TetraGraph Connectivity Solutions

Mindray BeneLink

TetraGraph® sets the standard for seamless integration in quantitative train-of-four (TOF) monitoring, offering unmatched connectivity across leading patient monitoring platforms. Designed to fit effortlessly into existing anesthesia workflows, its advanced interface ensures real-time, reliable data transmission, enhancing clinical decision-making and patient safety.

CONNECT

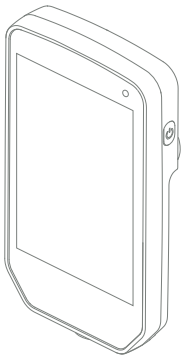
VIEW

TRANSFER

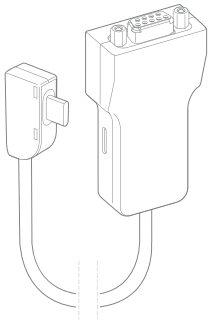
As the market leader in interoperability, TetraGraph provides hospitals and anesthesia providers with a future-ready solution that optimizes efficiency and standardizes neuromuscular monitoring across diverse healthcare environments. With a strong focus on flexibility and ease of integration, it connects with a wide range of monitoring systems, eliminating barriers to adoption and streamlining implementation. By connecting through TetraHub™, Senzime empowers clinicians with the tools they need to enhance perioperative care.

Required parts from Senzime

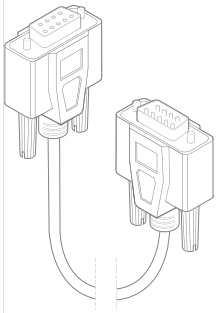
SEN2015
TetraGraph



SEN2017 TetraHub (use with Next-Generation TetraGraph)

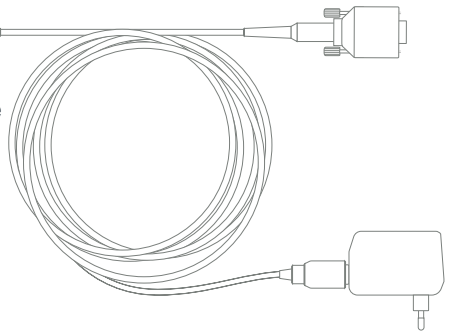


SEN2017*
includes a DB9 extension cable



Or

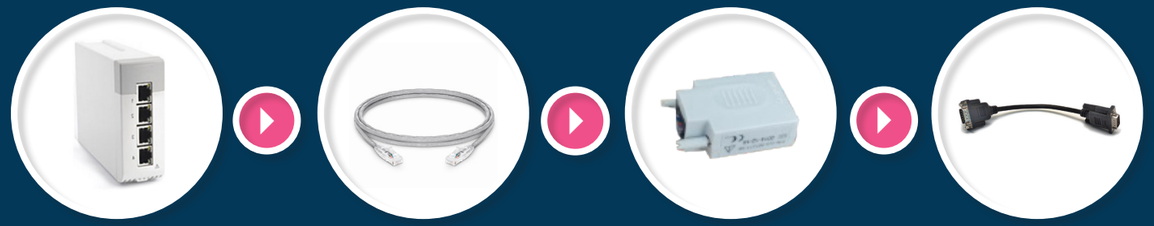
SEN2010
Xcom Cable (use with TetraGraph Classic)



SENZIME

Required Parts from Mindrays

- A BeneLink module (Mindray's hub)
- An RJ45 connecting cable (from Mindray part no 047-004857-00)
- An ID adapter (from Mindray part no 115-007277-00) – configured with ID 5447ABB9
- A "Type C" serial port adapting cable (from Mindray Part no 009-001769-00)



BeneLink module (Mindray's hub) | Mindray RJ45 Cable | Mindray ID Adapter | Mindray Type C" serial port adapting cable

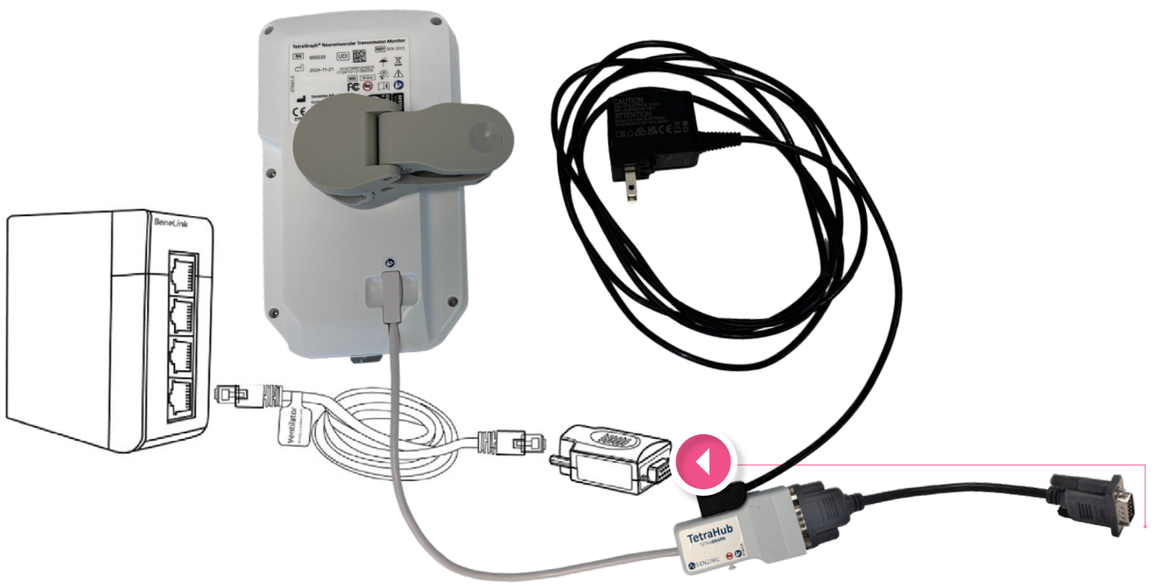
Software versions needed are:

