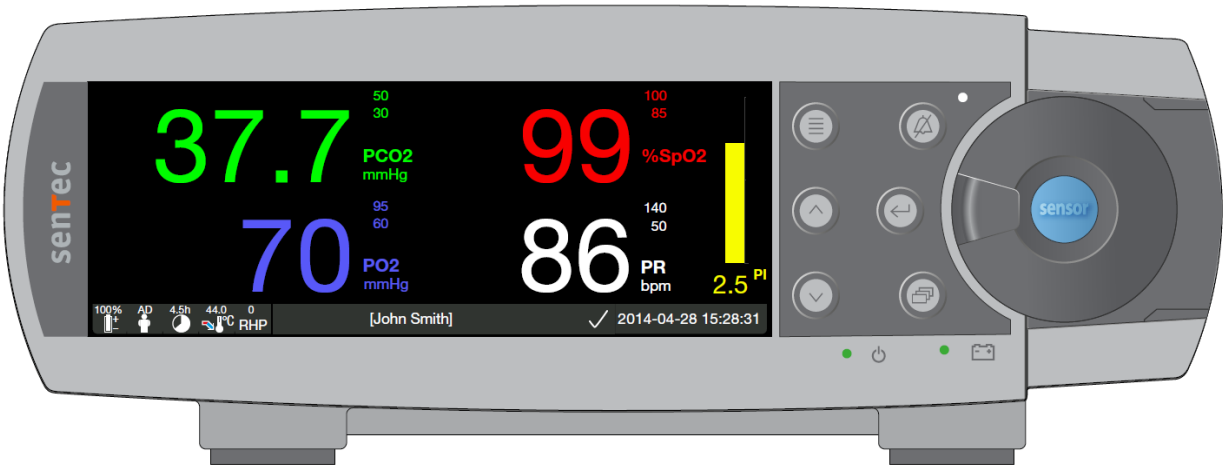
VueLink / IntelliBridge Installation Manual

sentec



Interfacing the SenTec Digital Monitor (SDM) with Philips Patient Monitoring Systems (PPMS)

(SDM Software Version SMB SW-V08.02; MPB SW-V06.02 or higher)

HB-005928-h

Contents

Introduction

The SenTec Digital Monitor (SDM) supports communication with Philips Patient Monitoring Systems (PPMS) by using a VueLink Interface Module Auxiliary Plus (Type B) or IntelliBridge Interface.

Once the connection between the SDM and the PPMS is established, the SDM transfers all patient data (PCO2, PO2, SpO2, PR, Absolute Heating Power (AHP) and the plethysmographic waveform) as well as most of the alert messages (alarms and inops (inoperable conditions)) to the PPMS online. Alarm limit violations of SpO2, PCO2, PO2 and PR are transferred as yellow alerts (see below).

The "Philips VueLink" and "Philips IntelliBridge" implementations from software version SMB V08.00 and higher support the "PCO2 only mode", the "PCO2 PO2 only mode", the "SpO2 PR only mode", and the "Demo Mode" of the SDM. If the SDM is operated in the "PCO2 only mode" only PCO2 data and PCO2 specific messages are transferred to the PPMS. In the "PCO2 PO2 only mode" only PCO2 and PO2 data and specific messages are transferred to the PPMS. In the "SpO2 PR only mode" PCO2/PO2 data and PCO2/PO2 specific messages are NOT transferred to the PPMS. In the Demo Mode, „SDM DEMO MODE" replaces all messages. AHP data are transferred to the PPMS in all modes.

The connection procedure has to be followed only once, afterwards the SDM and Philips monitor should communicate even after disconnecting / reconnecting the SDM or after power OFF/ON.

Note: The VueLink or IntelliBridge Open Interface Protocol is unidirectional, i.e. a PPMS can display data received from the SDM but cannot remotely control the SDM.

Note: Due to the specific features of the VueLink or IntelliBridge Open Interface Protocol the data transmission from the SDM to PPMS may be delayed by several seconds.

