

## Cerberus<sup>â</sup> LMSmodular Gateway GW-21

### Technical Manual



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<b>1</b>	<b>Introduction .....</b>	<b>1</b>
1.1	Scope of this document .....	2
1.2	Related publications .....	2
<b>2</b>	<b>Product Description.....</b>	<b>3</b>
2.1	CPU board .....	3
2.2	The expansion board .....	4
2.3	The connection board .....	5
2.4	The assembled gateway .....	5
2.5	Some network configuration.....	6
<b>3</b>	<b>Hardware Installation.....</b>	<b>9</b>
3.1	Inside the CS4.....	9
3.2	Power supply .....	9
3.3	Inside the CS11 .....	10
<b>4</b>	<b>CPU Board Configuration.....</b>	<b>11</b>
4.1	Introduction .....	11
4.2	Configuration by DIL-Switches .....	12
4.2.1	Subsystem setting .....	12
4.2.2	Cerban vitality telegram.....	13
4.3	Configuration by Flash EPROM.....	13
4.4	Two level network.....	13
4.4.1	Ciphering option.....	14
<b>5</b>	<b>Baud Rates.....</b>	<b>15</b>
<b>6</b>	<b>Cables and Connections.....</b>	<b>16</b>
6.1	Connection to LMS.....	16
6.2	Connection to GW-20 .....	17
6.3	Gateway to subsystem connection.....	17
6.4	Gateway to CMX connection.....	18
6.5	Gateway to Cerpass Connection/Interface CC30-CK3003.....	18
6.6	Gateway to Transliner .....	19
<b>7</b>	<b>Three Configuration Examples.....</b>	<b>20</b>
7.1	Example no. 1.....	20
7.2	Example no. 2.....	21
7.3	Example no. 3.....	22
<b>8</b>	<b>Troubleshooting.....</b>	<b>22</b>
<b>9</b>	<b>Appendix A: STT/GW-21 Connection .....</b>	<b>23</b>
9.1	First case.....	23
9.2	Second case.....	24
9.3	Example no. 1.....	25
9.4	Example no. 2.....	26
<b>10</b>	<b>Appendix B: Firmware Version.....</b>	<b>26</b>
<b>11</b>	<b>Appendix C: DIL-Switches Description .....</b>	<b>27</b>
<b>12</b>	<b>Appendix D: GW-21 Rev. A.....</b>	<b>28</b>
12.1	The connection board .....	28
12.2	Inside the CS4.....	30
12.3	Connection to LMS.....	31
12.4	Connection to GW-20 .....	33
12.5	Gateway to subsystem connection.....	34
12.6	Gateway to CMX / CF9003 connection.....	35
<b>13</b>	<b>Appendix E: Safety Instructions .....</b>	<b>36</b>



# 1 Introduction

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The GW-21 Gateway provides the following main functions:

1. interface between subsystems and operator workstations (LMS or a foreign system);
2. interactions among subsystems;
3. protocol conversions.

The GW-21 gateway is composed by one CPU board with serial communication capability to which can be connected an optional expansion board with additional serial lines in a piggyback configuration.

In a two level network architecture, the GW-21 can be used as communication layer that connect the subsystems to a higher level GW-20.

The GW-21 complies with the latest European Union standards for emission and immunity to electromagnetic disturbances. It is designed to replace the GW-01.



GW-21 rev. B has a new connection board and galvanic isolation on power supply for CS11 compatibility.

Old GW21 rev. A is still available in appendix D.

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Two kinds of hardware configurations are foreseen:

## **GW-21.06**

This configuration has 6 serial lines; it requires CPU board and an additional expansion board with two more asynchronous serial lines. Using this configuration you can connect up to four subsystems to one or two workstations.

## **GW-21.04**

This configuration has 4 serial lines; it is composed by the CPU board that has on-board 4 communication lines. Up to three control panels can be connected to one workstation, or it can connect two workstations and two subsystems.

## 1.1 Scope of this document

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This manual is intended as a guide for planning, installation and service personnel of Cerberus danger management systems which use GW-21 device.

All necessary information to install an LMS gateway are listed in this manual.

The manual is divided into 8 chapters and 4 annexes; a Table of Contents and an Index allow easy referencing to the arguments.

**Chapter 1** is an introduction to the manual;

**Chapter 2** describes the product and the available configurations;

**Chapter 3** shows how to install the gateway inside the CS4/CS11 and how to power it;

**Chapter 4** describes the CPU board;

**Chapter 5** explains how to set the baud rates and shows the suggested or compulsory baud rates for the various subsystems that can be connected to the GW-21;

**Chapter 6** shows the cable and connection among the GW-21 and the other devices it can be connected to;

**Chapter 6** contains three examples of gateway configuration

**Chapter 7** describes how you can identify problems that can possibly arise.

**Appendix A** explains the use of STT subsystem, manufactured by Cerberus Guinard, in conjunction with the Gateway GW-21.

**Appendix B** lists the firmware versions compatible with LMS software versions, as well as the limits about subsystems managed.

**Appendix C** contains a summary of DIL-Switch settings.

**Appendix D** describes the previous version of GW-21 board and connection cables.

**Appendix E** describes the safety instructions.  
They are included here for reference.

## 1.2 Related publications

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The following documents could be useful in dealing with GW-21 gateway and understanding how it relates to other pieces of the LMS network:

- GW-20 Technical manual e1478
- CMX Technical manual e1110
- CF9003 Technical Manual e1762
- LMSmodular User Manual e1865
- LMSmodular Configuration Guide e1863
- LMSmodular Configuration Reference e1864
- LMSmodular Installation Manual e1862

## 2 Product Description

### 2.1 CPU board

The CPU board is the main board. It must be present in any gateway GW-21, aside from its configuration.

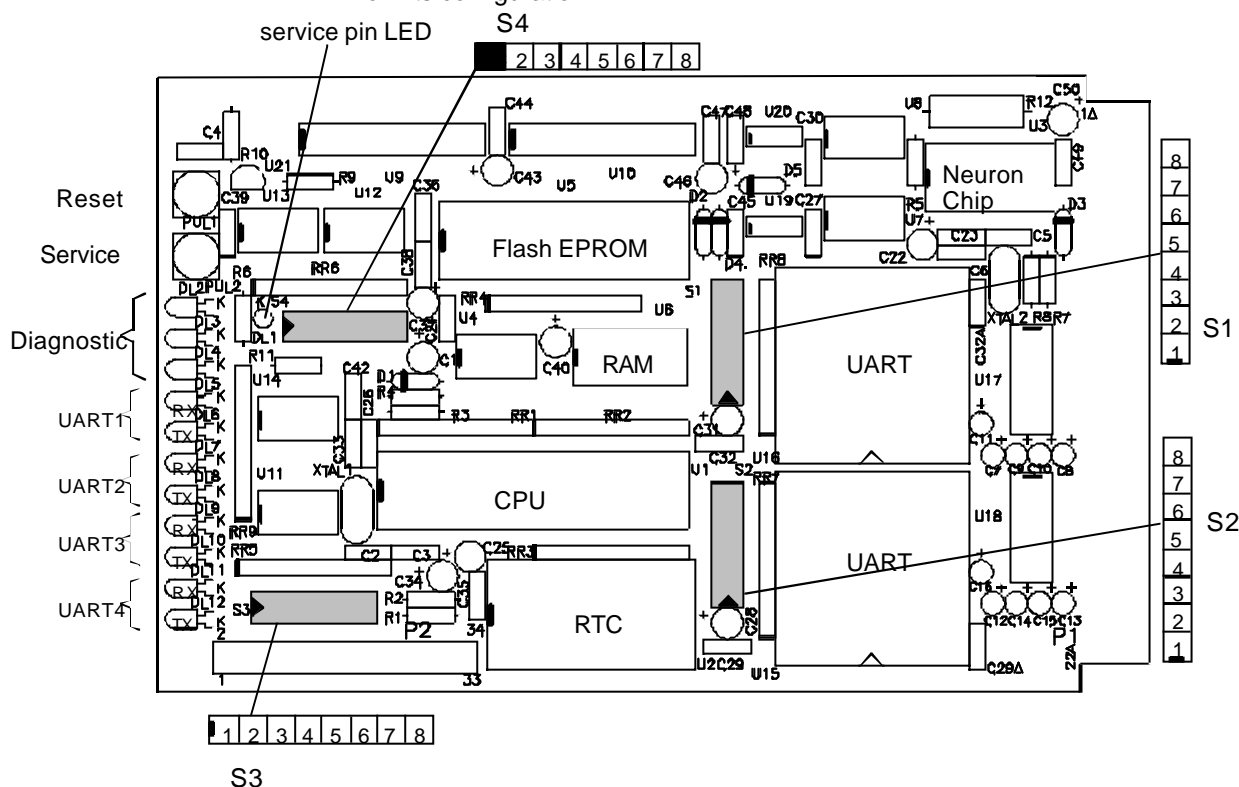


Fig. 1 The CPU board

On this board there are:

- the CPU, the RAM and Flash EPROM
- the Real Time Clock (RTC)
- two UART chips, that manage the four GW-21 serial lines
- the Neuron Chip, that lets the GW-21 to communicate with the LonWork network
- four DIL switch blocks (S1 - S4), used to configure the GW-21 as described later
- one reset push-button, used to reset the board
- one service push-button, to send the service signal to the Neuron Chip
- four sets of two LEDs. These LEDs show the status of UART RX/TX lines.
- three LEDs used for diagnostic purposes.

For GW-21, the CD95800 board is configured as type 3 (check label on the RTC component).

The three diagnostic LEDs marked LD1, LD2 and LD3 have the following meaning:

	ON	OFF	Blinking
LD1 (green)	Firmware vitality failure or out of memory jump	Firmware vitality failure or out of memory jump	Firmware vitality OK
LD2 (red)	Download failed	OK	Slow (1Hz): RAM test failed Fast (4Hz): wrong configuration or download in progress
LD3 (yellow)	-	-	-

Tab. 1

## 2.2 The expansion board

The expansion board supplies two asynchronous serial lines. It is mounted piggy back on the CPU board.

