

Shaping the future

... in FIELD COMMUNICATIONS



Integration of

- Voice and Data Terminals
- Radio Equipment
- Other Networks

CD-116

Field Digital Switchboard

The **CD-116** is a state-of-the-art digital switchboard designed for military tactical applications requiring integration of voice and data communications. Specifically, the CD-116 enables the integration of a variety of equipment into any field communication system:

- Analogue telephones (Local Battery and Common Battery)
- Digital terminals (voice and data) and computers
- Radio equipment, including Combat Net Radios
- Other switchboards, even old magneto type ones
- Public Networks, both analogue and digital

A highly compact solution provides complete system accessibility through front and rear connectors and binding posts.

The Operator Terminal is integrated in the front panel and includes an alphanumeric VF display, a keyboard and the operator handset/headset connector.



The CD-116 fulfils all operational and mechanical requirements of field environment operation. Its small size and low weight, together with its inherent properties for communication readiness, makes it particularly suitable when mobility, reliability and maintainability are at stake.

Main Features

Interfaces and Capacity

- CB, CBS and LB (FXS) subscriber lines (up to 64 ports)
- Radio interfaces: voice, PTT and squelch (up to 4 ports)
- E&M trunk lines, 2 or 4 wires (up to 4 ports)
- CO (FXO) trunk lines for legacy PBX or PSTN (up to 12 ports)
- PRI (E1/G.703) ISDN Primary Rate Interfaces (up to 3 ports)
- BRI ISDN Basic Rate Interfaces (up to 6 ports)

Functionalities

- Automatic Call Establishment:
 - CB or CBS telephones with Pulse or DTMF dialing
 - Radio and LB telephones with DTMF dialing
- Operator Assisted Calls:
 - CB, CBS and LB telephones and radios
- Hot Line (fixed destination)
- Call Parking
- Consultation and Call Swapping
- Call Waiting (Camp on), Call Hold and Call Transfer
- Call Forwarding
- Three Party and Extended Conference Call
- Call Priority and Pre-emption
- EuroISDN Supplementary Services
- Built-in self test (BITE) for easy and fast diagnostics
- Integrated AC and DC input power supply with automatic switching to battery back up, in case of AC mains failure

Technical Characteristics

Electrical Specification

Power Supply	90 to 132 VAC (47 – 63 Hz) or 180 to 264 VAC (47 - 63 Hz) or 21 to 28 VDC
Consumption:	39, 47 or 55 W for 16, 32 or 48 multifunctional interfaces, typical

Multifunctional Interfaces

Lightning Protection:	ITU-T K.11 & K.21 (6 kV)
Loop resistance (line side)	
CBS mode	5.000 Ω @ 7 mA (off-hook/on-hook detection and pulse dialing)
CB mode	1.300 Ω @ 20 mA
Closing voltage (exchange side)	
CBS mode	4 V @ 7 mA
CB mode	5V @ 20 mA
Ring Current Generator:	60 Vrms 20 Hz ±10%, 2 REN
Ring Current Detector:	35 Vrms, 10 – 40Hz

Radio Interfaces

PTT:	100 mA, 40 Ω
Squelch:	10 – 60 V, 2,2 kΩ

E&M Interfaces

0 or -48 V signaling

All analogue interfaces

Insertion loss:	± 1 dB @ 300 – 3400 Hz
Return loss:	10 dB @ 600 Ω, 300 – 3400 Hz
Crosstalk:	-65 dB @ 300 – 3400 Hz
Group delay distortion:	1.5 ms @ 300 – 3400 Hz
Idle noise:	-65 dBm0p
Intermodulation distortion:	-40 dB @ 300 – 3400 Hz

Environmental Specifications

	MIL-STD-810F
Operating temperature:	-25 to +70 °C
Storage temperature:	-40 to +75 °C
Humidity:	0 to 95 %
Waterproof:	Method 512.4
Shock:	Method 516.5
Vibration:	Method 514.5

Physical Specifications

Dimensions (W x D x H):	340 x 450 x 193 mm
Weight:	13.9 – 14.5 – 15.1 Kg for 16 – 32 – 48 multifunctional interfaces, typical
Case Color:	Olive green, RAL 6014

BLC-201 Field Telephone

The **BLC-201** is a rugged, lightweight and waterproof analogue telephone set designed according to military requirements and suitable for connection to manual (magneto) or automatic 2-wire switchboards, to a similar telephone or directly to the public telephone network (PSTN).