Note: The SDM has been validated with the English version of the VueLink or IntelliBridge Open Interface Protocol. If other languages are used on the PPMS while connected to the SDM, conflicts and unpredictable behavior may occur.

Note: The "Philips VueLink" and "Philips IntelliBridge" implementations of software version SMB V08.00 and higher support the PCO2 units "mmHg" and "kPa".

Note: The protocols "Philips VueLink" and "Philips IntelliBridge" enable the transfer of PCO2 data up to 99.9 mmHg only with a resolution of "xx.x", whereas the protocols "Philips VueLink 2" and "Philips IntelliBridge 2" enable the transfer of PCO2 data up to 200 mmHg with reduced resolution of "xxx".

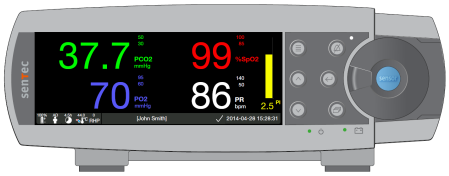
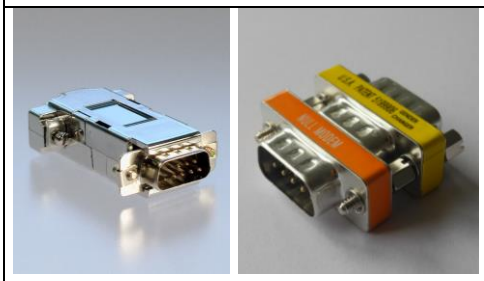
WARNING: Accessory equipment connected to the SDM's data ports must be certified according to the IEC 60950 standard. All resulting combinations of equipment must be in compliance with the IEC standard 60601-1 systems requirements. Anyone who connects accessory equipment to the SDM configures a medical system and is, therefore, responsible for ensuring that the resulting system complies with the requirements of standard IEC 60601-1 and the electromagnetic compatibility standard IEC 60601-1-2.

WARNING: When connecting/mounting the SDM to accessory equipment (e.g. PCs, PSG-Systems, (wireless) networks, roll stands, mounting plates, incubators, etc.)), verify proper operation before clinical use of the SDM and accessory equipment. In certain cases it may be required that the SDM and the accessory equipment must be connected to a grounded AC outlet. In case of doubt consult qualified technicians.

WARNING: The mains power supply of the SenTec Digital Monitor (SDM) is separated by two Means of Patient Protection (MOPPs) between the sensor port (for the applied part, the sensor) and the interface connectors. The three interface connectors – serial data port, Multipurpose I/O port (analog outputs, nurse call), LAN port – of the SDM are not separated from each other. If at a time accessory equipment is connected to only one of the three interface connectors no additional safety measures are necessary to comply with the requirements of IEC 60601-1. If however accessory equipment is simultaneously connected to two or three of the SDM's interface connectors additional safety measures may be required to be compliant with the requirements of IEC 60601-1. In case of doubt consult qualified technicians.

