Package 'synopR'

March 18, 2026

Title Tidy Decoding of SYNOP (Surface Synoptic Observations)
Meteorological Messages

Version 0.2.2

Description Decode raw SYNOP (surface synoptic observations) messages into
tidy data frames. Supports batch processing of messages from the same
station, extracting data from Sections 0, 1, and 3, including temperature,
dew point, pressure, wind, clouds, and precipitation. The decoding logic
follows the specifications defined in the World Meteorological
Organization (2019) ``Manual on Codes, Volume I.1 (WMO-No. 306)''
<https://library.wmo.int/idurl/4/35713>.

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Encoding UTF-8

RoxygenNote 7.3.3

Imports dplyr, stringr, tidyr, purrr

Suggests knitr, rmarkdown, testthat (>= 3.0.0)

URL https://ezequiel1593.github.io/synopR/

BugReports https://github.com/ezequiel1593/synopR/issues

VignetteBuilder knitr

NeedsCompilation no

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Depends R (>= 4.1.0)

Repository CRAN

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check_synop *Check SYNOP messages for structural integrity*

Description

Validates if SYNOP strings meet basic structural requirements, considering section indicators and 5-digit data groups.

Usage

```
check_synop(data)
```

Arguments

data A character vector of SYNOP strings or the exact data frame returned by `parse_ogimet()`.

Value

A tibble with validation results for each message.

Examples

```
msg <- paste0("AAXX 01123 87736 32965 13205 10214 20143 ",
              "30022 40113 5//// 80005 333 10236 20128=")
checked_synops <- check_synop(msg)
```

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parse_ogimet *Parse Ogimet strings into a data frame*

Description

Parse Ogimet strings into a data frame

Usage

```
parse_ogimet(ogimet_data)
```

Arguments

ogimet_data A character vector of Ogimet strings.

Value

A tibble with Year, Month, Day, Hour, and Raw_synop.

Examples

```
msg <- paste0("87736,2026,01,01,12,00,AAXX 01123 87736 32965 13205 10214 20143 ",
              "30022 40113 5//// 80005 333 10236 20128=")
parsed_data <- parse_ogimet(msg)
```

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show_synop_data	*Decode multiple SYNOP messages from a single station*

Description

This function decodes a vector or data frame column of raw SYNOP strings belonging to the same WMO station. It efficiently processes multiple observations at once, returning a tidy data frame.

Usage

```
show_synop_data(data, wmo_identifier = NULL, remove_empty_cols = FALSE)
```

Arguments

data	A character vector, or a data frame or tibble with one column containing raw SYNOP strings.
wmo_identifier	A 5-digit character string or integer representing the station WMO ID. If NULL (default), all messages are decoded.
remove_empty_cols	
	Logical. Should columns containing only NA values be removed?

Value

A tidy tibble where each row represents one observation time and each column a decoded meteorological variable.

1. wmo_id - WMO station identifier

2. Year - (from parse_ogimet())

3. Day - As informed by Section 0

4. Hour - As informed by Section 0

5. Cloud_base_height - Lowest cloud base height, not decoded

6. Visibility - Not decoded

7. Total_cloud_cover - In oktas, 9 means 'invisible' sky by fog or other phenomenon

8. Wind_direction - In tens of degree, 99 means 'variable wind direction'

9. Wind_speed

10. Wind_speed_unit - Either 'm/s' or 'knots'

11. Air_temperature - In degrees Celsius

12. Dew_point - In degrees Celsius

13. Relative_humidity - As a percentage

14. Station_pressure - In hPa

15. MSLP_GH - Mean sea level pressure (in hPa) or geopotential height (in gpm)

16. Present_weather - Not decoded

17. Past_weather1 - Not decoded

18. Past_weather2 - Not decoded

19. Precipitation_S1 - In mm

20. Precip_period_S1 - In hours ('Precipitation_S1' fell in the last 'Precip_period_S1' hours)

21. Cloud_amount_Nh - Cloud coverage from low or medium cloud, same as 'Total_cloud_cover'

22. Low_clouds_CL - Not decoded

23. Medium_clouds_CM - Not decoded

24. High_clouds_CH - Not decoded

25. Max_temperature - In degrees Celsius

26. Min_temperature - In degrees Celsius

27. Ground_state - Not decoded

28. Ground_temperature - Integer, in degrees Celsius

29. Snow_ground_state - Not decoded

30. Snow_depth - In cm, is assumed to be between 1 and 996 cm

31. Precipitation_S3 - In mm

32. Precip_period_S3 - In hours ('Precipitation_S3' fell in the last 'Precip_period_S3' hours)

Examples

```
msg <- paste0("AAXX 01123 87736 32965 13205 10214 20143 ",
              "30022 40113 5//// 80005 333 10236 20128 56000 81270=")
synop_df <- data.frame(messages = msg)
decoded_data <- show_synop_data(synop_df, "87736")
```

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