

Remote Implementation Example

for RWC5020A FW V1.172 or later
and RWC5020B

LoRa End Device
Radiated RF Performance
EU V1.1

RedwoodComm



Initialization

CONFIGURATION - GENERAL

CONFIGURATION - PROTOCOL

CONFIGURATION - RF

Activation

TX Measurements

POWER MEASUREMENT – [Part 1] 3D Pattern for MaxEIRP

Method 1

Method 2

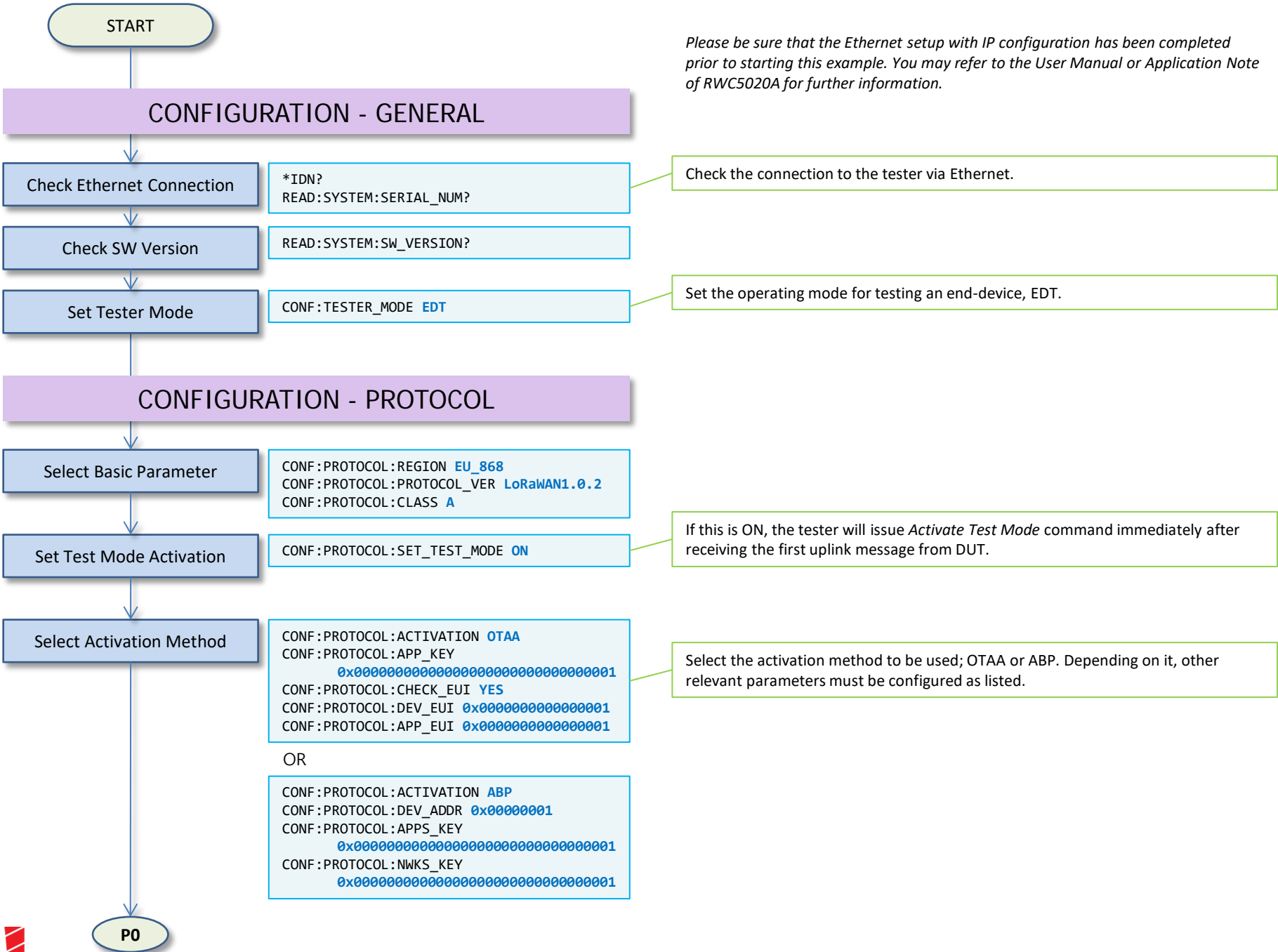
POWER MEASUREMENT – [Part 2] Meas. at Best Position for Non MaxEIRP