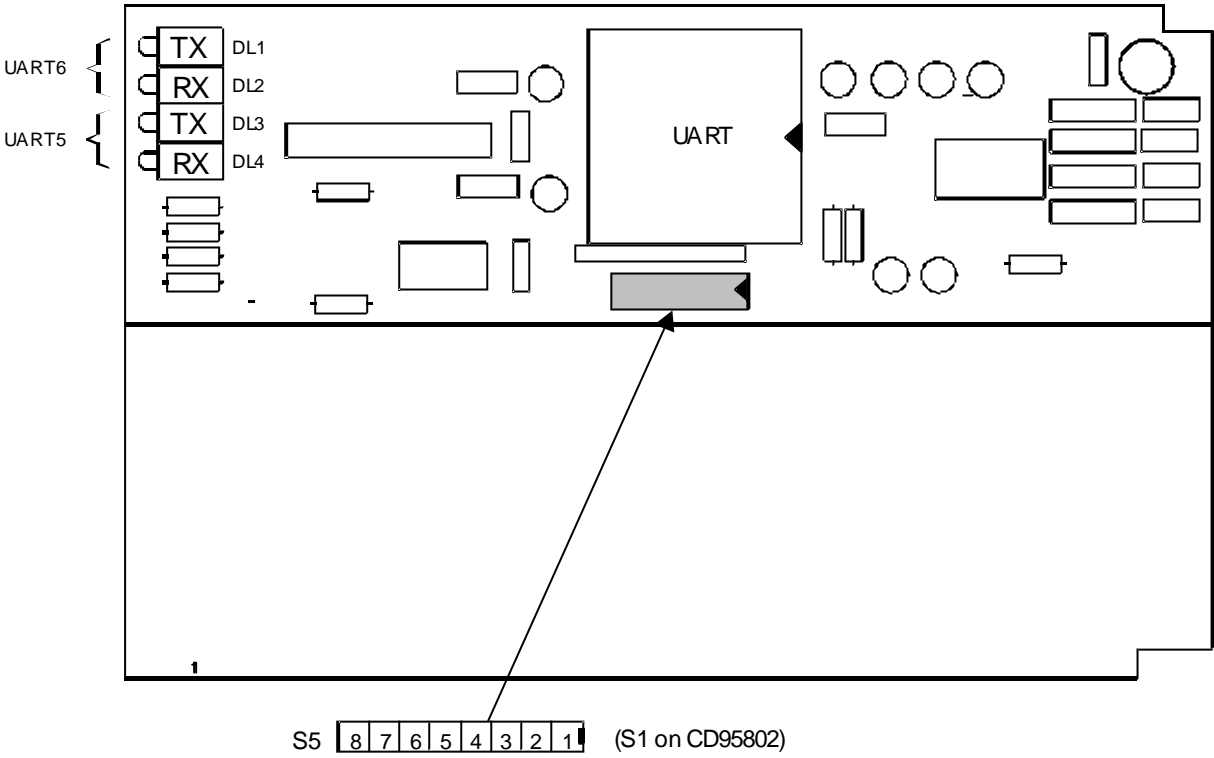


Fig. 2 The expansion board



## 2.3 The connection board

The connection board has two connectors to insert the CPU and I/O board in.

All the UARTs, from 1 to 6, are accessible through screw connectors located on the right side of the connection board. Only the TX, RX and GND signals are available.

UARTs 5 and 6, if the expansion board is installed, are accessible on the same connector.

In the lower right corner of the connection board there is the power supply block with two pins marked + and -. You must connect here the voltage source (10 to 30 V d.c.).

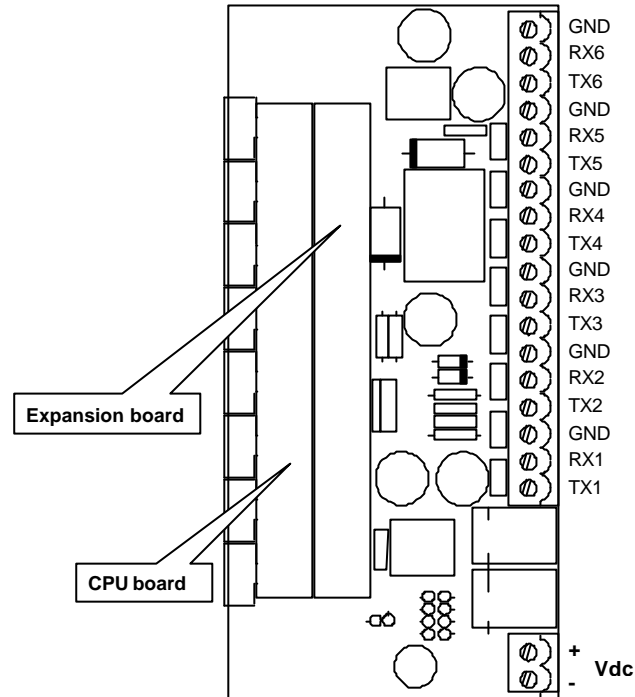


Fig. 3 The connection board

## 2.4 The assembled gateway

The three components (the CPU board, the Expansion board, the Connection board) can be assembled in two different ways.

The following table shows these configurations:

	CPU board	Expansion board	Connection Board
GW-21.06	x	x	x
GW-21.04	x		x

Tab. 2

## 2.5 Some network configuration

The most common network configuration the GW-21 gateway is inserted in is that shown in Fig. 4 to the gateway are connected one or more (up to 4 for a GW-21.06) subsystems. One or two LMS workstations are connected to the gateway and monitor the subsystems. This configuration is named one level network.

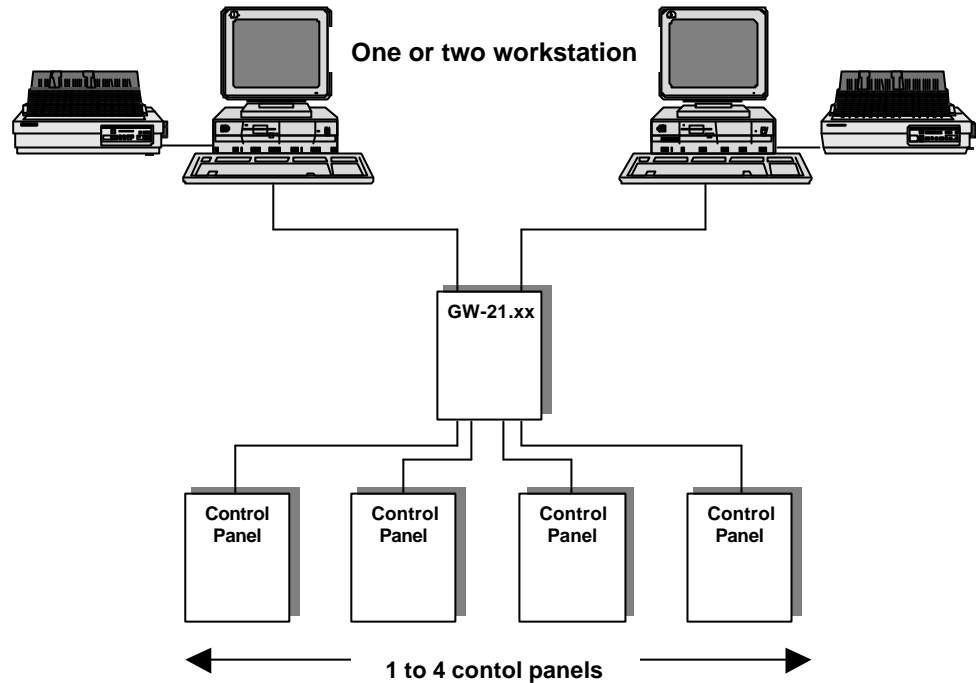


Fig. 4 The one level network configuration

A more complicated configuration is shown in Fig. 5 this network topology, the so called two level network, the GW-21 is connected to a GW-20 that acts as a gateway concentrator.

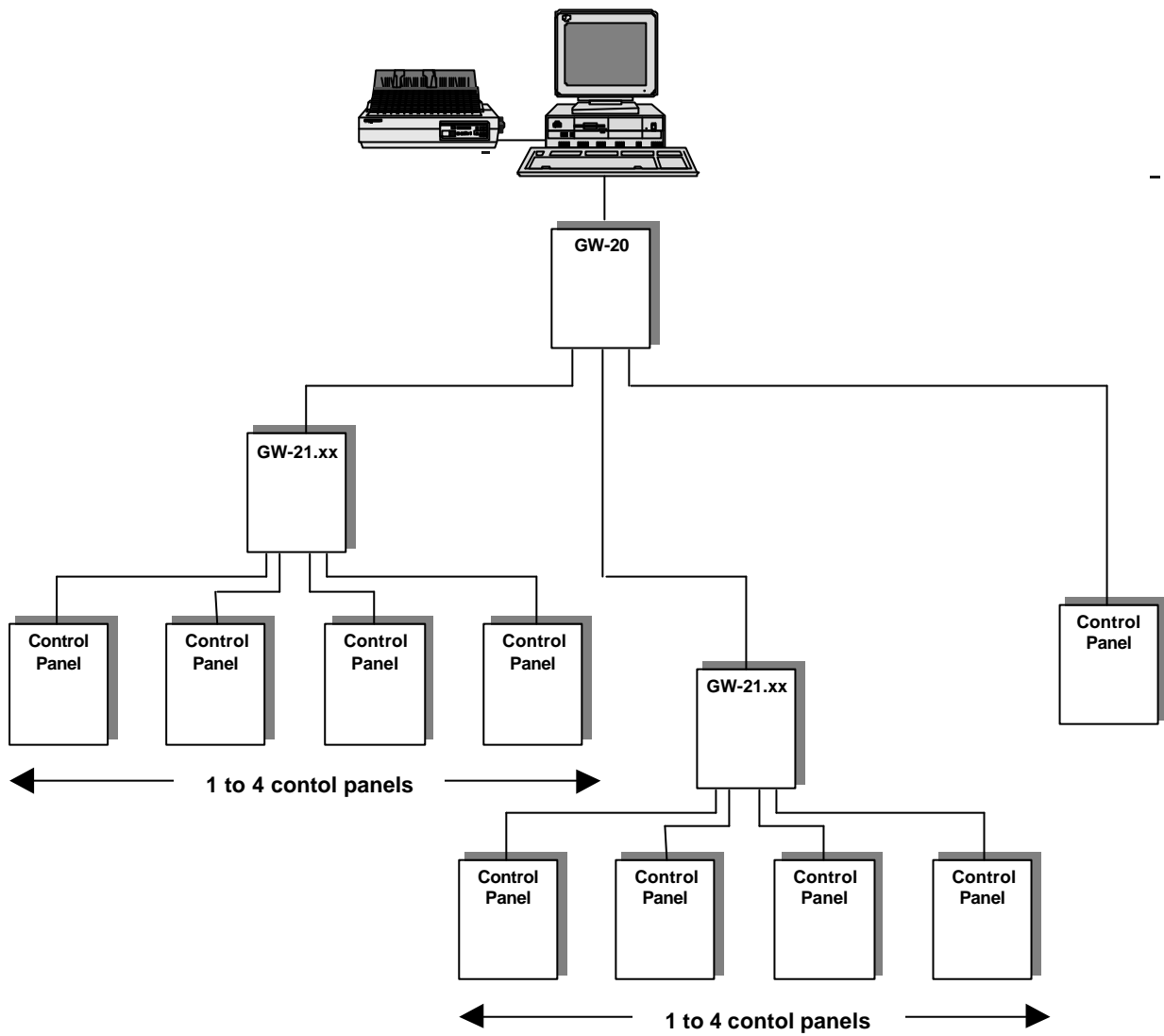


Fig. 5 The two level network

Fig. 6 shows a less usual configuration, used only in plants in which an high level of redundancy is required. In this configuration, the GW-21.xx gateway acts as an intelligent line splitter and protocol converter: the signals coming from the subsystem(s) are converted from Cerban to CMSDL protocol and routed toward two supervisor systems. The GW-20 that receive the messages should be equipped with Net-M Pad. The messages are treated in a completely independent way by the two supervising systems connected to the GW-20.

