

# DCA Accessories

## N1027A Kits and General-Purpose Parts

Achieving the highest accuracy with a Digital Communication Analyzer (DCA) can be made easier with the right accessories. This document lists recommended items for 86100D/N1000A DCA-X mainframes, their modules, the N109XX DCA-Ms and the N107XX clock recoveries:

- Attenuators, DC blocks
- Calibration kits, loads, shorts, terminations
- Adapters and connector savers
- Phase matching cable kits, equalizers
- Power dividers/splitters, pickoffs
- Rack mount kits, storage and protection
- Torque wrenches and other tools

**Unless stated otherwise, all accessories are sold separately from the main products.**



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## Accessory Kits for Electrical Channels

### N1027A-45A Demo Kit for N1045A and N1046B Remote Head Modules

Qty	Part Number	Description
1	8710-1582	7.9 mm (5/16 in) 0.57 Nm (5 lbs-in) torque wrench
2	N1027A-1PB	Remote head brackets
2	11901C	2.4 mm male to 3.5 mm female adapter
2	N9398G	1.85 mm DC block, 700 kHz to 67 GHz
2	N5520A	1.85 mm male-to-male adapter
2	N5520B	1.85 mm female-to-female adapter
2	N1027A-1C1	1.85 mm cable
1	9300-1367	ESD wrist strap
1	9300-0980	ESD ground cord
1	N1027A-1AC	Accessory case



N1027A-45A

## N1027A-46A Demo Kit for N1046A Remote Head Modules

Qty	Part Number	Description
2	11901C	Adapter, 2.4 mm male to 3.5 mm female
2	11920A	1.0 mm male to 1.0 mm male adapter
2	11921E	1.0 mm male to 1.85 mm male adapter
2	11921G	1.0 mm male to 1.85 mm female adapter
4	5022-6494	Bracket, remote head probe
1	8710-1582	7.9 mm (5/16 in) 0.57 Nm (5 lbs-in) torque wrench
1	8710-2079	6 mm (15/64 in) 0.45 Nm (4 in-lbs) torque wrench
1	9300-0980	ESD ground cord
1	9300-1367	ESD wrist strap
2	N1027-20001	Coaxial cable, 1.85 mm connectors, 100 mm
2	N9398G	1.85 mm DC block 16V 700 kHz to 67 GHz
1	N1046-40003	Accessory case for N1046A demo kit

## N1027A-AxF Accessory Kits Shipping with Every N1046A Module

-A1F	-A2F	A4F	Part Number	Description
1	2	4	11921E	1.0 (m) to 1.85 (m) adapter
1	1	1	8710-2156	6 mm holding wrench
1	1	1	710-1761	7 mm holding wrench
1	1	1	8710-2079	6 mm 0.45 Nm (4 lbs-in) torque wrench
1	1	1	8710-1582	7.9 mm (5/16 in) 0.57 Nm (5 lbs-in) torque wrench
1	1	1	N1027A-1CL	Clips for remote head cables (4 colors, qty 4 each)
-	1	2	N1027A-2CL	Clip for two N104XX remote heads
1	1	1	N1046-40002	Accessory case for N1046A



N1027A-A4F

## N1060-60005 Accessory Kit Shipping with Every N1060A Module

The N1060A module has 1.0 mm male ruggedized connectors. The N1060-60005 Accessory Kit provides ruggedized adapters (and required wrenches) to 1.85 mm and 2.92 mm female connector interfaces.

Qty	Part Number	Description
2	Y1901B	Ruggedized 1.0 mm female to 1.85 mm female adapter
2	Y1903B	Ruggedized 1.0 mm female to 2.92 mm female adapter
1	8710-1582	7.9 mm (5/16 in) 0.57 Nm (5 lbs-in) torque wrench
1	8710-1761	7 mm holding wrench
1	8710-1764	20 mm 0.9 Nm (8 lbs-in) torque wrench
1	8710-2819	14 mm 0.45 Nm (4 lbs-in) and 1.13 Nm (10 lbs-in) special double torque wrench
1	N1060-20009	8 mm holding wrench
1	N1060-90001	User Guide (how to torque adapters)
1	N1060-40001	Accessory case



N1060A-60005

## Accessory Kits for TDR/TDT Modules

### N1027A-34F/34M/54F/54M TDR/TDT Accessory Kits

The N1027A series accessory kits for N1055A modules provide ECal units, adapters and tools for the TDR/TDT remote heads. To be fully compatible the N1027A-xxx option of the accessory kit must match the N1055A-xxx option of the module (e.g., use a N1027A-54F for a N1055A-54F configuration<sup>1</sup>).

