# Data Sheet

SurroundMonitor 10820-203

GENERAL DESCRIPTION

The RTW SurroundMonitor as panel-mount unit 10820-203 for e. g. Lawo consoles contains seven instruments visible on two colour-TFT-displays.

- 8-channel multi-standard peakmeter
- Surround Sound Analyzer
- 2-, 4-, and 5-channel audio vectorscopes
- ITU Loudness/Loudness/Leq display
- Correlator
- Real Time Analyzer
- Dialnorm meter
- AES/EBU Status display

The SurroundMonitor 10820-203 features balanced analog inputs as well as AES/EBU digital inputs. Comprehensive menus allow a user defined configuration of the instrument to meet with the requirements of the application. This settings may be saved to or recalled from memory as user-presets. ITU Loudness measurement functions are available with software version V6.0 and higher.
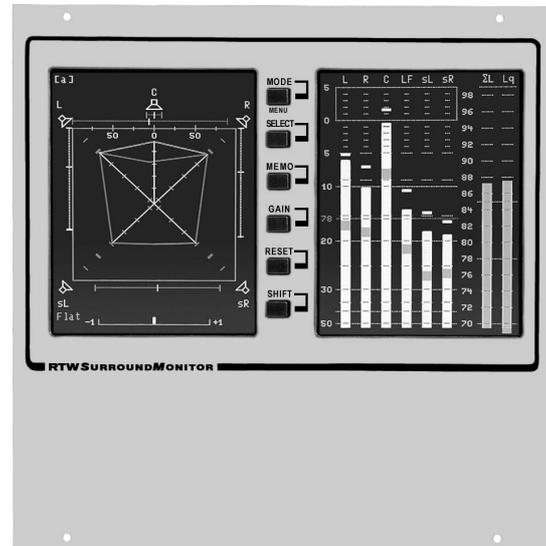
Surround Sound Analyzer • ITU Loudness • Loudness Leq • Audio Vectorscope • Peakmeter • Correlator • RTA

AES/EBU Status • Analog • Digital • 8-Channel • Mixed mode

TECHNICAL SPECIFICATIONS

General

Supply voltage:	+24 V DC
Current drain (nominal):	920 mA (power-up current is much higher)
Operating temperature:	0° to +45° celsius
Weight:	approx. 1300 g net
Connector:	1 x 9-pin Sub-D-F (remote)
	1 x 4-pin flange connector type 710 (DC)
	2 x 25-pin Sub-D-F
Dimensions:	203 x 199,8 x 60,2 mm (W x H x D)

Analog Inputs:

Inputs:	8 x analog, electronically balanced
Maximum input level:	+24 dBu
Adjustable range for reading reference:	–2 dBu to +13 dBu
CMRR:	min. 60 dB
Input impedance:	min. 10 kΩ (30 Hz to 20 kHz)

Digital Inputs:

Digital input:	4 x AES/EBU
Input impedance:	110 Ω or Hi-Z
Sample rate:	32 kHz to 96 kHz

Digital Outputs:

Digital Output:	4 x AES/EBU, input signal looped through

Display

Display:	2 x Color TFT 75 x 102 mm
Resolution:	240 x 320 pixel each
Colors:	8
Viewing area:	horizontal +40°/-65°
	vertical +/-65°, contrast >=5
Viewing direction:	3 o' clock
Contrast:	typical 1 : 60

Peakmeter

PPM display vertical:	up to 8 channels, peak hold indicator switchable, additional correlator with spot indicator

Bargraph length:	95 mm
Modes and bargraph configuration:	• 2-channel stereo (inputs 1-2, 3-4, 5-6, 7-8 selectable)
	• 8-channel (8 x 1 ch., 4 x 2 ch. or groups of 2 + 6, 4 + 4, 6 + 2 ch. with individual selectable standard and domain)
	• Surround 3/1
	• Surround 3/2 (5.1)
Peak memory:	additional peak hold indicators
Numerical level display:	available for level, peak level, loudness, over count. A single value can be selected to be displayed permanently, a list of all values is displayed, when the MEMO key is pressed
Correlation spot indicator:	switchable (but only available in the 8-channel mode with 4 stereo channels)
Loudness meter:	Additional spot indicator displayed on the bargraphs: acc. to ITU BS.1770, RTW mode or A, C or CCRIR-2k weighting, RMS

