



# Cisco Connected Grid Portfolio

# Cisco Connected Grid Router 2010

## Ordering Guide

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# 1. Introduction

The Cisco® 2010 Connected Grid Router (CGR 2010) is a rugged router designed for the harsh, rugged environments often found in the energy and utility industries. The Cisco CGR 2010 is designed to support the communications infrastructure needs of the energy delivery infrastructure across the generation, transmission, and distribution sectors. This infrastructure includes utility- and customer-owned energy infrastructure, such as substation applications supporting electrical transmission and distribution, renewable generation, oil and gas, water, distributed generation, co-generation, and trackside operations. The infrastructure also includes the communications infrastructure for delivery applications such as transmission pipelines, distribution mains, and service lines for oil, gas, and water. It is built upon the award-winning Cisco Integrated Services Router Generation 2 (ISR G2) portfolio, and provides the energy grid operator with the benefits of improved security, broadband connectivity, and network reliability. The CGR 2010 uses Cisco IOS® Software, which is the operating system powering millions of Cisco routers deployed worldwide. Cisco IOS Software delivers the benefits of integrated security for North American Electric Reliability Corporation / Critical Infrastructure Protection (NERC/CIP) compliance, quality of service, and network management to help ensure integrity and priority of operational data and nonoperational data communications.

The Cisco CGR 2010 builds on the high-quality offering of the existing Cisco 2900 Series Integrated Services Router (ISR) platforms. With embedded hardware encryption acceleration, optional firewall, and intrusion prevention, the CGR 2010 delivers integrated security to help operators comply with cyber security requirements outlined in the NERC/CIP mandates. In addition, the platform supports T1 and E1 WAN interfaces with integrated Channel Service Unit/Data Service Unit (CSU/DSU) interfaces, synchronous and asynchronous serial RS-232 interfaces, and copper and fiber Gigabit Ethernet. Figure 1 provides a visual image of the CGR 2010.

Please read the CGR 2010 data sheet for more details:

[http://www.cisco.com/en/US/prod/collateral/routers/ps10967/ps10977/data\\_sheet\\_c78\\_593509.html](http://www.cisco.com/en/US/prod/collateral/routers/ps10967/ps10977/data_sheet_c78_593509.html)

**Figure 1.** Cisco Connected Grid Router 2000 Series

Power Supply Side:



Cable Side:



The CGR 2010 can be ordered as a base system or as a security-bundled system. The only difference between the base system and the security bundle is the addition of the security license product activation key (PAK); all other options remain the same, and the configurations and options mentioned in this ordering guide remain the same for both systems.

The CGR 2010 base system and security bundle ordering SKUs are listed in Table 1.

**Table 1.** CGR 2010 SKUs

Ordering SKU	Description
CGR-2010/K9	Cisco CGR 2010 with 2GE, 4 GRWIC slots, 256 MB CF, 1 GB DRAM, IP BASE
CGR-2010-SEC/K9	Cisco CGR 2010 security bundle with SEC license PAK

## 2. Ordering Cisco CGR 2010 IOS Software and License Options

The Cisco Connected Grid Router Portfolio delivers innovative technologies running on industry-leading Cisco IOS Software. The CGR 2010 ships with a universal Cisco IOS image that contains all of the features available for use on the routers.

Two types of universal images will be supported on CGR 2010 routers (see Table 2):

1. **Universal images with UK9 or *universalk9* in the image name:** This universal image can offer all of the Cisco IOS features including strong payload encryption and cryptography functions.
2. **Universal images with the NPEK9 or *universalk9 npe* in the image name:** The strong control of encryption capabilities by Cisco Software Activation helps meet United States export control requirements for cryptography. However, some countries have import requirements that require that the platform does not support any strong payload cryptography. To satisfy the import requirements of those countries, the router can be ordered with the 'npe' universal image, which does not support any strong payload encryption. This image can support security features such as the zone-based firewall but no payload encryption functions.

**Table 2.** Universal IOS Image Cisco 2010 Connected Grid Router (CGR 2010)-15.2(3)T SKUs

Ordering SKU	Description
SG20UK9-15203T	Cisco IOS Universal Image for CGR 2010
SG20NPEK9-15203T	Cisco IOS Universal Image (no payload encryption) for CGR 2010

### Licensing

The Universal Cisco IOS image is loaded by Cisco manufacturing on all shipped routers. The Cisco IOS Universal Image contains all Cisco IOS features. Feature sets in the universal image are unlocked using licensing keys; i.e., the level of Cisco IOS functionality available is determined by the license applied to the device.

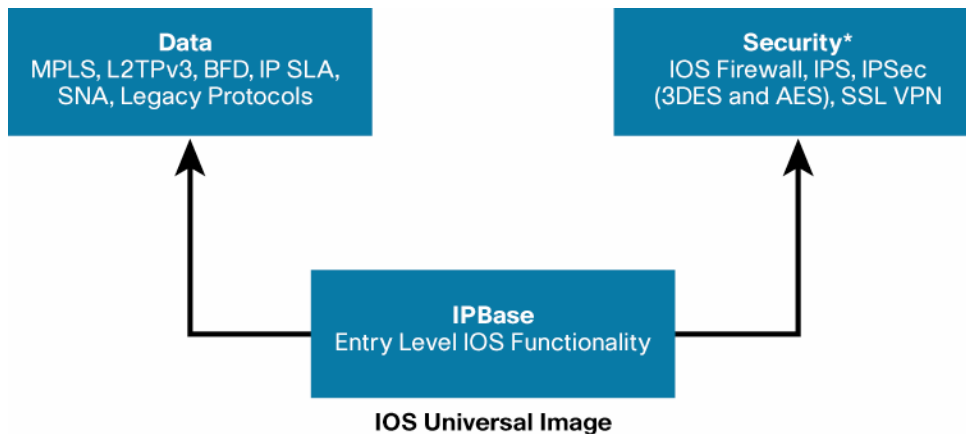
By default, all the routers ship with an IPBase license (see Table 3).