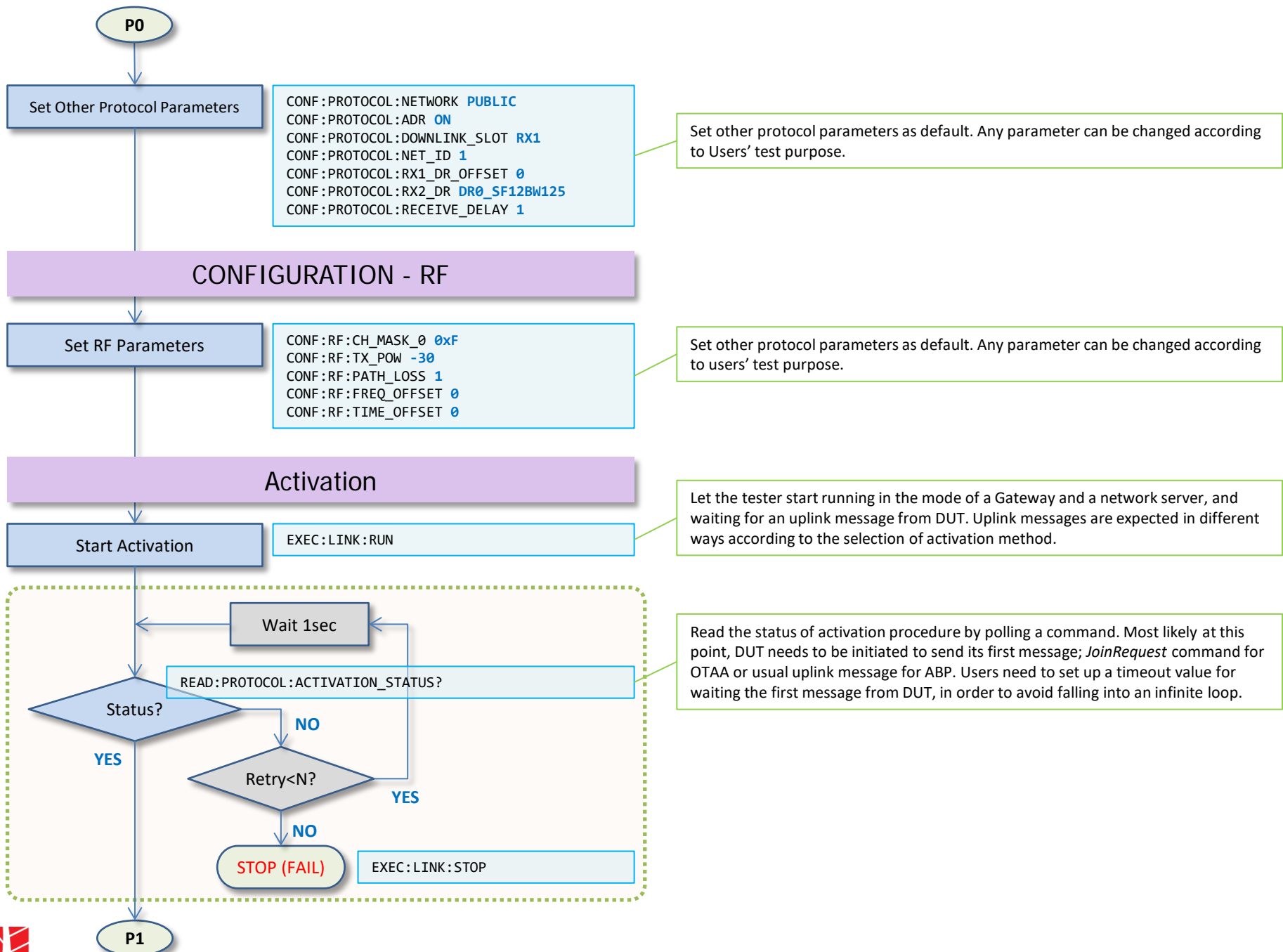
RX Measurements

RX SENSITIVITY MEASUREMENT – RX1 Window

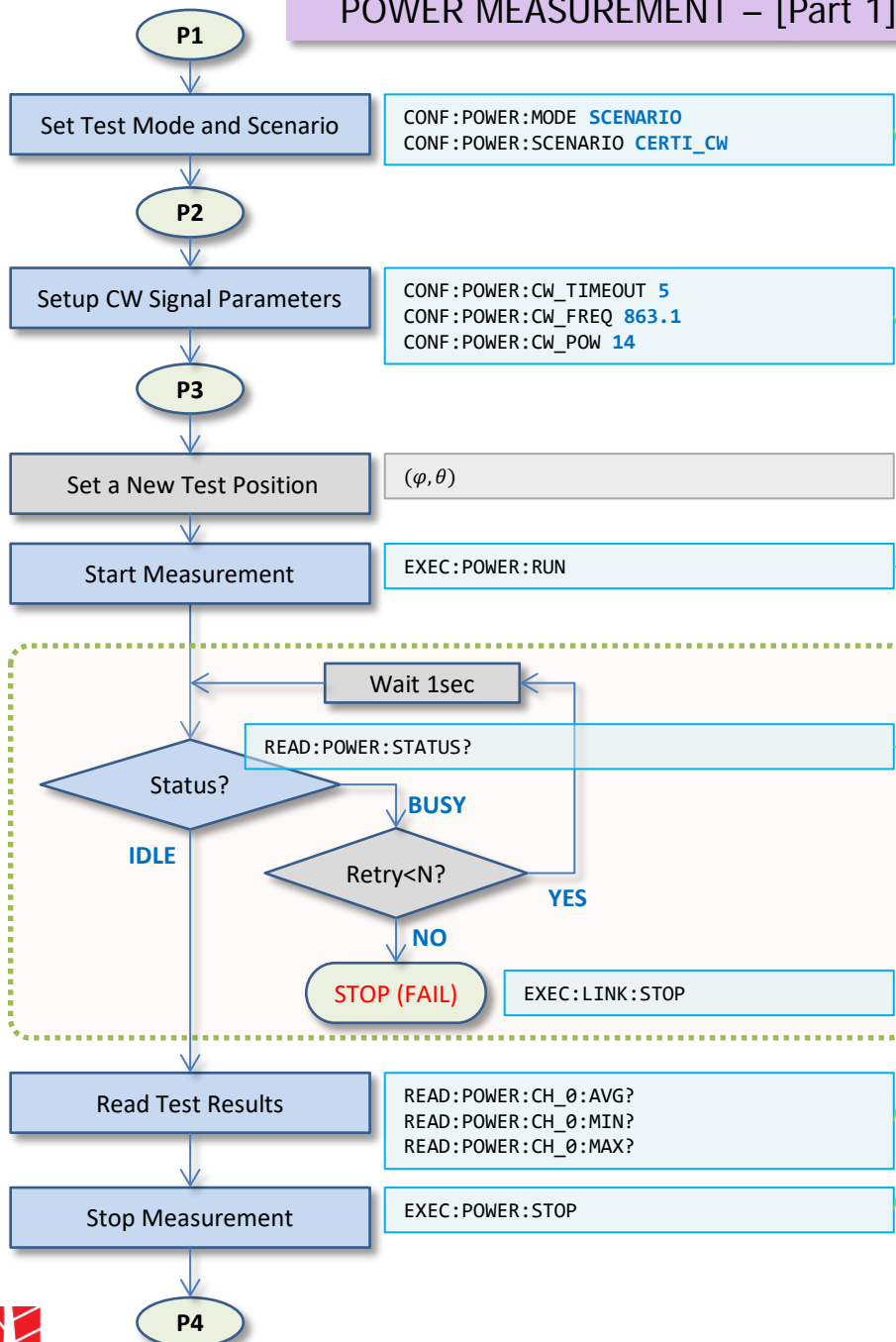
RX SENSITIVITY MEASUREMENT – RX2 Window

Please be sure that the Ethernet setup with IP configuration has been completed prior to starting this example. You may refer to the User Manual or Application Note of RWCS020A for further information.





