

## 1. Suitable Scope

This technical specification applies to the RS485 interface specification between the Argentina Project Network Control System (TCMS) and the Automatic Broadcast (PIDS) system.

## 2. Things Interface

TCMS and PIDS are connected by a single RS-485 (half-duplex bidirectional point-to-point communication), through which information is exchanged between TCMS and PIDS, and each head TCMS provides an interface with PIDS communication.

The RS-485 parameters used are configured as follows:

Baud rate: 19200bps

Data bits: 8,

Check digit 1 odd parity

Starting position: 1

Stop position: 1

Main station: TCMS

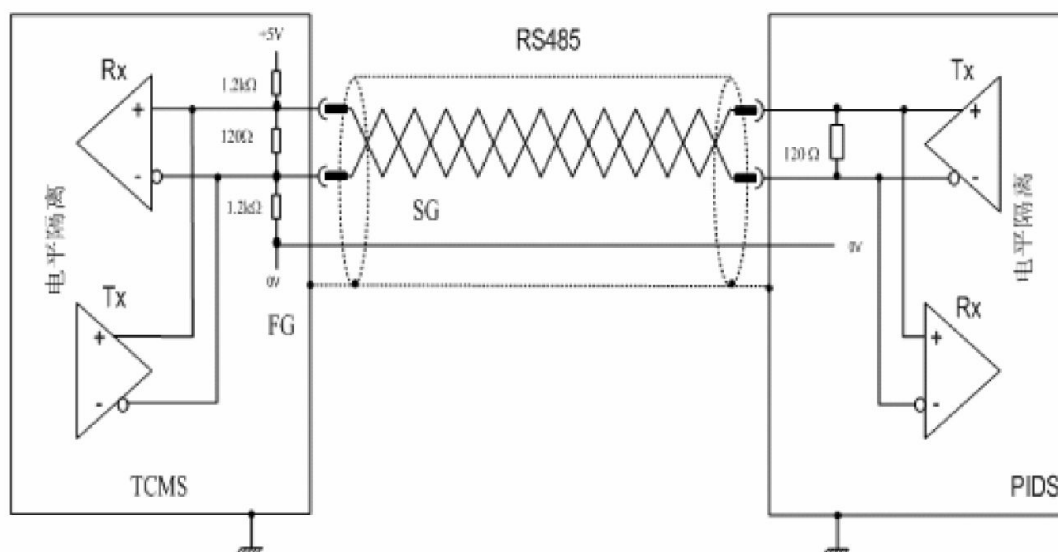
Slave: PIDS

Communication cycle 300ms

Slave response time: less than 20ms

Cable: 120 ohm, shielded, twisted pair

The following figure shows the interface wiring:



A resistance of 120 ohms is connected in parallel between the beginning and the end of the line to minimize reflections on the line.

### 3. Number Exchange TCMS and PIDS exchange data with RS-485 to transmit fixed-length messages.

#### 3.1 TC Data content sent by MS to PIDS

Byte number	Bit number								Remarks
	7	6	5	4	3	2	1	0	
1	Frame header (0xCC)								
2	Sequence detection code								
3			Gate 6	Gate 5	Gate 4	Gate 3	Gate 2	Gate 1	1 door unlock
4			Gate 6	Gate 5	Gate 4	Gate 3	Gate 2	Gate 1	2 door unlock
5			Gate 6	Gate 5	Gate 4	Gate 3	Gate 2	Gate 1	3 door unlock
6			Gate 6	Gate 5	Gate 4	Gate 3	Gate 2	Gate 1	4 door unlock
7			Gate 6	Gate 5	Gate 4	Gate 3	Gate 2	Gate 1	5 door unlock
8			Gate 6	Gate 5	Gate 4	Gate 3	Gate 2	Gate 1	6 door unlock
9			Gate 6	Gate 5	Gate 4	Gate 3	Gate 2	Gate 1	7 door unlock
10			Gate 6	Gate 5	Gate 4	Gate 3	Gate 2	Gate 1	8 door unlock
11			Gate 6	Gate 5	Gate 4	Gate 3	Gate 2	Gate 1	
12	year								
13	month								
14	day								
15	Time								
16	Minute								
17	second								
18	Train group number								
19								Battery shutdown signal	
20	CRC checksum high byte								
21	CRC checksum low byte								
22	End of frame (0xC6)								