Required Components / System Requirements

Components required from SenTec

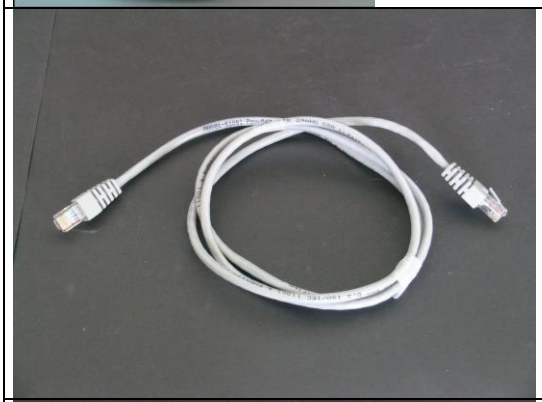
	**SenTec Digital Monitor** Product Code: SDM Software version SMB SW-V05.11.xx or higher is needed to connect to Philips Patient Monitoring Systems via VueLink. This manual, however, is specific for the version SMB SW-V08.02.x. Software version SMB SW-V07.01 or higher is needed to connect to Philips Patient Monitoring Systems via IntelliBridge. This manual, however, is specific for the version SMB SW-V08.02.x.
	**VueLink Adapter (only needed for Vuelink Interface)** Product Code: VL-A **Note:** The old (left side) adapter has been superseded by the new (right side) adapter. Both types can be used in equivalent fashion.
	**IntelliBridge Adapter IB#106-A (Product Code: IB#106-A)** For SDMs with motherboard version 32B_A01 or older (corresponds to SDM SN 303385 and older) SenTec's IntelliBridge Adapter IB#106-A is required to interface the SDM to Philips IntelliBridge EC10 Module. SenTec's IntelliBridge Adapter IB#106-A must be purchased from SenTec. **Note:** SDMs with motherboard hardware version SMBM 40C_A03 or higher (corresponds to SDM SN 303386 or higher) can be directly connected to Philips' IntelliBridge ID Module EC5 #101 (not to be purchased from SenTec, product from Philips). 

VueLink Components required from Philips

	**Philips Patient Monitoring System with at least one module rack** Connection is possible to the following systems: - IntelliVue™ MP40/50/60/70/80/90 (all software versions) or MX600/700/800 (all software versions) - Hewlett Packard or Agilent™ CMS™ (software versions C or newer) - Hewlett Packard or Agilent™ V24/26 (almost all software versions, for details please contact your local Philips representative)
	**Philips VueLink Interface Module Auxiliary Plus (Type B) with Digital Open Interface Driver** Philips order code*: M1032A #A05 **Note**: The VueLink Interface Module has been discontinued by Philips and cannot be purchased for Philips patient monitors software version M or higher. VueLink module M1032A are only supported until the end of 2017. **Note**: The VueLink Interface Module must be configured with the Digital Open Interface Driver.
	**VueLink connection cable with D-SUB 9 connector** Philips order code*: M1032-61699 **Note:** To be ordered from Philips for replacement of installed base only.

*SenTec assumes no liability for correctness of stated Philips order codes

IntelliBridge Components required from Philips

	**Philips Patient Monitoring System with at least one module rack** Connection is possible to the following systems: - IntelliVue™ MP40/50/60/70/80/90 (Rev. H.15 or higher) and MX600/700/800 (Rev. H.15 or higher) - IntelliVue™ MX400/450/500/550 (all software versions)
	**Philips IntelliBridge EC10 Module** To be ordered from Philips
	**Patch Cable, CAT5 or better, straight wired** To be ordered from Philips together with EC5, see below, (option L0X)
	**IntelliBridge EC5 ID Module (#101)** To be ordered from Philips **Note:** SDMs with motherboard hardware version SMBM 40C_A03 or higher (corresponds to SDM SN 303386 or higher) can be directly connected to Philips' IntelliBridge ID Module EC5 #101. For SDMs with motherboard version 32B_A01 or older (corresponds to SDM SN 303385 and older) SenTec's IntelliBridge Adapter IB#106-A is required to interface the SDM to Philips IntelliBridge EC10 Module.

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Setting up the connection

Note: The instructions below refer to the Philips IntelliVue MP50 patient monitor. The procedure to set up the connection can slightly vary for other models.

Note: The instructions below describe the setup for VueLink and IntelliBridge interfaces, some steps are identical, some are specific. Specific steps will be identified, otherwise a step applies to both interfaces.

To set-up a connection from the SDM to PPMS proceed as follows:

1. Switch the PPMS OFF.

2. Localize the module rack on your Philips monitor.

3. Insert the VueLink or IntelliBridge Interface Module in the module rack of the Philips Monitor

4. VueLink only: Connect the VueLink Adapter to the VueLink Connection Cable (use the screws to tighten the adapter to the cable).
   IntelliBridge only: Connect the EC5 ID Module OR the IntelliBridge Adapter IB#106-A to the IntelliBridge Patch Cable.