POWER MEASUREMENT – [Part 1] 3D Pattern for MaxEIRP : Method 1



We propose two different methods in implementing measurement of 3D pattern of TX power;

- 1) Method 1 – issue a *EnableCWMode* command at each position of DUT and the tester measure the power.
- 2) Method 2 – issue a *EnableCWMode* command once to force DUT to send CW signal for a long time until full 3D measurement completes and the tester will measure the power at each position.

Set the power measurement mode to SENARIO and set SENARIO to CERTI_CW, in which the tester will force DUT to transmit CW signal for specified timeout and measure the power of CW signal.

These are parameters for *EnableCWMode* command. The power must be MaxEIRP for 3D pattern measurement.

Start the TX power measurement.

Wait until the TX power measurement finishes by checking its status. Users need to stop checking after CW timeout expires, in order to avoid falling into an infinite loop.

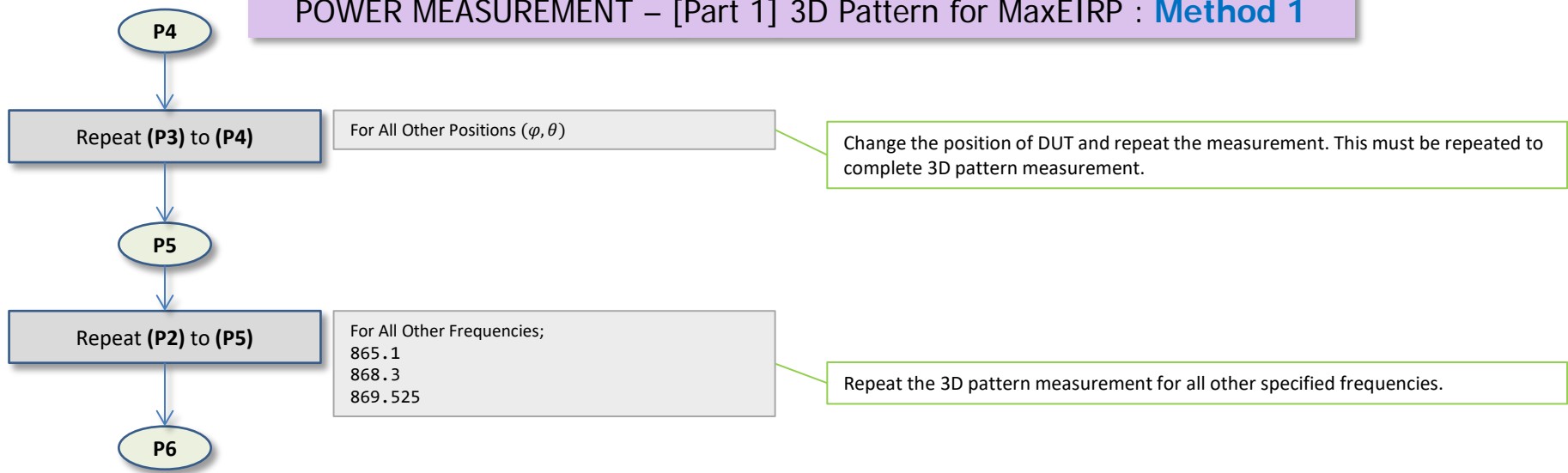
Read the result values for the current position.

Stop the TX power measurement.

3D Pattern for MaxEIRP – Method 1

Test	Configuration			Channels			
	Data rate	Tx Power revA (LW1.0.1)	Tx Power revB (LW1.0.2)	863.1 MHz	865.1 MHz	868.3 MHz	869.525 MHz
TRP / 15° step	SF12	1 (14 dBm)	0 (MaxEIRP)	x	x	x	x
EIRP/ERP 1 measurement Best position	SF12	3 (8 dBm)	3 (MaxEIRP - 6 dB)	x	x	x	-
EIRP/ERP 1 measurement Best position	SF12	5 (2 dBm)	6 (MaxEIRP - 12 dB)	x	x	x	-