**Table 3.** IP Base Licenses for Cisco CGR 2010; Maps to Both Types of Universal Images and Ships Default with the Image

Ordering SKU	Description
SL-20-IPB-K9	IP Base License (Paper) for Cisco CGR 2010

The specific feature set is activated by the use of technology package licenses such as security and data (Figure 2).

**Figure 2.** IOS Licensing Model for Cisco CGR 2010



\*Security license is also offered in NPE version that maps to the universal image with No Payload Encryption

Each device ships with a Universal image and IPBaseK9 license. Data (DATA) and Security (SEC) technology packages are enabled in the universal image using Cisco Software Activation licensing keys. Each licensing key is unique to a particular device and is obtained from Cisco by providing the product ID and serial number of the router and a PAK, which is provided by Cisco at time of the software purchase. Cisco installs license key(s) for software specified at the time of initial router purchase.

On each shipped device, the IPBase software activation key is installed by default. Additional keys are installed by manufacturing depending on the customer order. The details of each “technology package license” can be found in Table 4 below.

The Cisco CGR 2010 router also offers feature licenses. The feature licenses use the same model as the technology package licenses. Feature licenses work in conjunction with technology package licenses; e.g., the Secure Sockets Layer (SSL) VPN feature license requires a SEC technology package license.

**Table 4.** Technology Package License Details and Feature Licenses for Cisco CGR 2010

Technology Package	Details	Feature Licenses
IPBaseK9	Some of the primary features include: AAA, BGP, OSPF, EIGRP, ISIS, RIP, PBR, IGMP, Multicast DHCP, HSRP, GLBP, NHRP, HTTP, HQF, QoS, ACL, NBAR, GRE, CDP, ARP, NTP, PPP, PPPoA, PPPoE, RADIUS, TACACS, SCTP, SMDs, SNMP, STP, VLAN, DTP, IGMP Snooping, SPAN, WCCP, ISDN, ADSL over ISDN, NAT-Basic X.25, RSVP, NTP, Flexible NetFlow, etc., plus IPV6 parity for IPV4 features present in IPBase	None
SECK9	Some primary security features that come with the SECK9 technology license PAK include: IKE v1/IPSec/PKI certificates, IPSec/GRE, Easy VPN with DVTI, DMVPN, Static VTI, GETVPN, Firewall, Network Foundation Protection, Content Filtering, Flexible Packet Matching, etc.	SSLVPN (Counted) Content Filtering (Subscription)
DATA	Some primary data features that come with the DATA technology license PAK include: BSTUN, MPLS, BFD, RSVP, L2VPN, L2TPv3, Layer 2 Local Switching, Mobile IP, Multicast Authentication, FHRP-GLBP, IP SLAs, Pfr, DECnet, ALPS, RSRB, BIP, DLSw+, FRAS, Token Ring, ISL, IPX STUN, SNTP, SDLC, QLLC, etc.	None

You can find more details on the features in Table 4 at <http://www.cisco.com/go/fn>

The routers can be ordered from the factory with the technology license pre-installed using the paper license SKUs (start with keyword 'SL'). Alternately, if the advanced technology features are to be deployed later, the required licenses can be ordered as spares (spares denoted by "=" below). Spares for technology licenses can be ordered as paper licenses or e-delivery licenses (start with keyword 'L-SL').

The security licenses in Table 5 can be used to activate the advanced security features offered on the CGR 2010. These SKUs can be ordered only for the universal image that supports payload encryption or cryptography.

**Table 5.** Security Licenses for Cisco CGR 2010: Maps to UK9 or universalk9 Image

Ordering SKU	Description	Compatible With
SL-20-SEC-K9	Security License (Paper) for Cisco CGR2010 (both system and spare)	SG20UK9-15203T
L-SL-20-SEC-K9=	Security License (E-Delivery) for Cisco CGR2010 (only as spare)	SG20UK9-15203T

For activating security features on the universal image with no payload encryption, the security license SKUs are unique, as listed in Table 6.

**Table 6.** Security Licenses (No Payload Encryption) for Cisco CGR 2010: Maps to NPEK9 or universalk9\_npe Image

Ordering SKU	Description	Compatible With
SL-20-SECNPE-K9	SEC No Payload Encryption Paper License for Cisco CGR2010 (system and spare)	SG20NPEK9-15203T
L-SL-20-SECNPE-K9=	SEC No Payload Encryption E License for Cisco CGR2010 (only as spare)	SG20NPEK9-15203T

The DATA license in Table 7 can be used to activate the data features (shown in Table 4) on the Cisco CGR 2010.

**Table 7.** Data Licenses for Cisco CGR 2010: Maps to Both Universal Images

Ordering SKU	Description	Compatible With
SL-20-DATA-K9	Data License (Paper) for Cisco CGR2010 (both system and spare)	SG20UK9-15203T or SG20NPEK9-15203T
L-SL-20-DATA-K9=	Data License (E-Delivery) for Cisco CGR2010 (only as spare)	SG20UK9-15203T or SG20NPEK9-15203T

**Note:** The DATA technology license should be selected to allow Bisync Serial Tunnel (BSTUN) functionality to tunnel supervisory control and data acquisition (SCADA) traffic.

As mentioned before, the Cisco CGR 2010 also offers some feature licenses for advanced security and data functions, such as SSL VPN and content filtering. These licenses are needed in addition to the technology license for a given solution deployment.

The Feature licenses mentioned in Table 8 require that the Technology feature license be selected first.