Part Number	Description
N1027A-34F	Accessory kit for 35 GHz N1055A-32F/34F TDR/TDT module
N1027A-34M	Accessory kit for 35 GHz N1055A-32M/34M TDR/TDT module
N1027A-54F	Accessory kit for 50 GHz N1055A-52F/54F TDR/TDT module
N1027A-54M	Accessory kit for 50 GHz N1055A-52M/54M TDR/TDT module



N1027A-54F

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<sup>1</sup> The first character of the N1055A option code defines 35 or 50 GHz bandwidth, the second character the number of remote heads (2 or 4), and the third character the gender of the input connector on the remote head (male or female).

N1027A-xxx kits for the N1055A modules contain the following quantities:

-34F	-34M	-54F	-54M	Part Number	Description
1		1		N4694D/0DC/M0M	67 GHz 2-port 1.85 mm ECal module, DC coupled, 2 male connectors
	1		1	N4694D/0DC/F0F	67 GHz 2-port 1.85 mm ECal module, DC coupled, 2 female connectors
	2	4		11901C	2.4 mm male to 3.5 mm female adapter
2			4	11901D	2.4 mm female to 3.5 mm male adapter
1				85052-60014	3.5 mm male to 3.5 mm male adapter
	1			85052-60012	3.5 mm female to 3.5 mm female adapter
		1		85058-60113	1.85 mm male-to-male adapter
			1	85058-60114	1.85 mm female-to-female adapter
1	1	1	1	9300-1367	ESD wrist strap
1	1	1	1	9300-0980	ESD ground wire
4	4	4	4	5022-6494	Bracket for remote head
1	1	1	1	8710-1764	20 mm 0.9 Nm (8 lbs-in) torque wrench
1	1	1	1	8710-1765	7.9 mm (5/16 in) 0.9 Nm (8 lbs-in) torque wrench
1	1	1	1	8121-0506	USB cable (part of ECal)
1				85052-60006	3.5 mm male short
1				85052-60008	3.5 mm male open
1				00902-60003	3.5 mm male load
	1			85052-60007	3.5 mm female short
	1			85052-60009	3.5 mm female open
	1			00902-60004	3.5 mm female load
1	1	1	1	N1027A-xAC	Accessory case
	1			N1027A-xAC	Accessory case

## ECal Modules

ECal modules are included in the N1027A-xxx TDR/TDT accessory kits (page 7). They can also be purchased standalone. Configurations depend on the connector size and gender of the device under test (DUT). Keysight recommends the following combinations:

DUT Connector	ECal Module	TDR/TDT Module	Adapters
1.85 or 2.4 mm Female	N4694D with #F0F and #0DC	N1055A with #52M or \$54M	None
1.85 or 2.4 mm Male	N4694D/ with #M0M and #0DC	N1055A with #52F or \$54F	None
2.92 mm Female	N4694D with #F0F and #0DC	N1055A with #52M or \$54M	11901C on ECal 11901D on remote head
	N4694D with #F0F and #0DC	N1055A with #32M or \$34M	11901C on ECal (2.4 mm male to 3.5 mm female)
2.92 mm Male	N4694D/ with #M0M and #0DC	N1055A with #52F or \$54F	11901D on ECal 11901C on remote head
	N4694D/ with #M0M and #0DC	N1055A with #32F or \$34F	11901D on ECal (2.4 mm female to 3.5 mm male)



3.5 mm or SMA Female	N4694D with #F0F and #0DC	N1055A with #32M or \$34M	11901C on ECal (2.4 mm male to 3.5 mm female)
3.5 mm or SMA Male	N4694D/ with #M0M and #0DC	N1055A with #32F or \$34F	11901D on ECal (2.4 female mm to 3.5 mm male)

- The N4694D with options M0M and 0DC is a 67 GHz 2-port DC coupled ECal module with male 1.85 mm connectors.
- The N4694D with options F0F and 0DC is a 67 GHz 2-port DC coupled ECal module with female 1.85 mm connectors.
- The N1055A option code stands for:
  - First character: 35 or 50 GHz bandwidth
  - Second character: 2 or 4 remote heads per module
  - Third character: male or female inputs
- For best accuracy the ECal module (or the ECal module plus adapters) should have the same connector size and gender as the DUT. This allows the reference plane to be placed at the DUT's connectors during calibration. FlexDCA knows the 11901C/D adapters and can take their group delays into account (FlexDCA can also measure other adapters and add them to its database).