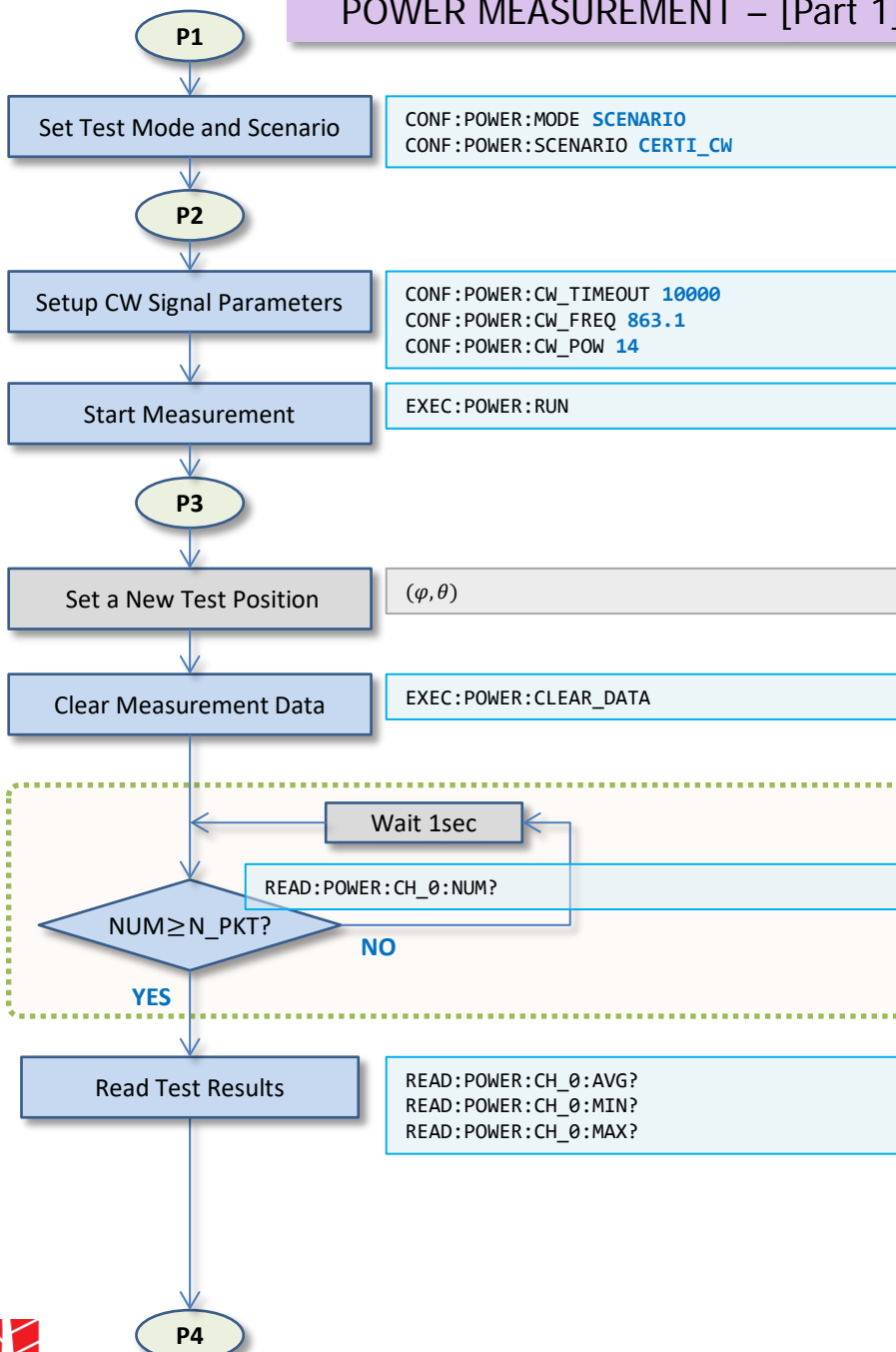
POWER MEASUREMENT – [Part 1] 3D Pattern for MaxEIRP : Method 1



3D Pattern for MaxEIRP – Method 1

Test	Configuration			Channels			
	Data rate	Tx Power revA (LW1.0.1)	Tx Power revB (LW1.0.2)	863.1 MHz	865.1 MHz	868.3 MHz	869.525 MHz
TRP / 15° step	SF12	1 (14 dBm)	0 (MaxEIRP)	x	x	x	x
EIRP/ERP 1 measurement Best position	SF12	3 (8 dBm)	3 (MaxEIRP - 6 dB)	x	x	x	-
EIRP/ERP 1 measurement Best position	SF12	5 (2 dBm)	6 (MaxEIRP - 12 dB)	x	x	x	-

POWER MEASUREMENT – [Part 1] 3D Pattern for MaxEIRP : Method 2



We propose two different methods in implementing measurement of 3D pattern of TX power;

- 1) Method 1 – issue a *EnableCWMode* command at each position of DUT and the tester measure the power.
- 2) Method 2 – issue a *EnableCWMode* command once to force DUT to send CW signal for a long time until full 3D measurement completes and the tester will measure the power at each position.

Set the power measurement mode to SENARIO and set SENARIO to CERTI_CW, in which the tester will force DUT to transmit CW signal for specified timeout and measure the power of CW signal.

These are parameters for *EnableCWMode* command. The CW TIMEOUT value must be estimated properly to consider the time required for measurement of all test positions. The power must be MaxEIRP for 3D pattern measurement.

Start the TX power measurement.

Clear the previous data for the next measurement.