VueLink Adapter connected to the VueLink Connection Cable.

Note: Picture shows old type of VueLink Adapter.

EC5 ID Module and IntelliBridge Patch Cable

OR

IntelliBridge Adapter IB#106-A and IntelliBridge Patch Cable

5. Connect the Connection Cable / Patch Cable to the Interface Module

6. Connect the VueLink Adapter / EC5 ID Module to the SDM serial data port (use the screws to fix the Adapter / EC5 ID Module to the SDM). **Note:** Picture shows old type of VueLink Adapter.

7. Switch ON the PPMS
8. VueLink only: Ensure that the device selection LED "Open Interface" on the VueLink Interface Module is on, indicating that the module has correctly been identified and configured by the PPMS (contact a Philips authorized technician if the VueLink Interface Module has not been configured).

9. On the SDM, set the menu-parameter "Interfaces / Serial Interface / Protocol" to "Philips VueLink / IntelliBridge" (*supported PCO2 range from 0.1 mmHg to 99.9 mmHg, resolution "xx.x"*) or to "Philips VueLink/IntelliBridge 2" (*supported PCO2 range from 0 to 200 mmHg, resolution "xxx"*)

10. The communication between the SDM and PPMS should be established within approx. 45 seconds. Once the communication is established, the SDM registers as "SenTec SDM" at the PPMS.
    Note: IntelliBridge only: Communication status is shown on LED on module: blinking green: establishing communication, green: running communication, blue: communication error, check setup (e.g. dis- and reconnect cable)

Note: When activating/deactivating different sets of enabled parameters (e.g. "PCO2 only mode" or "SpO2/PR only mode"), or switching between the PCO2 unit "mmHg" and "kPa" on the SDM, the communication between the SDM and the PPMS will be interrupted for a short period of time, as the SDM needs to send a new configuration file to the PPMS (Vuelink/IntelliBridge interface requirement).

Configurations

Configuration of the SDM

Set the menu-parameter "Interfaces / Serial Interface / Protocol" to:

- "Philips VueLink/IntelliBridge" (*supported PCO2 range from 0.1 mmHg to 99.9 mmHg, resolution "xx.x"*)
- "Philips VueLink/IntelliBridge 2" (*supported PCO2 range from 0 to 200 mmHg, resolution "xxx"*)

Configuration of the VueLink Interface Module

Philips delivers the VueLink Interface Modules in a generic state, i.e. they are inoperable until the appropriate drivers are loaded and activated. Usually, the modules arriving in this generic state are labeled as "EXT Plus B".

In a password-protected menu of the PPMS, each VueLink module can be loaded with up to three drivers for specific external devices. One of the drivers is called "Open Interface" and enables communication with a variety of external devices that have one common feature: they implement the VueLink Open Interface communication protocol. This driver needs to be loaded to and activated on your VueLink module in order to establish communication with the SDM.

VueLink Interface Module: Setting up the Open Interface Driver

The Open Interface Driver is delivered with the VueLink Interface Module. The configuration mode of your Philips monitor allows loading of this driver to your VueLink Interface Module. This mode is password-protected and the loading has to be done by qualified technical staff. Trained personnel needs to activate the "AUX Plus B" configuration of the VueLink Interface Module. Once the Open Interface driver has been loaded to the VueLink module, it is assigned to one of the three LEDs at the module's front panel. To avoid confusion, the technician should label this LED with the "Open Interface" sticker and replace the generic label ("EXT Plus B") of the VueLink module with "AUX PLUS B" sticker delivered by Philips.

Activation of the loaded Open Interface driver can be done in the normal monitoring mode, i.e. does not require a password.

Configuration of the IntelliBridge EC10 Module

No configuration is necessary for the EC10 module.