**Table 8.** Feature Licenses for Cisco CGR 2010: Requires Both Universal Images and Technology Feature License

Ordering SKU	Description	Requires
FL-CG-SSLVPN10-K9	SSLVPN Feature license PAK (Paper) for CGR2010-10 users (system and spare)	SG20UK9-15203T and SL-20-SEC-K9
FL-CG-SSLVPN25-K9	SSLVPN Feature license PAK (Paper) for CGR2010-25 users (system and spare)	SG20UK9-15203T and SL-20-SEC-K9
L-FLCG-SSLVPN10K9	SSLVPN 10-user Feature license PAK (E-Delivery) for CGR2010 (spare only)	SG20UK9-15203T and SL-20-SEC-K9

Ordering SKU	Description	Requires
L-FLCG-SSLVPN10K9	SSLVPN 25-user Feature license PAK (E-Delivery) for CGR2010 (spare only)	SG20UK9-15203T and SL-20-SEC-K9
FL-CG20-CNFIL-1Y	Content Filtering 1YR Subscription PAK (Paper) for CGR2010 (system and spare)	SG20UK9-15203T or SG20NPEK9-15203T and SL-20-SEC-K9 or SL-20-SECNPE-K9
L-FL-CG20CNFIL-1Y	Content Filter 1YR Subscription PAK (E-Delivery) for CGR2010 (spare only)	SG20UK9-15203T or SG20NPEK9-15203T and SL-20-SEC-K9 or SL-20-SECNPE-K9

Please visit the following link to get more details on software activation and licensing:

[http://www.cisco.com/en/US/docs/ios/csa/configuration/guide/csa\\_overview.html](http://www.cisco.com/en/US/docs/ios/csa/configuration/guide/csa_overview.html)



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## 3. Ordering Cisco CGR 2010 Memory Options

The Cisco CGR 2010 comes with one GB default DRAM memory (which is not upgradable). Additionally, Compact Flash Slot 0 is populated with a 256 MB compact flash by default from the factory. An additional compact flash Slot 1 can be optionally configured and ordered with another compact flash. You can choose to have additional compact flash or USB memory ordered for additional storage on the router. The SKUs in Table 9 show the orderable options for memory.

**Table 9.** Cisco CGR 2010 Compact Flash Upgrade or USB Memory Option (Factory Upgrades and Spares)

Ordering SKU	Description
MEM-CF-256MB-RGD	Compact Flash for Cisco CGR2010
MEMUSB-1024FT	1 GB USB Flash Token

## 4. Ordering Cisco CGR 2010 Module Options

### Cisco Channelized T1/E1 and ISDN PRI Rugged WAN Interface Card

The Cisco Channelized T1/E1 and ISDN Primary Rate Interface (PRI) Rugged grid router WAN interface card (GRWIC) modules are designed for use with the Cisco CGR 2010. The Cisco Channelized T1/E1 and ISDN PRI GRWICs combine multiple T1/E1 WAN connectivity and channelized T1/E1 and ISDN PRI in the same card. Applications include fractional or full T1/E1 WAN connectivity, ISDN PRI for primary WAN link or WAN backup, and dial access aggregation. The Cisco CGR 2010 supports a one- and a two-port version of the T1/E1 module (Figure 3) in a single-wide GRWIC. The different versions help enable customers to deploy different port densities depending on wide area network needs in utility substation locations.

Please read the Channelized T1/E1 Rugged WAN Interface Card data sheet for more details:

[http://www.cisco.com/en/US/prod/collateral/routers/ps10967/ps10977/data\\_sheet\\_c78\\_593473.html](http://www.cisco.com/en/US/prod/collateral/routers/ps10967/ps10977/data_sheet_c78_593473.html)

**Figure 3.** 1- and 2-Port Channelized T1/E1 and ISDN PRI Rugged WAN Interface Cards (GRWICs)



### 8-Port Asynchronous/Synchronous Grid Router WAN Interface Card

The 8-Port Asynchronous/Synchronous GRWIC (see Figure 4) provides low-speed synchronous/asynchronous serial connections, supporting EIA-RS232 for the Cisco CGR 2010. The 8-port serial RS-232 GRWIC helps customers to enable applications such as legacy protocol transport, console server, and dial access server. Combining a high-density serial GRWIC with the Cisco CGR 2010 helps enable energy networks to transport mission-critical communication such as SCADA over an IP network

Please see the Channelized T1/E1 Rugged WAN Interface Card data sheet for more details:

[http://www.cisco.com/en/US/prod/collateral/routers/ps10967/ps10977/data\\_sheet\\_c78\\_593525.html](http://www.cisco.com/en/US/prod/collateral/routers/ps10967/ps10977/data_sheet_c78_593525.html)

**Figure 4.** 8-port Asynchronous/Synchronous GRWIC



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## Ethernet Switch Module Interface Card

The Cisco Ethernet Switch Module (CGR 2010 ESM, shown in Figure 5) greatly expands the CGR 2010's capabilities by integrating industry-leading Layer 2 and Layer 3 (optional) switching with feature sets comparable to those found in the Cisco 2520 Connected Grid Switches (CGS 2520) (<http://www.cisco.com/go/cgs2500>). The new Cisco ESM, along with the Cisco CGR 2010, are designed specifically for use in connected energy applications such as grid automation, distributed generation, integrated renewable energy, trackside substations, and water, oil, and gas applications. The CGR 2010 ESM uses Cisco IOS Software, which is the operating system powering millions of Cisco switches worldwide, and provides the benefits of improved security, network resiliency and reliability, and scalability. Figure 5 displays the ESM GRWICs.

Please read the ESM Interface Card data sheet for more details:

[http://www.cisco.com/en/US/prod/collateral/routers/ps10967/ps10977/Datasheet\\_c78-669126\\_ps10984\\_Products\\_Data\\_Sheet.html](http://www.cisco.com/en/US/prod/collateral/routers/ps10967/ps10977/Datasheet_c78-669126_ps10984_Products_Data_Sheet.html)

**Figure 5.** ESM GRWICs



## Multimode VDSL2, ADSL2/2+ and G.SHDSL Grid Router WAN Interface Cards

The Cisco Multimode VDSL2 and ADSL2/2+ GRWICs (shown in Figure 6) provide 1-port multimode VDSL2 and ADSL2/2+ WAN connectivity. In combination with the CGR 2010, this GRWIC provides high-speed digital data transmission between remote energy infrastructure and the central office (DSL access multiplexer [DSLAM]), usually located on the service provider premises. The 2-pair (GRWIC-2SHDSL) symmetric high-bit-rate DSL GRWIC provides two ports of 2-wire or one port of 4-wire G.SHDSL connectivity to a WAN. G.SHDSL technology offers customers high-speed, symmetrical WAN connectivity at a lower cost than traditional WAN circuits. Together with the CGR 2010, the GRWIC provides energy infrastructure organizations with the necessary bandwidth for critical traffic and helps enable the option for point-to-point DSL that does not require a service provider.