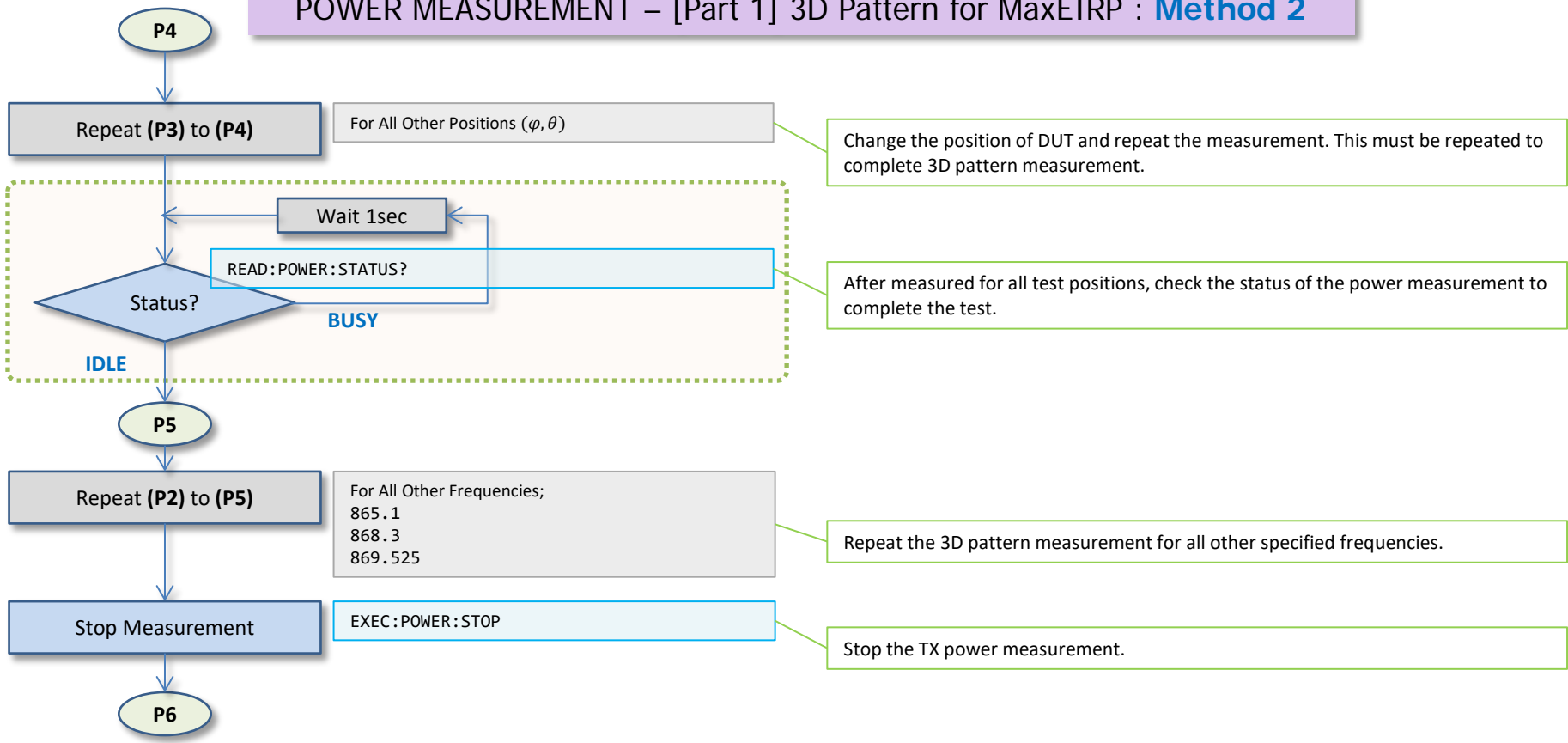
Check if the measurement data is ready for reading; read the number of packets received and compare with N_PKT, which means how many times the power will be measured at the current position, defined by users.

Read the result values for the current position.

3D Pattern for MaxEIRP – Method 2

Test	Configuration			Channels			
	Data rate	Tx Power revA (LW1.0.1)	Tx Power revB (LW1.0.2)	863.1 MHz	865.1 MHz	868.3 MHz	869.525 MHz
TRP / 15° step	SF12	1 (14 dBm)	0 (MaxEIRP)	x	x	x	x
EIRP/ERP 1 measurement Best position	SF12	3 (8 dBm)	3 (MaxEIRP - 6 dB)	x	x	x	-
EIRP/ERP 1 measurement Best position	SF12	5 (2 dBm)	6 (MaxEIRP - 12 dB)	x	x	x	-

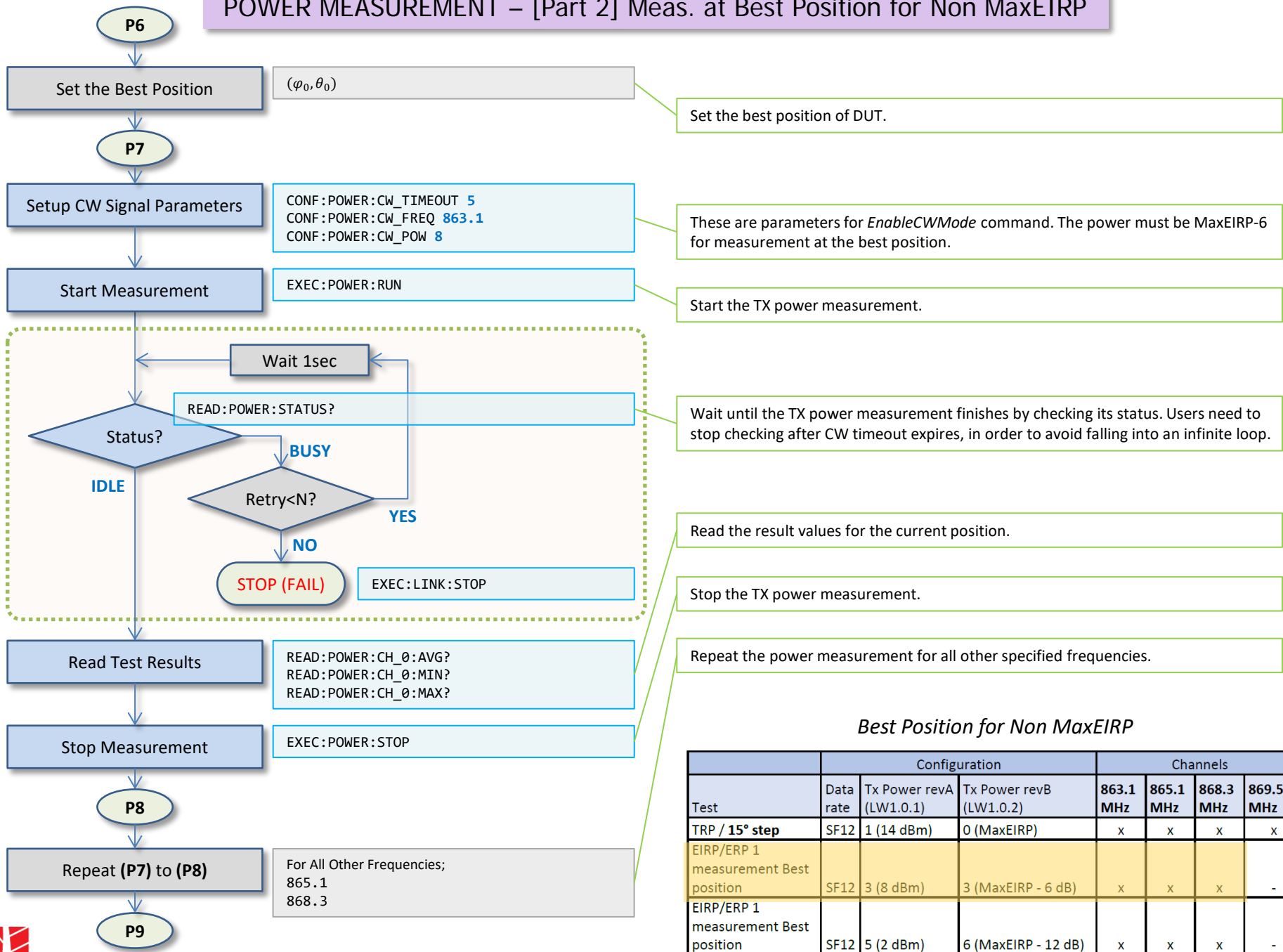
POWER MEASUREMENT – [Part 1] 3D Pattern for MaxEIRP : Method 2



