DCS 6000

User Manual

Digital Conference System

EX 6010   Extension Unit

List of Contents

Document version

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Important

Compliancy

The equipment has been tested and found to comply with the limits of the following standards for digital devices:

- EN55103-1 (Emission)
- EN55103-2 (Immunity
- EN60065 safety
- UL6500 safety
- FCC rules part 15, class A (Emission)

This device complies with part 15 of the FCC rules. Operation is subject to the following conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in residential, commercial or light industrial environments. The equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the user manual it may cause harmful interference to radio communications.

You are cautioned that any changes or modifications not expressly approved in this manual could void your authority to operate this equipment.

Safety

Check that the voltage of your local power supply is within the operating voltage of the unit (100-240V AC). If a voltage conversion is required, consult your DIS dealer or qualified personnel.

Should any liquid or solid object fall into the cabinet, unplug the unit and have it checked by qualified personnel before operating it further.

Set the Power switch to OFF if it is not used for several days.

The equipment must be connected to earth

Installation precautions

Allow adequate air circulation to prevent internal heat built-up. Do not place the unit on a surface (rugs, blankets, etc.) that may block the ventilation holes.

Do not install the unit in a location near heat sources such as radiators or air ducts, or in a place exposed to direct sunlight, excessive dust or humidity, mechanical vibration or shock.

To avoid moisture condensations do not install the unit where the temperature may rise rapidly.

When installing the unit inside a 19" rack, observe that the rack is properly ventilated. The maximum allowed temperature inside the rack is 40 °C.

Cleaning & Repacking

To keep the cabinet in its original condition, periodically clean it with a soft cloth. Stubborn stains may be removed with a cloth lightly dampened with a mild detergent solution. Never use organic solvents such as thinners or abrasive cleaners since these will damage the cabinet.

Save the original shipping cardboard box and packing material; they will become handy if you ever have to ship the unit. For maximum protection, re-pack the unit as originally packed from the factory.

Warranty

The unit is minimum covered by 12 months warranty against defects in materials or work-manship.

.Description of the DCS 6000 system

Features

The DCS 6000 system has the following main features:

- Fully digital

- Excellent sound quality

- "State of the Art" fully digital integrated interpretation, discussion and voting system offering interpretation, language distribution, conference microphone and voting facilities with attendance check with Chip Card ™.

- New, unique digital DATA and AUDIO bus.

- 39 incoming channels (8 floor channels + 31 interpreted channels)

- 33 distributed channel (2 x floor + 31 interpreted channels)

- The Delegate and Interpreter units are powered and controlled by the CU 6010 Central Unit, which drives up to app. 200 units on 4 chains.

- EX 6010 Extension Units or PS 6000 Power Supplies available if more units are required

- A total of 4000 units (delegate or interpreter units) can be connected to the system.

- Using screened CAT5 cabling (FTP or STP) ensuring a very cost effective installation and easy set-up of portable systems

- Firmware in Delegate units, Interpreter Units, Central Units etc. upgradeable through RS232 on Central Unit

- Can be operated with or without a PC.

- Added functionality and comprehensive features provided by SW 6000 software package running on PC

RS232/RS422 connection on CU 6010 for external operation of the system of a PC or control system such as AMX or Crestron

The SW 6000 is an optional software package, which expands the functionality of the DCS 6000 system. The software runs on standard computer technology (Standard PC with Windows 2000 or XP).

Main features of the SW 6000 are:

- Microphone management

- Mimic panel operation

- Interpretation management

- Voting management

- Message handling

- Agenda handling

- Data stored on SQL data base for easy export/import of data as well as easy links to external databases

- Multi language user interfaces

- Supports different user type with different priorities, user interfaces and control possibilities

- Variety of printing facilities such as speaker's log, voting results, delegates list etc.

System components

The CU 6010 Central Unit supports all available units in the DCS 6000 series:

Central equipment etc.