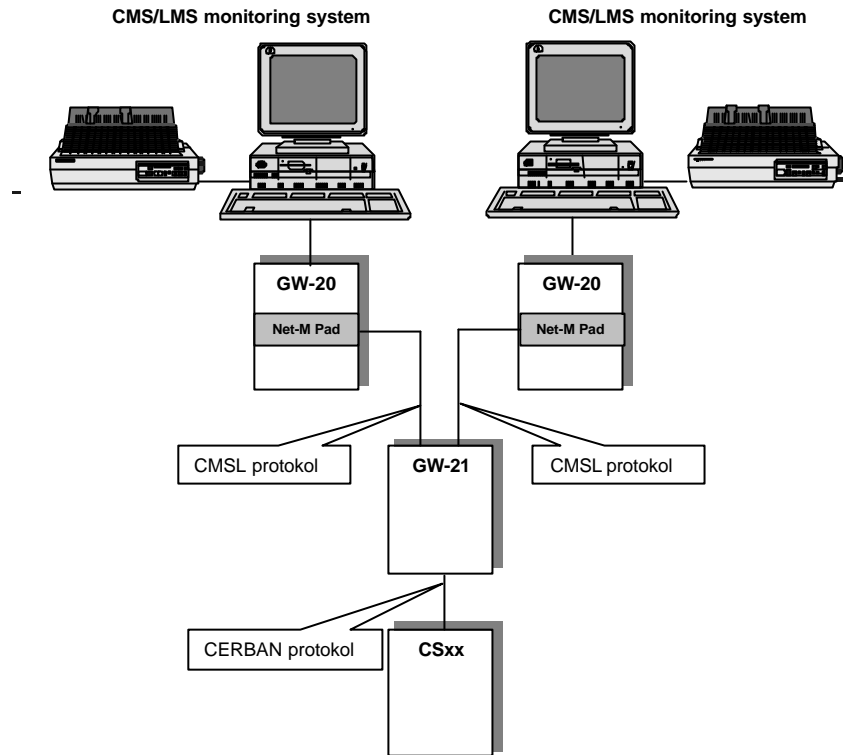


Fig. 6 The redundant configuration

## 3 Hardware Installation

### 3.1 Inside the CS4

In the CS4 intrusion detection control unit the gateway can be mounted on some of the standard housings.

You need:

- 2 plastic spacers
- 2 self-tapping screws
- 4 metal spacers
- 2 short screws
- 2 long screws
- 2 board supports

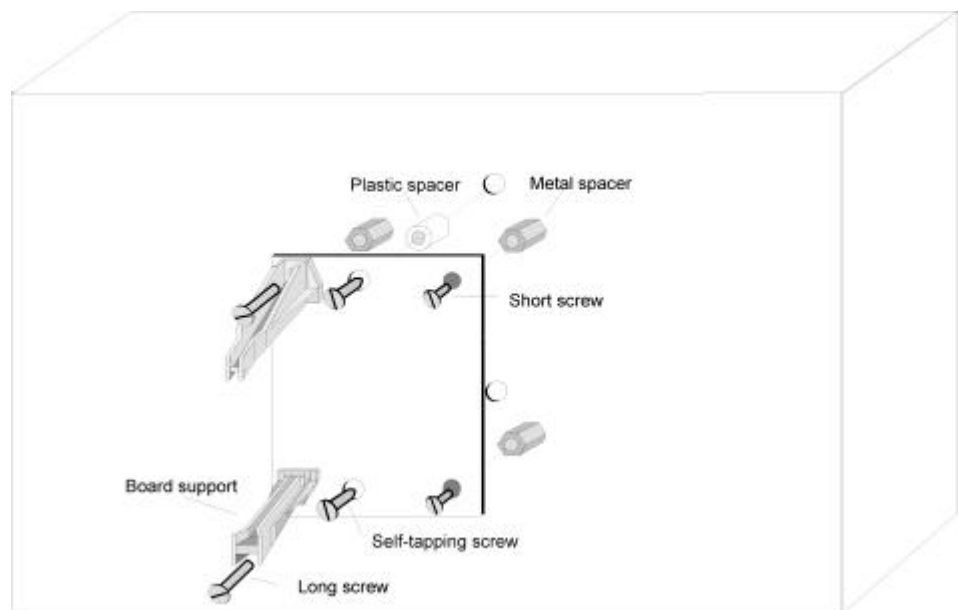


Fig. 7

### 3.2 Power supply

The gateway GW-21 is powered using the connectors CN1 or CN2 located on the connection board (Please refer to Fig. 3). It does not matter which connector you use for power supply connection, but pay attention to pin polarities.

The supply voltage must be in the range 10 to 30 V d.c.

### 3.3 Inside the CS11

In the CS11 intrusion detection control unit the gateway can be mounted on some of the standard housings.

You need:

- 4 plastic spacers
- 4 self-tapping screws
- 2 board supports

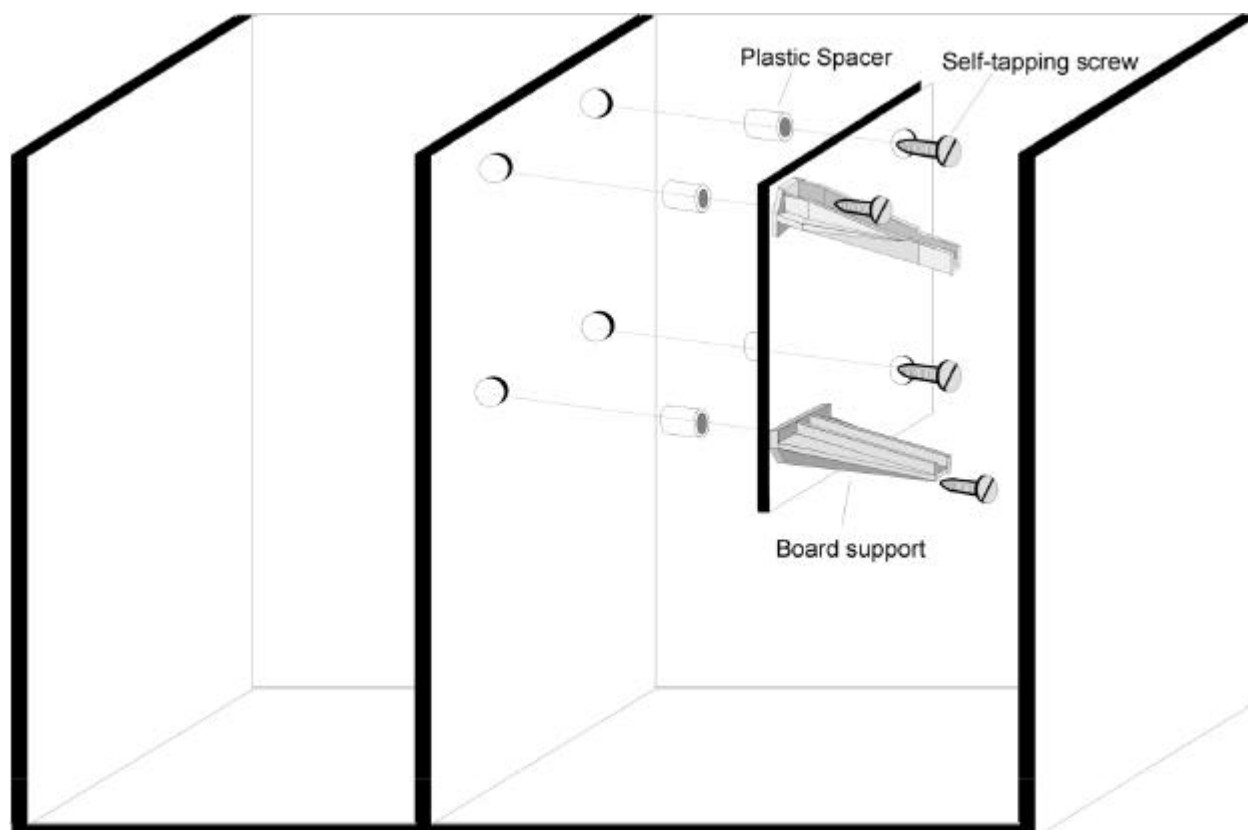


Fig. 8

# 4 CPU Board Configuration

## 4.1 Introduction

---

On the CPU board you can find four groups of DIL-Switches, numbered from S1 to S4. A fifth block can be found on the expansion board if it is installed. The DIL-Switches replace the jumpers that were used on the GW-01 for configuration purposes.

We will refer in this document to DIL-Switches with a double numbering convention: the first number refers to the block the DIL-Switch belongs to, the second number is the switch position inside the block. Therefore, S1-2 means "the second DIL-Switch on the first block".

### Gateway configuration

Gateway configuration can be done in two alternative ways:

- by DIL-Switches
- by Flash EPROM

Flash EPROM configuration is required when the gateway has to handle interactions among subsystems. The Flash EPROM can be configured using a proper software tool provided by Cerberus Dati.