Peakmeter analog

Scales:	DIN+5, DIN+10, Nordic, British (Br) IIa, British (Br) IIb, VU, Zoom 20, Zoom 2, +24 dBu, +20 dBr
Reference level:	• +6 dBu for:
	DIN (0 dB display)
	Nordic (+6 dB display)
	Zoom 20 (0 dB display)
	VU (adjustable lead from 0 to 10 dB)
	• +8 dBu for:
	Br IIa („6" display)
	Br IIb („8" display)
Integration time:	according to selected standard or selectable (1 ms, 0.1 ms)
Fall back time:	acc. to standards (i. e. DIN: 1.5 s/20 dB)
Gain:	according to standards:
	+20 dB (DIN, Zoom) or
	+40 dB (Nordic, IIa, IIb)
Memory:	Maximum level, peak hold

RTW

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Peakmeter digital

Word width:	16 to 24 bit
Scales digital:	0 dB FS to –60 dB FS, 0 dB FS to –20 dB FS
Scale quasi analog:	[ARD+9], [DIN+5], [DIN+10], [Nordic], British [Br IIa], British [Br IIb], [VU]
Special scales:	Zoom 20, Zoom 2, +18..0 dB, +18..–18 dB (0 dB FS @ +18 dB) –40..+20 dB (0 dB FS @ +20 dB)
Headroom:	–5 dB to –20 dB, adjustable in steps of 1 dB
Integration time (Attack):	acc. to corresponding standards (Norm) or selectable: sample, 0.1 ms, 1 ms, 10 ms
Fall back time:	acc. to standards (i. e. DIN: 1.5 s/20 dB)
Gain:	according to standards: +20 dB (Zoom, quasi DIN) or +40 dB (all digital scales, quasi scales [ARD+9], [Nordic], [Br IIa], [Br IIb])
High pass filter:	OFF, 5, 10 or 20 Hz
Peak hold indicator:	integration time same as level display or sample (selectable)
Memory:	Maximum level, peak hold
Digital over indicator:	red spot indicator above each bargraph
Threshold:	FS, FS-1LSB, FS-2LSB, –0.1 dB FS, –0.5 dB FS, –1 dB FS, –2 dB FS or –3 dB FS
Attack time:	1 – 15 samples
Word width:	16 – 24 bit
Mute indicator:	red spot indicators below each bargraph
Threshold:	All bits digital „0"
Attack time:	50, 100, 200 oder 300 ms or 5 to 80 samples (adjustable in steps of 5)

Total Loudness Meter/Leq

Display:	2 bargraphs, only available in the surround modes
Calibration:	SPL reference 72 – 80 dB (single channel)
Total loudness/SPL:	70 – 98 dB (without LF channel)
Weighting filters:	A, C, CCIR-2k, RTW loudness (fast or slow), all RMS
Leq:	range 70 – 98 dB

ITU Loudness Meter

Display:	• additional spots on each level display bargraph • "M" bargraph (momentary): sum of all single channels for a short span of time • "I" bargraph (short term): summed integrated Loudness value of a dynamic time frame
Weighting filter:	RLB (K) acc. to ITU BS.1770, RMS
Scale:	–21 to +9 dB LU (Loudness Units)
Reference value for "0 dB LU" display:	adjustable in the range from –25 to –10 dB FS in steps of 1 dB
Integration time "M":	125 ms (IEC), 250 ms (IRT), 500 ms, 750 ms, 1 s (IEC), 1.5 s
Integration time "I":	1 to 12 s, low level modulation can be eliminated

Surround Sound Analyzer

Surround formats:	3/1 or 3/2 (5.1), display of LF channel in peakmeters only
Function:	weighted loudness display (A, C, CCIR-2k, RTW loudness, RLB, all RMS)
Indicators:	• graphics display indicating the single channel and total program loudness (Total Volume Indicator - TVI) • correlation display of adjacent channels • position of dominant sound event (Dominance Vector - DMI) • position and with of phantom (virtual) sound sources (Phantom Source Indicator -PSI) • low frequency sL (LS)/sR (RS) phase meter • additional 2-channel or 4-channel vectorscope selectable

Multi-Correlator

in surround modes:	up to 10 phase meters for all channel pairs
in 8-channel mode:	up to 4 phase meters for up to 4 stereo channel pairs
Display mode:	spot indicator or bargraph
Scale range:	–1 r to +1 r
Standard color setting:	red: –1 r to –0.1 r yellow: 0 r green: 0.1 r to +1 r
Color:	adjustable
Attack-/release time:	1.0 s, 2.5 s
Memory:	most negative value
Memory accuracy:	better 0.1 r
Weighting filter:	300 Hz first order low pass (switchable) for sL/sR phase meter in 3/2 (5.1) surround mode