Please read the VDSL2, ADSL2/2+, and G.SHDSL WAN Interface Card data sheet for more details:

[http://www.cisco.com/en/US/prod/collateral/modules/ps10984/datasheet\\_c78-696810.html](http://www.cisco.com/en/US/prod/collateral/modules/ps10984/datasheet_c78-696810.html)

**Figure 6.** G.SHDSL and ADSL/VDSL GRWIC



### ISDN Grid Router WAN Interface Cards

The Cisco ISDN BRI GRWICs (see Figure 7) are designed for use with the Cisco CGR 2010. Applications include BRI U or BRI S/T WAN connectivity for energy infrastructure that utilizes ISDN for connectivity.

Please read the ISDN WAN Interface Card data sheet for more details:

[http://www.cisco.com/en/US/prod/collateral/modules/ps10984/datasheet\\_c78-696809.html](http://www.cisco.com/en/US/prod/collateral/modules/ps10984/datasheet_c78-696809.html)

**Figure 7.** ISDN GRWICs



Customers have the option to install up to four GRWIC modules in the Cisco CGR 2010. CGR 2010 allows any combination of GRWIC modules to be populated in the four GRWIC slots on the router. The GRWIC SKUs in Table 10 can be ordered with the router or as spares.

**Table 10.** Module Options for Cisco CGR 2010 (Factory Option and Spares)

Ordering SKU	Description
GRWIC-1CE1T1-PRI	1-Port Channelized T1/E1 and PRI GRWIC (both system and spare)
GRWIC-2CE1T1-PRI	2-Port Channelized T1/E1 and PRI GRWIC (both system and spare)
GRWIC-8A/S-232	8-Port Async/Sync Serial GRWIC, EIA-232 (both system and spare)
GRWIC-D-ES-2S-8PC	10-port Ethernet Switch Module
GRWIC-D-ES-6S	6-port Ethernet Switch Module
GRWIC-2SHDSL	Cisco Connected Grid G.SHDSL GRWIC
GRWIC-VA-DSL-A	Cisco Connected Grid VDSL2 and ADSL2/2+ GRWIC - Annex A
GRWIC-VA-DSL-B	Cisco Connected Grid VDSL2 and ADSL2/2+ GRWIC - Annex B
GRWIC-VA-DSL-M	Cisco Connected Grid VDSL2 and ADSL2/2+ GRWIC - Annex M
GRWIC-ISDN-1B-U	Cisco Connected Grid ISDN BRI U GRWIC
GRWIC-ISDN-1B-S/T	Cisco Connected Grid ISDN BRI S/T GRWIC

Figure 8 displays which options are available under the Cisco CGR 2010 Module in the ordering tool.

**Figure 8.** CGR 2010 Module Options

STEP 1: Select Item Category	STEP 2: Choose Options and Select Desired Quantity Below
<input type="checkbox"/> CISCO CGR 2010 Software and License	<input type="text" value="0"/> <b>GRWIC-1CE1T1-PRI</b> 1 port channelized T1/E1 and PRI GRWIC (data only)
<input type="checkbox"/> IOS Software Version and Type	
Image with Payload Encryption	
Image with No Payload Encryption	
<input type="checkbox"/> IOS Technology Package Licenses	
<input type="checkbox"/> IOS Feature Licenses	
<input type="checkbox"/> CISCO CGR 2010 Memory Options	
<input type="checkbox"/> CISCO CGR 2010 Module Options	
<input checked="" type="checkbox"/> Grid Router Interfaces (GRWIC)	
<input type="checkbox"/> GRWIC-D-ES-2S-8PC	
<input type="checkbox"/> GRWIC-D-ES-6S	
<input type="checkbox"/> CISCO CGR 2010 Power Options	
<input type="checkbox"/> CISCO CGR 2010 Cables and Accessories	
	<input type="text" value="0"/> <b>GRWIC-2CE1T1-PRI</b> 2 port channelized T1/E1 and PRI GRWIC (data only)
	<input type="text" value="0"/> <b>GRWIC-8A/S-232</b> 8-Port Async/Sync Serial GRWIC, EIA-232
	<input type="text" value="0"/> <b>GRWIC-2SHDSL</b> Cisco Connected Grid G.SHDSL GRWIC
	<input type="text" value="0"/> <b>GRWIC-VA-DSL-A</b> Cisco Connected Grid VDSL2 and ADSL2/ADSL2+ GRWIC - Annex A
	<input type="text" value="0"/> <b>GRWIC-VA-DSL-B</b> Cisco Connected Grid VDSL2 and ADSL2/ADSL2+ GRWIC - Annex B

## 5. Ordering Cisco CGR 2010 Power Supply Options

Cisco CGR 2010 can be ordered with a ruggedized power supply that is either High AC/DC (88-300VDC/85-264VAC) or Low DC (24/48VDC). The CGR 2010 can support a total of two power supplies in which case any combination of supplies can be used including one Low DC and one High AC/DC. The power supply type needs to be selected during product configuration. Given the various energy applications of these routers, the Cisco Connected Grid solution requires custom power cables and trained technicians to power these products. Therefore, standard power cables are not supplied with these products.

Customers have the option to select one or two power supplies as part of the Cisco CGR 2010 system order. The Power Supply SKUs in Table 11 can be ordered with the router or as spares. Note that the SKUs below are shared between Cisco CGR 2010 and Cisco CGS 2520.

**Table 11.** Cisco CGR-2010 and CGS-2520 Power Supply Options (Factory Options and Spares)

Ordering SKU	Description
PWR-RGD-AC-DC	High AC/DC (88-300VDC/85-264VAC) Power Supply for Cisco CGR 2010 and CGS 2520 (both system and spare)
PWR-RGD-LOW-DC	Low DC (24/48VDC) Power Supply for CGR 2010 and CGS 2520 (both system and spare)

Figure 9 shows the current Cisco CGR 2010 Power Supply Unit (PSU) options in the ordering tool.