### Gateway data-link

The Gateway GW-21 can be connected to various devices, and namely to:

- CS11 fire detection control unit, manufactured by Cerberus
- CS4 intrusion detection control unit, manufactured by Cerberus
- CC60 gas detection unit, manufactured by Cerberus
- Cerberus Dati CMX/CF9003, that allow I/O of digital signals
- Westinghouse Electronics access control devices which use the SEEP protocol
- Cerberus Guinard STT
- CCTV switching matrix, MX series, manufactured by Comerson.
- 8x00 Allegiant CCTV switcher control system, manufactured by Burle.
- MK7022 Cerloop Interface
- Devices supplied by third parties that use Cerberus Dati Standard Protocol (CDDL/CDSF)
- CC30 Door Controller manufactured by Cerberus Ristow
- Transliner intrusion detection control unit by Cerberus Ristow



Unfortunately, due to limited ROM space not all these devices can share the same gateway. Different firmware EPROM are needed to accommodate the most common and useful combinations of these devices. Appendix B lists the combinations available (please also refer to latest LMS News).

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A set of EPROM programs that allow connection of peripheral devices is called **software link**. All GW-21 links and its firmware are located on a single Flash EPROM.

### What to configure

The switch S1-1 is used to discriminate between Flash EPROM configuration or DIL-Switches configuration. If it is set OFF, the DIL-Switches are irrelevant for configuration purposes. Otherwise, they set the GW-21 parameters as described in the following section.

S1-1	Function
ON	Configuration by DIL-Switches
OFF	Configuration by Flash EPROM

Tab. 3

## 4.2 Configuration by DIL-Switches

To configure the CPU board by DIL-Switches, the DIL-Switch S1-1 has to be set ON. When you configure the GW-21 by DIL-Switches you have to:

- specify which subsystems is connected to each gateway UART;
- set the baud rate for the installed protocols;
- set the Cerban vitality telegram option;
- set the ciphering option, when needed.

### 4.2.1 Subsystem setting

To specify the type of subsystem connected to each UART you have to use the following two tables.

First of all define the DIL-Switches settings: look at Tab. 4 and identify the settings for the subsystem type you wish to connect to GW-21. For instance, a CS11 requires the (OFF, OFF, ON) setting.

Then, using the Tab. 5, find out the DIL-Switches that are used by the UART to which the subsystem is connected; set the three DIL-Switches as specified.

In a GW-21 up to six UART are available and so 18 DIL-Switches are reserved. They are divided into groups of three. Each group can assume the value corresponding to the subsystem you want connect.

You must remember that you can have up to table 4 subsystems and up to 2 LMS lines. These values cannot be exceeded.

SUBSYSTEM	DIL-Switches		
	MSB		LSB
no subsystem	OFF	OFF	OFF
CS11/CZ10/CC60(Cerban)	OFF	OFF	ON
CS4/CZ12(Cerban)	OFF	ON	OFF
CMX(CF9003 (CMX-DL)	OFF	ON	ON
CCTV Burle or MK7022 (ISO1745 (*)	ON	OFF	OFF
STT (Cerban)	ON	OFF	ON
WSE ACU (SEEP) or CDDL/CDSF or CC30 (Certalk) or Transliner (Size) (*)	ON	ON	OFF
LMS /Two level network	ON	ON	ON

(\*) depends on Firmware configuration

Tab. 4 Subsystem selection

UART	DIL-Switches		
	MSB		LSB
1	S1.6	S1.5	S1.4
2	S2.4	S2.3	S2.2
3	S3.2	S3.1	S2.8
4	S3.8	S3.7	S3.6
5 (on expansion board)	S4.7	S4.6	S4.5
6 (on expansion board)	S5.5	S5.4	S5.3

Tab. 5 Association UART/subsystem





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If only one LMS workstation is foreseen, it can use any of the six UART available; if two LMS workstation are installed, they MUST occupy UART 1 and 2.

---

The subsystem network address (to be specified in the LMS configuration software) is automatically assigned to the UARTs, from the lowest to the highest, starting from network address 0. UARTs used by LMS are of course skipped (see the examples in Section 6.5).

You must then set the communication baud rate according to the suggested protocol/baud rates (See section 5).

### 4.2.2 Cerban vitality telegram

---

The DIL-Switch S1-2 has the optional function to filter the Cerban vitality telegram; the DIL-Switch is valid for all of the Cerban line which are defined on the gateway.

The only reason to filter the vitality telegram is to limit the traffic of messages to the LMS station(s). Note that if the vitality check is enabled at LMS level, then this DIL-Switch must be set to ON, else LMS will generate false fault events.

S1-2	Function
OFF	Vitality telegram filtered
ON	Vitality telegram not filtered

Tab. 6 Cerban vitality telegram filtering

## 4.3 Configuration by Flash EPROM

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If you have the configuration EPROM, you have to set OFF the DIL-Switch S1-1. The default configuration for this DIL-Switch set is for EPROM **not** installed, so you actually have only to verify the settings.

Even if the Flash EPROM configuration is enabled, you must set the communication baud rate with subsystems using the DIL-Switches and according to the suggested protocol/baud rates (See section 5).

## 4.4 Two level network

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In the two level network or in the redundant configuration (shown in Fig. 5 and Fig. 6) the gateway GW-21 is connected to a GW-20. You have to set the DIL switches for the protocol selection of the used UARTs as specified in Tab. 4.

You must then set the communication baud rate according to the suggested protocol/baud rates (See section 5).

#### 4.4.1 Cipherring option

The DIL-Switch S1.3 have the optional function to enable the cipherring performance.

S1.3	Function
OFF	Cipherring disabled
ON	Cipherring enabled

Tab. 7

The cipherring applies only to two level network, in the communications between the GW-20 and the GW-21.

**Note about the cipherring :** To implement the following configuration

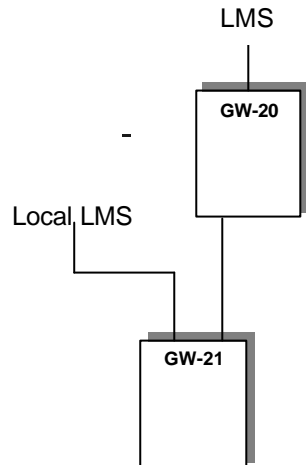


Fig. 9 .

you must set the DIL-Switch S1.3 OFF because it is not allowed to have on the same gateway one cipherring line and one non-cipherring line.

## 5 Baud Rates

The following baud rates apply to the subsystems connected either to the CPU or the expansion board.

SUBSYSTEM	SETTING	SUGGESTED BAUD RATE
CCTV Burle	compulsory	1200
CCTV Comerson	compulsory	4800
CDDL	suggested	4800
CERBAN	suggested	300
Cerloop	compulsory	1200 / 2400
CMX/CF9003	suggested	4800
LMS	suggested	9600
SEEP	suggested	4800
STT	compulsory	300
Two Level Network	suggested	4800
Cerpass	compulsory	9600
Size	compulsory	9600

Tab. 8 Subsystems suggested baud rate

UART		BAUD RATE							
		Spare	9600	4800	2400	1200	600	300	150
1	S1.7	ON	OFF	ON	OFF	ON	OFF	ON	OFF
	S1.8	ON	ON	OFF	OFF	ON	ON	OFF	OFF
2	S2.1	ON	ON	ON	ON	OFF	OFF	OFF	OFF
	S2.5	ON	OFF	ON	OFF	ON	OFF	ON	OFF
	S2.6	ON	ON	OFF	OFF	ON	ON	OFF	OFF
3	S2.7	ON	ON	ON	ON	OFF	OFF	OFF	OFF
	S3.3	ON	OFF	ON	OFF	ON	OFF	ON	OFF
	S3.4	ON	ON	OFF	OFF	ON	ON	OFF	OFF
4	S3.5	ON	ON	ON	ON	OFF	OFF	OFF	OFF
	S4.2	ON	OFF	ON	OFF	ON	OFF	ON	OFF
	S4.3	ON	ON	OFF	OFF	ON	ON	OFF	OFF
5	S4.4	ON	ON	ON	ON	OFF	OFF	OFF	OFF
	S4.8	ON	OFF	ON	OFF	ON	OFF	ON	OFF
	S5.1	ON	ON	OFF	OFF	ON	ON	OFF	OFF
6	S5.2	ON	ON	ON	ON	OFF	OFF	OFF	OFF
	S5.6	ON	OFF	ON	OFF	ON	OFF	ON	OFF
	S5.7	ON	ON	OFF	OFF	ON	ON	OFF	OFF
	S5.8	ON	ON	ON	ON	OFF	OFF	OFF	OFF

Tab. 9 DIL-Switch settings for baud rate

## 6 Cables and Connections

### 6.1 Connection to LMS

Fig. 10 and Fig. 11 show how to connect the GW-21 UARTs 1, 2, 3, 4, 5, 6 on the screw terminal of the connection board to the LMS for a 9 pin connector and a 25 pin connector respectively.

If there is only one LMS operating station, it can be connected to any UART among those available. However, if there are two Operating Stations, they must be connected to UARTs 1 and 2.



Fig. 10 Connection to 9 pin D connector (screw terminal block)

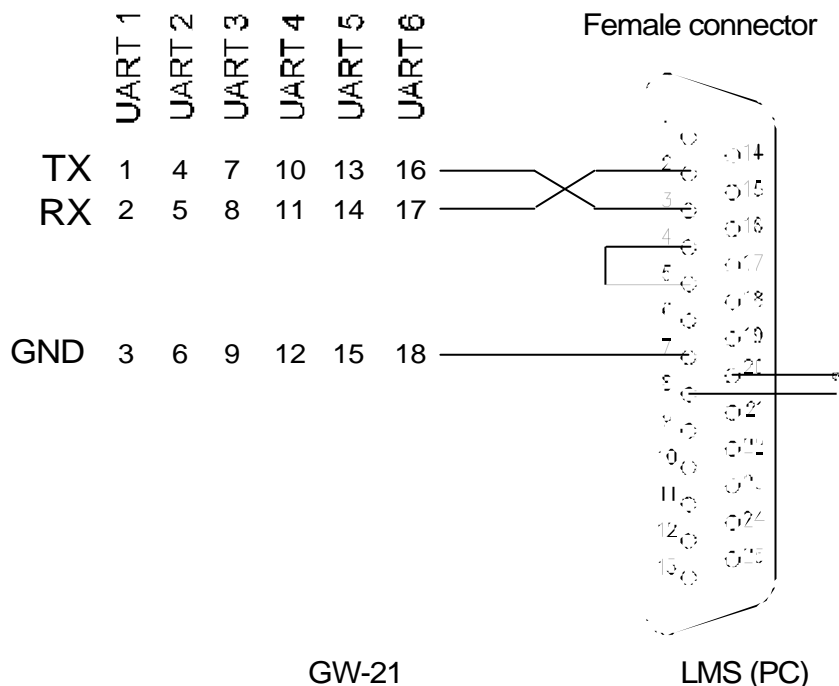


Fig. 11 Connection to 25 pin D connector (screw terminal block)

## 6.2 Connection to GW-20

This type of connection applies only to two level network configurations of the type shown in Fig. 5 and Fig. 6.

