

**Technical Requirements on Regional Data Collection Platform
for using the Data Collection System of the Himawari series of satellite
(Himawari-DCS)**

Japan Meteorological Agency
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1 Method of data collection

Data Collection System of **Himawari series** of satellite (**Himawari-DCS**) will collect data transmitted by self-timed regional Data Collection Platforms (DCPs).

2 Time slot

The time slot for a DCP will be allocated by the Japan Meteorological Agency (JMA).

3 Duration of transmission

Maximum duration of transmission is one minute.

4 Radio frequency channel

Data should be transmitted at a radio frequency channel, assigned by the JMA, within the radio frequency band from 402.0685 to 402.4000 MHz (100 bps) and 402.1 to 402.4 MHz (300 bps).

5 Frequency stability

5.1 Long-term stability

The stability of transmitted carrier frequency under assumed circumstances should be less than 1.5 parts per million over a period of one year.

5.2 Phase jitter

The phase jitter on the transmitted carrier should be less than three degrees (RMS).

6 Radiated power

The Equivalent Isotropic Radiated Power (EIRP) under assumed conditions should be kept within the range of 43 dBm to 46 dBm for 100 bps or 45 dBm to 48 dBm for 300 bps over a period of one year.

7 Polarization

The transmitted radio wave from the DCP should be polarized right-hand circular (electric field vector rotates clockwise as seen facing to the propagating direction).

8 Data transmission speed

The data transmission speed from the DCP should be at the rate of 100 ± 0.005 bps or 300 ± 0.005 bps.

9 Radio signal bandwidth

The radio signal bandwidth should be within 1.8 kHz for 100 bps and 300 bps.

10 Spurious emission

The spurious emission should be under the level to meet relevant provisions of the Radio Regulations of the International Telecommunication Convention and the radio regulations of the country where the DCP will be installed and operated.

11 Modulation

Modulation should be PCM-PSK, and the modulation index should be ± 60 degrees. The input signal for modulation of the carrier should be NRZ-L and Manchester-coded (see Figure 1).

12 Timing accuracy

The timing accuracy of the DCP under assumed conditions should be within ± 15 seconds over a period of one year.

13 Data format

The format of the data fed to the radio set of the DCP should be as follows.

Unmodulated carrier	Bit preamble	Sync word	DCP address	Meteorological /tidal(tsunami) data (text)	EOT
5 seconds	250 bits (100 bps) 450 bits (300 bps)	15 bits	31 bits		8 bits

13.1 Unmodulated carrier

The unmodulated carrier is used in order that the demodulator at the Meteorological Satellite Center (MSC) of JMA can be locked to the carrier signal. The unmodulated carrier should be five seconds long.

13.2 Bit preamble

The bit preamble is a sequence of alternate “1” and “0” bits used for bit synchronization, and should be 250 bits long at 100 bps or 450 bits long at 300 bps.

13.3 Synchronization word

The synchronization word is a bit sequence of MLS. The following bit pattern should be transmitted in the order from bit 1 (b₁) to bit 15 (b₁₅).

1 0 0 0 1 0 0 1 1 0 1 0 1 1 1
(b₁) (b₁₅)

13.4 DCP address

The DCP address is a code to identify the DCP when MSC processes incoming DCP data, and will be allocated by the JMA. The DCP address is a sequence of 31 bits shown below, and should be transmitted from bit 1 (b₁) to bit 31 (b₃₁).

Example:

(1) | (2) | (3) | (4) | (5) | (6)
0 0 0 | 0 0 | 0 1 0 | 0 0 0 1 | 0 0 0 1 1 1 1 0 1 | 0 1 1 0 0 0 0 0 0 0
(b₁) (b₃₁)

Notes:

- (1) should be 000
- (2) should be 00

- (3) designates the type of DCP
- (4) the WMO code form used for the report of data
- (5) serial number of DCP
- (6) BCH check bits

13.5 Data

The data should consist of 8-bit words (with odd parity) using the characters in the International Alphabet No.5 (see Table 1). One report should consist of a maximum of 649 words (at 100 bps) or 1999 words (at 300 bps).

The data should be transmitted in the order starting from LBS (bit 1), while MSB (bit 8) should be the parity bit.

The data should be described in one of the following WMO code forms described in the “Manual on Codes VOLUME I.1 - Part A” (WMO-No. 306), following the examples of the text part of the meteorological message formats described 1.(b), 2.(b) and 3.(b) in the Attachment II-4 to the “Manual on the Global Telecommunication System”(WMO Publication No. 386).

FM12 (SYNOP)	Report of surface observation from a fixed land station
FM13 (SHIP)	Report of surface observation from a sea station
FM33 (PILOT SHIP)	Upper-wind report from a sea station
FM35 (TEMP)	Upper-level pressure, temperature, humidity and wind report from a fixed land station
FM36 (TEMP SHIP)	Upper-level pressure, temperature, humidity and wind report from a sea station
FM62 (TRACKOB)	Report of a marine surface observation along a ship’s track
FM63 (BATHY)	Report of bathythermal observation
FM64 (TESAC)	Temperature, salinity and current report from a sea station

(See WMO’s website, for WMO-No. 306:

http://www.wmo.int/pages/prog/www/WMOCodes/Manual/WMO306_Vol-I-1-PartA.pdf,
and for WMO Publication No. 386:

http://www.wmo.int/pages/prog/www/ois/Operational_Information/Publications/WMO_386/WMO_386_Vol_I_2009_en.pdf)

13.6 EOT

The EOT code is an 8-bit code which designates the end of transmission of a report. The following pattern should be transmitted from the bit 1 (b₁).