3D Pattern for MaxEIRP – Method 2

Test	Configuration			Channels			
	Data rate	Tx Power revA (LW1.0.1)	Tx Power revB (LW1.0.2)	863.1 MHz	865.1 MHz	868.3 MHz	869.525 MHz
TRP / 15° step	SF12	1 (14 dBm)	0 (MaxEIRP)	x	x	x	x
EIRP/ERP 1 measurement Best position	SF12	3 (8 dBm)	3 (MaxEIRP - 6 dB)	x	x	x	-
EIRP/ERP 1 measurement Best position	SF12	5 (2 dBm)	6 (MaxEIRP - 12 dB)	x	x	x	-

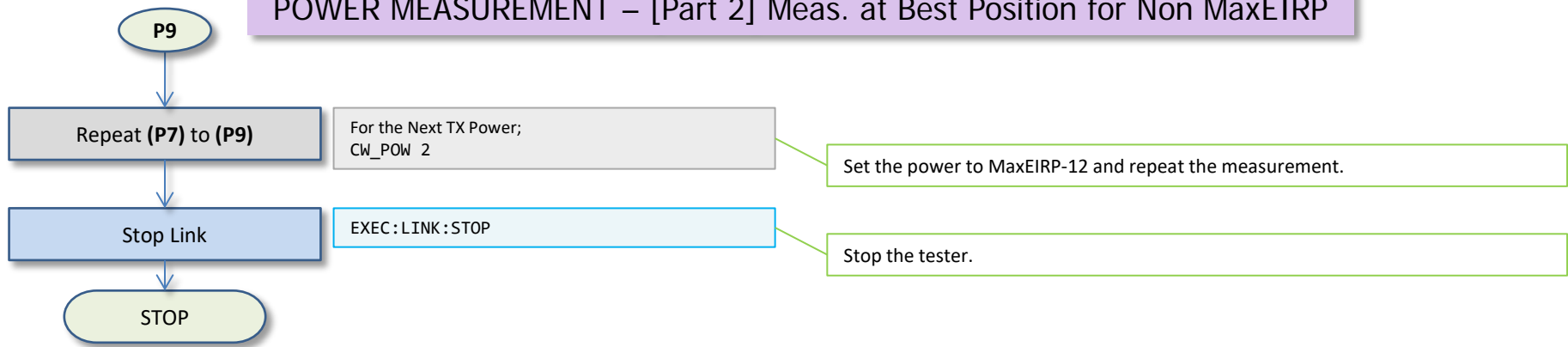
POWER MEASUREMENT – [Part 2] Meas. at Best Position for Non MaxEIRP



Best Position for Non MaxEIRP

Test	Configuration			Channels			
	Data rate	Tx Power revA (LW1.0.1)	Tx Power revB (LW1.0.2)	863.1 MHz	865.1 MHz	868.3 MHz	869.525 MHz
TRP / 15° step	SF12	1 (14 dBm)	0 (MaxEIRP)	x	x	x	x
EIRP/ERP 1 measurement Best position	SF12	3 (8 dBm)	3 (MaxEIRP - 6 dB)	x	x	x	-
EIRP/ERP 1 measurement Best position	SF12	5 (2 dBm)	6 (MaxEIRP - 12 dB)	x	x	x	-