**Figure 9.** Cisco CGR 2010 PSU Options

STEP 1: Select Item Category	STEP 2: Choose Options and Select Desired Quantity Below
<ul style="list-style-type: none"> <li><input type="checkbox"/> CISCO CGR 2010 Software and License</li> <li><input type="checkbox"/> CISCO CGR 2010 Memory Options</li> <li><input type="checkbox"/> CISCO CGR 2010 Module Options</li> <li><input checked="" type="checkbox"/> CISCO CGR 2010 Power Options               <ul style="list-style-type: none"> <li>PSU slot 0</li> <li>PSU slot 1</li> </ul> </li> <li><input type="checkbox"/> CISCO CGR 2010 Cables and Accessories</li> <li>Cisco Configuration Professional CD</li> </ul>	<ul style="list-style-type: none"> <li><input checked="" type="radio"/> <b>None Selected</b></li> <li><input type="radio"/> (1) <b>PWR-RGD-LOW-DC</b> Low DC (24/48VDC) Power Supply for CGR2010/CGS2520</li> <li><input type="radio"/> (1) <b>PWR-RGD-AC-DC</b> Hgh AC/DC (88-300VDC/85-264VAC) Pwr Sup for CGR2010/CGS2520</li> </ul>

## 6. Ordering Cisco CGR 2010 Cables and Accessories Options

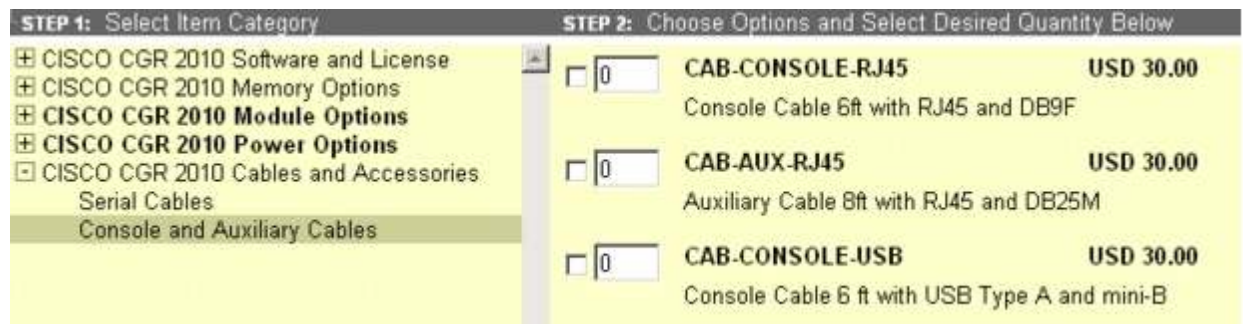
The default accessory kit does not include any Category 5 RJ45 Ethernet cables or cables for the router's console or auxiliary port. The console and auxiliary cables can be ordered as an option during router's configuration or as spares (Table 12). CGR 2010 offers an innovative USB-based console port, which needs a separate console cable.

**Table 12.** Console and Auxiliary Cables for Cisco CGR 2010 Routers (Factory Options and Spares)

Ordering SKU	Description
CAB-CONSOLE-RJ45	Console Cable 6 ft with RJ45 and DB9F (both system and spare)
CAB-AUX-RJ45	Auxiliary Cable 8 ft with RJ45 and DB25M (both system and spare)
CAB-CONSOLE-USB	Console Cable 6 ft with USB Type A and mini-B connectors (both system and spare)

In Figure 10, the ordering tool shows the current options for Cisco CGR 2010 under Console and Auxiliary Cables.

**Figure 10.** Cisco CGR 2010 Console and Auxiliary Cables



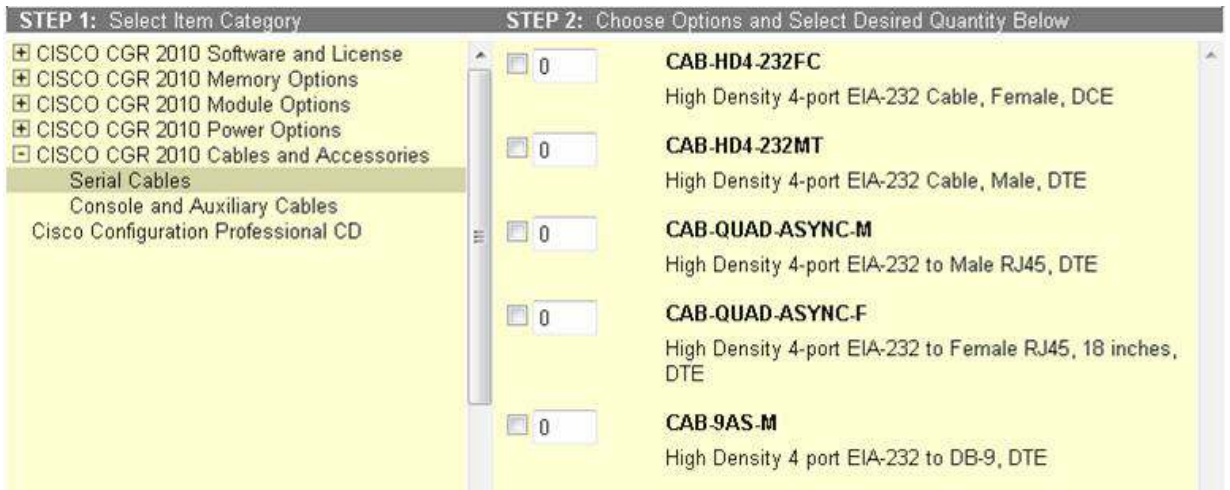
The default does not include any serial cables for the 8-Port Async/Sync Serial GRWIC, EIA 232. The DCE or DTE cable can be ordered as an option during the router's configuration or as spares (Table 13).

**Table 13.** Serial Cables for CGR 2010 Routers (Factory Options and Spares)

Ordering SKU	Description
CAB-HD4-232FC	High Density 4-port EIA-232 Cable, Female, DCE (both system and spare)
CAB-HD4-232MT	High Density 4-port EIA-232 Cable, Male, DTE (both system and spare)
CAB-QUAD-ASYNC-F	High Density 4-port EIA-232 Cable, DTE, Female RJ-45
CAB-QUAD-ASYNC-M	High Density 4-port EIA-232 Cable, DTE, Male RJ-45
CAB-9AS-M	High Density 4-port EIA-232 Cable, DTE, Male DB-9

In Figure 11, the ordering tool shows the current options for Cisco CGR 2010 under Serial Cables.