N1027A-45A

## Mechanical Calibration Kits

Part Number	Description
85052B	Standard mechanical calibration kit, DC to 26.5 GHz, for 3.5 mm applications
85052D	Economy mechanical calibration kit, DC to 26.5 GHz, for 3.5 mm applications
85058B	Standard mechanical calibration kit, DC-67 GHz, for 1.85 mm applications
85058E	Economy mechanical calibration kit, DC-67 GHz, for 1.85 mm applications
85056A	Standard mechanical calibration kit, DC-50 GHz, for 2.4 mm applications
85056D	Economy mechanical calibration kit, DC-50 GHz, for 2.4 mm applications
N1024B	Mechanical calibration kit for 3.5 mm applications

All kits provide SOLT calibration except the N1024B which is limited to SLT.



N1027A-54F TDR/TDT Accessory Kit



85058E Economy mechanical calibration kit

## Accessory Kits for Clock Recovery Instruments

### N1076A-CR1 (re-order: N1027A-76A)

This kit provides specially matched cables that will minimize (align) clock-to-data delays and ensure accurate jitter measurements when using the N1076A external clock recovery (or recovering clocks from electrical signals with the N1077A). It is designed for the following DCA configuration: an 86100D DCA-X mainframe with option PTB, the N1076A external clock recovery module and the N1045A 60 GHz electrical module, N1046A 75/85/100 GHz electrical module and/or N1055A 50 GHz TDR module.

Qty	Part Number	Description
2	N1027A-3C1	Coaxial cable, 2.92 mm (m) to 2.92 mm (m), 0.55m length
2	N1027A-3C2	Coaxial cable, 2.92 mm (m) to 2.92 mm (m), 1 m length
1	N1027A-DC1	Delay-line assembly, 18.2 ns
1	N1027A-2P2	Microwave pick-off tee, 2.4 mm connectors, matched pair
2	N1027A-EQ6	Microwave equalizer, 0.5 to 18 GHz, 6 dB negative slope, SMA
2	N1027A-EQ9	Microwave equalizer, 0.5 to 18 GHz, 9 dB negative slope, SMA
1	8710-1615	T-20 Torx screwdriver
1	8710-1623	T-10 Torx screwdriver
1	8710-1765	7.9 mm (5/16 in) 0.9 Nm (8 lbs-in) torque wrench



*N1027A-76A Clock Recovery Accessory Kit*

## N1076B-CR1 (re-order: N1027A-76B)

This kit provides specially matched cables that will minimize (align) clock-to-data delays and ensure accurate jitter measurements when using the N1076B external clock recovery (or recovering clocks from electrical signals with the N1078A). It is designed to be used with a N1000A DCA-X mainframe with an internal precision timebase plus any N1045A/N1046A/N1055A module.

Qty	Part Number	Description
1	N1027A-2P8	Microwave Pick-Off Tee 1.85 mm connectors, matched pair
2	N1027A-EQ6	Equalizer, 2.92 mm (m) to 2.92 mm (f), 6 dB
2	N1027A-EQ9	Equalizer, 2.92 mm (m) to 2.92 mm (f), 9 dB
2	N1027A-EQ3	Equalizer, 2.92 mm (m) to 2.92 mm (f), 3 dB
1	N1027-60015	SMA delay line, 18.2 ns
1	N1076-60015	Set of 2.92 mm delay lines, 2.37 ns matched pair plus 4.33 ns matched pair
1	8710-1615	T-20 Torx screwdriver
1	8710-1623	T-10 Torx screwdriver
1	8710-1765	7.9 mm (5/16 in) 0.9 Nm (8 lbs-in) torque wrench

## N1077A-CR1 (re-order: N1027A-77A)

This kit provides specially matched cables that will minimize (align) clock-to-data delays and ensure accurate measurements when using the N1077A external clock recovery. It is designed to be used with a DCA-X mainframe with Option ETR/PTB installed (with any DCA plug-in module) or any N109x Series DCA-M product.