0 0 1 0 0 0 0 0
(b₁) (b₈)

An EOT code longer than 8 bits is acceptable, provided that the first 8 bits of the EOT code are identical to the above.

13.7 Use of a special message format

If the applicant cannot use one of the WMO code forms and/or follow the examples of the text part of the meteorological message formats described in subparagraph 13.5 above in the reports from the DCP, the applicant should ask for JMA's consent on the use of a special message format, by submitting the application form with necessary item(s) filled in, with a detailed attachment.

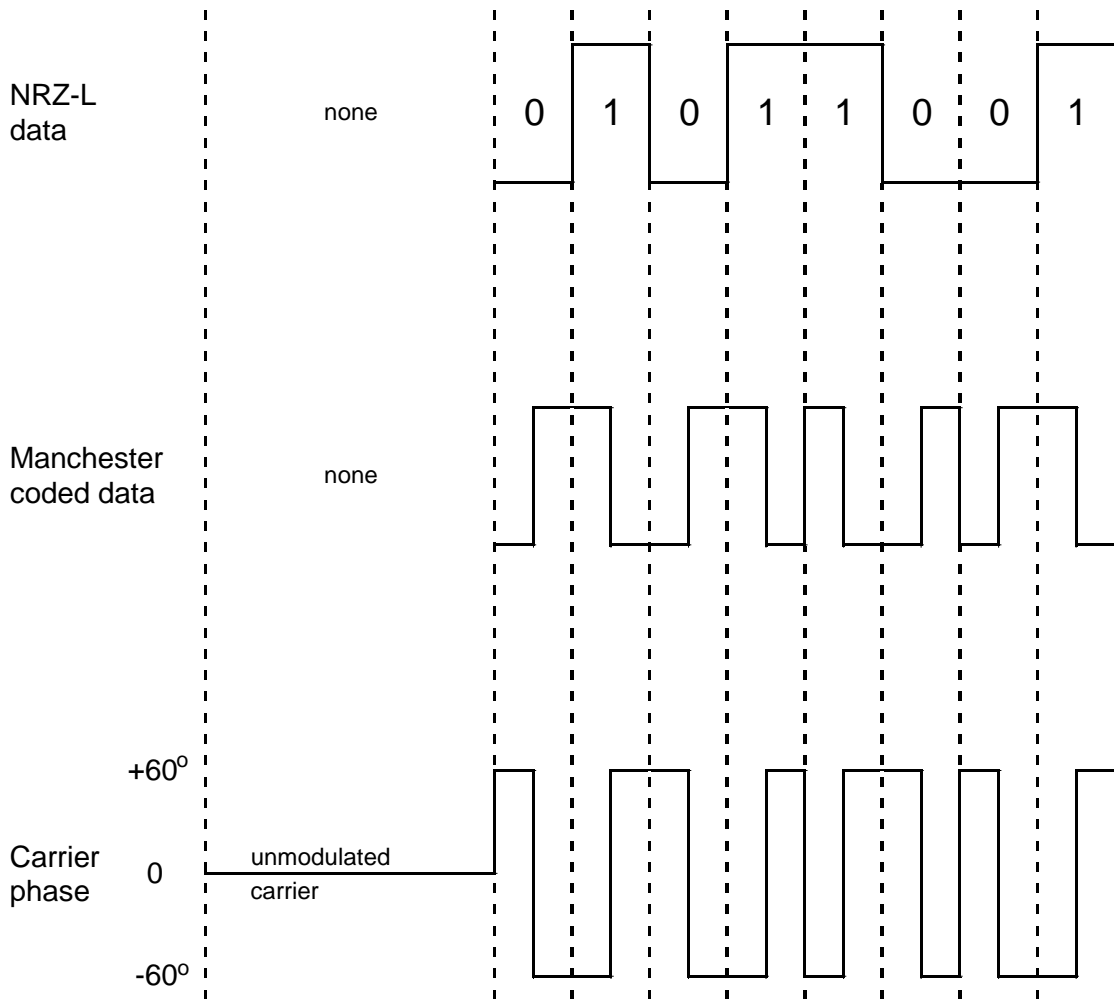


Figure 1 Definition of the modulation

					b ₇	0	0	0	0	1	1	1	1
					b ₆	0	0	1	1	0	0	1	1
					b ₅	0	1	0	1	0	1	0	1
						0	1	2	3	4	5	6	7
b ₄	b ₃	b ₂	b ₁										
0	0	0	0	0				SP	0		P		
0	0	0	1	1					1	A	Q		
0	0	1	0	2					2	B	R		
0	0	1	1	3					3	C	S		
0	1	0	0	4	E	O	T		4	D	T		
0	1	0	1	5					5	E	U		
0	1	1	0	6					6	F	V		
0	1	1	1	7				'	7	G	W		
1	0	0	0	8				(8	H	X		
1	0	0	1	9)	9	I	Y		
1	0	1	0	10	LF				:	J	Z		
1	0	1	1	11				+		K			
1	1	0	0	12				,		L			
1	1	0	1	13	CR			-	=	M			
1	1	1	0	14				.		N			
1	1	1	1	15				/	?	O			

Table 1 International Alphabet No. 5