**Figure 11.** Cisco CGR 2010 Serial Cable Options



Cisco Configuration Professional (CCP) is the device configuration tool that supports configuration on the CGR 2010 router. Customers can download a copy of CCP version 2.3 at <http://www.cisco.com/go/ccp>, which supports both CGS 2520 and CGR 2010 products. Additionally, customers will have the option to order a full copy of the CCP software by selecting the CD option SKU during router configuration or order as a spare later. The SKU for the CD in Table 14 is shared between Cisco CGS 2520 and Cisco CGR 2010.

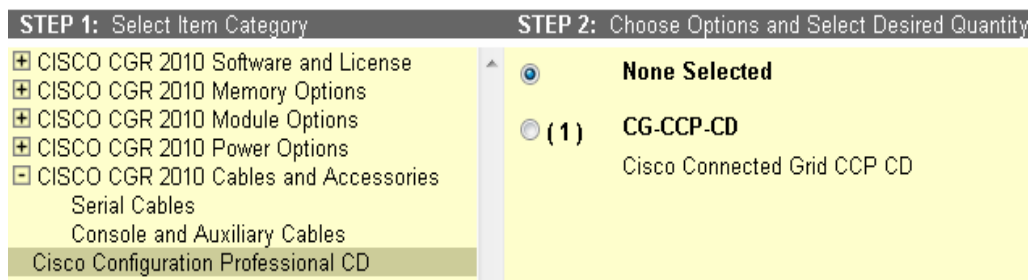
For more information and to download CCP version 2.3, please visit: <http://www.cisco.com/go/ccp>

**Table 14.** Cisco Configuration Professional for Cisco CGR 2010

Ordering SKU	Description
CG-CCP-CD	Cisco Configuration Professional on CD for CGR 2010 (both system and spare)

In Figure 12, the ordering tool shows the current options for Cisco CGR 2010 under CCP.

**Figure 12.** Cisco CGR 2010 Options Under CCP





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## Cisco Connected Smart Grid Switch CGS 2520

The Cisco 2520 Connected Grid Switches (CGS 2520) are rugged switches designed for the harsh, rugged environments often found in the energy and utility industries. The Cisco CGS 2520 is designed to support the communications infrastructure needs of the energy delivery infrastructure across the generation, transmission, and distribution sectors. This infrastructure includes utility- and customer-owned energy infrastructure such as substation applications supporting electrical transmission and distribution, renewable generation, oil and gas, water, distributed generation, co-generation, and trackside operations. The infrastructure also includes the communications infrastructure for delivery applications such as transmission pipelines, distribution mains, and service lines for oil, gas, and water. The CGS 2520 uses Cisco IOS Software, which is the operating system powering millions of Cisco switches worldwide and provides the energy grid operator with the benefits of improved security, network resiliency and reliability, and scalability.

Primary CGS 2520 features include:

- Rugged industrial design and substation compliance: IEC-61850-3 and IEEE 1613 for utility substation environments
- Tools for easy deployment, management, and replacement
- Extensive instrumentation and remote diagnostic capabilities
- Advanced quality of service (QoS) capabilities to support mission-critical substation applications such as SCADA and IEC 61850 GOOSE (Generic Object Oriented Substation Events) messaging
- Comprehensive network security features based on open standards

For more information, please visit the Cisco Connected Grid Switch 2520 product page at <http://www.cisco.com/go/cgs2520>.

The Cisco Connected Grid Switch 2520 comes in two models.

### CGS-2520-24TC

The CGS-2520-24TC is a rugged Ethernet switch with 24 10/100BaseTX ports and two dual-purpose Gigabit Ethernet uplinks (dual-purpose Gigabit Ethernet uplinks allow the user to activate either copper or fiber media). Two 10/100/1000BaseTX ports and two 100/1000 Small Form-Factor Pluggable (SFP) ports are on board. The user can activate two fiber ports, two copper ports, or a combination of fiber and copper ports. The Layer 2 LAN Base image is included. See Figure 13.

For more information, please visit the Cisco Connected Grid Switch 2520 product page at <http://www.cisco.com/go/cgs2520>.

**Figure 13.** CGS-2520-24TC

Cable Side View:



Power Supply Side View:



### CGS-2520-16S-8PC

The CGS-2520-16S-8PC is a rugged Ethernet switch with 16 Fast Ethernet SFP ports, eight 10/100BaseTX/Power over Ethernet (PoE) ports, and two dual-purpose Gigabit Ethernet uplinks. The Layer 2 LAN Base image is included as default. See Figure 14.

**Figure 14.** CGS-2520-16S-8PC

Cable Side View:



Power Supply Side View:



Table 15 shows the CGS 2520 ordering SKUs.

**Table 15.** Cisco Connected Grid Switch 2520 (CGS 2520)

Ordering SKU	Description
CGS-2520-24TC	Cisco CGS2520 Front/Rear Cabling with 2 GE, 24-10/100 Copper
CGS-2520-16S-8PC	Cisco CGS2520 Front/Rear Cabling with 2 GE, 16-SFP, 8-10/100 PoE

## 7. Ordering Cisco CGS 2520 Software Options

The CGS 2520 software is optimized for the harsh, rugged environments often found in the energy and utility industries and builds on the strength of Cisco IOS Software, which powers mission-critical networks across the world. Numerous new features make the CGS 2520 the optimal Ethernet switch for energy network operators, such as smartport templates, which enable simple configuration for utility environments. In addition, many default behaviors of the CGS 2520 are different from those of traditional Ethernet switches, making the CGS 2520 easier to configure, manage, secure, and troubleshoot.