Qty	Part Number	Description
1	N1077-60011	FC/PC optical cable, 50/125 $\mu\text{m}$ (multimode), 1.0 m length
1	N1077-60012	FC/PC optical cable, 50/125 $\mu\text{m}$ (multimode), 2.6 m length
1	N1077-60013	FC/PC optical cable, 50/125 $\mu\text{m}$ (multimode), 4.75 m length
1	N1077-60008	FC/PC optical cable, 9/125 $\mu\text{m}$ (single-mode), 1.0 m length
1	N1077-60009	FC/PC optical cable, 9/125 $\mu\text{m}$ (single-mode), 3.5 m length
1	N1077-60010	FC/PC optical cable, 9/125 $\mu\text{m}$ (single-mode), 5.6 m length
2	N1075-60017	Coaxial cable, 2.92 mm (m) to 2.92 mm (m), 1 m length
1	N1077-60005	Coaxial cable, 2.92 mm (m) to 2.92 mm (m), in. length
1	N1027A-EQ6	Microwave equalizer, 0.5 GHz to 18 GHz, 6 dB, negative slope, SMA
1	N1027A-EQ9	Microwave equalizer, 0.5 GHz to 18 GHz, 9 dB, negative slope, SMA

## N1078A-CR1 (re-order: N1027A-78A)

This kit provides specially matched cables that will minimize (align) clock-to-data delays and ensure accurate measurements when using the N1078A external clock recovery. It is designed to be used with a DCA-X mainframe with an internal precision timebase plus any optical DCA plug-in module, or with any N1092X Series DCA-M product.

Qty	Part Number	Description
1	N1027A-EQ6	Equalizer, 2.92 mm (m) to 2.92 mm (f), 6 dB
1	N1027A-EQ9	Equalizer, 2.92 mm (m) to 2.92 mm (f), 9 dB
2	N1075-60017	Coaxial cable, 2.92 mm (m) to 2.92 mm (m), 1 m length
1	N1077-60005	Coaxial cable, 2.92 mm (m) to 2.92 mm (m), 0.3 m length
1	N1077-60008	FC/PC optical cable, 9/125 $\mu\text{m}$ (single-mode), 1.0 m length
1	N1077-60014	FC/PC optical cable, 9/125 $\mu\text{m}$ (single-mode), 5.0 m length



*N1078A Clock Recovery triggering a N1092D DCA-M*

## RF/Microwave Parts

### Adapters<sup>2</sup>

Fits all 1.0 mm connectors (e.g., N1046A inputs):

Part Number	Description
11920A	1.0 mm male to 1.0 mm male adapter
11920B	1.0 mm female to 1.0 mm female adapter
11920C	1.0 mm male to 1.0 mm female connector saver
11921E	1.0 mm male to 1.85 mm male adapter
11921G	1.0 mm male to 1.85 mm female adapter



11920B

Recommended for ruggedized 1.0 mm connectors (e.g., N1060A inputs):

Part Number	Description
Y1900B	Ruggedized 1.0 mm female to 1.0 mm female adapter
Y1901B	Ruggedized 1.0 mm female to 1.85 mm female adapter
Y1903B	Ruggedized 1.0 mm female to 2.92 mm female adapter



Y1900B



Y1903B

Fits all 1.85 mm and 2.4 mm connectors (e.g., N1045A/B, N1055A inputs):

Part Number	Description
N5520A	1.85 mm male to 1.85 mm male adapter
N5520B	1.85 mm female to 1.85 mm female adapter
N5520C	1.85 mm female to 1.85 mm male connector saver
11900A	2.4 mm male to 2.4 mm male adapter
11900B	2.4 mm female to 2.4 mm female adapter
11900C	2.4 mm female to 2.4 mm male connector saver
11904A	2.4 mm male to 2.92 mm male adapter
11904B	2.4 mm female to 2.92 mm female adapter
11904C	2.4 mm male to 2.92 mm female adapter
11904D	2.4 mm female to 2.92 mm male adapter
11901A	2.4 mm male to 3.5 mm male adapter
11901B	2.4 mm female to 3.5 mm female adapter
11901C	2.4 mm male to 3.5 mm female adapter
11901D	2.4 mm female to 3.5 mm male adapter
11903A	2.4 mm male to type-N male adapter
11903B	2.4 mm female to type-N female adapter
11903C	2.4 mm male to type-N female adapter
11903D	2.4 mm female to type-N male adapter



11900B



11901C

<sup>2</sup> Descriptions specify gender of adapter. A male input connector on an instrument requires a female-to-female adapter for connecting a cable with male connectors.