EX 6010	Extension Unit
PS 6000	Power Supply
AO 6008	Audio Output box
RP 6004	Repeater for four chains
JB 6002	Junction Box with 2 outputs
JB 6004	Junction Box with 4 outputs

Interpreter equipment

IS 6032P	Interpreter Set
IS 6132P	Interpreter Set
LS 6032P	Interpreter Loudspeaker

Conference equipment and channel selectors

CS 6032FV/H	Channel Selector (flush mounted)
CM/DM 6010P	Conference Unit (portable)
CM/DM 6020P	Conference Unit (portable) with XLR microphone connector
CM/DM 6070P	Conference Unit (portable) with two built-in channel selectors
CM/DM 6090P	Conference Unit (portable) with two built-in channel selectors and XLR microphone connector
CM/DM 6060F	Conference Unit (flush mounted) with one built-in channel selectors
CM/DM 6510F	Conference Unit (flush mounted) with Chip-card and 3 voting buttons
CM/DM 6560F	Conference Unit (flush mounted) with one built-in channel selector, Chip-card and 3 voting buttons
MU 6040C/D	Microphone Unit for use with customised front plate with Loudspeaker, Microphone and Buttons. Available in Delegate (D) and Chairman (C) version
AM 6040	Ambient Noise Microphone

Operating instructions

EX 6010 Extension Unit

General description

The EX 6010 Extension Unit provides additional Power Supplies, Repeater and Splitter functionality for the DCS 6000 system. One CU 6010 Central Unit is needed in each DCS 6000 system, however for expansion of the system the EX 6010 Extension Unit is suitable.. The EX 6010 consist of two main parts:

- Repeater/splitter board with 4 individual outputs

- 4 individual power supplies

Features

The main features of the EX 6010 Extension Unit are:

- Built in Power Supplies for app 200 units (Delegate) or app. 600 Channel Selectors

- 4 outputs for connection to Delegate Units, Interpreter Units etc.

- Loop through connectors for connection additional EX 6010 or other units, which are part of the DCS 6000 system

- Delayed switching on of power to the four chains, to minimise the total 'in rush' current on the Mains supply.

- Designed in a standard 2HE 19" cabinet.

User Controls, indications & connectors

Front plate layout

Front plate controls
The EX 6010 Extension Unit features the following controls and display:

❑ *Power Led*

When power is switched ON at the CU 6010 Central Unit any connected EX 6010 Extension Units will automatically be powered up. An LED indicates when power is switched ON.

❑ *Fault LED*

This indication lights up, if the internal power supply is malfunctioning i.e. because of overheating or overload of a chain.

The Fault LED will always light up some seconds after the unit is switched on caused by the delayed switching on of the four supplies.

As a warning the light is flashing at an internal temperature above 45°C. At a temperature above 55°C or if one of the DCS-LAN outputs is

supplying no voltage, the LED is lighting constantly.

Please note that the maximum ambient temperature for the CU 6010 is 40 deg. Celsius.

Back panel layout
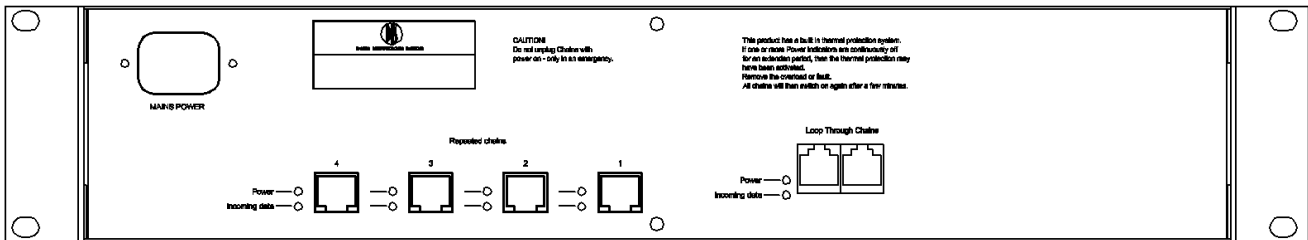
Connectors

❑   *Mains Power connector*

Connection for mains power. See specs.

❑   *Loop through connectors*

RJ45 connector, 2 pieces with auto-termination

DCS-LAN connectors for connection to the CU 6010 and for connection to other units with DCS-LAN connectors, such as more EX 6010.