Configuration of the Display of the PPMS

The following real-time data of the SDM are available on the PPMS through the VueLink/IntelliBridge Interface:

Parameter	**Name on PPMS**	**Type**
PCO_2	tcpCO2	Numeric
PO_2	tcpO2	Numeric
SpO_2	SpO2	Numeric
PR (Pulse Rate)	Pulse	Numeric
AHP	AHP	Numeric
Plethysmographic Waveform	Pleth	Wave

Each parameter can be selected or deselected individually, using the configuration screen "SenTec SDM" on the PPMS. To access the configuration screen on the PPMS, press "Main Screen → Measurement Selection (module rack - icon) → VueLink → Setup VueLink →Setup SenTec SDM " Use equivalent menu selections for the configuration of IntelliBridge.

Note: A PPMS may accommodate several VueLink/IntelliBridge interface modules at once. They are identified as "AUXILIARY PLUS 1", "AUXILIARY PLUS 2" etc. Be cautious to select the proper identifier.

Note: Regardless of whether `Absolute´ heating power (AHP) or `Relative´ heating power (RHP) (not `OFF´) is enabled on SDM, solely AHP data are transferred to PPMS when the parameter is activated.

Alerts

The VueLink/IntelliBridge Open Interface Protocol distinguishes between two types of alerts: alarms and inops (i.e. inoperable conditions).

Only one alert message text of each alert type is displayed at the PPMS at once. Thus a priority is assigned to each alarm and inop. All other functions related to alerts (e.g. value blinking, marking with question marks "?") of two or more active alerts may occur simultaneously.

Note: Alerts are by default deactivated in VueLink/IntelliBridge. Their activation requires access to the configuration mode of the monitor and can be done by technical staff only.

Note: The VueLink/IntelliBridge interface does not allow the PPMS to generate audible signals at the bedside for alarms and inops generated by the SDM.

Alarms

The VueLink/IntelliBridge Open Interface Protocol defines two types of alarms:

Red alarms: Indicate potentially life-threatening situations. An immediate response is required.

Yellow alarms: Indicate less critical situations. A response is required, but of a less critical importance.

The data from the SDM cause the following yellow alarms on the PPMS:

Message text	Explanation
SDM HI/LO tcpCO2	Alarm limit violation of tcpCO2 (PCO2) values
SDM HI/LO tcpO2	Alarm limit violation of tcpO2 (PO2) values
SDM HI/LOW SpO2	Alarm limit violation of SpO2 values
SDM HI/LO PULSE	Alarm limit violation of Pulse (PR) values

Note: Alarm limit violation of a parameter causes the respective numeric value to blink on the PPMS.

Note: If alarms are muted on the SDM, the PPMS displays an *alarm mute symbol* next to the numeric values of the SDM

Inops

The VueLink/IntelliBridge Open Interface Protocol defines an inop as a notice for the medical staff given by the equipment. Inop notices are based on the determination of the current equipment status. Each inop carries additional information either on the validity of all related measurements (general inop) or on the validity of a specific numeric value. Depending on this validity/inop combination, the numeric may differently be shown on the PPMS.

Message text	Specific to	Corresponding Status Messages (Codes) on the SDM
SDM SYSTEM FAULT		Monitor fault xx (MFxx) Sensor fault xx (SFxx) Incompatible sensor (IS) Sensor problem 38 (SP38) Sensor problem 42 (SP42) Replace sensor (LE)