Recommended for bulkhead inputs:

Part Number	Description
5061-5311	3.5 mm female to female connector saver (e.g., 86100A/B/C frames, 8610XX, 8611XX modules)
1250-4105	2.92 mm female to female connector saver (e.g., 86100D, N1000A)
11900B	2.4 mm female to female adapter (e.g., 86108B with #HBW, N1094A/B)
Y1903B	Ruggedized 1.0 mm female to 2.92 mm female adapter (e.g., N1060A)
Y1901B	Ruggedized 1.0 mm female to 1.85 mm female adapter (e.g., N1060A)
Y1900B	Ruggedized 1.0 mm female to 1.0 mm female adapter (e.g., N1060A)



5061-5311



1250-4105



Y1901B

NMD bulkhead adapters:

Part Number	Description
85130-60010	3.5 mm male to 2.4 mm female adapter
83059A	3.5 mm male to 3.5 mm male adapter
83059B	3.5 mm female to 3.5 mm female adapter
83059C	3.5 mm female to 3.5 mm male connector saver
5062-1247	3.5 mm male bulkhead to female 3.5 mm adapter

## Attenuators

Part Number	Description
8490G-003	1.85 mm 3 dB attenuator
8490G-006	1.85 mm 6 dB attenuator
8490G-010	1.85 mm 10 dB attenuator
8490G-020	1.85 mm 20 dB attenuator
8490D-003	2.4 mm 3 dB attenuator
8490D-006	2.4 mm 6 dB attenuator
8490D-010	2.4 mm 10 dB attenuator
8490D-020	2.4 mm 20 dB attenuator
8493C-003	3.5 mm 3 dB attenuator
8493C-006	3.5 mm 6 dB attenuator
8493C-010	3.5 mm 10 dB attenuator
8493C-020	3.5 mm 20 dB attenuator



11500J



N4910A

## Cables

Part Number	Description
11500J	1.0 mm female-to-male cable, 16 cm, DC-110 GHz
N1027A-1C1	1.85 mm cable, male-to-male, 67 GHz, 10 cm
N1027A-3C1	2.92 mm cable, male-to-male, 2.37 ns delay, 55 cm
N1027A-3C2	2.92 mm, cable, male-to-male, 4.33 ns delay, 1.0 m
N1027A-3C3	SMA cable, male-to-male, Data Out/Data In for N1076A/B
N4910A	2.4 mm matched cable pair, 61 cm

## Caps for Input Protection

Part Number	Description
N1027A-1CF	Shipping cap to protect 1.85/2.4 mm female inputs
N1027A-1CM	Shipping cap to protect 1.85/2.4 mm male inputs
N1027A-3CF	Shipping cap to protect 2.92/3.5 mm female inputs
N1027A-3CM	Shipping cap to protect 2.92/3.5 mm male inputs



N1027A-1CF/1CM

## DC Blocks

Part Number	Description
N9398G	1.85 mm male-to-female DC block 16 V 700 kHz to 67 GHz
N9398F	2.4 mm male-to-female DC block 16 V 50 kHz to 50 GHz
N9398C	3.5 mm male-to-female DC block 16 V 50 kHz to 26.5 GHz



N9398F

## Equalizers

Part Number	Description
N1027A-EF6	Equalizer, 6 dB, 2.92 mm (m/f), up to 56 GBd
N1027A-EQ3	Equalizer, 2.92 mm (m) to 2.92 mm (f), 3 dB
N1027A-EQ6	Equalizer, 2.92 mm (m) to 2.92 mm (f), 6 dB
N1027A-EQ9	Equalizer, 2.92 mm (m) to 2.92 mm (f), 9 dB

## Phase Trimmers

Part Number	Description
N1027A-PT2	2.4 mm male-to-female phase trimmer, range > 22 ps, IL ≤ 0.8 dB at 50 GHz
N1027A-PT3	SMA male-to-female phase trimmer, range > 53 ps, IL ≤ 0.8 dB at 26 GHz



N1027A-PT3

## Pick-Offs

Part Number	Description
N1027A-2P1	Microwave Pick-Off Tee 1.0 mm connectors, matched pair
N1027A-2P8	Microwave Pick-Off Tee 1.85 mm connectors, matched pair
N1027A-2P2	Microwave Pick-Off Tee 2.4 mm connectors, matched pair
N1027A-2P3	Microwave Pick-Off Tee 2.92 mm connectors, matched pair

The N1027A pick-off tees are designed to work with the electrical inputs on the N1076A/B, N1077A and N1078A clock recovery instruments.