Fig. 12 shows how to connect the GW-21 UARTs numbered 1, 2, 3, 4, 5 and 6 on the screw terminal block to the GW-20.

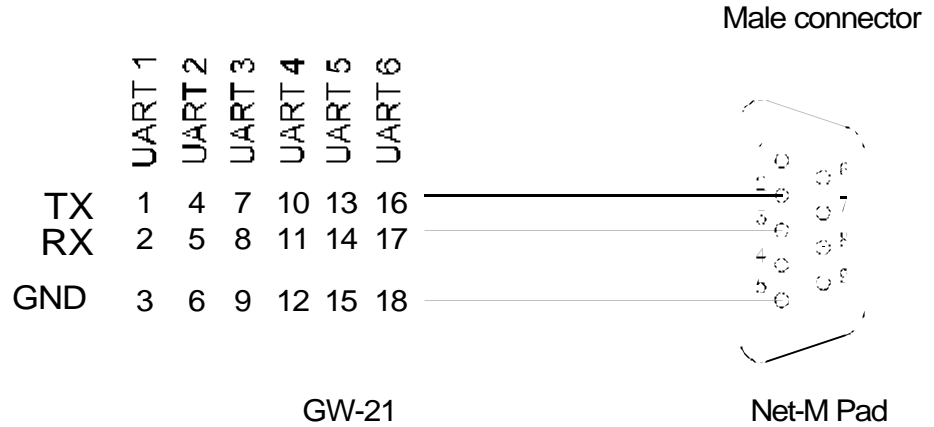


Fig. 12 GW-21/GW-20 connection (screw terminal block)

All connections should be done using a shielded cable and D connectors with metallic shells. Fasten the connector to the back plane of the gateway using the screws on the connector shell.

## 6.3 Gateway to subsystem connection

Each connector of the Subsystem Pad is used for one serial ports and to the connector is linked only one subsystem of any type (Fig. 13).



Fig. 13 GW-21 to CSxx subsystem (screw terminal block)

## 6.4 Gateway to CMX connection

The cable that links the gateway to the CMX IC-2 communication interface must be as shown in Fig. 14.



Fig. 14 GW-21 to CMX link (screw terminal block)

## 6.5 Gateway to Cerpass Connection/Interface CC30-CK3003

The cable that links the gateway to the Cerpass communication interface must be as shown in 0.

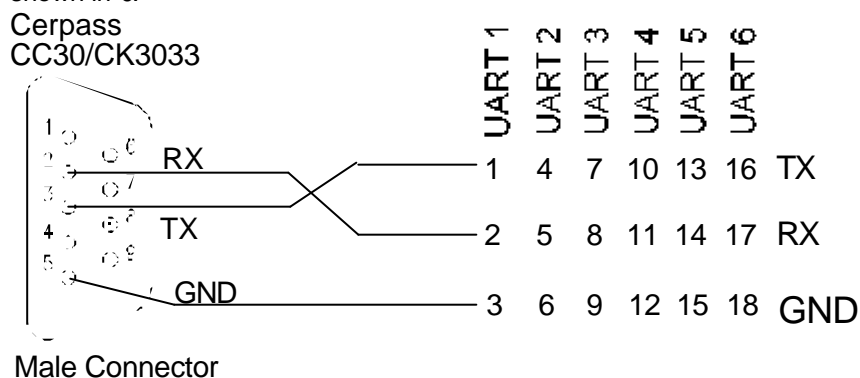


Fig. 15 GW-21 to CK3003

## 6.6 Gateway to Transliner

The cable that links the gateway to the Transliner communication interface must be as shown in fig. 6.7

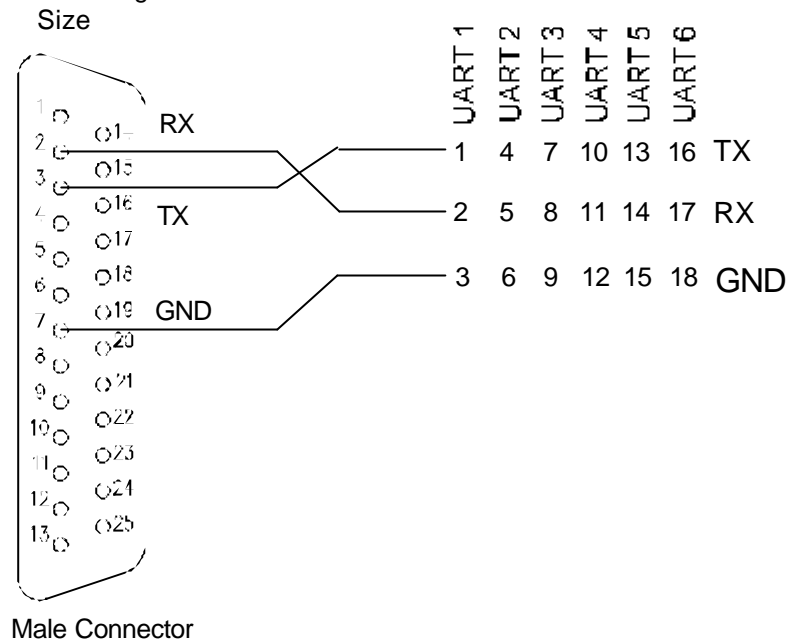


Fig. 16 GW-21 to Transliner





## 7.2 Example no. 2

In this second example, the gateway is configured for four subsystems and two monitoring stations:

- first central station LMS (master)            UART 1
- second central station LMS (slave)        UART 2
- 4 subsystems                                    CS11    UART 3
- CS11    UART 4
- CS4     UART 5
- CS4     UART 6

Setting of DIL-Switches:

	DIL-Switch		subsystem	network address
UART 1	S1.4	ON	LMS master	
	S1.5	ON		
	S1.6	ON		
UART 2	S2.2	ON	LMS slave	
	S2.3	ON		
	S2.4	ON		
UART 3	S2.8	ON	CS11	0
	S3.1	OFF		
	S3.2	OFF		
UART 4	S3.6	ON	CS11	1
	S3.7	OFF		
	S3.8	OFF		
UART 5	S4.5	OFF	CS4	2
	S4.6	ON		
	S4.7	OFF		
UART 6	S5.3	OFF	CS4	3
	S5.4	ON		
	S5.5	OFF		

Tab. 11

Remember that when your system needs two LMS stations, you must configure them using UART 1 (as a **master station**) and UART 2 (as a **slave station**).



## 9 Appendix A: STT/GW-21 Connection

The STT is a device manufactured and sold by Cerberus Guinard. It can be connected to the Gateway GW-21 in two different ways, shown in Fig. 17 and Fig. 18.

### 9.1 First case

Using this configuration the LMS system does not see the STT subsystem: its role is purely local. The communication line that connects GW-21 to STT works only *from* the GW-21 *to* the STT. Up to 3 CS11 can be connected to the gateway and all three of them can use the STT.

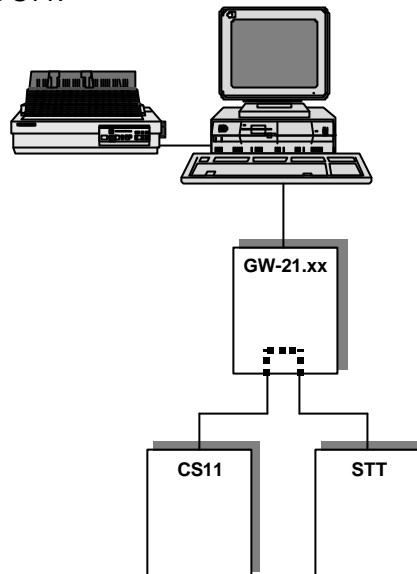


Fig. 17 STT as synoptic panel driver

STT has to be configured as STT subsystem on the gateway and it must not be configured on LMS. STT used as synoptic panel can be connected to any available UARTs.

## 9.2 Second case

In this configuration, the LMS system sees the STT as a subsystem and it fully manages it. Two lines are needed to connect the STT to the gateway.

The **first line** is a slave line for the gateway (and a master line for the STT), has to be configured as a CS11 subsystem on the gateway (see Section 4 for the proper setting) but it must be configured as STT subsystem on LMS.

The **second line** is a master line for the gateway (and a slave line for the STT), has to be configured as STT subsystem on the gateway (see Section 4 for the proper setting) and it must not be configured on LMS.

This configuration allows to connect a maximum of two CS11 to the Gateway; both of them can use the STT.

The address used for the first line (configured as STT on LMS) must be adjacent and lower than the address used for the second line (that is not configured on LMS). The two lines must be logically contiguous but not necessarily physically contiguous; i.e. if there is one LMS that use UARTs 2, the first line can be on UART 1 and the second line can be on UART 3. In this case they are not physically contiguous but are logically contiguous (see examples below).