The telephone electronics, based on DSP technology, uses a high efficiency electronic ring generator to ensure low power consumption and long battery life. The BLC-201 operates in Common Battery (CB), Common Battery Signaling (CBS) or Local Battery (LB) modes, as selected by the user.

When operating in LB or CBS modes, the BLC-201 Field Telephone is powered by a pack of four 'C' size (IEC-LR14) Ni-MH rechargeable or alkaline battery cells. Batteries are not required in CB mode.

A slim and lightweight military standard handset with push-to-talk switch allows easy operation even by personnel wearing helmet.

Silent calls are allowed with extra microphone amplification by selecting 'Whisper' mode of operation.



Accessories



The BPC-201 is a fast battery charger that will charge a set of rechargeable batteries for the BLC-201 telephone set usually in less than 2 hours.

The charger is microprocessor-controlled and uses -dV detection technology and a safety timeout for fast charging and a long battery life.

Technical Characteristics

Electrical Specifications

Connection:	Two wire binding posts for connection to line and one binding post for ground connection
Range:	40 km (LB mode); 20 km (CBS mode); 12 km (CB mode)
Return Loss:	> 14 dB
AC impedance at 800 Hz:	600 Ω, typical
Minimum DC current (CB mode):	17 mA
Call detection:	20 Vrms, 15 to 70 Hz, at least 80 ms
Call signal generation:	45 Vrms, 25 Hz ± 5 Hz, 2 sec, each time Call key is pressed
DTMF signaling:	According to ITU-T Q.23

Environmental Specifications

Operating temperature:	MIL-STD-810F -25 to +70 °C
Storage temperature:	-40 to +75 °C
Humidity:	0 to 95 %
Waterproof:	Method 512.4
Shock:	Method 516.5
Vibration:	Method 514.5

Physical Specifications

Dimensions (W x D x H):	259 x 148 x 105 mm
Weight:	< 1.2 Kg, without battery; < 1.5 Kg with battery
Case Color:	Olive green, RAL 6014

Accessories

BPC-201 Battery Pack Charger

Power Supply:	90 to 264 VAC, 50 to 60 Hz, 35 w
Dimensions (W x D x H):	125 x 225 x 57 mm
Weight:	670 g
Case Color:	Olive green, RAL 6014

CD-116

Accessories



MDF-116 Main Distribution Box

The MDF-116 is an external distribution box that provides 24 pairs of binding posts and mirrors the CD-116 rear panel socket to which it is connected.

The MDF-116 shall be used together with the CD-116 whenever more than 16 telephone lines are required. The unit then provides connectivity to an additional set of 16 telephone lines and, if required, E&M, radio and ISDN interfaces.

BP-116 Battery Pack for CD-116

The BP-116 is a Valve-Regulated Lead-Acid (VRLA) Battery Pack that provides DC power to the CD-116.

The batteries are housed in a rugged aluminum case, specially designed for use in field environments.



BPC-116 Battery Charger for BP-116

The BPC-116 is an intelligent, fast battery charger for the BP-116 battery pack.

The charger is microprocessor controlled and offers an extensive set of protection and self-protection functions.



VM-116 Vehicle Shock Mount

The VM-116 is a cradle that allows a user to slide in a CD-116 while retaining all the operational advantages and keeping the controls of the switchboard from the front. It is fitted with four (4) shock absorbers which reduce the effects from mechanical stresses when installed inside a vehicle or a shelter during displacement.



Other CD-116 Accessories include a complete set of cables, covering all interfaces available in the CD-116, and a canvas transport bag is available for transporting the equipment, its cables and manual.

Technical Characteristics

MDF-116

Connection to external lines:	24 pairs of binding posts 1 MDF like connector for 2 Radio or E&M circuits
Housing:	Rugged and waterproof 2mm aluminum box
Dimensions (W x D x H):	250 x 335 x 93 mm
Weight:	3.8 kg
Case Color:	Olive green, RAL 6014

Cable assemblies for MDF-116

Connection to CD-116:	MDF Cable, 7.5 m
Connection to radios or E&M lines:	E&M Radio Cable, 3.0 m