N1027A-PT8

## Power Dividers/Splitters

Part Number	Description
11636C	2.4 mm power divider, DC to 50 GHz
11667C	2.4 mm power splitter, DC to 50 GHz
11636B	3.5 mm power divider, DC to 26.5 GHz
11667B	3.5 mm power splitter, DC to 26.5 GHz



Divider



11636B

## Terminations

Part Number	Description
85138B	2.4 mm female 50 Ω load
85141B	2.4 mm female open
85140B	2.4 mm female short
85138A	2.4 mm male 50 Ω load
85141A	2.4 mm male open
85140A	2.4 mm male short
909D-011	3.5 mm female 50 Ω load
909D-305	3.5 mm male 50 Ω load
0960-0055	3.5 mm male short



Splitter



11667C



## Mechanical Accessories

### Filler Panels

Part Number	Description
86101-60017	86100D Module filler panel (1/4 bay width, quartz gray)
N1027A-AFP	N1000A Module filler panel (1/4 bay width, carbon black)

All 86100D and N1000A DCA-X mainframes ship with two filler panels to cover two slots. All mini-modules (i.e., modules that are ¼ bay wide) ship with one filler panel.



N1027A-RM1

### Rack Mount Kits

Part Number	Description
1CM015A	Rackmount kit for 86100D/N1000A
1CM030A	Rackmount kit for 86100A/B/C
1CP018A	Rackmount kit with handles for 86100A/B/C
1CP020A	Rackmount kit with handles for 86100D/N1000A
N1027A-RM1	Single DCA-M rack mount kit
N1027A-RM2	Dual DCA-M side by side rack mount



N1027A-RM2

### Remote Head Accessories Clips

Part Number	Description
N1027A-1CL	Clips for remote head cables (4 colors, qty 4 each)
N1027A-2CL	Clip for two N1045A/B, N1046A or N1055A remote heads



N1027A-1CL

### Storage

Part Number	Description
N1000-40008	Front cover for 86100D/N1000A DCA-X mainframe
N1027A-1AC	Empty N1027A-45A case
N1027A-2AC	Empty N1027A-54F accessory case
N1027A-3AC	Empty N1027A-54M accessory case
N1027A-4AC	Empty N1027A-34F accessory case
N1027A-5AC	Empty N1027A-34M accessory case
N1027A-1MC	Module storage case for N1045A/B, N1046A module
N1027A-3MC	Module storage case for N1055A module



N1027A-2CL



N1027A-1MC

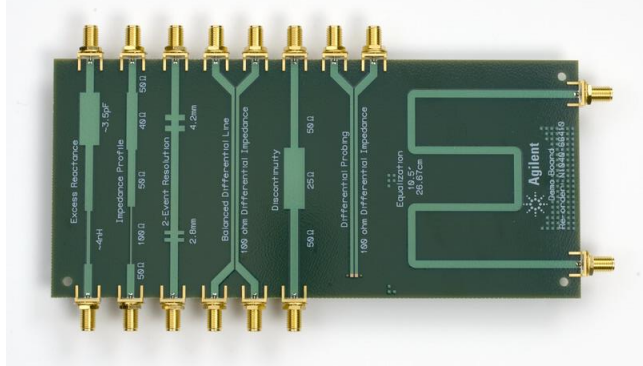
## Tools

Part Number	Description
8710-2156	6 mm holding wrench (to hold 1.0 mm adapters and interfaces while torquing a connector to them)
8710-1761	7 mm holding wrench (to hold 2.92/3.5/SMA adapters and interfaces while torquing a connector to them.)
8710-1582	7.9 mm (5/16 in) 0.57 Nm (5 lbs-in) torque wrench (recommended for 1.85/2.4 mm DCA connectors)
8710-1765	7.9 mm (5/16 in) 0.9 Nm (8 lbs-in) torque wrench (recommended for 3.5 mm DCA connectors)
N1060-20009	8 mm holding wrench (recommended for N1060A)
8710-2819	14 mm 0.45 Nm (4 lbs-in) and 1.13 Nm (10 lbs-in) special double torque wrench (recommended for N1060A)
8710-1764	20 mm 0.9 Nm (8 lbs-in) torque wrench (recommended for DCA bulkheads)
8710-1615	T-20 Torx screwdriver
8710-1623	T-10 Torx screwdriver

## Other Accessories

### Demo and Training Devices

Part Number	Description
N1040-66410	TDR/TDT, equalization and de-embedding demo board



N1040-66410

## ESD Protection

Part Number	Description
N9355CK01	3.5 mm DC coupled limiter (limits signals to $\pm 0.6 V_{peak}$ )
9300-1308	ESD heel strap
9300-1367	ESD wrist strap
9300-0980	ESD ground cord
9300-1484	ESD desk mat



N9355CK01



ESD heel strap,  
wrist strap and  
ground cord on  
desk mat

## USB Devices

Part Number	Description
E8900-D10	USB read-only licensing dongle - FLEX10

The non-writeable, no-memory dongle provides a unique host ID for Keysight licenses.