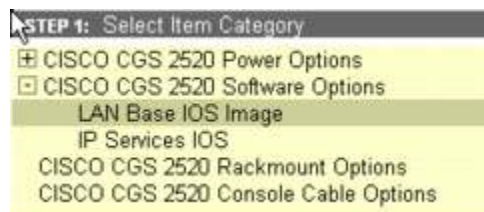
The CGS 2520 offers two different Cisco IOS Software images: LAN Base and IP Services. The LAN Base image offers advanced QoS, flexible VLAN handling, SCADA protocol classification support, Resilient Ethernet Protocol (REP) for improved convergence time in ring topologies, Flexlink for fast failover in hub-and-spoke topologies, and comprehensive security features. In addition, the IP Services image adds advanced Layer 3 features such as support for advanced IP routing protocols, Multi-VPN Routing and Forwarding Customer Edge (Multi-VRF CE/VRF-Lite), and policy-based routing (PBR). Table 16 shows the software option SKUs for CGS 2520.

**Table 16.** IOS Software Image Options for Cisco Connected Grid Switch (CGS-2520)-12.2(53) EX SKUs

Ordering SKU	Description
S252LLK9-12253EX	Cisco CGS 2520 LAN Base with Express Setup
S252LL-12253EX	Cisco CGS 2520 LAN Base without Crypto with Express Setup
S252ILK9-12253EX	Cisco CGS 2520 IP Services with Express Setup
S252IL-12253EX	Cisco CGS 2520 IP Services without Crypto with Express Setup
S252ILK9-12253EX=	Cisco CGS 2520 IP Services with Express Setup Spare
S252IL-12253EX=	Cisco CGS 2520 IP Services without Crypto with Express Setup Spare

In Figure 15, the ordering tool shows the current Cisco CGS 2520 Software Options.

**Figure 15.** Cisco CGS 2520 Software Options



## 8. Ordering Cisco CGS 2520 Power Supply Options

Cisco CGS 2520 can be ordered with a ruggedized power supply that is either High AC/DC or Low DC (24/48VDC). The power supply type needs to be selected during product configuration.

The customer has the option to select one or two power supplies as part of the Cisco CGS 2520 system order. The Power Supply SKUs in Table 17 can be ordered with the switch or as spares. Note that the SKUs below are shared between Cisco CGS 2520 and Cisco CGR 2010. Substation switches are products designed for use in power substations. These solutions require custom power cables and trained technicians to power these substation products. Therefore, standard power cables are not supplied with these products.

**Table 17.** Cisco CGS-2520 Power Supply Options (Factory Options and Spares)

Ordering SKU	Description
PWR-RGD-AC-DC	High AC/DC (88-300VDC/85-264VAC) Power Supply for Cisco CGR 2010 and CGS 2520 (both system and spare)
PWR-RGD-LOW-DC	Low DC (24/48VDC) Power Supply for CGR 2010 and CGS 2520 (both system and spare)

In Figure 16, the ordering tool shows the current Cisco CGS 2520 PSU options.

**Figure 16.** Cisco CGS 2520 PSU Options

STEP 1: Select Item Category	STEP 2: Choose Options and Select Desired Quantity Below
<input type="checkbox"/> CISCO CGS 2520 Power Options PSU slot 0 PSU slot 1 <input checked="" type="checkbox"/> CISCO CGS 2520 Software Options CISCO CGS 2520 Rackmount Options CISCO CGS 2520 Console Cable Options	<input checked="" type="radio"/> <b>None Selected</b> <input type="radio"/> (1) <b>PWR-RGD-AC-DC</b> <b>N/A</b> High AC/DC (88-300VDC/85-264VAC) Pwr Sup for CGR2010/CGS2520

## 9. Ordering Cisco CGS 2010 Cables and Accessories Options

The default accessory kit comes with 19-inch rack mount. An option is available to additionally select ETSI or a 23-inch NEBS rack mount. The rack mount can be ordered as an option during switch configuration or as spares. See Table 18.

**Table 18.** Rack Mount for Cisco CGS 2520 Routers (Factory Options and Spares)

Ordering SKU	Description
RM-RGD-ETSI	ETSI Rack-Mount Kit for Cisco CGS 2520 (both system and spare)
RM-RGD-23IN	23IN NEBS Rack-Mount Kit for the CGS 2520 (both system and spare)

The ordering tool in Figure 17 shows the current Cisco CGS 2520 Rack mount options.

**Figure 17.** Cisco CGS 2520 Rack Mount Options

The screenshot shows the ordering tool interface. On the left, under 'STEP 1: Select Item Category', the following categories are listed: CISCO CGS 2520 Power Options, CISCO CGS 2520 Software Options, CISCO CGS 2520 Rackmount Options (highlighted), and CISCO CGS 2520 Console Cable Options. On the right, under 'STEP 2: Choose Options and Select Desired Quantity Below', a note states: 'PLEASE NOTE THAT THIS PRODUCT COMES WITH 19 INCH RACKMOUNT'. Below the note, two options are listed:

Quantity	SKU	Description	Price
<input type="checkbox"/> 0	RM-RGD-ETSI	ETSI rack-mount kit for Cisco CGS 2520	N/A
<input type="checkbox"/> 0	RM-RGD-23IN	23IN NEBS rack-mount kit for the CGS 2520	N/A

The default accessory kit does not include any Category 5 RJ45 Ethernet cables or cables for the switches console port. The console cables can be ordered as an option during switches configuration or as spares. The CGS 2520 offers an innovative USB-based console port, which needs a separate console cable. See Table 19.

**Table 19.** Console Cables for Cisco CGS 2520 Routers (Factory Options and Spares)

Ordering SKU	Description
CAB-CONSOLE-RJ45	Console Cable 6 ft with RJ45 and DB9F (both system and spare)
CAB-CONSOLE-USB	Console Cable 6 ft with USB Type A and Mini-B Connectors (both system and spare)

The ordering tool in Figure 18 shows the current Cisco CGS 2520 Console Cable options.