❑   *Repeated Chains 1, 2, 3 & 4*

RJ45 connector, 4 pieces

Those connectors are DCS-LAN connectors for connection to DM/CM 6xxx, IS 6132, CS 6032, EX 6010, AO 6008 etc.

❑   *Power LED's*

Those LED's light up when Power is available on the connector next to the LED and only if the voltage is over 24V (not overloaded).

❑   *Incoming data LED's*

Those LED's lights up, when the unit is received incoming data from connected units on the connector next to the LED.

❑   *Outgoing data LED*

This LED lights up when outgoing data is received from the central unit

System design

There are no settings to be done on the EX 6010 Extension Unit.

However it is important to observe, that the unit is only repeating one of the chains on the CU 6010 Central Unit.

And as so, the specification, which applies to each of the chain outputs on the CU 6010 Central Units does also apply to all the repeated outputs in total.

So when designing a system to incorporate EX 6010 Extension units, bare in mind, that as the EX

6010 Extension Unit is repeating only one of the four outputs A (A1 or A2) or B (B1 or B2) the max. number of languages configured on the four outputs (1, 2, 3 and 4) is totally max. 16.

If more languages are required, Interpreter sets for those languages have to be connected either to an other EX 6010 Extension Unit, which is connected to the other of the two chains (A or B) on the CU 6010, or directly to the other of the two chains (A or B) on a CU 6010.

'Repeated chain' connector
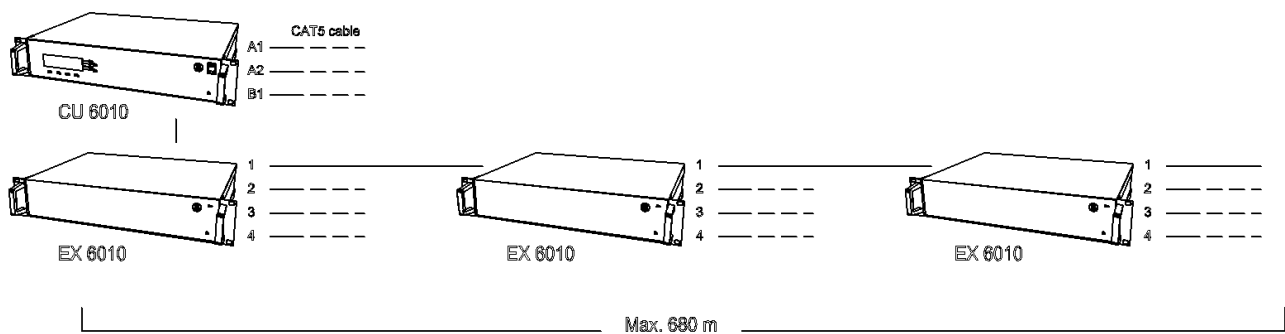
When connecting the EX 6010 Extension Units to the CU 6010 the first EX is connected to the 'Loop through' connector.

The next EX 6010 Extension units can be connected to either the other 'Loop through' connector or to one of the 'Repeated out' connectors. If using the

'Repeated' outputs two more EX 6010 Extension units (or RP 6004 Repeaters) can be connected extending the maximum cable length in one chain up to 650 m. The above schematic is showing the connection using the ''Repeated chains' connectors.

'Loop through' connector

When connecting a number of EX 6010 Extension Units to the CU 6010 an almost unlimited number of EX 6010 can be connected by using the 'Loop through' connector.

However the practical limitation is the maximum cable length in one chain, which is 200 m and the supply of power to the 'Loop Through' connectors at the EX 6010.

The following schematic is showing the connections using the 'Loop through' connectors.