## Appendix

### DCA Input Connectors

Product	3.5 mm	2.92 mm	2.4 mm	1.85 mm	1.0 mm	Optical	Comment
54754A	f/f CS						
83496B	f/f CS						
86100D		f/f CS					
86105C	f/f CS					FC/PC nut	
86105D-141	f/f CS					FC/PC nut	
86105D-281			f/f CS			FC/PC nut	
86107A	f/f CS		f/f CS				2.4 mm on 40 GHz input
86108A	f/f CS						
86108B	f/f CS		f/f CS				2.4 mm on 50 GHz inputs
86112A	f/f CS						
86115D						FC/PC nut	
86116C				m fixed		FC/PC nut	
86117A			f/f CS				
86118A				f fixed			
N1000A		f/f CS					
N1045A/B-xxF				f fixed			
N1045A/B-xxM				m fixed			
N1046A					f fixed		Includes 1.0 mm male to 1.85 female adapters
N1055A-3xF		f fixed					
N1055A-3xM		m fixed					
N1055A-5xF				f fixed			
N1055A-5xM				m fixed			
N1060A					m rug		Includes adapters (see N1060-60005 kit)
N1076A/76B		f fixed					
N1077A/78A		f fixed				FC/PC	
N1090A			f SMA			FC/PC	
N1092A/B/D						FC/PC	
N1092C/E			f/f CS			FC/PC	
N1094A/B			f/f CS				Option 030 includes 2.4 to 2.92 mm adapters

f SMA	Female SMA input (fixed)
f/f CS	Female/female connector saver (bulkhead is male, connector saver is removable)
m/m CS	Male/male connector saver (bulkhead is female, connector saver is removable)
f fixed	Female fixed interface
m fixed	Male fixed interface
f rug	Female fixed ruggedized interface
m rug	Male fixed ruggedized interface
FC/PC	Straight FC/PC bulkhead, cleanable
FC/PC nut	Straight FC/PC based on 81000FI interface (see page 21)
DCA-M clock	Use 2.92 or 3.5 mm cables to provide clocks to the N109XX series of DCA-Ms

## Optical Interfaces

Many DCA modules ship with 86100FI straight FC/PC interface pre-installed (see “FC/PC Nut” in table DCA Input Connectors on page 20). These interfaces can be removed and replaced with 81000xl interfaces shown here. The internal fiber tip is in a mini-HMS-10 ferrule that requires patchcords with straight physical contact connectors (e.g., DIN, E2000, FC/PC, LC, MU, SC, or ST connector).

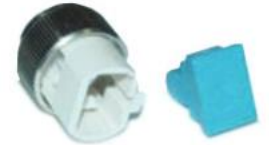
The 81000xl interfaces are not used on N107XX Clock Recovery and N109XX DCA-M instruments.



81000FI - FC/PC  
(Ships standard with all optical inputs on modules for the DCA family)



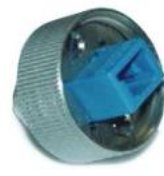
81000LI - LC



81000KI - SC



81000HI - E2000



81000MI - MU



81000SI - DIN4108/47256



81000VI - ST

## RF/Microwave Connectors

### NMD connector

The NMD connector is a ruggedized test-port connector. Most often, the connectors used are 3.5mm and 2.4mm male connectors. These connectors include a large threaded body that is specially designed to stabilize the test port cable when attached to the front of the analyzer or test set. The design of these connectors allows the use of standard female 3.5mm and 2.4mm cables and adapters. Since the test port connectors are male connectors, they have standard inside threads that can accommodate these female connectors. NMD stands for Network Measurements Division, an outdated term for the original HP division that produced the 8510A and 8720A analyzers.

### 3.5 mm connector

The 3.5 mm connector was primarily developed at Hewlett Packard (now Keysight Technologies, Inc.) with early manufacturing at Amphenol. Its design strategy focused on highly-rugged physical interfaces that would mate with popular SMA dimensions, allowing thousands of repeatable connections. It is mode-free to 34 GHz.

### 2.92 mm connector

The 2.92 mm connector mates with SMA and 3.5 mm connectors and offers mode-free performance to 40 GHz.