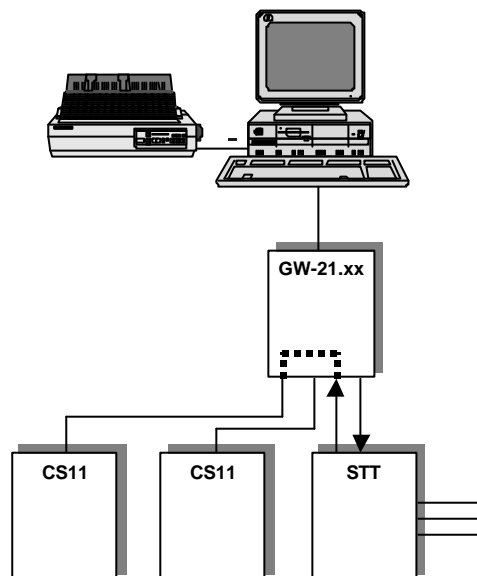


Fig. 18 STT as a subsystem

## 9.3 Example no. 1

In this first example we configure the gateway to connect to it one STT with master and slave lines, two LMS, one standard subsystem and one CMX, in this way:

- 1<sup>st</sup> central station LMS                    UART 1
- 2<sup>nd</sup> central station LMS                    UART 2
- STT first line                                UART 3
- STT second line                             UART 4
- Standard                                     UART 5
- CMX / CF9003                              UART 6

Please note that in this example the two lines are not physically contiguous (they are on UART 1 and 4) but they are logically contiguous (the network addresses are 0 and 1)

The DIL-Switch settings are as follows:

	DIL-Switch		subsystem	network address
UART 1	S1-4	ON	LMS	
	S1-5	ON		
	S1-6	ON		
UART 2	S2-2	ON	LMS	
	S2-3	ON		
	S2-4	ON		
UART 3	S2-8	ON	STT first line (=CS11)	0
	S3-1	OFF		
	S3-2	OFF		
UART 4	S3-6	ON	STT second line (=STT)	1
	S3-7	OFF		
	S3-8	ON		
UART 5	S4-5	OFF	Standard	2
	S4-6	ON		
	S4-7	ON		
UART 6	S5-3	ON	CMX / CF9003	3
	S5-4	ON		
	S5-5	OFF		

Tab. 13

## 9.4 Example no. 2

In this second example we configure the gateway to connect to it one STT with master and slave lines, one CS4 and one LMS, in this way:

- central station LMS        UART 1
- CS4                         UART 2
- STT first line             UART 3
- STT second line          UART 4
- no subsystems             UART 5
- no subsystems             UART 6

In this example the two STT lines are contiguous both logically and physically.

The DIL-Switch settings are as follows:

	DIL-Switch		subsystem	network address
UART 1	S1-4	ON	LMS	
	S1-5	ON		
	S1-6	ON		
UART 2	S2-2	OFF	CS4	
	S2-3	ON		
	S2-4	OFF		
UART 3	S2-8	ON	STT first line (=CS11)	1
	S3-1	OFF		
	S3-2	OFF		
UART 4	S3-6	ON	STT second line (=STT)	2
	S3-7	OFF		
	S3-8	ON		
UART 5	S4-5	OFF	no subsystems	
	S4-6	OFF		
	S4-7	OFF		
UART 6	S5-3	OFF	no subsystems	
	S5-4	OFF		
	S5-5	OFF		

Tab. 14

## 10 Appendix B: Firmware Version

Please refer to latest edition of LMS News concerning GW-21 firmware release. Contact Cerberus Dati Customer Support

Tel.           +39-02-452819.1  
 Fax           +39-02-452819.33  
 e-mail       support@cdi.cerberus.ch  
 Internet     www.cdi.cerberus.ch

# 11 Appendix C: DIL-Switches Description

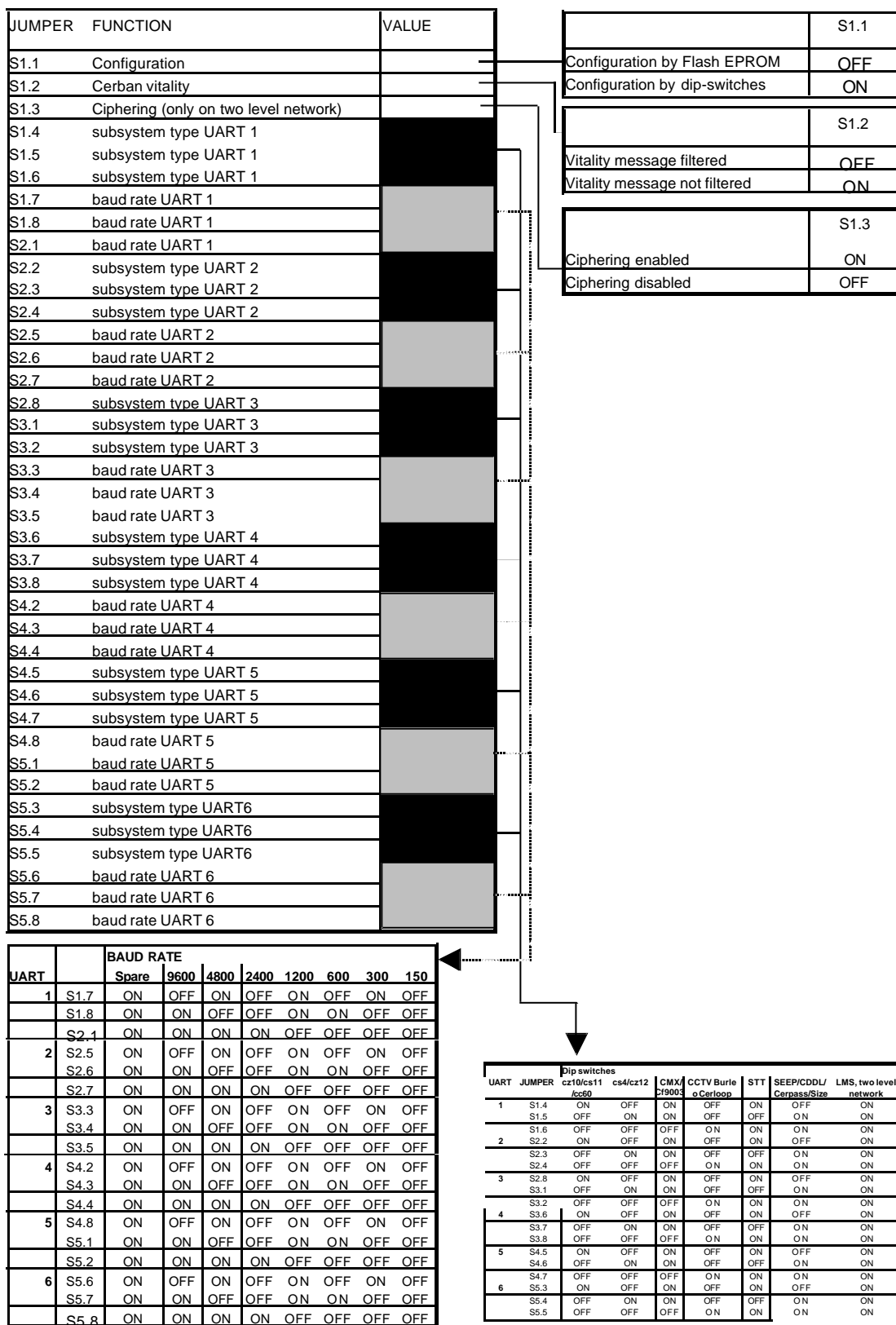


Fig. 19

## 12 Appendix D: GW-21 Rev. A

### 12.1 The connection board

---

The connection board has two connectors to insert the CPU and I/O board in.

On the board there are two DB9 D connectors for the two serial ports (UARTs 1 and 2). UART 2 is a full modem port, i.e. all the standard modem signals for a DB9 connector are foreseen. UART 1 lacks RI (Ring Indicator) and DCD (Data Carrier Detector) signals.

UARTs 3 and 4 are accessible through screw connectors located on the right side of the connection board. Only the TX, RX and GND signals are available.

UARTs 5 and 6, if the expansion board is installed, are accessible through the screw connectors from 31 to 36 on the connector block on the left side of the connection board.

On the same connection board there are the two power supply blocks. Each block has three pins: the central one is the ground, the two laterals are marked + and -. You must connect here the voltage source (10 to 30 V d.c.).



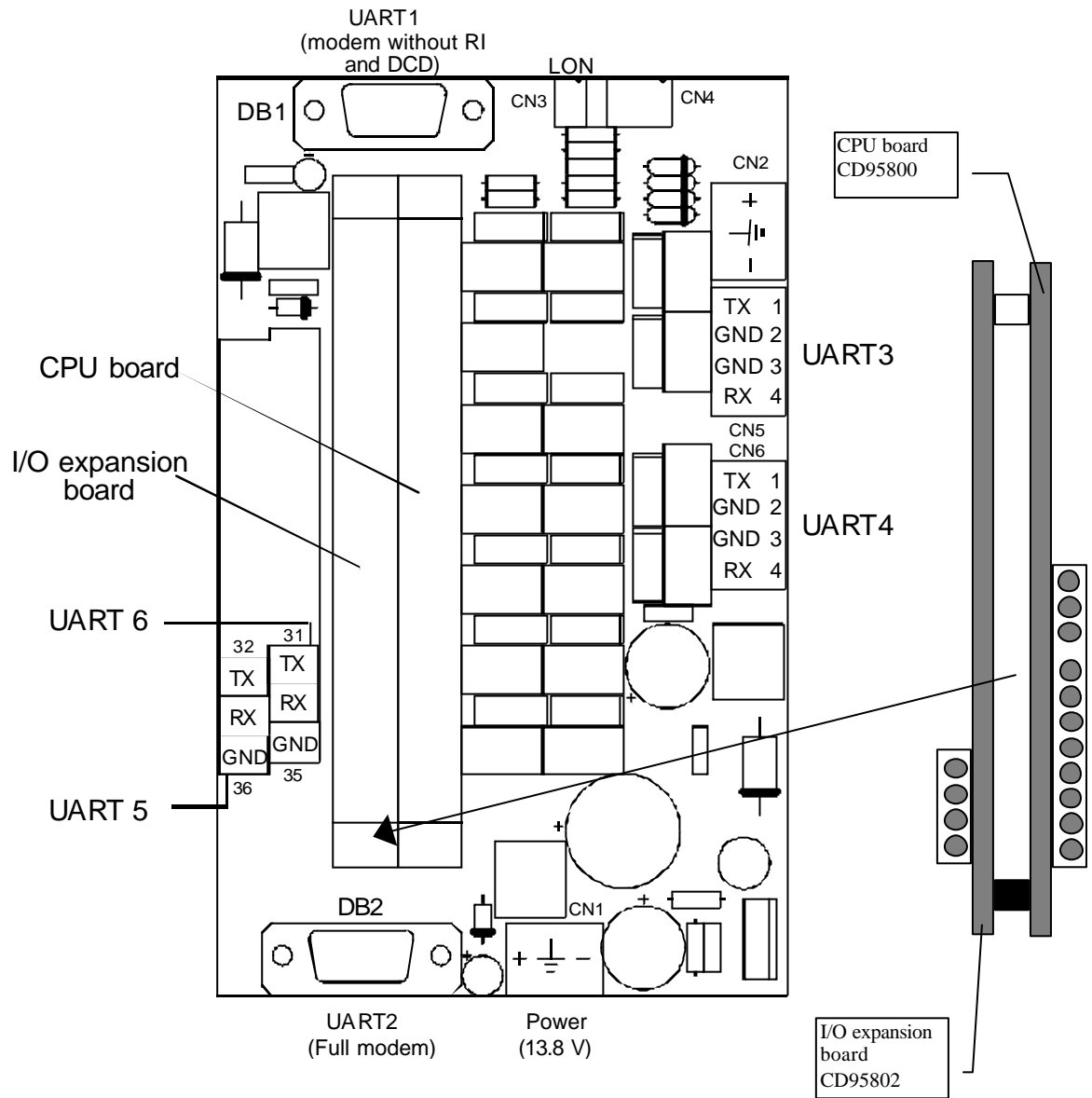


Fig. 20 The connection board

## 12.2 Inside the CS4

In the CS4 intrusion detection control unit the gateway can be mounted on the L-shaped plate on the right side of some of the standard housings.