#### 3.2 TCMS data sheet sent to PIDS

Number	Data name	Description	Format
1	Frame header	Frame header: Indicates the beginning of a data frame.	Value is: 0xCC
2	Sequence detection code	Number of data frames	Each data frame number is automatically incremented by 1, 0-0xFF cycle change
3	Door unlock	Car door emergency unlock	1: unlock is valid; 0: Unlocking is invalid
4	Battery off	When the battery is turned off, the train 110V power will be cut off after 30 seconds. During this period, the PIS will do the corresponding data storage.	1: turn off; 0: default;
5	CRC checksum	CRC check of all bytes before the CRC check byte, including the frame header byte	6-bit CRC calculation result polynomial (using CRC-CCITT (X <sup>16</sup> +X <sup>12</sup> +X <sup>5</sup> +1)), the starting term is 0xFFFF
6	End of frame	End of frame: indicates the end of the data frame.	Value is: 0xC6

### 3.3 PIDS data content sent to TCMS

Byte number	Bit number								Remarks
	7	6	5	4	3	2	1	0	
1	Frame header (0xC2)								
2	Sequence detection code								
3	Line number								
4	Start station code								
5	Current station code								
6	Next stop code								
7	Terminal code								
8	22 intercom	22 calls	21 intercom	21 calls	12 intercom	12 calls	11 intercom	11 calls	Emergency intercom status
9	42 intercom	42 calls	41 intercom	41 calls	32 intercom	32 calls	31 intercom	31 calls	Emergency intercom status
10	62 intercom	62 calls	61 intercom	61 calls	52 intercom	52 calls	51 intercom	51 calls	Emergency intercom status
11	82 intercom	82 calls	81 intercom	81 calls	72 intercom	72 calls	71 intercom	71 calls	Emergency intercom status
12	92 intercom	92 calls	91 intercom	91 calls					Emergency intercom status
13	PCU1	CAM_T1	CAM_C1	DACU1			FDU1		Estado de fallo
14	SCU1	CAM11	CAM12		SCU2	CAM21	CAM22		Estado de fallo
15	SCU3	CAM31	CAM32		SCU4	CAM41	CAM42		Estado de fallo
16	SCU5	CAM51	CAM52		SCU6	CAM61	CAM62		Estado de fallo
17	SCU7	CAM71	CAM72		SCU8	CAM81	CAM82		Estado de fallo
18	SCU9	CAM91	CAM92			Serious failure	Medium failure	Minor failure	Estado de fallo
19	PCU2	CAM_T2	CAM_C2	DACU2			FDU2		Estado de fallo
20	FMDU11	FMDU12	FMDU13	FMDU14	FMDU15	FMDU16	IDU11	IDU12	Estado de fallo
21	FMDU21	FMDU22	FMDU23	FMDU24	FMDU25	FMDU26	IDU21	IDU22	Estado de fallo
22	FMDU31	FMDU32	FMDU33	FMDU34	FMDU35	FMDU36	IDU31	IDU32	Estado de fallo
23	FMDU41	FMDU42	FMDU43	FMDU44	FMDU45	FMDU46	IDU41	IDU42	Estado de fallo
24	FMDU51	FMDU52	FMDU53	FMDU54	FMDU55	FMDU56	IDU51	IDU52	Estado de fallo
25	FMDU61	FMDU62	FMDU63	FMDU64	FMDU65	FMDU66	IDU61	IDU62	Estado de fallo
26	FMDU71	FMDU72	FMDU73	FMDU74	FMDU75	FMDU76	IDU71	IDU72	Estado de fallo
27	FMDU81	FMDU82	FMDU83	FMDU84	FMDU85	FMDU86	IDU81	IDU82	Estado de fallo
28	FMDU91	FMDU92	FMDU93	FMDU94	FMDU95	FMDU96	IDU91	IDU92	Estado de fallo
29	Software version low byte								
30	Software version high byte								
31	CRC checksum high byte								
32	CRC checksum low byte								
33	End of frame (0xCE)								

### 3.4 Data description sent by PIDS to TCMS

Number	Data name	Description	Format
7	Frame header	Frame header: Indicates the beginning of a data frame.	Value is: 0xC2
8	Sequence detection code	Number of data frames	Each data frame number is automatically incremented by 1, 0-0xFF cycle change
9	Line number	Set 4 line numbers for two lines	1-3 means Mitre's three intersections 4 indicates a crossroads of Sarmiento
10	Fault bit	Describe whether device communication is faulty	1: turn off; 0: default;
11	Start station code	Line start station number	01-255 corresponds to each site on the line
12	Current station code	Train current station number	01-255 corresponds to each site on the line
13	Next stop code	Train next stop number	01-255 corresponds to each site on the line
14	Terminal code	Train terminal number	01-255 corresponds to each site on the line
15	CRC checksum	CRC check CRC check of all bytes before the low byte, including the frame header byte	16-bit CRC calculation result polynomial (using CRC-CCITT (X16+X12+X5+1)), the starting term is 0xFFFF
16	End of frame	End of frame: indicates the end of the data frame.	Value is: 0xC6