A combination of the two methods of connection can be seen in the 'CU 6010 User Manual'.
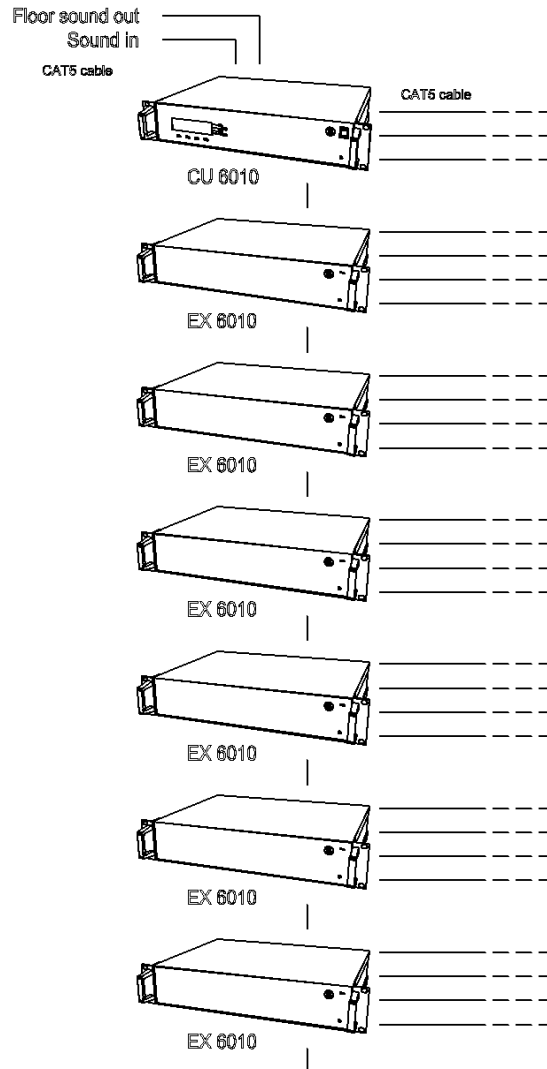
System Setup

General guidelines

Connect the EX 6010 to the various DCS 6000 units using Cat5 or Cat5e FTP or STP screened cables:

- Maximum cable length in one chain is 200 m (before repeating). This includes interconnection cables between the units. The max. usable cable length depends on the units connected and length of feeding cables etc.

- Maximum cable length in one chain when using repeaters is 650 m.

- Although each of the outputs DCS-LAN Network Output connectors (A1, A2, B1 and B2) have a 100W supply, this 100W power is not all usable with long cables, as there will be a voltage drop in the feeding cable from the EX 6010 to the units connected. If the feeding cables are short and the cables between the units are short, more units can be connected than if the feeding cable is long and/or the cables are long between the units. Please consult the next section (Max. Number of units to be connected)

- The max. number of languages configured on chain A (A1 or A2) or B (B1 or B2) is 16. If more languages are required, Interpreter sets for those languages have to be connected to both chains (A and B). Normally the languages are supposed to be divided equally on chains A (A1 or A2) and B (B1 or B2).

- If the last unit in one chain is a CS 6032 Channel Selector, this unit has to be terminated with an external termination, as the CS 6032 does not have an internal auto-termination.

It is desirable that the square of the feeding cables especially, but also the interconnection cables are as big as possible to minimize the voltage drop in the cables. Cat 5/Cat5E cables are delivered in various gauges:

The following table is showing the Diameter/square for various AWG types:

Type	Diameter	Square
AWG22	0.64 mm	0.32 mm2
AWG23/1	0.57 mm	0.25 mm2
AWG24	0,53 mm	0.22 mm2
AWG26	0,42 mm	0.14 mm2

Built into 19" Racks

The unit has a built-in fan taking air in at the right side of the unit and blowing the hot air out at the right side. That allows units in 19" racks to be stacked close with other units without extra room for cooling air between them. Please check that the other units will allow this.

Max. number of units to be connected

The following tables show the maximum number of units, which can be connected to each of the four outputs (A1, A2, B1 or B2) on a CU 6010 Central Unit or on each output on an EX 6010 Extension Unit or on the output of a PS 6000.