**Figure 18.** Cisco CGS 2520 Console Cable Options

The screenshot shows the ordering tool interface. On the left, under 'STEP 1: Select Item Category', the following categories are listed: CISCO CGS 2520 Power Options, CISCO CGS 2520 Software Options, CISCO CGS 2520 Rackmount Options, and CISCO CGS 2520 Console Cable Options (highlighted). On the right, under 'STEP 2: Choose Options and Select Desired Quantity Below', two options are listed:

Quantity	SKU	Description	Price
<input type="checkbox"/> 0	CAB-CONSOLE-RJ45	Console Cable 6ft with RJ45 and DB9F	USD 30.00
<input type="checkbox"/> 0	CAB-CONSOLE-USB	Console Cable 6 ft with USB Type A and mini-B	USD 30.00

Cisco Configuration Professional (CCP) is the device configuration tool that supports configuration on the CGS 2250 switch. Customers can download a copy of Cisco Configuration Professional (CCP) version 2.3 or higher at <http://www.cisco.com/go/ccp>. It supports both CGS 2520 and CGR 2010 products. Additionally, customers will have the option to order a full copy of the CCP software by selecting the CD option SKU during router configuration, or order as a spare later. The SKU for the CD in Table 14 is shared between Cisco CGS 2520 and Cisco CGR 2010. See Table 20.

For more information and to download CCP version 2.3 or higher, please visit: <http://www.cisco.com/go/ccp>

**Table 20.** Cisco Configuration Professional for Cisco CGS 2520

Ordering SKU	Description
CG-CCP-CD	Cisco Configuration Professional on CD for CGS 2520 (both system and spare)

### Ordering Small Form-Factor Pluggable SFPs for CGR 2010 and CGS 2520

The CGR 2010 only supports rugged SFPs. These SFPs are not available as part of the system order and should be ordered as spares if needed. The CGS 2520 supports rugged SFPs in addition to commercial and extended temperature SFPs.

The CGR-2010/K9 provides two SFP slots supporting 100 mbps or 1000 mbps rugged fiber SFPs. Both Ethernet WAN ports on the CGR 2010 are dual-purpose ports and can support either two SFP-ports, two 10/100/1000 mbps copper ports, or one of each.

The CGS-2520-16S-8PC supports a maximum of 16 fast Ethernet fiber SFP ports and two gigabit (100/1000) Ethernet fiber SFP ports, and the CGS-2520-24TC supports a maximum of two gigabit (100/1000) Ethernet fiber SFP ports. The gigabit ports on both models are also dual-purpose ports.

The SFPs shown in Table 21 below are compatible with CGR-2010/K9, CGS-2520-16S-8PC, and CGS-2520-24TC.

**Table 21.** Industrial SFP Options for the Cisco CGR 2010 Router and CGS 2520 Switch (Spare Only)

Ordering SKU	Description	Temperature Range
GLC-FE-100FX-RGD=	100Base-FX Multi Mode Rugged SFP (spare only)	IND
GLC-FE-100LX-RGD=	100 Mbps Single Mode Rugged SFP (spare only)	IND
GLC-SX-MM-RGD=	1000 Mbps Multi-Mode Rugged SFP (spare only)	IND
GLC-LX-SM-RGD=	1000 Mbps Single Mode Rugged SFP (spare only)	IND
GLC-ZX-SM-RGD=	1000BASE-ZX Single Mode Rugged SFP (spare only)	IND

**Table 22.** Additional SFP Options for the CGS 2520 Switch (Spare Only)

Ordering SKU	Description	Temperature Range
SFP-GE-L=	1000BASE-LX/LH SFP (DOM)	EXT
SFP-GE-S=	1000BASE-SX SFP (DOM)	EXT
SFP-GE-Z=	1000BASE-ZX Gigabit Ethernet SFP (DOM)	EXT
GLC-EX-SMD=	GE SFP, LC Connector, EX Transceiver	EXT
GLC-BX-D=	1000BASE-BX SFP, 1490NM	COM
GLC-BX-U=	1000BASE-BX SFP, 1310NM	COM

Ordering SKU	Description	Temperature Range
GLC-FE-100LX=	100BASE-LX SFP for FE Port	COM
GLC-FE-100BX-D=	100BASE-BX10-D SFP	COM
GLC-FE-100BX-U=	100BASE-BX10-U SFP	COM
GLC-FE-100FX=	100BASE-FX SFP for FE Port	COM
GLC-FE-100EX=	100BASE-EX SFP (40km)	COM
GLC-FE-100ZX=	100BASE-ZX SFP (80km)	COM
CWDM-SFP-1xxx= (i.e., 1470, 1490, 1510, 1530, 1550, 1570, 1590, 1610)	CWDM SFP with DOM (8 Channels)	COM

If nonindustrial (i.e., EXT, COM) SFPs are used, the CGS 2520 operating temperature range must be de-rated. See Table 23.

**Table 23.** CGS 2520 Operating Temperature Range Support

Temperature Range	CGS 2520 Operating Temperature Range Support
IND	-40°F to +140°F (-40°C to +60°C)
EXT	+23°F to +140°F (-5°C to +60°C)
COM	+32°F to +113°F (0°C to +45°C)

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## 10. Cisco and Partner Services for Substation Automation

Cisco Connected Grid products can be ordered through a Cisco authorized partner. These products will be accepted and scheduled only after partner status is verified and the order is reviewed for completeness. Once your order has been accepted, a scheduled delivery date will be posted in the Order Status Tool. For further questions, please contact your Cisco representative for more information.

Cisco, with our ecosystem of partners, can help you plan, build, and run smart grid solutions for transmission and distribution automation, security, business, and home energy management, as well as smart meter communications.

Cisco Connected Grid Services include:

- Business architecture and strategy analysis
- Smart grid network optimization and technical requirements development
- Utility compliance assessment and design, solution architecture, design, and deployment

### Technical Services Available for CGR 2010 and CGS 2520 Products

Cisco SMARTnet<sup>®</sup> Service provides comprehensive technical support services for the CGR 2010 and CGS 2520 platforms (both base systems and bundled systems), operating system software and feature licenses, and modules. Cisco SMARTnet Services includes advance hardware replacement, operating system updates, online tools and resources, and Cisco Technical Assistance Center (TAC) support.



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## 11. Additional Information and Marketing Contacts

To obtain current information about prices for products in the Cisco Connected Grid portfolio, please refer to the Cisco price list or contact your Cisco sales representative.

For more information about the Cisco Connected Grid portfolio, visit: <http://www.cisco.com/go/smartgrid>.

For more information about Cisco Technical Services, visit: <http://www.cisco.com/go/ts>.



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