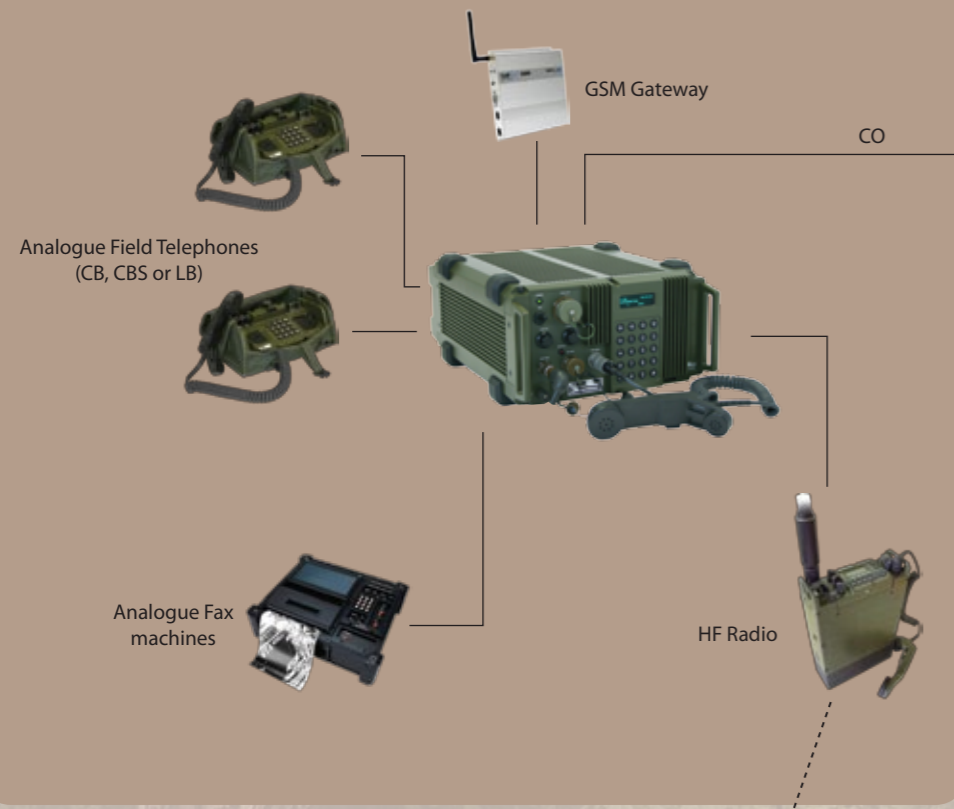
BP-116

Nominal Voltage:	24 V
Rated Capacity:	20 Ah (20 hour rate)
Dimensions (W x D x H):	202 x 212 x 217 mm
Weight:	14.57 kg
Case Color:	Olive green, RAL 6014

BPC-116

Input Voltage:	100 to 240 VAC, 45 to 65 Hz
Output Voltage:	28.8 VDC
Output Current:	8 A
Dimensions (W x D x H):	290 x 155 x 81 mm
Weight:	3 kg

PSTN



The CD-116 modular architecture offers a wide range of configurations from 16 to 60 multifunctional lines as well as interfaces for CO trunks, radios, E&M, ISDN, BRI and PRI (2Mbits/s), G.703 and Eurocom circuits.

Two or more CD-116 may be stacked for building larger switchboards.

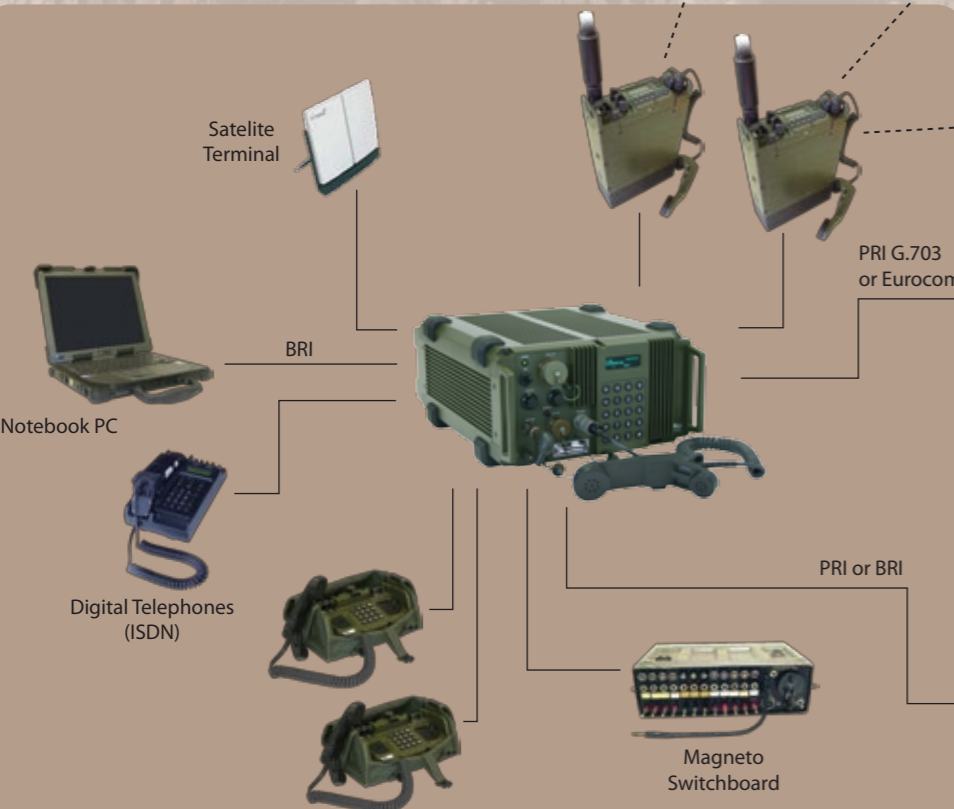
The multifunctional lines are used for CB, CBS and LB telephones and may also be used for CO trunk lines (CB, CBS or LB), if these interfaces are included in the CD-116 configuration. The multifunctional interfaces, as well as all the others, are software programmable through the front panel console, allowing configuration changes even at field level.