To properly mount the Gateway GW-21, you must follow the procedure described below:

4. remove the K3H010 board;
5. remove the L-shaped plate from the chassis;
6. unscrew the four plastic guides used to host the K1D080 and K1H021 boards for Cerloop;
7. mount the four spacers provided with GW-21 on the L-shaped plate;
8. mount the L-shaped plate inside the chassis;
9. mount the connection board of the GW-21;
10. mount the CPU board and the expansion board, if needed, on the connection board
11. mount again in its place the K3H010 board
12. Please follow this sequence, because the screws used to mount the L-shaped plate inside the chassis are under the connection board.

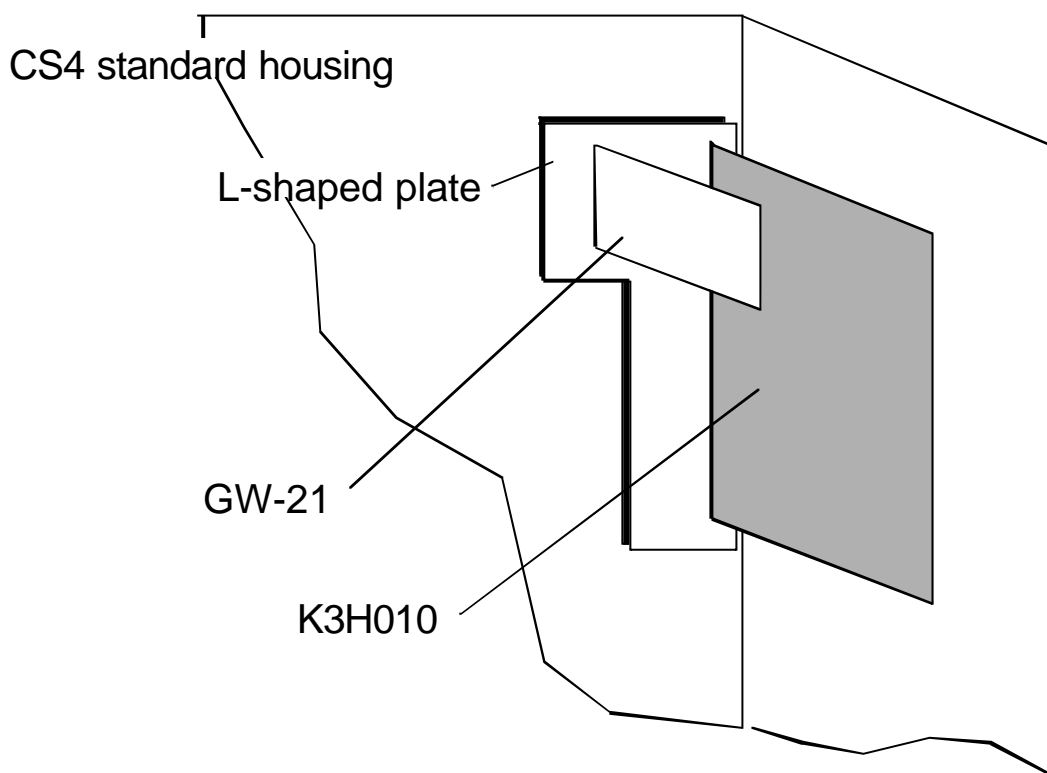


Fig. 21 Slots in the CS4 control unit

## 12.3 Connection to LMS

Fig. 22 and Fig. 23 show how to connect the GW-21 UARTs 3,4, 5, 6 on the screw terminal of the connection board to the LMS for a 9 pin connector and a 25 pin connector respectively.

Fig. 24 and Fig. 25 show how to connect the GW-21 UARTs 1 and 2 on the two DB9 connectors of the connection board to the LMS for a 9 pin connector and a 25 pin connector respectively.

If there is only one LMS operating station, it can be connected to any UART among those available. However, if there are two Operating Stations, they must be connected to UARTs 1 and 2.

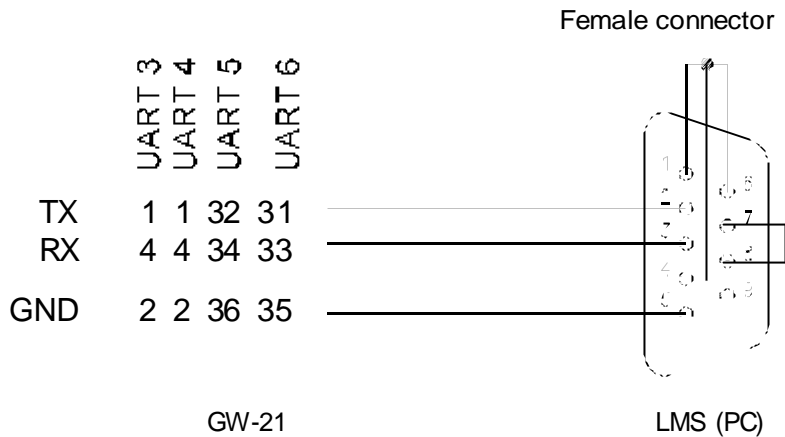


Fig. 22 Connection to 9 pin D connector (screw terminal block)

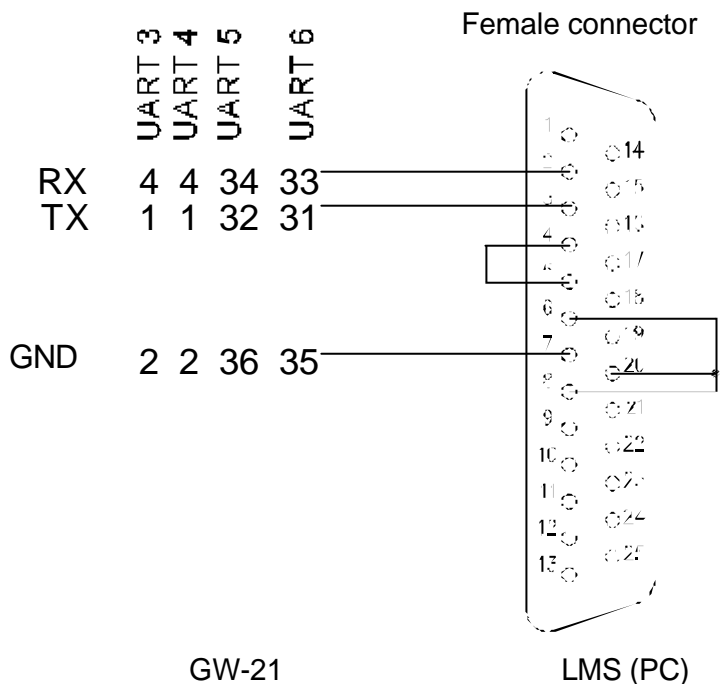


Fig. 23 Connection to 25 pin D connector (screw terminal block)

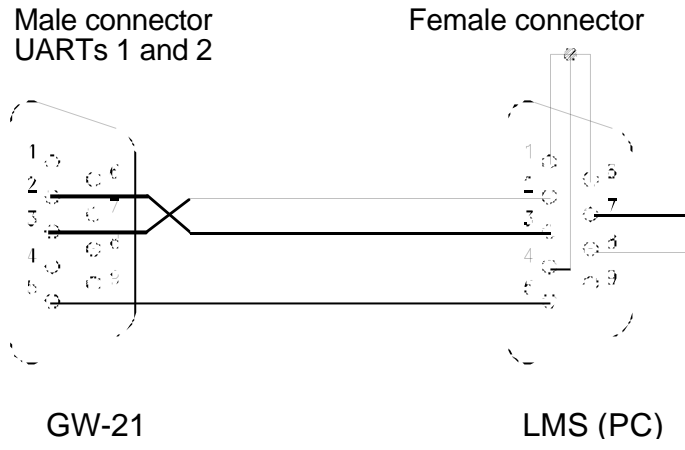


Fig. 24 Connection to 9 pin D connector (DB9 connectors)

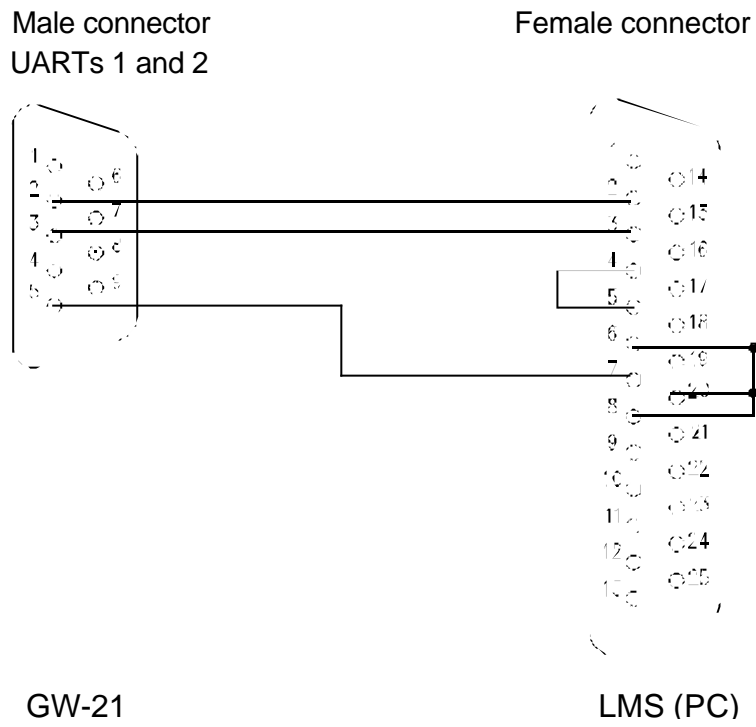


Fig. 25 Connection to 25 pin D connector (DB9 connectors)

## 12.4 Connection to GW-20

This type of connection applies only to two level network configurations of the type shown in Fig. 5 and Fig. 6.