2.92 mm and 3.5 mm connectors use the same center pin. Inserting the larger SMA (m) center pin into a 2.92 mm or 3.5 mm connector can slightly degrade the connector. It is recommended that you only mate SMA (m) connectors to other connectors that you reserve for this purpose.

### 2.4 mm connector

The 2.4 mm connector was developed by Hewlett Packard, Amphenol, and M/A-COM for use to 50 GHz. This design eliminates the fragility of the SMA and 2.92 mm connectors by increasing the outer wall thickness and strengthening the female fingers. It can mate with SMA, 3.5 mm and 2.92 mm only with the use of precision adapters. The 2.4 mm product is offered in three quality grades: general purpose, instrument, and metrology. General-purpose grade is intended for economy use on components, cables, and microstrip where limited connections and low repeatability is acceptable. Instrument-grade is best suited for measurement applications where repeatability and long life are primary considerations. Metrology-grade is best suited for calibration applications where the highest performance and repeatability are required.

### 1.85 mm connector

The 1.85 mm connector was developed in the mid-1980s by Hewlett Packard (now Keysight Technologies, Inc.) for mode-free performance to 65 GHz. Hewlett Packard offered its design as public domain in 1988 to encourage standardization of connector types; a few devices are available from

various manufacturers for research work. The 1.85 mm connector mates with the 2.4 mm connector and has the same ruggedness. In recent years, the 1.85 mm connector has been optimized to operate mode-free to 67 GHz.

To aid identification, 1.85 mm Keysight connectors have a groove in the male nut and female shoulder. The outer thread size of 1.85 mm and 2.4 connectors is larger than the tread size on SMA, 2.92 mm, and 3.5 mm connectors. This makes the area of the outer conductor's mating surface appear very large compared to the relatively smaller air dielectric.

### 1.0 mm connector

The 1.0 mm connector has been designed for ultra-high frequency signals (up to 110 GHz). Because of its small size it is **most at risk of being damaged** when making a connection. **Strictly follow the instructions** outlined in the N1060A Accessories Kit User Guide (literature # **N1060-90001**).

### Connector Summary

Type	Frequency Range	Recommended Torque	Compatible Connectors
1.0 mm	≤110 GHz	0.45 Nm (4 lbs-in)	
1.85 mm	≤70 GHz	0.57 Nm (5 lbs-in)	2.4 mm
2.4 mm	≤50 GHz	0.9 Nm (8 lbs-in)	1.85 mm
2.92 mm	≤40 GHz	0.9 Nm (8 lbs-in)	3.5 mm and SMA
3.5 mm	≤34 GHz	0.9 Nm (8 lbs-in)	2.92 mm and SMA
SMA	≤24 GHz	0.9 Nm (8 lbs-in)	2.92 mm and 3.5 mm



SMA



3.5 mm



2.92 mm



2.4 mm



1.85 mm



1.0 mm

*Typical female input connectors*

## Literature References

Generic literature link: [literature.cdn.keysight.com/litweb/pdf/<literature number>.pdf](http://literature.cdn.keysight.com/litweb/pdf/<literature number>.pdf)

Document	Literature #
DCA Family Brochure (Solutions overview)	5992-3301EN
FlexDCA Technical Overview	5992-3319EN
86100D DCA-X Mainframe and Modules Technical Specifications	5990-5824EN
N1000A DCA-X Mainframe and Modules Technical Specifications	5992-3271EN
N109XX DCA-M Technical Specifications	5992-1454EN
N107XX Clock Recovery Technical Specifications	5992-1620EN
N10xxx Series DCA Configuration Guide	5992-3372EN
861xxx Series DCA Configuration Guide	5992-0038EN
DCA Accessories	5991-2340EN

## Web Resources

Generic: [www.keysight.com/find/<product number>](http://www.keysight.com/find/<product number>) for any product number mentioned here

DCA-X Mainframe:	<a href="http://www.keysight.com/find/dcax">www.keysight.com/find/dcax</a>
DCA-M standalone:	<a href="http://www.keysight.com/find/dcam">www.keysight.com/find/dcam</a>
FlexDCA (main page)	<a href="http://www.keysight.com/find/flexdca_pro">www.keysight.com/find/flexdca_pro</a>
FlexDCA (download page)	<a href="http://www.keysight.com/find/flexdca_download">www.keysight.com/find/flexdca_download</a>
Clock recovery:	<a href="http://www.keysight.com/find/cdr">www.keysight.com/find/cdr</a>
Microwave Accessories:	<a href="http://www.keysight.com/find/mta">www.keysight.com/find/mta</a>

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