

DIN EN 16603-50-02:2014-12 (E)

Space engineering - Ranging and Doppler tracking; English version EN 16603-50-02:2014

Contents	Page
Foreword	4
Introduction	5
1 Scope	6
2 Normative references	7
3 Terms, definitions and abbreviated terms	8
3.1 Terms from other standards.....	8
3.2 Terms specific to the present standard	8
3.3 Abbreviated terms.....	8
4 Requirements	10
4.1 Functional.....	10
4.1.1 Functional breakdown	10
4.1.2 Earth-to-Space link function	12
4.1.3 Transponder function	12
4.1.4 Space-to-Earth link function	13
4.1.5 Link control function	14
4.1.6 Data acquisition function	14
4.2 Frequency assignment, modulation and spectral sharing.....	15
4.2.1 Frequency assignment.....	15
4.2.2 Modulation	16
4.2.3 Spectral sharing	18
4.3 Carrier frequency stability	22
4.4 Earth station	24
4.4.1 Earth-to-Space link.....	24
4.4.2 Space-to-Earth link.....	25
4.5 Spacecraft transponder	27
4.5.1 General	27
4.5.2 Range and range rate operations.....	27
4.5.3 Range only operations	28
4.5.4 Group delay	28

4.5.5	Telemetered monitoring	29
4.5.6	Amplitude response	29
4.5.7	Phase modulation	30
4.5.8	Baseband automatic gain control (AGC)	30
4.5.9	Modulation index	30
4.5.10	Ranging technological loss.....	30
4.6	Performance	31
4.6.1	Overview	31
4.6.2	Integrated Doppler performance.....	31
4.6.3	Ranging performance.....	32
4.6.4	Ancillary measurements	33
5	Compatibility testing	35
5.1	General.....	35
5.2	Tests.....	35
Annex A (informative) Compatibility with other ground stations networks		37
Annex B (informative) Transponder ranging technological loss		39
Annex C (informative) Integrated Doppler measurement		40
Bibliography.....		42

Figures

Figure 4-1:	Ranging and Doppler tracking: functional block diagram	11
Figure 4-2:	Ranging signal spectrum for code length = 2^0	18
Figure 4-3:	Ranging signal spectrum for code length = 2^2	19
Figure 4-4:	Ranging signal spectrum for code length = 2^4	19
Figure 4-5:	Ranging signal spectrum for code length = 2^{12}	20
Figure 4-6:	Carrier frequency stability requirements	23
Figure C-1 :	Integrated Doppler measurement	41