Benelink module	V02.26.00.01
N series of monitor	CFDA: V06.52.00.01 CE: V02.52.00.01
eGateway (Not necessarily involved)	V7.18.00.011
CMS (Not necessarily involved)	V08.01.00.01

Setting Up

Connecting TetraHub to TetraGraph and external monitor/hub

1. Connect one end of the RJ45 connecting cable to the BeneLink module.
2. Connect the other end of the RJ45 connecting cable to the ID adapter.
3. Connect one end of the serial port adapting cable to the ID adapter.
4. Connect the other end of the serial port adaper cable to the TetraHub if using Next-Generation TetraGraph and connect the USB connector of the TetraHub to the TetraGraph. Do not forget to connect the power cable to the TetraHub.
5. If using TetraGraph Classic, connect the other end of the serial port adapter cable to the TetraGraph Xcom and the DIN connector to the TetraGraph. Do not forget to connect the power cable of the Xcom cable to the power outlet.
6. If using Next-Generation TetraGraph, ensure Communication Setting is set to "General".
7. Mindray installations team or the hospital IT team are responsible for ensuring the connection of the Mindray BeneLink at the customer site.



When the TetraGraph monitor is connected to the Mindray BeneLink via TetraHub or the Xcom cable, the following data is transmitted to the external device:

- TetraGraph monitor identification (Serial number and software version)
- Pulse information
- Measurement and status flags
- TOF, PTC, and ST results
- Individual peak-to-peak amplitudes
- EMG waveforms

Operation

Consult the user manuals for the TetraGraph monitor and any connected external devices for device-specific handling and instructions for use.

Starting measurement sessions

1. Turn ON the TetraGraph monitor.
2. Settings > Device > Communication > General.
3. Check that the external monitor indication symbol is displayed in the information bar on TetraGraph.

4. Connect the patient to the system.
5. Start TOF measurements.
6. The external hub or monitor will start displaying information from the TetraGraph monitor.

Finishing measurement sessions

Consult the user manual for the corresponding external hub or monitor to shut down the device.

Consult the IFU for the TetraGraph monitor to shut down the device.

Disconnect TetraHub from the power supply, the external hub or monitor, and the TetraGraph monitor. Proceed to clean and disinfect TetraHub.

Data Mapping

- A request is submitted by a stakeholder (e.g., MD, IT representative, Biomed, Anesthesia Manager) to the EMR/IT team.
- Three data fields should be added to the Anesthesia Chart: TOFr, TOFc, and PTC.

Key data points to consider for EMR integration. For a complete list, see the table below.

Paramater Label	Description	MDIL Text ID	Range	Unit
TOFrat	Train-of-four (TOF) ratio: the ratio between the first and the fourth TOF response	0002-f897	0–100	Percent
TOFcnt	Train-of-four (TOF) count: the number of TOF responses	0002-f8ab	0–4	Unitless
PTC	Post tetanic count (PTC): the number of responses following tetanic stimulation, used to assess deep levels of neuromuscular block	0002-f88b	0–20	Unitless

List of Labels

In the table below, all labels are provided with numeric codes from the Medical Device Interface Language (MDIL).

MDIL Text ID	Label	Unit of Measure	Display Range	Definition	Description
002-593c	EMG	Percent	0–120	"EMG"	Electromyography Low EMG
002-f8ab	TOFcnt	Unitless	0–4	"TOFcnt"	Train-of-four (TOF) count – Number of TOF responses
002-f897	TOFrat	Percent	0–120	"TOFrat"	Train-of-four (TOF) ratio – the ratio between the first and fourth TOF response
002-f88b	PTC	Unitless	0–20	"PTC"	Post Tetanic Count stimulation – PTC
002-f8ac	Twitch	mV	0–50	"Twitch"	Twitch height of the 1Hz/0. 1Hz stimulation response
002-f8a7	TOF1	mV	0–50	"TOF1"	Train-of-four (TOF) first response value
002-f8aa	TOF4	mV	0–50	"TOF4"	Train-of-four (TOF) fourth response value
002-f8a8	TOF2	mV	0–50	"TOF2"	Train-of-four (TOF) second response value
002-f8a9	TOF3	mV	0–50	"TOF3"	Train-of-four (TOF) third response value

Disclaimer:
All product names, logos, and brands are the property of their respective owners. Any reference to third-party products is for informational purposes only and does not imply endorsement or affiliation with Senzime.

For the full TetraHub Instructions for Use (IFU), visit:
senzime.com/instructions-use