VHF or UHF Radio

When the CD-116 interfaces with Combat Net Radio equipment, radio communications to other switchboards and/or to stand-alone radios are available to network users.

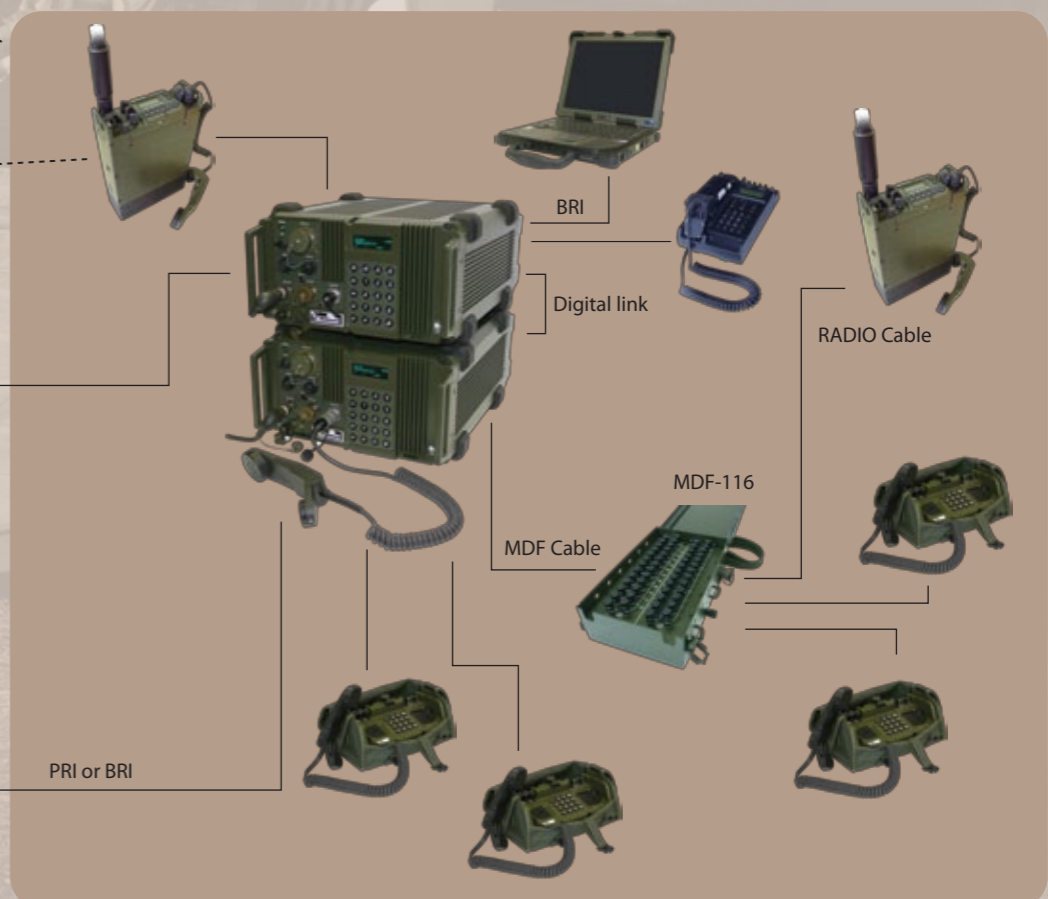
Automatic calls can be made from CD-116 to the radio network or from any remote radio to the CD-116 users, if DTMF dialing is available on the radio.