Audio Vectorscope

Modes:	2/0 (stereo), 3/1, 3/2
Channel configuration:	• 2-channel and 8-channel mode: displays the channel pairs 1 - 2, 3 - 4, 5 - 6, 7 - 8, the odd channel is displayed as left • surround modes: channel configuration is set automatically according to the presets
Viewing area:	70 x 70 mm
Display color:	8
AGC:	Auto/manual
Calibration mode:	available, 20° and 90° grids are available in 2-channel mode only
M/S mode:	available
Presistence:	fast, medium, slow

Real Time Analyzer

Filter:	31, 1/3 octave
Frequency range:	• 20 Hz to 20 kHz in normal mode • 5 Hz to 5 kHz in LF mode
Standard:	according to IEC-225 ANSI class 2
Measuring/display range:	selectable: 15 dB, 30 dB, 45 dB
Integration time:	fast/medium/slow, RMS or peak
Peak hold indicator:	selectable

AES/EBU Status Monitor

Status display:	digital channels 1 - 2, 3 - 4, 5 - 6, 7 - 8
Audio data bit display:	activity of digital audio data bits
Display modes:	hex, binary, plain text

Remote control

Parallel interface:	• external function control: Mode, Select, Memo, Gain, Reset, Shift • external preset recall: Preset 1 - 6

Controls and additional display elements

Keys:	Mode, Select, Memo, Gain, Reset, Shift

ITEMS DELIVERED

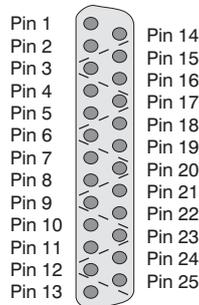|	
SurroundMonitor 10820-203	• SurroundMonitor (panel-mount unit for e. g. Lawo consoles) • Counter plug for power supply • Operating manual **Order number: 10820-203**

Data Sheet

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CONNECTION

Analog Connector (25-pin Sub-D-F)

Pin: Function:

1	audio input analog 8 (+, hot)
14	audio input analog 8 (-, cold)
2	screen/case
15	audio input analog 7 (+, hot)
3	audio input analog 7 (-, cold)
16	screen/case
4	audio input analog 6 (+, hot)
17	audio input analog 6 (-, cold)
5	screen/case
18	audio input analog 5 (+, hot)
6	audio input analog 5 (-, cold)
19	screen/case
7	audio input analog 4 (+, hot)
20	audio input analog 4 (-, cold)
8	screen/case
21	audio input analog 3 (+, hot)
9	audio input analog 3 (-, cold)
22	screen/case
10	audio input analog 2 (+, hot)
23	audio input analog 2 (-, cold)
11	screen/case
24	audio input analog 1 (+, hot)
12	audio input analog 1 (-, cold)
25	screen/case

Pin 1 ... Pin 13 / Pin 14 ... Pin 25

Remote Control Connector (9-pin Sub-D-F)

Pin: Function:

1	common potential for ext. switches-Gnd
2	external function selection: select
3	external function selection: gain
4	external function selection: shift
5	for future use
6	external function selection: mode - menu
7	external function selection: memo
8	external function selection: memo reset
9	for future use

Pin 1 ... Pin 5 / Pin 6 ... Pin 9

Digital Connector (25-pin Sub-D.F)

Pin: Function:

1	audio output digital 4 (+, hot)
14	audio output digital 4 (-, cold)
2	screen/case
15	audio output digital 3 (+, hot)
3	audio output digital 3 (-, cold)
16	screen/case
4	audio output digital 2 (+, hot)
17	audio output digital 2 (-, cold)
5	screen/case
18	audio output digital 1 (+, hot)
6	audio output digital 1 (-, col)
19	screen/case
7	audio input digital 4 (+, hot)
20	audio input digital 4 (-, cold)
8	screen/case
21	audio input digital 3 (+, hot)
9	audio input digital 3 (-, cold)
22	screen/case
10	audio input digital 2 (+, hot)
23	audio input digital 2 (-, cold)
11	screen/case
24	audio input digital 1 (+, hot)
12	audio input digital 1 (-, cold)
25	screen/case

Pin 1 ... Pin 13 / Pin 14 ... Pin 25
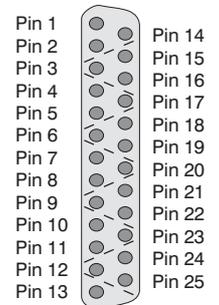
Note: Digital I/O´s are in parallel, not active buffered.