Fig. 26 shows how to connect the GW-21 UARTs numbered 3,4,5 and 6 on the screw terminal block to the GW-20.

Fig. 26 shows how to connect the GW-21 UARTs 1 and 2 on the two DB9 connectors of the connection board to the GW-20.

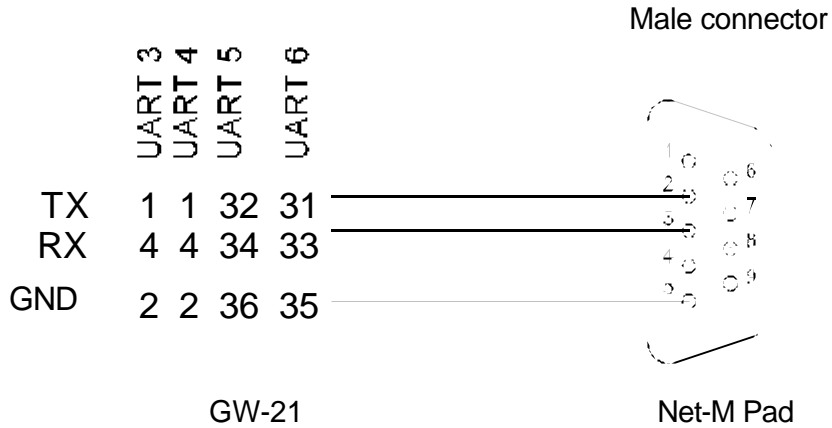


Fig. 26 GW-21/GW-20 connection (screw terminal block)

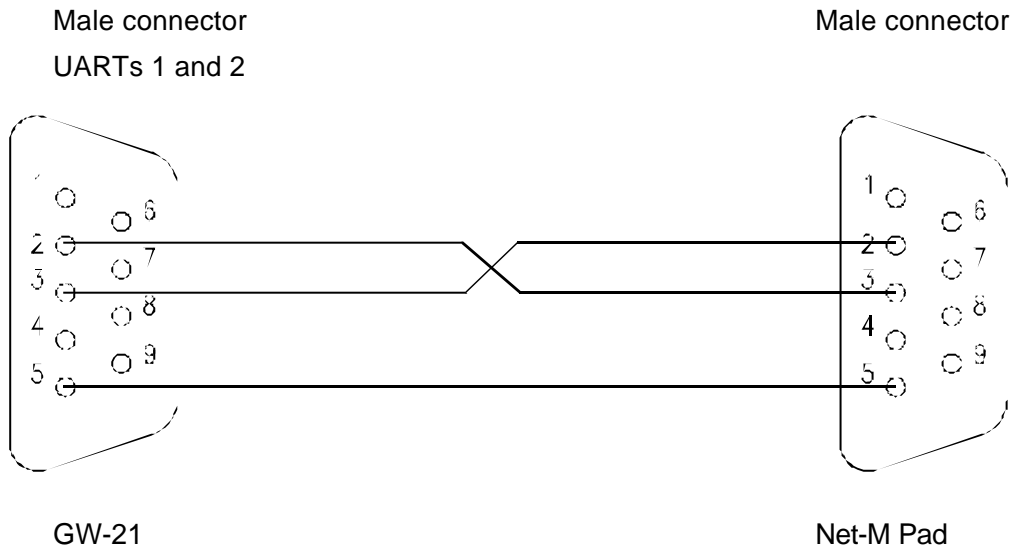


Fig. 27 GW-21/GW-20 connection (DB9 connectors)

All connections should be done using a shielded cable and D connectors with metallic shells. Fasten the connector to the back plane of the gateway using the screws on the connector shell.

## 12.5 Gateway to subsystem connection

Each connector of the Subsystem Pad is used for one serial ports and to the connector is linked only one subsystem of any type (Fig. 28 and Fig. 29).

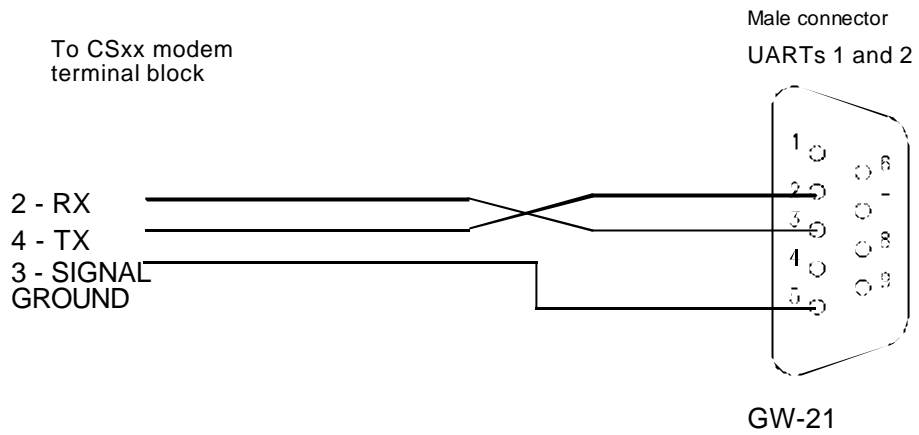


Fig. 28 GW-21 to CSxx subsystem (UARTs 1 and 2)

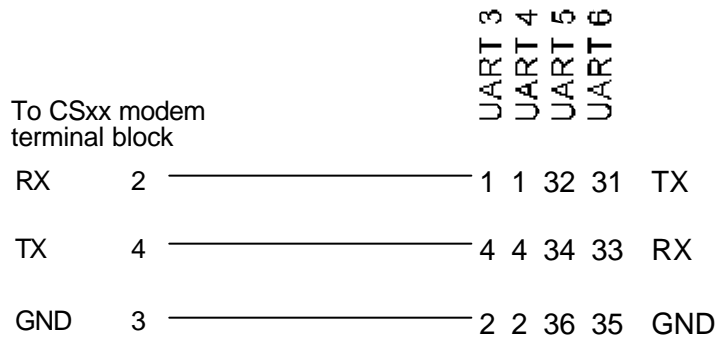


Fig. 29 GW-21 to CSxx subsystem (screw terminal block)



# 13 Appendix E: Safety Instructions

---

## **Scope of document (See EN 60950 Sec. 1.7.2)**

The safety instructions contained in this document are intended for use by service/maintenance personal for the proper installation of the equipment.

## **Wire size and isolation (See EN 60950 Sec. 1.5.5; 3.1.1; 3.2.4)**

---

When connecting to the mains supply the following prescriptions must be observed. The connection on the equipment side must be done using an approved (IEC 320-1/C13) type P-587 connector.

### **Isolation:**

The cable (wires) used must be suitable for 230 volts with a test voltage 1500V.

### **Wire size:**

The wires in must have a cross section adequate for the current rating of the protection devices of the in house mains circuit according to the following table:

Up to 6A	minimum 0.75 mm <sup>2</sup>
6A to 10A	1.0 mm <sup>2</sup>

## **Mains supply tolerance (See EN 60950 Sec. 1.6.5)**

---

The mains supply tolerance of this equipment is  $\pm 10\%$ .

## **Mains voltage adjustment (See EN 60950 Sec. 1.7.4; 4.3.1)**

---

This equipment has no mains voltage adjustment. The input voltage range permits operation from 100 to 240 VAC.

## **Protection in building installation (See EN 60950 Sec. 1.7.11)**

---

In house wiring to the socket to which the unit will be connected must be in accordance with local building codes and must include a valid protective earth. It must also be fused at max. 10A as this is the maximum current rating of the power inlet.

## **Fuses (See EN 60950 Sec. 1.7.6)**

---

The equipment is protected by a fuse located in the power inlet socket. The fuse is rating is 3.15A/T (Time delay)

## **Wire fixing (See EN 60950 Sec. 3.3.4)**

---

Mains wires must be fixed as close as possible to the terminal in such a way that if it becomes loose it will not touch any ungrounded part. This fixing must be done by the installer.

## **Internal wiring (See EN 60950 Sec. 3.1.2; 3.1.3)**

Mains wires must be routed in such a way to avoid the following:  
contact with sharp edges that could damage insulation.  
excessive strain on wire and terminal connections  
loosening of terminal connections







# Keyword index

---

## B

Baud rate 25

## C

Cable 21, 22, 36, 38

CC60 14

CCTV 23, 25, 28, 29

CCTV Burle 14

CDDL 14

CDSF 14

Cerban 9

Cerban vitality 16

Cerloop 14

CF9003 I, 2, 12, 14, 18, 23, 25, 28, 29, 38

Ciphering 16

CMSDL 9

CMX 14, 21, 23, 25, 28, 38

Connection board 5, 7, 32, 34, 36

connectors 36

CPU board 1, 3, 4, 7, 12, 14, 25, 26

CS11 14, 24, 26, 27

CS4 10, 11, 14, 23, 24, 33

CZ10 14

CZ12 14

## D

Dip-switch 16, 23, 24, 25, 28, 29

## E

EPROM 12

Example 23, 24, 25, 28, 29

Expansion board 4, 7

## F

FIRMWARE 29

Flash EPROM 12, 16

## G

GW-20 I, 2, 8, 9, 16, 17, 20, 25, 36

GW-21 1, 2, 3, 7, 8, 9, 10, 12, 13, 14, 16, 17, 19, 20,  
21, 22, 26, 29, 32, 33, 34, 36, 37, 38

GW-21.04 1, 7

GW-21.06 1, 7

## L

LED 25, 26

Line splitter 9

LMS 1, 2, 7, 14, 15, 23, 24, 26, 27, 28, 29, 34

## M

Master station 24

Message traffic 16

## N

Net-M Pad 9

## P

PC 25

Protocol converter 9

PROTOCOL SUPPORT 29

## R

Redundant configuration 16

## S

SEEP 14

Slave station 24

STT 2, 14, 25, 26, 27, 28

Subsystem Pad 37

Subsystem setting 14

## T

Traffic 16

Troubleshooting 25

Two level network 14

## W

Workstation 1, 14, 23

Siemens Building Technologies AG  
Cerberus Division  
CH-8708 Männedorf  
Alte Landstrasse 411  
Tel. +41 1 - 922 61 11  
Fax +41 1 - 922 64 50  
[www.cerberus.ch](http://www.cerberus.ch)