CM/DM 60x0P Chairman/Delegate Units

Length of Feeding Cable Type CAT5 AWG24	Length of inter connecting Cable, Type CAT5 AWG24	Total cable length	Max. number of CM/DM 60x0 pr output
10 m	1 m	51 m	42
30 m	1 m	67 m	38
50 m	1 m	83 m	34
100 m	1 m	123 m	24
150 m	1 m	165 m	16
10 m	2 m	88 m	40
30 m	2 m	98 m	35
50 m	2 m	108 m	30
100 m	2 m	142 m	22
150 m	2 m	180 m	16

CM/DM 60x0P Chairman/Delegate Units & JB 6002 Junction Box

This configuration shows two CM/DM 60x0 Delegate/Chairman Units connected to one JB 6002 Junction Box with 3m cables between each JB 6002. Maximum 5 m cable from JB 6002 to CM/DM 60x0 and max. one CM/DM 60x0 on each output of JB 6002.

Length of Feeding Cable, Type CAT5 AWG24	Length of Cable between each JB 6002, Type CAT5 AWG24	Total cable length	Number of JB 6002	Max. number of DM 60x0
10 m	3 m	61 m	18	36
30 m	3 m	75 m	16	32
50 m	3 m	89 m	14	28
100 m	3 m	127 m	10	20
150 m	3 m	168 m	7	14

CM/DM 6060F/6510F Chairman/Delegate Units

The following tables show the maximum number of units, which can be connected to each of the four outputs (A1, A2, B1 or B2) on a CU 6000 Central
.

Unit or on each output on an EX 6010 Extension Unit or on the output of a PS 6000.

Length of Feeding Cable Type CAT5 AWG24	Length of inter connecting Cable, Type CAT5 AWG24	Total cable length	Max. number of CM/DM 60x0 pr output
10 m	1 m	39 m	30
30 m	1 m	56 m	27
50 m	1 m	73 m	24
100 m	1 m	115 m	16
150 m	1 m	160 m	11
10 m	2 m	64 m	28
30 m	2 m	78 m	25
50 m	2 m	94 m	23
100 m	2 m	130 m	16
150 m	2 m	170 m	11

CM/DM 6560F Chairman/Delegate Units

Length of Feeding Cable Type CAT5 AWG24	Length of inter-connecting Cable, Type CAT5 AWG24	Total cable length	Max. number of CM/DM 60x0 pr output
10 m	1 m	35 m	27
30 m	1 m	53 m	24
50 m	1 m	70 m	21
100 m	1 m	113 m	14
150 m	1 m	159 m	10
10 m	2 m	58 m	25
30 m	2 m	72 m	22
50 m	2 m	88 m	20
100 m	2 m	126 m	14
150 m	2 m	166 m	9

MU 6040 C/D without connected loudspeaker

This table shows the maximum number of MU 6040 Microphone Units, which can be connected. The numbers are with no audio in loudspeaker (no loudspeaker connected to each unit). If loudspeakers are used, then use the figures for CM/DM 60x0 above.

Length of Feeding Cable, Type CAT5 AWG24	Cable length between each MU 6040	Total cable length	Max. number of MU 6040
10 m	2 m	168 m	80
30 m	2 m	178 m	75
50 m	2 m	188 m	70
100 m	2 m	200 m (202 m)	51 (52*)
150 m	2 m	200 m (232 m)	26 (42*)
100 m	1 m	151 m	52
150 m	1 m	191 m	42

Numbers in (') are the number of units, which could have been connected CU/EX, but where the total number of units has been lowered due to the restriction of the maximum length of cable (200 m).

IS 6132P Interpreter Units

This table shows the maximum number of IS 6132P Interpreter Sets, which can be connected. The numbers are with no audio in loudspeaker (no loudspeaker connected to each unit).

If loudspeakers are used, then use the figures for CM/DM 60x0 above.

Note: The number of units is dependant of how many interpreter sets there are per booth (or language), as there only can be one set switched ON per language (channel).

Length of Feeding Cable, Type CAT5 AWG24	Length of inter-connecting Cables, Type CAT5 AWG24	Max. number of units pr output All ON	½ ON	1/3 ON
10m	2 m	54	x	x
30m	2 m	49	57	60
50m	2 m	44	51	x
100m	2 m	35	40	x
150m	2 m	25	30	x

