

	SYLVAC SA	No. :	MEM-PM 292-1806-03
		Date :	14/12/202018
	Bluetooth Profile Recommendation For Use	Par :	rop
		Version :	B
		Statut:	Valide

Intended use:

This document highlights best practice for use of Sylvac Bluetooth low energy technology¹ enabled products.

To the attention of:

Developers who want to integrate Sylvac Bluetooth® instruments to custom apps or software solutions

Table of Contents

Timing parameters.....	2
Advertisement parameters.....	2
Connection parameters	2
Encryption, Pairing and Bonding.....	3
State Diagram	4
Profile: SIMPLE	4
Profile: PAIR	5

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Timing parameters

Sylvac has defined connection and advertisement parameters to get the best tradeoff between data rate, current consumption and reconnection delay

Advertisement parameters

Advertisement depends on 2 different parameters:

- Adv. interval: Idle time between two succeeding advertisement packets
- Adv. timeout: Advertisement time duration

These parameters are defined within the instrument. Sylvac devices use three distinct sets of advertisement parameters which are used in different cases

Mode	Interval (s)	Timeout (s)	Remark
Adv for connection/pairing	0.1	180	Need to be manually restarted
Adv for reconnection (phase 1, fast)	0.1	180	Followed by phase 2
Adv for reconnection (phase 2, idle)	7	∞	Optional for "SIMPLE" profile Return to phase 1 in case of probe movement

Connection parameters

A *Bluetooth*® low energy link uses three timing parameters to define a connection

- Connection interval: Idle time between two connection events
- Connection timeout: Timeout value for the connection
- Slave latency: Nb of successive connection events that the slave is not required to respond

The peer device operating in the central role (master) defines the connection parameters to use for each connection; however, the peripheral (slave) device may request the peer device to change these to more favourable parameters.

Recommended connection parameters (initiated by master)

Mode	Interval min/max (ms)	Timeout (s)	Slave latency
Active mode	120/140	1	0

Sylvac instruments will request timing parameters change in the cases below

Case	Interval min/max (ms)	Timeout (s)	Slave latency
Initial conn. faster than 40ms	40/60	0.5	0
ECO mode enabled	150/170	2	2
Standby mode ²	300/320	2	0

Note: Changing timing parameters takes about seven connection intervals (e.g. ~2.1s to get out of standby). The 20ms between min and max interval is due to the master capabilities (BLED112 up to 8 slaves).

² Device in standby mode is still connected and can be waked up by master

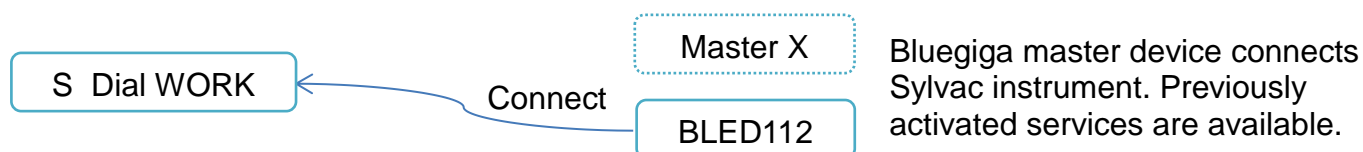
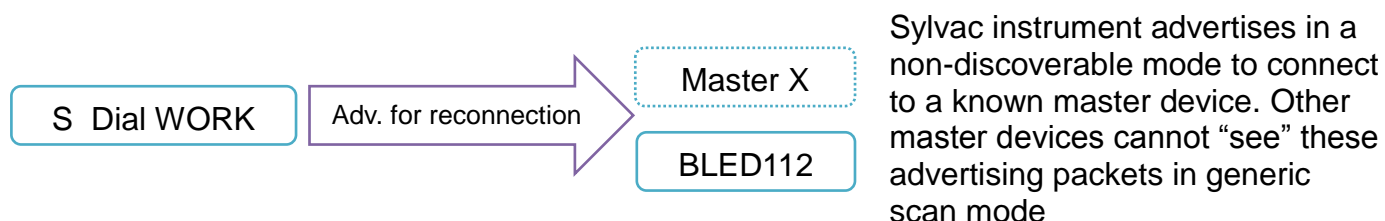
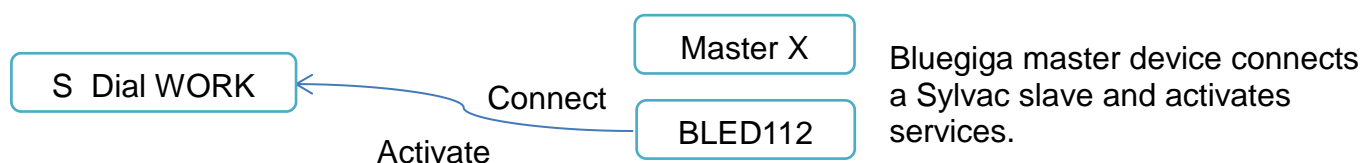
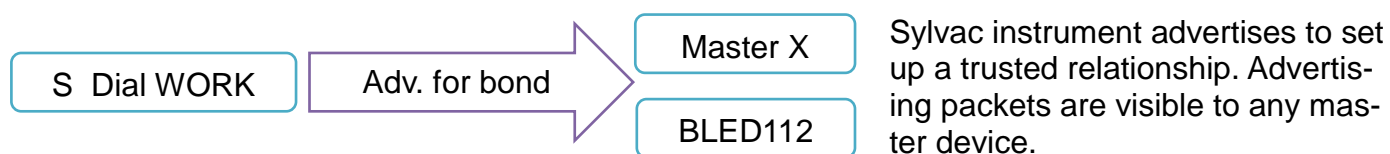
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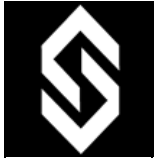
Encryption, Pairing and Bonding