Power Supply Connector (4-pin low voltage type Binder 710)

Pin: Function:

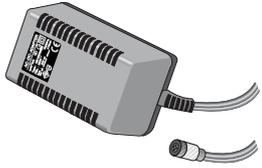|	
1-2	+24 V
3-4	0 V

COLORS

Front panel: Light grey RAL 7035, Scale: black RAL 9011

DIMENSION
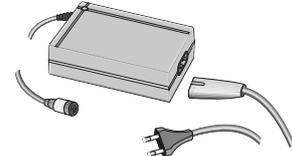
RTW
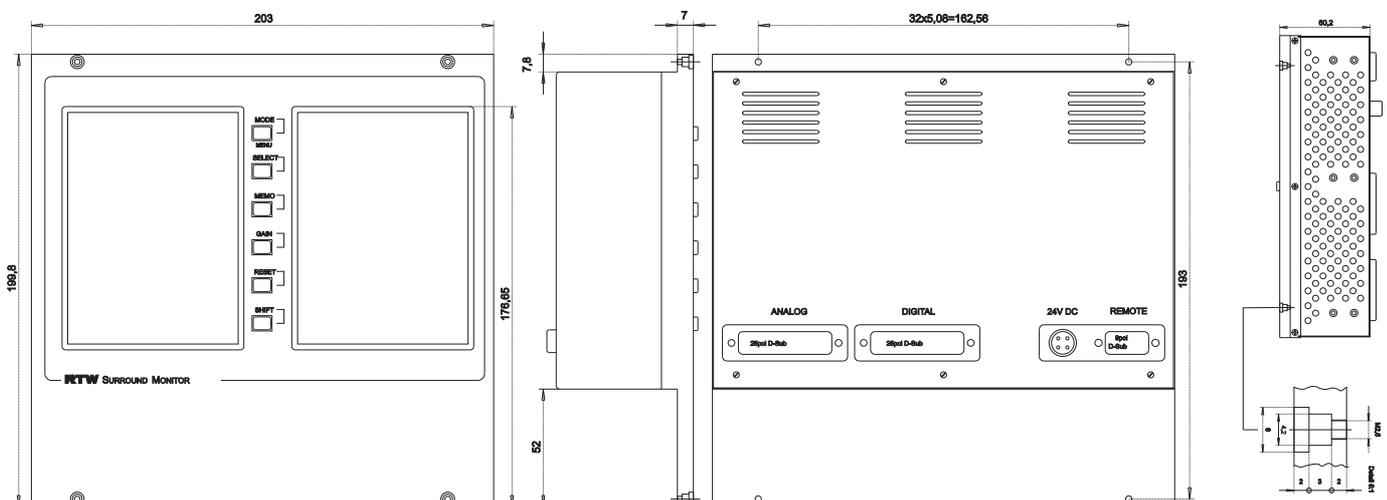
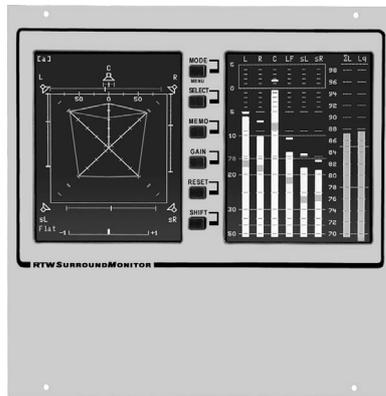## ACCESSORY COMBINATION

Mains adapter **1169-R**
90 - 240 V AC/24 V DC, 1.05 A
• Euro plug
• Locking 4-pin low voltage connector

Wide voltage power supply **1175-R**
100 - 240 V AC/24 DC, 2.7 A
• Corresponding power cable
• Locking 4-pin low voltage connector

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Panel-mount unit, e. g. fits to Lawo consoles

8-pair snake cable **1167**, 4 m
• Distributes 25-pin Sub-D connector to 4 XLR-F and 4 XLR-M cable connectors
• For connecting to "Digital" connector

8-pair snake cable **1186**, 4 m
• Distributes 25-pin Sub-D connector to 8 XLR-F cable connectors
• For connecting to "Analog" connector

Technical changes without prior notice 02/2010