IS 6132P w/JB 6004 and LS 6032

Length of Feeding Cable, Type CAT5 AWG24	Length of cable between booths	Number of booths	Number of IS 6132/ booths	Number of LS 6032/ booths
10 m	5 m	19	4	0
10 m	5 m	12	4	4
30 m	5 m	17	4	0
30 m	5 m	10	4	4
50 m	5 m	15	4	0
50 m	5 m	9	4	4
100 m	5 m	11	4	0
100 m	5 m	7	4	4
150 m	5 m	8	4	0
150 m	5 m	5	4	4

CS 6032F Channel Selector w/back light on

Length of Feeding Cable Type CAT5 AWG24	Length of Inter-connecting cable, Type CAT5 AWG24	Total cable length	Max. number of CS 6032 pr output
30 m	1 m	139 m	110
50 m	1 m	144 m	95
100 m	1 m	184 m	85
150 m	1 m	200 m	51 (67')
10 m	2 m	200 m	96
30 m	2 m	200 m	86 (90')
50 m	2 m	200 m	76 (85')
100 m	2 m	200 m	51 (70')
150 m	2 m	200 m	26 (60')

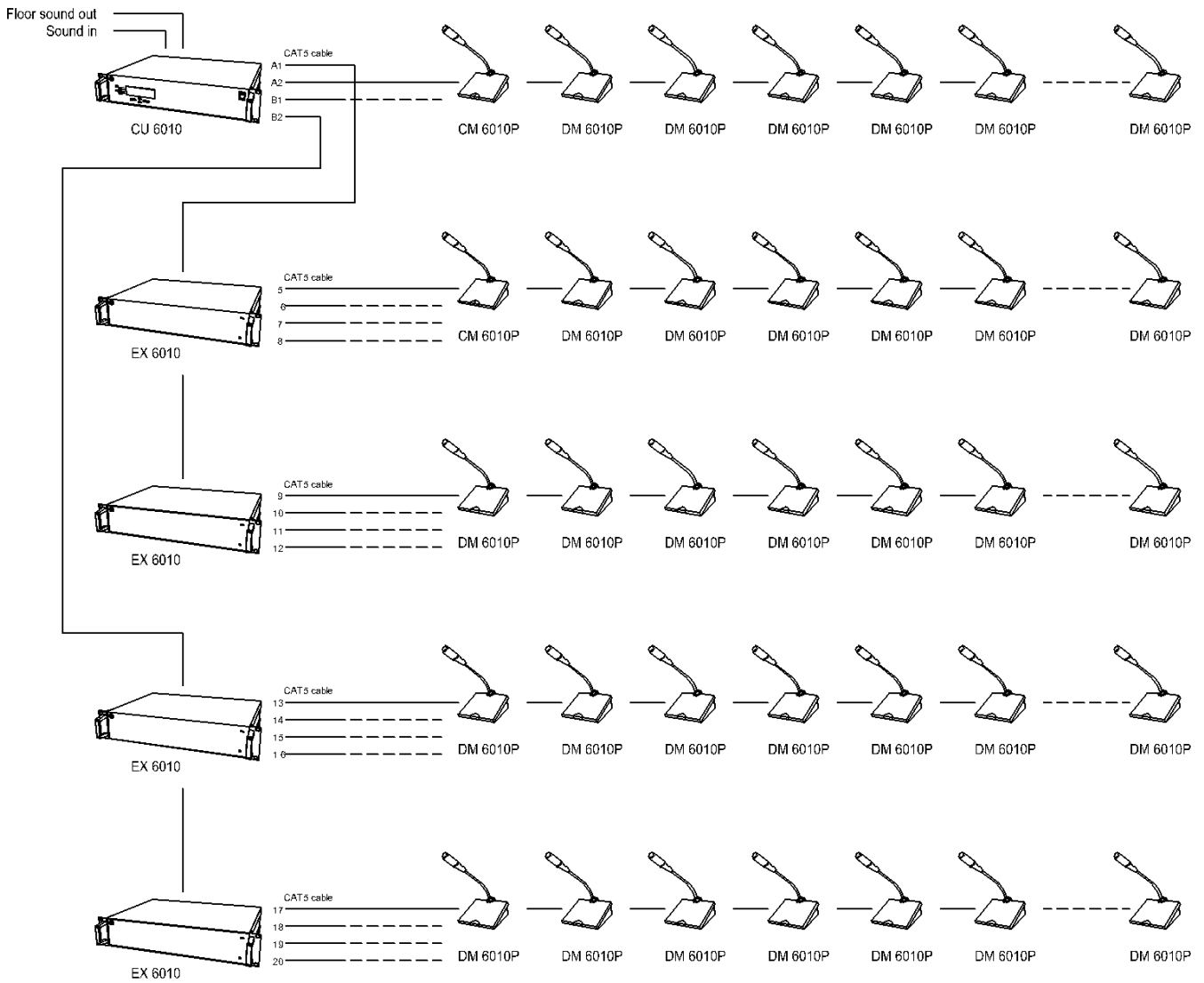Numbers in (') are the number of units, which could have been connected to the CU/EX, but where the total number of units has been lowered due to the restriction of the maximum length of cable (200 m).
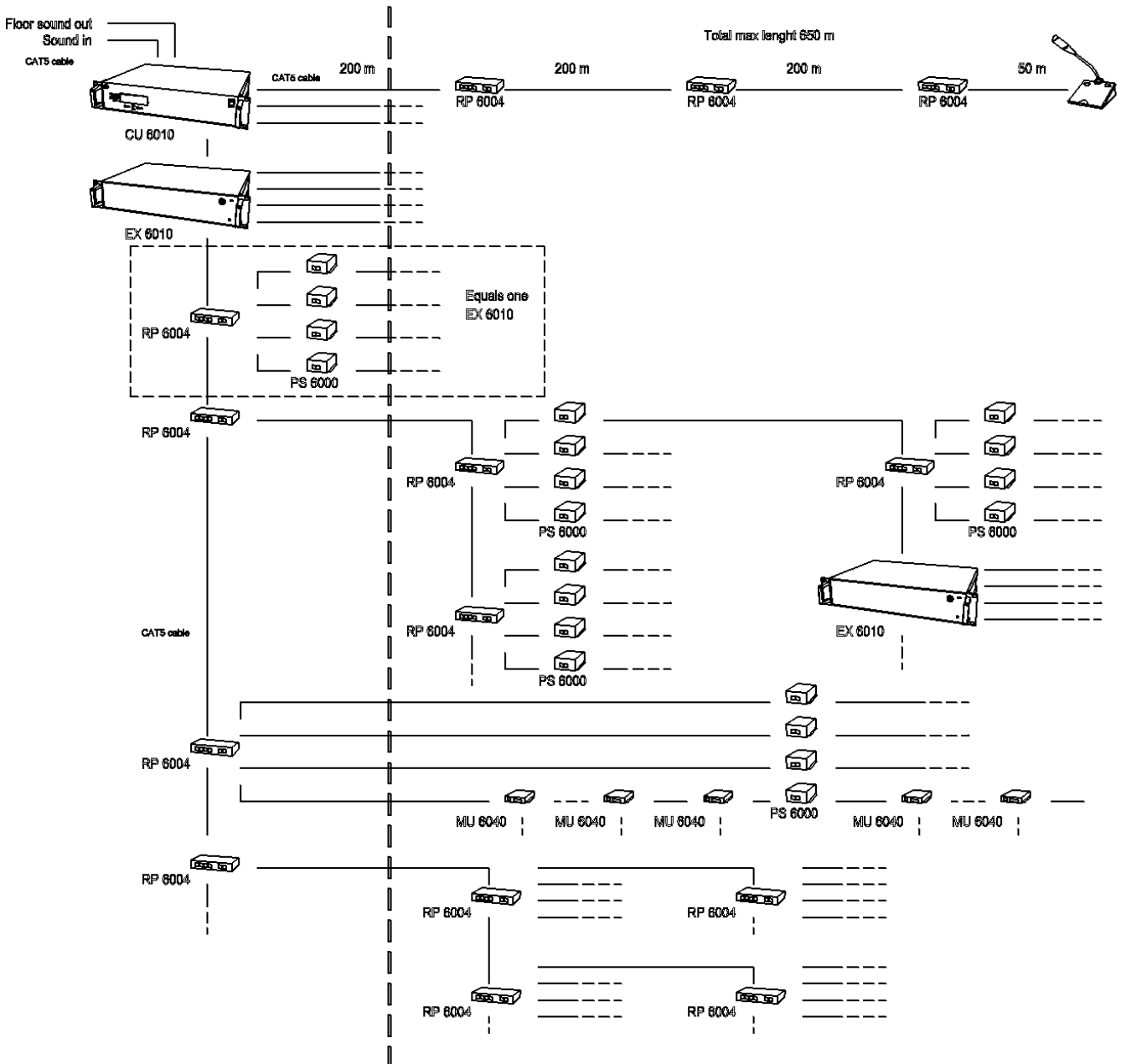
Typical schematics