Pairing is part of the link encryption process, which may happen without bonding. Bonding is the long-term storage of encryption info (particularly keys) so that the devices “know” each other and can easily reconnect in an encrypted way.

Sylvac’s instruments loaded with “PAIR” profile will use bonding and encryption to enable long term key storage. The instruments can then be reconnected faster and the master doesn’t need to do a complete service discovery procedure to set up the connection each time they reconnect.

The pairing information (stored in Sylvac *Bluetooth®* instruments) will make sure that the instruments only connect to a known master device. To connect with a new master device, the bonding information needs to be erased then a new bonding procedure can set up a new trusted data link.





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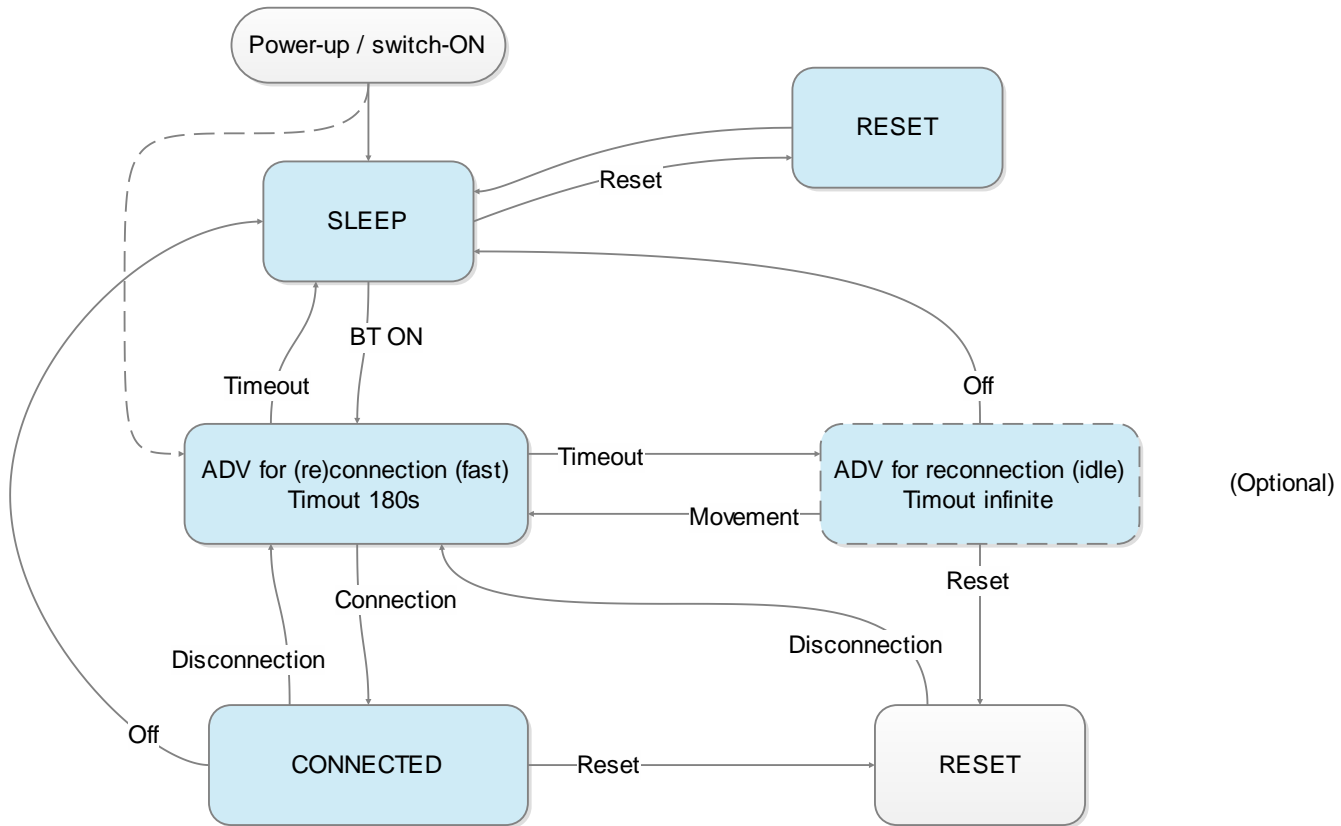
Par : rop

Version : B

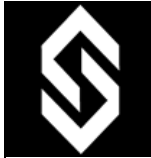
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State Diagram

Profile: SIMPLE



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