ISDN BRI interfaces are available for connecting PC's and digital telephones. Internetworking functionalities allow digital and analogue telephones to communicate transparently.



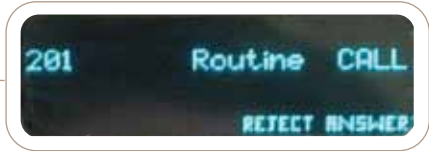
The ISDN, G.703 or Eurocom lines may be used for switchboard networking (by cable, microwave or optical fiber links), stacking or interfacing to digital public networks.

Public ISDN



PRI or BRI

High and clear character VF display, showing status of equipment, call progress, interfaces, configuration and maintenance operations. (Brightness is reduced in idle state)



Ethernet port for uploading configuration and on-line programming using a PC.

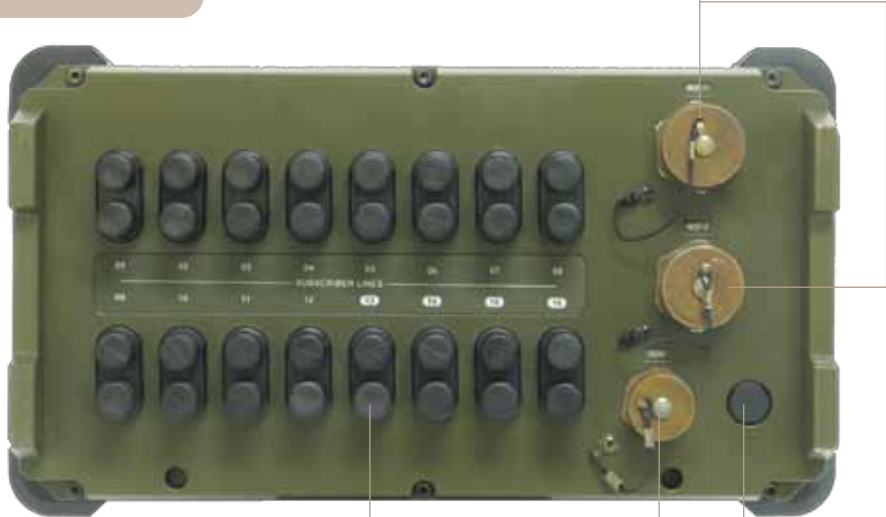
- Power Switch and Indicator
- AC Power Fuse
- DC Power Fuse
- Battery Status Indicator
- AC Power Input
- DC Power Input
- Earth Connecting Point



Operator Audio (Handset or Headset)

- Operator Console keypad with 20 buttons, including four soft-keys, used for:
- Call Operation
 - Configuration at field level (e.g.: select interface characteristics and profiles)
 - Maintenance at field level (e.g.: run BITE on-demand, audio, power supply checks, etc.)
 - Console Setup

- Depending on CD-116 configuration, each MDF Socket may be used for connecting:
- Up to 2 Radios or E&M circuits, using the specific cable (option)
 - An external Main Distribution Box – MDF-116 (provides connectivity to multifunctional lines, in addition to those available in the CD-116 rear binding posts, and to radio and E&M interfaces)



Pressure Compensation Breather Valve

- Binding Posts – 16 Pairs – for connecting multifunctional lines:
- Up to 16 Analogue Subscribers (LB/CB/CBS Telephones)
 - Up to 4 CO Lines (Trunk/PSTN)

- ISDN Socket used for connecting:
- Up to 3 PRI/E1, QSIG, G.703 or Eurocom interfaces
 - Up to 6 BRI Interfaces S0 (2B+D)

CD-116

Field Digital Switchboard

- 16 to 64 multifunctional interfaces for CB, CBS and LB telephones
- Integration of switchboards and their users into radio tactical networks
- Additional interfaces for PSTN, other switchboards, E&M, ISDN BRI and PRI (2 Mbit/s), G.703 and Eurocom circuits
- Expandable to larger configurations, stacking two or more switchboards
- Software configurable at field, from the front panel console
- Designed for meeting MIL-STD-810F: temperature, humidity, vibration, shock, dust and immersion

BLC-201

Field Telephone

- CB, CBS and LB Operation with Pulse or DTMF dialing
- Selectable ring volume (High, Low or Silent mode)
- Visual signals for incoming, off-hook, low battery and self test situations
- Whisper mode
- Rugged, lightweight and waterproof plastic case
- Designed for meeting MIL-STD-810F: temperature, humidity, vibration, shock, dust and immersion