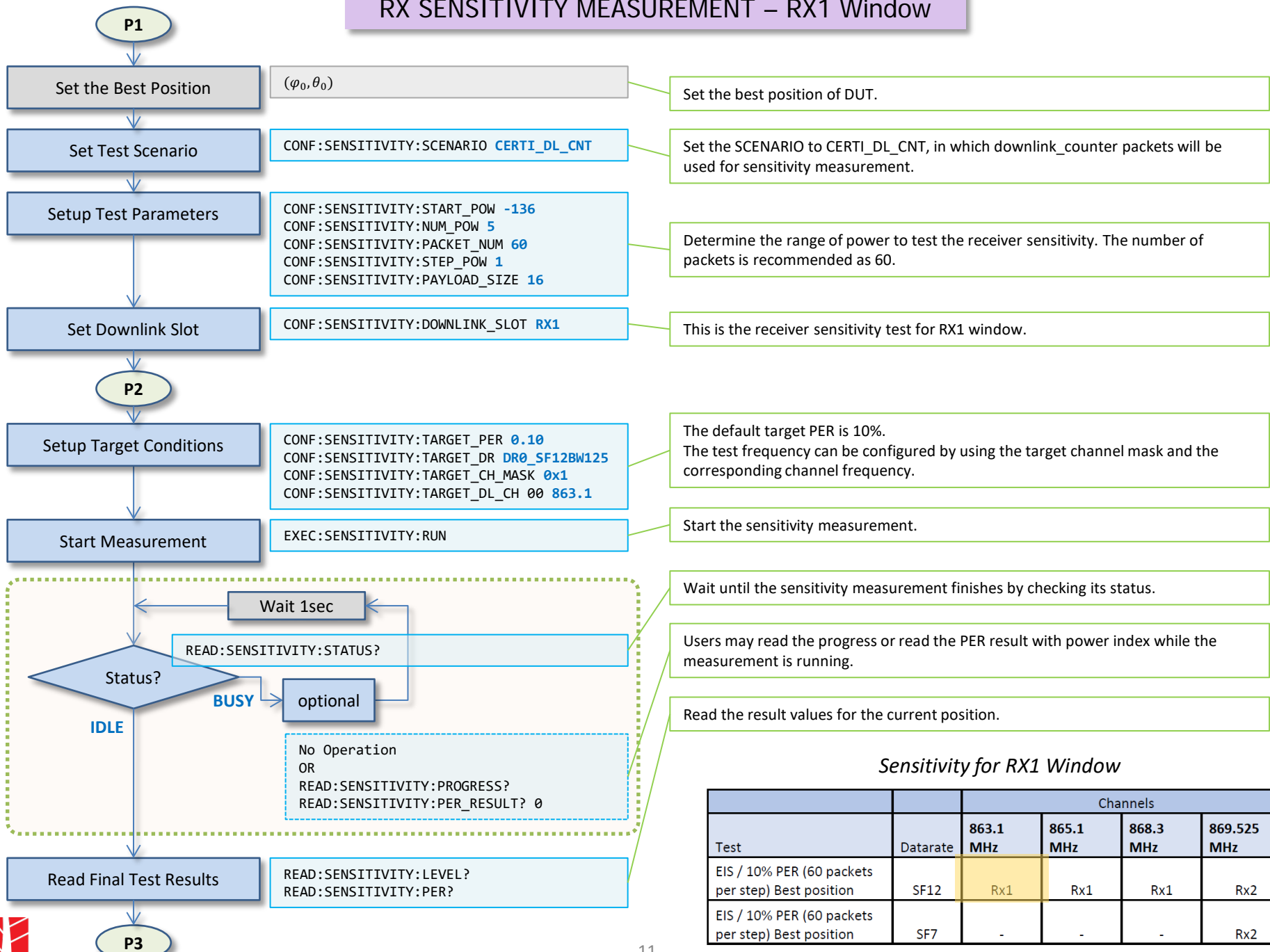
POWER MEASUREMENT – [Part 2] Meas. at Best Position for Non MaxEIRP



Best Position for Non MaxEIRP

Test	Configuration			Channels			
	Data rate	Tx Power revA (LW1.0.1)	Tx Power revB (LW1.0.2)	863.1 MHz	865.1 MHz	868.3 MHz	869.525 MHz
TRP / 15° step	SF12	1 (14 dBm)	0 (MaxEIRP)	x	x	x	x
EIRP/ERP 1 measurement Best position	SF12	3 (8 dBm)	3 (MaxEIRP - 6 dB)	x	x	x	-
EIRP/ERP 1 measurement Best position	SF12	5 (2 dBm)	6 (MaxEIRP - 12 dB)	x	x	x	-

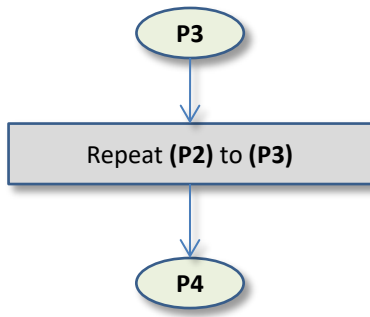
RX SENSITIVITY MEASUREMENT – RX1 Window



Sensitivity for RX1 Window

Test	Datarate	Channels			
		863.1 MHz	865.1 MHz	868.3 MHz	869.525 MHz
EIS / 10% PER (60 packets per step) Best position	SF12	Rx1	Rx1	Rx1	Rx2
EIS / 10% PER (60 packets per step) Best position	SF7	-	-	-	Rx2

