001
B	SPDT w/Term (Radiall R585833210)	408482-005	Up to 8 x SPDT	408442-001
C	2xSPDT (Radiall R570833010)	408481-008	4x2xSPDT	408442-001
D	2xSPDT w/Term (Radiall R585833210)	408482-006	4x2xSPDT	408442-001
E	3xSPDT (Radiall R570833010)	408481-009	2x3xSPDT	408442-001
H	SP4T (Radiall R573833415)	408483-003	Up to 4	408431-001
I	SP4T w/Term (Radiall R574833415)	408484-003	Up to 4	408431-001
J	SP6T (Radiall R573833615)	408485-003	Up to 2	408431-001
K	SP6T w/Term (Radiall R574833615)	408486-003	Up to 2	408431-001
L	SP8T (Radiall R573833815)	408487-003	Up to 2	408464-001
M	SP8T w/Term (Radiall R574833815)	408488-003	Up to 2	408464-001

Consult factory for additional switch options

## Part Number Ordering Example:

### 1257A-4-2-D-AABCC0-HHHIJJ

1257A 4U RFIU with two driver boards at a frequency of 40 GHz (Option D), two 1xSPDT switches (Option A), one 1xSPDT Terminated switch (Option B), and two 2xSPDT switches (Option C) on the top row, and three SP4T switches (Option H), one SP4T Terminated switch (Option I), and two SP6T switches (Option J) on the bottom row.

### 4U Accessory

408455-001 : Driver Board kit

### General Accessories for all versions

602269 : European power cord (unterminated)

602269-001 : African power cord

602269-003 : UK power chord

602269-008 : China power cord

500310-001 : GPIB cable, 1 m

500310-002 : GPIB cable, 2 m



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