Message text	Specific to	Corresponding Status Messages (Codes) on the SDM
SDM CONCT SENS.		Connect sensor (CoS)
SDM T LIM. ACTIVE		Temp. limiter active (OT)
SDM SENS. OFF PAT.		Sensor off patient (↲) (SO)
SDM REPLACE GAS		Gas bottle empty (GE)
SDM SpO2 SIGNAL Q.	SpO2, PR	SpO2 low signal (LS), High ambient light (HA), SpO2 signal quality (MA)
SDM HEATING REDUCD	tcpCO2, tcpO2	Heating reduced (HR)
SDM SITE TIMEOUT		Site time elapsed (TE)
SDM REMBR. SENS.	tcpCO2, tcpO2	Change sensor membrane (RS)
SDM CALIB. SENS.	tcpCO2, tcpO2	Calibrate sensor (CSi, CSo)
SDM TC MSG.	tcpCO2, tcpO2	Sensor Calibration Recommended (CS), PCO2 slow (PS), High ambient light (SA)
SDM BATTERY LOW		Battery low (LB) Battery critical (BC) **Note**: The SDM's message "Battery critical" is only transmitted to the PPMS if the SDM is not connected to AC power.
SDM CHECK APPLI.	tcpCO2, tcpO2	Check application (CA)
SDM TC UNSTBL.	tcpCO2, tcpO2	PCO2 stabilizing (CE), PO2 stabilizing (OE), PCO2/PO2 stabilizing (TS)
SDM INI. HEAT ON		No message (Temperature Icon yellow) (IH)
SDM CALIB. RUNNING	tcpCO2, tcpO2	Calibration in progress (SC)
SDM READY FOR USE		Ready for use (RU)
SDM SYSTEM MESSAGE		Monitoring time < 15 min (TL) Atm. P. unstable (AU) Leak test in progress (LT) TC sensitivity test (ST) Open DS door (OD) Sensor problems 10, 11, 12 (SP10-12), SpO2, PR still valid Sensor problems 70, 71, 72, 73, 74 (SP70-74), tcpCO2, SpO2, PR still valid Sensor problem 20 (SP20) , tcpCO2, tcpO2 and PR still valid Low life / usage time reminder (LL) Barometer fault (BF), SpO2, PR still valid Gas leak in DS (GL), SpO2, PR still valid Docking station fault (DF), SpO2, PR still valid V-CareNeT™ required (VR) Remote monitoring connection lost (RL) Watch battery low (LW) Monitor problem 42 (MP42)
SDM DEMO MODE		DEMO MODE (DM)

Depending on the position of the connected sensor and/or the operation mode/status of the SDM the data displayed on the PPMS are as follows.

	Sensor Position (Quality of parameter on SDM)	**PCO2**	**PO2**	**SpO2**	**PR**	**AHP**	**Pleth**
Monitoring Mode	**On Patient**, respective parameter valid	**Value**	**Value**	**Value**	**Value**	**Value**	**Wave**
	On Patient, respective parameter questionable	**Value** ('?' before label)	**Value** ('?' before label)	**Value** ('?' before label)	**Value** ('?' before label)	n.a	n.a.
	On Patient, respective parameter unstable	**-?-**	**-?-**	**-?-**	**-?-**	n.a.	n.a.
	On Patient, respective parameter invalid	--	--	--	--	--	**line**
	Off Patient	--	--	--	--	--	**line**
	In Docking Station	--	--	--	--	--	**line**
"Demo Mode"	**On Patient** (not applicable, the Demo Mode automatically deactivates if the sensor is applied to the patient)	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
	Off Patient ("SDM DEMO MODE ")	**Value**	**Value**	**Value**	**Value**	**Value**	**Wave**
	In Docking Station ("SDM DEMO MODE ")	--	--	--	--	--	**line**

Note: Irrespective of the sensor position or operation mode/status of the SDM only the parameter PCO2 and (optional) AHP are displayed on the PPMS in PCO2-only mode (i.e. in 'Neonatal' mode or if the menu parameter 'Measurement Settings/Enabled Parameters' is set to 'PCO2' in the 'Adult' mode).

Note: Irrespective of the sensor position or operation mode/status of the SDM only the parameters PCO2, PO2 and (optional) AHP are displayed on the PPMS in PCO2/PO2 mode (i.e. in 'Neonatal' mode with PCO2/PO2 enabled or if the menu parameter 'Measurement Settings/Enabled Parameters' is set to 'PCO2 PO2' in the 'Adult' mode).

Note: Irrespective of the sensor position or operation mode/status of the SDM only the Pleth and the parameters SpO2, PR and (optional) AHP are displayed on the PPMS in SpO2/PR-only mode (i.e. if the menu parameter 'Measurement Settings/Enabled Parameters' is set to 'SpO2 PR' in the 'Adult' mode).