RX SENSITIVITY MEASUREMENT – RX1 Window



For All Other Frequencies;
865.1
868.3

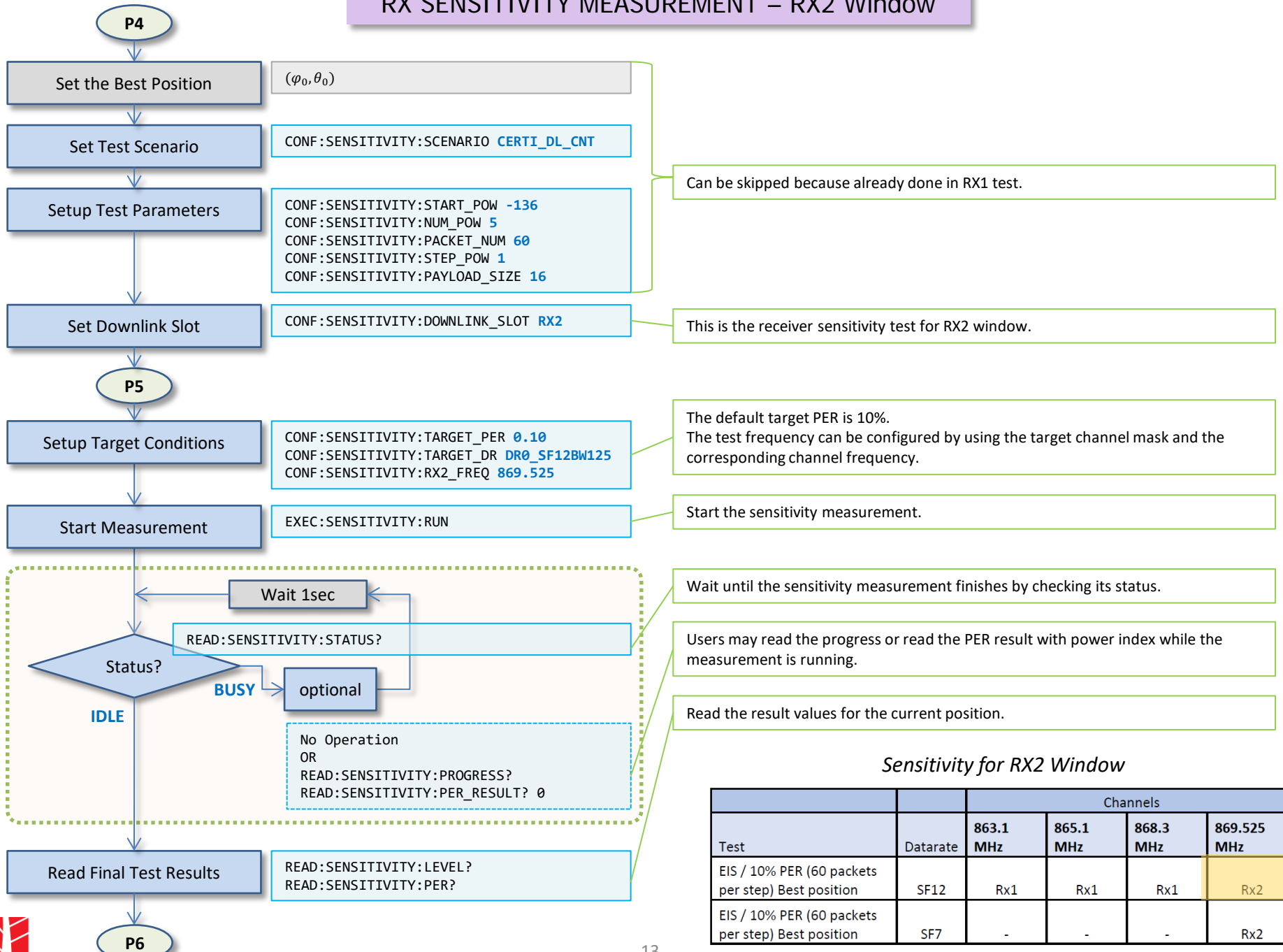
Repeat the sensitivity measurement for all other specified frequencies.

The sensitivity measurement automatically ends after the sensitivity level is found at which the PER exceeds the target PER or all the power values in the range are tested.

Sensitivity for RX1 Window

Test	Datarate	Channels			
		863.1 MHz	865.1 MHz	868.3 MHz	869.525 MHz
EIS / 10% PER (60 packets per step) Best position	SF12	Rx1	Rx1	Rx1	Rx2
EIS / 10% PER (60 packets per step) Best position	SF7	-	-	-	Rx2

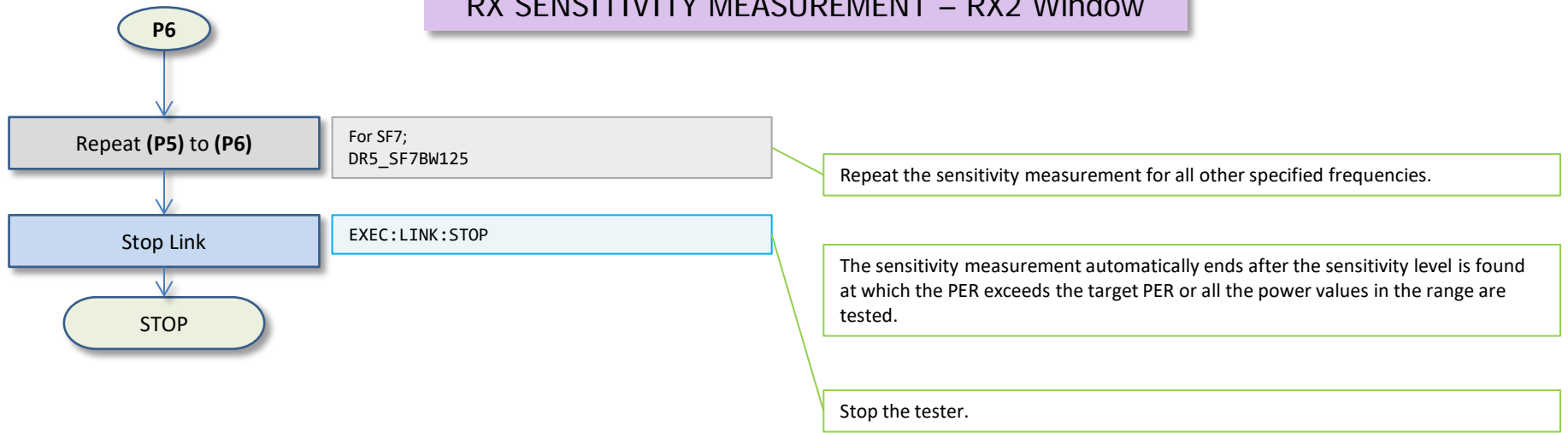
RX SENSITIVITY MEASUREMENT – RX2 Window



Sensitivity for RX2 Window

Test	Datarate	Channels			
		863.1 MHz	865.1 MHz	868.3 MHz	869.525 MHz
EIS / 10% PER (60 packets per step) Best position	SF12	Rx1	Rx1	Rx1	Rx2
EIS / 10% PER (60 packets per step) Best position	SF7	-	-	-	Rx2

RX SENSITIVITY MEASUREMENT – RX2 Window



Sensitivity for RX2 Window

Test	Datarate	Channels			
		863.1 MHz	865.1 MHz	868.3 MHz	869.525 MHz
EIS / 10% PER (60 packets per step) Best position	SF12	Rx1	Rx1	Rx1	Rx2
EIS / 10% PER (60 packets per step) Best position	SF7	-	-	-	Rx2