The following schematics are showing various configurations:

Large size conference microphone system

Various configurations with RP 6004 Repeater and PS 6000 Power Supply

Appendix

Technical appendix

Cabling

CAT5

The DCS 6000 system uses CAT5, CAT5e or CAT6 FTP or STP cables with screened RJ45 connectors.

EIA 568-B wiring shall be used.

It is important to use only FTP or STP (screened) cables and screened RJ45 connectors and not UTP cable, which is unscreened.

How to wire a CAT5 (EIA 568-B) Cable:

Pin	Function	Connector #1	Connector #2
1	In-going +	ORG/WHT	ORG/WHT
2	In-going -	ORG	ORG
3	+48V	GRN/WHT	GRN/WHT
4	0V	BLU	BLU
5	0V	BLU/WHT	BLU/WHT
6	+48V	GRN	GRN
7	Outgoing -	BRN/WHT	BRN/WHT
8	Outgoing +	BRN	BRN

Note.   If other colour codes are used then the four pairs are connected as follows:

       Pair 1:   Pin 1 & 2

Pair 2:   Pin 3 & 6

Pair 3:   Pin 4 & 5

Pair 4:   Pin 7 & 8

The phase of the pairs must be correct and the wiring spec. as stated in CAT5 (EIA 568-B) have to be followed.

Note: Cat6 cables can normally only be terminated in sockets (female) and not in cable plugs.

Cat6 can thus only be used for longer cable draws terminating in wall outlets or jack patch panels

Accessories (not supplied)

Cat 5e Connection Cables (AWG24)

EC 6000-..5 Connection Cable 0,5 m......................10 03 12500

EC 6000-01 Connection Cable 1 m.........................10 03 13101

EC 6000-02 Connection Cable 2 m.........................10 03 13201

EC 6000-05 Connection Cable 5 m.........................10 03 13501

EC 6000-10 Connection Cable 10 m.......................10 03 14102

EC 6000-20 Connection Cable 20 m.......................10 03 14202

EC 6000-50 Connection Cable 50 m.......................10 03 14502

Technical specifications

General

Power consumption ....max. 600VA

In-rush current...............max. 30A@115V or max. 60A@230V

Mains voltage: .... 100 - 240V, 50 - 60Hz

Supply voltage for units (each A1, A2, B1, B2)........48V/100W

Max. power load on Loop Through connectors.................7,5W

Temperature to guarantee specified performance

.............................5 Deg C. to 40 Deg C. (35 to 80% humidity)

Storage temperature

..........................-20 Deg C. to 60 Deg C. (10 to 80% humidity)

Weight .... 5,5 kg

Dimensions (W x H x D).......... 425 (483) x 87 x 317 (357) mm

dimensions in bracket are including 19" brackets

Accessories supplied .... User manual

....Mains cable

....5 pieces termination plugs

Connectors

DCS-LAN loop through .... 2 pieces RJ45

DCS-LAN repeated output ....4 pieces RJ45

System performance with CU 6010 as central unit

Max. number of DM/CM (excl. CS)..................................1000

Max. number of IS 6xxx in one booth 32

Max. number of IS 6xxx 150

Max. number of AO 6008..20

Max. number of CS 6032...........................practically unlimited

Max. number of languages..31

Max number of open microphones 8

Max. system performance

Max. number of units (excl. CS)..4000

Max. number of IS 6xxx in one booth 32

Max. number of CS 6032...........................practically unlimited

Max. number of languages..31

Specifications are subject to change without notice.